

**Preparatory Study on
Urban Environment Improvement
against COVID-19
(CUREIP)**

Final Report

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Japan International Cooperation Agency (JICA)

**ALMEC Corporation
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Table of Contents

1	Introduction	1-1
1.1	Background	1-1
1.2	Purpose	1-1
1.3	Implementation Structure	1-1
1.4	Target cities	1-3
1.4.1	Target Cities and Main Cities	1-3
1.4.2	General Situation of Target Cities	1-4
2	COVID-19 Pandemic in Cities in Developing Countries.....	2-1
2.1	COVID-19 Expansion and its Influence in Cities in Developing Countries	2-1
2.2	COVID-19 Infection Expansion in Cities	2-3
2.2.1	COVID-19 Infection by Country	2-3
2.2.2	COVID-19 Infection Status by City	2-5
2.3	Infection Prevention Measures	2-15
2.3.1	Methodology	2-15
2.3.2	Stay-at-home Requirement and Influence on Infection Expansion	2-15
2.3.3	Inter-city Travel Restrictions	2-22
2.3.4	Infection Prevention Measures on Public Transport	2-24
2.3.5	Testing Policy	2-29
2.3.6	Contact Tracing Smartphone Application	2-31
2.3.7	Infection Prevention Measures and Infection Status in Characteristic Cities	2-33
2.4	Actual Status and Issues of COVID-19 Infection	2-51
2.4.1	Analysis Perspective	2-51
2.4.2	Urban Structure and COVID-19 Infection Status	2-52
2.4.3	Urban Sanitation and COVID-19 Infection Status	2-69
2.4.4	Urban Socioeconomics and COVID-19 Infection Status	2-74
2.5	Impact of COVID-19 and Responses	2-76
2.5.1	Analysis Perspective	2-76
2.5.2	Economic Impact	2-76
2.5.3	Social Impact	2-83
2.5.4	Environmental Impact	2-85
2.5.5	Supportive Measures	2-86
2.6	Change in Urban Society and Activity due to COVID-19	2-91
2.6.1	Change in People’s Movement	2-92
2.6.2	Demand for Urban Development and Land Use	2-104
2.7	Change in Issued of Cities in Developing Countries during Pandemic	2-106
3	Review of the Expected Status of Cities in With-COVID-19 and Post COVID-19 Eras.....	3-1
3.1	Discussions on Post COVID-19 Cities by International Organizations and Donors	3-1
3.1.1	United Nations	3-1
3.1.2	UN-Habitat	3-3
3.1.3	UNESCAP	3-6
3.1.4	UNESCO	3-8
3.1.5	Organization for Economic Co-operation and Development (OECD)	3-10
3.1.6	World Bank (WB)	3-11
3.1.7	Asian Development Bank (ADB)	3-12
3.1.8	International Urban Cooperation European Union-Latin America and the Caribbean.....	3-16

3.2	Initiatives for Post COVID-19 Cities by Developing Countries and Cities.....	3-20
3.2.1	Indonesia	3-20
3.2.2	Philippines.....	3-20
3.2.3	Colombia.....	3-21
3.3	Initiatives for Post COVID-19 Cities by Developed Countries and Cities.....	3-23
3.3.1	Paris: Paris en Commun.....	3-23
3.3.2	Milan: Milano 2020	3-24
3.3.3	Melbourne: 20-Minute city neighborhood.....	3-29
3.4	Academic Literature.....	3-35
3.4.1	Urban Function-Spatial Response Strategy for the Epidemic – A Concise Manual on Urban Emergency Management (Southeast University, China, March 2020).....	3-35
3.4.2	Others	3-37
4	Expected Direction of Urban Development in with COVID-19 and Post-COVID-19 Eras.	4-1
4.1	Discussion Points	4-1
4.2	Short-Term Initiatives for Resumption of Urban Activities	4-2
4.2.1	Five Perspectives for Resumption of Urban Activities.....	4-2
4.2.2	Short-Term Program.....	4-3
4.3	Mid- and Long-Term Initiatives towards Post COVID-19 Cities.....	4-15
4.3.1	Post COVID-19 Resilient City and New Neighborhood	4-15
4.3.2	Mid- and Long-Term Program	4-22
5.	Formulation of Cooperation Project in Jakarta.....	5-1
5.1	Change of Urban Issues caused by COVID-19	5-1
5.1.1	Change of COVID-19 Cases and Urban Activities.....	5-1
5.1.2	Urban Space and Structure.....	5-2
5.1.3	Urban Transport	5-4
5.1.4	Urban Sanitation	5-6
5.1.5	Urban Socio-Economy.....	5-7
5.1.6	Urban Administration	5-7
5.1.7	Change of Urban Issues with COVID-19.....	5-8
5.2	Urban Development Program with and post Covid-19.....	5-10
5.2.1	Review of Existing Master Plans.....	5-10
5.2.2	Review of JICA Projects	5-17
5.2.3	Urban Development Orientation based on New Neighborhood and Five Agenda.	5-21
5.2.4	Proposals of Urban Development Program	5-22
5.3	Formulation of JICA's Cooperation Project	5-24
5.3.1	Capacity Enhancement Project for Neighborhood Management in DKI Jakarta	5-24
5.3.2	Transport System Improvement Program.....	5-33
6.	Formulation of Cooperation Project in Yangon	6-1
6.1	Change of Urban Issues by COVID-19.....	6-1
6.1.1	Urban Structure.....	6-1
6.1.2	Mobility	6-1
6.1.3	Inclusive Access.....	6-1
6.1.4	Urban and Socio Economics, Community.....	6-2
6.1.5	Changes of Urban Issues under COVID-19 Pandemic	6-2
6.2	Urban Development Program during and after Pandemic	6-4
6.2.1	Review of Yangon MP (SUDP) and Related Plans.....	6-4
6.2.2	Overview of Related Plans based on Urban Issues under COVID-19 Pandemic.....	6-5
6.2.3	Direction of Urban Development based on New Neighborhood and 5 Agenda.....	6-8
6.2.4	Proposed Urban Development Program.....	6-13

6.3	Cooperation Project Formulation.....	6-15
7.	Formulation of Cooperation Project in Kathmandu	7-1
7.1	Emerging Urban Problems Revealed by COVID-19.....	7-1
7.1.1	Urban Structure in Kathmandu Valley	7-1
7.1.2	Trends in COVID-19 Cases.....	7-3
7.1.3	Analysis of Correlations between COVID-19 Cases Per Capita and Different Factors	7-5
7.1.4	People’s Awareness and Behavior Changes.....	7-6
7.1.5	New Urban Sector Issues.....	7-7
7.1.6	Summary of Urban Issues and Their Changes	7-18
7.2	Urban Development Program for the With/Post COVID-19 Era	7-22
7.2.1	Review of Existing Urban Development Master Plans, Relevant Development Plans, and Relevant Infrastructure Programs.....	7-22
7.2.2	Division or Roles among Different Government Levels in the Period of Transition to the Federal Government System	7-25
7.2.3	Present Situation of Detailed Land Use Plans and Land Use Regulations/Building Regulations for Local Governments and Integrated Urban Development Master Plan for Kathmandu Valley	7-27
7.2.4	Review of JICA’s Cooperation Policy and Past and Ongoing Projects	7-29
7.2.5	Other International Development Partners’ Assistance Activities	7-31
7.2.6	Urban Development Strategies Built around New Neighborhoods and Five Pillars	7-32
7.2.7	Overview of the Proposed Urban Development Program	7-35
7.3	Cooperation Project Formulation.....	7-36
7.3.1	Possible Cooperation Projects.....	7-36
7.3.2	Formulation of Cooperation Projects	7-45
8.	Formulation of Cooperation Project in Dhaka	8-1
8.1	Changes in urban issues in COVID-19.....	8-1
8.1.1	Increased awareness of public health and urban environment (interview, news)	8-1
8.1.2	Avoidance of crowded places.....	8-1
8.1.3	Change in Mobility.....	8-2
8.1.4	Economy	8-4
8.1.5	Urban issues pointed out in Dhaka	8-4
8.1.6	Change of urban issues by COVID-19	8-5
8.1.7	The Expected Status of Cities in the Post COVID-19 Period	8-6
8.2	Organizing an Urban Development Program for With and Post-COVID-19.....	8-8
8.2.1	Review of Existing MP (Review of Detail Area Plan [DAP]).....	8-8
8.2.2	Changes of Planning Issues after COVID-19 Period.....	8-8
8.2.3	Review of ongoing JICA Project.....	8-9
8.2.4	Direction of urban development based on New Neighborhood and 5 Agendas	8-11
8.2.5	Project Proposal Approach.....	8-11
8.2.6	Proposal of the Program	8-13
8.3	Formation of Cooperation Projects.....	8-20
8.3.1	Detail analysis of the projects.....	8-20
8.3.2	Proposed Cooperation Projects.....	8-46
9.	Formulation of Cooperation Project in Nairobi	9-1
9.1	Change of Urban Issues by COVID-19.....	9-1
9.1.1	Increased Awareness to Public Health and the Urban Environment during COVID-19....	9-1
9.1.2	Avoidance of Crowded Places	9-2
9.1.3	Change in Mobility.....	9-2

9.1.4	Change in Economic Behavior.....	9-3
9.1.5	Change of urban issues by COVID-19.....	9-4
9.1.6	The Expected Status of Cities in the Post COVID-19 Period	9-5
9.2	Urban Development Program during and after Pandemic	9-7
9.2.1	Review of Existing Master Plan.....	9-7
9.2.2	JICA Program in Kenya	9-8
9.2.3	New Neighborhood and Five Agenda	9-8
9.2.4	Urban Development Program Formulation	9-9
9.3	Cooperation Project Formulation.....	9-23
9.3.1	Conditions of proposal of the projects.....	9-23
9.3.2	Proposed Cooperation Projects.....	9-23
10.	Formulation of Cooperation Project in Mombasa	10-27
10.1	Change of Urban Issues by COVID-19.....	10-27
10.1.1	Change of traffic volume.....	10-27
10.1.2	Economy	10-30
10.1.3	Urban issue	10-31
10.1.4	The Expected Status of Cities in the Post COVID-19 Period	10-31
10.1.5	Change of urban issues by COVID-19.....	10-32
10.2	Urban Development Program during and after Pandemic	10-34
10.2.1	Review of Existing Master Plan.....	10-34
10.2.2	New Neighborhood and Five Agenda	10-36
10.2.3	Urban Development Program Formulation	10-37
10.3	JICA Project Formulation	10-50
10.3.1	Conditions of proposal of the projects.....	10-50
10.3.2	Proposed JICA Cooperation Projects.....	10-50
11.	Formulation of Cooperation Project in Kampala	11-1
11.1	New Urban Problems Revealed by COVID-19.....	11-1
11.1.1	Overview of COVID-19 Pandemic	11-1
11.1.2	New Urban Problems Revealed by the COVID-19 Pandemic.....	11-4
11.1.3	Urban Spatial Structure	11-5
11.1.4	Transport Sector.....	11-7
11.1.5	Urban Sanitation	11-10
11.1.6	Urban Socioeconomic.....	11-14
11.1.7	Urban Administration	11-15
11.2	Consideration on Urban Development Programs for the With- and Post- COVID-19 Era	11-26
11.2.1	Review of Existing Master Plans.....	11-26
11.2.2	On-going JICA Projects	11-35
11.2.3	Urban Development Strategies based on New Neighborhood Policy and Five Agendas	11-36
11.2.4	Overview of the Proposed Urban Development Program	11-38
11.3	Cooperation Project Formulation.....	11-39
11.3.1	Detailed Analysis.....	11-39
11.3.2	Project Profiles.....	11-44
11.3.3	Recommendations	11-54
12.	Formation of Cooperation Project in Abidjan	12-1
12.1	Changes in urban issues in COVID-19.....	12-1
12.1.1	Situation of infection.....	12-1
12.1.2	Infection situation in the city of Abidjan	12-1

12.1.3	Impacts of COVID-19 on the lives of citizens, etc.....	12-2
12.1.4	Changes brought about by COVID-19	12-3
12.1.5	Existing urban issues in Abidjan	12-4
12.1.6	Correlation analysis of infected persons per 10,000 people	12-6
12.2	Sorting-out of urban development programs for With-Corona and Post-Corona	12-8
12.2.1	Outline of existing master plan.....	12-8
12.2.2	Outline of urban development programs.....	12-10
12.2.3	Review of existing JICA projects	12-18
12.2.4	Direction of urban development based on New Neighborhood and Five Urban Agendas	12-22
12.2.5	Cooperation Project (draft).....	12-23
12.3	Formation of cooperation projects.....	12-26
12.3.1	Public Administrative Service Improvement by Introducing ICT (Digitalization) Project.	12-26
12.3.2	The Project for Improvement of Water Supply, Sanitation and Hygiene (WASH) in Primary Schools	12-48
12.4	Rapid Environmental Impact Assessment.....	12-66
12.4.1	Côte d'Ivoire Country Environment Institution	12-66
12.4.2	Environmental and Social Licensing System in Côte d'Ivoire.....	12-67
12.4.3	Rapid Environmental and Social Impact Assessment for Cooperative Projects.....	12-69
13.	Formulation of Cooperation Project in Cairo	13-1
13.1	Change of Urban Issues by COVID-19.....	13-1
13.1.1	Overview of the Greater Cairo Region	13-1
13.1.2	COVID-19 Infection and the Change of Urban Activities.....	13-4
13.1.3	Change in Urban Issues by COVID-19.....	13-4
13.2	Urban Development Program during and after Pandemic	13-11
13.2.1	Review of the Existing Master Plan.....	13-11
13.2.2	Review on the Past Projects conducted by JICA.....	13-13
13.2.3	Direction of Urban Development Given the New Neighborhood and 5 Agenda... ..	13-15
13.2.4	Concept of Urban Development Programs.....	13-16
13.3	Proposed JICA Cooperation Projects.....	13-18
13.3.1	Project for Mobility Improvement in the Existing Urban Area.....	13-18
13.3.2	Improvement of the Living Environment toward the Realization of Low Carbon City.....	13-24
13.3.3	Other Urban Issues and Directions of Prospective Responses	13-25

List of Figures

Figure 1.3.1 Study Implementation Structure	1-2
Figure 1.3.2 CUREIP Team Formulation	1-2
Figure 1.4.1 Target Cities and Main Cities for General Survey	1-3
Figure 1.4.2 Population and GDP per Capita of Target and Main Cities	1-5
Figure 1.4.3 Population Density Distribution of Target Cities	1-7
Figure 1.4.4 Future Urban Structure of Target Cities	1-14
Figure 1.4.5 Modal Share in Target Cities (Except for Walking)	1-15
Figure 1.4.6 Urban Administration System in Target Cities	1-18
Figure 2.1.1 COVID-19 Expansion, Impacts, and Countermeasures	2-2
Figure 2.2.1 Target Cities and Main Cities for the Study	2-3
Figure 2.2.2 Change in Positive Cases and Deaths of COVID-19 in Target Countries	2-5
Figure 2.2.3 Relationship between No. of Cumulative Positive Cases and Maximum No. of Daily Cases per 100,000 population	2-7
Figure 2.2.4 Infected Cases per 100,000 Population in Jakarta	2-9
Figure 2.2.5 Infected Cases per 100,000 Population in Yangon	2-9
Figure 2.2.6 Infected Cases per 100,000 Population in Kathmandu	2-10
Figure 2.2.7 Infected Cases per 100,000 Population in Bangladesh	2-11
Figure 2.2.8 Infected Cases per 100,000 Population in Nairobi	2-11
Figure 2.2.9 Infected Cases per 100,000 Population in Mombasa	2-12
Figure 2.2.10 Infected Cases per 100,000 Population in Egypt	2-13
Figure 2.2.11 Infected cases per 100,000 population in Kampala	2-13
Figure 2.2.12 Infected Cases per 100,000 Population in Cote d'Ivoire	2-14
Figure 2.3.1 BRT Routes for non-medical employees	2-26
Figure 2.3.2 BRT Routes for medical employees	2-26
Figure 2.3.3 Relationship between No. of Tests per 1,000 population and Positivity Rate	2-29
Figure 2.3.4 Change in No. of RT-PCR Testing Facilities in Bangladesh and Dhaka	2-30
Figure 2.3.5 Timeline of the Number of Positive Cases and COVID-19 Measures in Peru	2-36
Figure 2.3.6 Essential Services Allowed To Operate during the Circuit Breaker	2-40
Figure 2.3.7 Number of Community Infection Cases and Positive Cases Found in Dormitories	2-41
Figure 2.3.8 Dormitories in Singapore	2-42
Figure 2.3.9 Change in the Daily Ridership of MRT in Singapore	2-43
Figure 2.3.10 Care Ambassador Activities by the Singapore Airlines Flight Attendants	2-44
Figure 2.3.11 Three-phase Approach for Resumption of Economic Activities	2-45
Figure 2.3.12 SafeEntry	2-46
Figure 2.3.13 TT Token (left) and TraceTogether App (right)	2-47
Figure 2.3.14 Timeline of the Number of Positive Cases and COVID-19 Measures in Singapore	2-47
Figure 2.4.1 Relationship between Gross Population Density and No. of Positive Cases per 10,000 Population (Jakarta)	2-53
Figure 2.4.2 Relationship between Net Population Density and No. of Positive Cases per 10,000 Population (Jakarta)	2-54
Figure 2.4.3 Relationship between Residential-Area-Based Population Density and No. of Positive Cases per 10,000 Population (Jakarta)	2-54
Figure 2.4.4 Relationship between Population Density and No. of Positive Cases per 100,000 Population in each Township (Yangon)	2-55
Figure 2.4.5 Population Density by Sub-County and No. of Positive Cases per 10,000 Population (Nairobi)	2-55
Figure 2.4.6 Population Density by Sub-County and No. of Positive Cases per 10,000 Population (Mombasa)	2-56
Figure 2.4.7 Number of COVID-19 Positive Cases by District (March 2020–March 2021)	2-56
Figure 2.4.8 Correlation between Population Density and the Number of COVID-19 Positive Cases per	

10,000 population by District (Abidjan)	2-57
Figure 2.4.9 Relationship between Population Density by Localidad and No. of Positive Cases per 100,000 Population (Bogota).....	2-57
Figure 2.4.10 Relationship between Population Density by Municipality and No. of Positive Cases per 10,000 Population (Tokyo).....	2-58
Figure 2.4.11 Relationship between Building Coverage Ratio by Kelurahan and No. of Positive Cases per 100,000 Population (Jakarta)	2-59
Figure 2.4.12 Relationship between Building Density by Township and No. of Positive Cases per 100,000 Population (Yangon)	2-59
Figure 2.4.13 Dhupkhola Kitchen Market Relocated to a Park	2-60
Figure 2.4.14 Outdoor Market in Kalaw.....	2-60
Figure 2.4.15 No. of infected persons in the top 50 clusters by Kelurahan (Jakarta)	2-62
Figure 2.4.16 Changes in the distribution of No. of COVID-19 infected persons in Nepal.....	2-64
Figure 2.4.17 Distribution of District-Level COVID-19 cases in Uganda.....	2-65
Figure 2.4.18 Correlation between Air Transport Trip and number of COVID-19 positive case by 10 000 population by Commune (Abidjan)	2-65
Figure 2.4.19 Phasing Based on COVID-19 Infection Status in Jakarta	2-66
Figure 2.4.20 COVID-19 Spread in Jakarta	2-67
Figure 2.4.21 Relationship between No. of Trips and No. of Infection per 100,000 population in Jakarta	2-68
Figure 2.4.22 Positive Cases per 100,000 vs Trip Numbers of Bus (2018).....	2-69
Figure 2.4.23 Vulnerability Index in Greater Kampala Metropolitan Area.....	2-70
Figure 2.4.24 Water Supply Facilities Installation Project in Kampala.....	2-71
Figure 2.4.25 Handwashing Facility in Jakarta.....	2-72
Figure 2.4.26 Support for Village Health Volunteer in Uganda.....	2-73
Figure 2.4.27 Support for Local Residents by Village Health Volunteer in Thailand.....	2-74
Figure 2.4.28 Relationship between Ratio of Elderly by Localidad and Number of Deaths per 100,000 Population (Bogota).....	2-75
Figure 2.4.29 Posters to Educate Alternative Ways of Greeting (Jakarta).....	2-75
Figure 2.5.1 GDP Growth Rate by Industry in Kenya (2018–2019, 2019–2020)	2-77
Figure 2.5.2 GDP Growth Rate by Industry in Uganda (2018–2019, 2019–2020).....	2-78
Figure 2.5.3 Income Decline Rate by Income Group in Bangladesh	2-79
Figure 2.5.4 The Number of Tourists in Jakarta	2-79
Figure 2.5.5 Change in Traffic Congestion Situation (2020)	2-80
Figure 2.5.6 Number of MRT Jakarta Passengers.....	2-80
Figure 2.5.7 Change in Number of YBS Operation	2-81
Figure 2.5.8 Average Number of Daily Passengers of MRT (Bangkok).....	2-81
Figure 2.5.9 Average Daily Fare Revenue of MRT (Bangkok).....	2-81
Figure 2.5.10 Change in Transport Times and Costs from Mombasa to Kampala and Kigali	2-82
Figure 2.5.11 Proportion of E-commerce Payment Method in Indonesia	2-83
Figure 2.5.12 Image of Coordin	2-89
Figure 2.5.13 Digital Water Provision System in Lilongwe	2-89
Figure 2.5.14 Image of Digital Technology Utilization in Rural Areas in Indonesia.....	2-90
Figure 2.6.1 Change in Expected Status of Cities and Required Urban Responses during and after Pandemic.....	2-91
Figure 2.6.2 Relationship between Smartphone Penetration Rate and Current GNI per Capita.....	2-93
Figure 2.6.3 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Sao Paulo	2-94
.....	2-94
Figure 2.6.4 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Jakarta....	2-96
Figure 2.6.5 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Singapore	2-97
.....	2-97

Figure 2.6.6 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Tokyo	2-98
Figure 2.6.7 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Cairo	2-99
Figure 2.6.8 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Bangkok	2-100
Figure 2.6.9 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Taipei	2-101
Figure 2.6.10 Location of Traffic Volume Survey in Dhaka	2-102
Figure 2.6.11 Change in Traffic Volume between before and during Pandemic	2-102
Figure 2.6.12 Traffic Volume on Arterial Roads around Bangkok during Songkran in 2019 and 2020	2-104
Figure 2.6.13 Provision of Office Floor and Occupancy Rate in Jakarta	2-105
Figure 3.2.1 DOTr's Road Section Realignment Plan for EDSA (May 2020)	3-21
Figure 3.2.2 Bicycle lanes in EDSA (August 2020)	3-21
Figure 3.2.3 Bicycle lanes in Bogota (March 2020)	3-22
Figure 3.3.1 Diagram of 15-Minute City in Paris	3-23
Figure 3.3.2 Area to be cleared of through traffic by 2020 (central Paris)	3-23
Figure 3.3.3 Road Space Planning to Encourage Bicycle and Walking (Milan)	3-25
Figure 3.3.4 Development and Utilization Planning of Public Spaces (Milan)	3-26
Figure 3.3.5 Development and Utilization of Open Spaces for Children (Milan)	3-28
Figure 3.3.6 Bicycle Lanes and Speed Limit for Cars Proposed in Milano 2020	3-29
Figure 3.3.7 Features of 20-Minute Neighbourhood (Melbourne)	3-30
Figure 3.3.8 Pilot Program Sites of 20-Minute Neighborhood	3-31
Figure 3.3.9 Neighborhood (left) and Suburb (right) of the City of Moonee Valley	3-32
Figure 3.3.10 Development Plan of Strathmore Neighbourhood in the MV2040 Strategy	3-33
Figure 3.3.11 Future Decelopment Potential of Strathmore	3-34
Figure 3.4.1 Formation Process of EPA in Line with Infection Spread	3-36
Figure 4.1.1 Topics for Expected Status of Cities in With- and Post-COVID-19 Eras	4-1
Figure 4.2.1 Use of Digital Technology for Distribution of Administrative Service	4-5
Figure 4.2.2 Use of Digital Technology for Water Supply	4-8
Figure 4.2.3 Use of Digital Technology for Grasping Congestion Status	4-10
Figure 4.2.4 Use of Digital Technology for Integration of Public Services	4-14
Figure 4.3.1 Concept of New Neighborhood accommodating Self-sustaining Urban Livelihood	4-16
Figure 4.3.2 Post-COVID Resilient City and New Neighborhood	4-17
Figure 4.3.3 Concept of Deconcentated and Connected City	4-18
Figure 4.3.4 Transport Services with Diversified Moblity Services	4-18
Figure 4.3.5 Inclusive Cities with Universal Access of Urban Services	4-19
Figure 4.3.6 Accessible Service Points by ICT Network	4-20
Figure 4.3.7 Self-supportive and Responsive Community	4-21
Figure 4.3.8 Population and GDP per Capita of Target and Main Cities	4-22
Figure 4.3.9 Program Formulation Based on 5+1 Agenda	4-23
Figure 4.3.10 Deconcentrated and Connected City Development Program	4-24
Figure 4.3.11 Urban Administration System in Target Cities (Reiterated)	4-27
Figure 4.3.12 Sub-component of Decentralized and Connected City Program	4-28
Figure 4.3.13 New Neighborhood Improvement Program	4-29
Figure 4.3.14 New Neighborhood Improvement Program	4-29
Figure 4.3.15 Image of Efficient Urnban Administration According to ICT Level	4-33
Figure 4.3.16 Concept of Diversified Mobility to support Neighborhood	4-35
Figure 4.3.17 Public Transport Network with Diversified Mobility Services Program	4-35
Figure 4.3.18 Integrated Urban Sanitation Improvement Program	4-39
Figure 4.3.19 Integrated Informal Settlement Improvement Program	4-45
Figure 5.1.1 Change of Urban Activities in DKI Jakarta	5-2
Figure 5.1.2 Location of JKI Jakarta in JABODETABEK	5-2

Figure 5.1.3 Land Use Plan of JABODETABEK.....	5-2
Figure 5.1.4 Nighttime Population by Kelurahan (2018 data)	5-3
Figure 5.1.5 Number of infected cases per 1,000 people by Kelurahan (Mar 2020~Feb 2021, nighttime population based).....	5-3
Figure 5.1.6 Location of CBD as a hotspot of COVID-19	5-3
Figure 5.1.7 Large-scale buildings and low-rise buildings along Thamrin Street in CBD.....	5-3
Figure 5.1.8 Number of Trips from out of Jakarta to DKI Jakarta (coverage: JABODETABEK).....	5-4
Figure 5.1.9 Number of Trips from out of Jakarta to DKI Jakarta (coverage: DKI Jakarta).....	5-4
Figure 5.1.10 Number of Trips to the hotspot Kelurahan (initial period of infection spread)	5-5
Figure 5.1.11 Correlation between number of trips to hotspot and infected people per 10,000....	5-5
Figure 5.1.12 Number of Monthly MRT Passengers	5-6
Figure 5.1.13 Shared Bicycle Stand at Thamrin Street.....	5-6
Figure 5.1.14 Water Tank for Handwash along Sidewalk	5-7
Figure 5.1.15 Sterilization facility in the station.....	5-7
Figure 5.2.1 Paradigm Shift of Spatial Plan	5-13
Figure 5.2.2 Neighborhood Development along Public Transport Network	5-13
Figure 5.2.3 Socioeconomic Planning System of Indonesia.....	5-17
Figure 5.2.4 Jabodetabek Transport Network Plan 2035	5-19
Figure 5.2.5 Current Status of Sewage in Jakarta (Domestic Wastewater Flowing into Rivers).....	5-20
Figure 5.3.1 RTRW and RDTR in Spacial Plan Hierarchy.....	5-25
Figure 5.3.2 Examples of RTRW and RDTR.....	5-26
Figure 5.3.3 Planning Mechanism of Spatial Plan of DKI Jakarta	5-27
Figure 6.1.1 Modal Share in Yangon City in 2016.....	6-1
Figure 6.1.2 Type of Work in Yangon city	6-2
Figure 6.2.1 Vision of Yangon MP (SUDP)	6-4
Figure 6.2.2 Direction of Proposed Program toward With COVID-19/ Post COVID-19.....	6-9
Figure 6.2.3 Candidate for Priority Projects	6-12
Figure 7.1.1 Distribution of Population Densities in Kathmandu Valley: Monocentric Spatial Pattern	7-2
Figure 7.1.2 Distribution of Population Densities in Kathmandu Valley: Monocentric Spatial Pattern	7-2
Figure 7.1.3 Monthly COVID-19 Cases from April 2020 to March 2021 (Kathmandu Valley).....	7-3
Figure 7.1.4 New Road Market during the Dasain Festival in 2020.....	7-3
Figure 7.1.5 Weekly COVID-19 Cases from April 2020 to June 2021 (Kathmandu, Lalitpur, and Bhaktapur Districts).....	7-4
Figure 7.1.6 Weekly COVID-19 Cases from January to March 2022 (Kathmandu Valley)	7-4
Figure 7.1.7 Trends in COVID-19 Vaccinations from April 2021 to April 2022	7-5
Figure 7.1.8 COVID-19 Cases Per 1,000 Population from April 2020 to March 2021 (Kathmandu Valley)	7-5
Figure 7.1.9 Crowd Waiting to Receive Tickets in the Outpatient Reception Area at Bir Hospital (National Academy of Medical Sciences) in Kathmandu.....	7-8
Figure 7.1.10 Bicycle Lanes (Marked by Signs on the Roads) and Cyclists in the Kathmandu Valley	7-11
Figure 7.1.11 The Ratio of Change in the Number of Visitors at Categorized Facilities under COVID-19 Pandemic.....	7-14
Figure 7.1.12 Locations of 84 Open Spaces in Kathmandu Valley	7-15
Figure 7.1.13 Use of Parks and Open Spaces in the Kathmandu Valley.....	7-16
Figure 7.2.1 Proposed Land Use Plan for Disaster Risk Management in the Kathmandu Valley	7-22
Figure 7.2.2 Development Plans on the Outer Ring Road and Urban Centers in the Kathmandu Valley	7-23
Figure 7.2.3 Locations of 3 Satellite Towns (New Towns) in the Kathmandu Valley	7-24

Figure 7.2.4 Three Pillars for Urban Development to Achieve Higher Resilience, Sustainability, and Inclusiveness in the Kathmandu Valley.....	7-32
Figure 7.2.5 Concept of New Neighborhoods.....	7-34
Figure 7.3.2 Network of Bicycle Lanes under Construction and in Planning/Proposal Stages in KMC and LMC.....	7-50
Figure 7.3.3 Development of Radial Road in Kathmandu Valley: Godawari Corridor River (red line)....	7-51
Figure 7.3.4 Locations of Government Central Hospitals and Private Hospitals in Kathmandu Valley.....	7-51
Figure 8.1.1 Car in Mohakhali area Reduce Significantly in a Post-COVID-19 Situation.....	8-2
Figure 8.1.2 Traffic Flow Comparisons Implying Increased Use Of Bicycle.....	8-3
Figure 8.1.3 Remittance Inflow (in USD billion) and b. Yearly RMG Export (USD billion).....	8-4
Figure 8.2.1 Change in Preference of Mode Choice for Work Purpose.....	8-14
Figure 8.2.2 The graph is representing devices and internet access inequality that underpinning the quality of e-learning.....	8-19
Figure 8.3.1 Uttara Model Town, Dhaka.....	8-20
Figure 8.3.2 Multi Land Owner development Project by Wintech Developer 2000 Ltd.....	8-21
Figure 8.3.3 RAJUK Organization Chart.....	8-24
Figure 8.3.4 Location Map and density profile of Bangshal.....	8-25
Figure 8.3.5 Structural Development of Bangshal.....	8-26
Figure 8.3.6 Proposed Land Use of Bangshal Area.....	8-26
Figure 8.3.7 Narrow roads and chaotic development in Bangshal area.....	8-27
Figure 8.3.8 Transport connectivity of Bangshal.....	8-29
Figure 8.3.9 Location Map and Density Profile of Gabtoli.....	8-30
Figure 8.3.10 Structural Development of Gabtoli.....	8-31
Figure 8.3.11 Proposed land use of Gabtoli area.....	8-31
Figure 8.3.12 Narrow Roads and Chaotic Development in Gabtoli.....	8-32
Figure 8.3.13 Proposed Land Use, Building Height and Land Ownership Within 1 Km Buffer of MRT Station: Gabtoli.....	8-33
Figure 8.3.14 Transport Connectivity of Gabtoli.....	8-35
Figure 8.3.15 Location Map and Density Profile of Karwan Bazar.....	8-36
Figure 8.3.16 Structural development of Karwan Bazar.....	8-37
Figure 8.3.17 Proposed Land Use of Karwan Bazar area.....	8-37
Figure 8.3.18 Proposed Master Plan.....	8-38
Figure 8.3.19 Transport Connectivity of Karwan Bazar.....	8-39
Figure 8.3.20 Existing Karwan Bazar Kitchen Market.....	8-40
Figure 8.3.21 Location Map and density profile of Township Site.....	8-41
Figure 8.3.22 Existing land use of Township Site.....	8-42
Figure 8.3.23 Structural Development of Township Site.....	8-42
Figure 8.3.24 Proposed Land Use of Township Site.....	8-43
Figure 8.3.25 Congested Development in Township Site.....	8-43
Figure 8.3.26 Transport Connectivity of Township Site.....	8-45
Figure 8.3.27 showing the affordability scenario of housing sector in Dhaka.....	8-46
Figure 9.1.1 Modal Shift by COVID-19.....	9-3
Figure 10.1.1 Cargo throughput, January–March 2020.....	10-28
Figure 10.1.2 Number of Containers during the Early Stages of COVID-19.....	10-28
Figure 10.1.3 Time taken to complete inspection and testing, January-April 2020.....	10-30
Figure 10.1.4 Pedestrian paths developed in Mombasa.....	10-32
Figure 11.1.1 COVID-19 Pandemic in Uganda.....	11-1
Figure 11.1.2 Daily COVID-19 Infection Cases and Changes in Movement in Uganda (March 2020–March 2022).....	11-3

Figure 11.1.3 Map of the Greater Kampala Metropolitan Area	11-4
Figure 11.1.4 Urbanization in the Greater Kampala Metropolitan Area.....	11-5
Figure 11.1.5 Population Density by Parish in the Greater Kampala Metropolitan Area (2014).....	11-6
Figure 11.1.6 Infection Numbers Per 10,000 People in Uganda (March 2020 to June 2021)	11-7
Figure 11.1.7 Prospective BRT Routes in the Greater Kampala Metropolitan Area.....	11-8
Figure 11.1.8 Means of Transport in the Greater Kampala Metropolitan Area	11-9
Figure 11.1.9 Proposed and Constructed Cycling Lanes in Kampala City.....	11-9
Figure 11.1.10 Informal Settlements Identified as of 2011	11-10
Figure 11.1.11 Proportions of Households with Access to Piped Water by Parish in the Greater Kampala Metropolitan Area (2014).....	11-11
Figure 11.1.12 Local People Collecting Spring Water in a Community without Water Supply in Kampala City.....	11-11
Figure 11.1.13 Present Situation of Water Supply (Main Transmission Pipelines) in the Greater Kampala Metropolitan Area.....	11-12
Figure 11.1.14 Water Supply Reliability in Greater Kampala Metropolitan Area in 2020.....	11-13
Figure 11.1.15 COVID-19 Impact on Household Income in Kampala (2020).....	11-14
Figure 11.1.16 Composition of Local Government in Uganda.....	11-16
Figure 11.1.17 Structure of Ministry of Kampala Capital City and Metropolitan Affairs	11-17
Figure 11.1.18 Structure of Kampala Capital City Authority, as of December 2017.....	11-17
Figure 11.1.19 General Structure for Districts in Uganda as of May 2016.....	11-21
Figure 11.1.20 General Structure of Municipalities in Uganda, as of May 2016.....	11-22
Figure 11.1.21 General Structure of Towns in Uganda, as of May 2016	11-24
Figure 11.1.22 General Structure of Sub-counties in Uganda, as of May 2016	11-24
Figure 11.2.1 Future Urban Structure Proposed in KPDP/KPDP 2012.....	11-26
Figure 11.2.2 Future Urban Structure Proposed in the Wakiso District Physical Development Plan.....	11-30
Figure 11.2.3 Public Transport Network Planned in the MMUTMP	11-33
Figure 11.2.4 Locations of Satellite Cities to be Developed by the MLHUD	11-35
Figure 11.2.5 Proposed Future Distribution of Urban Centers in the Greater Kampala Metropolitan Area.....	11-37
Figure 11.3.1 Coverage Area of Digital Map Prepared for Greater Kampala Metropolitan Area in CUREIP.....	11-39
Figure 11.3.2 Building Footprint Size in and around Kampala Capital City (2019).....	11-40
Figure 11.3.3 Parishes and Village Names Related to Wetland and Waterbodies in Greater Kampala Metropolitan Area.....	11-43
Figure 12.1.1 Trends in the number of infected cases in Côte d'Ivoire (March 2020–May 2021)...	12-1
Figure 12.1.2 Number of Infected People by Health District in Abidjan.....	12-2
Figure 12.1.3 Urbanization Pressure and Informal Settlement Areas in Abidjan	12-4
Figure 12.1.4 Correlation between the number of infected cases per 10,000 in Abidjan by various indicators.....	12-7
Figure 12.2.1 Direction of urban spatial development	12-9
Figure 12.2.2 Greater Abidjan Urban Development Spatial Strategy 2030	12-9
Figure 12.2.3 Urban Development Program 2015–2020	12-10
Figure 12.2.4 Urban Development Program 2020–2025	12-11
Figure 12.2.5 Urban Development Program 2025–2030	12-12
Figure 12.2.6 SDUGA Project Location Map (Roads and Road Facilities)	12-13
Figure 12.2.7 SDUGA Project Location Map (Public Transportation and Rail).....	12-13
Figure 12.2.8 Urban Units in the Abidjan Region (Urban Unit)	12-16
Figure 12.2.9 Water Supply Areas in the 2014 SAFEGE Abidjan Municipal Water Supply Master Plan	12-17
Figure 12.2.10 Seven treatment systems of the Abidjan Sewage and Drainage Master Plan (SDAD	12-17

2019)	12-18
Figure 12.2.11 Areas covered by SDUGA survey and planning.....	12-19
Figure 12.2.12 COSAY Phase 1 Pilot Project.....	12-20
Figure 12.2.13 COSAY Phase 2 pilot project	12-21
Figure 12.3.1 Proposed Project and Related Programs of the Côte d'Ivoire Country Development Cooperation Policy	12-26
Figure 12.3.2 Abobo and Yopougon Communes	12-34
Figure 12.3.3 Congestion in Abobo commune government offices	12-35
Figure 12.3.4 Congestion at Yopougon Commune Town Hall.....	12-36
Figure 12.3.5 Abobo Commune Organization Chart.....	12-38
Figure 12.3.6 Yopougon Commune Organization Chart.....	12-40
Figure 12.3.7 Abobo commune home page.....	12-41
Figure 12.3.8 Yopougon Commune's trial online application.....	12-42
Figure 12.3.9 Location map of city hall and annex commune halls in Abobo	12-43
Figure 12.3.10 Map of the development and location of the city hall and annex commune halls in Yopougon.....	12-45
Figure 12.3.11 JMP's Service Ladder for the WASH Sector.....	12-51
Figure 12.3.12 Relevant institutions for WASH services.....	12-52
Figure 12.3.13 Cover of Pocket Book of School Statistics (Ministry of Education,2021)	12-55
Figure 12.3.14 WASH Facilities in Public Primary Schools in Abidjan - Water Supply Facilities	12-56
Figure 12.3.15 Availability of water supply facilities in public and private primary school in Abidjan	12-56
Figure 12.3.16 Water and Sanitation Facilities in Public Elementary Schools in Abidjan - Toilet Facilities	12-57
Figure 12.3.17 Water and Sanitation Facilities in Public Primary Schools in Abidjan - Hand Washing Facilities.....	12-57
Figure 12.3.18 Availability of Handwashing Facilities in Public and Private Elementary Schools in Abidjan.....	12-58
Figure 13.1.1 Boundary of GCR.....	13-1
Figure 13.1.2 Trends in the Population of GCR.....	13-2
Figure 13.1.3 Change of the Population Density in GCR (1996–2020)	13-2
Figure 13.1.4 Population Growth Rate (2006–2020).....	13-3
Figure 13.1.5 Development of New Urban Communities on the President's Initiative	13-3
Figure 13.1.6 Trend of People's Mobility and Positive Cases per 100k Population	13-4
Figure 13.1.7 Changes in Urban Issues.....	13-5
Figure 13.1.8 Hotspots Estimated by the World Bank	13-5
Figure 13.1.9 Correlation between Habitat Density and Fatality from COVID-19	13-6
Figure 13.1.10 Slum Improvement Projects of the Government of Egypt.....	13-7
Figure 13.1.11 Waste Collection and Recycling in El-Zaraeb Area.....	13-8
Figure 13.1.12 Infectious Risk Percieved in El-Zaraeb Area	13-8
Figure 13.1.13 Major Volunteer Actions using Social Media.....	13-10
Figure 13.2.1 Urban Issues Identified in SUDMP	13-11
Figure 13.2.2 Route Map of Cairo Metro Line 4.....	13-14
Figure 13.2.3 Changes in the Urban Issues toward Post-COVID-19.....	13-15
Figure 13.2.4 Proposed Programs Built on Five Agenda	13-17
Figure 13.3.1 Indicative Cooperation Projects	13-18
Figure 13.3.2 Slum of Manshiyet Nasser.....	13-19
Figure 13.3.3 Road conditions of Shubra El-Kheima.....	13-19
Figure 13.3.4 Scope of Work of UDF	13-20
Figure 13.3.5 Contribution from JICA.....	13-20
Figure 13.3.6 Contribution from JICA.....	13-21

Figure 13.3.7 Overall Framework of the Mobiltiy Improvement Project in the Existing Urban Area	13-22
Figure 13.3.8 Output and Activities of Mobiltiy Improvement Project in the Existing Urban Area	13-22
Figure 13.3.9 Project Implementation Structure (draft).....	13-23
Figure 13.3.10 Candidate of Pilot Project Implementation.....	13-23
Figure 13.3.11 Synergy Effects wit JICA's Other Projects.....	13-24
Figure 13.3.12 Pedestrian Environment in GCR.....	13-26
Figure 13.3.13 Residential Areas for Relocated Former Slum Dwellers.....	13-27

List of Tables

Table 1.4.1 Main 40 Cities fir General Survey	1-4
Table 1.4.2 Basic Information of the Target Cities.....	1-4
Table 1.4.3 Transportation in Target Cities.....	1-14
Table 1.4.4 Duties of Municipal Governments in Target Cities	1-18
Table 1.4.5 IT-related Indexes of Target Cities	1-21
Table 2.2.1 Data Availability of COVID-19 Positive Cases in 40 Main Cities	2-5
Table 2.2.2 Released COVID-19 Data in Target Cities	2-6
Table 2.2.3 Classification of Main 40 Cities by No. of Positive Cases per 100,000 Population.....	2-7
Table 2.2.4 Classification of 40 Main Cities by Infection Status.....	2-8
Table 2.3.1 Countermeasures against COVID-19	2-15
Table 2.3.2 Stay-at-home Requirement in Main Cities.....	2-16
Table 2.3.3 Travel Restrictions in Main Cities	2-19
Table 2.3.4 Intensity and Timing of Travel Restrictions in Main Cities	2-20
Table 2.3.5 Relationship between Intensity and Timing of Travel Restrictions and Cumulative No. of positive cases as of December 2020	2-22
Table 2.3.6 Inter-city Travel Restrictions in Main Cities.....	2-22
Table 2.3.7 COVID-19 Infection Prevention Measures on Public Transport by Governments and Municipalities	2-24
Table 2.3.8 COVID-19 Infection Prevention Measures on Public Transport by Operators.....	2-24
Table 2.3.9 BRT Operation Hours during Social Restriction	2-26
Table 2.3.10 Infection Prevention Measures on Public Transport in Main Cities	2-26
Table 2.3.11 Smartphone Applications for Containing COVID-19 Expansion.....	2-32
Table 2.3.12 Characteristic Cities and Reasons for Selection.....	2-33
Table 2.3.13 Change in Nighttime Curfew Time.....	2-34
Table 2.3.14 Border Control Measures against COVID-19 in Singapore.....	2-38
Table 2.3.15 Border Control Measures against COVID-19 in Taiwan.....	2-48
Table 2.4.1 Perspectives of Analysis on COVID-19 Infection Status and Its Influence	2-51
Table 2.4.2 Clusters in DKI Jakarta	2-61
Table 2.4.3 Clusters in Yangon.....	2-63
Table 2.4.4 Examples of Infection Prevention Activities by Community	2-74
Table 2.5.1 COVID-19's Impact on Society, Economy, and Environment.....	2-76
Table 2.5.2 Estimated Growth Rate of Bangladesh's Exports	2-77
Table 2.5.3 Economic Growth Rate of Warehousing and Courier Industry (2020).....	2-82
Table 2.5.4 Change in Air Quality Index in Dhaka	2-85
Table 2.5.5 Response Policies and Countermeasures against COVID-19.....	2-86
Table 2.5.6 Change in Internet Subscribers due to COVID-19.....	2-88
Table 3.1.1 Proposal of Cities and Pandemics: Towards a More Just, Green and Healthy Future	3-3
Table 3.1.2 Priority Measures Proposed in COVID-19 and the Urban Poor - Addressing those in slums	3-12
Table 3.3.1 Directionas and Policies Related to Outcome 5 (Melbourne)	3-31
Table 4.2.1 Program for Strengthening Neighborhood to avoid Congestion	4-3
Table 4.2.2 Program for Water, Sanitation, and Hygiene Improvement Program	4-5
Table 4.2.3 Program for Safe and Secured Mobility	4-9
Table 4.2.4 Program for Quick Support for Vulnerable Group	4-10
Table 4.2.5 Program for Information Collection, Sharing and Utilization with ICT.....	4-12
Table 4.3.1 Deconcentrated and Connected City Development Program by the Development Stage of Metropolitan Area.....	4-24
Table 4.3.2 New Neighborhood Improvement Program Profile (1).....	4-30
Table 4.3.3 New Neighborhood Improvement Program Profile (2).....	4-31
Table 4.3.4 New Neighborhood Improvement Program Profile (3).....	4-32

Table 4.3.5 New Neighborhood Improvement Program Profile (5).....	4-33
Table 4.3.6 New Neighborhood Improvement Program Profile (6).....	4-34
Table 4.3.7 Public Transport Network with Diversified Mobility Services Program Project (1).....	4-36
Table 4.3.8 Public Transport Network with Diversified Mobility Services Program Project (2).....	4-37
Table 4.3.9 Public Transport Network with Diversified Mobility Services Program Project (3).....	4-38
Table 4.3.10 Integrated Urban Sanitation Improvement Program (1)	4-40
Table 4.3.11 Integrated Urban Sanitation Improvement Program (2)	4-41
Table 4.3.12 Integrated Urban Sanitation Improvement Program (3)	4-42
Table 4.3.13 Integrated Urban Sanitation Improvement Program (4)	4-43
Table 4.3.14 Integrated Urban Sanitation Improvement Program (5)	4-44
Table 4.3.15 Integrated Informal Settlement Improvement Program (1)	4-46
Table 4.3.16 Integrated Informal Settlement Improvement Program (2)	4-46
Table 4.3.17 Integrated Informal Settlement Improvement Program (3)	4-47
Table 5.1.1 Characteristics of Jakarta and Urban Issues toward Post Corona	5-8
Table 5.2.1 Vision, Objectives, Policies and Strategies of DKI Jakarta	5-10
Table 5.2.2 Six Strategies, Objectives and Activities proposed in DKI Jakarta Spatial Plan (draft)	5-13
Table 5.2.3 JICA's Project of Urban Sector in Jakarta	5-17
Table 5.3.1 Neighborhood Management Program (draft)	5-32
Table 6.1.1 Changes of Urban Issues in Yangon	6-3
Table 6.2.1 Planning Areas of Urban Development Listed in Yangon MP (SUDP)	6-4
Table 6.2.2 SUDP's Priority Projects and Its Relationship to Five Agendas	6-5
Table 6.2.3 Projects listed in SUDP	6-9
Table 6.3.1 Proposed New Project for Sewerage Sector	6-15
Table 6.3.2 Proposed New Project for Urban Sanitation and Hygiene Sector	6-17
Table 6.3.3 Draft Project Paper (The Project for Strengthening Capacity of Sewerage Service of YCDC)	6-20
Table 7.1.1 Population Changes of Kathmandu Valley and Population Distribution within Kathmandu Valley	7-1
Table 7.1.2 Conventional Urban Issues and New Challenges Caused by the COVID-19 Pandemic in the Kathmandu Valley	7-19
Table 7.2.1 Future Population Numbers in the Kathmandu Valley	7-23
Table 7.2.2 Proposed Development Plans for 3 Satellite Towns (New Towns) in the Kathmandu Valley	7-24
Table 7.2.3 Japan's Financial Assistance in the Kathmandu Valley	7-30
Table 7.2.4 Japan's Technical Cooperation for Capacity Development in the Kathmandu Valley	7-31
Table 7.3.1 Potential Cooperation Projects: Short-term Crowding Prevention, Short- to Medium-term New Neighborhood Development, and Medium- to Long-term Transformation to Polycentric Spatial Structure	7-36
Table 7.3.2 Proposed Project: Urban Development Master Plan Study for Polycentric Spatial Transformation and New Neighborhood Formation for Resilient City Building in Kathmandu Valley under the Federal System (Medium- to long-term)	7-46
Table 8.1.1 Changes in Urban Issues in Dhaka	8-5
Table 8.2.1 Changes of planning issues	8-9
Table 8.2.2 Relationship with ongoing JICA projects	8-9
Table 8.2.3 Five Agendas and Directions for Urban Development	8-11
Table 8.2.4 Lack of hospital to combat the pandemic	8-17
Table 8.3.1 Present and future connectivity of Bangshal	8-28
Table 8.3.2 Present and future connectivity of Gabtoli	8-34
Table 8.3.3 Present and future connectivity of Karwanbazar	8-38
Table 8.3.4 Present and Future Connectivity of the Area	8-44
Table 9.1.1 Investment in the Health Sector for COVID-19	9-1

Table 9.1.2 Change of Urban Issues (Nairobi)	9-4
Table 9.2.1 Changes in need in consideration of NIUPLAN.....	9-7
Table 9.2.2 Changes in needs in relation to JICA's 5 agenda issues.....	9-8
Table 9.2.3 List of Urban Development Programs with related Five Agenda.....	9-10
Table 10.1.1 Change of Urban Issues (Mombasa).....	10-33
Table 10.2.1 Changes in needs in relation to the MGCMP.....	10-34
Table 10.2.2 Change in needs due to COVID-19 pandemic considering JICA's 5 agenda.....	10-37
Table 10.2.3 Relationship between the proposed programs and the agenda.....	10-38
Table 11.1.1 Urban Population Numbers in the Greater Kampala Metropolitan Area	11-6
Table 11.1.2 Overview of Recent KCCA Budgets (UGX).....	11-18
Table 11.1.3 Comparison of Budget Allocations in KCCA by Function for FY 2019/20 and FY 2020/21	11-18
Table 11.1.2 Revenue Plans by Source for FY 2020/21 by District in Greater Kampala Metropolitan Area	11-19
Table 11.1.3 Summary of Program Allocations for FY 2020/21 by District in Greater Kampala Metropolitan Area	11-20
Table 11.1.4 Municipalities' Revenue Plans by Source for FY 2020/21 in Greater Kampala Metropolitan Area	11-22
Table 11.1.4 Summary of Municipalities' Programme Allocations for FY 2020/21 in Greater Kampala Metropolitan Area	11-23
Table 11.2.1 KPDF/KPDP 2012 Category I Projects (Excluding Projects Confirmed Implemented)	11-27
Table 11.2.2 KPDF/KPDP 2012 Category II Projects with Higher Priority Due to COVID-19	11-28
Table 11.2.3 Strategic Interventions Proposed in the Wakiso District Physical Development Plan.....	11-31
Table 11.2.4 Strategic Objectives and Major Programs and Projects in the GKMAEDS.....	11-34
Table 11.2.5 Proposed Projects for the Urban Environment Improvement Program against COVID-19 and Other Infectious Diseases in the Greater Kampala Metropolitan Area	11-38
Table 11.2.5 Share of Number of Building by Building Footprint Size by Parish.....	11-40
Table 11.3.1 Project Profile 1: Project for Capacity Development for Urban Environment Improvement in Suburban Areas of Greater Kampala Metropolitan Area	11-44
Table 11.3.3 Project Profile 2: Project for Development of Sub-centres and Suburban Centres in Greater Kampala Metropolitan Area	11-48
Table 11.3.3 Project Profile 3: Project for Improvement of Water Supply Reliability in Suburban Areas of Greater Kampala Metropolitan Area.....	11-51
Table 12.1.1 Number of Infected People by Health District in Abidjan.....	12-2
Table 12.1.2 Impacts of COVID-19.....	12-2
Table 12.1.3 Lifestyle Changes due to COVID-19.....	12-3
Table 12.1.4 Key Issues in Transportation Sector	12-5
Table 12.2.1 Greater Abidjan Population Projection.....	12-8
Table 12.2.2 SDUGA Project List and Current Status (1/2).....	12-14
Table 12.2.3 Number of community facilities developed by urban unit.....	12-16
Table 12.2.4 Waste Management Projects.....	12-18
Table 12.2.5 Characteristics of Abidjan and Challenges to Post-COVID-19	12-22
Table 12.3.1 Proposed projects to improve public services by introducing ICT (digitization)	12-27
Table 12.3.2 Issues related to national ID and resident registration	12-32
Table 12.3.3 Current Survey on Public Services in Abobo and Yopougon	12-34
Table 12.3.4 Methods of Requesting and Issuing Administrative Documents in Abobo and Yopougon	12-35
Table 12.3.5 Administrative Document Processing Time in Yopougon Commune	12-36
Table 12.3.6 Citizens' Responses to the Services at the communes.....	12-36

Table 12.3.7 Citizens' and civic groups' recommendations for improving government services .	12-37
Table 12.3.8 Number of people in each department of Abobo commune	12-38
Table 12.3.9 Number of staff in each department of Yopougon commune.....	12-39
Table 12.3.10 Staffing of the main office and branch offices of Yopougon Commune	12-39
Table 12.3.11 Status of the planned construction of a city hall branch office in Abobo.....	12-43
Table 12.3.12 Status of the planned construction of a city hall branch (annex) in Yopougon	12-44
Table 12.3.13 Schedule of activities for the project to improve public administrative services through digitization (Proposal).....	12-47
Table 12.3.14 Proposed Elementary School Water Sanitation Improvement Project	12-48
Table 12.3.15 Master Plan for Water Supply, Sanitation, and Waste Management in Abidjan.....	12-53
Table 12.3.16 UNICEF National Standards for School Water and Sanitation Facilities (2020, excerpts)	12-60
Table 12.3.17 Challenges and Responses in the Project for Improvement of WASH in Primary Schools	12-62
Table 12.3.18 Schedule of activities for the project for improvement of WASH in primary schools (draft).....	12-65
Table 12.4.1 Relevant departments and areas of responsibility within MNEDD.....	12-66
Table 12.4.2 Categorization related to EIES.....	12-68
Table 12.4.3 Environmental and Social Impact Indicators	12-70
Table 12.4.4 Simplified Environmental and Social Impact Assessment (Public Services Improvement through Digitization Project).....	12-70
Table 12.4.5 Simplified Environmental and Social Impact Assessment (Sanitation Facility Development and Sanitation Education Project for Elementary Schools)	12-71
Table 13.1.1 ISDF's Definition of Slum and Informal Settlement.....	13-6
Table 13.1.2 Economic Measures in Responce to COVID-19 by the Government of Egypt.....	13-9
Table 13.2.1 Objectives and Development Strategies of SUDMP	13-12
Table 13.2.2 Country Assistance Policy for Egypt.....	13-13
Table 13.2.3 The first Pahse of the Metro Line 4	13-14
Table 13.2.4 Direction of Urban Development based on New Neighborhood Concept.....	13-16
Table 13.3.1 Project for Development of the Low Carbon City in New Urban Community (NUC).....	13-25
Table 13.3.2 Other Urban Issues and Indicative Measures.....	13-25

Abbreviation

ADB	Asian Development Bank
ADSL	Asymmetric Digital Subscriber Line
AFD	<i>Agence Française de Développement</i>
AMREF	African Medical Research Foundation
ANAGED	<i>Agence Nationale de Gestion des Déchets</i>
AQI	Air Quality Index
ASEAN	Association of Southeast Asian Nations
AfDB	African Development Bank
BAD	African Development Bank (<i>Banque Africaine de Développement</i>)
BAPPEDA	Regional Development Planning Agency (<i>Badan Perencanaan Pembangunan Daerah Provinsi Dki Jakarta</i>)
BC	Bicycle
BCG	Boston Consulting Group
BOAD	West African Development Bank (<i>Banque Ouest Africaine de Développement</i>)
BPTJ	Greater Jakarta Transport Authority (<i>Badan Pengelola Transportasi JABODETABEK</i>)
BRAC	Bangladesh Rural Advancement Committee
BRT	Bus Rapid Transit
BTS	Bangkok Skytrain
C/P	counterpart
CAPMAS	Central Agency for Public Mobilization and Statistics
CBD	Central Business District
CBO	community-based organization
CCF	Community Care Facility
CCG	<i>Comité Conjoint de Gestion</i>
CCMC	COVID-19 Crisis Management Center
CECC	Central Epidemic Command Center
CEP	Community Empowerment Project
CFS	Clearing and Forwarding Services
CHPC	Citizens Housing & Planning Council
CMCO	Conditional Movement Control Order
CMP	Cutting, Making, and Packing
CNG	Compressed National Gas
COSAY	Project for Community Reinforcement towards Social Cohesion in Greater Abidjan (<i>Cohésion Sociale Abobo Yopougon</i>)
COVID-19	Coronavirus Disease 2019
CRF	Community Recovery Facility
CSO	Civil Society Organization
CUREIP	Preparatory Study on Urban Environment Improvement against COVID-19
CUWG	Community Unit Working Group
DAP	Detailed Area Plan
DBRTCL	Dhaka Bus Rapid Transit Company Limited
DELWP	Department of Environment, Land, Water and Planning

DF/R	Draft Final Report
DGHS	Directorate General of Health Services
DKI	Special Capital Region (<i>Daerah Khusus Ibukota</i>)
DL	Download
DMTCL	Dhaka Mass Transit Company Limited
DNA	deoxyribonucleic acid
DNCC	Dhaka North City corporation
DOD	Digital oriented development
DORSCON	Disease Outbreak Response System Condition
DOTr	Department of Transportation
DSCC	Dhaka South City corporation
DTCA	Dhaka Transport Coordination Authority
DUHD	Department of Urban and Housing Development
DV	Domestic violence
DWASA	Dhaka Water Supply and Sewerage Authority
DX	Digital Transformation
EC	Electronic commerce
ECQ	Enhanced community quarantine
EGDI	E-Government Development Index
EGP	Egyptian Pound
EMCO	Enhanced movement control order
EPA	Epidemic Prevention Area
ES	Engineering service
F/R	Final Report
FMDV	Global Fund for Cities Development
FS	Feasibility study
FY	Fiscal year
GBV	Gender-based violence
GCMR	Google Community Mobility Report
GCQ	General community quarantine
GCR	Greater Cairo Region
GDP	Gross Domestic Product
GIS	Geographic Information System
GKMA	Greater Kampala Metropolitan Area
GNI	Gross National Income
GPS	Global Positioning System
GRDP	Gross Regional Domestic Product
GRID	Green, Resilient and Inclusive Development
GoK	Government of Kenya
HCI	Human Capital Index
HES Code	<i>Hayat Eve Sığar</i> Code
HPCIDBC	High Powered Committee for Integrated Development of the Bagmati Civilization
IC	Integrated circuit
IC/R	Inception Report
ICDB	Inland Container Depot Nairobi

ICT	Information and Communication Technology
ICU	Intensive Care Unit
ID	identification
IEC	Information, Education, and Communication
IFC	International Finance Corporation
IMF	International Money Fund
IOM	International Organization for Migration
IPC	Infection prevention and control
ISDF	Informal Settlements Development Fund
ISO	International Organization for Standardization
ISOCARP	International Society of City and Regional Planners
IT	Information Technology
IT/R	Interim Report
ITU	International Telecommunication Union
IUC	International Urban Cooperation
JETRO	Japan External Trade Organization
JHU	Johns Hopkins University
JICA	Japan International Cooperation Agency
JUTPI	JABODETABEK Urban Transportation Policy Integration Project
KCCA	Kampala Capital City Authority
KDVA	Kathmandu Valley Development Authority
KIWASH	Kenya Integrated Water, Sanitation and Hygiene Project
KMTC	Kenya Medical Training College
KNBS	Kenya National Bureau of Statistics
KPA	Kenya Ports Authority
KPDF	Kampala Physical Development Framework
KPDP	Kampala Physical Development Plan
KRC	Kenya Railways Corporation
KV	Kathmandu Valley
LA	Loan Agreement
LMK	<i>Lembaga Manajemen Kolektif</i>
LRT	Light Rail Transit
LTDP	Long Term Development concept Plan
MC	Motorcycle
MCC	Millennium Challenge Corporation
MCG	Mombasa County Government
MECQ	Modified enhanced community quarantine
MERS	Middle East respiratory syndrome
MGCMP	Mombasa GateCity Master Plan
MICE	Meeting, incentive, conference and exhibition
MICS	Multiple Indicator Cluster Survey
MM	man-month
MMUTMP	Multi Model Urban Transport Master Plan
MOWASCO	Mombasa Water Supply and Sanitation Company
MP	Master plan

MRT	Mass Rapid Transit
MRTJ	Jakarta MRT Company
MoFAGA	Ministry of Federal Affairs and General Administration
MoHUUD	Ministry of Housing, Utility, and Urban Development
MoUD	Ministry of Urban Development
NAMATA	Nairobi Metropolitan Area Transport Authority
NCA	National Construction Authority
NCWSC	Nairobi City Water and sewerage company
NERC	National Emergency Response Committee
NGO	Non-governmental organization
NHA	National Housing Authority
NHC	National Housing Corporation
NITA	National Information Technology Authority
NIUPLAN	Nairobi Urban Development Master Plan
NMS	Nairobi Metropolitan Service
NMT	Non-motorized transport
NPO	Non-profit organization
NRW	Non-Revenue Water
NTD	New Taiwan Dollar
NUC	New Urban Community
NWSS	National Water Services Strategy
NZ	New Zealand
OD	Origin-destination
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
OSI	Online Service Index
OTT	Over the top
P/R	Progress Report
PACOGA	Projet d'Intégration Port-Ville d'Abidjan
PAP	Pre-arrival Processing
PHBS	Clean and Healthy Living Behavior (Perilaku Hidup Bersih dan Sehat)
PHV	Public Village Health Volunteer
PKH	Family Hope Program (<i>Program Keluarga Harapan</i>)
PM	Particulate matter
PPE	Personal protective equipment
PPKM	Community activities restrictions enforcement (<i>Pemberlakuan Pembatasan Kegiatan Masyarakat</i>)
PPP	Public private partnership
PPSU	Unit for Public Infrastructure and Facilities Handling (<i>PENANGANAN PRASARANA DAN SARANA UMUM</i>)
PSBB	Large-scale social restrictions (<i>Pembatasan Sosial Berskala Besar</i>)
PUPR	Ministry of Public Works and Housing (<i>Kementerian Pekerjaan Umum dan Perumahan Rakyat</i>)

PUD	Plan d'urbanisme de détail
RAJUK	Rajdhani Unnayan Kartipakkha
RECDTS	Regional Electronic Cargo and Driver Tracking System
RITJ	JABODETABEK Transportation Master Plan (<i>Rencana Transportasi JABODETABEK</i>)
RMCO	Recovery Movement Control Order
RMG	Readymade garment
RSTP	Revised Strategic Transport Plan
RT	Neighborhood Unit (<i>Rukun Tetangga</i>)
RT-PCR	Reverse Transcription Polymerase Chain Reaction
RW	Community Unit (<i>Rukun Warga</i>)
SAARC	South Asian Association for Regional Cooperation
SACCO	Saving and Credit Cooperative Organization
SARS	Severe acute respiratory syndrome
SCEA	Shippers Council of East Africa
SDGs	Sustainable development goals
SDUGA	Schème Directeur d'Urbanisme du Grand Abidjan
SEZ	Special economic zone
SGA	standard gauge railway
SGD	Singapore Dollar
SHN	Stay-home notice
SIF	Swab Isolation Facility
SITRAMP	The Study on Integrated Transportation Master Plan
SME	Small and Medium-sized Enterprise
SMS	Short message service
SNS	Social Networking Service
SOE	State of emergency
SUDMP	Strategic Urban Development Master Plan
SUDP	The Project for the Strategic Urban Development Plan of Greater Yangon
TAZ	Traffic analysis zone
TEU	Twenty Foot Equivalent Unit
THB	Thai Baht
TII	Telecommunication Infrastructure Index
TOD	Transit-oriented development
TT	TraceTogether
TV	television
UECCD	Urban Environmental Conservation and Cleaning Department
UDF	Urban Development Fund
UFW	Unaccounted-for Water
UHC	Urban Health Center
UN	United Nations
UN- EGOVKB	United Nations e-Government Knowledgebase
UN-Habitat	United Nations Human Settlements Programme

UNB	United News Bangladesh
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UPT	<i>Unit Pelaksana Teknis</i>
USAID	United States Agency for International Development
VHT	Village Health Volunteer
WASH	Water, Sanitation and Hygiene
WASREB	Water Services Regulatory Board
WB	World Bank
WDI	World Development Indicators
WHO	World Health Organization
WSD	Water and Sanitation Department
WTP	Wastewater treatment plant
YBS	Yangon Bus Service
YCDC	Yangon City Development Committee
YRG	Yangon Regional Government
YUTRA	Comprehensive Urban Transport Plan of the Greater Yangon

1 Introduction

1.1 Background

As the novel coronavirus disease (COVID-19) expanded worldwide from the beginning of 2020, countries implemented containment measures, such as lockdown of cities and closure of borders, which had unprecedented impacts. Large cities where people and economic activities are concentrated were seriously affected. COVID-19 has highlighted vulnerability in informal settlements of developing countries, being densely populated without adequate water supply and sanitation facilities. Improving the living environment of such areas became an urgent issue to prepare for the next wave of COVID-19 infection or another infectious disease.

On the other hand, in the countries which have experienced a slowing spread of COVID-19 infection, urban economic and social activities are gradually resuming. New normal lifestyles and businesses start to emerge. It is widely discussed by government agencies and international organizations how to make cities resilient against infectious diseases, including COVID-19, and how the cities will be changed with new-normal activities.

1.2 Purpose

The Preparatory Study on Urban Environment Improvement against COVID-19 (hereinafter called the Study or CUREIP) is conducted with the following objectives.

- To understand the actual status of COVID-19 infection expansion and its subsequent impact in developing countries.
- To examine how cities will change in a post-COVID-19 period and how urban development administration should respond to such changes.
- To formulate the perspective of the assistance and relevant projects of the Japan International Cooperation Agency (JICA).

1.3 Implementation Structure

The study was conducted by a 33-member study team, with the JICA Infrastructure Management Department as secretariat, and was composed based on discussions with relevant departments and each country office of JICA. Additionally, the following two experts provided advice in considering the expected status of cities.

- Prof. Sadatsugu Nishiura, Meisei University
- Dr. Norihisa Shima, Toyo University

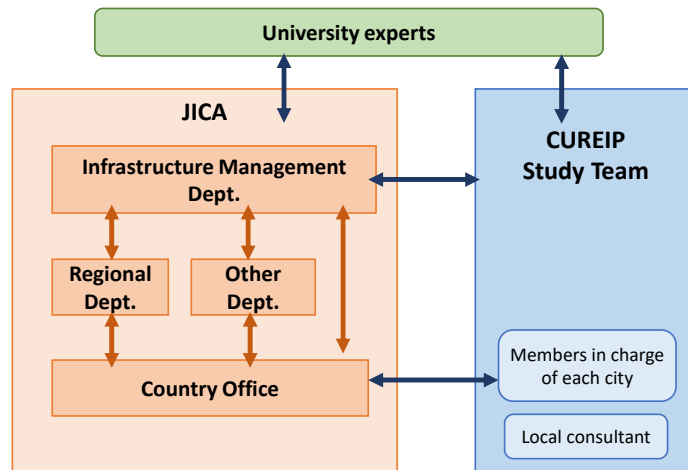


Figure 1.3.1 Study Implementation Structure

Examining the expected future status of the cities based on the results of a detailed analysis of the target cities is necessary to formulate JICA’s future development program for each city. At the same time, formulating technical assistance projects requires a wide range of expertise in planning, institution, and capacity building other than in infrastructure. Given this context, the CUREIP Team was created, as shown in Figure 1.3.2.

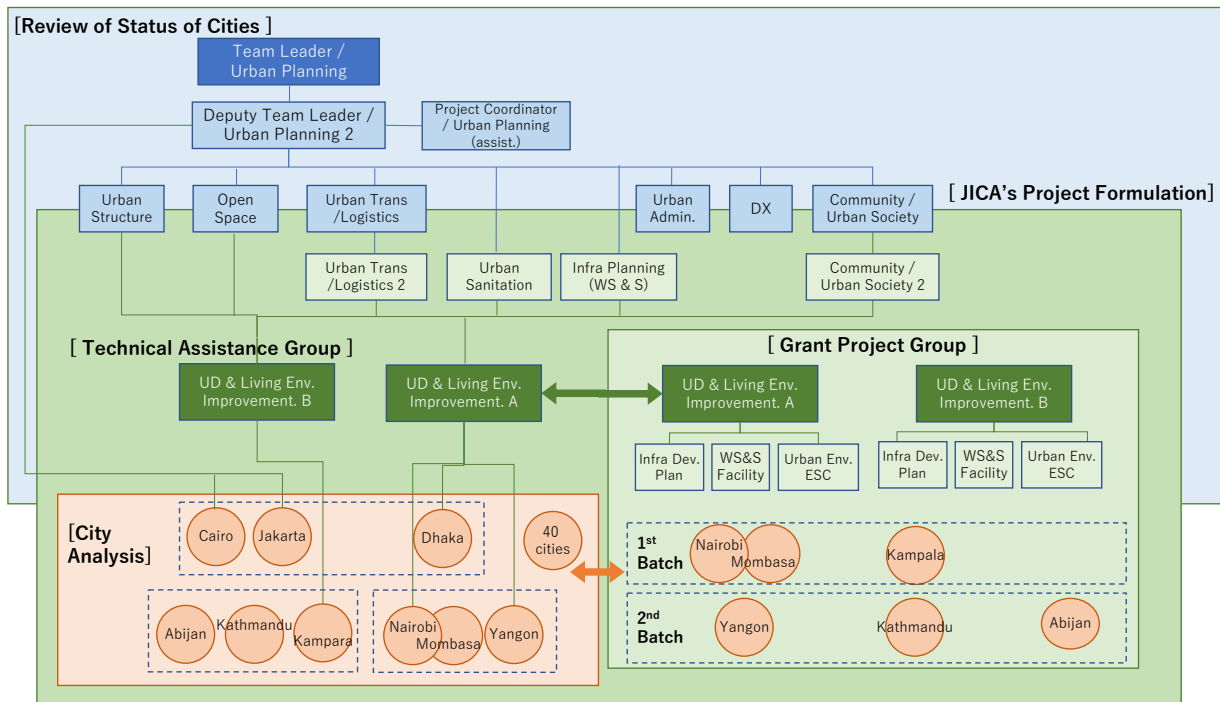


Figure 1.3.2 CUREIP Team Formulation

1.4 Target cities

1.4.1 Target Cities and Main Cities

The Study has nine target cities.

Asia: Jakarta (Indonesia), Kathmandu (Nepal), Dhaka (Bangladesh)

Africa: Nairobi and Mombasa (Kenya), Kampala (Uganda), Abidjan (Cote d'Ivoire), Cairo (Egypt)

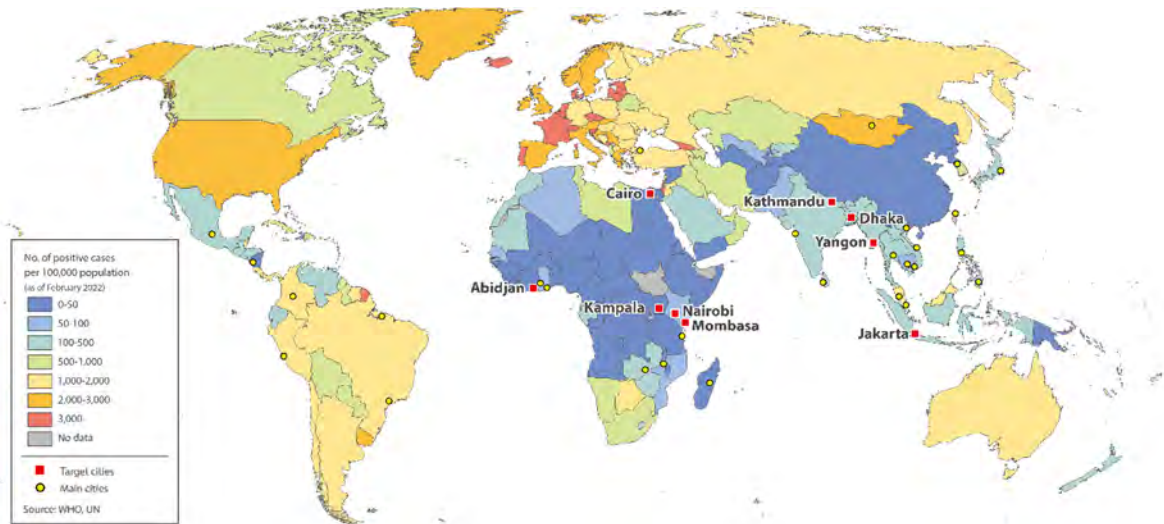


Figure 1.4.1 Target Cities and Main Cities for General Survey

The expected future status of cities was discussed to cover the entire world, including developed and developing countries. A COVID-19 general survey was conducted for 40 main cities (see Table 1.4.1), including the target cities, which were selected on the following criteria:

- cities with a variety of regions and sizes,
- data availability,
- multiple cities from a few countries, and
- cities that successfully contained the pandemic, such as Singapore, Seoul, and Taipei.

Table 1.4.1 Main 40 Cities for General Survey

East and Southeast Asia		South Asia		Africa	
Jakarta	Indonesia	Dhaka	Bangladesh	Nairobi	Kenya
Surabaya		Kathmandu	Nepal	Mombasa	
Yangon	Myanmar	Colombo	Sri Lanka	Kampala	Uganda
Mandalay		Mumbai	India	Abidjan	Cote d'Ivoire
Bangkok	Thailand	Central and South America		Cairo	Egypt
Krabi		Managua	Nicaragua	Lusaka	Zambia
Manila	Philippines	Sao Paulo	Brazil	Dar Es Salaam	Tanzania
Cebu		Belem		Lilongwe	Malawi
Davao		Bogota	Colombia	Accra	Ghana
Hanoi	Viet Nam	Lima	Peru	Kumasi	
Ho Chi Minh City		Mexico City	Mexico	Antananarivo	Madagascar
Da Nang		Europe		Developed Countries	
Kuala Lumpur		Istanbul	Turkey	Tokyo	Japan
Phnom Penh	Malaysia			Taipei	Taiwan
Ulaanbaatar	Cambodia			Seoul	Korea
	Mongolia			Singapore	Singapore

Source: JICA Study Team

1.4.2 General Situation of Target Cities

Table 1.4.2 shows the basic information of the nine target cities. These cities are diverse in terms of scale, urbanization phase, economic level, and institution of urban governance and society, detailed in the following chapters as an assumption of this Study.

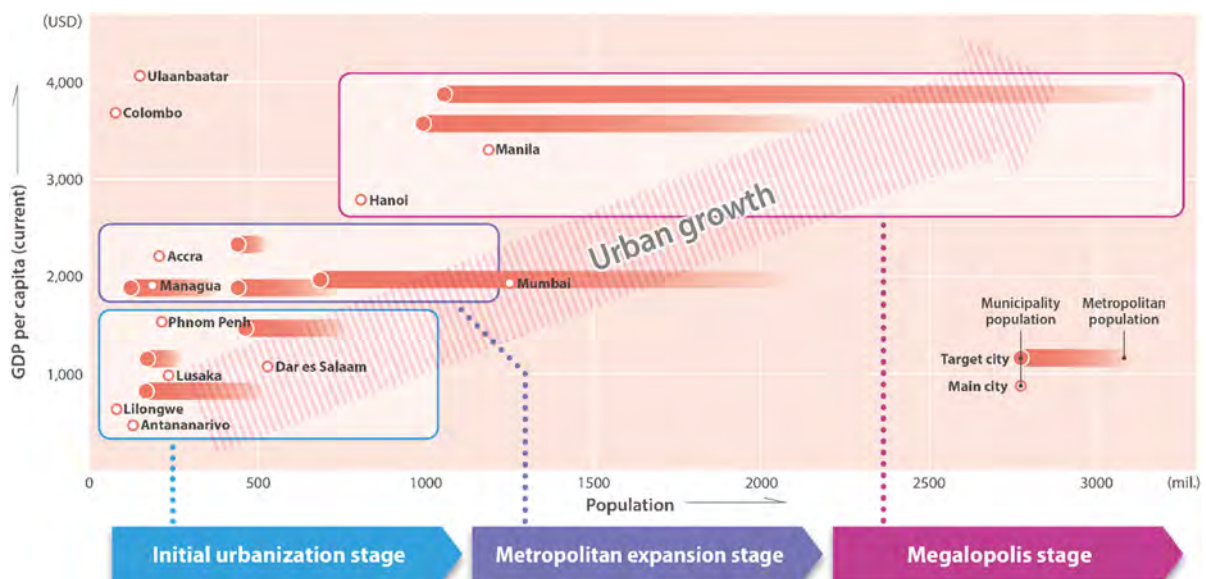
Table 1.4.2 Basic Information of the Target Cities

City	Jakarta	Yangon	Kathmandu	Dhaka	Nairobi	Mombasa	Kampala	Abidjan	Cairo
Country	Indonesia	Myanmar	Nepal	Bangladesh	Kenya		Uganda	Cote d'Ivoire	Egypt
City population ¹⁾ (thousand)	10,534 (2020)	4,621 (2019)	1,699 (2011)	6,845 (2011)	4,397 (2019)	1,208 (2019)	1,507 (2014)	4,395 (2014)	9,909 (2020)
City area (km ²)	653	912	434	306	684	224	196	491	453
City pop density (/km ²)	16,132	5,067	3,915	22,409	6,428	5,384	8,373	8,948	21,874
Metropolitan pop. ¹⁾ (thousand)	31,213 (2020)	7,361 (2014)	2,456 (2011)	21,006 (2011)	7,074 (2018)	3,529 (2019)	3,436 (2014)	5,054 (2014)	21,323 (2017)
Metropolitan area ¹⁾ (km ²)	6,392	10,170	954	2,161	4,853	N/A	1,450	4,311	6,639
Metropolitan pop density ¹⁾ (/km ²)	4,883 (2020)	724 (2014)	2,574 (2011)	9,720 (2011)	1,458 (2018)	N/A	2,370 (2014)	1,173 (2014)	3,212 (2017)
GDP per capita ²⁾ (2019, current, USD)	4,136	1,408	1,071	1,856	1,817		777	2,286	3,020
Access to drinking water ²⁾ (2018, urban pop, %)	95.5	93.0	89.1	97.5	84.6		75.1	87.7	99.5
Slum pop. ratio ²⁾ (2014, urban pop, %)	21.8	41.0	54.3	55.1	56.0		53.6	56.0	10.6
EGDI ³⁾	88	146	132	119	116		137	139	111
Availability of positive case data by district ¹⁾	By <i>kelurahan</i>	By township	By ward	No	By subcounty		By division	No	No
Availability of digital map	1/25,000 (2000)	1/5,000 (JICA) (2019)	1/5,000 (JICA) (2016)	1/25,000 (2016)	1/50,000 (2005)		1/2,500 (2015)	1/5,000 (2011)	1/2,500 (2015)

Notes: ²⁾ country data, ³⁾ E-Government Development IndexSource: ¹⁾ Country/City statistics, ²⁾ World Bank, ³⁾ UN e-Government Knowledgebase (UN-EGOVKB)

1) City Scale and Development Stage

Figure 1.4.2 shows the current economic level and current and year 2035 predicted population of the target and main cities/metropolises. Jakarta, Cairo, and Dhaka are already megalopolises with a population of more than 10 million. Although the population of Dhaka is approximately 6.8 million, the United Nations (UN) estimates that the metropolitan population is 21 million and will increase to 30 million in the future. Abidjan, Nairobi, and Yangon are developing into metropolises with a population of more than five million. Particularly, Nairobi and Abidjan are in the process of country-scale urbanization, and further growth is predicted. Meanwhile, Mombasa, Kathmandu, and Kampala have a relatively small population of less than three million. Kampala, in particular, is in the initial stage of urbanization. Therefore, how to respond to the dramatic population growth is an urgent challenge.



Source: JICA Study Team based on WDI, UN World Urbanization Prospects (2018), and other materials

Figure 1.4.2 Population and GDP per Capita of Target and Main Cities

2) Population Density Distribution

Figure 1.4.3 shows nighttime population density distribution of the target cities.

Jakarta: Population density is low in the central area, where many government offices, commercial buildings and large parks are located. A relatively higher population density is observed in the surrounding areas and along the Java Sea. While the density is lower in the suburbs, the main corridors along arterial roads are relatively dense.

Yangon: Population density is especially high in the central business district (CBD), north of Yangon River, which gets lower as it goes further away from the CBD. The south bank of the Yangon River has not been urbanized yet.

Kathmandu: Most of the Kathmandu District has been urbanized, of which the central area is highly dense. Lalitpur and Bhaktapur Districts, both adjacent to Kathmandu District, have been urbanized. The same has also been observed in the mountainous areas of the Bhaktapur District.

Dhaka: Population density is high in a part of Old Dhaka (or south of the city) and lower in the surrounding areas. There are several linear areas with high population density in the

suburban areas such as Mirpur. Less dense areas are observed with military bases or an airport, along rivers, and on the periphery of Dhaka City.

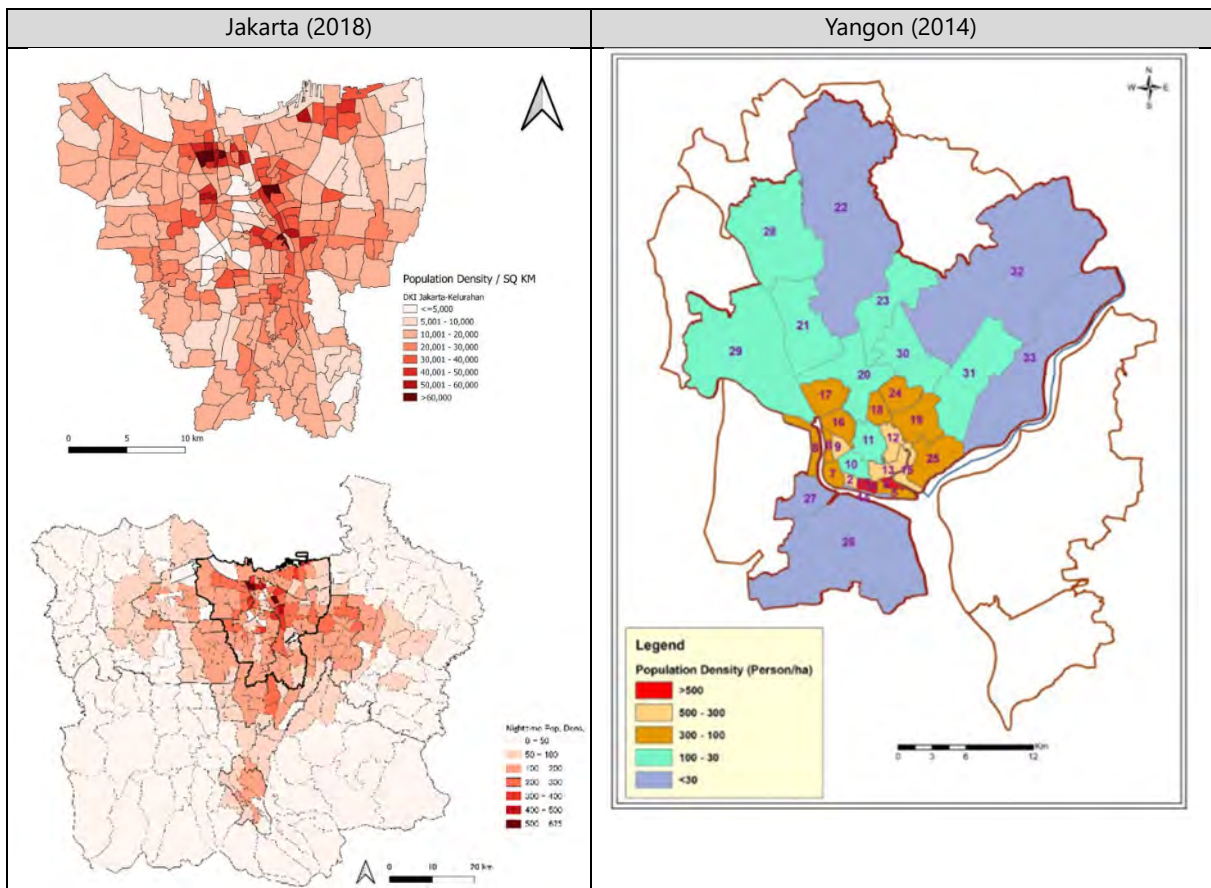
Nairobi: Population density is high in the central area of the Nairobi metropolitan area. It is low in Langata because of the Nairobi National Park and the limited residential area. The slum areas such as Mathare and Kibera have high population densities.

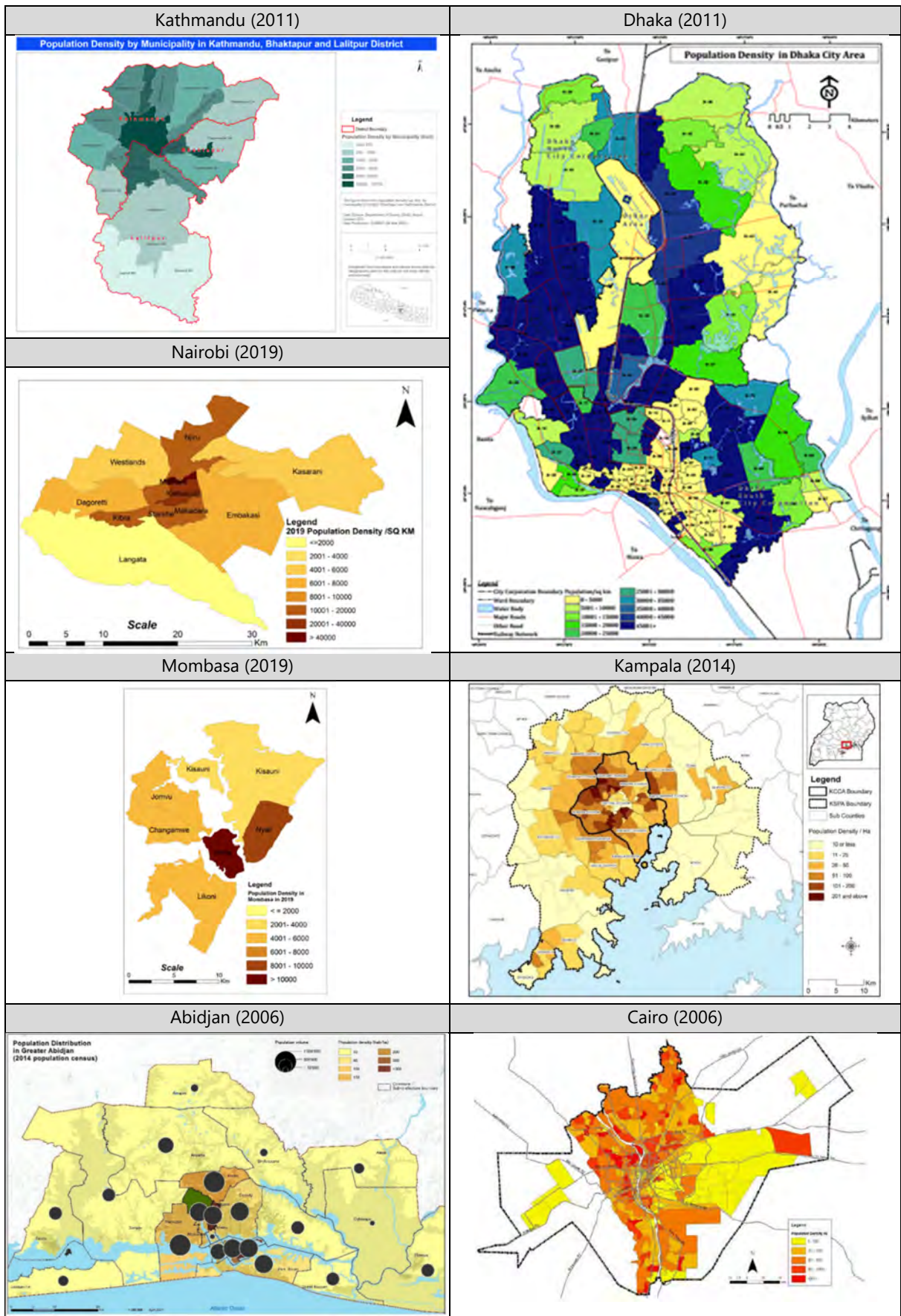
Mombasa: Population density is particularly high in Mombasa Island and the surrounding area.

Kampala: Population density is low in the city center, where the government facilities are located. Its surrounding area has a high population density, especially in the north and south of the city.

Abidjan: Population density is high in the central area, such as Plateau and Treichville, which gets lower further into the suburban areas beyond the Abidjan Autonomous District.

Cairo: While dense areas are scattered across the city, areas with high density are especially concentrated in the north where farmlands were converted into residential areas. the east and west of the city were formerly desert areas constructed with new towns, which has a relatively high population density.





Source: JICA Study Team based on JICA Reports and other materials

Figure 1.4.3 Population Density Distribution of Target Cities

3) Future Urban Structure

Figure 1.4.4 shows the future urban structure plans based on the urban development masterplan in each target city.

Jakarta: The *Rencana Tata Ruang Wilayah DKI Jakarta 2030*, published in 2013, plans to cluster commercial business districts in the old city center in the north, the current CBD, and along the main roads, with residential areas behind them. There are plans to concentrate commercial and business functions in some areas as a strategic hub.

Yangon: Yangon faces a problem of traffic congestion and in the environment due to the concentration of central urban functions in the CBD. The Strategic Urban Development Plan of the Greater Yangon (SUDP), formulated in 2013, adopted the sub-center and green island system (decentralized urban center functions) among the urban structure alternatives for the future urban structure of the Yangon Metropolitan Area. In this plan, urban center functions will be decentralized from the CBD to sub-centers that will be developed in the future, and urbanization will be promoted in the sub-center growth axis within 10–15 km from the CBD. Specifically, it proposes to create a "second CBD" and multiple "sub-centers" as a new commercial business, industrial, and residential centers.

Kathmandu: The "Vision 2035 and Beyond: 20 Years Strategic Development Master Plan (2015–2035) for Kathmandu Valley," released in 2016, addresses the issues of rapid urban concentration, urban population growth, unplanned investment in infrastructure, and land use. It also calls for urban development with enhanced resilience to disasters and other risks. Specifically, the strategies include the Risk Sensitive Land Use Plan (RSLUP), Satellite Town, and Outer Ring Road development, and the plan calls for urban decentralization, enhanced connectivity, and risk-sensitive land use.

Dhaka: Based on "The Town Improvement Act 1953 Section 74," Dhaka has developed a Detail Area Plan (DAP) that outlines two main principles, "Inclusive planning" and "Reconnect urban people to the environment." The latest DAP covers the period from 2016 to 2035 and is updated every five years. It consists of two parts, the "land use zone management" and "overlay zone management," and the development within the city is managed based on this.

Nairobi: Based on the urban structure with sub-centers, the urban planning in Nairobi aims to make the city a symbolic area as a gateway to the East African region by strengthening the functions of the CBD. The sub-centers will be strengthened to reduce the east–west divide, ease development pressure on the existing CBD, and promote decentralization of social activities and balanced development throughout the city of Nairobi. In addition, the establishment of sub-centers at the nodes of the urban transport system, urban development, and urban transport development will be coordinated, particularly to strengthen major nodes between roads and rails, including LRT.

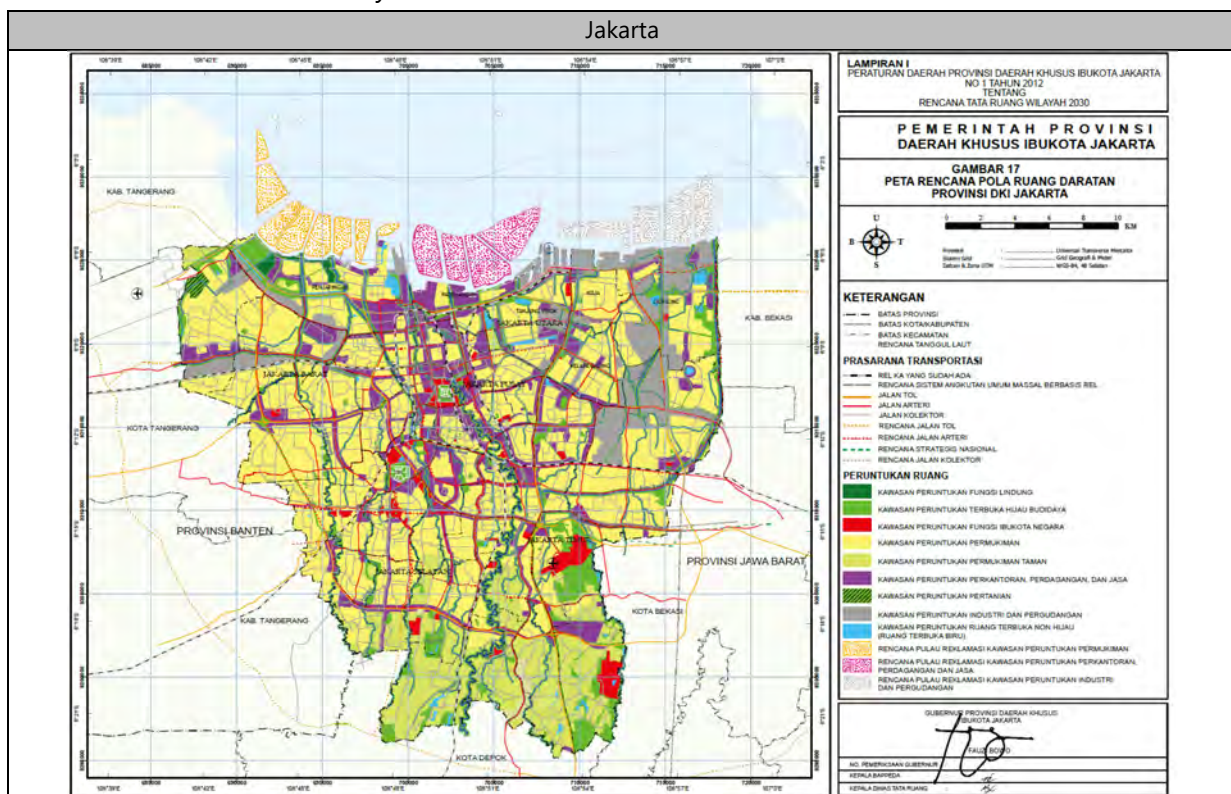
Mombasa: A "logistics-oriented" urban structure is proposed, with emphasis on the separation of northern corridor traffic from intra-regional traffic by network improvements along the northern corridor, the development of sub-centers along the northern corridor, and the enhancement of commercial and tourist functions through improved land use on Mombasa Island and in existing urban areas.

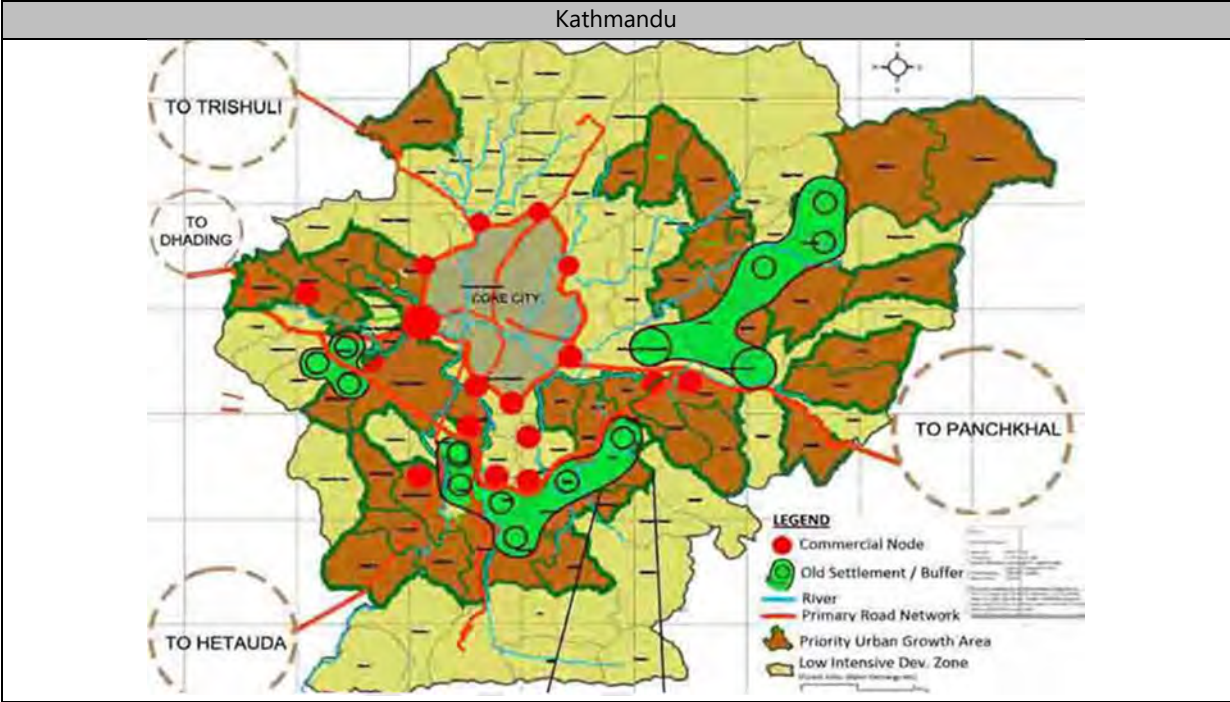
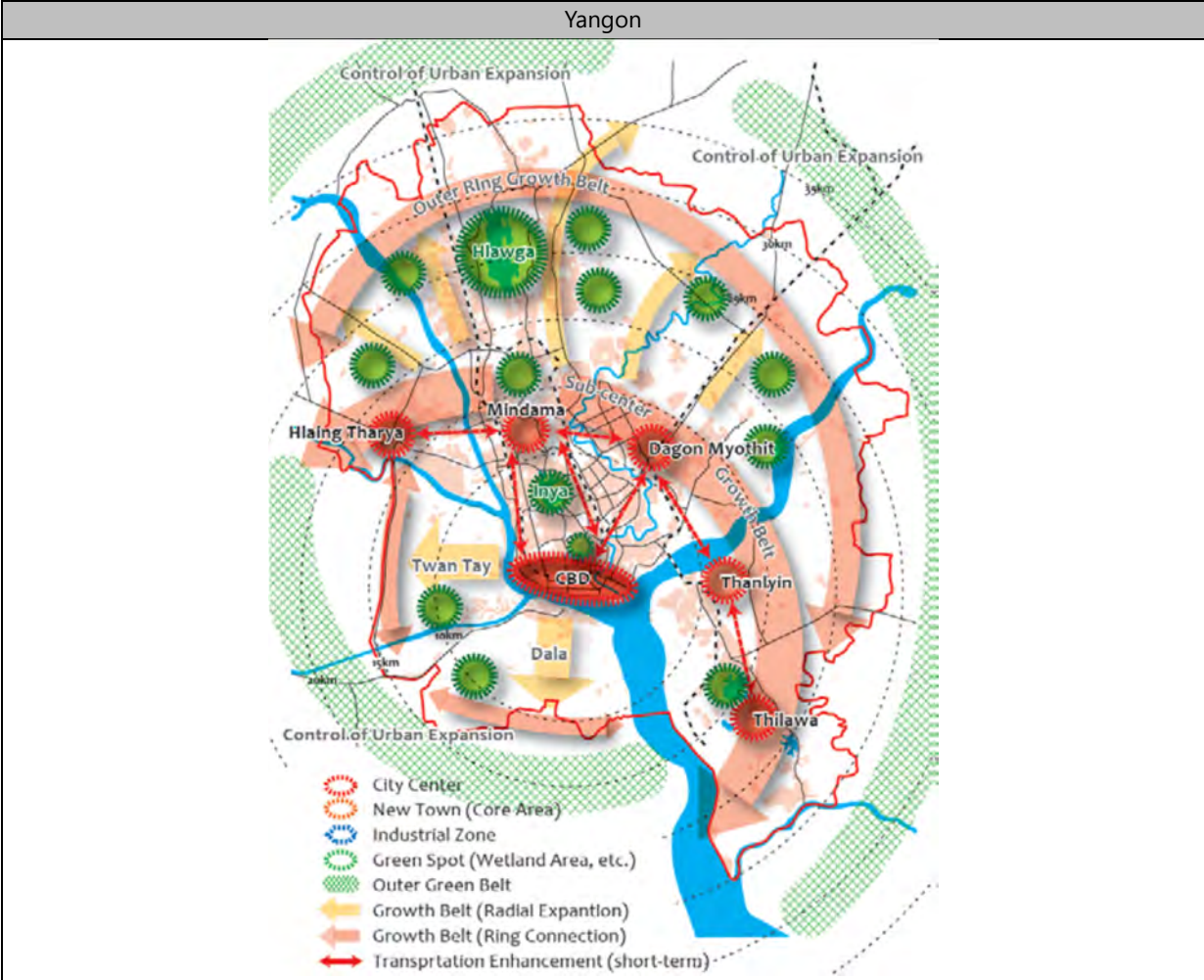
Kampala: In the Greater Kampala Metropolitan Area, the Kampala Physical Development Framework with a target year of 2040 and the Kampala Physical Development Plan with a

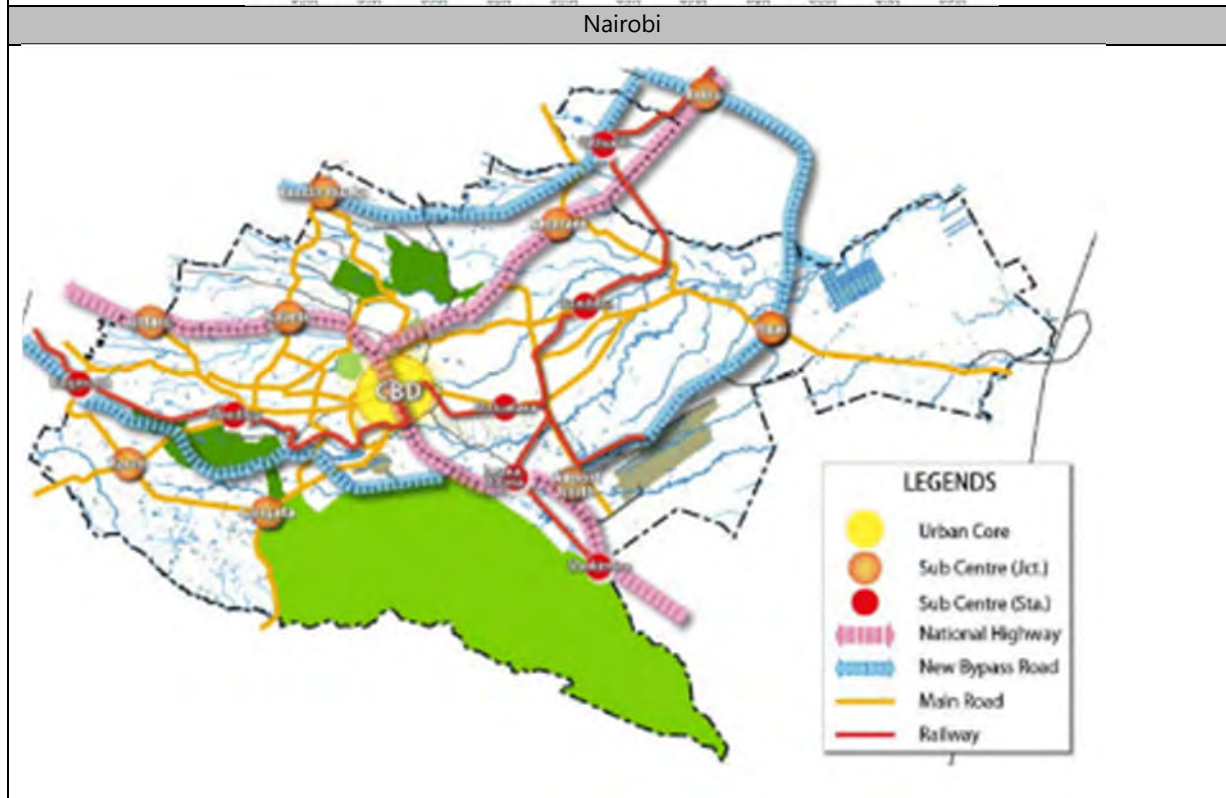
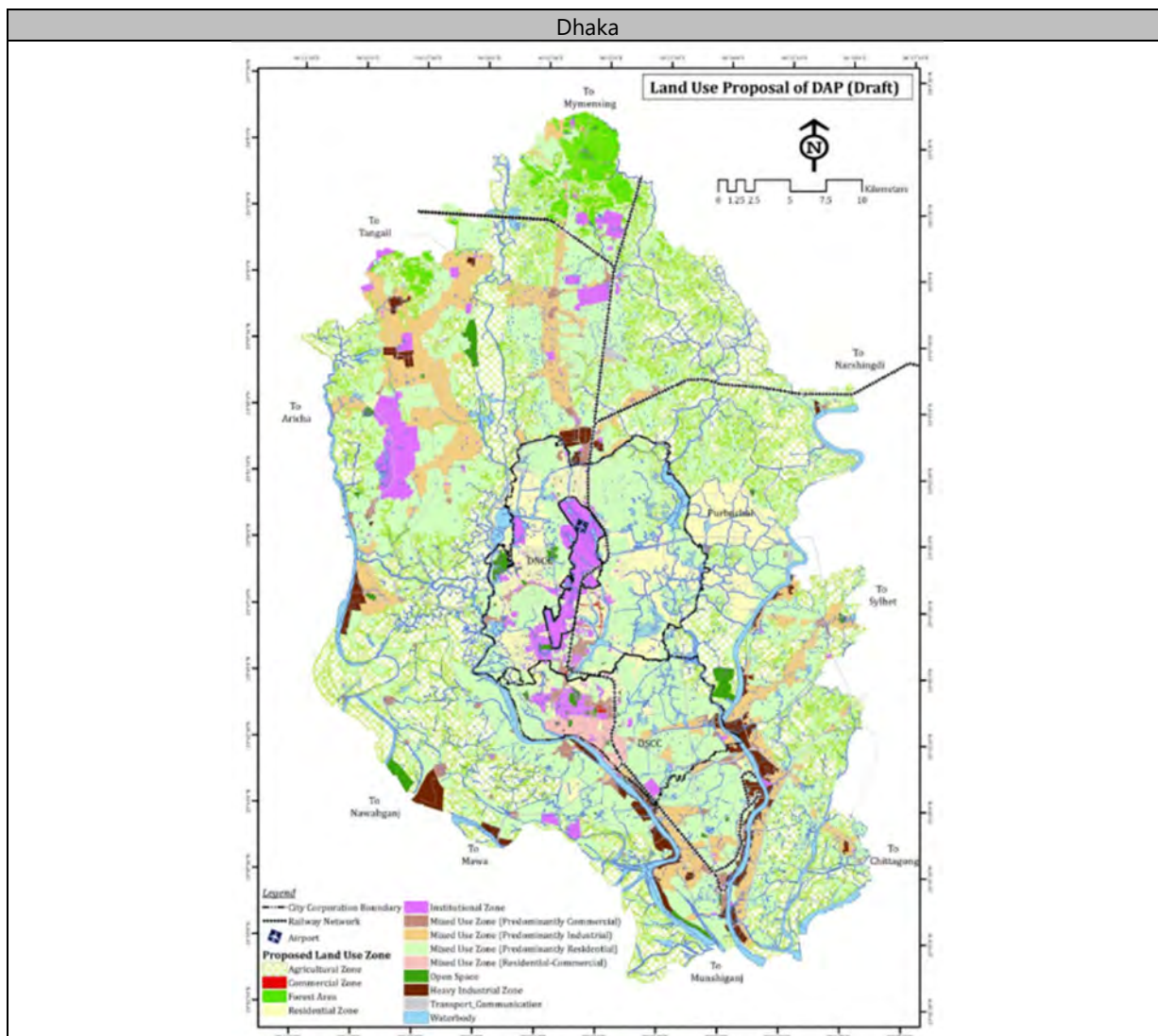
target year of 2030 were developed in 2012. The framework adopted a "radial integrated" model urban structure with a multipolar distribution outside the city of Kampala. However, despite the existing plan's proposal for a multipolar and decentralized urban structure, its formulation is based on a population frame on the assumption that the population will continue to be concentrated in Kampala City. As a result, the 2014 population census shows that the population outside of Kampala has increased significantly, and the infrastructure to support the population outside of Kampala cannot keep pace with the population growth. A revision of the urban development master plan for the Kampala Metropolitan Area is currently underway as part of JICA's project. While following the policy of a multi-pole decentralized urban structure that was discussed in the 2012 plan, the revised plan would allow for a more decentralized urban structure with more distributed urban functions.

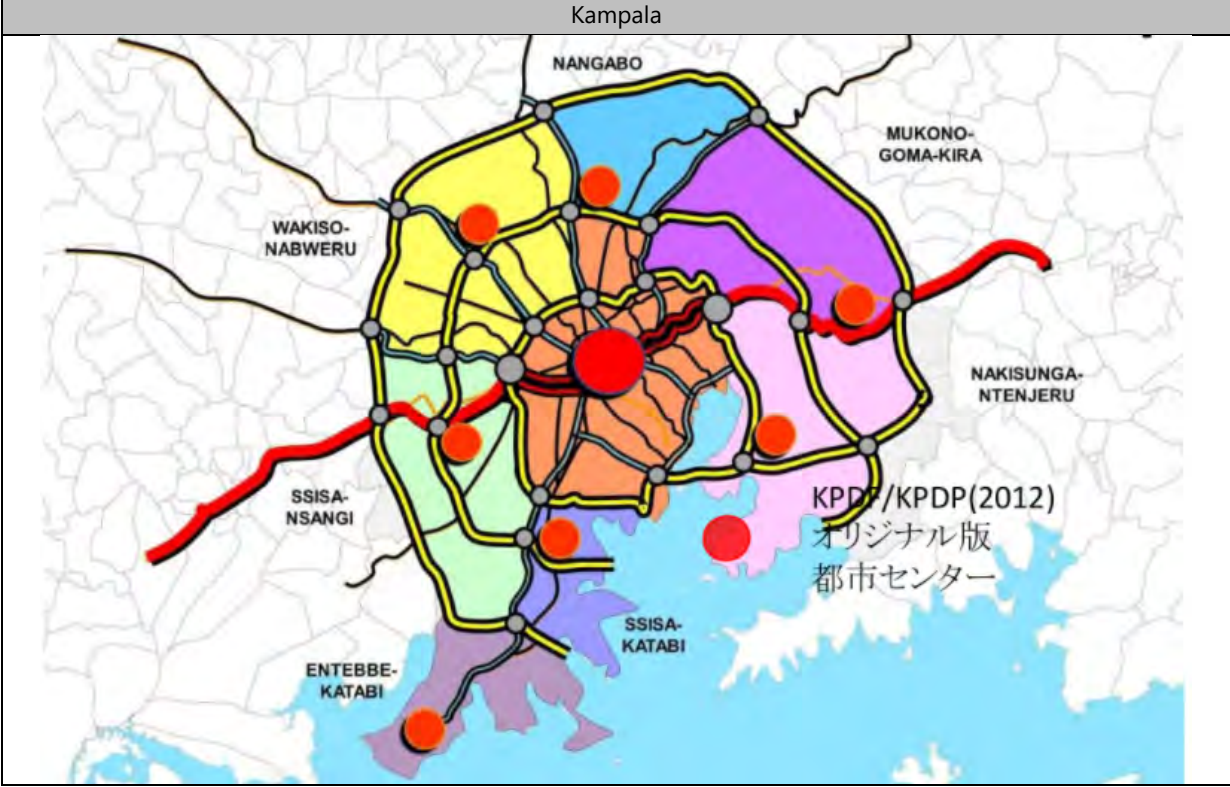
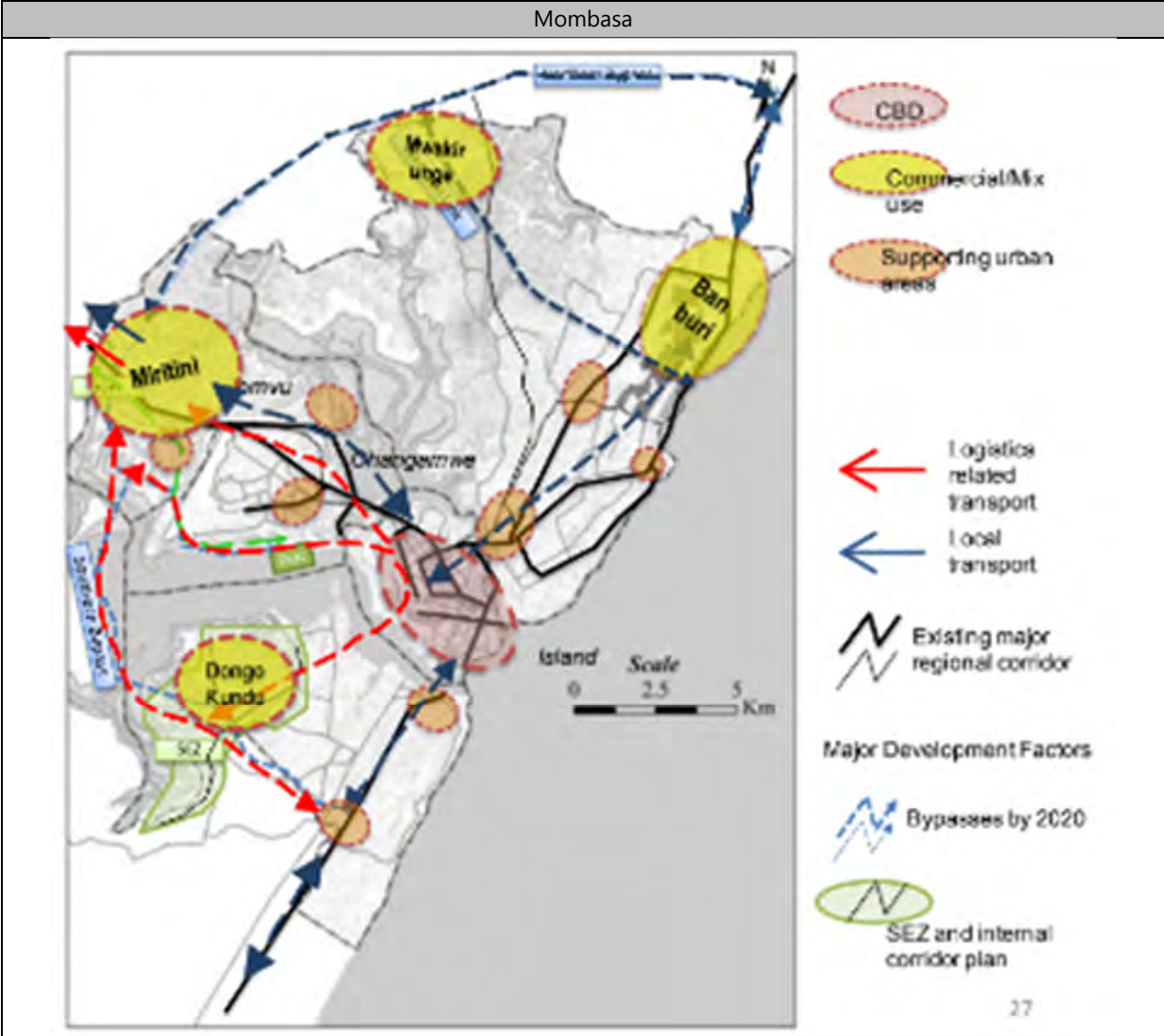
Abidjan: The "Shéma Directeur d'Urbanisme (Urban Development Plan for the Grand Abidjan Region: SDUGA)" for the Grand Abidjan Region (including 13 municipalities of the Autonomous Region of Abidjan, 6 surrounding municipalities and surrounding counties) with the target year of 2030 was approved by the government in 2016. It plans to solve urban problems such as unregulated urbanization and traffic congestion due to lack of infrastructure, and to establish a compact city structure within proximity to work and residence by promoting development of satellite centers and public transportation-oriented urban development as a means of accommodating a rapidly growing population in the future.

Cairo: In the General Land Use Plan of Cairo with the target year of 2027, Cairo plans to build a multipolar urban structure while constructing a new town in a desert area to accommodate the rapidly growing population, given that the existing urban areas are already overcrowded. Three development corridors have been established from the city center to the suburbs with the new town development, and development is planned to be integrated with the construction of subways and monorails.









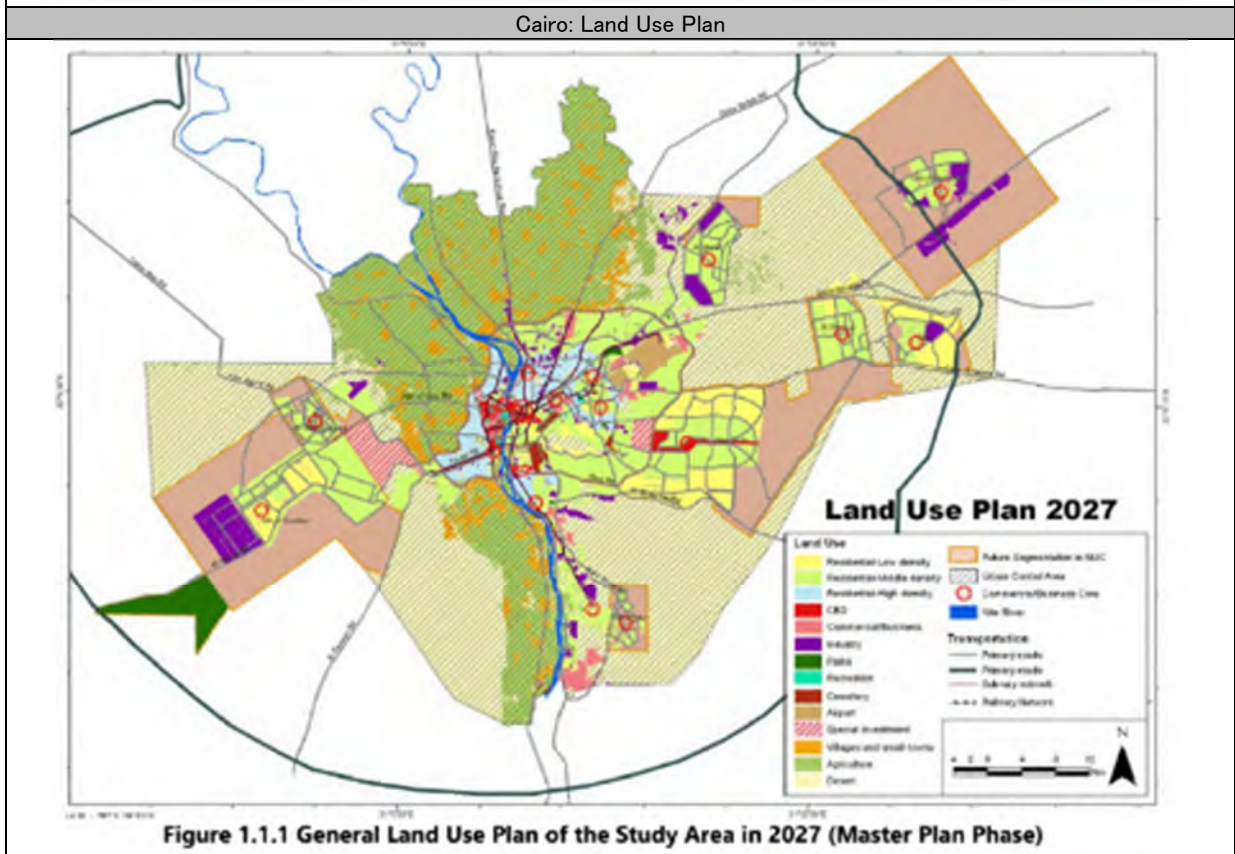
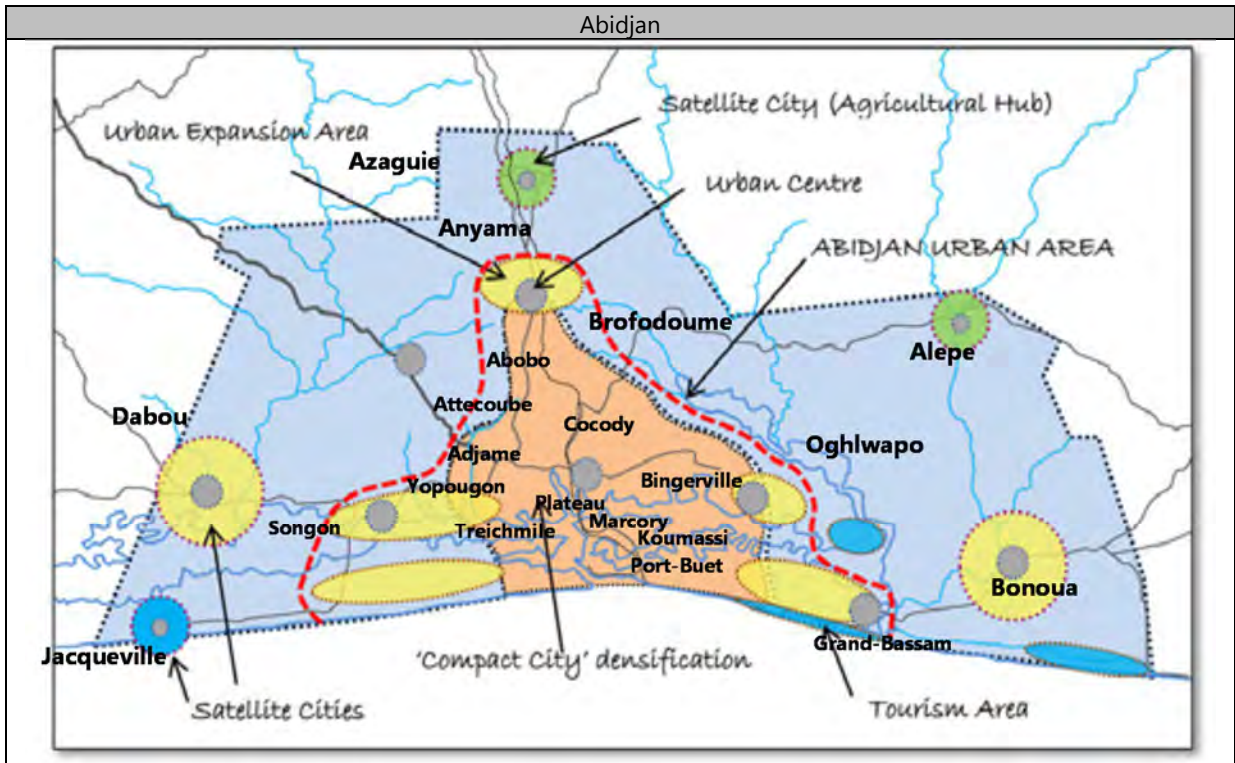
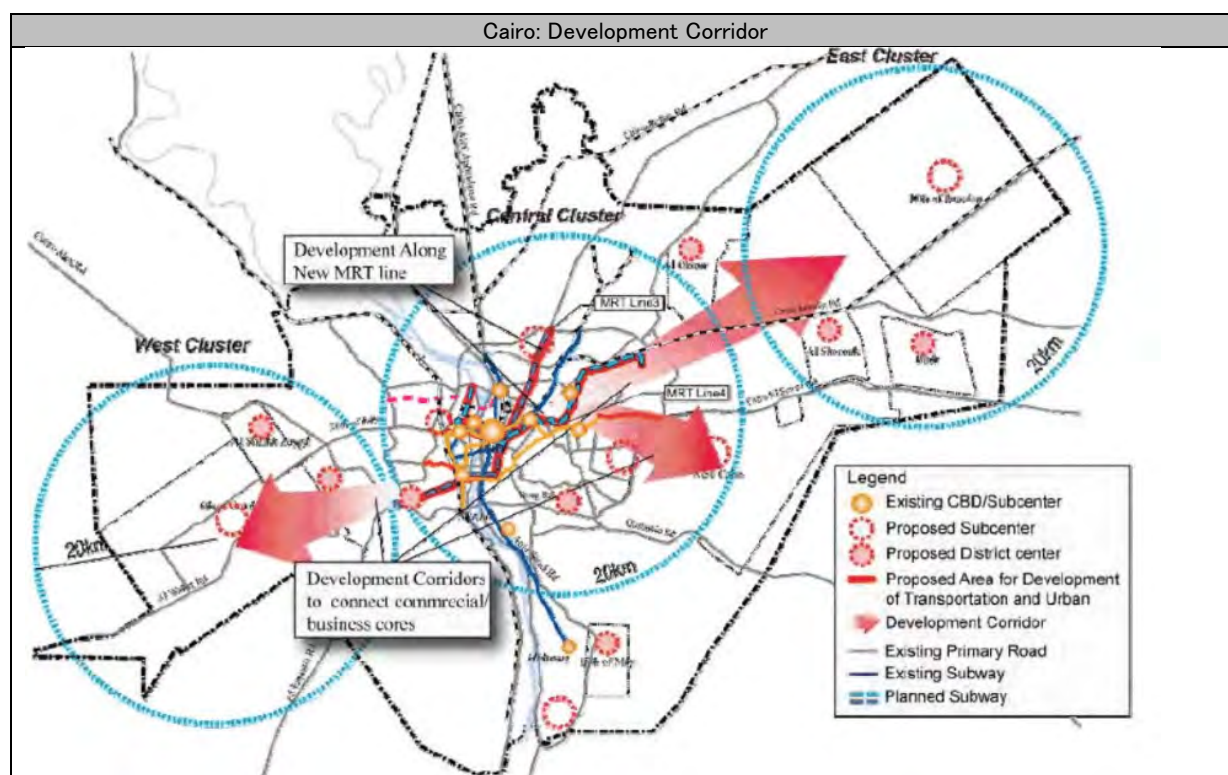


Figure 1.1.1 General Land Use Plan of the Study Area in 2027 (Master Plan Phase)



Source: JICA Study Team based on JICA Reports and other materials

Figure 1.4.4 Future Urban Structure of Target Cities

4) Urban Transport

Table 1.4.3 and Figure 1.4.5 summarize the transport situation in target cities. The modal share of walking is 30–40% in general except in Jakarta and Dhaka, where such data is unavailable. In particular, cities with a low economic level tend to depend on walking trips.

Without walking trips, Jakarta and Kathmandu are the only cities where more than half of the trips are made by private transport, especially by motorcycle. In contrast, the modal share of public transport surpasses that of private transport in other cities. Dhaka, Kampala, and Abidjan have more than 80% of the public modal share.

Diverse public transport modes can be observed in target cities. While rail transport operates in Jakarta (metro and commuter lines) and Cairo (metro), the modal share is still low. In Yangon, Kathmandu, Dhaka, and Cairo, the modal share of large buses is relatively high. Medium- and small-sized buses called matatu in Nairobi and taxi in Kampala are widely used in those cities. While those buses operate in Abidjan as well, their share is lower than that of shared taxis called *woro-woro*.

Table 1.4.3 Transportation in Target Cities

City	Jakarta	Yangon	Kathmandu	Dhaka	Nairobi	Mombasa	Kampala	Abidjan	Cairo
Country	Indonesia	Myanmar	Nepal	Bangladesh	Kenya		Uganda	Cote d'Ivoire	Egypt
Public transport mode	Inter-City railway MRT: 1 route BRT MC taxi (Ojek) Tricycle taxi (Bajaj)	Inter-City railway Intra-City railway (circular line) Bus Ferry	Bus	Inter-City railway Bus Tuk-tuk, Rickshaw	Inter-City railway Bus Minibus (matatu)	Inter-City railway Matatu Bus Ferry	Minibus Taxi MC taxi	Minibus (Gbaka) Share taxi (woro-woro)	Subway: 3 routes Bus

City	Jakarta	Yangon	Kathmandu	Dhaka	Nairobi	Mombasa	Kampala	Abidjan	Cairo
Country	Indonesia	Myanmar	Nepal	Bangladesh	Kenya		Uganda	Cote d'Ivoire	Egypt
Modal share									
Walking	N/A	42.2	40.7	N/A	39.7	45.5	39		32.5
Private transport	Car: 14.2 MC: 76.1	Car: 4.7 MC: 4.2 BC: 13	Car: 4.2 MC: 26 BC: 1.5	Car: 9 MC: 3	Car: 13.5 Two-wheeler: 5.4	2.5	Car: 8	NMT: 53.2 Car/MC: 4.8	Car: 19.5
Public transport	MRT: 2.9 ¹⁾ Bus: 3.1 Para: 3.7 ²⁾	Bus: 25.1 Truck bus: 3.5 Truck: 0.9 Taxi: 4.4 Railway: 0.6 Water: 1.4	Bus: 27.6	Bus: 47 CNG (Tuktuk): 9 Rickshaw: 32	Railway: 0.2 Bus: 12.2 Minibus: 28.4	36.9	Minibus: 41 MC taxi: 10 Car taxi: 2	SOTRA bus: 6.3 minibus: 11.5 Share taxi: 19.8 Meter taxi: 2.4 Other bus: 1.2 Water bus: 0.5	Metro: 9.5 Bus+: 38.4
Others	-	-	-	-	0.5	15.1	-	0.3	
Year	2018	2013	2011	2014	2013	2015		2013	2002

Notes: MC: motorcycle, BC: bicycle, NMT: non-motorized transport

¹⁾ includes inter-City railway, MOT, and BRT.

²⁾ includes motorcycle taxis and tricycle taxis

Source: JICA Study Team based on JICA reports and other materials



Notes: MC: motorcycle, BC: bicycle, NMT: non-motorized transport

Source: JICA Study Team based on relevant JICA reports

Figure 1.4.5 Modal Share in Target Cities (Except for Walking)

5) Water Supply Distribution

Table 1.4.1 shows the actual status of water utilities in the nine cities surveyed, covering only the major water utilities. Comparing water utilities among cities in terms of water supply coverage and daily water supply volume is difficult since each water utility has different standards.

Table 1.4.1 Status of Water Utilities in Target Cities

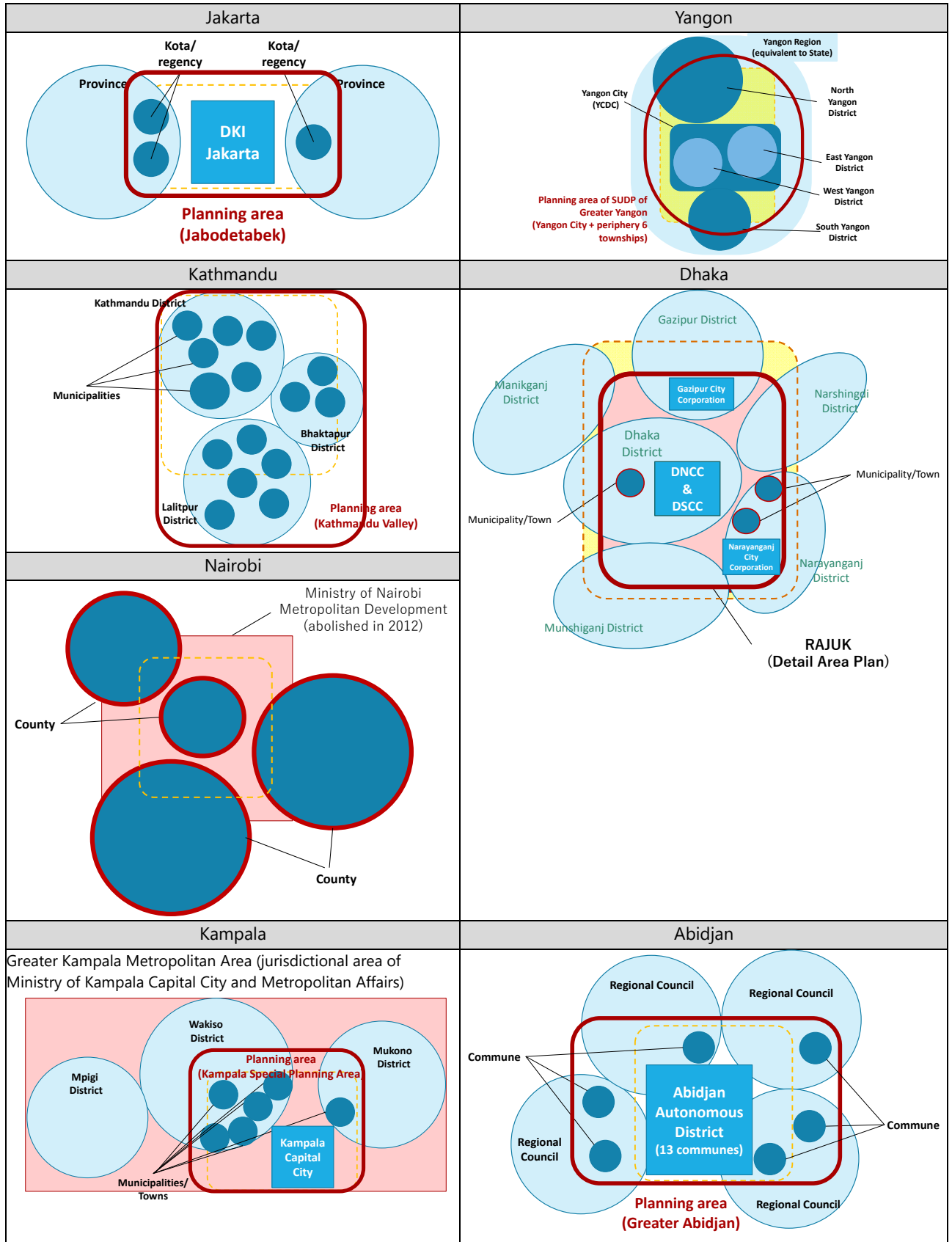
City	Jakarta	Yangon	Kathmandu	Dhaka	Nairobi	Mombasa	Kampala	Abidjan	Cairo
Country	Indonesia	Myanmar	Nepal	Bangladesh	Kenya		Uganda	Cote d'Ivoire	Egypt
Water utility	PAM Jaya	YCDC	KUKL	DWASA	NCWSC	MOWASS CO	SDE de Cote d'Ivoire	NWSC	GCWS
Piped Water Provision Status									
Provision area	DKI Jakarta	Yangon City	Kathmandu Metropolitan Area	Dhaka City	Nairobi County	Central area of Mombasa County	Abidjan City	Kampala City	Greater Cairo Region
	662 km ²	829 km ²	695 km ²	401 km ²	578 km ²	64 km ²	2,140 km ²	180 km ²	3,651 km ²
Population in the provision area	10,311,000	5,211,000	3,196,000	10,761,905	3,138,000	281,000	4,707,000	1,680,600	15,862,893
Population with water supply	5,725,000	1,845,000	2,557,000	9,040,000	2,157,000	120,000	3,247,000	1,171,000	15,703,000
Water supply penetration (%)	55.5	35.4	80.0	84.0	68.7	42.7	69.0	69.7	99.0
Year	2015	2014	2015	2011	2008	2017	2014	2020	2020
Water Supply Status									
Daily water supply volume (m ³ /day)	1,030,666	321,500	116,720	1,476,000	255,000	4,125	120,756	17,881	2,700,916
	Including non-domestic	Including non-domestic	Estimated based on 20% of non-valid water	Including non-domestic	Including non-domestic	Estimated based on 50% of valid rate	Calculated based on l/c/d and population with water supply	Calculated based on l/c/d and population with water supply	Calculated based on l/c/d and population with water supply
Daily water supply volume per capita (l/c/d)	180	174	46	163	118	34	37.2	15.3	172
	Including non-domestic	Including non-domestic		Including non-domestic	Including non-domestic	Including non-domestic	IB-NET	IB-NET	IB-NET, estimated non-valid rate: 60%
Non-revenue water rate (%)	40	66	20	40	40	49.74	23.9	37.4	50

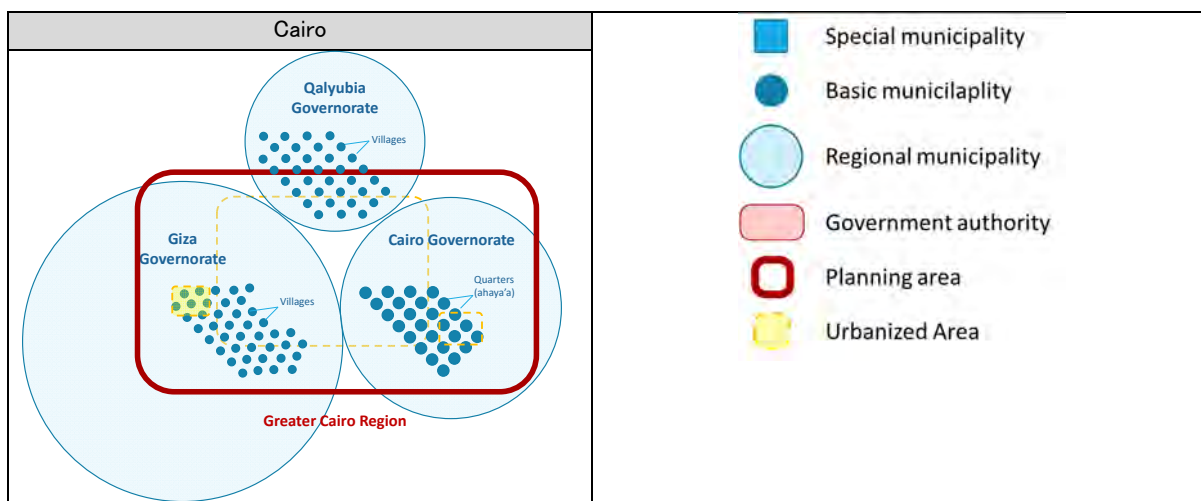
Source: JICA Study Team based on various sources

6) Urban Governance in Metropolitan Area

The urban governance structure differs by city, depending on the local administration system of each country. Urban development mechanisms and urban service provisions in large metropolitan areas are largely affected by the size of municipalities, whether the city is a special municipality or not, and the presence of a metropolitan-level administrative body. For instance, a metropolitan area with a special administrative city as its center tends to have larger disparities between the central city and surrounding municipalities. A metropolitan government authority would make it more efficient to provide regional infrastructures, such as a trunk transport network and water provision. Figure 1.4.6 depicts the actual status of

metropolitan area governance in the target cities.





Source: JICA Study Team based on materials in each country

Figure 1.4.6 Urban Administration System in Target Cities

7) Duties of Municipal Government

The duties of a municipal government are different among cities. Some cities have a metropolitan agency in charge of the metropolitan area. In countries like Egypt and Cote d’Ivoire, their municipal governments are authorized only to implement, operate, and manage projects following the directions decided by the national government. While Yangon, Kathmandu, Nairobi, and Kampala have government agencies covering the whole metropolitan area, other cities have organizations in charge of only metropolis-scale specific services. Jakarta, Nairobi, and Kampala designate a department or officials in charge of information and communication technology (ICT).

Table 1.4.4 Duties of Municipal Governments in Target Cities

City	Country	Duties of municipalities	Duties of metropolitan authorities
Jakarta	Indonesia	<p>DKI Jakarta</p> <ul style="list-style-type: none"> • Development planning: Infrastructure development and management • Spatial planning: Formulation and management of spatial plan in each municipality • Development management: Approval of land rights, construction, etc. • Transport: Transport planning, development, and management • Public works • Water resources • ICT <p>PD PAL JAYA</p> <ul style="list-style-type: none"> • Maintenance of sewage system in specific areas inside the municipality 	
Yangon	Myanmar	<p>Yangon City Development Committee</p> <ul style="list-style-type: none"> • Urban planning and development (approval, regulation, etc.) • Water and sewage, waste management • Maintenance of roads and bridges • Parks • Transport (City bus) • Markets (public markets are in each township) • Health 	<p>Yangon Region Development Committee</p> <ul style="list-style-type: none"> • Traffic policies in the region • Supervision of bus operators • Maintenance and planning of roads and bridges • Reservoir operation

Kathmandu	Nepal	<p>Kathmandu Municipality</p> <ul style="list-style-type: none"> • Police • Collection of local taxes and fines • Local service management • Local-level development planning and projects • Primary and secondary education • Basic medical care and public health • Local market management and environment conservation • Local, rural, and farm roads, irrigation • Issue of building/land ownership certificate • Water provision, small-scale hydropower station, alternative power • Disaster prevention • basin conservation, wildlife preservation, management of mining and natural resources 	<p>Kathmandu Valley Development Authority</p> <ul style="list-style-type: none"> • Formulation and implementation of the spatial plan in Kathmandu Valley
Dhaka	Bangladesh	<p>Dhaka City Corporation</p> <ul style="list-style-type: none"> • Education: Education facilities management • Health: Containment of infectious diseases, hospital for infectious diseases, primary medical center, registration of private hospitals • Public hygiene: Maintenance of public toilets • Waste management: Garbage collection • Water: Implementation of water provision projects following the national government's plan, quality management of drinking water (wells, etc.) • Sewage: Construction and management of sewage pipes • Road: Road maintenance, approval of new road construction • Market: Market development and management • Transport: Regulation for pedestrian safety, license registration, and pricing of public transport 	
Nairobi	Kenya	<p>Nairobi County Government</p> <ul style="list-style-type: none"> • Education, youth problems, culture, social welfare • ICT, e-government • Public service management • Development of farm, stock raising, and fishery sectors • Formulation of economic and financial planning • Management of water, energy, forestry, environment, and natural resources • Commerce, industrialization, joint development, tourism, and wildlife • Public works, roads, transport projects • Land management, housing provision, and physical planning formulation 	<p>Nairobi Metropolitan Services (NMS)</p> <ul style="list-style-type: none"> • Formulation and approval of physical and land use planning • Approval of development • Promotion of plan implementation • Adjustment mechanism • Forum for physical and land use planning in the county • Survey and mapping of the county • Land management based on the 2012 Land Law • Implementation committee's member of planning formulation for urbanized and city areas
Mombasa		<p>Mombasa County Government</p> <ul style="list-style-type: none"> • Farming sector development • County health service • Management of air pollution, noise, and outdoor activities • Cultural activities, public entertainment, public facilities • Public transport in the county 	

		<ul style="list-style-type: none"> • Animal management and welfare • Formulation and development of the county's planning • Provision of pre-school education, technical colleges in villages, craft centers, nurseries • Implementation of national policies on specific natural resources and environment conservation • Provision of public works and services in the City • Firefighting services and disaster management • Community participation, coordination among communities, capacity development 	
Kampala	Uganda	<p>Kampala Capital City Authority</p> <ul style="list-style-type: none"> • Urban planning: City planning formulation and development permission • Water: Water provision for public facilities by water trucks • Health: Management of public health centers • Public hygiene: WASH promotion, construction, and management of toilets in public facilities • Education: management of public elementary and secondary schools • Market: construction and management of public markets, private market registration, installation of public infrastructure • Waste management: garbage collection • Transport: construction and management of public bus terminals, public transport license registration, public transport routes • Road: construction, rehabilitation, improvement, and maintenance of roads managed by KCCA • ICT: e-government • Environment: wetland conservation 	<p>Ministry of Kampala Capital City and Metropolitan Affairs</p> <ul style="list-style-type: none"> • Coordination of spatial planning in the metropolitan area
Abidjan	Cote d'Ivoire	<p>Abidjan Autonomous District</p> <ul style="list-style-type: none"> • Water: Project planning, water tower construction in suburban areas • Public health: Implementation of public health sector planning, awareness-raising education for citizens, drainage cleaning • Education: Support for the national government in developing infrastructure in primary and secondary schools • Health: duties in compliance with the national government's policies 	<p>Greater Abidjan Urban Mobility Authority</p> <ul style="list-style-type: none"> • Transport: Coordination among agencies and transport modes within the metropolitan area
Cairo	Egypt	<p>Cairo Governorate</p> <ul style="list-style-type: none"> • Water: Respond to the citizens' demands • Public transport: Urban transport regulation in Greater Cairo Region, operation and management of minibus routes • Health • Education 	<p>Greater Cairo Water and Wastewater Company</p> <ul style="list-style-type: none"> • Water: Operation and management of water and sewage facilities

Source: JICA Study Team based on materials from each country

8) ICT Penetration

Table 1.4.5 shows the 2020 E-Government Development Index (EGDI) presented by the UN Department of Economic and Social Affairs and the 2019 telecommunication environment indexes published by the International Telecommunication Union (ITU). EGDI is an average score of the Online Service Index (OSI), Human Capital Index (HCI), and Telecommunication Infrastructure Index (TII).

Among the target countries, EGDI is prominently high in Indonesia, followed by Egypt, Kenya, and Bangladesh with a score over 0.5, and Nepal, Uganda, Cote d'Ivoire, and Myanmar at less than 0.5. The OSI of Myanmar, TII of Kenya and Uganda, and HCI of Cote d'Ivoire are significantly low.

Except for Myanmar and Nepal, where the data is unavailable, the number of fixed broadband subscriptions per 100 population is less than 10, implying the difficulty in working from home and online education. On the other hand, the number of mobile phone subscriptions per a population of 100 is over 90 except for Uganda, and more than 60% of the population in Indonesia, Cote d'Ivoire, and Egypt are subscribed to mobile broadband services. These countries may have the potential to use the Internet through wireless access.

Table 1.4.5 IT-related Indexes of Target Cities

City	Jakarta	Yangon	Kathmandu	Dhaka	Nairobi Mombasa	Kampala	Abidjan	Cairo
Country	Indonesia	Myanmar	Nepal	Bangladesh	Kenya	Uganda	Cote d'Ivoire	Egypt
EGDI (rank)	0.6612 (88)	0.4316 (146)	0.4699 (132)	0.5189 (119)	0.5326 (116)	0.4499 (137)	0.4457 (139)	0.5527 (111)
OSI	0.6824	0.2588	0.4	0.6118	0.6765	0.5824	0.4529	0.5706
HCI	0.7342	0.5125	0.5405	0.5731	0.5812	0.5395	0.3808	0.6192
TII	0.5669	0.5234	0.4691	0.3717	0.3402	0.2278	0.5034	0.4683
Mobile phone subscriptions (per 100 pax)	126	N.A.	N.A.	102	104	57	145	95
Fixed phone subscriptions (per 100 pax)	4	N.A.	N.A.	1	0	0	1	9
Internet user ratio (%)	48	N.A.	N.A.	13	23	N.A.	36	57
Fixed broadband subscriptions (per 100 pax)	4	N.A.	N.A.	5	1	0	1	8
Mobile broadband subscriptions (per 100 pax)	81	N.A.	N.A.	53	41	13	66	59
The ratio of HHs with a computer (%)	19	N.A.	N.A.	6	9	N.A.	12	64
The ratio of HHs with internet access (%)	N.A.	N.A.	N.A.	38	18	N.A.	17	60

Source: :JICA Study Team based on the UN-EGOVKB and ITU

9) Urban Societies and Communities

Various types of communities in each urban society are closely related to culture, tradition, and the relationship with government agencies in each country. This Study examined the communities based on specific geographical areas in each city. In some cities, they are regarded as the last unit of the government system, such as in Vietnam. On the other hand, urban communities originated from traditional mutual support groups and have been gradually regarded as local communities by the government.

In addition, community organizations in developing countries are often established around religious activities (churches, mosques, etc.) or blood relations. In some slums and squatters, communities are formed as an implementing body of projects supported by NGOs or other external organizations.

Jakarta (Indonesia): Local communities called *Rukun Tetangga* (RT; a neighborhood unit) are regarded as the end of the government system. With the widespread notion of *Gotong Royong* (mutual help), RTs play a traditional role in living environment improvement and providing social services assigned to *kelurahans* (villages) in the community. RTs consist of approximately 30 households and their leaders are elected by the citizens. Several RTs usually form *Rukun Warga* (RW; a community unit). These RTs/RWs are responsible for cleaning, constructing public toilets, and so on, and served as a fundamental participant in the Kampong Improvement Program.¹ Recently, DKI Jakarta has established a scheme to support the activities proposed by RT/RW by setting an organization under DKI Jakarta at the kelurahan level.

Nairobi (Kenya): Local communities in Kenya are derived from the concept of mutual help called *harambee*. Originally, these communities was responsible for local self-help activities. However, as government intervention has increased, the civil society organizations (CSOs) now play a central role in these local activities. While most CSOs are based on *harambee*, their scope is diverse, such as social welfare, social promotion, fundraising, and job creation. Thus, they play a key role in promoting participatory social development.²

Dhaka (Bangladesh): It is said that there are no neighborhood-based local communities in Dhaka City and that people's sense of belonging to the community is low. However, different types of communities can be observed depending on the area or attributes. Traditional local communities called *Ponchait* still exist in Old Dhaka, which is responsible for self-patrol and garbage collection. Mosques are deeply rooted in people's lives and serve as the core of communities with social purposes. In newly developed areas, resident associations are formed to ensure security and collect garbage within the area. The JICA's solid waste management project mobilized these existing communities to establish Community Unit Working Groups (CUWGs), which coordinated with citizens, governments, and garbage collectors to adopt a participatory solid waste management system.³

¹ Survey Report on BOP Groups in Indonesia (JETRO, 2013)

² Diversity and Challenges of Community-Based Organizations (CBO)s: Comparative Analysis between Asia and Africa (Sekiya), Survey Report on BOP Groups in Kenya (JETRO, 2013)

³ Introduction of participatory solid waste management in Dhaka where there are no neighborhood-based communities (Okamoto, Ishii, Kubota, et al.)

2 COVID-19 Pandemic in Cities in Developing Countries

2.1 COVID-19 Expansion and its Influence in Cities in Developing Countries

A basic understanding of the COVID-19 expansion, its countermeasures, and its associated influence in developing countries on urban society and the economy are summarized below.

Infection spread: COVID-19 was initially confirmed in China in December 2019 and has spread globally. The timing, scale, and speed of expansion differ by country, city, and even district within a city. Furthermore, the situation is changing day by day.

Preventive Measures: Hygiene behavior, such as handwashing and gargling, are promoted as fundamental infection prevention measures. However, it highlighted the vulnerability of areas lacking access to water facilities. People worldwide started wearing face masks to avoid droplet infection, which made the governments distribute masks in many countries. The government also took closure, containment, and travel restriction measures to avoid the 3c situations: closed spaces, crowded places, and close-contact settings. It includes the stay-at-home order, a ban on travel across provincial borders, closure of public facilities, schools, and commercial facilities, gathering prohibition, and capacity restriction of public transport. Some cities have succeeded in containing the disease through rapid information dissemination via SNS and/or identification of close contact harnessing a smartphone app.

Influence of containment measures and risk of vulnerable groups: Containment measures have had great impacts on citizens and economic activities in cities. Lockdowns, either voluntary or compulsory, have led to a halt in economic activities. Many workers, especially those informal, in the service sector, and part-timers, have lost their jobs. In addition to these economic impacts were social impacts, such as delay in education and expansion of educational gaps due to school closure and isolation of immigrant and informal workers. These socio-economic impacts have highlighted the risks of vulnerable people that have been originally inherited in the cities of developing countries.

- **Vulnerability to infection:** Settlements with small houses that accommodate multiple households, in dense buildings with insufficient open spaces, and without adequate access to water, hygiene, and medical access are exposed to the risk of infection expansion.
- **Economic vulnerability:** People working in service or informal sectors have been deprived of their jobs by containment measures. In developing countries where few people can work from home, many workers have lost their jobs due to economic stagnation.
- **Social vulnerability:** Informal citizens and informal settlement dwellers without land and house tenure have been vulnerable in terms of social security.
- Unlike vulnerability to natural disasters, the people and areas vulnerable to COVID-19 might have a socio-economic impact on the city or country as a whole. For instance, the settlements can become an epicenter of the spread of infection in a city if infected persons are in the area. Moreover, if infected people who lost their jobs move outside the city to search for new jobs, they can cause countrywide virus expansion.

Supportive measures for socioeconomic impacts: Many countries have taken supportive measures against these impacts, such as the provision of food, necessary items, and money,

income compensation for the unemployed, and an exemption from public services fees and taxes. Social support includes support for filling educational gaps and for the isolation of immigrant workers.

Resume of urban activities and emerging changes: As the spread of COVID-19 has been curbed and containment measures have been lifted, some countries have resumed urban economic activities. However, some countries strengthened their closure and containment measures as the second, third, and subsequent waves hit cities. While repeating the relaxing and tightening of such measures, people tend to avoid congestion and long-distance trips as the “new normal” lifestyle during the pandemic. New technologies and services have emerged and become popular, such as online services and capturing people’s movement.

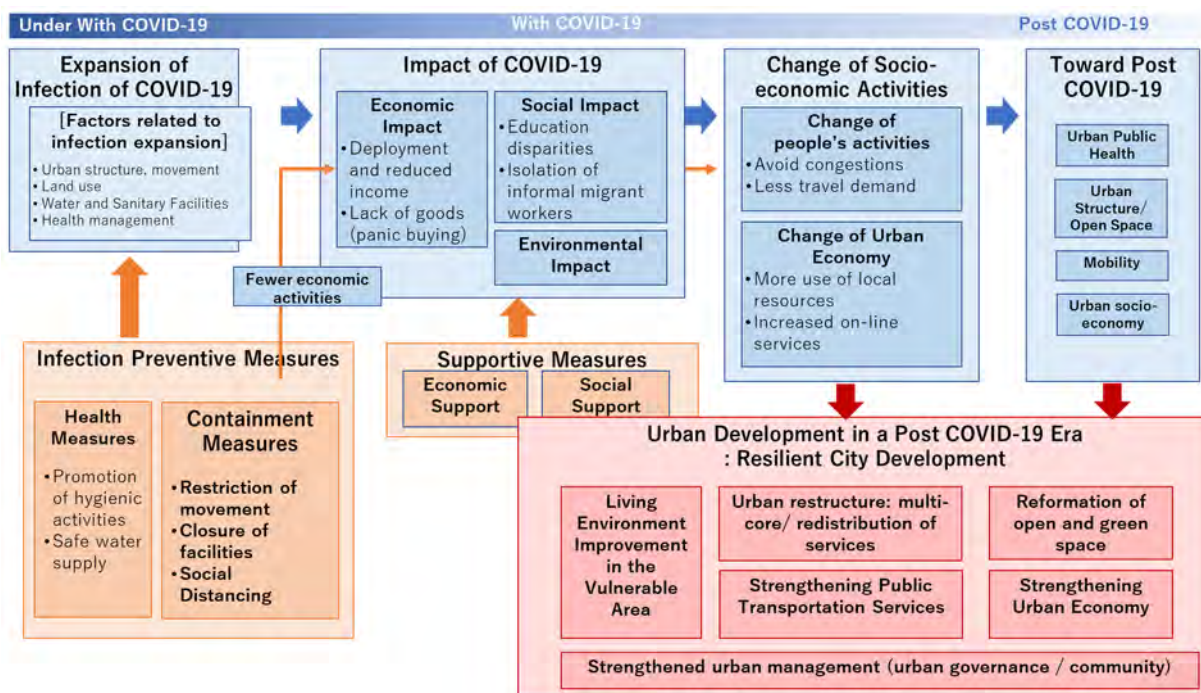


Figure 2.1.1 COVID-19 Expansion, Impacts, and Countermeasures

Expected status of cities in the post-COVID-19 period: As of July 2022, some countries have succeeded in containing the community infection, but not all national borders have fully opened. Some countries are still facing waves of the pandemic. It can be said that no countries are in the post-COVID-19 period. Considering the immense damage to cities caused by containment measures, it is preferable to avoid travel restrictions or lockdowns when another wave or new infectious diseases hit the urban areas.

History shows that the worldwide pandemic greatly influenced the perspective of cities and building designs.¹ The COVID-19 pandemic may also cause a change in urban planning and urbanization, although its clear image is not depicted yet. At least, it is highly likely that people will be more conscious of urban hygiene, health, and environmental improvement.

People’s behavior and urban economy have been changing after the economic activities resumed during the pandemic. This includes continuous handwashing and mask-wearing,

1 Cholera pandemic in the 19th century urged sewage network development in Paris and London. Spanish flu and other pandemics in the 20th century promoted the movement of modernist architecture that is considered clean and hygienic due to its simple design.

avoidance of crowded places and public transport, and frequent use of online services. This Study examines the necessary urban planning and urban environment development to correspond to these changes.

2.2 COVID-19 Infection Expansion in Cities

2.2.1 COVID-19 Infection by Country

The timing, speed, and scale of COVID-19 expansion differ greatly among countries.

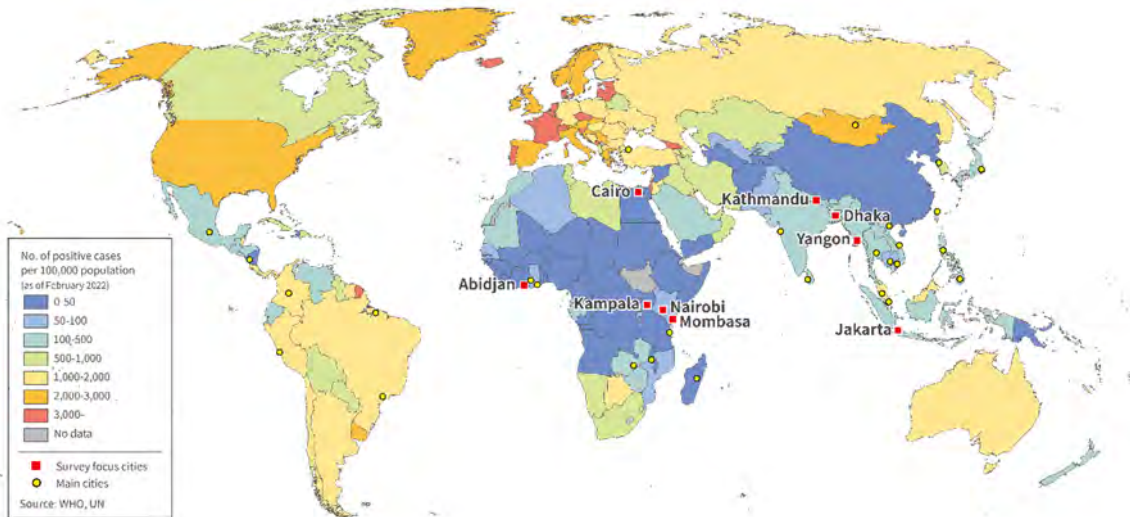
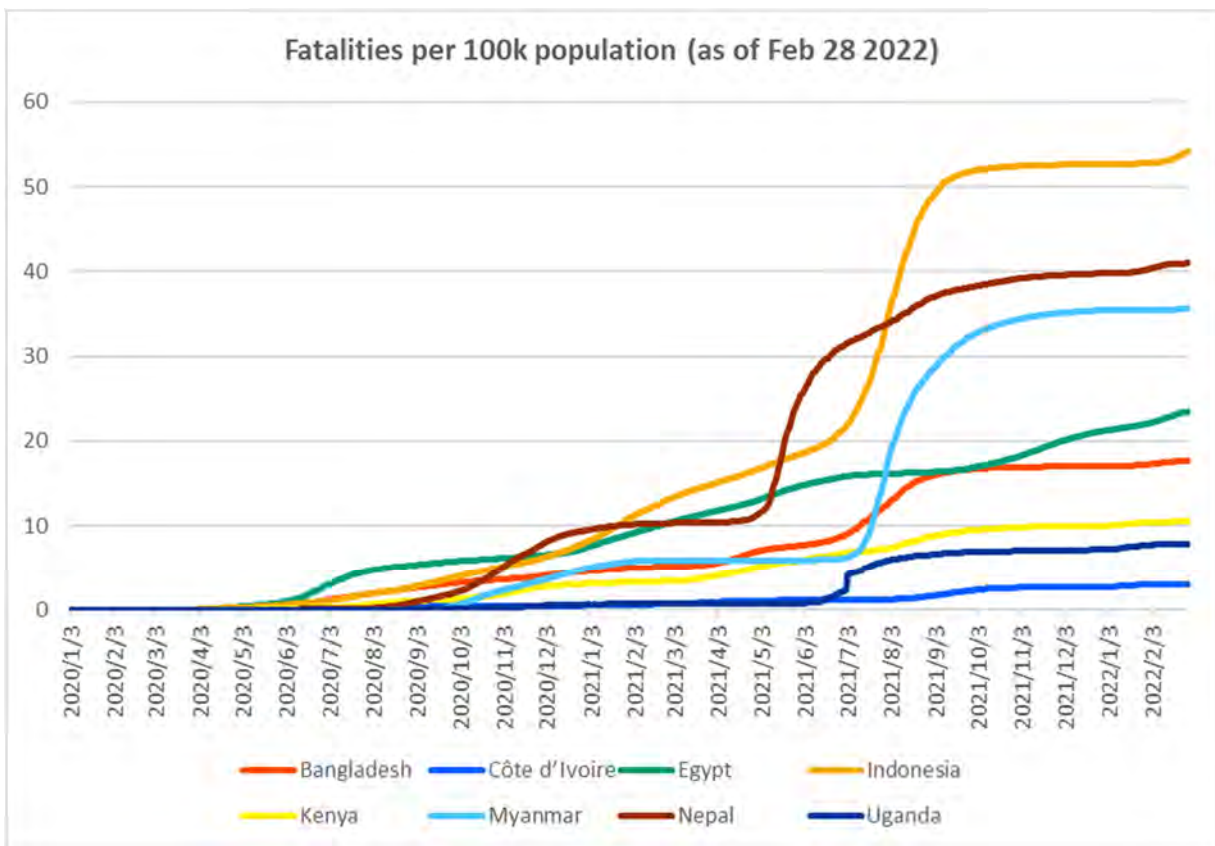
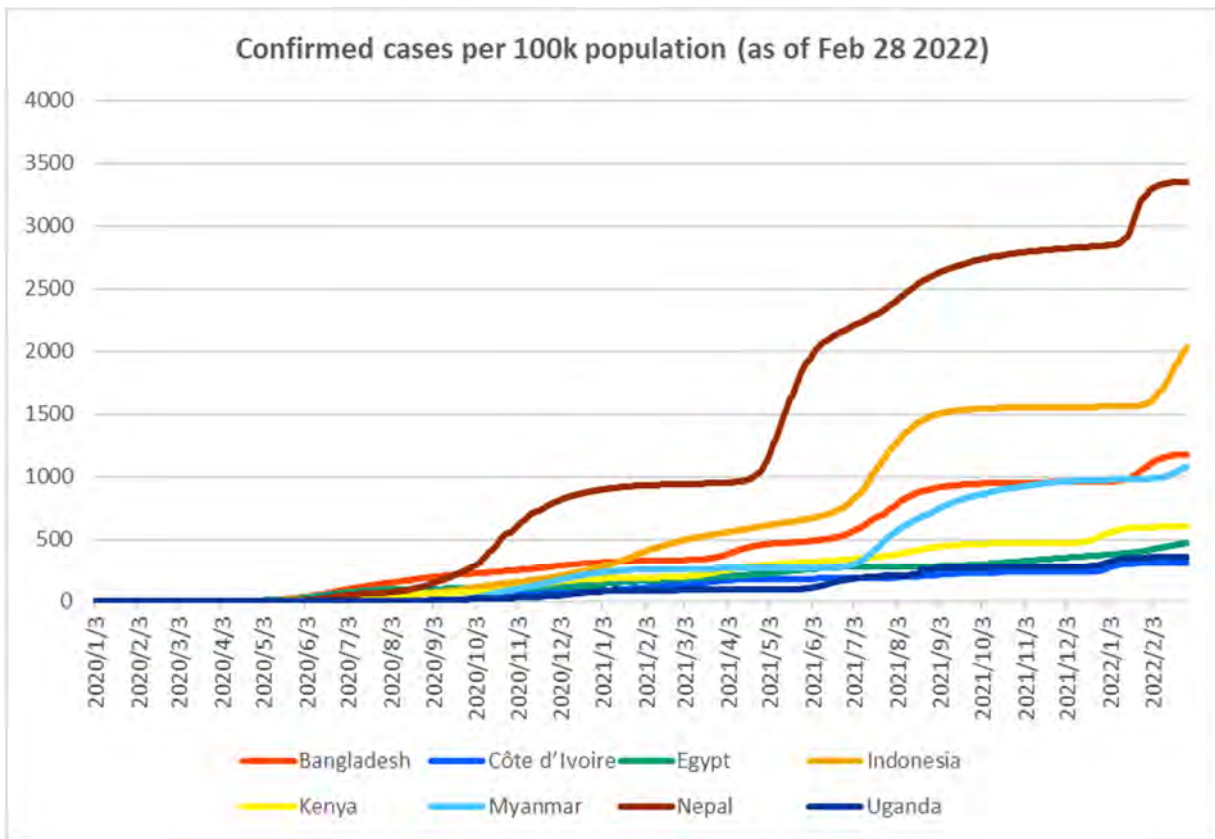


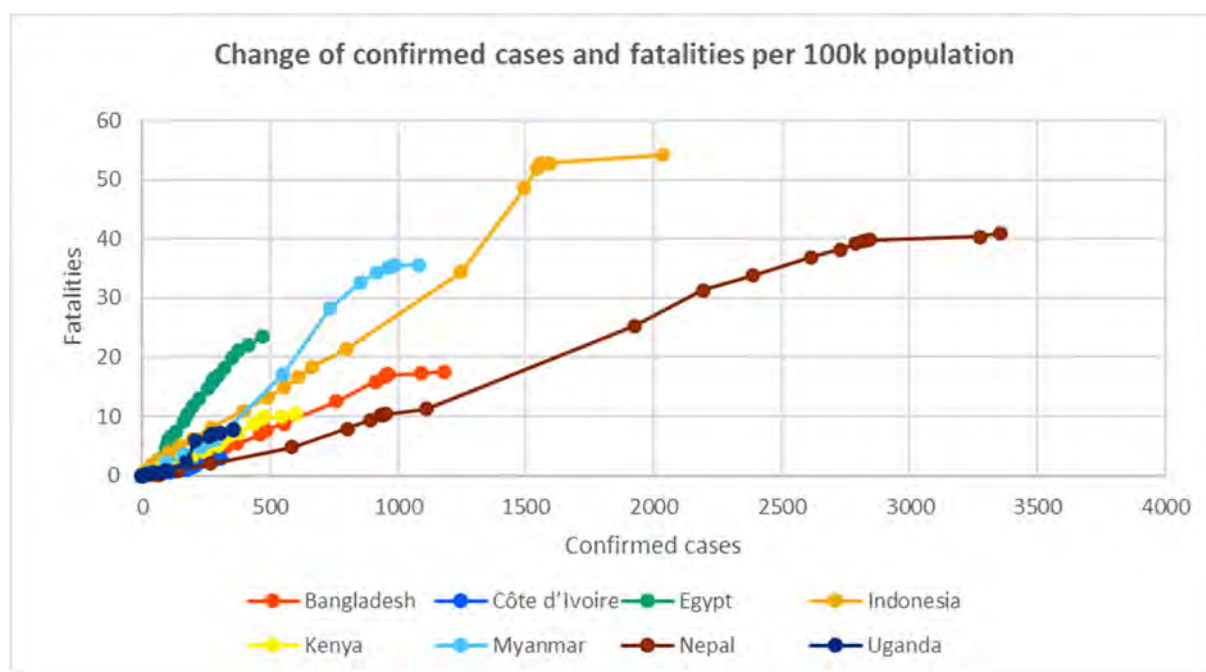
Figure 2.2.1 Target Cities and Main Cities for the Study

As shown in Figure 2.2.2, infection expansion started in March 2020 in Egypt and Indonesia, in April 2020 in Bangladesh, Cote d'Ivoire, Kenya, and Myanmar, and in June 2020 in Nepal and Uganda. Bangladesh and Egypt experienced a sharp increase in positive cases in a relatively early stage. While Egypt contained the expansion from July, Bangladesh was the first country that recorded 100 cumulative cases per 100,000 population on 6 July 2020. In August, Nepal exceeded Bangladesh in the positive cases per 100,000 population. The cases increased in Indonesia and Kenya as well since July. While the infection continued to grow in Indonesia, Kenya curbed the spread in September (but faced waves in October and March 2021). Although Myanmar and Uganda successfully contained the infection, their cases have increased since October. Cote d'Ivoire maintains its mild situation.

As of 31 March 2021, cumulative positive cases per 100,000 population are 969.32 in Nepal, 558.60 in Indonesia, 374.92 in Bangladesh, 263.54 in Myanmar, 254.99 in Kenya, 201.35 in Egypt, 92.31 in Uganda, and 17.07 in Cote d'Ivoire. The cumulative deaths per 100,000 population are 15.10 in Indonesia, 11.95 in Egypt, 10.59 in Nepal, 5.93 in Myanmar, 5.55 in Bangladesh, 4.10 in Kenya, 0.76 in Uganda, and 0.09 in Cote d'Ivoire. Egypt records a large number of deaths compared to positive cases, while Myanmar and Nepal are opposite.

The number of positive cases largely depends on the testing policy and capacity. In some countries, there could be people who cannot be tested even if having symptoms. It should be noted there might be a difference between positive cases and actual infectious status when comparing these data among countries.





Note: Each plot shows data collected on the first day of the month from February 2020 to April 2021.

Source: WHO

Figure 2.2.2 Change in Positive Cases and Deaths of COVID-19 in Target Countries

2.2.2 COVID-19 Infection Status by City

1) COVID-19 data by City

Understanding the city-scale COVID-19 infection status requires analyzing the trends and distribution of positive cases within the city. However, data availability is different among cities. Table 2.2.1 summarizes whether the country- or city-scale positive case data are available in the 40 main cities. While city-scale data of 17 cities are available on the Internet, the data of the other 23 cities are difficult to obtain. For these cities, the CUREIP Team utilized the country-scale data released by the World Health Organization (WHO).

Table 2.2.1 Data Availability of COVID-19 Positive Cases in 40 Main Cities

City	Scale		City	Scale		City	Scale	
	country	city		country	city		country	city
Jakarta*		✓	Ulaanbaatar	✓		Kampala*		✓
Surabaya			Dhaka*	✓		Abidjan*	✓	
Yangon*		✓	Kathmandu*	✓	**	Cairo*	✓	
Mandalay			Colombo	✓		Lusaka		✓
Bangkok	✓		Mumbai	✓		Dar Es Salaam	✓	
Krabi			Managua	✓		Lilongwe	✓	
Manila		✓	Sao Paulo	✓		Accra	✓	
Cebu		✓	Belem	✓		Kumasi	✓	
Davao		✓	Bogota		✓	Antananarivo	✓	
Hanoi		✓	Lima	✓		Tokyo		✓
Ho Chi Minh City		✓	Mexico City	✓		Taipei		✓
Da Nang		✓	Istanbul	✓		Seoul		✓
Kuala Lumpur		✓	Nairobi*		✓	Singapore		✓
Phnom Penh	✓		Mombasa*		✓			

Note: ✓ = data available, * = target cities, ** = data acquired by the Ministry of Health and Population

Source: JICA Study Team

Table 2.2.2 summarizes the district-scale data availability in the target cities as of April 2021. Among the nine cities, Jakarta releases the most granular data. Jakarta publishes daily kelurahan-scale data (the city is divided into 267 kelurahans) and location data where positive cases were found. The district-scale data within a city is available in Nairobi, Mombasa, Yangon, Dhaka, Kathmandu, Kampala, and Abidjan. On the other hand, it is extremely difficult to acquire city-scale data in Cairo; only the country-scale data released by WHO and other organizations are available in Egypt.

Table 2.2.2 Released COVID-19 Data in Target Cities

City	Jakarta	Yangon	Kathmandu	Dhaka	Nairobi	Mombasa	Kampala	Abidjan	Cairo
Country	Indonesia	Myanmar	Nepal	Bangladesh	Kenya		Uganda	Cote d'Ivoire	Egypt
Smallest unit of available data	Kelurahan	Township	Kathmandu: Ward Lalitpur, Bhaktapur: Municipality	Ward	Subcounty		Division	District	N/A
No. of units	267	33	Kathmandu: 35 Others: 10	129	17	7	5	9	-
Status of collection	Daily data acquired	Daily data acquired	Daily data acquired	Collecting	Daily data acquired		Citywide: Daily data acquired By division: collecting	Collecting	-

Source: JICA Study Team based on data in each city

2) Classification of COVID-19 Infection Status by City

To understand the COVID-19 infection situation in each city, the CUREIP Team analyzed the data from the number of positive cases and changes in the timeline of infection expansion. Specifically, the 40 main cities are categorized by two perspectives:

- (i) cumulative no. of positive cases and maximum daily cases per 100,000 population, and
- (ii) no. of waves when the virus spread dramatically.

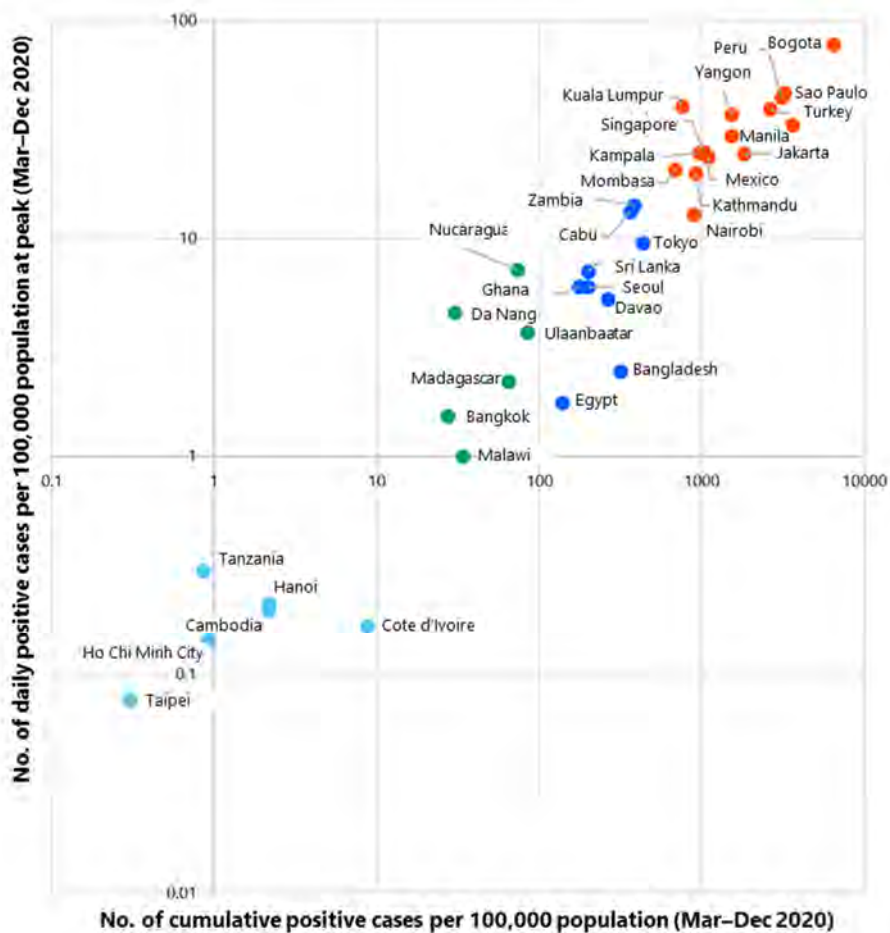
It should be noted that this analysis is based on the data as of December 2020, and the situation might be different in the cities that experienced significant waves in 2021.

The analysis for (i) revealed that these two indexes are correlated with each other (see Figure 2.2.3 and Table 2.2.3) and classified the cities into groups 1–4. In the analysis of (ii), the 40 cities are classified into 10 groups, as shown in Table 2.2.4. Group 1-2 cities were recategorized into two sub-groups according to the cumulative cases per 100,000 population (Group 1-2-1: over 3,000, Group 1-2-2: less than 2,000). Group 3-1 cities were also divided into two according to the time the expansion occurred (Group 3-1-1: March to June, Group 3-1-2: after July).

Table 2.2.3 Classification of Main 40 Cities by No. of Positive Cases per 100,000 Population

		Cumulative No. of positive cases			
		~10	10~100	100~500	500~
Maximum No. of positive cases per 100,000 population	15–100				Group 1 Kuala Lumpur, Singapore, Yangon, Nairobi, Mombasa, Mexico City, Manila, Kampala, Lima, Sao Paulo, Jakarta, Belem, Istanbul, Bogota
	1–15		Group 3 Bangkok, Da Nang, Lilongwe, Ulaanbaatar, Antananarivo, Managua	Group 2 Colombo, Seoul, Accra, Kumasi, Davao, Cebu, Lusaka, Tokyo, Dhaka, Cairo	
	–1	Group 4 Dar Es Salaam, Ho Chi Minh City, Hanoi, Phnom Penh, Taipei, Abidjan			

Source: JICA Study Team based on materials in each city



Source: JICA Study Team based on materials in each city

Figure 2.2.3 Relationship between No. of Cumulative Positive Cases and Maximum No. of Daily Cases per 100,000 population

Table 2.2.4 Classification of 40 Main Cities by Infection Status

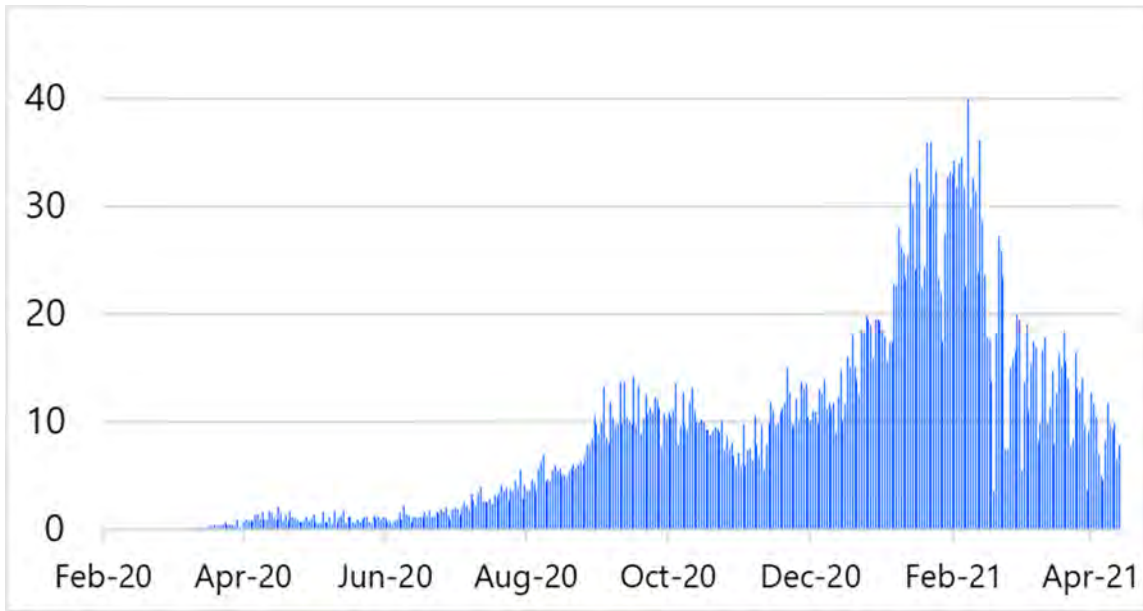
	No. of waves: 1		No. of waves: 2		Others
Group 1	1-1 Manila Yangon Kampala		1-2-1 Bogota Belem Sao Paulo Lima		1-3 Istanbul Mexico City
			1-2-2 Singapore Nairobi Jakarta Mombasa Kuala Lumpur		
Group 2	2-1 Kumasi Davao Accra Colombo	2-2 Tokyo Cebu Lusaka Seoul			
Group 3	3-1-1 Ulaanbaatar Bangkok	3-1-2 Antananarivo Lilongwe Da Nang			
Group 4	4 Taipei Phnom Penh Hanoi Ho Chi Minh City Dar Es Salaam				

Source: JICA Study Team

3) COVID-19 Infection Status in Target Cities

COVID-19 infection status in the target cities is analyzed based on the city-scale data available in Jakarta, Yangon, Nairobi, and Mombasa, and on the country-scale data for Kathmandu (Nepal), Dhaka (Bangladesh), Cairo (Egypt), and Abidjan (Cote d'Ivoire). It should be noted that there might be a large difference between the infectious status of a city and that of a country since the spread of the virus tends to be concentrated in large cities.

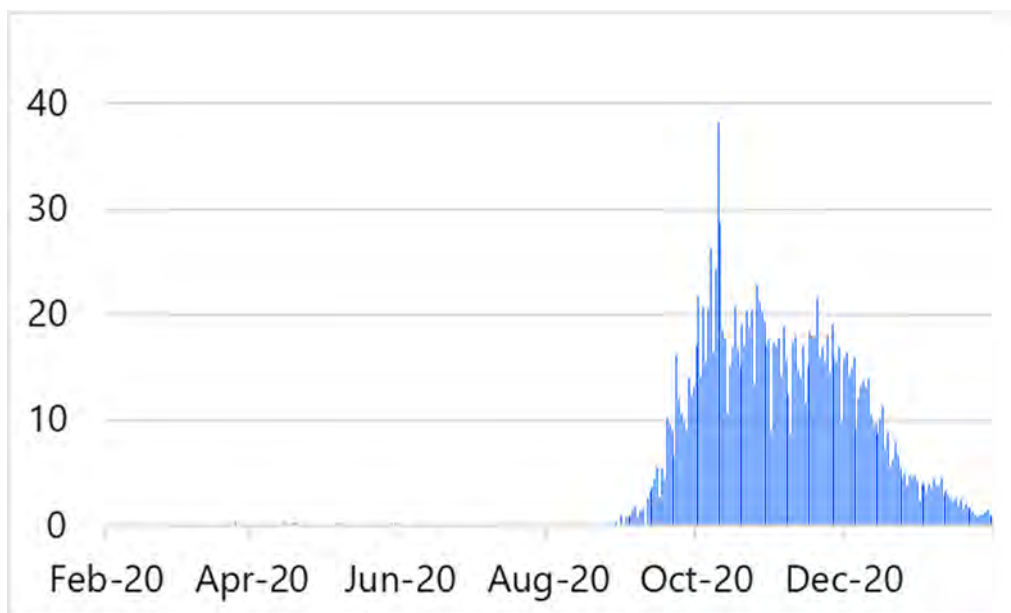
Jakarta (Indonesia): As of 1 April 2021, the cumulative number of infected per 100,000 persons was 3,639.57. In the initial outbreak, large-scale social restriction measures were taken, such as facility closures and requests to work from home, and the daily number of newly infected persons was about 100 (about 1.04 per 100,000 persons) from May–June 2020. After the restrictions were slightly eased in early June, the infection spread rapidly from August to September, and although the restrictions were tightened again in the first half of September, the number of daily infected cases rose to about 1,100 (approximately 11.45 per 100,000) from late September to late October. Restrictions eased again in mid-October, followed by a slight control of the spread in early November. However, from December to January 2021, the number of cases surged again, and social restrictions tightened again by mid-January, with the number of daily infected persons reaching about 3,000 (approximately 31.2 per 100,000) from mid-January to mid-February. In early February 2021, restrictions were introduced on social activities in RW, and the number of cases has been declining since then.



Source: Jakarta Tanggap COVID-19 (website: <https://corona.jakarta.go.id>)

Figure2.2.4 Infected Cases per 100,000 Population in Jakarta

Yangon (Myanmar): Due to the lack of sufficient information on COVID-19 since the coup in February 2020, the analysis is based on the information available until the end of January. The cumulative number of infected cases was 1,627.70 per 100,000 as of 31 January 2021. The first infected person was confirmed on 24 March 2020, and the number of infected persons remained very low for a long time. The number of infections spread rapidly after the second half of August 2020, averaging about 815 daily infections (about 17.24 per 100,000 persons) in October and November. In December, the number of infections showed a downward trend.

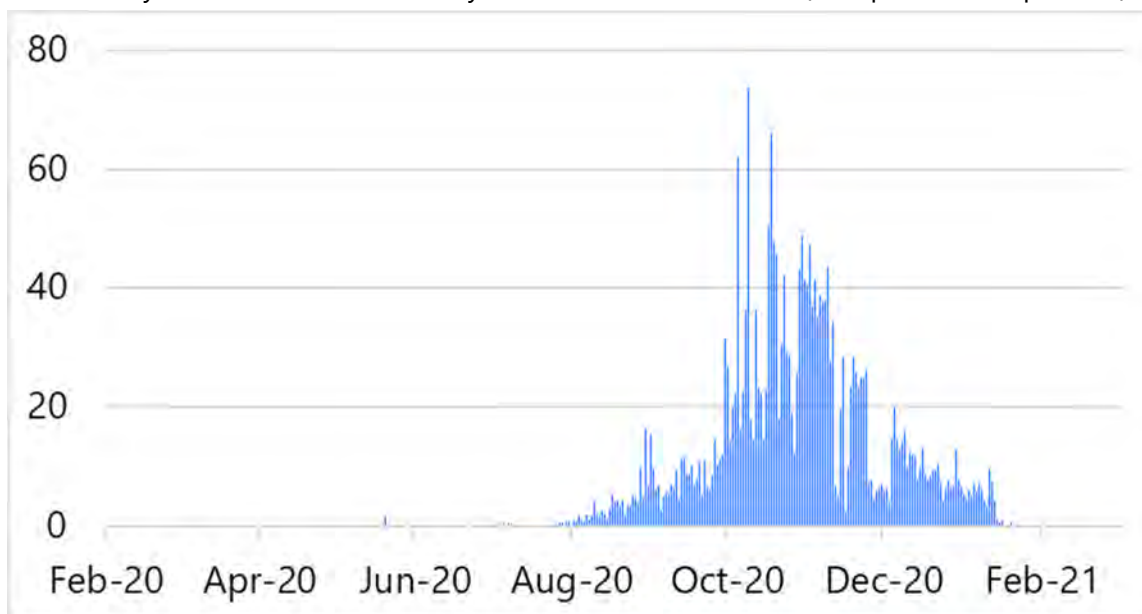


Note: Data for 4/1-14 are based on laboratory-based data, while the rest of the period is based on the number of positives recorded on a residential basis.

Source: Government data

Figure2.2.5 Infected Cases per 100,000 Population in Yangon

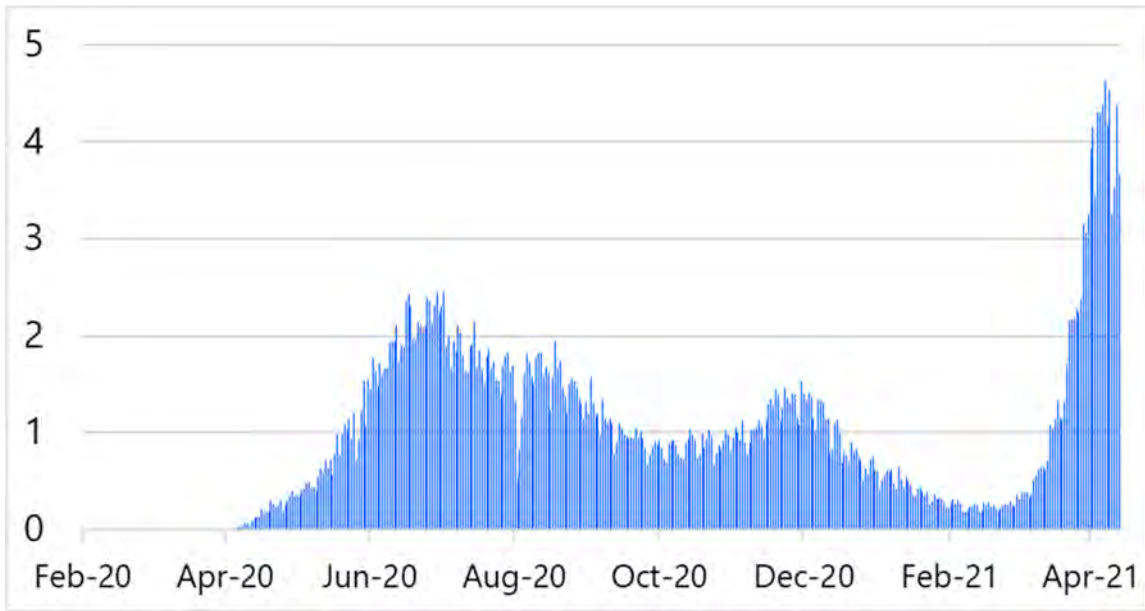
Kathmandu (Nepal): As of 4 March 2021, the cumulative number of cases per 100,000 people was 2,487.28; until around July 2020, the number of cases was negligible but began increasing rapidly in August, with the highest daily number of cases at 1,252 (73.68 per 100,000 people) on 9 October 2020. Consequently, the number of cases declined, and in January 2021, the number of daily infections was about 100 (5.88 per 100,000 persons).



Source: Ministry of Health and Population

Figure2.2.6 Infected Cases per 100,000 Population in Kathmandu

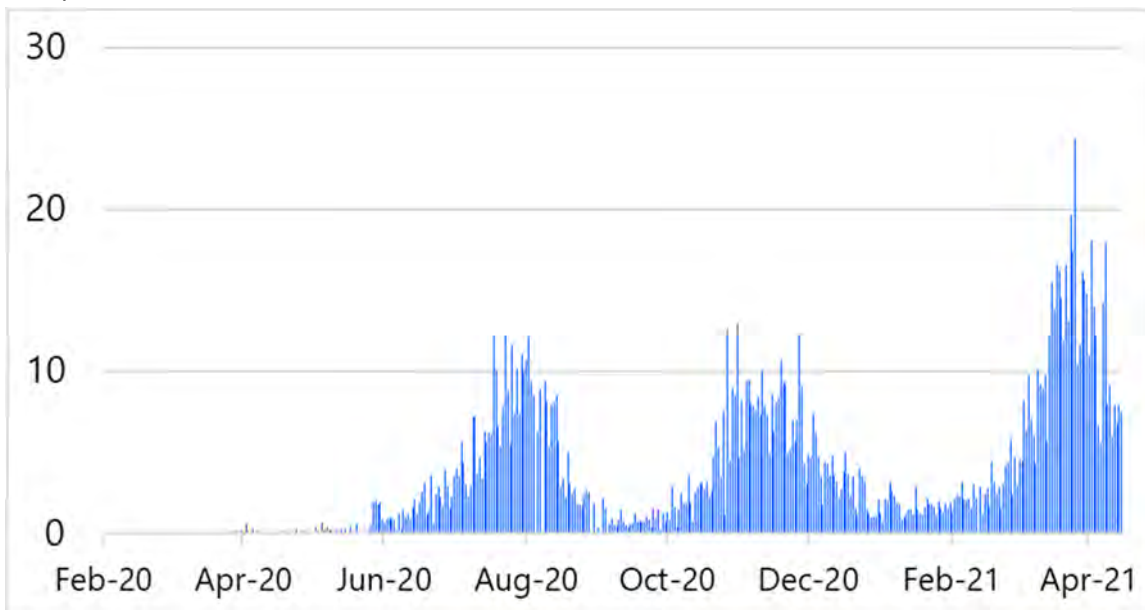
Dhaka (Bangladesh) <Country-level infection status>: As of 1 April 2021, the cumulative number of cases per 100,000 people was 378.89. The first case was confirmed on 8 March 2020. The number of cases increased rapidly in April, reaching a peak of approximately 4,000 daily cases (2.45 per 100,000) in the latter half of June. Subsequently, infections began to be suppressed, and the number of daily infections abated to about 1,300 (0.80 per 100,000 persons) in the first half of October. The second wave of infections happened in the second half of November at about 2,200 daily infections (or about 1.35 per 100,000 people), and the overall number of daily infections declined to 291 (about 0.18 per 100,000 people) on 13 February 2021. However, in March, the number of daily infections rose sharply, reaching 6,469 (3.97 per 100,000) on 1 April 2021.



Source: WHO

Figure2.2.7 Infected Cases per 100,000 Population in Bangladesh

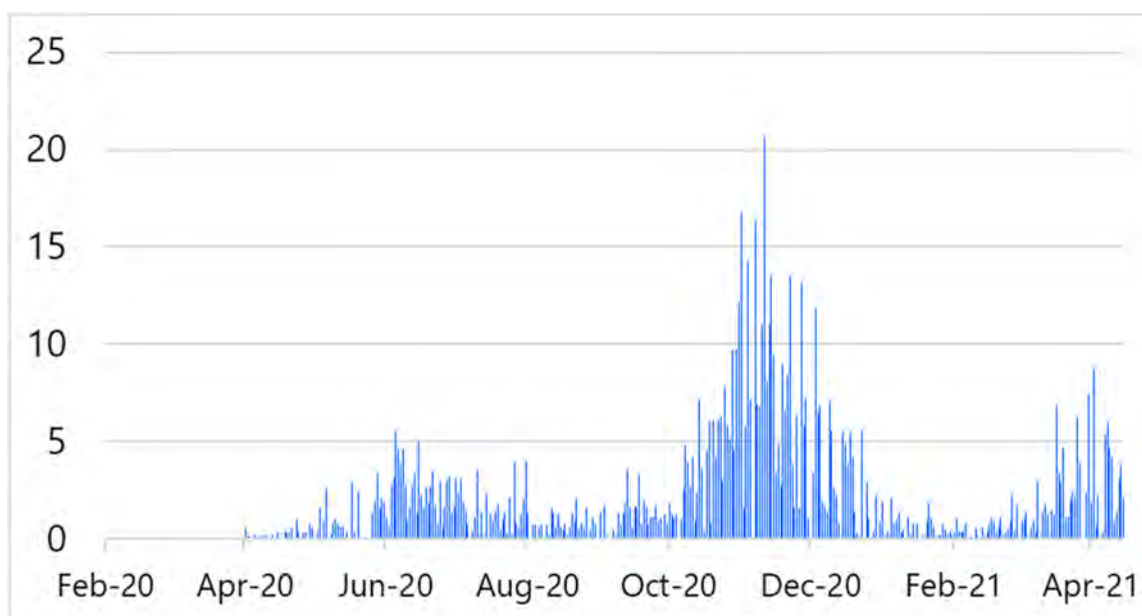
Nairobi (Kenya): As of 1 April 2021, the cumulative number of infections per 100,000 people was 1,383.67. The first infection was confirmed on 13 March 2020, and the number of infected increased rapidly after June, reaching a peak in the first wave from late July to early August (the daily infected cases was approximately 400 or 9.10 per 100,000 people). The spread of COVID-19 was controlled after mid-August, but it spread again in October, with a second wave of cases in early November (about 360 daily cases (8.19 per 100,000 people)). By December 2020, the number of infected persons decreased, but another wave (third wave) began in March 2021, with 1,071 infected persons (24.36 per 100,000) recorded on 26 March 2021. It was said that the third wave was mainly caused by political rallies associated with the presidential election and other events.



Source: Ministry of Health

Figure2.2.8 Infected Cases per 100,000 Population in Nairobi

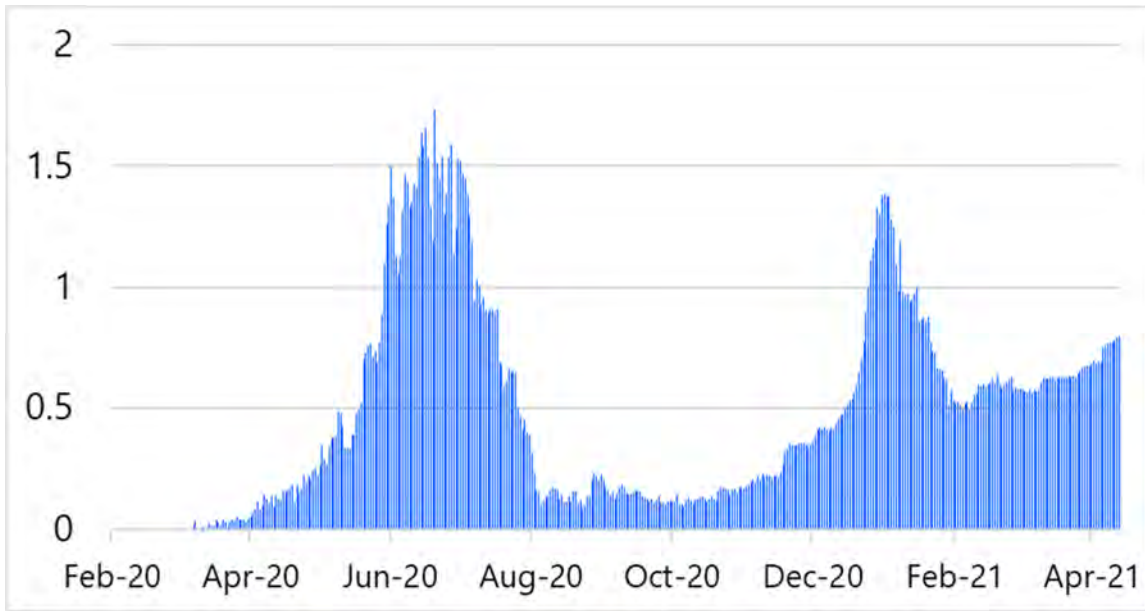
Mombasa (Kenya): The cumulative number of cases per 100,000 as of 1 April 2021 was 778.15. The first cases of infection were confirmed on 24 March. The number of infected people increased around the end of May, slightly earlier than in Nairobi, but it did not lead to a large-scale spread (the first wave peaked on 5 June with 67 infected people or about 5.55 per 100,000). However, after October in Nairobi, a rapid spread of infection was observed, and the highest number of infected persons recorded on 11 November was 250 (20.70 per 100,000). While Nairobi has faced the third wave of infections since March 2021, Mombasa has not seen a widespread infection at that time (the highest was 106 or 8.77 per 100,000 on 2 April 2021).



Source: Ministry of Health

Figure 2.2.9 Infected Cases per 100,000 Population in Mombasa

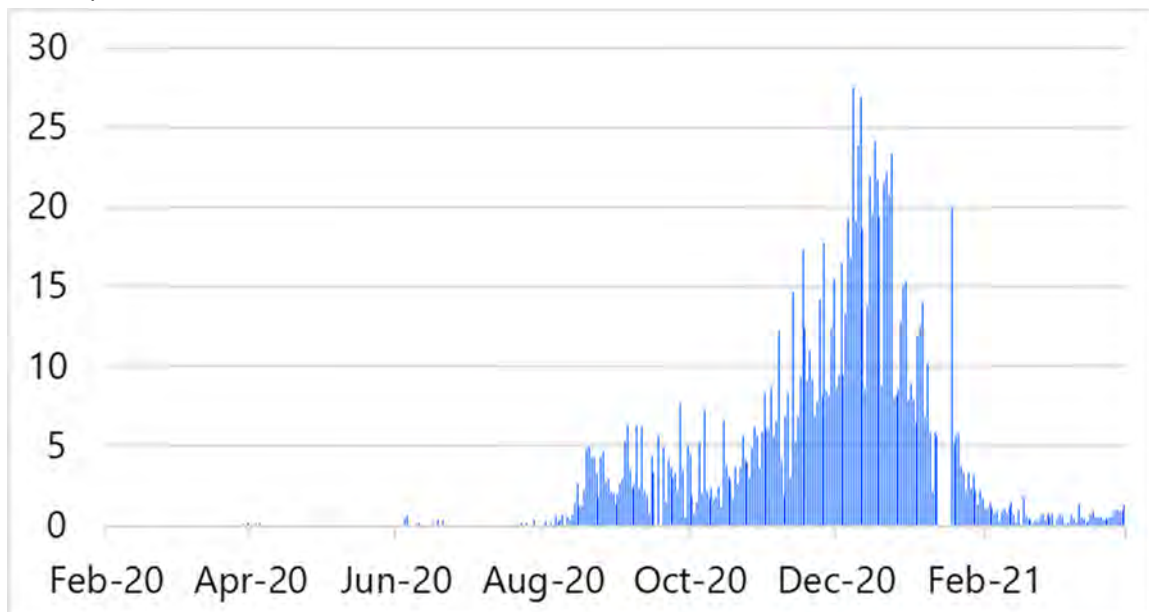
Egypt (Cairo) <Country-level infection status>: As of April 1, 2021, the cumulative number of cases per 100,000 people is 209.68. The first case of infection was detected on February 14, 2020 (the second earliest among 9 countries), and although a curfew was imposed on March 25, the disease spread from a relatively early stage in early April, reaching 1,774 daily cases (1.78 per 100,000) on June 19. This is partly because it coincided with the period of Ramadan (April 23-May 23). By June 19, the daily number of infected persons reached 1,774 (1.78 per 100,000 persons). The number of infected persons then declined sharply, and by June 27 the curfew and restrictions on public transportation were lifted, and by August 22 the daily number of infected persons had dropped to 89 (0.09 per 100,000), but by December 31 the number had risen to 1,418 (1.41 per 100,000). Thereafter, it declined again. After February 3, 2021, when the number of daily infections reached 512 (0.51 per 100,000), it has been on a slight upward trend.



Source: WHO

Figure2.2.10 Infected Cases per 100,000 Population in Egypt

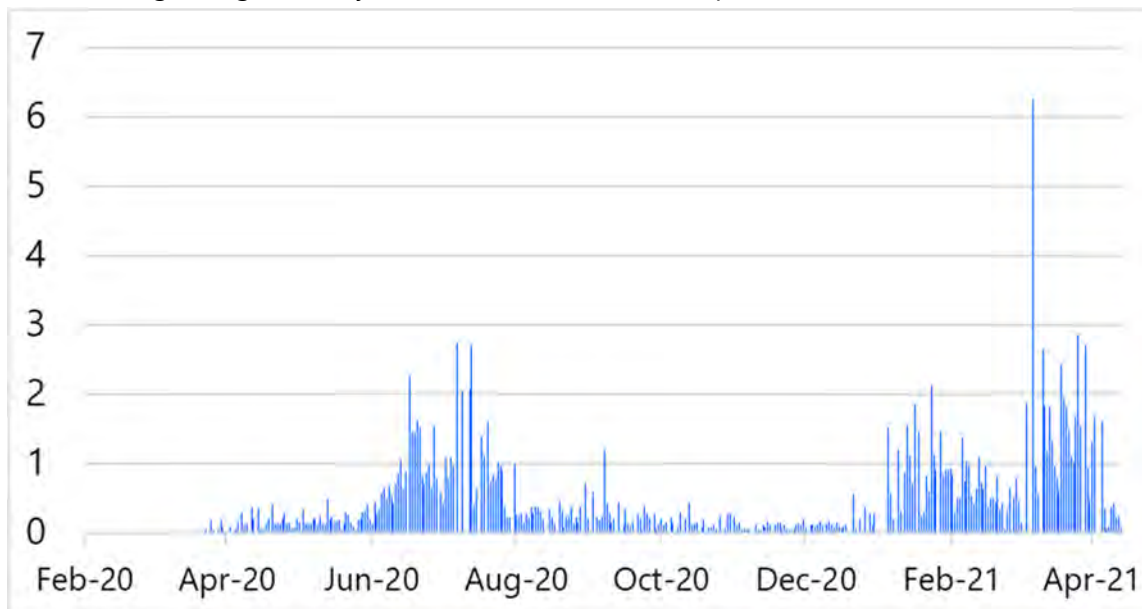
Kampala (Uganda): The cumulative number of cases per 100,000 people as of 31 March 2021 was 1251.63. The first infected person was detected on 29 March 2020, the latest of the nine target cities. Although the initial number of infected persons was relatively small since early lockdown measures were enforced, the outbreak began to spread gradually around August, reaching 414 daily infected persons (24.64 per 100,000) on 8 December 2020. Since then, the number of infected has been decreasing, and by February 2021, the daily number of infected people has remained at around 10 (0.60 per 100,000 people). The number of daily infections during the presidential election period from 13 to 17 January 2021 was not reported.



Source: Ministry of Health

Figure2.2.11 Infected cases per 100,000 population in Kampala

Abidjan (Cote d'Ivoire) <Country-level infection status>: As of 1 April 2021, the cumulative number of cases per 100,000 people was 17.07, the lowest among the nine countries. The first domestic cases were confirmed on 11 March 2020, and the first wave peaked on 19 June 2020. But the number of daily cases was very low at 430 or 0.17 cases per 100,000 persons. The spread of infection was then controlled and remained at about 30 daily infections (0.01 per 100,000) until December, but the disease spread again from January 2021, reaching its highest daily number of 767 (about 0.29 per 100,000) on 25 March 2021.



Source: WHO

Figure2.2.12 Infected Cases per 100,000 Population in Cote d'Ivoire

2.3 Infection Prevention Measures

2.3.1 Methodology

Countermeasures against COVID-19 are summarized based on the categories in Table 2.3.1, namely (i) infection prevention measures, (ii) closure and isolation, and (iii) others. Information is collected through (i) Oxford Coronavirus Government Response Tracks, (ii) websites of overseas diplomatic establishments, Japan External Trade Organization (JETRO), and the national governments, and (iii) interviews with the national governments in charge of the response to the pandemic.

Among these countermeasures, stay-at-home restrictions, restrictions on internal movement, and closed public transport will be detailed, considering the impacts on urban activities.

Table 2.3.1 Countermeasures against COVID-19

Purpose	Measure	Examples
(1) Infection prevention measures	Information sharing and awareness-raising	<ul style="list-style-type: none"> Information dissemination of infection status through SNS Guidelines and seminars on infection prevention measures
	Testing system establishment	<ul style="list-style-type: none"> Testing for any applicants Testing for symptomatic persons only
	Close contact identification	<ul style="list-style-type: none"> Isolation of close contacts Contact tracing application
	Follow-up for people under self-quarantine	<ul style="list-style-type: none"> Community-level information dissemination and health management by health volunteers
	Personal protective equipment	<ul style="list-style-type: none"> Distribution of facial masks Disinfection
(2) Closure and isolation for containment	Travel restriction	<ul style="list-style-type: none"> Compulsory lockdown Voluntary stay-at-home requirements/ Promotion of work-from-home Curfew Domestic travel restriction Closure of national border
	Facility closure	<ul style="list-style-type: none"> Closure of large commercial facilities School closure Workplace closure Suspension of public transport
	Ensuring social distancing	<ul style="list-style-type: none"> Gathering prohibition Frequency and capacity control of public transport Entry control in markets Check-in application Public space utilization Road space reallocation

Source: JICA Study Team

2.3.2 Stay-at-home Requirement and Influence on Infection Expansion

1) Stay-at-home requirement

Stay-at-home requirements in the main cities in 2020 are shown in Table 2.3.2.

Table 2.3.2 Stay-at-home Requirement in Main Cities

Classification	City	Overview	
Group 1	1-1	Manila	Enhanced Community Quarantine (ECQ) was issued on 17 March 2020. As the positive cases decreased, the restrictions gradually alleviated from Modified Enhanced Community Quarantine (MECQ) on 16 May 2020 to General Community Quarantine (GCQ) on 1 June 2020. Positive cases increased again in July 2020, and the restriction was reinforced on 4 August 2020 by imposing MECQ on 4 August. On 19 August 2020, restrictions were mitigated again by declaring GCQ, while the positive cases were still high. However, the cases eventually decreased.
		Yangon	A nighttime curfew was imposed in Yangon Region beginning on 18 April 2020. Some townships monitored the restrictions by ward administrators and imposed fine on offenders by law. The curfew was lifted on 15 May 2020. However, as the positive cases increased, the stay-at-home order was issued gradually in Yangon Region from 1 September 2020 (except for essential travels). This prohibited workers in the cutting, making, and packing (CMP) sector from commuting to factories.
		Kampala	On 30 March 2020, a curfew from 19:00 to 6:30 was issued, prohibiting selling commodities in markets and traveling by car. On 9 April 2020, the government prohibited gathering and closed some facilities while allowing travel by car by 14:00. The operation of commercial facilities and restaurants and travel by car by 17:00 were gradually permitted from 5 May 2020 as long as face masks are worn. On 27 July 2020, the curfew was shortened to 21:00–06:00. Though religious and educational facilities were opened in September and cinemas in November, the curfew is still in effect, and bars remain closed.
	1-2-1	Lima	A state of emergency was declared on 16 March 2020, prohibiting unessential travels and commutes. nighttime curfew was issued on 18 March. On 8 April, the number of people going outside (one per household) and traveling on Sunday were restricted. Although the travel restrictions were lifted except for children and the elderly on 25 June, the virus spread widely in August. As the cases decreased in September, travel restrictions have been mitigated.
		Bogota	A state of emergency was declared on 17 March 2020, prohibiting the elderly over 70 years old from going outside. On 25 March 2020, a mandatory stay-at-home order was imposed except for essential travel, and fines or imprisonment were imposed on offenders. Additionally, in Bogota, travel restrictions by personal attribute (23 April: by gender, 16 June: by ID card number, and 10 July: by residence area) were issued. National and municipal restrictions were lifted on 31 August and 21 September, respectively.
		Belem	Lockdown was imposed in Para State on 7 May 2020, prohibiting travel and outside activities except for essential ones. Travel for the purchase of essential items or banks was permitted for only one person per household.
		Sao Paulo	Lockdown was imposed on 24 March 2020, and all facilities except for essential ones were closed. Since 1 June 2020, five-grade travel restrictions (Phase 1–5) were issued. The travel restrictions were gradually mitigated despite the increase in positive cases (Phase 2: 1 June–25 June, Phase 3: 26 June–8 October, Phase 4: 9 October–29 November). In Phase 4, the operation of commercial facilities and restaurants was permitted up to 60% of capacity. However, due to the spike in positive cases, the restriction was reinforced in Phase 3 from 30 November 2020.
	1-2-2	Singapore	The work-from-home requirement was issued on 2 April 2020, and the circuit breaker started on 7 April 2020, prohibiting service operation except for essential ones. Offenders were penalized by law. As the infection curbed, the circuit breaker was lifted on 1 June 2020, and a three-phase approach toward urban activity resumption was announced. The first stage, Phase 1, allowed the partial operations of offices, schools, and small gatherings. In Phase 2, starting from 19 June 2020, restrictions were lifted further (while keeping the work-from-home requirement). As the positive cases continued to decrease, Phase 3 started on 28 December 2020, allowing urban activities as long as appropriate

Classification	City	Overview	
Group 2	1-3		safety measures were taken.
		Kuala Lumpur	On 21 March 2020, the number of people going outside was restricted to one per household. On 30 March, the Enhanced Movement Control Order (EMCO) was issued, prohibiting almost all urban activities. As positive cases decreased, the Recovery Movement Control Order was issued on 10 June 2020, allowing some events and urban activities that do not cause crowdedness. However, due to the increase in positive cases in October, the restrictions were strengthened on 14 October (Conditional Movement Control Order (CMCO)), mandating work-from-home except for specific sectors.
		Jakarta	The governor requested to refrain from unessential travel on 15 March 2020. Large-scale social restriction (PSBB) was issued on 10 April 2020, during which unessential travel was restricted and work-from-home was mandated. Since the positive cases did not increase so much, transitional large-scale social restrictions (PSBB Transisi) were issued on 5 June 2020, allowing some outdoor activities. However, as positive cases increased again in June, the PSBB was reimposed on 14 September 2020. The restriction was mitigated into PSBB Transisi on 12 October due to the decrease in cases. Though the cases increased again in November, the restriction was not strengthened.
		Nairobi	A nighttime curfew was imposed in the following periods: March–May 2020: 19:00–5:00, June–August 2020: 21:00–4:00, September–October 2020: 23:00–4:00, and November 2020–March 2021: 22:00–4:00. A 14-day isolation was imposed on offenders. If arrested, penalties, such as community service, were imposed.
	Mombasa	A nighttime curfew was imposed in the following period. March–May: 19:00–5:00, June–August: 21:00–4:00, September–October: 23:00–4:00, and November–March 2021: 22:00–4:00. A 14-day isolation was imposed on offenders. If arrested, penalties, such as community service, were imposed.	
	Istanbul	Although the government prohibited the elderly from going outside on 27 March 2020, the positive cases increased dramatically. Travel restriction was imposed on 10 April 2020 except for essential ones. As positive cases started to decrease at the end of April, the president lifted the travel restrictions on 1 June except for children and the elderly. However, since the cases increased gradually from November, the curfew on evening weekends was reissued on 20 November.	
	Mexico City	A state of emergency was declared on 30 March 2020, and a voluntary stay at home was requested. While the positive cases continued to increase, the state of emergency was lifted on 1 June 2020, and a four-grade travel restriction was taken. Though the most severe restriction (red) was issued, cases did not increase, so it was lifted. However, due to the rising positive cases again in December, the restriction was reinforced on 19 December 2020.	
	2-1	Kumasi	Travel restriction was imposed on 30 March 2020, requesting people to minimize non-essential travel. Positive cases did not increase, so the restriction was removed on 20 April 2020. When there were cases of infection again in July–August, the travel restriction was not issued, partly because of the presidential election activities.
Accra	Travel restriction was imposed on 30 March 2020, requesting people to minimize non-essential travel. Positive cases did not increase, so the restriction was removed on 20 April 2020. When there were cases of infection again in July–August, the travel restriction was not issued, partly because of the presidential election activities.		
Davao	State of Public Hygiene Emergency was issued on 19 March 2020, prohibiting travel during 21:00–5:00. The ECQ was issued on 4 April 2020, and the curfew period was changed to 18:00–6:00. Since the cases were curbed, the restriction was gradually alleviated to GCQ on 15 March 2020 and then MGCQ on 30 June 2020. Davao City announced the MGCQ guideline on 1 August 2020, imposing stay-at-home, mask-wearing when going out, social distancing, and frequent handwashing. The cases started to increase again in October 2020, and a 19:00–5:00 curfew was imposed on 27 October 2020. The restriction was		

Classification	City	Overview	
2-2		reinforced in GCQ on 20 November 2020.	
	Colombo	Travel restrictions were imposed around the international airport on 18 March 2020, and all over the country on 24 March 2020. On 4 May 2020, commuting and essential shopping were permitted. Since the positive cases were curbed, the curfew period was shortened to 22:00–4:00 by 26 May 2020. However, positive cases started to increase immediately when an all day and nighttime curfew was issued, which were lifted on 28 June 2020. Since a new case was found on 4 October 2020, the travel restriction was reissued in the Western Province, including Colombo, on 29 October 2020. After that, the district in the city has been imposing/lifting restrictions.	
	Lusaka	Though a voluntary stay-at-home requirement was requested on 24 April 2020, lockdown measures have not been taken.	
	A state	A state of emergency was declared on 7 April, requesting not to go out except for unessential needs. The infection was converged, and the state of emergency was lifted on 25 May.	
	Cebu	The curfew from 22:00–5:00 was imposed on 15 May 2020. On 28 March 2020, the ECQ was issued on 28 May 2020, where a travel permit was required to go out (including for buying essential needs such as food), and the number of people allowed to go out was restricted to one per household. On 15 May 2020, the restrictions eased to MECQ, allowing some outdoor exercise. The restriction was either strengthened or mitigated according to the infection status.	
Group 3	3-1-1	Seoul	Work-from home was requested on 2 March 2020, but positive cases did not increase, so the request was removed on 29 May 2020. However, a spike in cases immediately occurred, so on the same day, the government requested not to go outside. Another increase in positive cases in August 2020 urged the government to strengthen the restrictions, but no lockdown measures were taken. On 4 December 2020, restaurants and commercial facilities were prohibited from 21:00–5:00, and the frequency of public transport was reduced.
		Ulaanbaatar	Since no community infection cases were found in Mongolia until November, no travel restriction measures were imposed except for gathering restrictions and stay-at-home requests for children. On 7 May 2020, a lockdown drill was conducted in a part of Ulaanbaatar City. However, the first community infection case was found on 11 November 2020, and the government prohibited all people from going outside except for essential needs (people's travel was monitored at checkpoints). On 19 November 2020, entry to the area where the positive cases were found was banned.
	3-1-2	Bangkok	Closure of some facilities began on 18 March 2020, and a state of emergency was declared on 25 March 2020. Restaurants, shopping malls, and markets were closed, and the travel of the elderly and children was prohibited. A 22:00–4:00 curfew was issued on 3 April (penalties applied), which was mitigated gradually. Almost all facilities were open from 1 June 2020, and the curfew was removed on 15 June 2020. However, due to the spike in positive cases in December, entry to high-risk areas was prohibited on 26 December.
		Antananarivo	A strict travel restriction was issued from 22 March 2020. During the lockdown, only one person per household was allowed to go outside for essential needs, and a 20:00–5:00 curfew was imposed. The restrictions were gradually lifted since 20 April, but the increasing positive cases again in June urged the travel restrictions again in 6–20 July 2020. The state of public health emergency was lifted in October, which permitted gathering less than 200 people.
		Lilongwe	The countrywide lockdown was imposed from 14 April–9 May, when stay-at-home was mandated except for people engaged in essential services with a special permit (penalties applied).
	Da Nang	The government imposed stay-at-home requirements on 1 April 2020, which were prolonged in Hanoi, Ho Chi Minh City, Da Nang, and other major cities until 22 April 2020. Though the infection was contained for a while, a new community infection case was found in Da Nang on 25 July 2020, and the travel restriction was reimposed on 28 July 2020. This restriction was gradually	

Classification	City	Overview
3-3		mitigated from 4 September 2020 as the cases were curbed.
	Managua	No measures were implemented.
Group 4 4	Taipei	No measures were implemented.
	Phnom Penh	No measures were implemented.
	Hanoi	The government imposed stay-at-home requirements on 1 April 2020, which were extended until 22 April 2020 in Hanoi, Ho Chi Minh City, Da Nang, and other major cities. In some parts of Hanoi, similar measures were taken on 23 April as well.
	Ho Chi Minh City	The government imposed stay-at-home requirements on 1 April 2020, which were extended in Hanoi, Ho Chi Minh City, Da Nang, and other major cities until 22 April.
	Dar Es Salaam	No measures were implemented.

Source: JICA Study Team based on websites of overseas diplomatic establishments, JETRO, etc.

The CUREIP Team analyzed the stay-at-home requirement measures by their intensity and specific conditions.

- (i) **Intensity:** The measures were classified into A, B, and C, as shown below.
 - A. The measure has legal force, and the penalty is imposed on offenders.
 - B. The measure has no legal force, or no travel restriction is issued, but the government request people to stay at home except for essential needs.
 - C. No travel restriction is issued.
- (ii) **Conditions:** Some countries added specific conditions to the travel restriction measures, as shown below.
 - Travel restriction by time: Nighttime curfew is one of the common travel restriction measures. Some cities flexibly changed the curfew period according to the infection status. In Lima, a weekend curfew was imposed from April to September.
 - Travel restriction by attributes: Some cities issued travel restriction orders by people's attributes, such as age and gender. In particular, special restrictions on children and the elderly, who are considered vulnerable to COVID-19, were often observed. Lima and Bogota took gender-based restrictions, which were lifted shortly. In Bogota, travel restrictions by ID number were also imposed.
 - Restrictions on the number of persons going out: Some cities with severe infection situations permitted only one person per household to go out for essential travel.
 - Travel restrictions by area: Some specific areas in a city were identified as targets of the travel restrictions. As of December 2020, this measure was taken in Nairobi, Mombasa, Bogota, Ulaanbaatar, Colombo, and Hanoi. In 2021, Jakarta and Mumbai also issued this measure.

Table 2.3.3 summarizes the travel restriction measures imposed in the main cities by intensity and conditions. For cities where different measures were taken, the most intensive is shown.

Table 2.3.3 Travel Restrictions in Main Cities

Category	City	Intensity	By time	By attribute	No. of person	By area
Group 1 1-1	Manila	A			✓	
	Yangon	A	✓			
	Kampala	A	✓			

Group 1	1-2-1	Lima	A	✓	✓	✓	
		Bogota	A	✓	✓		✓
		Belem	B			✓	
		Sao Paulo	B				
	1-2-2	Singapore	A				
		Kuala Lumpur	A			✓	
		Jakarta	B				
		Nairobi	A	✓			✓
	1-3	Mombasa	A	✓			✓
		Istanbul	A	✓	✓		
Mexico City	B						
Group 2	2-1	Kumasi	B				
		Accra	B				
		Davao	A	✓	✓	✓	
		Colombo	A	✓			✓
	2-2	Lusaka	B				
		Tokyo	B				
		Cebu	A	✓		✓	
		Seoul	B				
Group 3	3-1-1	Ulaanbaatar	A		✓		✓
		Bangkok	A	✓	✓		
	3-1-2	Antananarivo	A	✓		✓	
		Lilongwe	A				
	3-3	Da Nang	A				
		Managua	C				
Group 4	4	Taipei	C				
		Phnom Penh	C				
		Hanoi	A				✓
		Ho Chi Minh City	B				
		Dar Es Salaam	C				

Source: JICA Study Team

2) Relationship between Intensity and Timing of Travel Restrictions and Infection Status

Some literature² points out that the initial response by governments affect the spread of the virus in cities. The CUREIP Team examined the relationship between the intensity (see 2.3.2) and timing of the travel restrictions and infection status in each city. The intensity is categorized into A, B, and C, as shown in 2.3.2, and the number of positive cases per 100,000 population as of the first day of the travel restriction is used as an index showing the timing of the measures.

Table 2.3.4 shows a summary of this data.

Table 2.3.4 Intensity and Timing of Travel Restrictions in Main Cities

Category	City	Intensity	Date of measure	Cumulative No. of positive cases per 100,000 population by the date of the measure	
Group 1	1-1	Manila	A	17 March 2020	1.02
		Yangon	A	18 April 2020	1.65
		Kampala	A	30 March 2020	0.12
	1-2-1	Lima	A	16 March 2020	0.23*

² Yahagi (2020). Will the City Changes with COVID-19? Report from Europe and America. Gakugei Shuppansha

Group 1	1-1-1	Bogota	A	25 March 2020	2.53
		Belem	B	7 May 2020	54.0*
		Sao Paulo	B	24 March 2020	1.03*
	1-2-2	Singapore	A	8 April 2020	26.7
		Kuala Lumpur	A	30 March 2020	22.1
		Jakarta	B	10 April 2020	18.2
		Nairobi	A	27 March 2020	0.34
		Mombasa	A	27 March 2020	0.08
	1-3	Istanbul	A	10 April 2020	50.1
		Mexico City	B	30 March 2020	0.65
Group 2	2-1	Kumasi	B	30 March 2020	0.49*
		Accra	B	30 March 2020	0.49*
		Davao	A	4 April 2020	1.35
		Colombo	A	20 March 2020	0.25*
	2-2	Lusaka	B	24 April 2020	2.49
		Tokyo	B	7 April 2020	8.41
		Cebu	A	28 March 2020	0.03
		Seoul	B	22 March 2020	2.50
Group 3	3-1-1	Ulaanbaatar	A	12 November 2020	0.27 ¹⁾
		Bangkok	A	25 March 2020	6.17
	3-1-2	Antananarivo	A	22 March 2020	0.01
		Lilongwe	A	14 April 2020	0.08*
		Da Nang	A	1 April 2020	0.91
	3-3	Managua	C	—	—
Group 4	4	Taipei	C	—	—
		Phnom Penh	C	—	—
		Hanoi	A	1 April 2020	0.77
		Ho Chi Minh City	B	1 April 2020	0.62
		Dar Es Salaam	C	—	—

*Calculated by the countrywide positive cases.

¹⁾ In Ulaanbaatar, the first community infection case was confirmed on 11 November 2020, and travel restrictions with a penalty on offenders were issued on 12 November 2020. Though the official data on positive cases include those found in the immigration quarantine, the figure here indicates only the number of community cases on 11 and 12 November 2020. The official data as of 12 November 2020 is 57.0.

Source: JICA Study Team

Table 2.3.5 categorizes the 40 main cities into groups by the intensity of travel restrictions and the cumulative number of positive cases as of the day of the measure. The color of each city corresponds to the classification explained in 2.2.2 2). This table indicates that cities that imposed strong restrictions early tend to succeed in controlling the spread of the virus. On the other hand, cities where travel restrictions were issued only after a cumulative number of positive cases per 100,000 population exceeded 10.00 had difficulty curbing the cases regardless of the measure intensity. Most cities with few positive cases (Group 4) did not implement any travel restrictions except those in Viet Nam, implying that other factors might affect these cities' success. This analysis shows that the initial response by the government influences the mid- and long-term tendency of infection expansion.

Table 2.3.5 Relationship between Intensity and Timing of Travel Restrictions and Cumulative No. of positive cases as of December 2020

		Cumulative No. of positive cases as of the date of issue of travel restriction measure			
		Less than 1.00	1.00–10.00	More than 10.00	No measures implemented
The intensity of the measure	A	Kampala Lima Nairobi Mombasa Colombo Cebu Ulaanbaatar Antananarivo Lilongwe Da Nang Hanoi	Manila Yangon Bogota Davao Bangkok	Singapore Kuala Lumpur Istanbul	
	B	Mexico City Kumasi Accra Ho Chi Minh City	Sao Paulo Lusaka Tokyo Seoul	Belem Jakarta	
	C				Managua Taipei Phnom Penh Dar Es Salaam

Note: **Red**=Group 1, **Blue**=Group 2, **Green**=Group 3, **Pale Blue**=Group 4

Source: JICA Study Team

2.3.3 Inter-city Travel Restrictions

Inter-city/province travel restrictions taken in the 40 main cities as of December 2020 are summarized in Table 2.3.6. Davao mandated all arriving passengers by flight to submit a PCR negative certificate. Cities in Viet Nam requested people from Da Nang to self-quarantine for 14 days, considering the comparatively higher risk of COVID-19 infection in the city.

Table 2.3.6 Inter-city Travel Restrictions in Main Cities

Classification	City	Overview	
Group 1	1-1	Manila	Travel into/from Metropolitan Manila was banned from 15 March to 21 June 2020. Since 21 June 2020, such travel is allowed as long as one has a travel permit issued by the police.
		Yangon	Domestic travel was restricted from 18 April to 15 May 2020 and since 1 September 2020, when stay-at-home order was issued. However, specific target areas were not articulated.
		Kampala	Travel by car was prohibited from 30 March to 26 May 2020, except for some essential needs such as shopping, public, medical, financial, and delivery services.
	1-2-1	Lima	Travel across provinces is prohibited from 15 March 2020.
		Bogota	Domestic flights were suspended due to the travel restriction order on 25 March 2020. Land traffic was also banned beginning 22 April 2020. From 7 July 2022, however, inter-regional flight connecting less risky areas has resumed.
		Belem	During Easter and Tiradentes holidays in April, travels across cities and counties in Para State was banned. On 25 May 2020, entry into Greater Belem Region and cities/counties under lockdown is prohibited.
	1-2-2	Sao Paulo	No measures were implemented.
Singapore		No measures were implemented.	

Classification	City	Overview	
Group 2		Kuala Lumpur	Inter-state travel was banned during 30 March–9 June 2020. Since 12 October 2020, inter-regional travel under CMCO is prohibited (but allowed if issued a permit by the police or employers).
		Jakarta	Travel across the Jabodetabek area is prohibited during Ramadan in April. From 14 May to 17 July 2020, travel into DKI Jakarta is restricted except for the residents in the Jabodetabek area and permit holders issued by the DKI Jakarta.
		Nairobi	The government prohibited all travel into Nairobi region by road, railway, and flight for 21 days from 8 April. Travel from/into the Eastleigh area was also banned for 15 days from 6 May. Fourteen-day isolation was imposed on offenders, and community services such as cleaning were imposed if arrested.
		Mombasa	The government prohibited all travel into Nairobi region by road, railway, and flight for 21 days from 8 April 2020. Travel from/into the old town of Mombasa was also banned for 15 days from 6 May 2020.
	1-3	Istanbul	Non-essential travels from/to Istanbul and other provinces from 4 April to 1 June.
		Mexico City	No measures were implemented.
	2-1	Kumasi	No measures were implemented.
		Accra	No measures were implemented.
		Davao	On 19 March 2020, all flights arriving in and departing from Davao are prohibited. From 15 May 2020, travel between GCQ regions was allowed, and from 21 June 2020, domestic flights or between provinces required a travel permit issued by the police. From 20 July, arriving passengers by flight was required to submit the PCR negative certificate within 72 hours before departure. From 12 October 2020, the online registration of passenger, boarding pass, a negative PCR certificate, and an issued QR code was mandated.
		Colombo	From 24 March to 28 June 2020 and since 29 October 2020, traveling between districts was banned.
2-2		Lusaka	No measures were implemented.
		Tokyo	The government requested not to travel between prefectures during a state of emergency.
	Cebu	Flights and ferries from/to Cebu Island were suspended from 15 March 2020. From 21 June 2020, domestic travel by flight or between provinces required a travel permit issued by the police. On 17 November 2020, the government issued a guideline of how to obtain necessary documents to enter Cebu City by flight or ferry.	
Seoul	No measures were implemented.		
Group 3	3-1-1	Ulaanbaatar	Travel from/to Ulaanbaatar city was restricted during the Mongolian New Year (24–26 February) and on 10–17 March, cutting off the arterial roads and suspending public transport. Travel inside and from/to Ulaanbaatar City was banned during the lockdown (11–13 November 2020).
		Bangkok	Due to the state of emergency on 25 March 2020, inter-province travel was prohibited except for essential trips; ID and body temperature were checked at checkpoints established surrounding Bangkok. This measure was mitigated on 1 June. In December 2020, many positive cases were found in Samut Sakhon Province, adjacent to Bangkok, so travel from/to the province was restricted.
	3-1-2	Antananarivo	Since 24 March 2020, permission was required to travel by vehicle. From 27 March 2020, patrol by military police and road interruption was carried out, and from 5 April, the checkpoint was established at the regional border of the Analamanga region, where Antananarivo is located.
		Lilongwe	No measures were implemented.
		Da Nang	Electric health report was mandated to domestic transport users from 21 March 2022. Beginning April, a 14-day self-quarantine was required for all people coming from high-risk areas. Due to the community infection found

Classification	City	Overview
3-3		on 26 July, unessential travels from/to the city were prohibited with checkpoints installed at the municipal border. This restriction was lifted on 7 September 2020.
	Managua	No measures were implemented.
Group 4 4	Taipei	No measures were implemented.
	Phnom Penh	Non-essential travels from/to Phnom Penh and Kandal Province and inter-provincial travel were banned from 9 to 16 April 2020.
	Hanoi	Electric health report was mandated to domestic transport users from 21 March 2020, and travel from Hanoi and Ho Chi Minh City was prohibited from 28 March to 15 April. Since 7 September when passenger transport from Da Nang resumed, people from Danang were required to go through the test, a medical report, and a 14-day self-quarantine.
	Ho Chi Minh City	Electric health report was mandated to domestic transport users from 21 March, and travel from Hanoi and Ho Chi Minh City was prohibited from 28 March to 15 April 2020. Since infection expansion was confirmed outside Da Nang city as well, people from these cities were required to take infection prevention measures since the middle of August 2020.
	Dar Es Salaam	No measures were implemented.

Source: JICA Study Team

2.3.4 Infection Prevention Measures on Public Transport

JICA conducted the survey on COVID-19 infection prevention and support measures on public transportation by the government and operators in the Survey on Insight and Experience of COVID-19 Prevention Measures on Public Transport in the World (JICA, September 2020). The survey classifies the measures taken by the government and municipality and by the operators into six and five groups, respectively (Table 2.3.7 and Table 2.3.8).

Table 2.3.7 COVID-19 Infection Prevention Measures on Public Transport by Governments and Municipalities

Category	Examples
Guideline	<ul style="list-style-type: none"> Formulation and promotion of guidelines
Awareness-raising	<ul style="list-style-type: none"> Dissemination of COVID-19 infection prevention measures
Mask	<ul style="list-style-type: none"> Mandatory mask wearing for all public transport passengers
Subsidy	<ul style="list-style-type: none"> Increasing subsidy for public transport operators Grant and financial support
App	<ul style="list-style-type: none"> Smartphone applications to prevent virus expansion (contact trace app, etc.) Development and promotion of ticketless and contactless transaction
Others	<ul style="list-style-type: none"> PCR test facility at public transport facilities Public transport promotion campaign

Source: The Report on Insight and Experience of COVID-19 Prevention Measures on Public Transport in the World (JICA)

Table 2.3.8 COVID-19 Infection Prevention Measures on Public Transport by Operators

Category	Examples
Employee Measures to ensure employee safety	<ul style="list-style-type: none"> Formulation and operation of guidelines Check employees' health status Mask wearing Promotion of ticketless/e-payment transaction Isolation of driver's area

Category		Examples
Passengers	Measures to prevent passengers from infection	<ul style="list-style-type: none"> • Check body temperature • Mask wearing • Hands and fingers disinfection • Promotion of social distancing • Awareness raising of infection prevention measures • Dissemination of congestion status • Development of smartphone applications
Vehicle	Measures on vehicles to prevent employees and passengers from infection	<ul style="list-style-type: none"> • Cleaning and disinfection of vehicles • Restriction on seats • Ventilation • Marking for social distancing on vehicles
Operation	Ensuring social distancing and response to lockdown measures by adjusting operation	<ul style="list-style-type: none"> • Reducing frequency • Operation suspension • Shortened operation hours • Restriction on the number of passengers
Facilities	Infection prevention measures at stations and bus stops	<ul style="list-style-type: none"> • Cleaning and facilities of facilities • Equipment installation for hands and fingers disinfection • Ventilation • Marking for social distancing in facilities

Source: The Report on Insight and Experience of COVID-19 prevention measures on Public Transport in the World (JICA)

The infection prevention measures on public transport practiced in the 40 main cities as of December 2020 are summarized in Table 2.3.10. Considering the classification shown in Table 2.3.8, these measures can be categorized into the following:

Employee: To reduce cash transactions, cashless payments (contactless IC cards, etc.) was mandated in Manila, and an online top-up service on contactless IC cards was started in Bangkok. Davao City formulated guidelines during the MGCQ period.

Passengers: Many cities obliged passengers to wear masks and keep social distancing. Davao's guidelines included keeping physical distance, opening windows, establishing separators between seats, and limiting the number of tricycle passengers to two. In Turkey, the Ministry of Health issues individual QR codes (called HES codes) to confirm and trace close contact with infected persons, and the urban public transport in Istanbul requires passengers to show and register the code when they use it. This system was connected with the transport IC card system, and the IC cards not linked to the HES code system have been invalid since January 2021.

Vehicles: Cleaning and disinfection of vehicles were conducted in many cities.

Operation: Public transport was suspended in cities such as Manila, Belem, Ulaanbaatar, and Da Nang during lockdown or state of emergency. Public transport in Kuala Lumpur stopped operations except for the rush hours, and frequency was reduced in Singapore and Jakarta. While the number of passengers was limited in many cities, the urban railways in Bangkok increased the frequency to ensure social distancing on carriages.

Facilities: Many cities conducted cleaning and disinfection of stations and bus stops. In Lima, bus stops were considered hotbeds of infection, and passenger capacity was limited to 50%. Some stations in Mexico City were closed down.

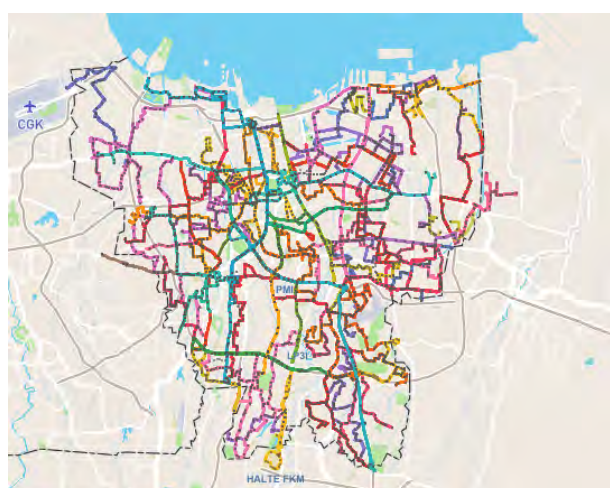
Others: In Manila, shuttle bus services were provided for medical employees. In Jakarta, while

BRT operation hours were shortened during the PSBB, buses for medical employees were provided after the normal operations of the buses (Table 2.3.9). Normal and special routes for medical employees are shown in Figure 2.3.1 and Figure 2.3.2, respectively.

Table 2.3.9 BRT Operation Hours during Social Restriction

Social Restrictions	Period	Operation hours for non-medical employees	Operation hours for medical employees
PSBB	6 April–8 May	06:00-20:00	-
	9 May–14 June	06:00-18:00	19:30-23:30
PSBB Transisi	15 June–19 September	05:00-22:00	22:00-23:59 (13 routes)
	20 September–12 November	05:00-19:00	05:00, 05:30, 19:00, 19:30, 21:00,
	13 November–25 January	05:00-22:00	21:30 (8 routes)
PPKM	11 January–25 January	05:00-22:00	
	26 January–8 February	05:00-21:00	
PPKM Mikro	9 December–	05:00-22:00	22:30-23:00 (13 routes) 05:00, 05:30, 19:00, 19:30, 21:00, 21:30 (8 routes)

Source: JICA Study Team based on Transjakarta website: covid19.transjakarta.co.id



Source: Transjakarta website:
<https://covid19.transjakarta.co.id>

Figure 2.3.1 BRT Routes for non-medical employees



Source: Transjakarta website:
<https://covid19.transjakarta.co.id>

Figure 2.3.2 BRT Routes for medical employees

Table 2.3.10 Infection Prevention Measures on Public Transport in Main Cities

Classification	City	Overview
Group 1	1-1 Manila	Due to the ECQ measure on 17 March 2020, all public transportation, including urban railways, buses, and paratransit, was suspended from 18 March 2020. The Department of Transportation started operating shuttle bus services for medical employees on the same day. On 16 May 2020, when restrictions were alleviated to MECQ, public transport resumed only for essential travel. Upon transition to GCG on 1 June 2020, public transport resumed with limited capacities (LRT and MRT at 10–12% and the national railway at 35%). Public transport operations stopped again on 4 August 2020 but resumed on 19 August 2020. Since 29 November 2020, cashless payments using an IC card have been mandatory for some bus services.
	Yangon	As of September, the railway frequency has been reduced by 50%. The city bus reduced its frequency, especially during national holidays. There have

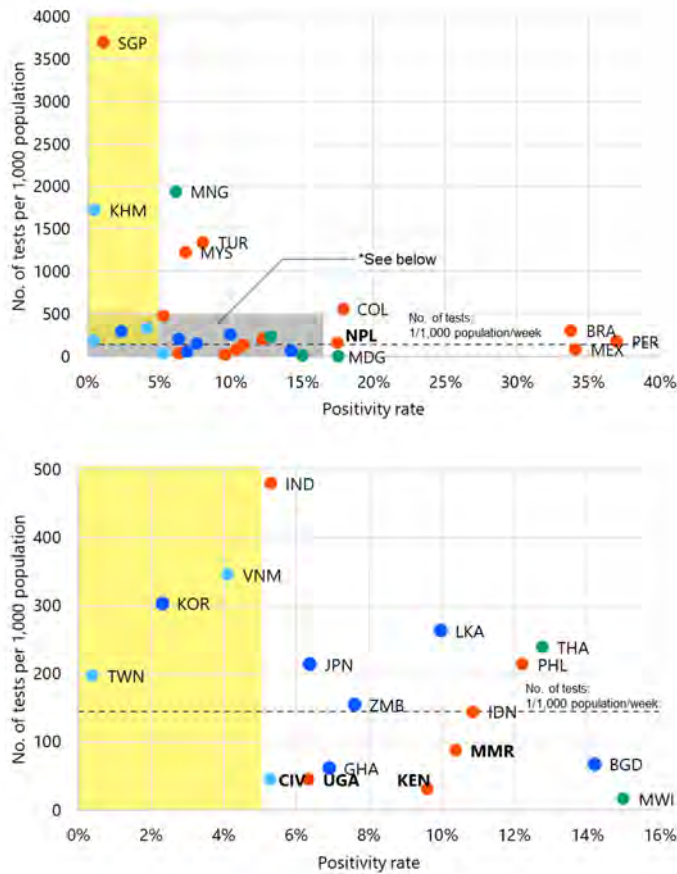
Classification	City	Overview	
Group 2		been no restrictions on the number of passengers.	
	1-2-1	Kampala	Since 30 March 2020, when the nighttime curfew was imposed, travel by vehicle, including public transport, was prohibited. From 4 June, minibus operation was resumed with limited capacity (less than half), and on 27 July, motorcycle taxis also started operations again.
	1-2-1	Lima	The president prohibited all people from using privately-owned vehicles, resulting in the inevitable use of public transport when going outside. However, the urban railways and buses stop operations by 20:00. On 8 May 2020, the president announced that the bus stops generated infection clusters and mandated operators to clean the facilities thoroughly and limit the capacity inside the vehicles and at bus stops to 50%.
		Bogota	On 22 April, the measure was reinforced to limit the number of passengers to 35% of the capacity.
		Belem	Para State prohibited any travel by public transport since April, which was lifted on 18 June 2020. However, Belem City continued the restriction.
		Sao Paulo	Since 18 March 2020, operations of railways and buses have been restricted.
		1-2-2	Singapore
	Kuala Lumpur		Since 25 March 2020, operating hours of public transport were only from 6:00 to 10:00 and 17:00 to 22:00 (on 2 May 2020, it was relaxed to 6:00–23:00). The recurrence of the spread of COVID-19 on 12 October 2020 and the CMCO order restricted the hours from 6:00 to 24:00 and the number of taxi passengers to two. These measures were removed on 7 December 2020.
	Jakarta		From the middle of March, even before PSBB, the frequency and operation hours of MRT, BRT, and commuter railways were reduced. These measures were gradually lifted after the removal of PSBB. The limit on the number of passengers and mandatory mask-wearing were also imposed. BRT operated special services for health sector employees before and after the normal operation period.
	Nairobi		The number of passengers on public transport was limited to 60% during normal hours, and a 1-meter social distance was ensured on buses. Passengers went through body temperature checks and disinfection before boarding buses.
	Mombasa		The number of passengers on public transport was limited to 60% during normal hours, and a 1-meter social distance was ensured on buses. Passengers went through body temperature checks and disinfection before boarding buses.
	1-3		Istanbul
		Mexico City	Twenty percent of stations and stops of subways, suburban railways, and buses were closed from 23 April 2020.
	2-1	Kumasi	No measures were implemented.
		Accra	No measures were implemented.
Davao		Public transport was suspended from 4 April 2020 when ECQ was applied but resumed on 15 May 2020 due to the relaxation to GCQ. On 1 August 2020, the municipality issued a guideline that regulates keeping physical distance, opening windows, establishing separators between seats, and limiting the number of tricycle passengers to two. The municipality	

Classification	City	Overview	
2-2		operated bus services free of charge.	
	Colombo	The number of passengers was restrained upon confirmation of community infection cases on 4 October 2020.	
	Lusaka	No measures were implemented.	
	Tokyo	No measures were implemented.	
	Cebu	Public transport, such as jeepneys and buses, was suspended by 15 March 2020. It resumed on 1 June 2020 when the restriction was relaxed into GQC but suspended again from 16 June to 31 July 2020 when restrictions heightened again.	
	Seoul	Social and economic activities after 21:00 were restrained from 15 to 18 December 2020. Public transport reduced operations by 30% after 21:00.	
Group 3	3-1-1	Ulaanbaatar	Though the route bus services were stopped on 24–27 February 2020, they resumed operations from 27 February 2020 with reduced frequency. Upon confirmation of community infection cases on 11 November, the operation hours of public transport were limited between 12–17 November 2020.
		Bangkok	Urban railways: Since 25 March 2020, passengers must wear face masks and keep a 2-meter distance on trains. Due to the nighttime curfew from 3 April to 15 June 2020, the operation hours were changed. From 7 April 2020, the frequency was increased to meet the demand during rush hours.. The number of passengers was limited to 25% of the capacity on 8 May 2020, but it was relaxed to 70% on 1 July 2020 when the school started. The limit was removed on 1 September 2020. On 13 April 2020, an online top-up service on the IC cards was launched. Buses: Since 27 March 2020, the number of passengers was restricted to ensure a 1-meter distance apart. The bus frequency was reduced by 30% on 1 April 2020, and capacity was reduced to 25% on 8 May 2020. As schools started on 1 July 2020, the frequency returned to normal.
	3-1-2	Antananarivo	All inter- and intra-city public transport was suspended on 22 May 2020. Since April, when the “health state of emergency” was removed, operations by 15:00 was permitted as long as appropriate disinfection and hygiene measures were done. On 3 May 2020, all passengers and drivers were mandated to wear masks, and on 3 June 2020, taxi be (minibus) operation hours were extended to 17:00.
		Da Nang	While buses and railways stopped on 1 April 2020, operations could resume as long as passengers and crew members wear face masks and disinfect their hands and fingers. As community infection cases were found on 25 July, the public transport suspended its operation for 15 days since 28 July. Since 7 September, it resumed on the condition of mask-wearing, medical report, and sufficient distance between seats.
	3-3	Managua	No measures were implemented.
Group 4	4	Taipei	Since 3 February 2020, wearing masks on subways/buses was recommended (mandated since 4 April 2020), and passengers with body temperatures over 38°C were prohibited entry to the stations. However, since 7 June 2020, the mandatory mask-wearing was removed as long as distances between surrounding passengers were enough.
		Phnom Penh	No measures were implemented.
		Hanoi	While buses and railways stopped on 1 April 2020, operations could resume if passengers and crew members wear face masks and disinfect their hands and fingers.
		Ho Chi Minh City	While buses and railways stopped on 1 April 2020, operations could resume if passengers and crew members wear face masks and disinfect their hands and fingers.
		Dar Es Salaam	No measures were implemented.

Source: JICA Study Team

2.3.5 Testing Policy

The testing rate (cumulative number of tests per 1,000 population) and positivity rate (no. of positive cases divided by the No. of tests) as of May 2021 are shown in Figure 2.3.3. (The area with the testing rate of less than 500 and the positivity rate of less than 10% (colored in gray) is enlarged in the second figure.) WHO³ regards countries with a testing rate of more than one in a week as successful in “comprehensive surveillance and testing of suspected cases” and countries with a positivity rate of less than 5% for at least two weeks as successful in containing the virus. In Figure 2.3.3, the countries predicted to meet these conditions fall in the yellow zone.⁴ These are Singapore, Mongolia, Malaysia, Korea, Thailand, and Cambodia, in which the number of positive cases is very low, or the virus was contained early. On the other hand, 12 countries are below the WHO criteria. It can be predicted that Latin American countries, except Colombia, conduct insufficient tests judging from the low testing rate and high positivity rate. It should be noted that the testing rate might be higher in cities where access to testing is better.⁵



Note: The data on testing numbers are collected on 31 May 2021, except for Brazil (24 May), Ghana (28 May), Kenya (4 May), Malawi (26 May), Peru (27 May), and Viet Nam (30 May). Red=Group 1, Blue=Group 2, Green=Group 3, Pale blue=Group 4. Countries in bold are the eight target countries.

Source: JICA Study Team based on Our World in Data by WHO, WB, and JHU

Figure 2.3.3 Relationship between No. of Tests per 1,000 population and Positivity Rate

³ WHO (2020). Public health criteria to adjust public health and social measures in the context of COVID-19.

⁴ Area, where the number of tests per 1,000 population exceeds 65 in 65 weeks from 1 March 2020–31 May 2021, is shown yellow.

⁵ As of 31 May 2020, while the number of tests per 1,000 population in Indonesia is 41.58 the figure in Jakarta is 378.9.

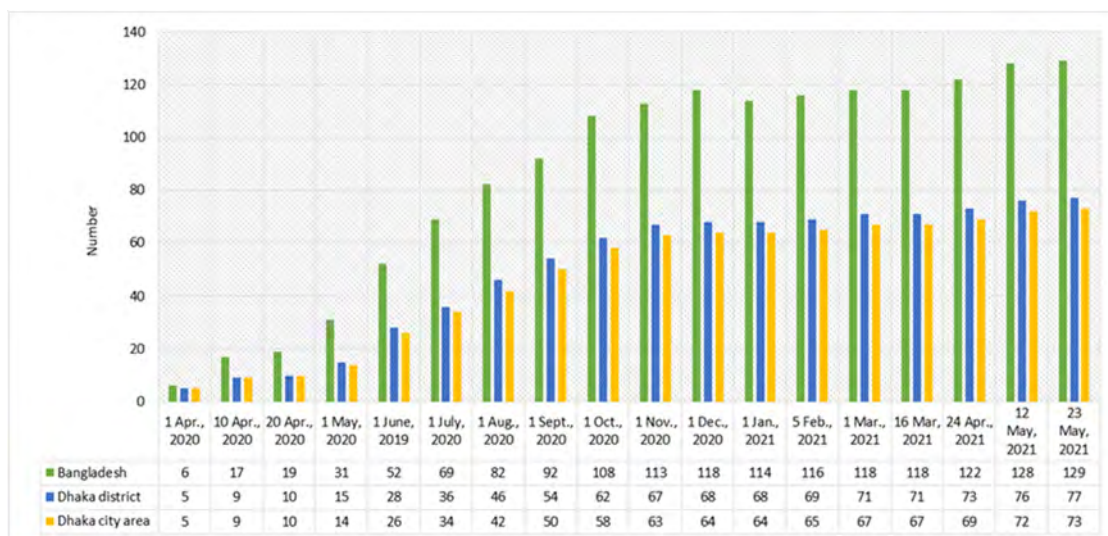
Focusing on the target countries, excluding Egypt (where testing data is unavailable), the countries exceeding WHO’s criteria on “comprehensive surveillance and testing of suspected cases” are Bangladesh and Nepal. However, considering the high positivity rate in Nepal at 18.2%, it can be said that the testing capacity of Nepal is insufficient for the actual infection status in the country.

Testing policies in target countries are explained below. Several types of COVID-19 testing include (i) PCR test that collects saliva or pharyngeal swab and amplifies the DNA segments to confirm the existence of the virus, (ii) antigen test that confirms antigen from saliva or pharyngeal swab, and (iii) antibody test that checks the antibody from blood.

Jakarta: Symptomatic patients, especially those in close contact with infected persons, can take the test free of charge. Other applicants can take it at their expense. Although originally there was only one testing facility in the country, it increased to 830 (114 in Jakarta) as of May 2021. The government conducts testing on citizens and workers near areas where infected cases are found. In Tanah Abang, citizens and transport workers around a market went through the test. Although the number of tests was very low in Indonesia as a whole, more than 80 thousand people had taken tests as of May 2021.

Yangon: Testing facilities are available in all 23 townships. The Ministry of Health and Sports defines close contact as those who had contact with the infected between 48 hours before and 14 days after symptoms occurred. Those who were in close contact are isolated for 21 days and must be tested after isolation.

Dhaka: Due to the shortage of testing kits, public hospitals only conduct tests for the symptomatic. People can take the test at their expense at private hospitals authorized by the government. Only a few were tested initially when the testing kits were lacking but gradually increased as more testing kits became available. As of May 2021, there are 73 testing facilities in Dhaka, more than half of the total around the country (Figure 2.3.4).



Source: DGHS

Figure 2.3.4 Change in No. of RT-PCR Testing Facilities in Bangladesh and Dhaka

Kathmandu: Originally, Nepal had only one testing facility. However, through the efforts of the Ministry of Health and Population and with the aid of WHO, there are now 83 testing facilities, of which 33 are in the Kathmandu Valley. For fast test results, a rapid diagnostic

test was introduced. However, due to its low accuracy, this method was replaced by the PCR test. People with symptoms can take the test free of charge if they are economically vulnerable, helpless, a single female, disabled, elderly, or engaged in medical, cleaning, hygiene, or guarding sectors. (Health insurance is applied if available.)

Nairobi, Mombasa: The country has 43 authorized testing facilities, of which 25 are in Nairobi and 3 in Mombasa. Due to the shortage of testing kits, the test is conducted only for those with symptoms. At the same time, the government implements intensive testing for certain areas (e.g., Kibera, Kawangware, and Eastleigh in Nairobi).

Cairo: There are 62 testing facilities in Egypt, and samples are transferred to and analyzed at a central testing institute. Online reservation is available to take the test. There are hundreds of private testing centers in the Greater Cairo Region, and applicants can go through the test for approximately EGP2,000.

Kampala: Initially, the testing was limited to the governmental institute, but the number of hospitals and facilities capable of testing has increased as the community infection cases have grown. From October 2020, a new testing policy was introduced to focus more on symptomatic persons. Tests are conducted (i) within 24 hours for those with symptoms, (ii) within 24–36 hours for those with contact with infected persons, (iii) within 48 hours for those identified in the monitoring program, and (iv) within 72 hours for those identified in the community-based testing.

Abidjan: Tests are conducted in screening, isolation, and hospitalization. Originally, those with symptoms or close contacts were prioritized due to the lack of testing capacities, but currently, any applicants can take the test.

2.3.6 Contact Tracing Smartphone Application

Containment of the spread of COVID-19 requires rapid identification and isolation of those who had close contact with infected persons. Thus, many countries utilize smartphone applications. Although the target countries of this Study developed such apps, very few have downloaded them partly due to the low access to smartphones.⁶ Table 2.3.11 is a list of the apps that the target countries introduced to prevent the spread of COVID-19.

Indonesia: The Ministry of Communication and Information Technology and the Ministry of State-Owned Enterprises jointly developed PeduliLindungi, a contact tracing phone app that uses Bluetooth. The number of downloads exceeds five million. The Indonesian COVID-19 Response Task Force released the app Bersatu Lawan COVID-19 to show the vulnerability to COVID-19 in each area. Furthermore, the Faculty of Medicine of Airlangga University and the Indonesian Medical Association developed the app DokterSafe to provide medical employees with correct information about COVID-19 and a self-diagnosis system.

Myanmar: Myanmar Computer Federation and the Emergency Response ICT Team under the Ministry of Transport and Communication developed the contact tracing app Saw Saw Shar, which was released by the Ministry of Health and Sports in February 2020. The app enables

⁶ In Japan, the app called COCOA was downloaded more than 250 million times, or by approximately 20% of the Japanese people as of November 2020.

users to report their health status and grasp the location of isolation facilities.

Nepal: The Ministry of Health and Population released the app Hamro Swasthya to provide citizens with reliable information on COVID-19. The COVID-19 Crisis Management Center developed the app COVID NP to disseminate official information and grasp health status.

Bangladesh: The government released the Corona Tracer BD app to trace and identify close contacts through Bluetooth. The app also provides information on the COVID-19 symptoms, health and testing facilities nearby, official information on COVID-19, and guidelines for those with associated symptoms. As of July 2021, the app is only available on Android and has been downloaded more than 500,000 times (0.3% of the population).

Kenya: The country has not developed a contact tracing app. However, the government utilizes mobile phone data by mobile carriers to trace close contact with an infected person.

Egypt: The Ministry of Health authorized the app 100 Million Health (seha), which aims to raise people's awareness, provide information on prevention measures and responses when symptomatic, and show hospitals that treat infected persons. It is not capable of contact tracing. As of March 2021, it was downloaded more than one million times.

Uganda: The National Information Technology Authority and a mobile carrier MTN Uganda developed the Electronic Pass app to monitor infected people's movement. Furthermore, a private company developed the app COVID Tracer, which uses GPS and Bluetooth to identify a close contact and their location and notifies the Ministry of Health. Logistic drivers crossing the national borders were required to take several tests, which caused severe traffic congestion. In this context, the Regional Electronic Cargo and Driver Tracking System (RECDTS) app was developed to issue an electronic test result certificate. The app prevented drivers from taking several tests in one travel, therefore mitigating traffic congestion.

Cote d'Ivoire: No app is confirmed.

Table 2.3.11 Smartphone Applications for Containing COVID-19 Expansion

Country	Name	Overview	No. of Downloads (proportion to the population)
Indonesia	Pedulilindungi	Record location data and trace the contacts if an infected person is found.	Android: 5 million+ (2%) Available for Apple as well
	Bersatu Lawan Covid-19	Understand areas where an infected case is found.	n.a.
	DokterSafe	Provide information for health workers and doctors. Self-diagnose the symptom.	1,000+
Myanmar	Saw Saw Shar	Report health status and check the location of isolation facilities.	Android: 100,000+ (0.2%)
Nepal	Hamro Swasthya	Disseminate information by the government. Will be utilized for other health-related matters in the future.	n.a.
	COVID NP	Obtain reliable information from the government and check health status.	n.a.
Bangladesh	Corona Tracer BD	Identify the history of contact with infected persons through Bluetooth. Provide information on COVID-19 and health and testing facilities nearby.	500,000 (0.3%)

Country	Name	Overview	No. of Downloads (proportion to the population)
Kenya	mSafari	Provide operation information for public transport users and passenger data for operators. Send an alert if there was an infected person in the same vehicle based on the registered boarding data.	n.a.
Uganda	Call The Clinic	Provide the latest infection status and information on COVID-19 issued by the government. Report the existence of symptomatic persons.	n.a.
Cote d'Ivoire	—	—	—
Egypt	Egypt Health (100 million health)	Report health status, issue an alert when approaching high-risk areas, and provide information.	Android: 1 million (1%) Available for Apple as well

Source: JICA Study Team

2.3.7 Infection Prevention Measures and Infection Status in Characteristic Cities

Based on the infection status, stay-at-home requirements, and inter-city travel restrictions, three cities are selected as characteristic cities and surveyed infection prevention measures taken in these cities by December 2020.

Table 2.3.12 Characteristic Cities and Reasons for Selection

Category	City	Characteristics and reason for selection
Group 1	1-2-1 Lima	Lima imposed a stay-at-home order in the very early stage of the pandemic and issued nighttime and weekend curfew. Despite these efforts, the cumulative number of positive cases by the end of 2020 was high at 3,064.72 per 100,000 population. The CUREIP Team explored the background of this extensive virus spread compared to other cities where the timing and intensity of the measures are similar.
	1-2-2 Singapore	The timing when Singapore issued the "circuit breaker" was relatively late and likely impelled the cumulative number of positive cases at the end of 2020 at 1,025.83 (per population of 100,000). On the other hand, the significant spread of COVID-19 occurred only in April and August, and new positive cases have been very few since October. On 28 December 2020, Singapore lifted major restrictions as long as safety management measures are taken. The Study Team examined its policies that resulted in the success in curbing the infection.
Group 4	4 Taipei	Although Taipei has not imposed any travel restrictions, the cumulative number of positive cases at the end of 2020 was very low at 3.04 per population of 100,000. Taipei is regarded as one of the countries to succeed in containing the pandemic, even though it did not interrupt most urban activities. The CUREIP Team examined the measures in the city.

Source: JICA Study Team

1) Lima

(1) Infection Prevention Measures

Lima took the following infection prevention measures.

Stay-at-home Requirements

State of emergency: As of 15 March 2020, the cumulative number of positive cases was 71 in the whole country (of which 68 were found in Lima). On the same day, the president announced the city in a state of emergency from 16 to 30 March 2020. The regulations are as follows:

- People’s international travel was banned beginning 16 March 2020. Per the requests by some foreign countries, such as the U.S. and Japan, flights were permitted to/from airbases for foreigners wishing to return to their home countries.
- Traffic volume in the city was restrained to 50% of normal.
- Inter-city transport was prohibited.
- Freedom of safety, housing, gathering, and domestic travel guaranteed by the constitution was halted except for only essential activities:
 - purchase, production, and provision of necessary items and medical supplies;
 - urgent needs like visiting hospitals;
 - return to homes;
 - care and protection for those in need, such as the elderly, children, and the challenged;
 - financial, health, and pension services;
 - production, stock management, transport, provision, and sale of fuels;
 - telecommunication media and call centers;
 - necessary trips to hotels for quarantine and isolation;
 - public and production sectors must implement this state of emergency; and
 - travel by vehicle is necessary for essential sectors and activities.

During the state of emergency, the national police and army were authorized to intervene persons, objects, vehicles, lands, and facilities, and stop inappropriate services and activities. More than 36,000 people were arrested by 30 March.

Nighttime curfew: Travel between 8 p.m. and 5 a.m. is prohibited since 18 March 2020. The nighttime curfew was issued continuously (Table 2.3.13).

Table 2.3.13 Change in Nighttime Curfew Time

Period	Time of curfew
March 18–March 30	22:00–05:00 (7 hours)
March 31–April 12	18:00–05:00 (11 hours)
April 13–May 10	18:00–04:00 (10 hours)
May 11–May 23	20:00–04:00 (8 hours)
May 24–June 30	21:00–04:00 (7 hours)
July 1–September 20	22:00–04:00 (6 hours)
September 21–November 30	23:00–04:00 (5 hours)
December 1–21	00:00–04:00 (4 hours)
December 22–	23:00–04:00 (5 hours)

Source: JICA Study Team based on the website of Embassy of Japan in Peru

Travel restriction by gender: As of 2 April 2020, the number of positive cases and people under intensive care was 1,414 and 51, respectively. Since the domestic intensive care system can accommodate only 500 patients at this time, the number of patients needing intensive

care supposedly exceeds this capacity. In this regard, the government started travel restrictions by gender beginning 3 April 2020, where males are allowed to go out only for essential purposes on Mondays, Wednesdays, and Fridays, while females only on Tuesdays, Thursdays, and Saturdays. The government also ordered all people outside to wear face masks. This restriction by gender was removed on 12 April.

Travel restrictions during Easter: During the Easter holiday (Semana Santa) on 9 and 10 April 2020, any travel was prohibited, including essential travel.

Travel restriction by the number of people: Since 13 April 2020, only one person per household has been allowed to go outside. On Sundays, any travel except for permitted labor and hospital trips was prohibited. The travel restriction was lifted on 1 July 2020 but reimposed on 13 August 2020 and removed again on 20 September 2020.

Travel permitted for children: Considering the mental health of kids, children under 14 are allowed to go outside with one accompanying adult. However, this is restricted within 500 meters from their house and for 30 minutes per day. The time limit was removed on 14 November 2020.

Travel restrictions for the elderly: The government defined people aged over 65 with comorbidity as a high-risk group because their conditions might be exacerbated when infected with COVID-19. Since 11 May 2020, the government has prohibited them from traveling outside except for essential needs when they cannot be assisted by others. By 4 October 2020, they are allowed to go outside within 500 meters for 60 minutes per day with one accompanying caregiver. All restrictions imposed was lifted on 30 November.

Restrictions on Intra-city Travel and Use of Public Transport

Ban on use of private vehicles: On 19 March 2020, the government announced the ban on the use of private vehicles and obliged people to use public transport including taxis when going outside. On 11 May 2020, people were allowed to use private vehicles as long as they reported to the Ministry of Interior in advance. While this restriction was removed on 14 November 2020, it was applied on 24, 25, and 31 December 2020.

Restrictions on Public Transport: From 11 May 2020, the government has required all public transport operators to thoroughly clean their fleets and facilities and reduce the number of passengers in vehicles and stations to half their capacity.

Medical Measures

Securing the beds: As of 2 April 2020, the number of patients under intensive care was 51, while the capacity of intensive care in the country was only 500. To increase the capacity, on 22 May 2020, the President decided to increase the number of normal beds from 10,000 to 20,000 and intensive care unit (ICU) beds from 1,000 to 2,000.

(2) Movement to Resume Economic Activities

Relaxation of activity restrictions: The following activities were allowed since 25 May 2020.

- Online shopping for clothes, shoes, office, and school supplies
- Non-urgent dental and animal clinic
- Information services

- Barbers
- Dry cleaning
- Repair services
- Delivery services using a smartphone app
- Professional soccer league matches without audiences

On 22 June 2020, shopping centers, streets, and large stores were allowed to open. However, several conditions were imposed, such as the number of customers (up to 50% of capacity), only delivery and take-away in food courts, prohibition of entry of underage, closure of cinemas and entertainment facilities, and mandatory mask-wearing. On 22 December 2020, they are allowed to accept customers only up to 40% of the capacity.

On 1 October 2020, outdoor sports activities for no more than two people are allowed, and since 23 October, the beach has been opened from Monday to Thursday. Moreover, from 2 November 2020, religious facilities were allowed to resume as long as the number of people inside is less than one-third of the capacity.

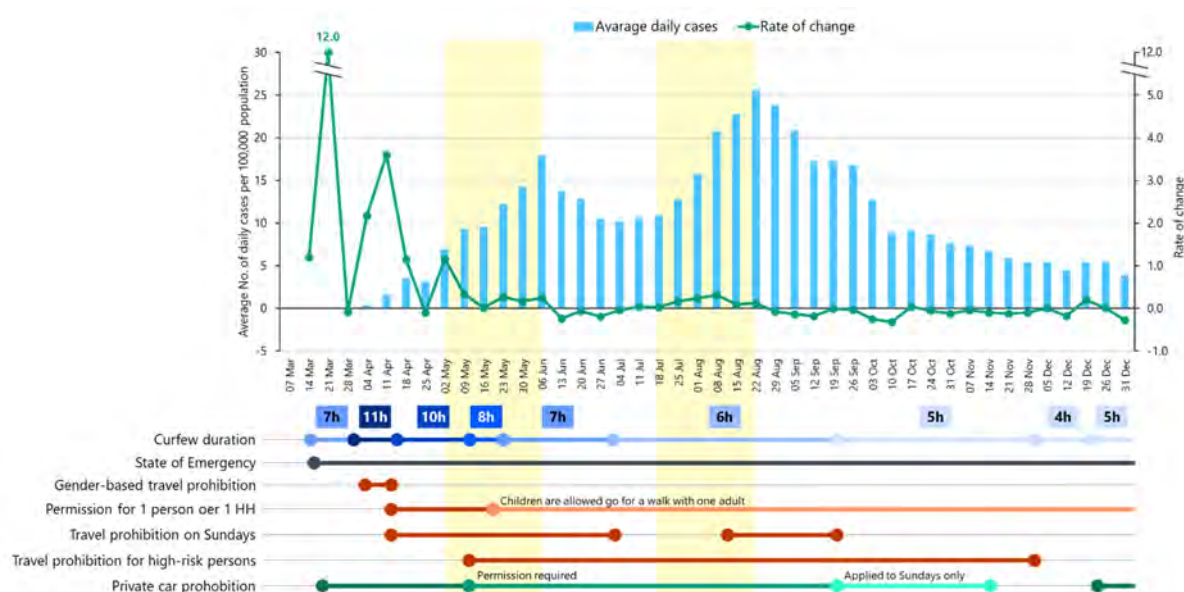
(3) Other Infection Prevention Measures

Smartphone app: On 3 April 2020, the president announced that the Ministry of Health introduced an app, "Peru en tus manos," with which users can self-diagnose their symptoms.

Clusters: On 29 April 2020, the president said that markets are considered a hotbed of infection; a random test for market merchants in Lima identified 163 positive cases out of 842. On 8 May, the president reported that the virus is especially spread in markets, banks, and bus stops.

(4) Relationship between Infection Prevention Measures and Infection Status

Figure 2.3.5 shows the 7-day-average daily positive cases per 100,000 population and its rate of change and major preventive measures against COVID-19. Despite an early issue of the state of emergency, Lima experienced an extensive virus expansion.



Note: the infection data of Peru as a whole is shown.

Source: JICA Study Team based on WHO data

Figure 2.3.5 Timeline of the Number of Positive Cases and COVID-19 Measures in Peru

The possible reasons for this could be the following:⁷

- Necessity of frequent purchase of food: On 29 April 2020, markets are identified as one of the hotbeds of virus expansion. However, many people cannot afford to store food in their houses. Only 49% of all households in Peru (or 61% in urban areas) have a refrigerator, forcing those without food storage capacity to buy food frequently and creating congestion in markets.
- People flood to banks to receive benefits: In April 2020, the government announced financial aid for low-income people. However, those without bank accounts had to go to banks to receive the money. Since only 38% of all adults in the country had bank accounts, many went to and crowded the banks. In the press conference on 8 May 2020, the president referred to banks as one of the most high-risk of spreading the disease.
- Ignorance of stay-at-home requirements: The state of emergency issued on 19 March 2020 had a legal force to penalize the offenders. However, as of 30 March 2020, more than 36,000 people were arrested for breaking the rule. While the government took strong measures in the early stage of the pandemic, people's weak compliance could be one of the causes of the spread of the disease.
- Restrictions on the use of private vehicles: On 19 March 2020, the government also banned the use of privately-owned vehicles. While non-essential travel was restricted at the time, it might be true that this made people use public transport for essential errands and induced congestion. The president announced on 8 May 2020 that bus stops are one of the hotbeds of virus expansion and ordered cleaning and capacity limitations on 11 May 2020. As the country was already faced with the first wave at that time, this might be a cause of the unstoppable infection expansion.

2) Singapore

(1) Infection Prevention Measures

Infection prevention measures in Singapore include (i) border control measures, (ii) stay-at-home measures (circuit breaker), (iii) prevention measures at dormitories, and so on.

Border Control Measures

Table 2.3.14 summarizes the border control measures in Singapore. Singapore issued a stay-home notice (SHN) for immigrants from high-risk countries in February 2020 and for all immigrants from 20 March 2020. During the SHN period, people are prohibited from leaving home, including purchasing food and daily necessities. SHN was originally conducted in houses or hotels, but since 10 April 2020, people under SHN were required to stay at designated isolation facilities. SHN is stipulated by the Infectious Diseases Act, and violators were subject to a fine of up to \$10,000 or imprisonment for up to six months, or both. The authority monitored people under SHN through a smartphone app, phone calls, and home visits.

On the other hand, business trips between Malaysia were allowed for a limited number of people and periods through the Reciprocal Green Lane and Periodic Commuting

⁷ Reference: CNN. Peru seemed to do everything right. So how did it become a Covid-19 hotspot? (<https://edition.cnn.com/2020/05/25/americas/peru-covid-hotspot-why-intl/index.html>)

Arrangement.

Since 23 August, border control has been flexibly mitigated or reinforced according to the infection status in each country.

Table 2.3.14 Border Control Measures against COVID-19 in Singapore

Date	Target country/region	Measures
1/23	Hubei Province, China	Travel to Hubei Province was prohibited. Immigrants from Hubei Province are required to keep in contact with the authority and monitor their health status for two weeks after immigration.
2/2	China	People who stayed in China in the past 14 days are prohibited from new immigration or transit. Those who had already entered the country were recommended to take 14-day leave and mandated to monitor their health status.
2/23	Korea	The monitoring of immigrants was strengthened on this day.
3/16	China, Iran, Italy, Spain, Germany, Korea, France, Japan, ASEAN countries, UK	People staying in these countries for the past 14 days are required to stay home. Short-period immigrants from ASEAN countries are required to get approval from the Ministry of Health in advance. Foreign housework assistants are required to get approval from the Ministry of Manpower in advance. Employers are mandated to apply for immigration approvals, arrange appropriate facilities during the SHN period, and report them to the Ministry of Manpower.
3/21	Global	All immigrants to Singapore must undergo the SHN for 14 days.
3/24	Global	Short-time residents are prohibited from immigration or transit.
3/24	Malaysia	Malaysian people with work permits in Singapore are allowed to continue working in the country as long as appropriate accommodations are assigned. This promoted logistics between the two countries.
3/25	UK	All immigrants are required to go through the SHN for 14 days. In compliance with the Infectious Diseases Act, all offenders are penalized by fines up to SGD10,000 or imprisonment up to six months or both. SHN monitoring was strengthened through a smartphone app, phone calls, and home visits.
4/10	Global	All people entering Singapore must conduct SHN at designated facilities for 14 days.
6/18	Global	All people entering Singapore must take a test before the SHN is finished. The immigrants themselves must cover the costs of SHN and tests.
7/20	Japan, Hong Kong, Australia (Victoria)	People staying in these countries for the past 14 days are required to conduct SHN at the designated facilities.
7/26	Malaysia	To promote official, business, and labor travel, Singapore and Malaysia agreed to the Reciprocal Green Lane (short-term stay allowed for 400 people per week) and the Periodic Commuting Arrangement (long-term residents allowed longer than three months for 2,000 people per day). These protocols started on 17 August 2020.
8/23	Brunei, New Zealand (NZ)	Travel to Brunei and NZ for study purposes longer than one year is allowed. Immigrants from Brunei and NZ are exempted from SHN as long as they take a test.
8/23	Australia (except for Victoria), Macau, Mainland China, Taiwan, Viet Nam, Malaysia	SHN of immigrants is shortened to seven days if a monitoring app (Homer) or electronic monitoring device is installed.
9/17	India	All immigrants from India are required to take a PCR test within 72 hours before departure.
9/24	Global	Official and business trips from Singapore are allowed if the travelers comply with an itinerary registered in advance and take an immigration test (if negative, exempted from SHN).

Date	Target country/region	Measures
10/15	Malaysia (Sabah)	People staying in the state for the past 14 days must undergo the SHN.
10/20	Indonesia, Philippines	Immigrants are required to show a negative certificate on arrival.
10/20	Brunei, NZ, Australia (except for Victoria), Viet Nam	Travelers are exempt from SHN by showing a negative test certificate on arrival. For immigrants from other low-risk countries, the SHN period was shortened to seven days.
11/4	Estonia, Fiji, Finland, Japan, Norway, Korea, Sri Lanka, Thailand, Turkey	SHN is allowed at home.
11/23	Malaysia, Japan	People staying in these countries for the past 14 days are required to conduct SHN at designated facilities.

Source: JICA Study Team based on the Embassy of Japan in Singapore

Stay-at-home Requirements, Facilities Closure, Gathering Restrictions

Request for restraint in non-essential travels and working from home: On 7 February 2020, as the cumulative number of positive cases reached 33, the Ministry of Health raised the Disease Outbreak Response System Condition (DORSCON) to orange. On 11 March 2020, the elderly was requested to refrain from conducting activities and leaving home for non-essential purposes, and on 27 March 2020, the government recommended working from home and teleconferencing.

Temporary facility closure and gathering restrictions: The following measures were taken on 27 March 2020.

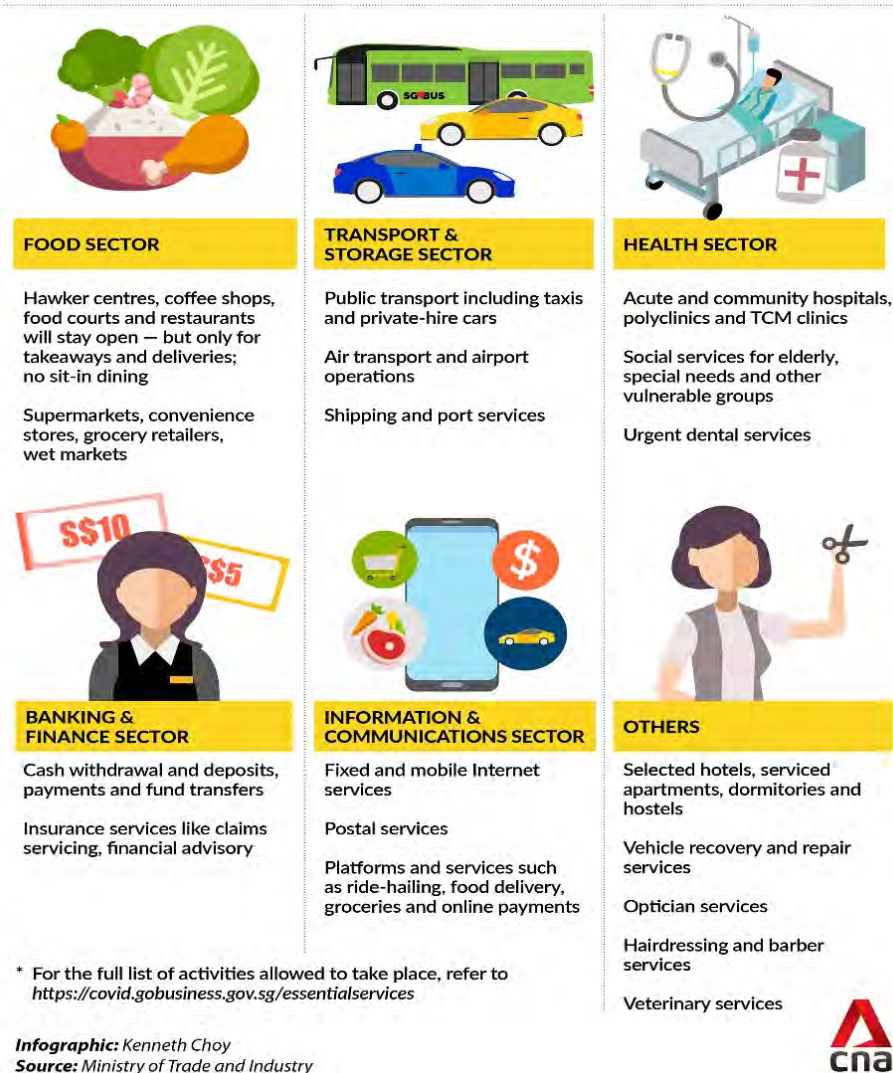
- More than 10 people should not gather except in schools and workplaces, and people must maintain a one-meter distance apart for non-temporal contact.
- Entertainment facilities, such as bars, nightclubs, discos, cinemas, theaters, and karaoke shops, are closed.
- Public facilities where non-temporal contact is not expected, such as retail malls and museums, are allowed to continue operations if the following conditions are kept.
 - Limit entry, so the number of people inside an establishment is one per 16m².
 - Prohibit entry of more than ten people and tours in museums and sales events in open atriums.
 - Distribute the people inside so they can keep a distance of more than one meter from one another. Introducing a reservation system or service digitalization (online exhibition, etc.) is recommended.
 - In restaurants, chairs and tables must be arranged so customers can keep a distance of more than one meter. While family members or couples can sit at one table, the tables should be placed away from each other. A group should be less than ten people. If the tables or chairs are fixed onto the floor, the customers must maintain distance between seats.
- Prohibit operation of cram schools and lessons.
- Religious activities, events, and gatherings with more than ten people are prohibited. Temples, mosques, and churches are allowed to open unless there are more than ten people at a time.

Circuit Breaker: Positive cases continued to increase, and the cumulative cases reached 1,049 on 3 April 2020. By 7 April 2020, the Government of Singapore started restrictive measures

called circuit breaker. The measures as of the date of issue are as follows:

- Restaurants are allowed to open for takeaway or delivery services only. Some companies in the food, trade, and other essential services are allowed to continue operations.
- Essential service providers such as supermarkets, pharmacies, restaurants, health care, welfare, finance services, barbers, and elevator maintenance services are allowed to continue operation. Other retail stores are ordered to be closed.
- Work from home is required if available. Companies, where work from home is not feasible, are forbidden from operating, except for essential service providers (see Figure 2.3.6) and companies that constitute domestic or global supply chains.
- School and university education are conducted online.
- Theme parks, museums, casinos, public swimming pools, golf courses, gyms, fitness studios, sports facilities, and religious facilities are closed.

COVID-19: ESSENTIAL SERVICES STILL AVAILABLE FROM APR 7



Source: Channel News Asia

Figure 2.3.6 Essential Services Allowed To Operate during the Circuit Breaker

During the circuit breaker, those who left home for unpermitted purposes or ignored safe distance are penalized. Originally, enforcers issued a warning for first violators and collected

fines from repeaters. As of 11 April 2020, more than 6,200 received warnings, and 90 were collected with fines. Based on this situation, the penalty has since been reinforced with a SGD300 fine for first-time offenders and SGD1,000 for repeaters. In malicious cases, they were prosecuted.

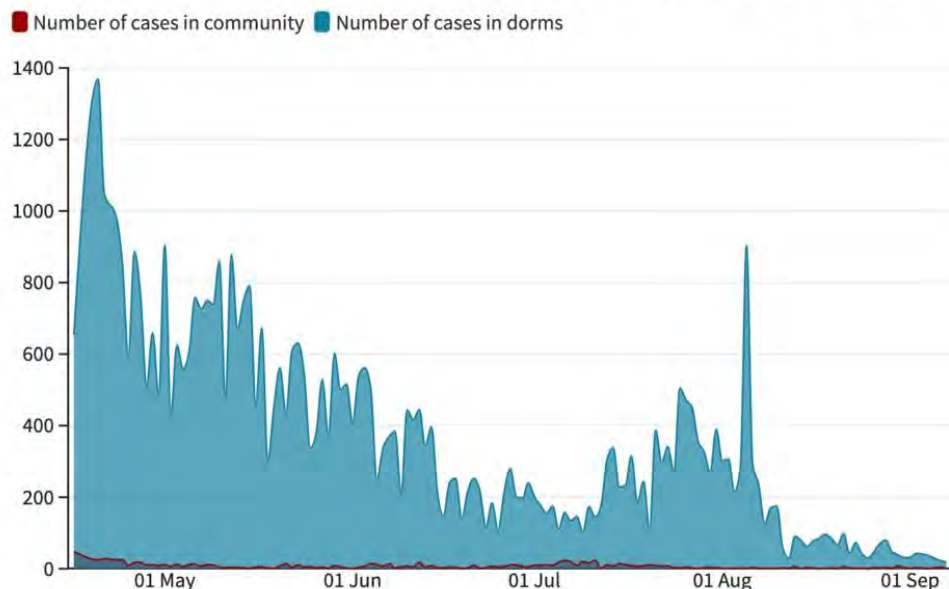
As of 14 April 2020, the number of people going outside had decreased by 30–40% on weekdays and 20–30% on weekends. However, the government further restricted business operations and reduced the number of commuters allowed from 20% to 15% of all employees. Moreover, the government required companies to record the entry and exit of their employees, and the fine for an offense is more than SGD1,000. Any office found with a cluster shall be closed. While the markets are allowed to continue operations, entry restrictions were imposed on four busy fresh food markets according to the National Registration Identity Card number.

The circuit breaker was terminated on 1 June 2020, and social activities gradually resumed in three phases.

Infection Prevention Measures in Dormitories

As shown in Figure 2.3.7, most positive cases in Singapore are in dormitories that accommodate migrant workers. Therefore, the government prioritizes infection prevention measures in these facilities.

Reported cases of coronavirus in community and dorms



Source: Singapore government, data to 7 Sep

BBC

Note: The graph shows 2020 data.

Source: BBC

Figure 2.3.7 Number of Community Infection Cases and Positive Cases Found in Dormitories



Source: todayonline.com

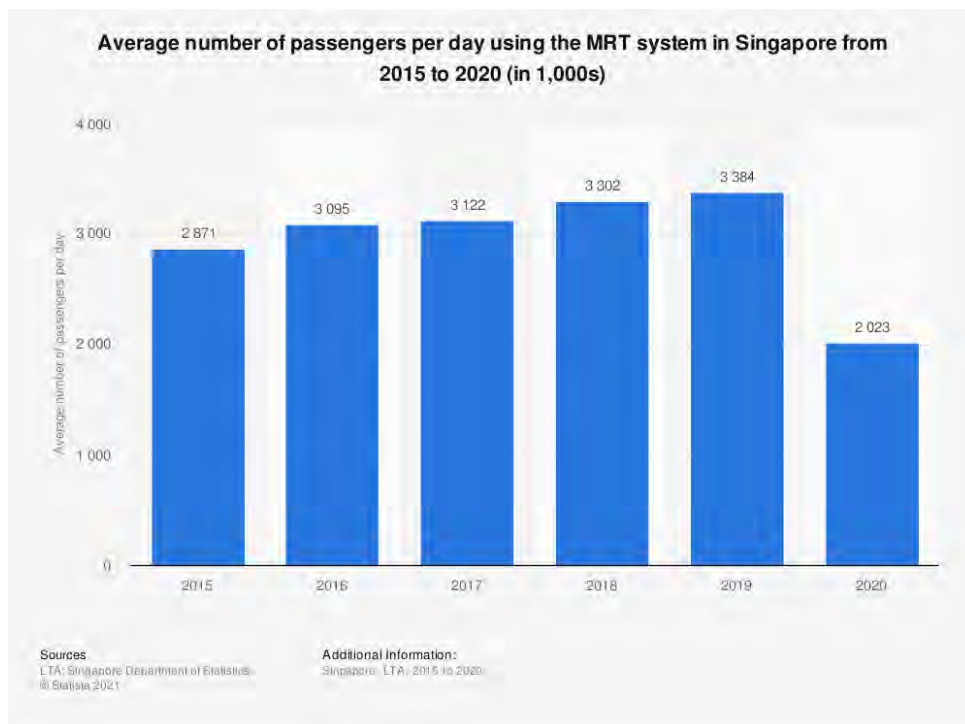
Figure 2.3.8 Dormitories in Singapore

As of 21 April 2020, the government conducted intensive testing in the dormitories, which caused a spike in the number of positive cases found since the middle of April. The authority relocated healthy workers engaged in essential services and prohibited all workers from entering any dormitories. At the same time, the government dispatched medical assistance teams to dormitories to monitor their health status and meet their daily needs.

Although the circuit breaker was terminated on 1 June 2020, the government continued massive testing for dormitory workers until 11 August 2020. Afterwards, the government took the following measures: (i) periodical self-check of health status, (ii) monitoring of symptomatic workers, (iii) monitoring of virus in wastewater, and (iv) periodical testing every 14 days. The workers are allowed to go outside since the beginning of 2021 as long as they use a contact tracing device (explained later) and comply with the safety protocols.

Public Transport Restrictions

Reduced frequency during the circuit breaker: On 14 April 2020, the Land Transport Authority announced a reduction of MRT frequency and suspension of some bus services running in CBD and recreation areas to ensure the profitability of the public transport service. This is because the number of passengers had been reduced by 71 percent and 75 percent for buses and MRT, respectively. Interval of the MRT line operations was increased from three to five minutes during rush hours and from five to ten minutes during off-peak hours. The feeder lines also reduced operating hours. Earlier in May, profits from public transport services were reduced by 80 percent. After the termination of the circuit breaker on 1 June 2020, the operation has gradually come to normal. The daily MRT ridership reduced from 3.4 million in 2019 to 2 million in 2020 (Figure 2.3.9).



Source: Statista

Figure 2.3.9 Change in the Daily Ridership of MRT in Singapore

Infection prevention measures on vehicles: The Land Transport Authority requested passengers to (i) wear a face mask at all times, (ii) conduct hygiene behavior, such as washing hands, and (iii) use check-in and contact tracing systems such as SafeEntry and TraceTogether. Wearing a mask is mandatory when using public transport, and offenders were subject to fines.

Medical and Isolation Set-up

On 24 March 2020, the government started operating an isolation facility, converted from a resort, accommodating 500 people. The isolation facility served positive patients not requiring hospitalization.

On 27 April 2020, the Ministry of Health announced the following medical measures:

- **Infected patients with no or light symptoms** are observed in community care facilities (CCF) and would be transferred to hospitals if necessary. As of 27 April 2020, the CCF was established at Singapore Expo, accommodating 10,000 people, but the government planned to double the capacity by June. Patients who do not recover within 14 days after the onset of symptoms would be transferred to the Community Recovery Facility (CRF) prepared in an army camp.
- **Patients with symptoms but no medical problems** must self-quarantine at home. Patients that meet the criteria should take a test and stay home or at designated hotels (called Swab Isolation Facilities [SIF]) until the confirmation of results. Patients needing medical care are transferred to hospitals.
- To optimize the medical capacity, the public hospitals dealing with COVID-19 patients postponed non-urgent operations. Private hospitals also accepted patients with relatively light symptoms.

- To increase the medical staff, medical facilities accepted approximately 3,000 volunteer medical qualifiers or retired medical staff. Furthermore, people whose jobs were affected by the pandemic are also engaged in medical facilities. For example, the flight attendants of Singapore Airlines assisted patients under the instruction of nurses (Figure 2.3.10). To reduce the burden on the medical staff, 24-hour remote medical services, pulse oximeters, and smartphone apps were utilized to monitor the health status of patients.



Source: The Straits Times

Figure 2.3.10 Care Ambassador Activities by the Singapore Airlines Flight Attendants

Other Infection Prevention Measures

Mask wearing: After issuing the circuit breaker, the government distributed reusable masks at community centers, community clubs, and residents' committee centers. On 12 April 2020, the National Environment Agency ordered everyone to wear face masks in public markets and permitted supermarkets, convenience stores, and pharmacies to refuse entry to those without masks. On 14 April 2020, people going outside were required to wear face masks, and offenders were subject to fines.

(2) Movement to Resume Economic Activities

Although the circuit breaker forced many business operators to work from home or stop operations, some offices were gradually allowed to resume their activities (traditional Chinese medicine stores beginning 5 May 2020 and food processing and cooking, laundry, barber, and pet supplies from 12 May 2020). On 19 May 2020, schools were allowed to conduct face-to-face classes in small groups and accept students in their graduation year.

The government announced on 20 May a three-phase approach to resume economic activities after lifting the circuit breaker on 1 June 2020 (Figure 2.3.11).



Source: REACH from website: <https://www.reach.gov.sg/>

Figure 2.3.11 Three-phase Approach for Resumption of Economic Activities

Phase 1: Low-risk economic activities are resumed. Essential travels are allowed, but face masks should still be worn. Industries and workplaces are open in parallel with work from home. Offices are required to submit employee information to the authority. Non-essential retail, individual services, and eating inside restaurants are not allowed. Gatherings, such as wedding parties, funerals, and religious activities, are limited to a small group of people. Pre-schools are fully open by 10 June 2020, and primary, secondary, and higher schools can conduct hybrid classes (face-to-face and online classes).

Phase 2: Supposing the spread of COVID-19 slows down in Phase 1, the shift to Phase 2 was planned when the situation became better. Phase 2 was started on 19 June. More companies and businesses were allowed to reopen, including restaurants (alcohol cannot be served after 22:30) and sports gyms. Potentially crowded establishments, such as shopping malls, must control the number of entries. Sports facilities, performances, beaches, and visits to elderly facilities are also allowed. On 29 August 2020, two congested shopping malls started an entry restriction according to the National Registration Identity Card number. By 11 September 2020, the authority suspended the operations of approximately 20 restaurants that disobeyed the safety management measures, such as offering alcoholic beverages after 22:30 and not wearing a mask.

Social activity restrictions were even more relaxed during Phase 2. On 24 September 2020,

meetings allowed a maximum of 50 people, the capacity of religious activities and wedding parties was increased from 50 to 100, and cinemas allowed 50% of their capacity. In October, an antigen test was conducted as a pilot implementation for participants in a large-scale event.

Phase 3: The criteria to shift to Phase 3 were (i) compliance with the safety management measures, (ii) ensuring testing capacity to early detect infected cases and take appropriate public health measures, and (iii) wide use of TraceTogether (contact tracing system). As these criteria were satisfied, Phase 3 started on 28 December 2020. During Phase 3, gatherings of no more than eight people and entry to large shopping malls not exceeding 65% of their capacity or 1 person per 8m² are allowed. Services that induce congestion, such as spas, cinemas, theaters, and nightclubs, are also permitted as long as they comply with the safety management measures. The maximum number of participants in an event is also allowed as long as they can be divided into 50-people groups. Video and photo recordings might be required to check compliance with the rules.

(3) Use of Information and Communication Technology

The government conducted contact tracing through a smartphone app and provided devices and learning modules to the elderly not familiar with digital technology.

SafeEntry: The government introduced SafeEntry on 23 April 2020. The system allows people visiting workplaces or public facilities to register information, such as name, ID number, and mobile number, by scanning the QR code or swiping the ID card. On 12 May 2020, the government ordered all companies and services with operation permission to record the entries to and exits from the facility by SafeEntry.



Source: The Straits Times

Figure 2.3.12 SafeEntry

TraceTogether: TraceTogether is a Bluetooth-based contact tracing app that the government launched on 20 March 2020. The app notifies users if the SafeEntry system revealed they were in the same facility at the same time with an infected person. Furthermore, the government started distributing to those without smartphones a device called TT Token with similar functions as the app to expand the coverage of the system. One of the criteria for the shift to Phase 3 on 28 December was that more than 65 percent of people were using the

TraceTogether system. Since the beginning of 2021, migrant workers in the dormitories have been allowed to go out if they use the TT token.



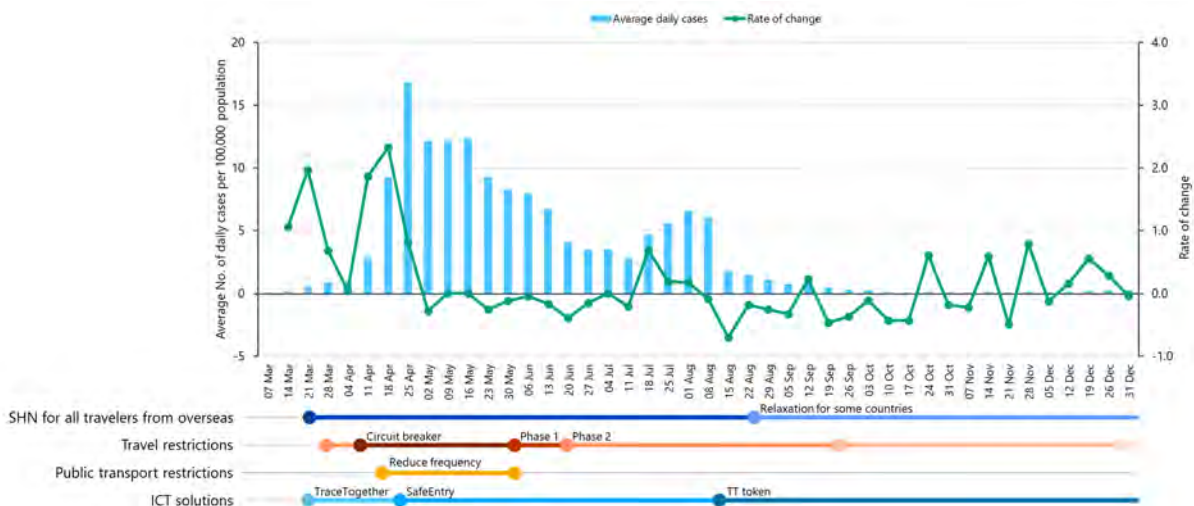
Source: The Straits Times

Figure 2.3.13 TT Token (left) and TraceTogether App (right)

Digital Pods, Virtual Digital Clinic, Together with Me: The Information Media Development Authority launched these programs to educate the elderly about how to use digital technology in their daily lives.

(4) Relationship between Infection Prevention Measures and Infection Status

Figure 2.3.14 shows the 7-day-average daily positive cases per 100,000 population and its rate of change and major prevention measures against COVID-19.



Notes: SHN: stay-home notice, ICT: information and communication technology

Source JICA Study Team based on WHO

Figure 2.3.14 Timeline of the Number of Positive Cases and COVID-19 Measures in Singapore

Many infected cases were found from April to June, partly due to the intensive test for migrant workers in dormitories where a large-scale cluster was detected. As Figure 2.3.7

shows, most of the infected patients were migrant workers, and there were few community infection cases during this period. Furthermore, Singapore did not experience an outstanding re-increase in the number of positive cases until September 2021. Therefore, despite the delay in the initial response and recurrence of the virus spread in September 2021, Singapore is said to be one of the countries that successfully contained the pandemic to some extent. The possible reasons for this are (i) strict social restrictions by the circuit breaker, (ii) isolation and intensive testing in dormitories, and (iii) wide use of the contact tracing system through smartphone apps and special devices. As disobeying these measures may result in a penalty, this might have effectively affected people's behavior.

3) Taipei

(1) Infection Prevention Measures

While Taipei has not imposed any strict stay-at-home requirements, unlike Lima or Singapore, it has succeeded in containing the pandemic due to the border control measures.

Border Control Measures

Table 2.3.15 summarizes the border control measures in Taiwan. One of the possible reasons for the containment of the pandemic in Taiwan is the early travel restrictions from/to China despite the strong economic relationship with the country and the strict quarantine system. Taiwan reinforced a quarantine against travelers from Wuhan on 31 December 2019, when an unknown pneumonia case was found in the city. At the end of January 2020, the government requested people not to travel to Wuhan, Hubei province, and mainland China. On 6 February 2020, Taiwan refused the immigration of foreigners and imposed citizens of Taiwan, Hong Kong, and Macau in mainland China, Hong Kong, or Macau a 14-day home quarantine. On 19 March 2020, all people except for Taiwanese were not allowed to enter the country.

The head of *Li* (the minimum administrative division in Taiwan) monitored the health status of those under the home quarantine. People under the home quarantine received a subsidy of TWD1,000 per day, but offenders were penalized (such as a fine of TWD100,000–1 million, mandatory isolation in a designated facility, suspension of subsidy payment, etc.)

Table 2.3.15 Border Control Measures against COVID-19 in Taiwan

Date	Target country/region	Measures
12/31	Wuhan City	The authority reinforced a quarantine for those from Wuhan, as an unknown pneumonia case was reported there.
1/20	Wuhan City	The government raised the infectious diseases risk level of Wuhan to "warning." It discouraged people from visiting there for non-essential purposes and encouraged people from Wuhan to call the infection prevention line and see a doctor if they have symptoms within 14 days after arrival.
1/25	Hubei Province	The area with "warning" infectious diseases risk level was extended.
1/28	Mainland China	The area with "warning" infectious diseases risk level was extended.
2/6	—	People that are a nationality of Taiwan, Hong Kong, and Macau and people with a resident certificate in Taiwan are required to do a 14-day home quarantine if they have visited mainland China, Hong Kong, or Macau. Other foreigners, including mainland Chinese, are prohibited entry.
2/10	Mainland China, Hong Kong, Macau	All people arriving in Taiwan via mainland China, Hong Kong, and Macau are required to do a 14-day home quarantine. Passenger

Date	Target country/region	Measures
		flights from/to mainland China except for Beijing, Shanghai, Xiamen, and Chengdu are suspended.
2/22	Thailand, Italy, Iran, Singapore, Japan	All immigrants from these countries must do a 14-day home quarantine.
3/14	27 countries in Europe and Dubai	All immigrants from these countries/regions must do a 14-day home quarantine.
3/17	—	Foreign immigrants without a place to stay in Taiwan are allowed to stay at a quarantine facility at their own expense.
3/19	—	All non-Taiwanese are not allowed to enter Taiwan except those with a special permit.
3/24	—	Transit in Taiwan is banned.
4/1	—	Penalties for home-quarantine offenders are strengthened. The first violation may result in a fine of NTD100,000 to NTD1 million and mandatory isolation at an isolation facility at their expense.
4/5	—	Those subject to home quarantine are requested to continue managing their health status for the subsequent seven days.
6/17	—	Short-term residents for business purposes from low-risk countries are allowed to shorten the quarantine period.
6/29	—	Immigrants are allowed to enter Taiwan as long as they receive a permit from an overseas diplomatic establishment. A PCR test negative certificate within three days before the flight departure and 14-day home quarantine are required.

Source: JICA Study Team based on Japan-Taiwan Exchange Association

Stay-at-home Requirements, Facilities Closure

While the Taiwan government imposed a strict border control measure, it did not issue a stay-at-home requirement, unlike Lima or Singapore. The related measures that the government took as of December 2020 were social distancing, mask-wearing, and temporary school closure.

The government announced on 2 February 2021 that the first day of school would be postponed for two weeks until after the Chinese New Year holidays (11 February 2020) and that parents with children under 12 are allowed to take leaves to take care of their children. The schools were resumed on 25 February 2020 with the necessary equipment, such as masks, hand sanitizer, and body thermometers.

On 1 April, the Central Epidemic Command Center (CECC) under the Ministry of Health and Welfare announced the social distancing measures for COVID-19. This announcement showed the models of social distancing in each establishment (e.g., restaurants, public facilities, offices, and commercial facilities) and requested people to maintain social distancing in the two phases according to the infection status.

- Phase 1: The CECC recommends that people should avoid activities with close contacts, such as exhibitions, sports games, concerts, and entry to entertainment facilities. Distance should be kept at 1.5 m inside and 1 m outside. In congested and closed areas, mask-wearing is recommended. If frequent close contact is inevitable and maintaining 1.5 m distancing is difficult, the managers are encouraged to suspend their operation.
- Phase 2: No unnecessary activities, especially entertainment-related, are not allowed. During necessary activities, distance should be maintained at 1.5 m inside and 1 m outside. Even when a mask is worn, a social distance of more than 1 m is recommended.

According to the CECC, Taiwan is in Phase 1 at the time of the issue of the social distancing

measures. The center had not announced a transition to Phase 2 as of December 2020.

On 4 April 2020, as tourist attractions are congested during the Taiwanese holidays (Qingming Festival), the government requested people to keep social distancing, wear a mask, do hygiene behaviors, and refrain from visiting those spots if crowded.

On 1 December 2020, the government announced that the mask-wearing would be more strictly monitored in public spaces (public transport, stores, medical, entertainment, and religious activities), considering the virus spread in Taiwan and the world. By May 2021, a fine would be imposed on people outside without a mask).

Restrictions of Public Transport

On 4 April 2020, the Taiwan Center for Disease Control mandated all public transport passengers to check their temperature before boarding and wear a mask inside the vehicle. Offenders were subject to a fine of up to TWD15,000. Subsequently, the spread of infection was controlled, and on 7 June 2020, although temperature checks and wearing of masks were required upon entry to the ticket gate, not wearing masks was permitted on the train if social distance could be maintained. At the same time, on-board services on high-speed trains, Taiwan Railways, and airplanes (domestic flights) were permitted, as well as the sale of non-reserved seats on high-speed trains and standing seats on Taiwan Railways express trains.

Other Infection Prevention Measures

Purchase and production of masks: On February 6, the purchase of masks was restricted because the supply could not keep up with demand. Only two face masks per person can be purchased at designated pharmacies, and the customer must present his/her health insurance card. Upon purchase of face masks, they are prohibited from repurchasing for seven days. In addition, the days of the week when purchasing masks were differentiated according to the last number on the health insurance card, and the wearer's health insurance card must be presented for proxy purchases, including for children. On the same day, the development of an application that displays the availability and number of masks in a pharmacy began and was complete in 48 hours. To secure the mask production capacity, in February, the Taiwanese government ordered 60 mask production machines and contracted out production to private companies, establishing a system under which the government purchases all masks produced at a higher price than the market price. The number of masks produced in March was more than 10 million.

Liaison System: On May 28, the Taiwan Center for Disease Control issued a guideline for the so-called "liaison system" in its "Quarantine New Life Activities" for the resumption of economic activities. The "liaison system" refers to the system for immediate contact with infected or suspected infected persons if a COVID-19 infection check becomes necessary. In May 2021, under the government initiative, a QR code-based visit recording system was developed. Note that contact tracking applications developed in Japan, Singapore, and other countries have not been introduced in Taiwan due to location privacy concerns.

2.4 Actual Status and Issues of COVID-19 Infection

2.4.1 Analysis Perspective

COVID-19 infection spreads through closed spaces, crowded places, and close contact between people. The factors related to cities that cause these "3Cs" are analyzed from the spatial urban structure of cities, such as human density and contact due to human movement. On the other hand, since COVID-19 infection is greatly influenced not only by spatial structure but also by socioeconomic factors, such as sanitation conditions (e.g., access to water), sanitation management systems, information sharing on infection prevention measures, and religious and cultural environments, the Study Team analyzes these factors. Table 2.4.1 contains a summary of the perspectives of the analysis, referring to analyses conducted by international organizations, academic institutions, and national governments. While the Study Team analyzed the statuses based on these perspectives, confirming the numerical relationship between these factors and status is difficult considering the restrictions that the infection status is not fully apprehended in each city. Considering this, the Study Team tried to specify factors contributing to the containment or spread of the virus by analyzing the characteristics of the areas with significantly low or high infection rates. These factors were categorized into the urban structure, infrastructure environment and institutions, and so on. These factors are considered through case studies in the 40 main cities other than the nine target cities.

Table 2.4.1 Perspectives of Analysis on COVID-19 Infection Status and Its Influence

Perspective of analysis (factors)		Relationship with COVID-19 infection expansion (hypothesis)	Responses during the pandemic (2.3)	
Urban structure	People's movement	Inter-city/regional travel	Infection in neighboring countries spreads across borders, along regional corridors, and border areas. Urban lockdown causes unemployed migrant workers to return to rural areas, spreading the infection throughout the country.	Closure of border Restriction of inter-city travel
		Intra-city travel	Infection spreads through commuting and leisure travel.	Voluntary curfew Nighttime curfew
		Travel within daily life area	Infection spreads through movement for basic services such as communal taps and shared toilets.	None
	People's congestion	Living population density	Densely populated areas are at higher risk of infection (the density of the resident population does not necessarily correlate with high rates of infection). Situations where many people live in a residence that is over capacity were highlighted as hot spots (no spread of infection was reported).	None
Building density and public space		The higher the building density, the greater the risk of spreading infection due to inevitable congested situations (no specific correlation has been found).	Utilization of Open space	

Perspective of analysis (factors)		Relationship with COVID-19 infection expansion (hypothesis)	Responses during the pandemic (2.3)
	Density inside buildings	Clusters in enclosed spaces (offices, religious facilities, events, etc.) drive the spread of infection (offices, religious facilities, events)	Securing Social Distance Capacity control
Hygiene environment	Hygiene environment infrastructure	Water provision	The risk of infection is increased due to the lack of access to water for basic infection prevention measures, namely handwashing and gargling.
		Hygiene facilities	The infection risk is high in an environment where individual toilets are insufficiently equipped, and many people use shared toilets. Furthermore, using toilets and the waste disposal method might also increase the risk of infection.
		Solid waste management	The infection risk is high in the areas with an inappropriate medical solid waste management system, such as poor sorting system and infrequent collection.
	Hygiene management system	Information dissemination and method	Dissemination of appropriate information on infection prevention measures (handwashing, gargling, quarantine, social distance) and necessary isolation measures would contribute to infection prevention.
		Community system, primary health care	Preventing the spread of infection can be through the promotion of appropriate hygiene behavior, health checks, and quarantine measures by health volunteers at the community level
Other urban socioeconomic factors	Age group	The infection spreads among the elderly.	
	Distance between people		Ban on shaking hands

Source: JICA Study Team based on various materials

2.4.2 Urban Structure and COVID-19 Infection Status

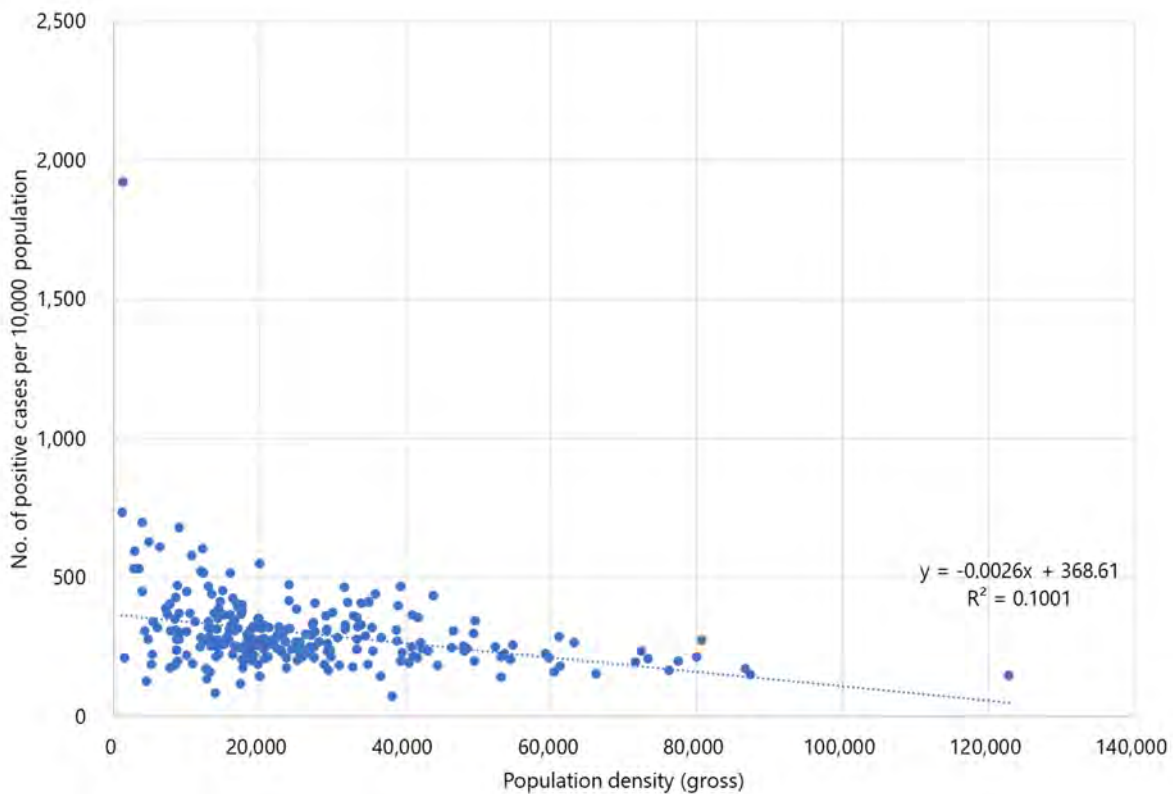
1) Congestion

(1) Analysis of Relationship between Population Density and Infection Rate

The higher population density was thought to lead to "3Cs" that cause COVID-19 transmission, suggesting that population density is strongly correlated with the spread of infection. However, a direct causal relationship between population density and COVID-19 infection was not always clearly identified. Specifically, the analysis of the nine cities surveyed in this study, as well as other cities from which data were obtained, suggests that there is no direct causal relationship between population density and COVID-19, as the positive correlation between them is not observed in some cities. This is because the number of people per hectare or square kilometer represented by the "population density" in terms of a city is on a different scale from the density that causes COVID-19 infection. This suggests

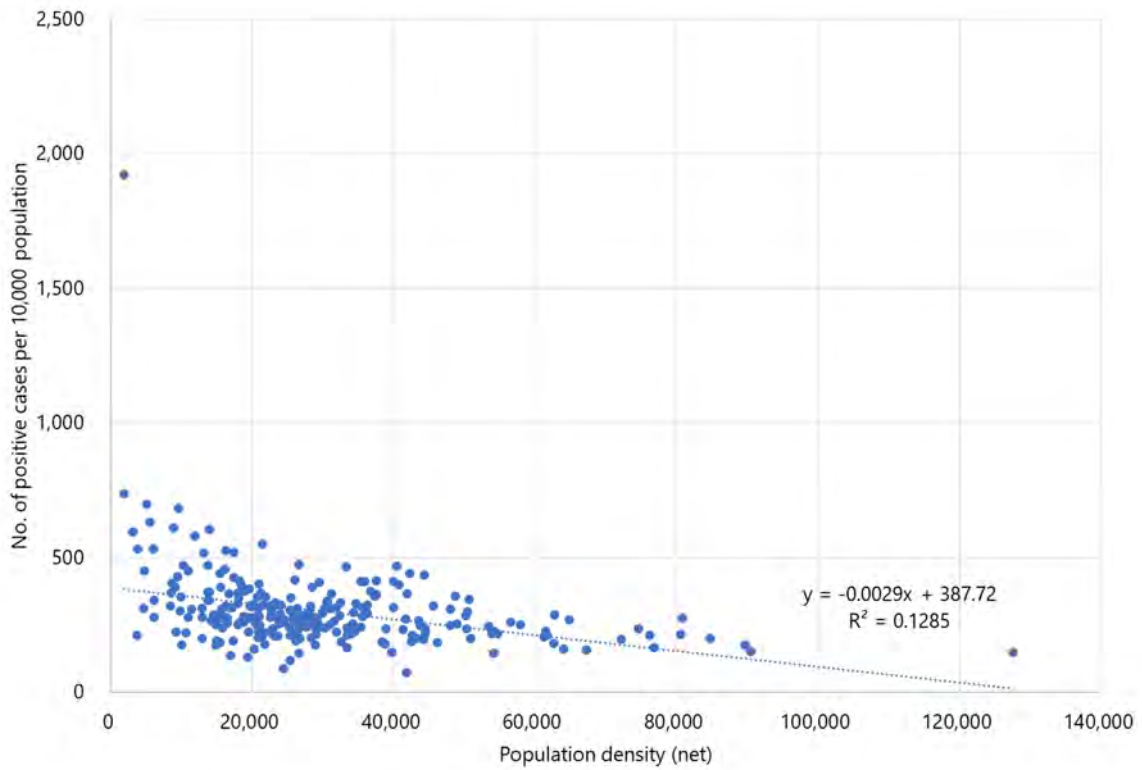
that, even in cities with low population density, infection rates could increase in a congested situation.

Jakarta: The relationship between the number of cumulative positive cases in each Kelurahan as of February 2021 and (i) Kelurahan-area-based gross population density, (ii) building-area-based net population density, and (iii) residential-area-based population density is shown in Figure 2.4.1, Figure 2.4.2 and Figure 2.4.3, respectively. These graphs show a negative correlation between these factors (correlation coefficients are -0.316, -0.358, and -0.319, respectively). In Jakarta, urban centers with lower population density tended to have higher rates of COVID-19 infection, suggesting that factors other than population density may be responsible for the spread of COVID-19 infection.



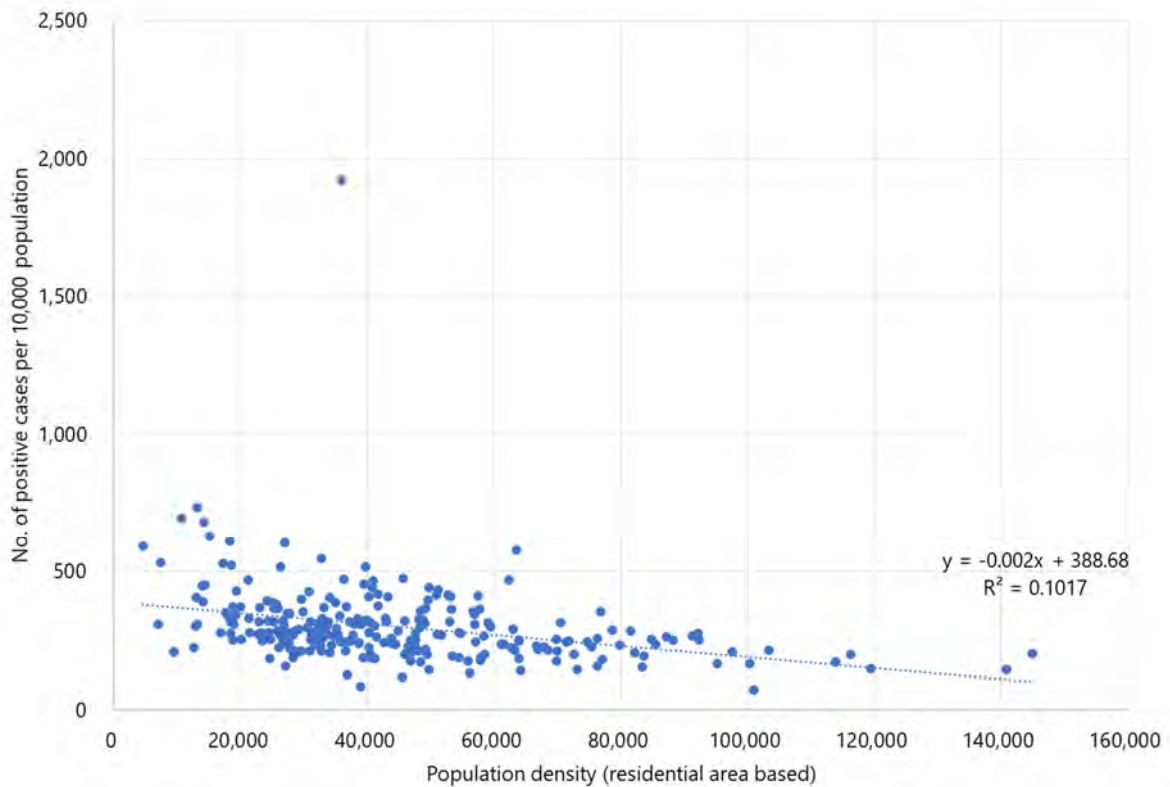
Source: JICA Study Team based on Jakarta Tanggap COVID-19 (website: <https://corona.jakarta.go.id>)

Figure 2.4.1 Relationship between Gross Population Density and No. of Positive Cases per 10,000 Population (Jakarta)



Source: JICA Study Team based on Jakarta Tanggap COVID-19 (website: <https://corona.jakarta.go.id>)

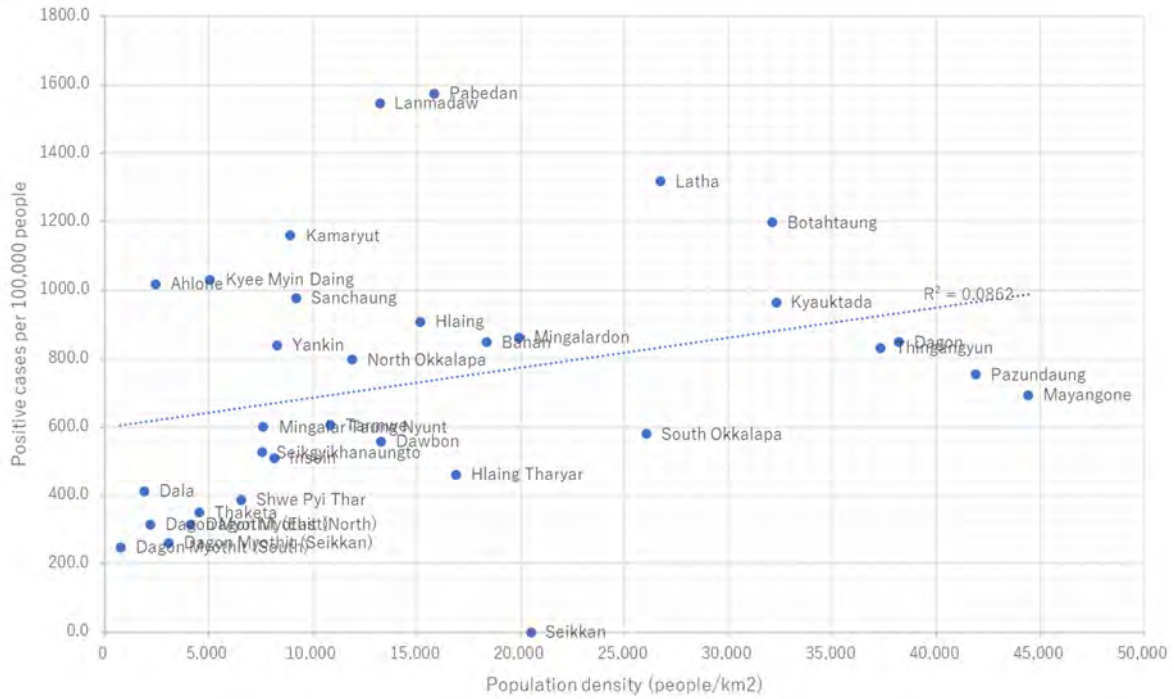
Figure 2.4.2 Relationship between Net Population Density and No. of Positive Cases per 10,000 Population (Jakarta)



Source: JICA Study Team based on Jakarta Tanggap COVID-19 (website: <https://corona.jakarta.go.id>)

Figure 2.4.3 Relationship between Residential-Area-Based Population Density and No. of Positive Cases per 10,000 Population (Jakarta)

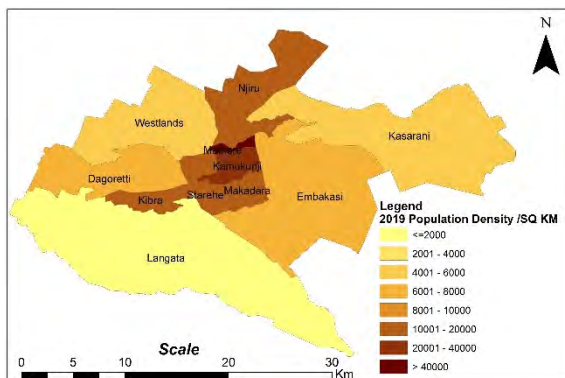
Yangon: Figure 2.4.4 shows the relationship between population density by Township and the cumulative number of infections per 100,000 population at the end of January 2021. Although the correlation coefficient is very weak at 0.293, the Township with the highest population density tends to have a relatively high number of infections per 100,000 population.



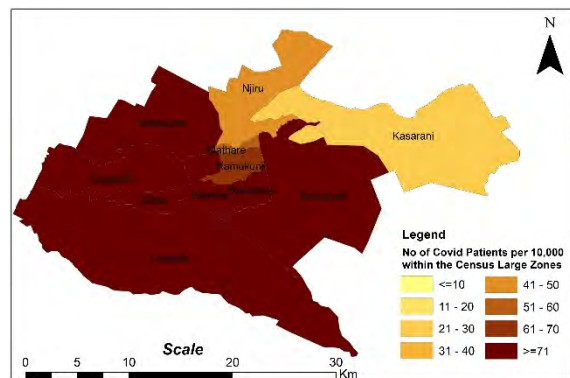
Source: JICA Study Team based on materials from the government

Figure 2.4.4 Relationship between Population Density and No. of Positive Cases per 100,000 Population in each Township (Yangon)

Nairobi, Mombasa: Figure 2.4.5 and Figure 2.4.6 shows the population density by sub-county and the number of positive cases per 10,000 population as of March 2021. The relationship between these two cannot be observed.



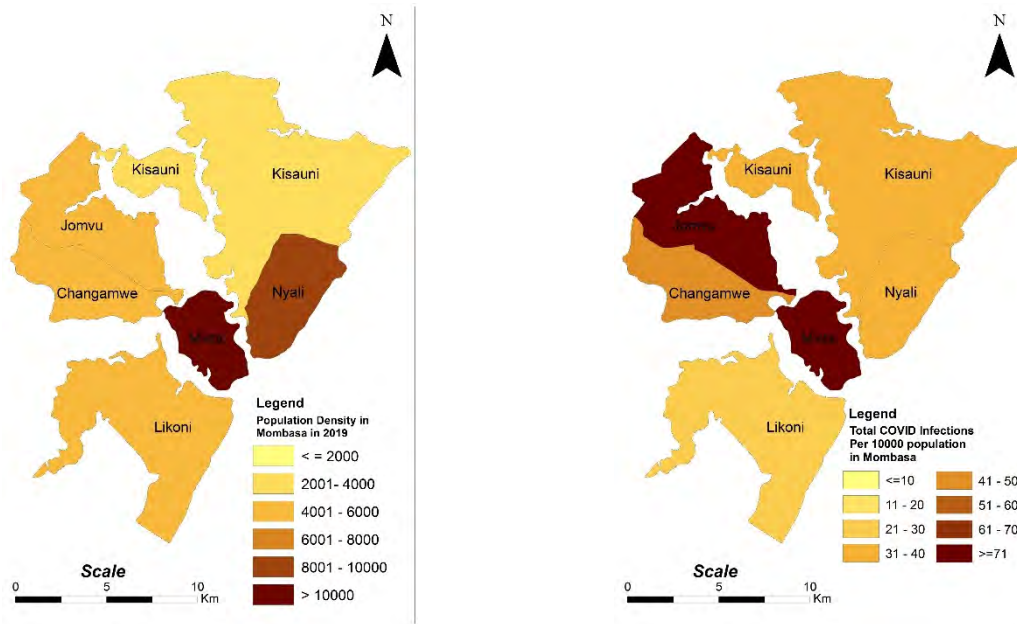
Population density (2019)



No. of COVID-19 cases per 10,000 population

Source: JICA Study Team based on materials from the government

Figure 2.4.5 Population Density by Sub-County and No. of Positive Cases per 10,000 Population (Nairobi)



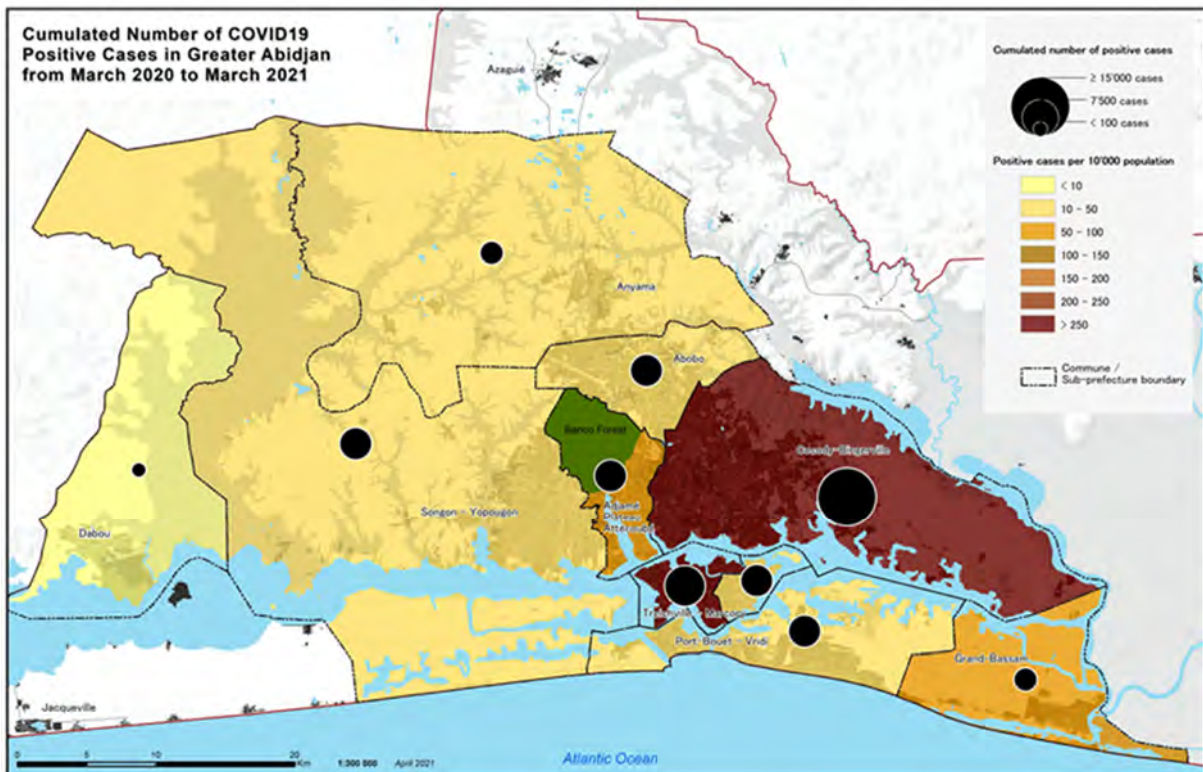
Population density (2019)

No. of COVID-19 cases per 10,000 population

Source: JICA Study Team based on materials from the government

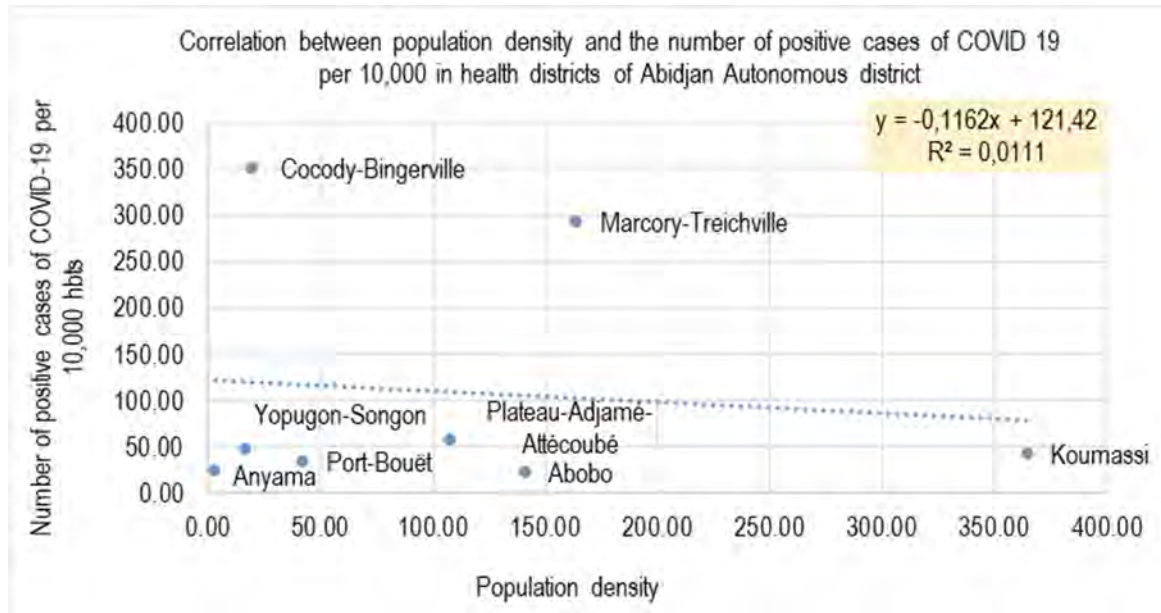
Figure 2.4.6 Population Density by Sub-County and No. of Positive Cases per 10,000 Population (Mombasa)

Abidjan: The number of COVID-19 positive cases is concentrated in the CBD area, while that in suburban communes is low. The relationship between population density by Commune and the number of positive cases per 10,000 population as of 25 November 2020 is relatively low, as shown in Figure 2.4.7.



Source: JICA Study Team based on materials from the government

Figure 2.4.7 Number of COVID-19 Positive Cases by District (March 2020–March 2021)

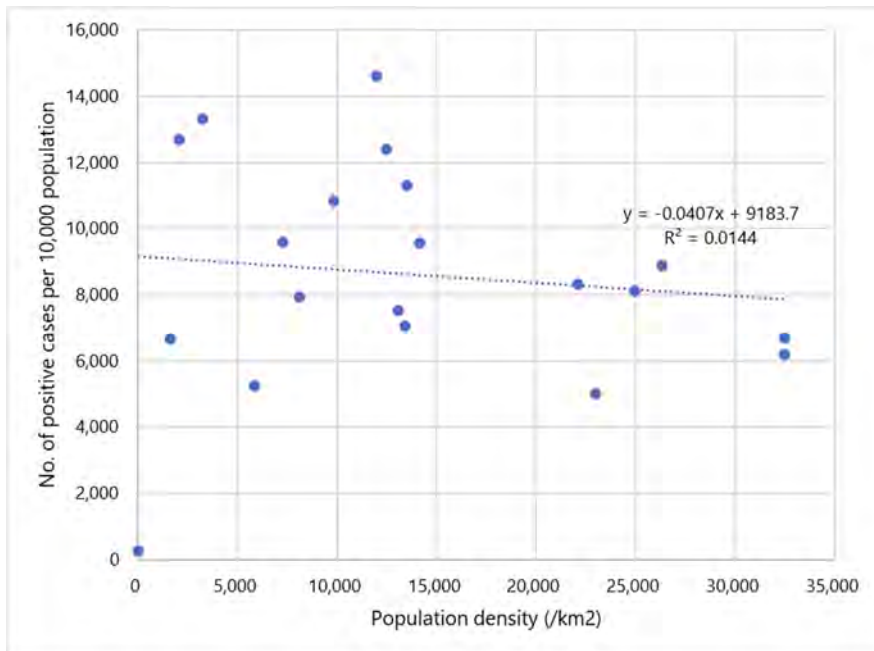


Source: JICA Study Team based on materials from the government

Figure 2.4.8 Colleration between Population Density and the Number of COVID-19 Positive Cases per 10,000 population by District (Abidjan)

Bogota and Tokyo are also discussed as their data on the number of infections by district within the city are available.

Bogota: Figure 2.4.9 shows the relationship between the population density of each of the 20 *localidades* within the city and the cumulative number of cases per 100,000 population as of 7 March 2021. With a correlation coefficient of -0.12, there is virtually no relationship between the two.

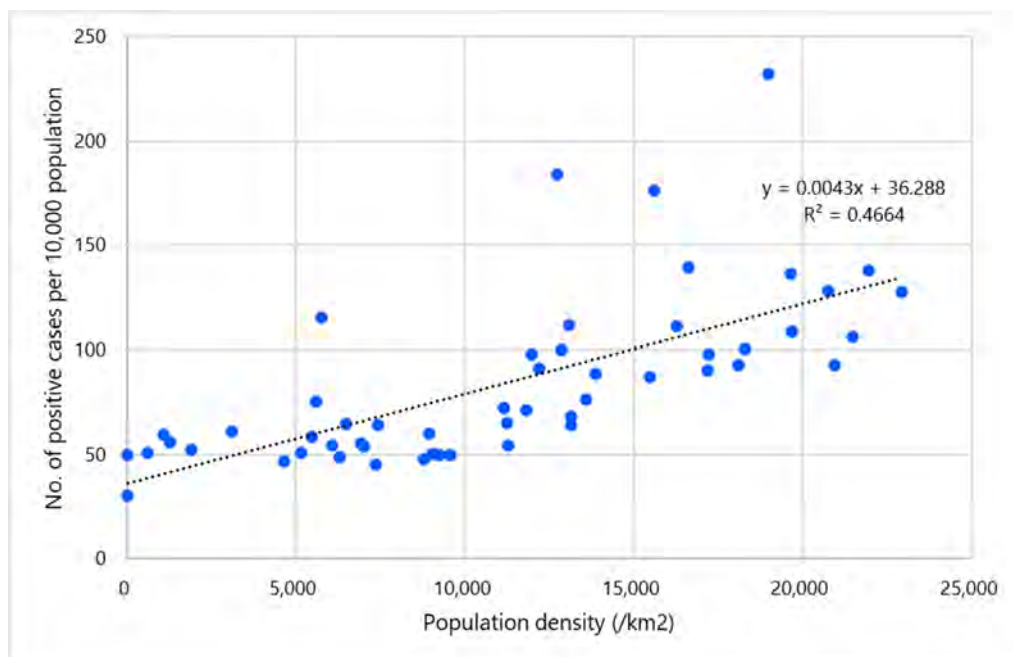


Source: JICA Study Team based on materials from the government

Figure 2.4.9 Relationship between Population Density by Localidad and No. of Positive Cases per 100,000 Population (Bogota)

Tokyo: Figure 2.4.10 shows the relationship between population density by municipality

(excluding islands) and the number of infected persons per 10,000 population as of 8 May 2021. The correlation coefficient is 0.683, indicating a rather strong correlation. The correlation coefficient is even larger, especially when the wards in the central area are excluded. In municipalities with a population density of less than 10,000 persons/km², the number of infected persons per 10,000 population is about 50 (excluding Chiyoda-ku in the city center), but when the population density exceeds 10,000 persons/km², the number of infected persons per population tends to increase proportionally.



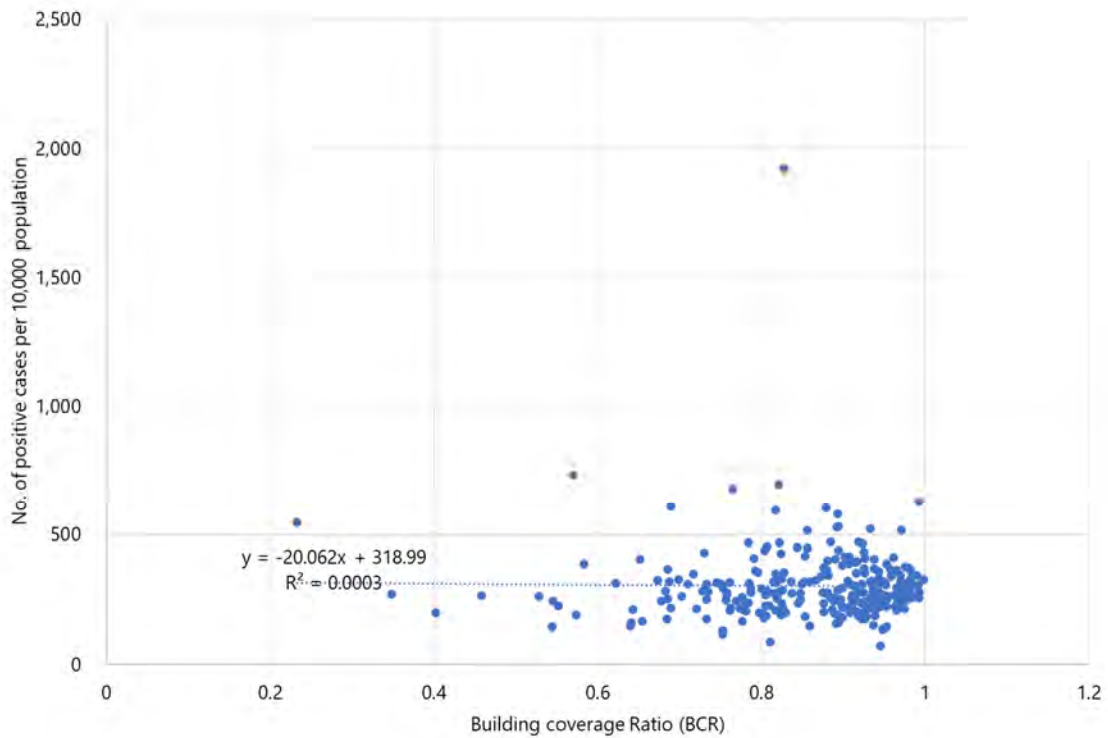
Source: JICA Study Team based on data of Tokyo Metropolitan Government

Figure 2.4.10 Relationship between Population Density by Municipality and No. of Positive Cases per 10,000 Population (Tokyo)

(2) Open Space and Building Density

Outdoor spaces have been discussed as a risk for the spread of infection, particularly in informal settlements in developing countries. In areas where outdoor space is small and many people live in densely built-up areas, congestions are likely to occur, and people have more contact in their daily lives due to the shared water supply and hygiene facilities. In this regard, the Study Team analyzed building density and infection rates in cities where the data on building density was available.

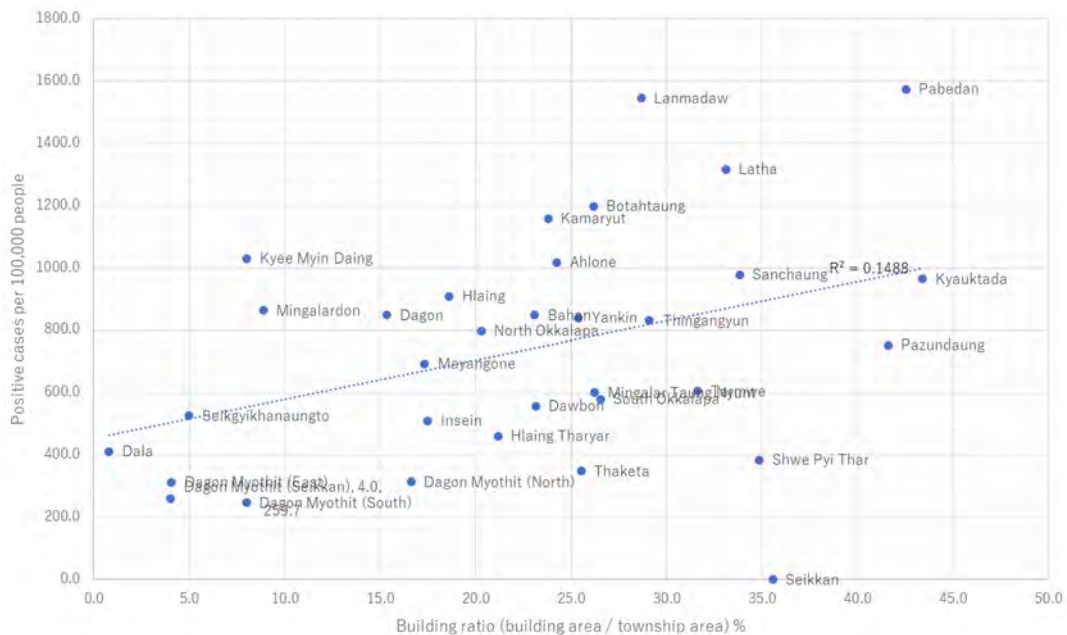
Jakarta: Figure 2.4.11 shows the relationship between building density by Kelurahan and the cumulative number of infections per 100,000 population as of February 2021. The correlation coefficient is -0.017, indicating there is almost no relationship between the two.



Source: JICA Study Team based on the DKI Jakarta

Figure 2.4.11 Relationship between Building Coverage Ratio by Kelurahan and No. of Positive Cases per 100,000 Population (Jakarta)

Yangon: Figure 2.4.12 shows the relationship between building density (ratio of building area to Township area) by township and the cumulative number of infections per 100,000 population as of January 2021. Although the correlation coefficient is low at 0.386, the higher building density tends to result in more cases of infection per 100,000 population.



Source: JICA Study Team based on the DKI Jakarta

Figure 2.4.12 Relationship between Building Density by Township and No. of Positive Cases per 100,000 Population (Yangon)

Some cities established markets in open spaces to continue urban activities while maintaining social distancing.

Dhaka: The Dhupkhola kitchen market in central Dhaka originally operated on a 13-foot-wide road. In order to keep the distance between people, it was relocated to a nearby park in April 2020 under the leadership of local police and the military. In this market, vendors are mandated to operate within a circle drawn around them to ensure that they maintain distance from each other.



Source: The Daily Star (website: <https://www.thedailystar.net/>)

Figure 2.4.13 Dhupkhola Kitchen Market Relocated to a Park

Yangon: In local cities such as Kalaw, markets are in open spaces, and distances are maintained by indicating the range available for each store. However, in a city like Yangon, where open space is limited, it is difficult to take such measures.



Source: The Irrawaddy (website: <https://www.irrawaddy.com/>)

Figure 2.4.14 Outdoor Market in Kalaw

Nairobi and Mombasa: Although there are no examples of public space utilization during the pandemic, the Ministry of Health recommends outdoor activities, such as walking rather than taking public transportation.

(3) Clusters inside Facilities

One of the urban factors directly related to the spread of COVID-19 is the development of clusters due to the high concentration of people in a facility. The reported occurrence of clusters varies from city to city, with the following characteristics.

Dhaka: Clusters occur in religious, political, and social gatherings, as well as in markets, buses, boats, and railroads. Clusters have also been reported in banks, offices, hospitals, residential apartments, etc. At the end of March 2020, a COVID-19-infected person died in the Mirpur area, and 40 apartments in the area were sealed. Also, on 29 April 2020, 22 medical staff members were found to be infected at St. John Vianney Hospital in the Tejgaon district of central Dhaka, and lockdown measures were taken.

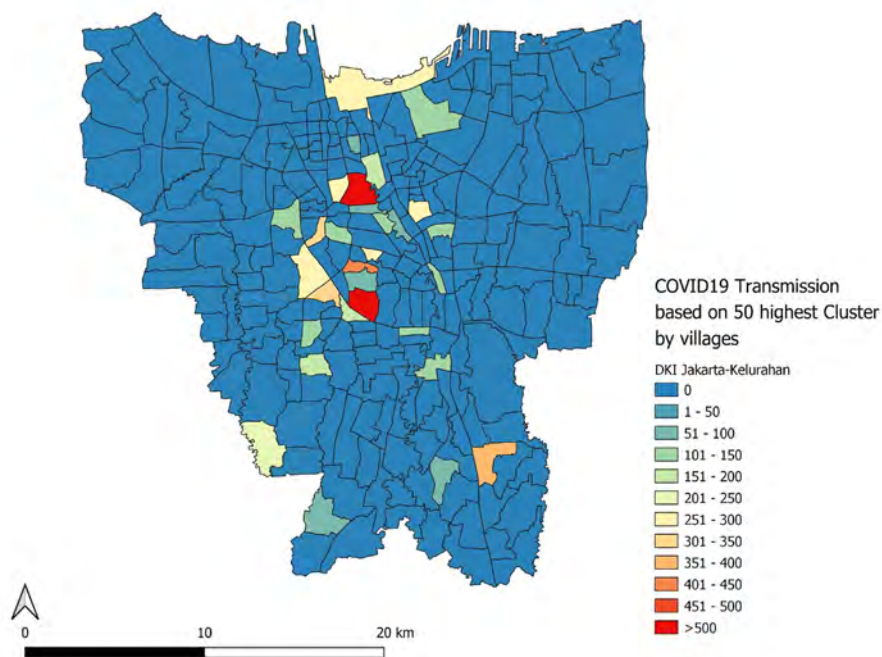
Jakarta: Table 2.4.2 shows the cluster outbreak sites with the 50 highest number of confirmed cases as of the end of February 2021, according to the DKI Jakarta. Government offices and companies account for 22 and 20 locations, respectively, indicating that, in general, clusters occur more frequently in the workplace. Furthermore, Figure 2.4.15, which shows the number of infected persons in these clusters in Kelurahan, suggests that these clusters occur especially in the central area.

Table 2.4.2 Clusters in DKI Jakarta

No	Cluster	Remarks	Total Cases Until 28 Feb 2021
1	Ministry Office	Ministry of Health	1124
2	Ministry Office	Ministry of Transportation	822
3	State-Owned Enterprise	PT Pertamina Persero	566
4	Ministry Office	Ministry of National Development Planning	446
5	Orphanage	PSBL HSL2	385
6	Ministry Office	Ministry of Defence	332
7	Private Company	BRI Bank	318
8	Police Office	Detainee of Regional Police of Metro Jaya	307
9	Gov. Institution	Corruption Eradication Commission	268
10	Gov. Institution	Harbour Office Tanjung Priok	264
11	Islamic Boarding School	Perguruan Tinggi Ilmu Quran	247
12	Ministry Office	Ministry of Communication and Information	218
13	Private Company	BCA Bank	208
14	Ministry Office	Ministry of Finance	184
15	Gov. Institution	Central National Food and Drug Agency	180
16	Private Company	MotoVillage	168
17	Private Company	M&T III	162
18	Ministry Office	Ministry of Youth and Sport	156
19	Gov. Institution	BPKP East Jakarta	146
20	Gov. Institution	Health Agency of DKI Jakarta	146
21	Private Company	PT DNP	144
22	Ministry Office	Ministry of Energy and Mineral Resources	138
23	Private Company	PT SOS Tbk	130
24	Ministry Office	Ministry of Tourism and Creative Economy	126
25	Police Office	Detainee of East Jakarta Regional Police	120
26	Private Company	Amar Bank	114
27	Private Company	PT Samudera Indonesia	110
28	Private Company	PT Pertamina Drilling Contractor	108
29	Regional-Owned Enterprise	PD Pasar Jaya	108
30	Gov. Institution	Environmental Agency of DKI Jakarta	106
31	Ministry Office	Ministry for Cooperatives Small and Medium Enterprises	102
32	Ministry Office	Ministry of Health_Research and Development	102

No	Cluster	Remarks	Total Cases Until 28 Feb 2021
33	Private Company	PT Dunia Express Transindo	102
34	Private Company	BTN Bank	98
35	Ministry Office	Ministry of Cultural and Education	96
36	Ministry Office	Ministry of Foreign Affairs	94
37	Private Company	i-News TV	94
38	Private Company	PT Pegadaian	92
39	Gov. Institution	Insitution of Witness Protection and Victim	88
40	Islamic Boarding School	Ciganjur Jagakarsa	88
41	Ministry Office	Ministry of Law and Human Rights	86
42	Private Company	BRI Bank	86
43	Private Company	BJB Bank	84
44	Private Company	BJB Bank	84
45	Boarding School	Bethel Tanah Abang	82
46	Regional-Owned Enterprise	Palyja	82
47	Boarding School	Bethel Tanah Abang	82
48	Regional-Owned Enterprise	Palyja	82
49	Gov. Institution	Centra Bank of Indonesia	80
50	Mosque	Taman Sari Mosque	80

Source: DKI Jakarta



Source: JICA Study Team based on DKI Jakarta

Figure 2.4.15 No. of infected persons in the top 50 clusters by Kelurahan (Jakarta)

Yangon: According to newspaper reports, many clusters occur in religious institutions (Table 2.4.3). These facilities may have large numbers of people clustered in enclosed spaces.

Table 2.4.3 Clusters in Yangon

No	Cluster place	Reported date	Location/ Townships	Total Cases ¹⁾
1	Monasteries, homes for the aged and factories.	(Newspaper on 29 October 2020)	(Yangon Region)	Not reported
2	Living together	The day before 1 September 2020?	Paw San Hmwestreet in Thuwanna area	25
3	Church events	13 and 14 April 2021	Mayangone township	22
4	Monastery (clusters between monks)	The day before 25 September 2020	Insein township	75 275
5	Bahosi hospital	23 September 2020	Lanmadaw township	103
6	KTV	9 September 2020	Thumingalar Road in Thingangyun	86
7	Clusters in markets	15 November 2020	San Pya Central fish market in Kyeemyin Daing, township and Thiri Mingalar market in Hlaing township	Not reported

¹⁾ including estimates

Source: JICA Study Team based on Government Report

Nairobi and Mombasa: Clusters are occurring in clinics in Nairobi and schools in Mombasa.

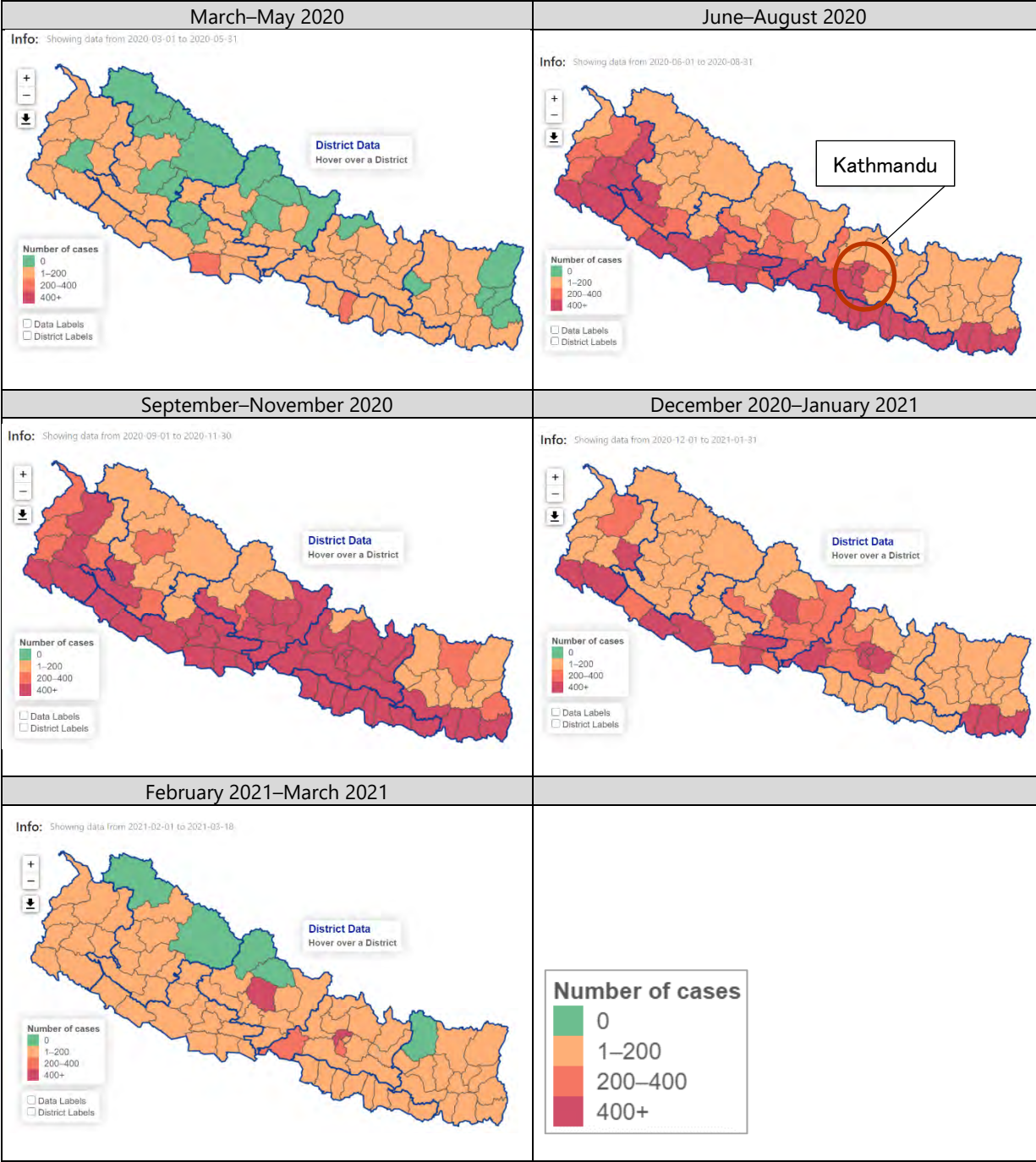
2) COVID-19 Spread Due to People's Movement

One of the possible factors that spread COVID-19 infection is the movement of people, which directly contributes to the spread of infection as it increases the opportunities for human-to-human contact. By comparing the status of the spread of COVID-19 in each city with the actual conditions of human movement, the Study Team analyzed of the relationship between movement and infection status for inter-regional movement across cities, regions, or national borders and daily commuting to and from work within cities.

(1) Inter-Regional Movement

Inter-regional spread of COVID-19 can be seen particularly in landlocked countries like Nepal, where COVID-19 originated in a neighboring country and spread to rural areas through migrant workers to the neighboring country, and Uganda, where it spread along a cross-border logistics corridor. Cases have also been pointed out in India, Bangladesh, and other countries where COVID-19 originated in urban areas and spread throughout the country as migrant workers from rural areas returned to the countryside due to the lockdown of urban areas (detailed data not yet available).

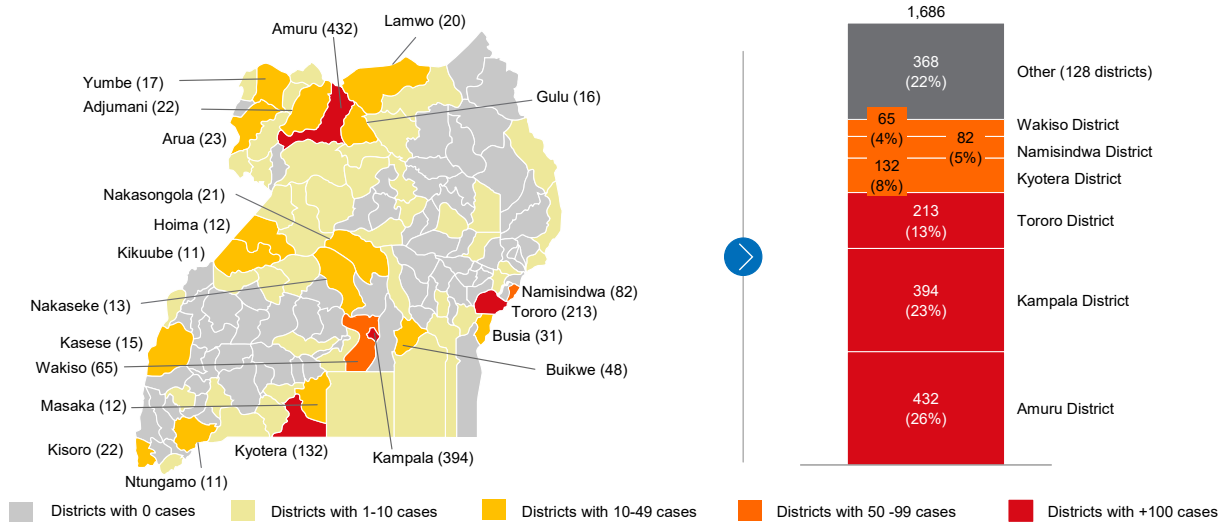
Nepal: In Nepal, the first infected case was a man returning from Wuhan (China), but at the same time, COVID-19 spread across the border between India and Nepal as migrant workers from India returned to Nepal following the spread of infection in the former. Figure 2.4.16 shows that the number of infected individuals was higher in areas along the Indian border, indicating that the disease spread inland from the border areas. In addition, parts of the northern part of the country, where the number of migrants to India is high, also have a high number of cases.



Source: Nepal COVID-19 Dashboard

Figure 2.4.16 Changes in the distribution of No. of COVID-19 infected persons in Nepal

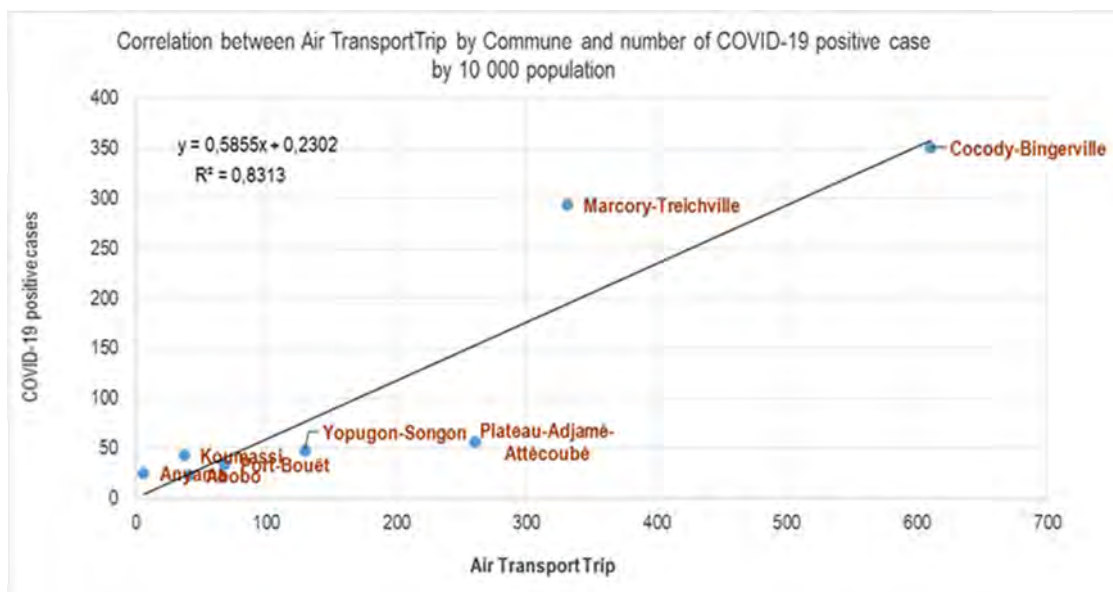
Uganda: At the beginning of the outbreak, many positive cases were identified in the border quarantine, with truck drivers traveling along the International Regional Corridor accounting for most of the positive cases. Subsequently, except for the Kampala region in the capital, the number of positive cases continued to increase in border areas, indicating that traffic to and from neighboring countries accelerated the spread of COVID-19 infection.



Source: Data Collection Survey for Building Pandemic Resilience in Urban Areas in Kenya and Uganda (JICA, 2020)

Figure 2.4.17 Distribution of District-Level COVID-19 cases in Uganda

Abidjan: The correlation between the number of air transport trip and the number of COVID-19 positive cases per 10,000 by district is very high, showing that COVID-19 has spread by air transport from other foreign countries.



Source: JICA Study Team

Figure 2.4.18 Correlation between Air Transport Trip and number of COVID-19 positive case by 10 000 population by Commune (Abidjan)

(2) Intra-city Travel

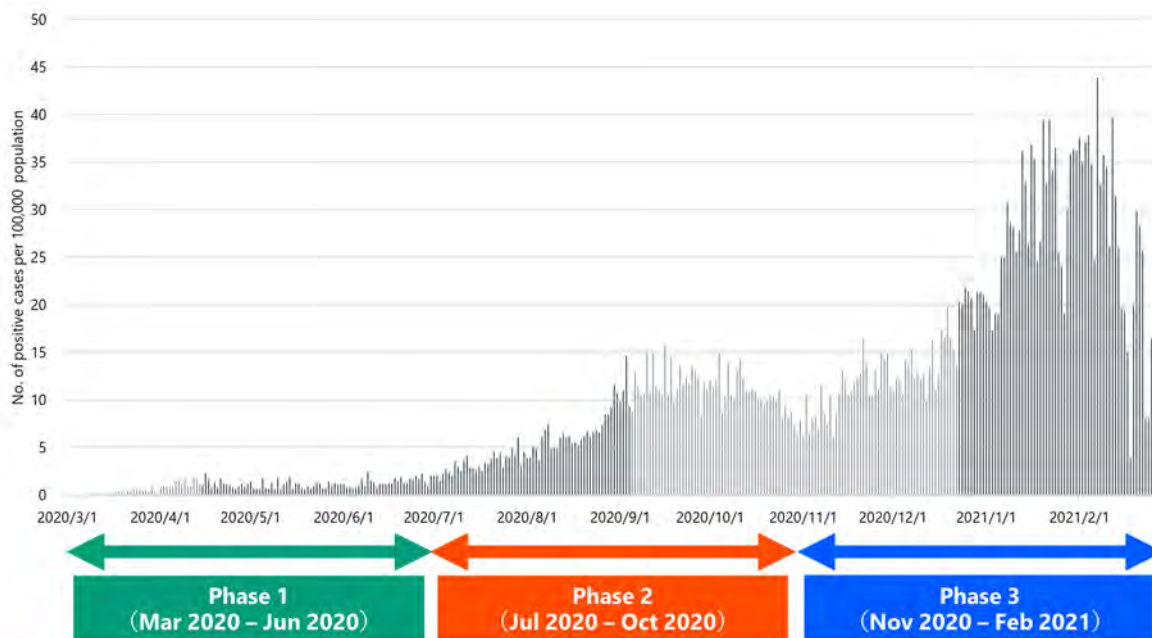
Jakarta: Jakarta is one of the nine target cities where the data on the number of COVID-19 positives can be collected in the most detailed units, an understanding of understand how the virus spread within the city. The infected cases in Jakarta are presented on a residential area basis.

As shown in Figure 2.4.20, the initial cases were mainly found in the CBD, where office

buildings and shopping malls are, followed by the spread of infection mainly in the vicinity of the CBD until around July 2020. The spread of infection throughout the city can be seen from August to September 2020. By January 2021, the disease had spread throughout the city, especially in the south and southeast, not so much to the northeast and northwest.

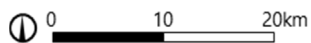
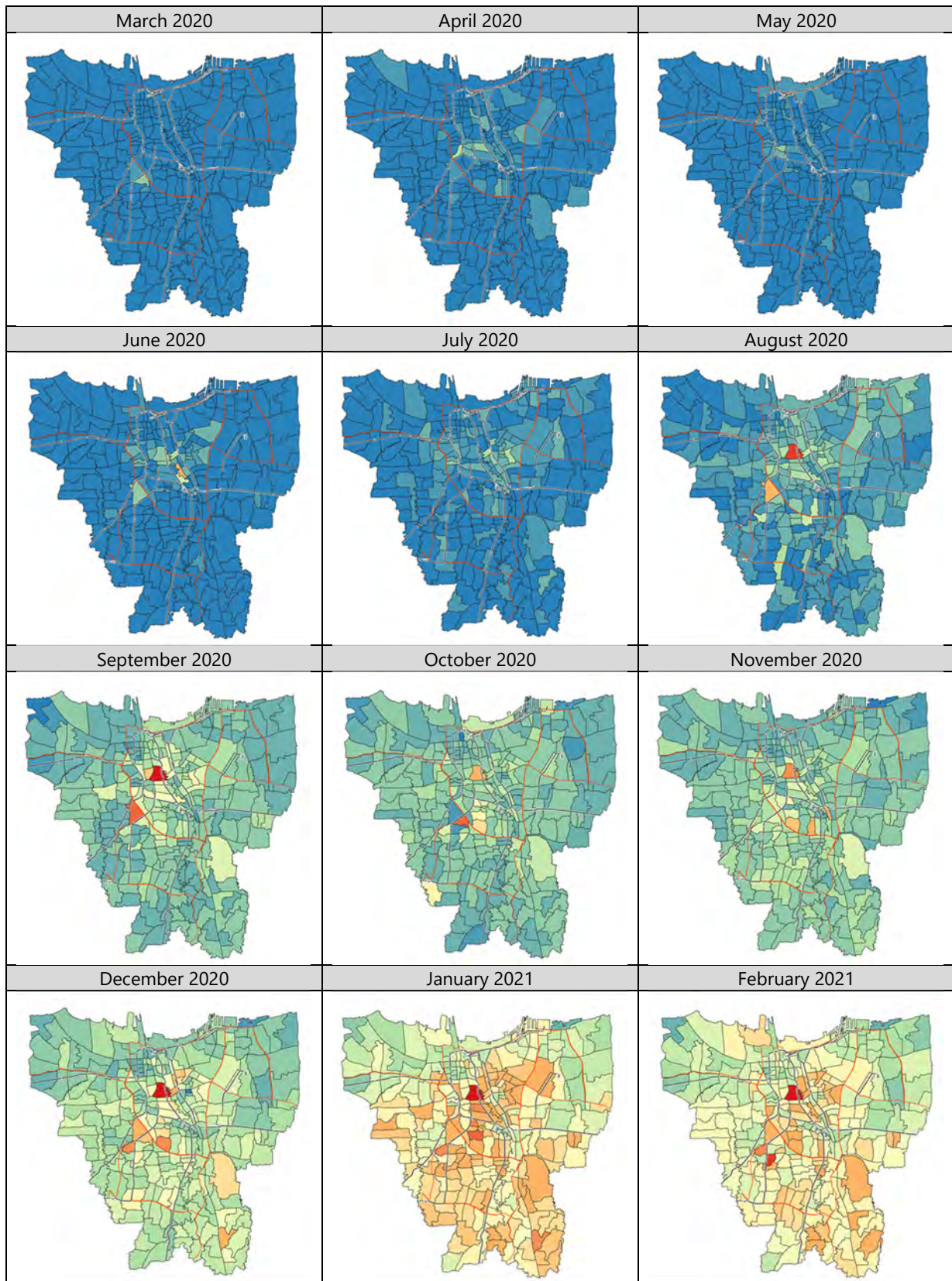
The CUREIP Team analyzed the relationship between the spread of infection and intra-city movement concerning the number of trips collected before the pandemic. First, in line with the trends in the spread of infection in Jakarta, the period from March to June 2020 was defined as Phase 1 (first wave), July to October 2020 as Phase 2 when the first major spread of infection (second wave) was observed, and November 2020 to February 2021 as Phase 3 when the third wave arrived (Figure 2.4.19). Next, based on the zones (traffic analysis zone [TAZ]) and OD tables obtained from the traffic survey conducted during the "JABODETABEK Urban Transportation Policy Integration Project Phase 2 (JUTPI2)" (JICA, 2017–2019), seven TAZs were identified where the number of infections per 100,000 people in Phase 1 was approximately 30 or more, and the relationship between the number of trips to/from these TAZs and the number of infected persons per 100,000 persons by phase was analyzed.

The relationship between the number of trips and the number of infections per 100,000 persons is shown in Figure 2.4.21. The correlation coefficients for Phases 1, 2, 3, and the overall are 0.535, 0.388, 0.075, and 0.188, respectively, indicating a relatively strong correlation, especially in Phase 1, and a gradual weakening of the correlation after Phase 2. These analyses suggest that there is some relationship between the movement of people and the spread of infection in Jakarta, especially in the early stages of infection.



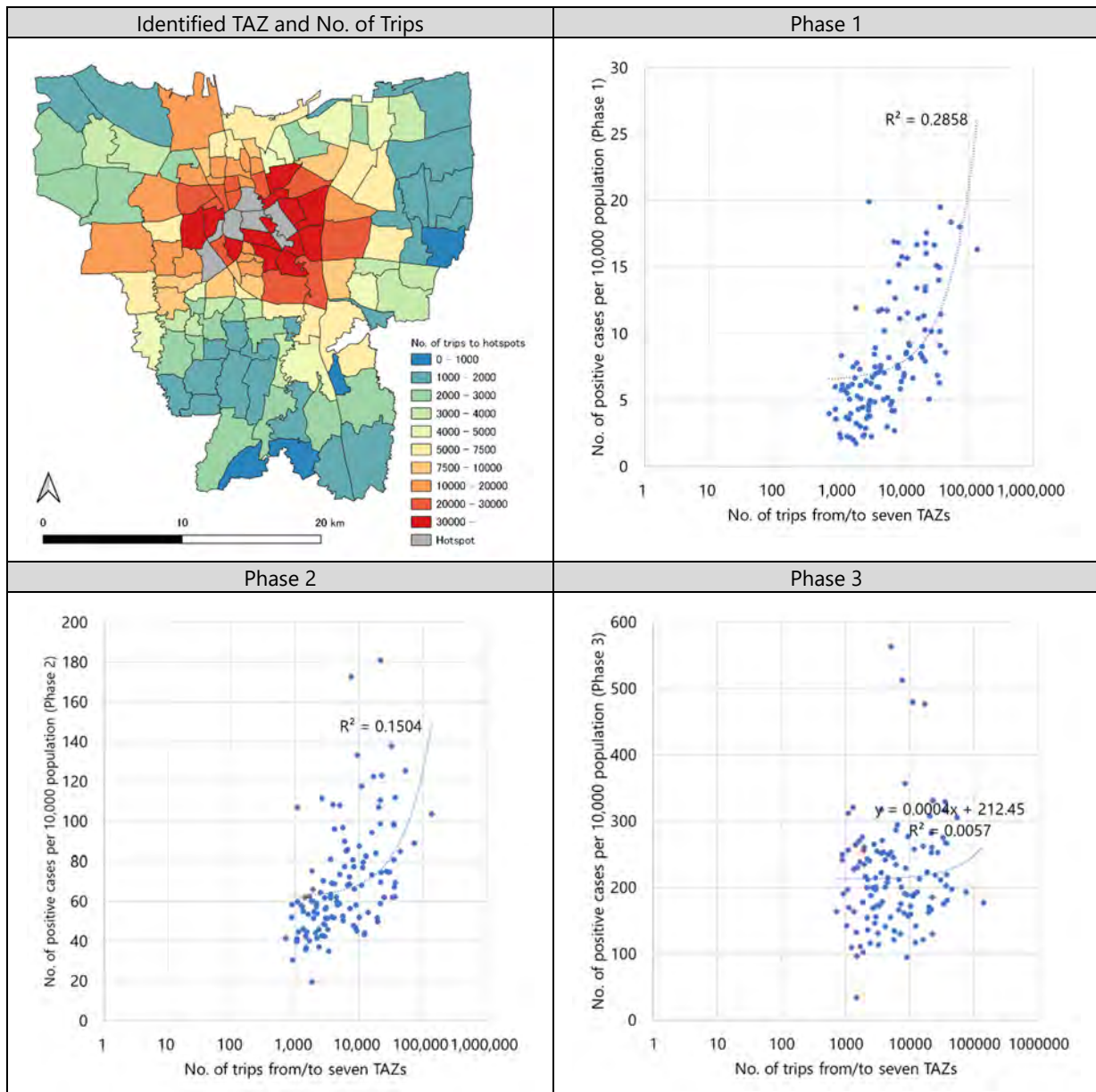
Source: JICA Study Team based on Jakarta Tanggap COVID-19 (website: <https://corona.jakarta.go.id>)

Figure 2.4.19 Phasing Based on COVID-19 Infection Status in Jakarta



Source: JICA Study Team based on Jakarta Tanggap COVID-19 (website: <https://corona.jakarta.go.id>)

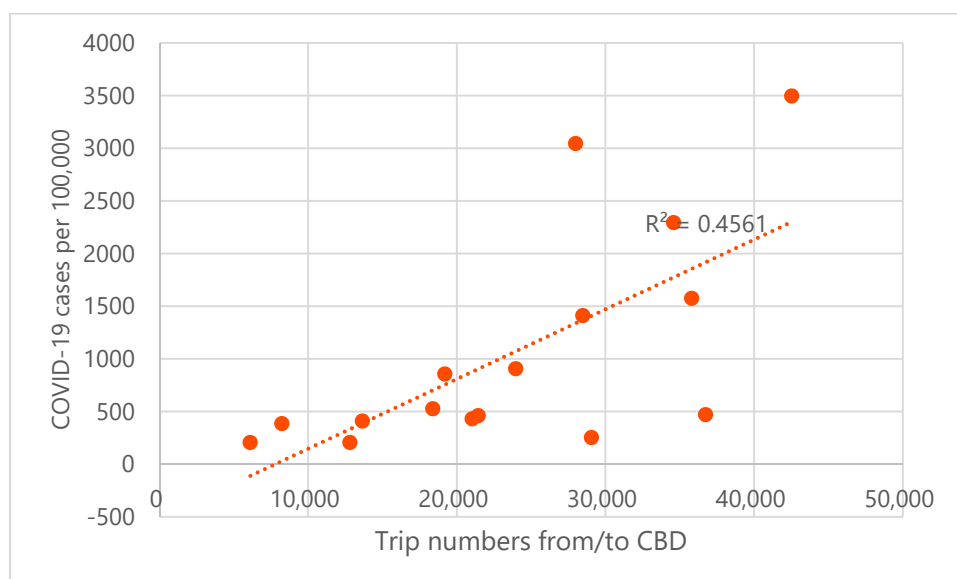
Figure 2.4.20 COVID-19 Spread in Jakarta



Source: JICA Study Team based on Jakarta Tanggap COVID-19 (website: <https://corona.jakarta.go.id>)

Figure 2.4.21 Relationship between No. of Trips and No. of Infection per 100,000 population in Jakarta

Yangon: The analysis between COVID-19 positive cases and the number of bus trips from/to CBD to/from each district shows a relatively higher correlation.



Source: JICA Study Team based on the YUTRA data (2018) and MOHS data

Figure 2.4.22 Positive Cases per 100,000 vs Trip Numbers of Bus (2018)

2.4.3 Urban Sanitation and COVID-19 Infection Status

1) Sanitation Infrastructure and Spread of Infection

It is recognized worldwide, including by WHO, that handwashing and gargling are the most important hygiene behaviors to prevent COVID-19 infection. On the other hand, many cities/districts in developing countries do not have individual water supply systems and rely on communal taps, making it difficult for many residents to wash their hands and gargle sufficiently. In addition, many areas have poor sanitary conditions due to inadequate facilities like toilets and poor waste management. These areas with vulnerable living environments have been recognized as high risk for the spread of COVID-19 infection from the outset of the outbreak, prompting cities to take early steps to restrict movement and lockdown to prevent the spread of the disease.

To prevent the spread of the infection, governments have installed additional communal and public taps in open spaces such as markets and public transport terminals to ensure a water supply, sanitation, and the WASH (water supply, sanitation, and handwashing) environment. Governments in many countries promoted handwashing and gargling awareness-raising activities via posters, radio, and community outreach.

However, based on the analysis of 40 major cities and 9 target cities, there are few reports of cases that contributed to the spread of infection, especially in districts with poor sanitary conditions. It is also pointed out that in these cities, since the COVID-19 testing system is not in place, people living in areas with poor sanitation are not adequately tested, and the number of COVID-19 positive cases does not represent the actual situation.

(1) Uganda: Vulnerability Assessment of Living Environment⁸

In Uganda, the Vulnerability Assessment was introduced early to identify areas vulnerable to

⁸ Bamweyana, I., Okello, D.A., Ssengendo, R., Mazimwe, A., Ojirot, P., Mubiru, F., Ndungo, L., Kiyangi, C.N., Ndyabakira, A., Bamweyana, S. and Zabali, F. (2020) Socio-Economic Vulnerability to COVID-19: The Spatial Case of Greater Kampala Metropolitan Area (GKMA). *Journal of Geographic Information System*, 12, 302-318. (Bamweyana, et al

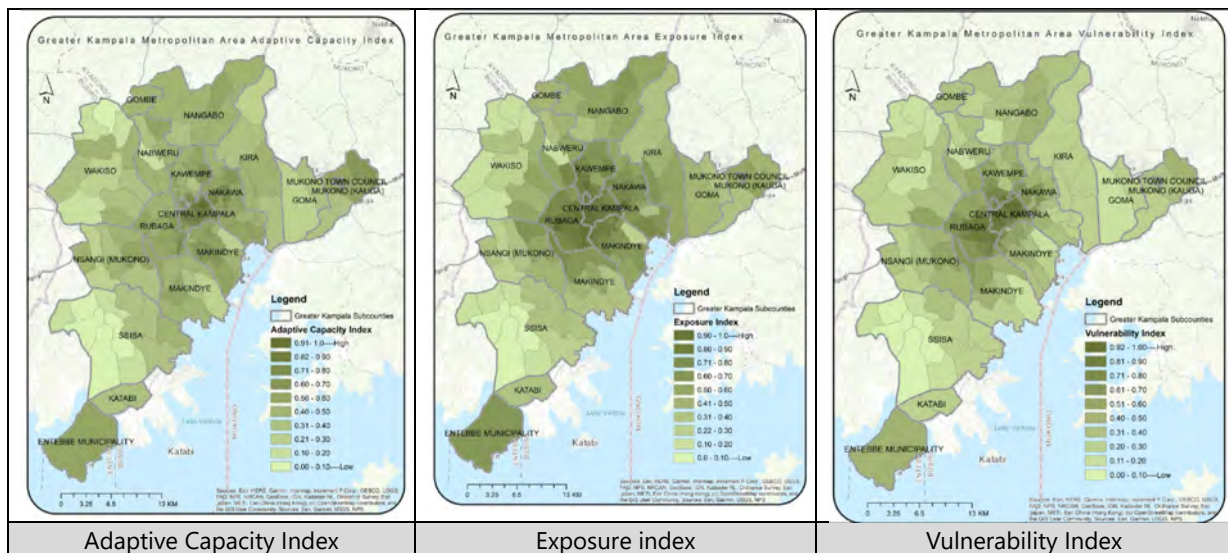
the spread of COVID-19 infection and inform decision-making. The vulnerability is analyzed through three perspectives, namely exposure, susceptibility, and adaptive capacity. The target area is the Greater Kampala Metropolitan Area (GKMA), which consists of the city of Kampala and some of its surrounding districts. The Vulnerability Index is estimated through socioeconomic index and infrastructure status.

Exposure: Population density, transactional offices, transport hubs, shopping, and commercial hubs (potentially affected by COVID-19)

Susceptibility: Old age population, pre-existing medical conditions (factors directly related to COVID-19 transmission)

Adaptive Capacity: Food security, income level, access to good health care (resources that can help reduce the impact of COVID-19 in communities and organizations)

Thus, by visualizing the vulnerability of each district to the spread of COVID-19 and its ability to respond, it is hoped that regulatory policies can be introduced for more vulnerable areas and that resources can be preferentially allocated to districts with lower response capacity. However, its use in specific local policies has not been confirmed.



Source: Bamweyana, et. al, 2020

Figure 2.4.23 Vulnerability Index in Greater Kampala Metropolitan Area

(2) Uganda: Installation of Handwashing Facilities in Public Spaces

Since the early stages of the outbreak, Uganda has been installing handwashing facilities in public spaces in the city, including taxi and bus terminals, markets, and public schools.



Source: Kampala City Facebook page (#Partner with KCCA)

Figure 2.4.24 Water Supply Facilities Installation Project in Kampala

2) Sanitation Management System and Spread of COVID-19 Infection

Urban sanitation management systems play a major role in preventing the spread of COVID-19. Even in developed countries, it has been reported that even within the same city, the infection rates are lower in central areas with better access to medical services, such as hospitals and clinics (Yahagi (2020), "Will COVID-19 Change Cities?").

It has also been reported that, in many cases, the primary health care systems established before the pandemic have been mostly preventing the spread of the disease.

The central government of each country has taken the lead in the fight against COVID-19. However, it is important that policies are properly communicated from the local government to residents and that the residents understand them. Community-level hygiene management and awareness-raising for residents have also played a significant role.

(1) COVID-19 Response System at District Level in Jakarta

Jakarta has decided to implement COVID-19 testing, tracking, and isolation of close contacts at the RT/RW level, with the RT/RW being the smallest administrative unit. The city has established the guidelines for COVID-19 infection prevention measures at the district level titled "Community Empowerment in Preventing COVID-19 in RT/RW/Village (Pedoman Pemberdayaan Masyarakat dalam Pencegahan COVID-19 di RT/RW/Desa)". In cases where it is difficult to act at the RT/RW level, the government manages the situation.

Representatives of RT/RW: Deliver information on COVID-19 to the community, educate

residents on infection control measures, ensure that residents implement infection prevention measures, distribute infection prevention items, aid those under quarantine and their families, and report possible spread of COVID-19 to the sub-district.

Religious Leaders/Public Figure: Provide information on COVID-19 infection control measures through religious activities, encourage residents to participate in infection control measures, support RT/RW leaders

Sub-District Level Police: Provide information on COVID-19 to the community, social distance, ban gatherings, support people in complying with requests to stay at home, patrol, and provide security in areas where new positive cases have been detected.

Healthy Cadre: Health volunteers elected by each RT/RW. Responsible for promoting clean and healthy living behaviors (PHBS) in the community, and in collaboration with the Public Health Center (Puskesmas), conducting integrated service posts (Posyandu, regular health services). During the COVID-19 pandemic, they provide information on COVID-19 prevention measures, educate residents on hygienic and contact avoidance behaviors, and support RT/RW leaders in assisting quarantined persons.

In addition, the government has issued Home Affairs Circular No. 2 40/2020 to encourage NGOs, local governments, and community organizations to work together to support COVID-19 infection prevention measures. Typical activities include the installation of handwashing facilities by private and community organizations.



Source: Kompas.com

Figure 2.4.25 Handwashing Facility in Jakarta

(2) Primary Health Care by Village Health Team in Uganda

In Uganda, Village Health Teams (VHTs) were introduced in 2001 by the Ministry of Health to serve as a bridge between health facilities and communities in primary health care. VHTs are selected from community members and address hygiene and cross-cutting issues to enhance the health and well-being of the community members. Specifically, they manage community information, educate community members on health promotion, promote the use of health services, care for simple and deadly diseases (malaria, diarrhea, pneumonia), care for newborns, and distribute health supplies, among others.⁹

During the COVID-19 pandemic, the VHTs, with international support, are responsible for promoting infection prevention measures and health management at the community level.

⁹ National Village Health Teas Assessment in Uganda (UN. Uganda, 2015)

Specifically, the African Medical Research Foundation (AMREF) Health Africa, in collaboration with the Ministry of Health, has supported VHTs in training on infection prevention measures and the establishment of activity centers.



Source: AMREF Website

Figure 2.4.26 Support for Village Health Volunteer in Uganda

(3) Primary Health Care in Communities by Public Health Volunteer in Thailand

Public Village Health Volunteer (PHV) in Thailand is a primary health care structure to promote public health at the community level. They are selected and trained by the Public Health Center under the Health Department of Bangkok Metropolitan Administration and receive a monthly allowance of THB1,000. Pre-pandemic, they provide daily care for the elderly and physically challenged in the community. Each PHV is responsible for 15–30 households. There are approximately 15,000 certified PHVs in the entire Bangkok.

During the COVID-19 pandemic, PHVs have closely coordinated with the district government to perform the following efforts to prevent the spread of the disease.

- Educate the public on hygiene behaviors to prevent infection, such as washing hands, gargling, wearing masks, etc.
- Communicate government guidelines such as curfew, request to stay at home, etc.
- Receive medicines from the hospital on behalf of the elderly who need to visit the hospital regularly.
- Follow-up with community members who have returned from abroad or moved from other provinces and have been subject to quarantine.

The cooperation between the PHVs and the district government, even during pre-pandemic, and the fact that the former are members of the community and have built a relationship of trust with the residents, enabled rapid and flexible implementation of the infection prevention measures. It led to the control of the spread of the disease in its early stages. This approach has been highly evaluated by WHO and other organizations.

Migrant health workers (MHWs) have also been established in Bangkok and its surrounding provinces, where many migrants from neighboring countries, such as Myanmar and Laos, are residing. These migrants are at a high risk of COVID-19 infection since they tend to live in poor conditions and miss information from the government. In Bangkok, since the initial stage of the pandemic, MHWs have been disseminating information to the migrant community, providing health care, and acting as a bridge to various private sector supports.

This prevented the outbreak of clusters in the early stages of the pandemic. (In the later stages of the outbreak, clusters were observed among workers from Myanmar.)

In Thailand, a similar system has been in place nationwide since 1977, with approximately 1 million Village Health Volunteers assigned to each community throughout the country. They are reported to have contributed to infection prevention in many cities.



Source: WHO News

Figure 2.4.27 Support for Local Residents by Village Health Volunteer in Thailand

Table 2.4.4 Examples of Infection Prevention Activities by Community

Community's role	City/Country	Description
Information dissemination on infection prevention	Kamwokya II, Kampala	Information Platform on SNS "Weyonje' clean yourself," a community group in Kampala, with the aid of WaterAid and KCCA, established the "Weyonje WhatsApp Group" as a platform to share information for community support to counter misinformation on SNS.
Community-driven infection control measures	Sudan	(Production and provision of homemade hand sanitizer) Use homemade alcohol, which is conventionally illegal, to produce hand sanitizers and distribute free-of-charge in the community.
	Bangladesh	(Mobility for medical employees) Community groups partner with the Ministry of Health to provide free shuttle bus service during public transportation outages.
	Sierra Leone	Based on the lessons learned from the Ebola experience, community members created devices for protection (e.g., washing hands and feet with soap after burial and boiling shoes with lime for disinfection)

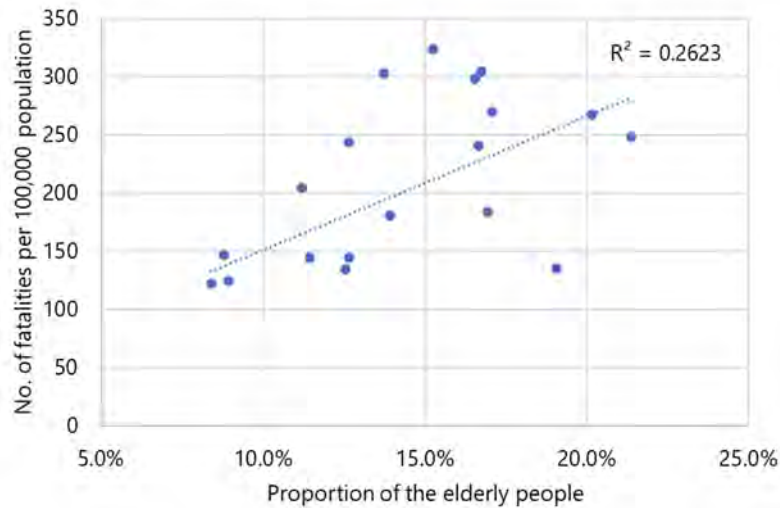
Source: JICA Study Team based on several materials

2.4.4 Urban Socioeconomics and COVID-19 Infection Status

1) Socioeconomic Attributes and Spread of Infection

Spread of Infection in Bogota: As mentioned earlier, the number of infected persons by localidades in Bogota showed no correlation with population density. On the other hand, the infection rates by district varied widely, and the causes were analyzed in terms of the socioeconomic attributes of the districts.

The relationship between the elderly ratio (percentage of the total population aged 60 years or older) and the number of deaths per 100,000 population is shown in. The correlation coefficient is 0.512, indicating a relatively strong correlation between the two. It is said that the elderly are likely more severely ill when infected with COVID-19, and this analysis suggests that an intensive medical care system may be required in the inner city, especially in areas with a large elderly population.



Source: JICA Study Team based on local government website

Figure 2.4.28 Relationship between Ratio of Elderly by Localidad and Number of Deaths per 100,000 Population (Bogota)

2) Lifestyle and COVID-19

In cities where physical contact, such as handshakes and hugs, are customary ways of greeting, further increases the spread of COVID-19. Therefore, as part of social distancing in preventing the spread of the disease, people are being educated to refrain from shaking hands.

In Indonesia, specifically, its government has created posters to educate people on avoiding shaking hands and using alternative means of greeting, such as waving hands, putting feet together, and nudging elbows.



Source: AMREF Website

Figure 2.4.29 Posters to Educate Alternative Ways of Greeting (Jakarta)

2.5 Impact of COVID-19 and Responses

2.5.1 Analysis Perspective

The impacts of the measures to control the spread of COVID-19 were analyzed from social, economic, and environmental perspectives.

Table 2.5.1 COVID-19's Impact on Society, Economy, and Environment

	Category	Description
Economy	Stagnation of socioeconomic activities	Dramatic decrease in tourists Decrease in GDP Deterioration of city finances Decrease in traffic
	Economic damage	Increase in unemployment Decrease in income Lack of remittances from migrant workers
	Shortage of supply	Panic buying in the onset of the pandemic Shortage of goods and surplus of goods due to stagnant logistics network
	Rise in e-commerce	Increase in online payments Increased online shopping Increased demand for home delivery
Society	Restrictions on urban activities	Reduced time for leisure activities Reduced gatherings
	Loss of educational opportunities	Closure of educational opportunities Widening educational gap (depending especially on access to IT)
	Isolation of informal citizens	Isolation of migrant workers
	Increased psychological damage	Increase in mental illness Increase in domestic violence
Environment	Increased demand for water	
	Decreased air pollution	
	Increased medical waste	
	Increased environmental awareness	

Source: JICA Study Team

2.5.2 Economic Impact

1) Economic Loss

(1) GDP Growth and Industry

Jakarta: The economic growth rate of Indonesia was -5.32% in the second quarter and -2.07% for the year 2020. Losses were mostly large in transportation and warehousing (-15.24%), followed by accommodation and catering (-10.22%) and corporate services (-5.44%). On the other hand, the growth rate was positive in the health and social sector (+11.60%), information and communication industry (+10.58%), and water supply, waste disposal, and recycling sector (+4.94%). Jakarta's gross regional domestic product (GRDP) growth rate for 2020 was -1.58%

Dhaka: According to the International Monetary Fund, Bangladesh's GDP growth rate for

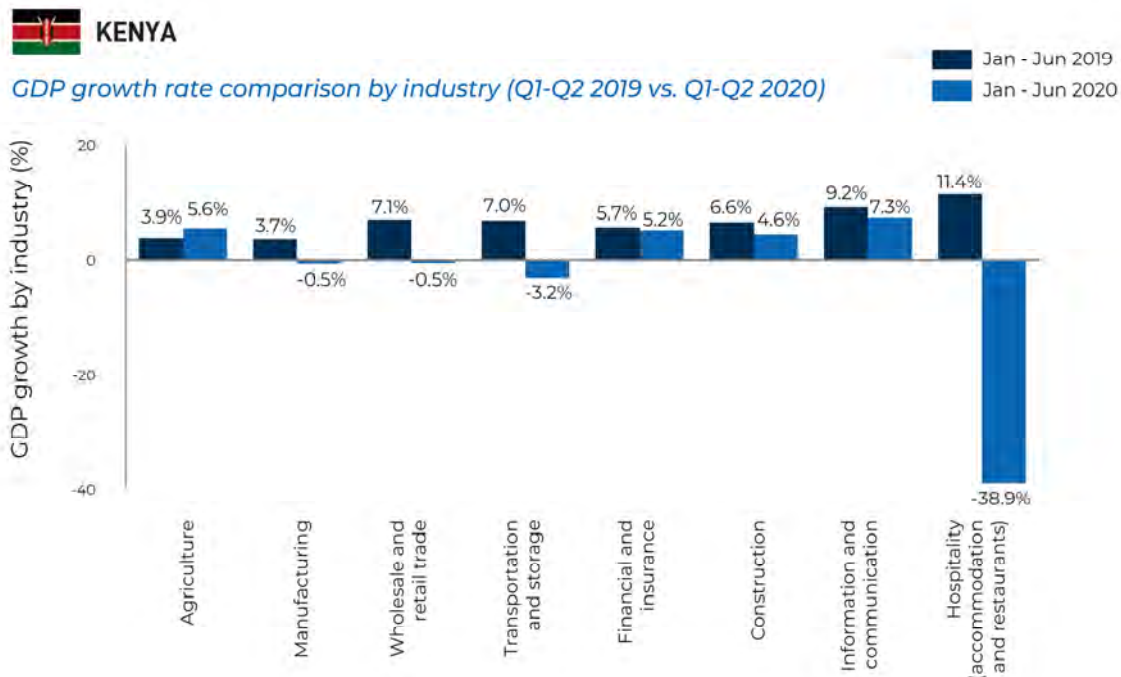
2020 is 1.1%, a significant decrease from about 8% in 2019. The government estimated the budget deficit at 6% of GDP. Export-dependent industries and import-dependent supply chains were particularly affected by the collapse of the transportation and market system (Table 2.5.2). The textile industry, which accounts for more than 80% of exports, 11.2% of GDP, and 36% of manufacturing employment, in particular, suffered a significant economic impact as orders worth USD1.05 billion were canceled, especially for exports to Europe and the US, which account for 80% of total sales. Demand for domestic flights has also declined, with each airline's revenue decline in March 2020 estimated at BDT250-400 million (about USD3-5 million).

Table 2.5.2 Estimated Growth Rate of Bangladesh's Exports

Source	FY 2019–2020 (%)	FY 2020–2021 (%)	FY 2021–2022 (%)
EPB	-16.93		
MoF	-10.0	15.0	10.8
GED	5.00	10.15	10.30
IMF	-17.9	-0.8	16.1

Source: JICA Study Team based on several organizations

Nairobi/Mombasa: Before the pandemic, Kenya's projected GDP growth rate for 2020 was 6.0%. However, the October 2020 IMF projection based on the spread of COVID-19 infection showed a significant decline, with a GDP growth of +1.0% in 2020. Agriculture, which contributes significantly to GDP, was less affected, but the hospitality and transportation and warehousing industries suffered severe losses (Figure 2.5.1). The survey conducted by JICA and Boston Consulting Group (BCG) in 2020 targeting the informal sector found that 94% of business owners in Nairobi reported a decrease in sales.

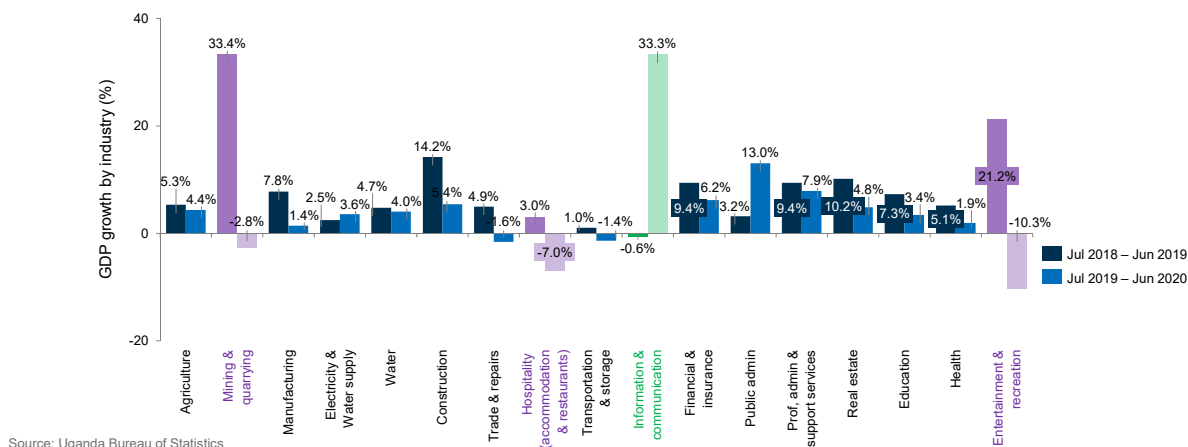


Source: JICA and BCG (2020)

Figure 2.5.1 GDP Growth Rate by Industry in Kenya (2018–2019, 2019–2020)

Kampala: A sharp decrease in the GDP growth rate from July 2019 to July 2020 was observed in the mining and quarrying, hospitality, and entertainment and recreation industries, while the information and communications industry grew strongly (Figure 2.5.2). In the survey by JICA and BCG (2020) targeting the informal sector, 86% of business owners reported a decrease in sales.

Hospitality, mining & entertainment contraction can be attributed C19 restrictions in Uganda and abroad
GDP growth comparison of FY2018/19 and FY2019/20 (Jul – Jun) by industry



Source: JICA and BCG (2020)

Figure 2.5.2 GDP Growth Rate by Industry in Uganda (2018–2019, 2019–2020)

(2) Increased unemployment and decreased household income

Jakarta: According to Statistics Indonesia, the number of unemployed as of February 2021 was 8.75 million, an increase of 1.82 million from February 2020 but a decrease from 9.77 million in August 2020. Unemployment has also led to an increase in poverty, with 27.55 million poor as of September 2020 (10.19% of the population), an increase of 2.76 million from September 2019.

Yangon: According to the UN-Habitat survey conducted in April 2020, 81% of households in informal settlements had at least one unemployed member. Unemployment is particularly high among women and youth.

Dhaka: According to the Bangladesh Institute of Development Studies, 13% of the population was unemployed as of 24 June 2020, and the income of about 80% of wage workers decreased. Informal workers, accounting for 85% of the population, were particularly affected by the income decline; according to a survey by the Bangladesh Rural Advancement Committee, national income declined by 75% on average (Figure 2.5.3). As a result of these impacts, 32% of households in Dhaka are cutting back on food expenses (Government of Bangladesh, 2020), and reports indicate that the poverty rate may reach 40.9%, double the rate pre-pandemic rate (South Asian Network on Economic Modeling, 2020).

Income Group (Tk.)	Average reduction in Income	No. of sample households	
Below 10000	68%	Rural	76%
		Urban	66%
10000- 24999	78%	Rural	82%
		Urban	72%
25000 and above	70%	Rural	73%
		Urban	61%
Total	75%	Rural	80%
		Urban	69%
			724
			1649
			299
			1331
			1344

Source: Bangladesh Rural Advancement Committee

Figure 2.5.3 Income Decline Rate by Income Group in Bangladesh

Nairobi/Mombasa: The unemployment rate in Kenya, which was 5.2% in the first quarter of 2020, doubled to 10.4% in the second quarter. The unemployment rate for the 20–29 age group is over 60%. In the informal sector survey mentioned previously, 74% of respondents in Nairobi and 83% in Kampala cut salaries or laid employees off (JICA & BCG, 2020).

Kampala: According to the BCG survey (JICA and BCG, 2020), 84% of all respondents indicated that their income had decreased, and about two-thirds indicated that their income had decreased by more than half. In addition, this survey found that 56% of those living in informal settlements and 45% of the entire country's residents reported losing their jobs due to COVID-19.

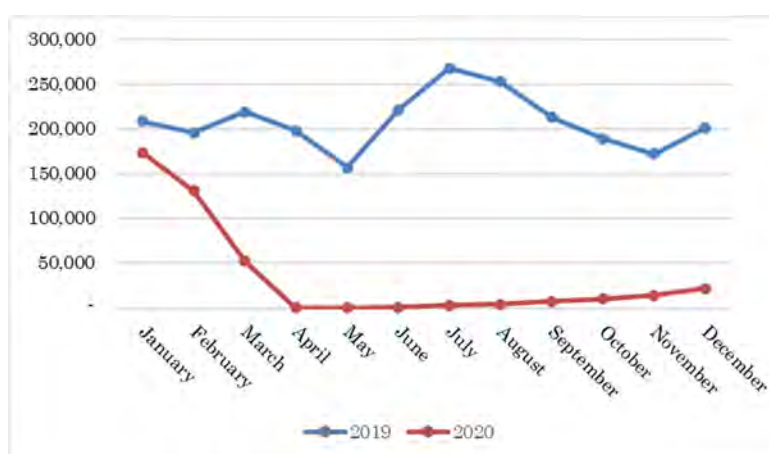
(3) Migrant Worker

Dhaka: More than 10 million Bangladeshis are estimated to be working abroad. Remittances are a major source of foreign currency. However, in April 2020 alone, 95,062 migrant workers lost their jobs and returned to Bangladesh, causing a 25% decrease in remittances from abroad in 2020 compared to 2019, approximately USD 14 billion.

2) Stagnation and Change in Socioeconomic Activities

(1) Decrease in Tourists

Jakarta: The number of foreign tourists in Indonesia from January to August 2020 decreased by 68.17% compared to the same period of the previous year. Even within the DKI Jakarta, the number of tourists declined sharply, especially in April 2020 when large-scale social restrictions were imposed, followed by a slight recovery in July. However, the number is still very small compared to pre-pandemic levels (Figure 2.5.4).

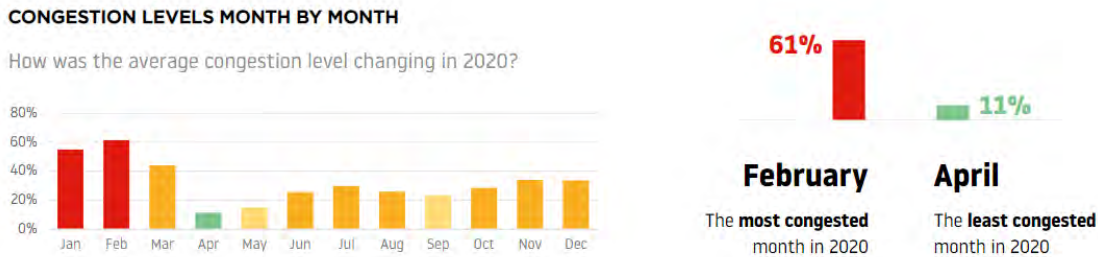


Source: Tourism Office, DKI Jakarta (2020)

Figure 2.5.4 The Number of Tourists in Jakarta

(2) Decrease in Traffic Volume

Jakarta: According to TomTom, since April 2020, when large-scale social restrictions were introduced following the confirmation of COVID-19 infection, traffic volume has decreased, and traffic congestion has been eliminated (Figure 2.5.5). Tolls collected on toll roads also decreased, especially at the Cenkareng Toll Station, which serves as an access road to the airport, where the amount collected decreased by 83% from the second week of March to the first week of April.



Source: : TomTom (2021)

Figure 2.5.5 Change in Traffic Congestion Situation (2020)

(3) Reduction of Public Transportation Services

Jakarta: In response to the government's policy, the number of public transportation services, operating intervals, and hours was adjusted, and each public transportation system saw a decline in passenger numbers and fare revenues. MRT ridership in 2020 was about 60% lower than in 2019 (Figure 2.5.6), and fare revenues from public transportation services overall were 73% less than before the pandemic.



Source: MRT Jakarta (2020)

Figure 2.5.6 Number of MRT Jakarta Passengers

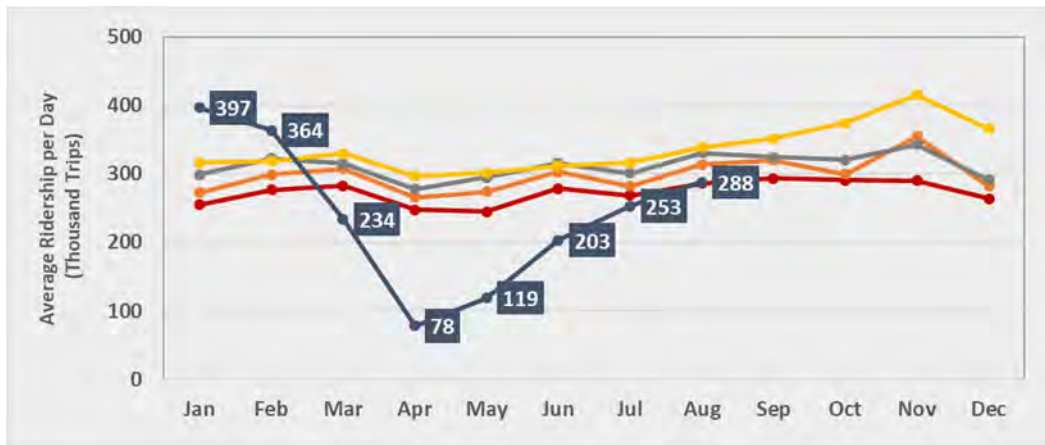
Yangon: As of September 2020, the number of daily runs of the Circular Line was reduced to 30 from the previous 54. The number of buses (YBS) also decreased in line with the COVID-19 infection status (Figure 2.5.7).



Source: JICA Study Team based on several articles

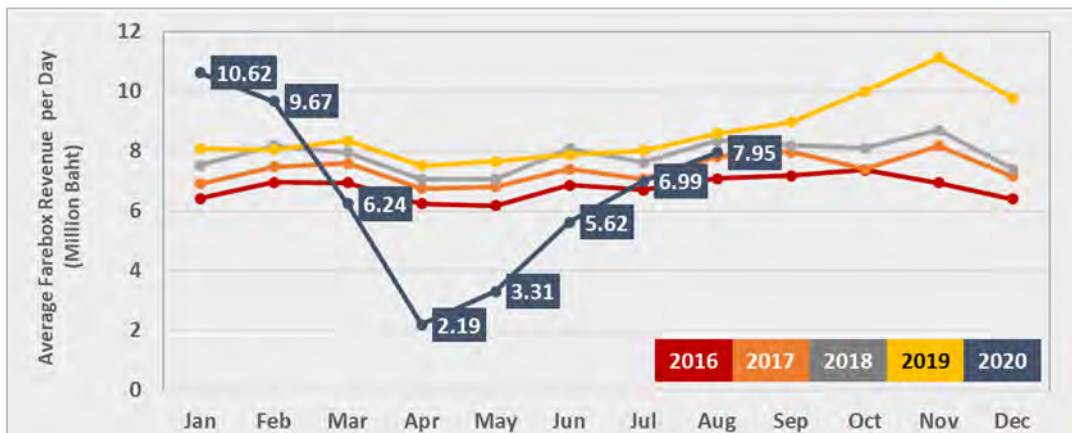
Figure 2.5.7 Change in Number of YBS Operation

Other Cities: In Bangkok, MRT ridership, which had been hovering around 250,000–400,000 passengers/day in recent years, declined to 78,000 passengers/day in April 2020, and fare revenue fell from a normal average of THB7.66 million per day to THB4.34 million per day (Figure 2.6.8 and Figure 2.6.9). The number of passengers on the BTS Skytrain also declined by 45.2% and 81.5% in March and April 2020, respectively, compared to the previous year.



Source: Bangkok Expressway and Metro, The Project for Promoting Sustainability in Future Cities of Thailand (Phase 4 and 5, JICA)

Figure 2.5.8 Average Number of Daily Passengers of MRT (Bangkok)



Source: Bangkok Expressway and Metro, The Project for Promoting Sustainability in Future Cities of Thailand (Phase 4 and 5, JICA)

Figure 2.5.9 Average Daily Fare Revenue of MRT (Bangkok)

(4) Changes in Logistics Volume

Jakarta: Economic growth in Indonesia's warehousing and courier industry has been positive since the third quarter of 2020, mainly due to the rise of online shopping (Table 2.5.3). SiCepat Ekspres, a courier service company, saw sales of 110% y/y in 2020, and other courier companies have seen similar trends.

Table 2.5.3 Economic Growth Rate of Warehousing and Courier Industry (2020)

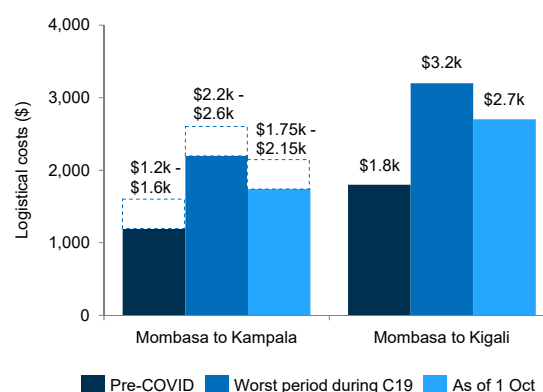
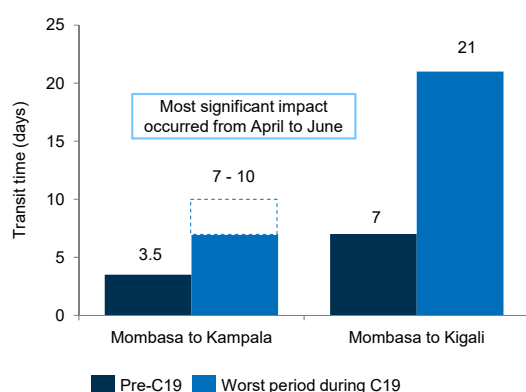
Period	Growth Rate
1 st quarter	-10.87%
2 nd quarter	-34.70%
3 rd quarter	41.31%
4 th quarter	5.64%

Source: Kompas.id

Kampala: Logistics volumes have returned to normal as of June 2021. However, truck drivers without a negative PCR test certificate must be tested at the border, resulting in longer transport times and higher transport costs compared to pre-pandemic levels (Figure 2.5.10).

Transit time increases have been driven by disruptions at major border crossings

Cost increases have been driven by increased transit times and testing requirements

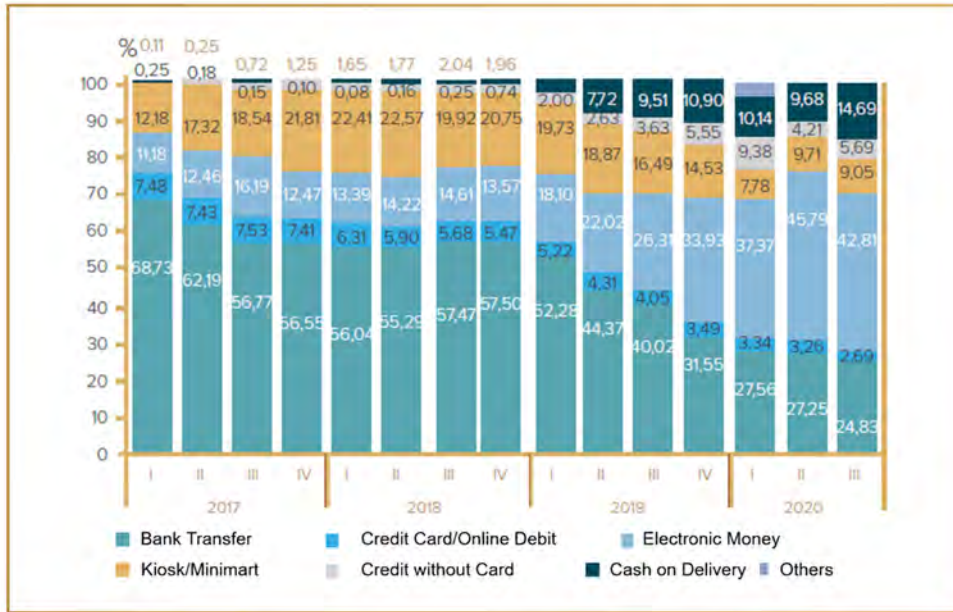


Source: JICA & BCG (2020)

Figure 2.5.10 Change in Transport Times and Costs from Mombasa to Kampala and Kigali

3) Increase in E-Commerce and increased opportunities for electronic payments

Jakarta: Digitalization of transactions is accelerating during the pandemic, with the value of digital payments in 2020 growing 29.6% over last year to IDR266.3 trillion (Bank Indonesia, 2020). The share of e-commerce transactions of eMoney was 42.81% in Q3 2020 and 41.71% in Q4, significantly higher than bank transfers and cash (Figure 2.5.11). In particular, food delivery services offered by e-hailing companies (such as Gojek and Grab) are very popular; Gojek showed a 20% increase in the value of food delivery transactions during the early stages of the pandemic. However, according to the 2019 Financial Services Authority's survey, public literacy about digital finance is low at 38%.



Source: Bank Indonesia (2020)

Figure 2.5.11 Proportion of E-commerce Payment Method in Indonesia

Yangon: Internet usage was 65% as of March 2020, a significant increase from 40% the previous year. COVID-19 has accelerated the use of online payments. E-commerce in Myanmar began to spread in 2017 and expanded further in 2019–2020. Online retailers are improving their websites, and supermarkets are offering online shopping and delivery services.

Dhaka: Mobile financial services are expanding in Bangladesh. The government has announced a total of BDT40 billion benefits for 4.1 million workers in the ready-to-wear industry, and 1.92 million new mobile financial service accounts were opened in the first two weeks of April 2020 alone. Expectations are now high for the interoperability of these services. In addition, online delivery and online services have become widely used in groceries, medicine, and health care. Chaldal, a major online grocery retailer, saw its daily order volume jump from around 5,000 before the pandemic to 10,000 to 15,000 during the pandemic. Other online sales such as electronics, medicines, and hygiene products also increased. On the other hand, food delivery orders dropped by 75–80%, partly because almost all restaurants were closed in April and May 2020 due to the lockdown. In June of the same year, food delivery giant Uber Eats pulled out of Bangladesh.

Kampala: An online shopping mechanism utilizing *boda-boda* (motorcycle taxi) was implemented by the Kampala Metropolitan Authority. The system allows boda-boda drivers to deliver goods when ordered at the market online or by phone, helping to relieve market congestion and ensure income for the boda-boda drivers. This system continues to be used by some wealthy individuals even after the lockdown is lifted.

2.5.3 Social Impact

1) Access to Housing

Dhaka: Many low- and middle-income residents who could no longer afford rent due to declining incomes moved to less expensive housing or out of Dhaka. A United Nations

Development Program (UNDP) survey found that about 70% of North Dhaka City residents were unable to pay their rent on time, and a United News of Bangladesh (UNB) survey found that residents are demanding relocation and rent reductions. On the other hand, demand for larger two-bedroom homes has been increasing since March 2020.

2) Delay in Education

Jakarta: Online classes have been introduced in response to the spread of COVID-19. Children with access to suitable infrastructure (computer, Internet, etc.) and support from teachers can continue receiving quality education, but the poor have limited access. This situation has created educational disparities and may reduce the effectiveness of education.

Dhaka: Schools in Bangladesh have been closed since 17 March 2020, affecting 40 million students. The Ministry of Education started TV education at the end of March 2020, but only 56% of Bangladesh's population has access to TV, and a study shows that only 16% of all students are watching these educational programs (BRAC Institute of Governance and Development). According to a 2019 survey by UNICEF-MICS, only 5.6% and 37% of Bangladesh households have computers and internet access, respectively, and very few households have access to online education. The impact on the poor and marginalized is particularly severe. Women not only have limited access to digital devices, but they also lose more educational opportunities due to the increase in child marriages as a result of declining family incomes. Child marriage and child labor, which have increased due to the economic distress caused during the pandemic, the failure of private schools, and the unfamiliarity of both teachers and children/students with online classes, are also contributing to the weakening educational effectiveness.

Kampala: In Kampala, all public and private schools were closed for more than six months after March 2020. The state-run broadcaster aired educational programs for primary school grades 4 through secondary school grade 6, while no programs were provided for grades 3 and below. Since September 2020, face-to-face classes have gradually resumed in schools.

3) Increased Mental Damage

Jakarta: The psychological burden on children caused by the introduction of online classes has become an issue. According to one survey of students, 28.3% of respondents felt stress and fatigue due to the online classes. Parents are also concerned about the increased expenses.

Yangon: In an October 2020 survey by U-Report and UNICEF, 75% of the 10,302 respondents indicated that they had suffered psychological damage due to COVID-19. Such damage is more severe among the elderly.

Dhaka: Many students are depressed due to unstable academics and employment, as well as financial difficulties. The government survey also found that 83% of respondents were suffering from mental stress, 28% were experiencing domestic violence, about half of fatherless families are anxious about not being able to meet their daily needs during the lockdown, and suicide and drug use are becoming more common among youth and students.

2.5.4 Environmental Impact

1) Improvement in Air Pollution

Jakarta: During the large-scale social restrictions, air pollution did not improve much, although traffic congestion decreased. According to the Ministry of Environment, NO₂ decreased in mid-April, but the U.S. Embassy states that PM_{2.5} density increased from late March to early June. Considering that PM_{2.5} travels over relatively long distances, the reason for the lack of PM_{2.5} reduction is predicted due to the operation of coal-fired power plants outside Jakarta.

Dhaka: From March 26 to May 30, 2020, Dhaka was on lockdown, restricting people's movements. The air quality in Dhaka, like in other cities, improved significantly in April, with PM_{2.5} and PM₁₀ decreasing to 62% of normal levels. According to Islam (2020), which compiles the Air Quality Index (AQI) for Dhaka, the percentage of good or moderate air quality increased in 2020 compared to 2019, and the percentage of unhealthy for sensitive groups, unhealthy, and very unhealthy decreased (Table 2.5.4).

Table 2.5.4 Change in Air Quality Index in Dhaka

AQI Level	2020	2019	2018	2017	2016
% of 'Good' AQI	1.23	0.14	2.37	0.14	0.82
% of 'Moderate' AQI	36.71	16.57	26.09	19.74	18.37
% of 'Unhealthy for sensitive group' AQI	28.07	37.39	33.33	42.90	51.16
% of 'Unhealthy' AQI	32.39	41.21	35.85	35.45	29.58
% of 'Very unhealthy' AQI	1.57	3.82	2.07	1.50	0.07
% of 'Hazardous' AQI	0	0.85	0.30	0.27	0

Source: Islam (2020)

2) Increase in Solid Waste Volume

Jakarta: The amount of household waste has increased by 36% compared to pre-pandemic levels. Medical waste from households is disposed of with general waste without segregation. These wastes are sorted by waste pickers before incineration, but these people tend to work without gloves, masks, etc. and are at high risk of infection.

Yangon: The increase in medical waste from COVID-19 has resulted in a significant increase in waste volume. From April to August 2020, the 23 isolation facilities in Yangon generated 110 tons of medical waste per month.

Dhaka: The amount of medical waste per day in Dhaka increased from 48 tons before the pandemic to 206 tons during the pandemic. Medical waste generated in Dhaka in April 2020 totaled 3,076 tons, including gloves, masks, plastic bags, and disinfectant containers. Between 8 March and November 8 2020, Dhaka residents generated 63,630 tons of medical waste and discarded an estimated 8,285,200 masks per day.

Kathmandu: Although medical waste from medical procedures, such as examinations, diagnostics, and treatments, and the use of personal protective equipment (PPE), such as masks and protective clothing, is increasing, there are only a limited number of medical facilities in Kathmandu Valley that can properly dispose of such medical waste. Much of it is

landfilled with general waste or incinerated in open environments.

Cairo: The increase in food consumption due to more time spent at home and online shopping has generated more general waste. Medical waste generated by hospitals has also increased to 100 tons per day from the previous 70 tons per day. The government has promoted reducing waste and disposing of medical waste appropriately through various campaigns, training, and guidelines. In addition, private companies started waste-to-energy projects and electricity sales in eight governorates in the country.

Nairobi and Mombasa: The quantity of infectious wastes, such as masks, increased, and the national and county governments implemented guidelines. The discharge of non-reusable plastics has also increased. Nairobi Metropolitan Service (NMS) and Kenya Power Generation Company (KenGen) are jointly operating a waste-to-energy operation. (NMS provides land and transports waste, while KenGen is responsible for plant construction, power generation, and transmission.)

2.5.5 Supportive Measures

This section summarizes the supportive measures implemented by the government in response to the impacts described above. Specifically, the measures are divided into (i) economic support, (ii) social support, and (iii) measures for economic and social restoration.

Table 2.5.5 Response Policies and Countermeasures against COVID-19

Purpose	Measures	Example
Economic support	Support for citizens	<ul style="list-style-type: none"> In-kind support Money provision Exemption from tax Exemption from utility bills
	Support for enterprises	<ul style="list-style-type: none"> Income compensation Support for public transport operators, in-kind support for drivers
	Support for new business	<ul style="list-style-type: none"> Expansion of online services Promotion of electronic payment Promotion of domestic travels
Social support	Support for the socially vulnerable	<ul style="list-style-type: none"> Support for non-registered citizens Provision of transport means for essential needs Educational support
Enhance resilience for economic and social restoration	Utilization of public spaces	<ul style="list-style-type: none"> Development of bicycle lanes Multipurpose use of road spaces
	Infection prevention measures for public transport	<ul style="list-style-type: none"> Cleaning and disinfection of vehicles Isolation facilities at stations Body temperature check at main stations Contactless fare payment Real-time information on congestion
	Promotion of DX utilizing ICT	<ul style="list-style-type: none"> Security and disinfection robots in public spaces Community health management and information dissemination

Source: JICA Study Team

1) Economic Support

(1) In-kind Support

Jakarta: Food was disbursed to 1,880 poor households covered by the Family Hope Program

(PKH) throughout Indonesia.

Dhaka: A total of 500,000 tons of rice and 100,000 tons of wheat were provided to low-income people.

Kampala: The Uganda government had planned to provide food to vulnerable groups during the first lockdown period, but in reality, poor families received nothing, prompting criticism.

(2) Financial Support

Jakarta: The government provided IDR200,000 per month for 12 months to 10 million PKH-eligible households nationwide and IDR200,000 per month for 6 months to 10 million households not eligible for PKH.

Dhaka: The government provided a total of BDT7.6 billion (approximately USD91 million) to informal sector workers. Cash support was provided to health workers and bank employees in case of infection or death.

(3) Exemption from Taxes, Utility Bills, and Debt Repayment

Jakarta: The Indonesian government took measures such as income tax and import tax exemption and advance refund of VAT.

Yangon: Taxes were exempt on medical equipment for COVID-19 treatment and infection control, as well as electricity charges for religious facilities. In addition, income tax and business tax were reduced and exempted from the second quarter of FY2020.

Dhaka: The measures include extended debt repayment period by banks, increased transaction limits for mobile payment services and contactless debit and credit cards, and refinanced loans to the agricultural sector, low-income individuals, and microenterprises.

(4) Others

Jakarta: In April 2020, the government launched the Pre-Employment Card (Kartu Prakerja) program. This program will provide financial assistance to those who lost their jobs due to the pandemic for training to re-enter the workforce.

Dhaka: The Bangladesh government has launched a BDT677.5 billion (about USD8 billion) economic stimulus package. This ran from March to June 2020 and is specifically targeted at export industries, agriculture, low-income individuals, and other affected businesses. In addition, financial assistance was provided by the World Bank, the British government, the South Asian Association for Regional Cooperation (SAARC), ADB, IMF, and other international organizations.

2) Support Utilizing Digital Technology

This section summarizes the use of digital technologies in the nine target cities and reference cities in response to COVID-19. The number of Internet subscribers in the nine target cities has been increasing rapidly overall as a result of the pandemic, with more than half of the population in seven countries (excluding Uganda and Myanmar) having access to the Internet. Especially in Indonesia, Nepal, Bangladesh, Kenya, and Cote d'Ivoire, more than 70% of the population has access.

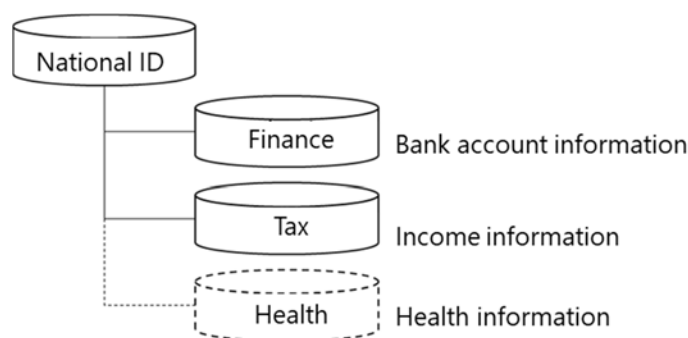
On the other hand, since most people subscribe to mobile Internet, its use is limited, and online learning, which requires large-volume data transmission, is not widespread. In addition, although contact tracking applications have been developed in most countries, less than a few percent of their population downloaded such applications, with the low penetration of smartphones as a contributing factor. Japan's COCOA had just over 25 million downloads as of November 2020, equivalent to about 20% of the population.

Table 2.5.6 Change in Internet Subscribers due to COVID-19

Country	Change in Internet Subscribers
Indonesia	January 2021: 75% of the population are Internet subscribers (10% more than in 2019) *Fixed broadband is only 10% of subscribers
Myanmar	2020: 40% of the population are Internet subscribers (mostly mobile data users)
Nepal	May 2021: Over 90% of the population are Internet subscribers. However, only 12% of public schools are online, making remote learning difficult. December 2020: 53% of the population are smartphone users. 17% are 4G-connected and the rest are 3G or slower
Bangladesh	May 2021: Over 70% of the population are Internet subscribers (90% are mobile data users) Online learning is not available because Internet access is not widespread in households.
Kenya	As of March 2021: 85% of the population are Internet subscribers. Cellphone subscribers: 57 million, 106% of the population
Uganda	March 2021: About 39% of the population are Internet subscribers June 2021: 20% of the population are smartphone users A certain amount of usage is exempted from telephone companies.
Cote d'Ivoire	March 2021: 70% of the population has Internet access (ADSL, mobile phones mostly, and only 1% of the population has fiber optic access)
Egypt	March 2021: Approx. 60% of the population are Internet subscribers (10% increase from the previous year)

Source: JICA Study Team based on various resources

In economic support, there are several cases where mobile money and national ID data are used in the provision of COVID-19 assistance payments. Outside of the surveyed countries, in Chile, in particular, following the month of discovering COVID-19-infected patients in the country (April 2020), assistance payments to low-income groups were promptly made using bank account and income information linked to national IDs. This practice has been disseminated by the UN and other organizations. In addition to these developments, a certain number of countries are using national ID data for COVID-19 vaccination.



Source: JICA Study Team

Figure2.5.12 Image of Coordin

As mentioned above, e-commerce is quickly being introduced in all countries, as face-to-face transactions are becoming more and more difficult. In Senegal, UNCTAD is supporting the construction of e-commerce websites as a national policy to help small and medium-sized enterprises continue their business. In Kenya, private e-commerce website operators provide loans to merchants based on their transaction records.

Most of the digital technologies described above require users to have smartphones and Internet access. However, in the case of supporting the socially vulnerable without access, there is a movement to apply digital technology to communities rather than individuals or households.

In Lilongwe (Malawi), a smart card system is being applied to kiosks installed at water supply stations to supply drinking water to the surrounding areas of the city to reduce overcrowding. In Indonesia, an app has been developed to educate and inform rural communities on COVID-19 and report on the status of rural areas, and volunteers were dispatched to those areas with this app to assist those having difficulties accessing the system.

Concerns

- Risk of infection at overcrowded water points (water is available for three days in the morning and evening only)
- Risk of infection by handing cash (cash is handed to attendants directly)

Digital solution

- Automated water provision with prepaid smart cards

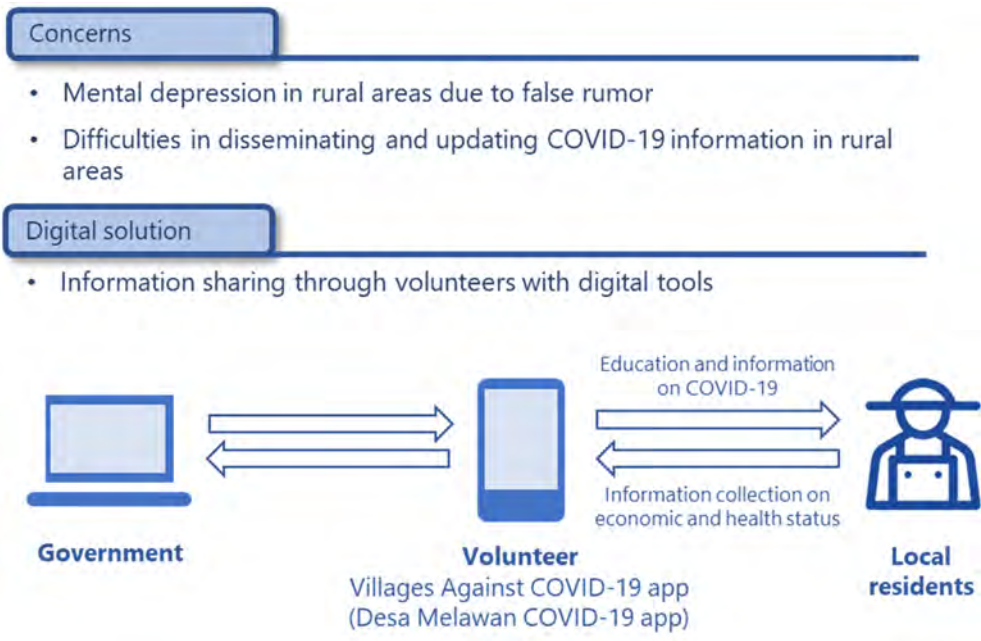


- Water is available anytime
- Automated water supply contributed to water conservation
- Attendants were reduced
- ➔ Operation cost was reduced by 65%

Source: World Bank News, 9 September 2020¹⁰

Figure2.5.13 Digital Water Provision System in Lilongwe

¹⁰ Automated Water Kiosks Provide Continuous Water for Malawians During COVID-19. (2020, September 20). Retrieved from World Bank website: <https://www.worldbank.org/en/news/feature/2020/09/09/automated-water-kiosks-provide-continuous-water-for-malawians-during-covid-19>



Source: World Bank News, 1 June 2020¹¹

Figure 2.5.14 Image of Digital Technology Utilization in Rural Areas in Indonesia

¹¹ Community Responses to COVID-19: The Resilience of Indonesia. (2020, June 1). Retrieved from World Bank website: <https://www.worldbank.org/en/news/feature/2020/06/01/community-led-responses-to-covid-19-the-resilience-of-indonesia>

2.6 Change in Urban Society and Activity due to COVID-19

With the convergence scenario of COVID-19 still not in sight, it is difficult at this stage to predict urban changes in the post-pandemic era. On the other hand, sanitation behavior established during the pandemic has led to a change in thinking about urban sanitation, which resulted in increased health and urban environmental awareness.

With the resumption of urban activities, this change in awareness and behavior due to isolation and control measures brings about changes in the social economy and people’s lifestyles. These changes are the avoidance of densification and the reduction of international/domestic/intra-city mobility, which is a fundamental change in the urban agglomeration economy and attractiveness of cities.

- (i) Freedom of movement: International/Inter-provincial/Intra-city movement
- (ii) Freedom of gathering: Business activities, social gatherings, shopping behavior

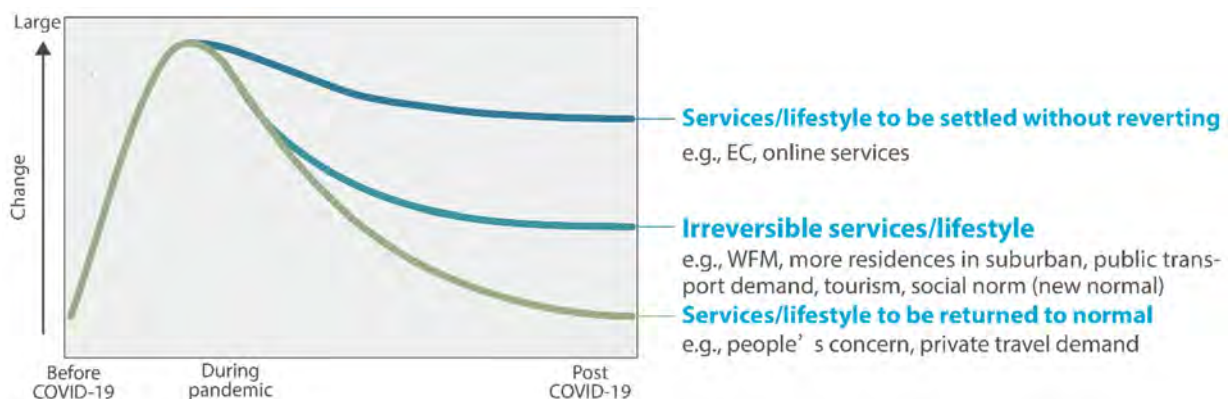
Although few quantitative findings are available on such changes in urban activities and urban society, changes in the demand for urban transportation and urban socio-economic activities have been identified in the result of field surveys in target cities.

Table 2.6.1 Change in Demand for Urban Activities Due to COVID-19

	Change in urban activities
Traffic demand	<ul style="list-style-type: none"> • Reduction in travel frequency • Shift from public transport to private modes • Leveling off demand • Rising non-motorized transport (NMT) demand
Urban demand	<ul style="list-style-type: none"> • Decline in demand for business use in city centers • Revisit of neighborhood commercial facilities • Rise in urban space use

Source: JICA Study Team

Figure 2.5.1 shows possible conceptual image about expected changes in urban socio-economic activities as the pandemic converges. At this stage, these are only hypotheses, but based on these, the expected status of cities in the post-pandemic era can be examined.



Source: JICA Study Team

Figure2.6.1 Change in Expected Status of Cities and Required Urban Responses during and after Pandemic

2.6.1 Change in People's Movement

1) Changes in People's Travel Volume by Destination

Google has been publishing the Google Community Mobility Report (GCMR) since April 2020. It gives a summary of region-wise mobility trends by destination categories (see Table 2.6.2) compiled based on the location information collected through Google Map. Each value represents the amount of change in travel volume by day of the week based on the median value by day of the week on the base date (3 January–6 February 2020).

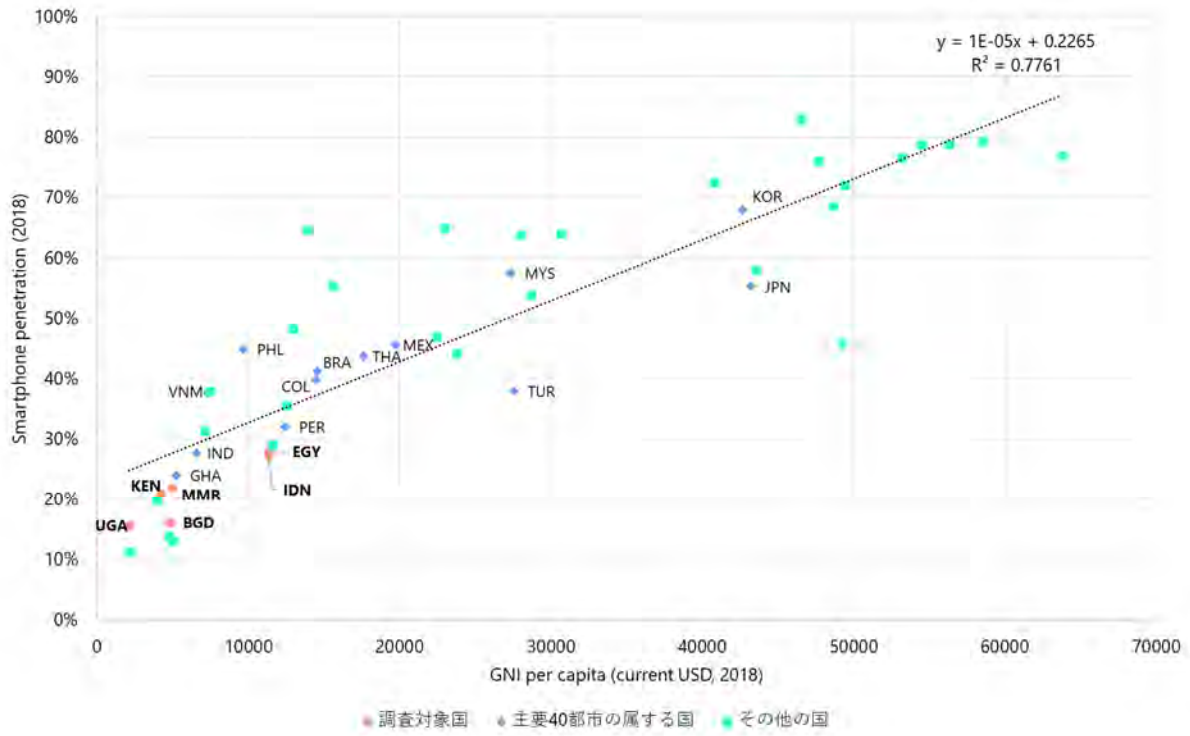
Table 2.6.2 Destination Categories of Google Community Mobility Report

Category	Facilities
Retail and recreation	Restaurants, cafes, shopping centers, theme parks, museums, libraries, movie theaters, etc.
Grocery and pharmacy	Grocery stores, food wholesalers, fresh markets, high-end grocery stores, drug stores, pharmacies, etc.
Parks	Local parks, national parks, public beaches, marinas, dog parks, plazas, gardens, etc.
Transit stations	Public transportation hubs (e.g., subway, bus, train stations), etc.
Workplaces	Workplaces
Residential	Residential

Source: GCMR

Since the GCMR is based on the location information of mobile devices, its reliability depends on the penetration of mobile devices in each country. Figure 2.6.2 shows the relationship between the 2018 smartphone penetration rate (percentage of smartphone users among the population) published by Newzoo¹² and the per capita current GNI (USD) for 50 countries published by WB. There is a strong correlation between the two ($R=0.8810$). In this survey, five countries (cities) are selected from those with smartphone penetration rates of 40% or higher (or current GNI per capita of approximately USD20,000 or higher), taking into consideration the infection situation in each country (city) as described in Chapter 2.2 and infection prevention measures as described in 0. Two countries (Indonesia and Egypt) are also selected since they have a relatively high smartphone penetration rate among the eight target countries. The period covered was from 1 March 2020 to 12 June 2021.

¹² Newzoo Global Mobile Market Report 2018. (2018, September 11). Retrieved from Newzoo website: <https://newzoo.com/insights/trend-reports/newzoo-global-mobile-market-report-2018-light-version/>



Source: newzoo (2018), WB

Figure 2.6.2 Relationship between Smartphone Penetration Rate and Current GNI per Capita

Table 2.6.3 Target Countries/Cities for GCMR Analysis

Group	Country	City	Cumulative infected cases per 100,000 population (As of end of 2020)	Intensity of stay-at-home requirement (see 2.3.2)	Smartphone penetration rate	Current GNI per capita (2018, USD)
1	Brazil	Sao Paulo	3184.5 人	B	41.3%	14,530
	Indonesia	Jakarta	1802.3 人	B	27.4%	11,310
	Singapore	Singapore	1,025.8 人	A	N/A	90,510
2	Japan	Tokyo	429.6 人	B	55.3%	43,220
	Egypt	Cairo	137.5 人*		28.0%	11,350
3	Thailand	Bangkok*	27.3 人	A	43.7%	17,630
4	Taiwan	Taipei*	0.30 人	N/A	N/A	26,421

Note: As the GCMR data of Bangkok and Taipei is not available, the data of Thailand and Taiwan was used. Cumulative infected cases shown here is the city-scale data (except for Cairo) and the country-scale data for Cairo.

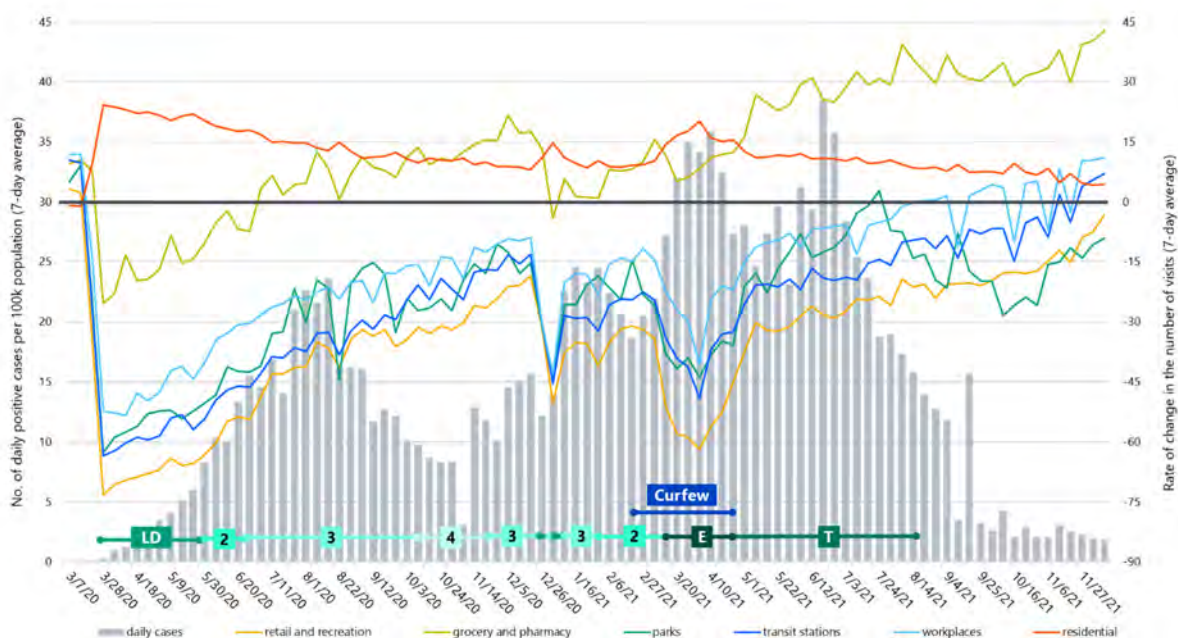
Source: JICA Study Team based on several materials, Newzoo (2018), and WB

(1) Sao Paulo

Figure 2.6.3 summarizes the changes in the number of infected persons per 100,000 persons and the people’s movement (daily averages by week) from March 2020 to mid-June 2021 in Sao Paulo, as well as the stay-at-home measures. Sao Paulo State had four phases of mitigation for the resumption of economic activities until March 2021, depending on the infection status of each region (see Table 2.6.1). However, the infection situation has worsened since March 2021, and an emergency phase was introduced with further restrictions on businesses, gatherings, and the use of public spaces. In the transition phase, which began in mid-April, commercial and cultural facilities were reopened in phases.

The travel trends show that with the lockdown measures introduced on 24 March 2020, visitors to retail and recreation, transit stations, and workplaces dropped by more than 50%, while those staying at home increased by about 24%. This indicates that many people have refrained from leaving their homes. The gradual decrease in the number of people staying at home and the gradual increase in the number of visitors to other facilities suggest that people were returning to their pre-pandemic activities even during the lockdown period. The travel volumes increased even more with the lifting of lockdown on 1 June 2020 and the transition to Phase 3 on 25 June. This trend continued to increase even during the peak period of July to August, while the rate of increase slowed down slightly. In particular, travel to grocery and pharmacy recovered early, while travel to retail, recreation, and transit stations was slower. The rate of increase in the number of people at home declined to about +8% in mid-December, despite the transition to Phase 3 on 30 November 2020 that restricted economic activities again.

After some recovery in the amount of travel, Sao Paulo experienced New Year's vacation and summer vacation, and at the same time, a variant was confirmed in the Amazon area, leading to a spread again of the disease in 2021. After the New Year's, curfew restrictions were tightened to Phase 3 and then to Phase 2, resulting in reduced travel, especially to retail and recreation areas and transit stations. In March 2021, when the emergency phase was introduced following the widespread infection cases, travel volume declined sharply, but not as much as in the March 2020 lockdown, with grocery and pharmacy +10%. The transition phase since 18 April 2020 has seen an even more rapid increase in travel volume than when the 2020 lockdown was lifted.



Note: Curfew restrictions measures show the measures taken in Sao Paulo metropolitan area.

LD: Lockdown, 2-4: Phases 2-4, E: Emergency Phase, T: Transition Phase

Source: JICA Study Team based on official materials and Google Community Mobility Report

Figure2.6.3 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Sao Paulo

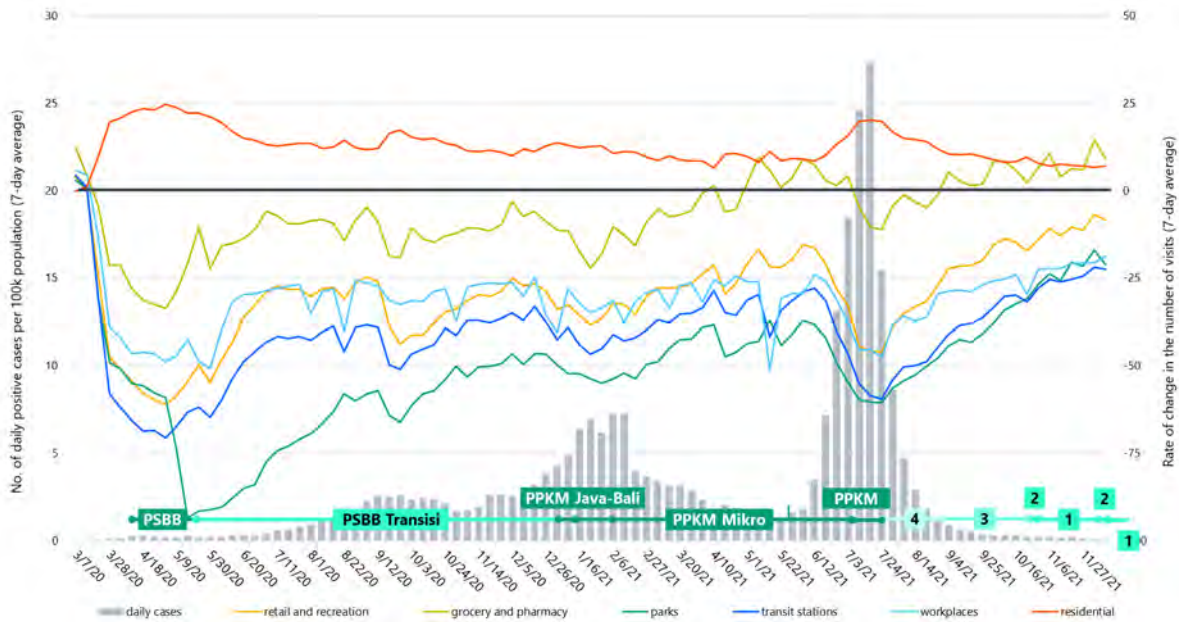
Table 2.6.4 Measures to Resume Economic Activities in Sao Paulo

	Phase 1 (lockdown)	Phase 2	Phase 3	Phase 4
Shopping centers, department stores	Operation prohibited	<ul style="list-style-type: none"> • Less than 20% capacity • Open for 4 hours • Food court prohibited 	<ul style="list-style-type: none"> • Less than 40% capacity • Open for 6 hours • Inside food court prohibited 	<ul style="list-style-type: none"> • Less than 60% capacity
General commercial facilities	Operation prohibited	<ul style="list-style-type: none"> • Less than 20% capacity • Open for 4 hours • Food court prohibited 	<ul style="list-style-type: none"> • Less than 40% capacity • Open for 6 hours 	<ul style="list-style-type: none"> • Less than 60% capacity
Service facilities	Operation prohibited	<ul style="list-style-type: none"> • Less than 20% capacity • Open for 4 hours 	<ul style="list-style-type: none"> • Less than 40% capacity • Open for 6 hours 	<ul style="list-style-type: none"> • Less than 60% capacity
Restaurants	Operation prohibited	Operation prohibited	<ul style="list-style-type: none"> • Outside only • Less than 40% capacity • Open for 6 hours 	<ul style="list-style-type: none"> • Less than 60% capacity
Beauty salons, barbers	Operation prohibited	Operation prohibited	<ul style="list-style-type: none"> • Less than 40% capacity • Open for 6 hours 	<ul style="list-style-type: none"> • Less than 60% capacity
Sports gym	Operation prohibited	Operation prohibited	Operation prohibited	<ul style="list-style-type: none"> • Less than 60% capacity
Other facilities causing congestion	Operation prohibited	Operation prohibited	Operation prohibited	Operation prohibited

Source: Shizuoka Prefecture Regional Diplomatic Office

(2) Jakarta

Figure 2.6.4 summarizes the changes in the number of infected persons per 100,000 persons and the people's movement (daily averages by week) from March 2020 to mid-June 2021, as well as the stay-at-home measures. The travel volume declined from before the issuance of the PSBB, with transit stations falling to about -70%, retail and recreation and parks to about -60%. During the PSBB period, travel to workplaces declined to about -50%. Through the phase of gradual resumption of economic activities while limiting capacity (PSBB Transisi), the travel volume gradually increased, and by November 2020, parks were about -50%, transit stations about -37%, and retail, recreation, and workplaces about -30%. In January 2021, a more severe capacity restriction was imposed in Java and Bali (PPKM Java-Bali) due to an outbreak of infection, but the decrease in travel volume was minimal. After the transition to the neighborhood (RT/RW)-based activities restrictions (PPKM Mikro), travel volume has been gradually recovering.



Note: PSBB: large-scale social restrictions, PSBB Transisi: transitional large-scale travel restrictions, PPKM Java-Bali: activities restrictions in Java and Bali, PPKM Mikro: activities restrictions in small units

Source: JICA Study Team based on official materials and Google Community Mobility Report

Figure 2.6.4 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Jakarta

(3) Singapore

Figure 2.6.5 summarizes the changes in the number of infected per 100,000 persons and the people’s movement (daily averages by week) from March 2020 to mid-June 2021 in Singapore, as well as the stay-at-home measures. Urban activity volume dropped sharply after the circuit breaker on 7 April 2020, which banned businesses, except for certain industries, and closed schools. This trend was particularly seen in retail and recreation, transit stations, parks, and workplaces, where visits dropped by more than 60%, while the number of people at home increased by more than 40%. With the transition to Phase 1 on 2 June 2020 (reopening of some businesses and schools) and Phase 2 on 19 June 2020 (reopening of almost all stores), there was a rapid recovery, especially in retail and recreation, transit stations, parks, and workplaces, which initially showed a significant decline. From August 2020 to May 2021, although Christmas, New Year’s holidays, and Chinese New Year were observed, the change in travel volume was generally small, with about +15% for those at home, about +/-0% for grocery and pharmacy, about -15% for retail and recreation, parks, and workplaces, and about -25% for transit stations. However, following the discovery of clusters in medical facilities, Phase 3 (heightened alert) and Phase 2 (heightened alert) measures were implemented on 4 May and 16 May, respectively, imposing restrictions on workplace contact and eating and drinking inside stores. As a result, the travel volume decreased again, with retail and recreation and transit stations falling by about -45%. Since then, the travel volume has repeatedly increased and decreased with infection status and policy intensity.



CB: Circuit breaker, 1–3: Phase 1–3, 2+: Phase 2 (heightened alert), 3+: Phase 3 (heightened alert)

Source: JICA Study Team based on official materials and Google Community Mobility Report

Figure 2.6.5 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Singapore

(4) Tokyo

Figure 2.6.6 summarizes the changes in the number of infected per 100,000 persons and people’s movement (daily averages by week) from March 2020 to mid-June 2021 in Tokyo, as well as the stay-at-home measures. Activity declined with the declaration of the state of emergency, with transit stations, retail and recreation, and workplaces decreasing by about 60% from April to May. On the other hand, parks decreased by about -15%, which is a slightly smaller decrease than in other cities except Taipei, where no curfew restrictions were imposed. The number of people at home increased to about 25%. After the declaration of the state of emergency was lifted, the volume of urban activity gradually recovered from June to July, with the residential sector at about +10%, grocery and pharmacy at about -5%, parks at about -15%, workplaces and retail and pharmacy at about -20%, and transit stations at about -30%, while some increase or decrease can be seen after July due to public holidays. The state of emergency was re-declared on 7 January 2021 due to a sharp increase in the number of infected people during the New Year season. However, the decrease in travel was from two-thirds to half of that during the first emergency declaration and travel increased gradually even during the emergency declaration period. After a one-month period of priority measures to prevent the spread of the disease (quasi-state of emergency), a state of emergency was declared again on April 25, but again the decrease in the amount of movement was small.

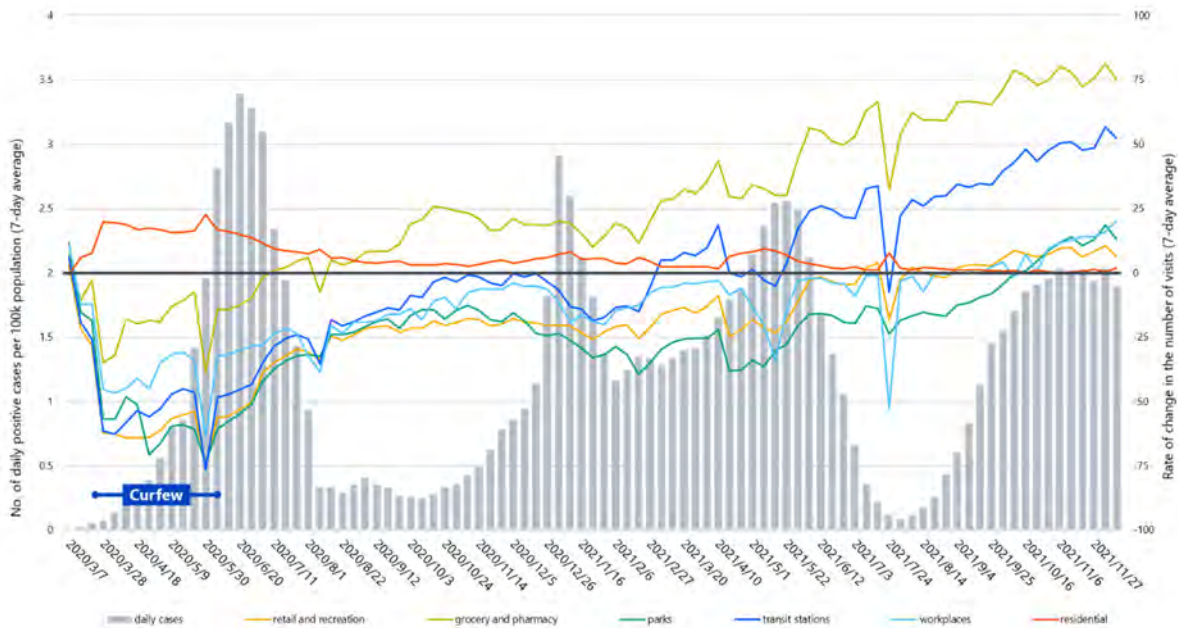


SOE: state of emergency, PM: priority measures to prevent the spread of the disease (quasi-state of emergency)
 Source: JICA Study Team based on official materials and Google Community Mobility Report

Figure 2.6.6 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Tokyo

(5) Cairo

Figure 2.6.7 summarizes the changes in the number of infected persons per 100,000 persons and the people’s movement (daily averages by week) from March 2020 to mid-June 2021 in Cairo, as well as the stay-at-home measures. The number of infected cases shown here is the country-scale data. In Egypt, the nighttime curfew, restrictions on opening hours of stores and restaurants, and closure of schools have been implemented since March 2020, and the travel volume decreased by more than 50% in parks, retail and recreation, and transit stations, and by more than 30% in workplaces. Since the end of May, after Ramadan, the number of infected cases has increased sharply but the curfew has eased and travel volume increased. By October 2020, when infections remained low, there was a trend towards recovery in urban activities, with the travel volume to parks and retail and recreation at about -10% to -15% and to workplaces, residential, and transit stations at about +/-0%. The trend has been similar since then, except during January–February 2021, just after the resurgence of the number of infected people and during Ramadan in April–May 2021. The travel volume to transit stations has been very high since March 2021, ranging from +15% to +40%.



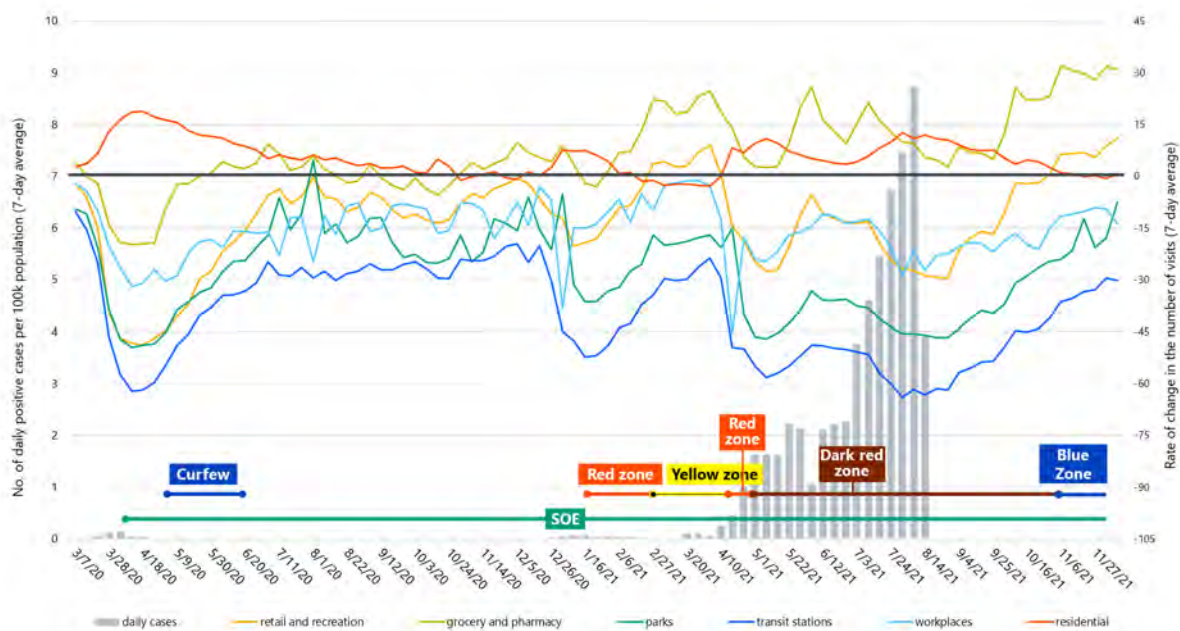
Source: JICA Study Team based on official materials and Google Community Mobility Report

Figure 2.6.7 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Cairo

(6) Bangkok

Figure 2.6.8 summarizes the changes in the number of infected per 100,000 persons and people’s movement (daily averages by week) from March 2020 to mid-June 2021 in Bangkok, as well as the stay-at-home measures. It should be noted that the GCMR data is for Thailand as a whole. In Bangkok, a state of emergency was declared in mid-March and a curfew was imposed in early April, resulting in a decrease in travel volume. In particular, transit stations decreased by more than 60%, retail and recreation and parks by about 50%, while workplaces decreased by approximately -30%, which is a small decrease compared to other cities. The number of infected persons quickly decreased and travel volume gradually increased, even during the curfew period. By July–November 2020 when the infection situation had calmed down, the travel volume was almost unchanged, except for parks, which may have been affected by the rainy season (residential and grocery and pharmacy were almost at pre-pandemic levels, retail and recreation were about -7%, workplaces were about -13%, parks were about -16%, and transit stations were about -27%). Excluding parks, this trend is similar to Singapore, which is also in Southeast Asia and where the spread of the disease had not been severe comparatively.

By 2021, Bangkok and the surrounding regions experienced a surge in infected cases, and infection prevention measures were implemented by province according to infection status. Facilities causing congestion were closed from 22 January 2021, schools were closed from mid-April, and eating and drinking inside stores were banned from 1 May 2021. In response to these measures, the travel volume declined sharply in January and again in April and May. A smaller decline was seen in retail and recreation than in March 2020, and an increase in grocery and pharmacy was observed more than the baseline, partly since the 2021 regulations allowed shopping malls to remain open. On the other hand, travel volume to workplaces, parks, and transit stations decreased to the same level as in March 2020.



Note: SOE: state of emergency

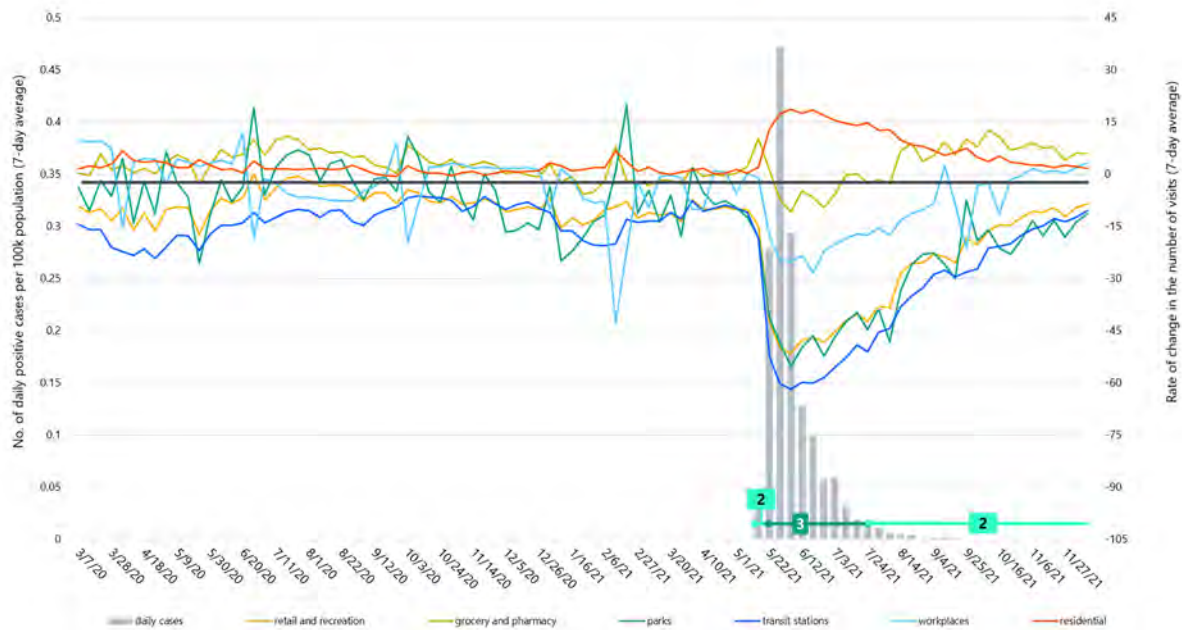
Source: JICA Study Team based on official materials and GCMR

Figure 2.6.8 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Bangkok

(7) Taipei

Figure 2.6.9 summarizes the changes in the number of infected per 100,000 persons and the people’s movement (daily averages by week) from March 2020 to mid-June 2021 in Taipei, as well as the stay-at-home measures. Taiwan has implemented four-scale infection prevention measures according to the infection status, as shown in Table 2.6.5. The infection is controlled until May 2021, and the change in the volume of travel is small compared to other cities. However, transit stations and retail and recreation experienced relatively large declines, averaging about -13% and -9% from March 2020 to April 2021, respectively.

In May 2021, the city experienced a community infection case and raised its quarantine level to level 3. As a result, the travel volume declined significantly, with transit stations at approximately -60% and retail and recreation and parks at approximately -50%.



2: quarantine level 2, 3: quarantine level 3

Source: JICA Study Team based on official materials and Google Community Mobility Report

Figure 2.6.9 Change in Infected Cases, Stay-at-Home Measures, and Travel Volume in Taipei

Table 2.6.5 Step-by-Step Economic Activity Mitigation Measures in Taiwan

	Quarantine level 1	Quarantine level 2	Quarantine level 3	Quarantine level 4
Condition	Sporadic community infections due to imported cases	Community infection with unknown transmission routes	Three clusters per week or more than 10 community cases per day with unknown infection route	More than 100 cases of average daily community infection over a 14-day period, and half of the cases have no known infection route
Mask wearing	Places with a lot of people Public transportation	Fines for not wearing	Whenever outside	Always
Criteria for ban on gathering	Recommend cancel or postpone	Outdoor: 500+ Indoor: 100+	Outdoor: 10+ Indoor: +5	All gatherings
Others	Liaison system, body temperature check, disinfection, maintenance of social distancing	Closure of leisure facilities and public spaces if necessary	Testing at cluster areas	School and office closure, lockdown at areas with severe status

Note: Liaison system means the system to can get in touch with close contacts immediately in case infection testing becomes necessary.

Source: YS Consulting Group (website: <https://www.ys-consulting.com.tw/>)

2) Change in Traffic Volume

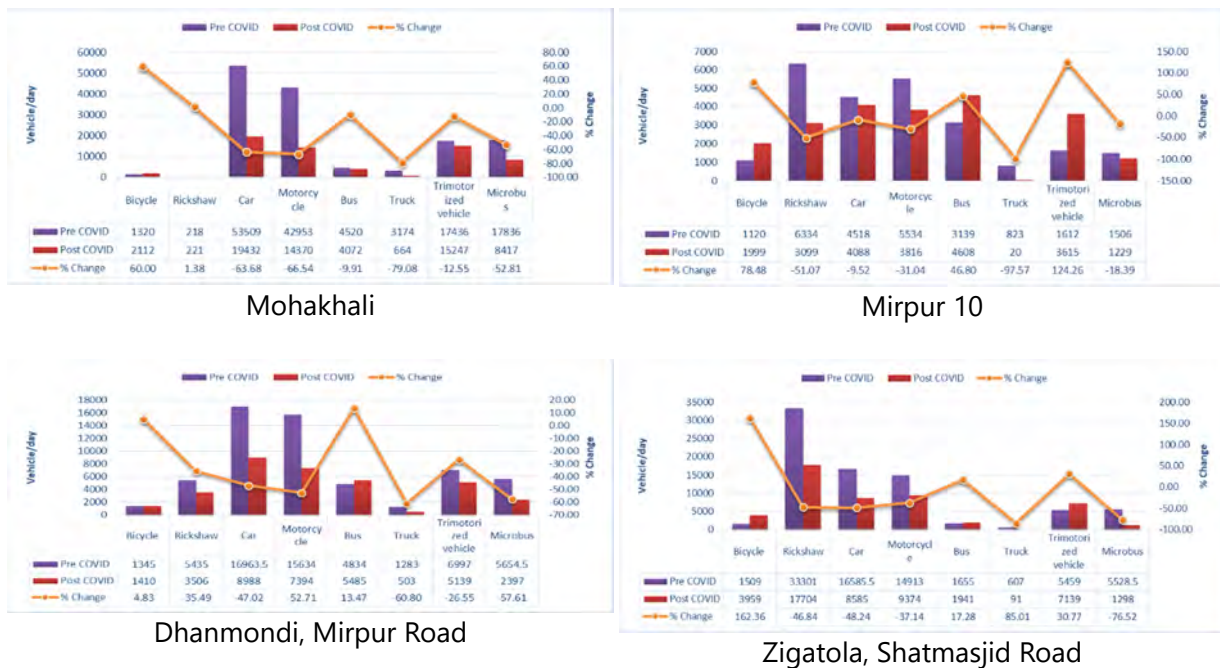
Jakarta: According to the Indonesian Bicycle Entrepreneurs Association, the demand for bicycles increased by three to four times during the pandemic. The DKI Jakarta government started a bicycle sharing project. The surveys by the Ministry of Transport in March 2020 and by a newspaper company in May 2020 revealed that more than half of the respondents were not returning to their hometowns during the Eid period (57% and 95.7%, respectively).

Dhaka: Figure 2.6.11 shows the comparison of traffic volume by mode based on the traffic volume survey conducted before the pandemic (January–April 2019) and during the pandemic (December 2020–January 2021) at four locations shown in Figure 2.6.10. The increase in cyclists was observed in all locations. The number of rickshaws, cars, and motorcycles decreased partly because of the closure of offices and education facilities. At Mirpur 10 and Zigatpla, Shatmasjid Road, the bus users increased with the new bus routes in operation.



Source: JICA Study Team

Figure 2.6.10 Location of Traffic Volume Survey in Dhaka



Source: JICA Study Team based on the Dhaka Mass Rapid Transit Development Project (Line 1 and 5) (JICA)

Figure 2.6.11 Change in Traffic Volume between before and during Pandemic

Traffic speed surveys were also conducted in January 2019 and February 2021 at the locations shown in Table 2.6.6. The results for all survey locations are tabulated in Table 2.6.7, showing that traffic speeds increased for both cars and buses as traffic volume decreased.

Table 2.6.6 Location of Traffic Speed Survey in Dhaka

No	Pre-COVID-19 Survey time: 23 June 19		Post-COVID-19 Survey time: 23 February 2021	
	Route	Distance (km)	Route	Distance (km)
01	Gabtolli to Azimpur	9.4	Gabtolli to Azimpur	9.4
02	Kakoli to Kakrail	9.5	Kakoli to Kakrail	9.5
03	Uttara to Kamalapur	16.7	Gabtolli to natunBazar	12.4
04	Azimpur to jatrabari	5.2	uttara (jasimuddin) to Saidabad	18.9
05			Mohakhali to Gulistan	8.8

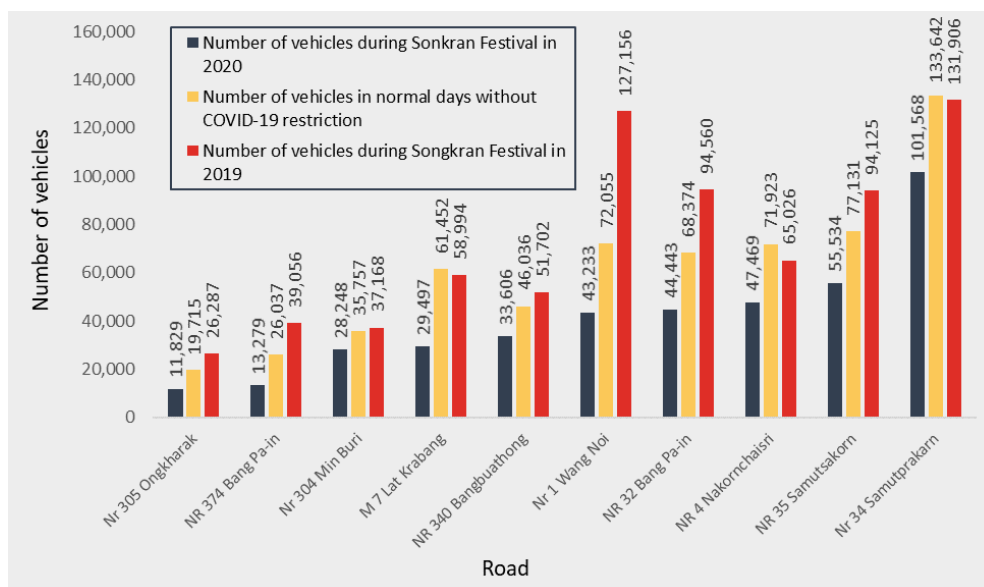
Source: JICA Study Team based on the Dhaka Mass Rapid Transit Development Project (Line 1 and 5) (JICA)

Table 2.6.7 Change in Traffic Speed

	Car travel speed (km/h)			Bus travel speed (km/h)			Bus running speed (km/h)		
	Pre COVID	Post COVID	Speed increase after COVID	Pre COVID	Post COVID	Speed increase after COVID	Pre COVID	Post COVID	Speed increase after COVID
Morning peak	12.72	21.06	8.34	10.56	15.07	4.52	12.28	21.16	8.88
Inter peak	11.08	13.71	2.63	9.52	11.30	1.78	11.65	15.30	3.65
Evening peak	12.09	13.41	1.32	8.21	10.33	2.13	9.04	12.73	3.69
Avg. Speed	11.96	16.06	4.10	9.43	12.23	2.81	10.99	16.40	5.41

Source: JICA Study Team based on the Dhaka Mass Rapid Transit Development Project (Line 1 and 5) (JICA)

Other cities: In Bangkok, the traffic volume on arterial roads during the Thai New Year (Songkran) in April 2020 was 33% lower than normal and 44% lower than the same period in 2019 (Figure 2.6.12). In addition, only 37 traffic accidents occurred during Songkran, with the number of traffic accidents, fatalities, and injuries decreased by 81%, 87%, and 89%, respectively, compared to the same period in 2019.



Source: THAI PBS News and The Project for Promoting Sustainability in Future Cities of Thailand Phase 4 and 5 (JICA)

Figure 2.6.12 Traffic Volume on Arterial Roads around Bangkok during Songkran in 2019 and 2020

2.6.2 Demand for Urban Development and Land Use

Jakarta: The Ministry of Public Works has decided to allocate 37% of its budget to mitigate the effects of COVID-19 (e.g., hospital construction), causing delays in many infrastructure projects implemented by the ministry, including toll roads, bridges, dams, irrigation, high-speed rail, and new capital construction.

Out of the projects implemented by PT. Pembangunan Perumahan, a state-owned enterprise, 31 projects, or 24% of the total, are experiencing delays or temporary construction stoppages, and some projects have been suspended due to designation as a red zone with high infection risk. Furthermore, in Jakarta, sidewalk repairs are underway, but the budget of IDR1.2 trillion allocated before the pandemic has been reduced to IDR20 billion, and only about 10% of the targeted 100 km has been completed. Private developers are also delaying development projects due to the unstable economic situation. Real estate developers with mixed-use developments have seen a 31% to 50% drop in sales. The pandemic has also reduced people’s purchasing power, which has had a significant impact on the private sector.

In 2021, the office floor area is expected to increase by 9.2% y/y, but demand for office floors will decline, resulting in a possible surplus. Meanwhile, the occupancy rate for office floors has been on a downward trend since 2013, falling from 80.6% in 2020 to an estimated further decline of 77.9% in 2021 (Figure 2.6.13). This is estimated to result in a 1% decline in rental rates in the CBD and a 5% decline outside the CBD. While some companies have been forced to reorganize their office space due to the prevalence of telecommuting, there is also a growing focus on coworking spaces, which are more flexible office spaces.



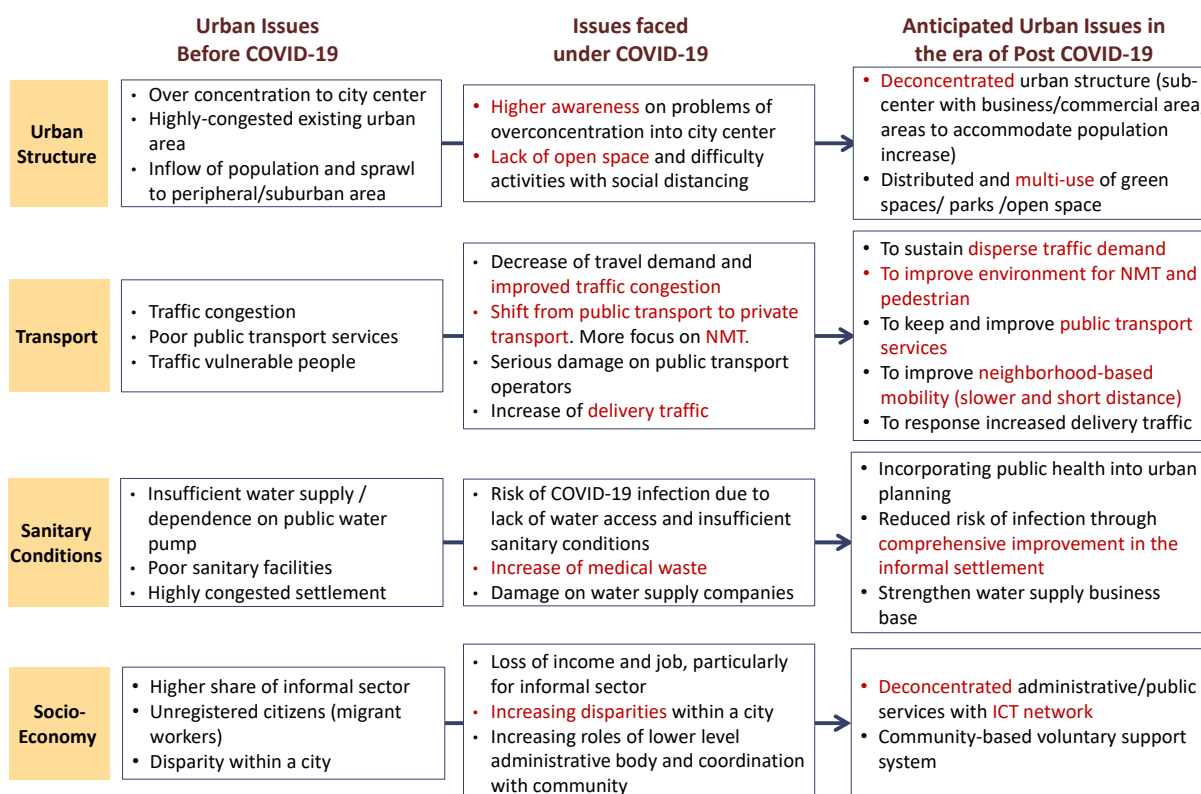
Source: Kompas.com

Figure 2.6.13 Provision of Office Floor and Occupancy Rate in Jakarta

Yangon: The pandemic had a significant impact on urban development projects, but the coup that began in February 2021 was more severe. As of May 2021, almost all urban development projects have been suspended and are unlikely to resume.

2.7 Change in Issued of Cities in Developing Countries during Pandemic

Based on the previous analysis, changes in urban issues in developing countries are summarized with the arrival of the COVID-19 pandemic in terms of urban spatial structure, transportation, urban sanitation, and urban socio-economy, which are closely related to COVID-19. The challenges expected for the post-pandemic era are also examined, based on the changes in urban society and activities observed during the pandemic, as summarized in Chapter 2.6. Since the issues faced by cities themselves vary greatly from city to city, this section summarizes the challenges that are considered common to cities in developing countries. The challenges unique to each city are summarized in Chapter 5 and subsequent Chapters.



Source: JICA Study Team

3 Review of the Expected Status of Cities in With-COVID-19 and Post COVID-19 Eras

National government agencies, international organizations, and academia are disseminating their opinions on the expected status of the cities with COVID-19 and post-COVID-19 and policies toward them. Discussions in the major literature are summarized below.¹

3.1 Discussions on Post COVID-19 Cities by International Organizations and Donors

3.1.1 United Nations

1) Policy Brief: COVID-19 in Urban World (July 2020)

While cities are at the center of the spread of COVID-19, with 90% of the COVID-19 cases reportedly concentrated in cities, cities can manage this crisis and remain as hubs of energy, resilience, and innovation. However, given that COVID-19 specifically affects vulnerable sectors of society, policies should focus on disparities, local capacity, and green and inclusive recovery.

While the role of local government was particularly important during the pandemic, a drop in the economic activity is expected to reduce tax revenues by 15–25% by 2021, which could lead to reduced infrastructure investment, lower public services, and hamper efforts toward sustainable development. These effects are not limited to cities, but throughout the country, with severe impacts particularly on the informal sector and women.

Adequate housing is needed to maintain social distancing and implement sanitation guidelines that would be effective in preventing the spread of COVID-19 infection. Public transport has seen a sharp decline in passengers and revenues, which raises the concerns about the provision of safe and sustainable public transport services. On the other hand, the encouragement of bicycling and walking has prompted a rethinking of road space. Studies have shown that air pollution is related to COVID-19 lethality, and the improved air quality and greenhouse gas emission reductions during the pandemic must continue. In addition, COVID-19 has accelerated the trend toward digitization and telecommuting, both of which may have implications for widening inequality and migration within cities.

Cities must rethink and reform themselves to cope with the realities of COVID-19 and future pandemics. To build resilient cities against future crises in an increasingly urbanized world, it is necessary to take long-term measures while continuing to implement short-term measures.

To achieve these goals, the following three areas need to be addressed.

(i) Tackling Inequalities and Development Deficits

The impact of COVID-19 varies greatly depending on the socioeconomic situation in which a person is located. Disparities in housing, health, basic infrastructure, public space, digital access were highlighted. It is important for local governments to take measures to protect vulnerable groups, reduce intra-urban inequalities, strengthen human rights, and enhance resilience.

¹ This chapter summarizes mainly about discussion in 2020 and early 2021.

- Understand inequalities and commit to disaggregated data gathering and utilization
- Provide safe shelter for all and consider a moratorium on all evictions
- Make large-scale public investments in affordable and adequate housing and slum upgrading
- Ensure that public services are uninterrupted, equally accessible for the urban poor and other vulnerable groups and payments in default forgiven or deferred
- Ensure equitable access to health supplies, facilities, and resources
- Guarantee equitable distribution of vaccines
- Ensure the most marginalized communities and individuals play leadership roles in immediate response, design, and planning efforts

(ii) Strengthening the Capacities of Local Actors, Particularly Local Governments

Local governments were important in the response to COVID-19, but they were severely limited in terms of service delivery and investment in infrastructure. On the other hand, there were innovations such as contact tracing and administrative services through digital technology. The central governments are required to support these initiatives.

- Ensure collaboration across levels of government and subnational jurisdictions
- Enhance local government budgetary capacity with policy measures and dedicated funds in stimulus packages
- Promote accountability and transparency
- Ensure communication campaigns reach all urban communities
- Support local governments in avoiding disruptions of essential public services

(iii) Pursuing a Resilient, Inclusive, Gender-equal and Green Economic Recovery

The pandemic caused significant damage to tourism and other industries, as well as to global value chains, resulting in a wave of unemployment, especially in the informal sector. On the other hand, environmental impacts improved in the short term as a result of lockdowns and reduced economic activity. Strengthening resilience for the future is a common global priority. Creating resilient cities requires addressing socioeconomic vulnerable groups, using data for urban planning, and investing in climate resilience.

- Bolster micro, small, and medium enterprises (MSMEs) and support the safe reopening of businesses
- Formulate sustainable economic development strategies
- Social protection for marginalized groups, including the informal sector
- Build future-ready cities by supporting eco-friendly and job-creating sectors
- Create compact cities with adequate housing and public green spaces
- Formulate resilience plans utilizing disaggregated data
- Develop preparedness plans for predictable disasters and investments in resilience enhancement against multiple hazards

The response to COVID-19 revealed that the society could change and adapt to the surroundings. It is necessary to direct cities toward becoming resilient, inclusive, eco-friendly, and economically sustainable.

3.1.2 UN-Habitat

1) Cities and Pandemics: Towards a More Just, Green and Healthy Future (March 2021)

Cities have been at the forefront of COVID-19 transmission. When lockdowns and other infection control measures were taken, the impact on urban economies was severe. The risk of COVID-19 for urban residents is high due to inequality, inadequate housing, and lack of access to clean water, sanitation, and solid waste disposal. On the other hand, there is no evidence that urban density was a decisive factor in the spread of the virus, and carefully planned density is a prerequisite for cost-effective and environmentally sound service delivery. Thus, the key dichotomy would be "balanced density and adequate services" and "overcrowding and excluded settlements/slums," and efficient management and control of COVID-19 will not be achieved unless inequalities and exclusions in urban areas are addressed. With this in mind, this report outlines the current urban context and various policies for sustainable recovery, with particular attention to the following four points.

(1) Rethinking the Form and Function of the City

The need to consider health through blue and green networks, public spaces, food systems, mobility, housing, and access to basic services when planning a built environment was reaffirmed. Urban forms and systems must be reconfigured to be sustainable and inclusive as well as resilient. Compact design, mobility, and mixed land use are required at various scales. At each of the regional, city, neighborhood, and building scales, the items listed in Table 3.1.1 are proposed.

Table 3.1.1 Proposal of Cities and Pandemics: Towards a More Just, Green and Healthy Future

Scale	Proposal
Regional	<ul style="list-style-type: none"> • Establish decision-making platforms among cities and regions and enhance collaboration. • Implement environmental protection measures, such as establishing blue and green networks and urban expansion boundaries, preventing land use conversion, ecological degradation, and spreading animal-borne infectious diseases and air pollutants. • Establish strict guidelines that prioritize air quality and public health. Apply carbon taxes, emissions trading to heavy industry, construction and demolition, and deforestation. • Emphasize and improve connectivity between cities and regions and ensure the movement of logistics, services, and labor to reduce the socioeconomic impact of infectious diseases. • Strengthen localized supply chains for essential goods (such as food and medical supplies).
City	<ul style="list-style-type: none"> • Improve vulnerable urban areas in terms of both structure and space to increase resilience to future crises. • Promote equal access to urban services and amenities under compact, carefully planned densities and mixed-use developments that enhance healthy lifestyles and a sense of community. • Rethink zoning and building standards to allow for high-density residential areas while requiring a design that encourages pedestrian distribution and walkability. • Ensure that public transport is safe, affordable, reliable, and efficient, and take steps to prevent the spread of infectious diseases. • Build urban structures that are compact and highly accessible to public transport. Such a structure will encourage health-promoting activities such as walking and bicycling.
Neighborhood	<ul style="list-style-type: none"> • Focus on neighborhoods in urban planning. Promote socially inclusive communities where necessary services and amenities are available within the neighborhood. • Develop the necessary knowledge and tools to ensure effective neighborhood strategies are based on local, granular decision-making. • Place accessibility and inclusiveness at the center of neighborhood strategies. • Recognize the multifunctionality of public spaces, such as streets, sidewalks, and plazas, and ensure the variety of usages is respected. The flexibility and adaptability of public spaces are demonstrated, especially during the pandemic with emerging needs.

Scale	Proposal
	<ul style="list-style-type: none"> • Design, provide, and manage a system of public spaces that are distributed yet connected through urban planning. • Convert existing neighborhoods in urban centers to provide space for mixed uses.
Building	<ul style="list-style-type: none"> • Place adequate housing at the center of public health strategies by establishing standards for minimum living space area, daylight conditions, temperature, ventilation, and so on. • Identify and improve weaknesses in offices, factories, plants, hospitals, and other facilities that were hotbeds of COVID-19 expansion. • Prioritize the demand for green space and outdoor access for urban residents during a pandemic. • Rethink the existing building stock to meet the new challenges posed by COVID-19. • Ensure flexibility in building uses to prepare for future public health crises.

Source: JICA Study Team based on UN-Habitat (2021)

(2) Addressing Systematic Poverty and Inequality in Cities

The impact of COVID-19 on poor and vulnerable groups needs to be mitigated through emergency response and service delivery or by addressing underlying factors. Factors that have significantly affected these segments include overcrowding and lack of basic services, lack of access to digital services, and reduced activity in the informal sector during the lockdown.

(3) Rebuilding a “New Normal” Urban Economy

More support for small businesses and informal workers is needed for the transition to a greener and more equitable urban economy. The central government, as well as local authorities with limited financial resources, must continue to provide such support.

(4) Clarifying Urban Legislation and Governance Arrangements

A more integrated, coordinated, and multi-layered administrative structure is needed to achieve a flexible and innovative institutional and fiscal framework. Both central and local governments must respond creatively to crises in various ways.

Furthermore, the responses to COVID-19 have revealed future developments for a better and more sustainable urban future. The following five points characterize the various response measures by cities and regions.

(i) Clear approach for public health protection

In preparation for the post-pandemic era, many cities are striking a balance between some degree of normal life and possible measures to prevent the spread of infection. Paris, for example, has reopened its subway system with masks and hand disinfection, which has been successful in preventing the spread of infection.

(ii) Multidimensional Strategies Especially for Vulnerable Groups

COVID-19 has had a significant impact on livelihoods and education as well as on the health sector. In response, the government has had to implement economic protection measures for low-income and marginalized communities.

(iii) Community-Based Approach and Learning

It is not only the use of government resources and adherence to national strategies but also the support of the people and the lead taken by the various localities. In Kerala (India), the state government decentralized the decision-making structure so that emergency shelter, health care, and food assistance were quickly provided.

(iv) Creative adaptation According to COVID-19 Situation

Flexibility and creativity are important elements in responding to the pandemic. In Lima (Peru), the city reduced the bus frequency while improving bicycle lanes and supplying affordable bicycles. Manufacturing bicycles in the city contributed to the revitalization of the city's economy.

(v) Focus on Both Survival and Recovery

In addition to recovering from the losses caused by COVID-19, some cities are seeing the pandemic as an opportunity to build back better. For example, Washington, DC's ReOpen DC Plan aims to recover from the crisis and become "a more equitable, resilient, and vibrant city.

Recovery from COVID-19 is an opportunity for cities to address public health strengthening, economic resilience, and service access for all. Dealing with the divisions and inequalities exposed by the pandemic is not enough. What is needed now is transformative change through inclusive policies, community engagement, and a shift to more sustainable approaches that can make cities more resilient than ever before.

2) **Integrating health in urban and territorial planning: A sourcebook (May 2020, Co-authored with WHO)**

Proper urban and regional planning contributes to realizing health in cities and regions, while it is an essential element in promoting sustainable development. Therefore, health must be integrated and realized as part of urban and regional planning. To realize this, it is necessary to focus on the locality and develop strategies within that context, and three principles apply to many situations.

- Spaces with appropriate compactness and connectivity: Economically and socially active communities with highly accessible amenities give people the opportunity to engage in daily physical activity through mobility.
- Socially inclusive urban environments: Involves more people in the placemaking process and promotes informal interactions in public open spaces.
- Resource-neutral and resilient habitat design: Create habitats that are environmentally protective and resilient to climate change and natural disasters by using green solutions and technologies.

Dealing with health in urban and regional planning requires collaboration and involvement of diverse stakeholders, such as central government, local government, civil society, and academia. Furthermore, urban and regional planning for health has four dimensions: basic planning and legal standards, planning codes (regulations), spatial frameworks, and urban and regional initiatives to create synergies.

The asset-based approach is preferred for these efforts. It focuses not on the problems but the resources (including the natural and built environment) and unmet demands of each community and region and examines the possibility of utilizing them. This approach is promoted through the collaboration and participation of stakeholders and seeks to foster community movement and leadership. It is also important to disseminate health-related knowledge to stakeholders and decision-makers during the planning process.

3.1.3 UNESCAP

1) **THE FUTURE OF ASIAN & PACIFIC CITIES: Transformative Pathways towards Sustainable Urban Development in the Post COVID-19 Era (January 2021)**

Cities in the Asia-Pacific region were among the first in the world to be affected by COVID-19. At the same time, non-communicable diseases that make the disease severe and mental health issues caused by movement restriction measures also received attention. These factors have led to an emphasis on investing in sustainable urban development that will strengthen of health systems and urban resilience, in addition to short-term measures to respond to COVID-19 and economic recovery. This report presents the following four pillars and 15 pathways highlighting the investments in health enhancement in addition to the existing foundational ideas for sustainable urban development.

(1) **Pillar 1: Urban and Regional Planning as a Spatial Vaccine**

Residential areas with poor conditions where social distancing and isolation measures are difficult, such as informal settlements, need to be improved. On the other hand, high-density conditions still need to be promoted, as compact cities have positive health, economic, and environmental benefits. In addition, using the latest science technology and data will enable sector integration and deeper consideration of urban and regional planning and health.

- Sustainability and Quality of Life: Mainstreaming evidence-based planning and monitoring and incorporating clear health goals in urban and regional planning will trigger public and private investments focused on health and resilience. Currently, there is a growing momentum among local governments and communities to make urban environments healthier and more accessible. This is an opportunity for a shift toward sustainable urban development in the post-pandemic era.
- Co-creation with citizens using digital technology: As collaboration between local governments and communities can be seen nowadays, the use of digital technology in urban and regional planning can have the effect of rethinking community-driven public spaces and strengthening neighborhood health.
- Urban-regional linkages: Linkages between cities and regions are needed to address issues such as affordable housing, local economies, and urban sprawl. Cities and regions can work together to develop urban revitalization and growth strategies enabling small and medium-sized cities to become economic hubs instead of mega-cities.
- Strengthened housing policies: In the short term, policies are needed to prevent evictions for vulnerable groups that have been economically hit during the pandemic. In the medium to long term, structural public investments in affordable housing and slum improvement are required.

(2) **Pillar 2: Resilience of Citizens as Resilience of Cities**

The pandemic underscored the importance of integrating public health into strengthening urban resilience. Overall public health resilience requires the expansion of health facilities, supply chains, and risk communication. In particular, the needs of those living in informal settlements should be prioritized.

- Invest in nature-based solutions and resilient infrastructure: Nature-based solutions at

various scales are needed, such as the development of places to experience nature within neighborhoods, the creation of sustainable food systems, and the shift from fossil fuels to clean natural resources.

- Understanding the informal economy and supporting the poor: Investing in essential services will not only enable the implementation of infection control measures but also reduce the impact on vulnerable populations. To do this, it is necessary to augment social safety nets and social security as well as infrastructure and services.
- Establish and strengthen partnerships: The health sector should be positioned within an inclusive cross-sectoral and multi-tiered governance mechanism.
- Utilize data: Investments in data-driven approaches will require data integration and developing access to data and the Internet. Access to education is also expected with digital technology.

(3) Smart and Inclusive City

Cities in the Asia-Pacific region have been developing smart cities, but their full potential has not been realized. Good use of the latest digital technologies can improve urban health and reduce inequalities. On the other hand, privacy issues must also be addressed. COVID-19 is the first pandemic since the establishment of social media and communication technologies, and benefits from digital technologies, such as responding to COVID-19 using data, staying connected while ensuring social distancing, and the rise of digital democracy, are being applied in response to the pandemic.

- Strengthening smart city governance: By applying digital technologies to urban health, city governments can collect and share data to increase health resilience.
- Transparency and clarity of data sharing: Agreements on transparency and clarity of data sharing are needed to improve data quality, encourage citizen participation, enhance policies, and increase the reliability of the government.
- Strengthening cybersecurity: Cybersecurity safeguards and reliable health data need to be established to gain trust in the government through risk communication with citizens and to develop scientific public health strategies.
- Investment in smart mobility: Electric vehicles and digitally connected public transport systems should be integrated into the overall mobility system.
- Increased investment in smart cities: It is important to guarantee Internet access to all residents so that the current gaps are not exacerbated. In cooperation with the private sector and social enterprises, consideration should be given to the socioeconomically disadvantaged by offering affordable Internet packages.

(4) Investment in Healthy Cities

While local governments play a major role in disaster response, they generally lack the financial resources for emergency response. As the pandemic prolongs the financial damage, local government finances need to be strengthened. To this end, urban fiscal systems need to develop new spending programs that reach informal settlements and informal labor markets, underpinned by intergovernmental financing and improved means of income generation.

- Affordable housing development through public-private partnerships: the construction of affordable housing through public-private partnerships should be promoted. Such housing should also incorporate a localized supply chain and infectious disease control. In the medium term, update of housing unit standards and utilization of space between buildings should be taken into consideration.
- Land-tied financing mechanisms: in the post-pandemic era, the value of nature-based biophilic solutions should be emphasized.
- Introduction of congestion and environmental taxes: A national economic support package in the post-pandemic era is also an opportunity to strengthen the policy and regulatory framework and integrate the pricing structure with environmental aspects. While it is difficult to revisit the pricing, a first step could be to revise lifeline tariffs and ensure flexibility in tariff levels based on environmental impacts.

3.1.4 UNESCO

1) Urban Solutions: Learning from cities' responses to COVID-19 (June 2020)

The UNESCO Cities Platform hosted a series of three discussions on COVID-19 measures in cities and the future perspective of sustainable and resilient cities in the post-pandemic era. Topics discussed in the third session, "A More Resilient Future: Imagining the Cities of Tomorrow," included the following:

- COVID-19 has caused vulnerability not only due to inadequate access and services but also to the interconnectedness of people in cities. On the other hand, initiatives that focus on living in neighborhoods are occurring all over the world.
- According to the UN, the impact of COVID-19 is highest in poor and dense neighborhoods, especially the informal settlements and slums. In consideration of recovering from the pandemic in the long run, the structural disparity should be addressed, even the urban design and architecture. Inclusivity requires the participation of various people, including youth.

In the subsequent discussion, the following comments were made.

- Failure to manage population density has resulted in overcrowding, leading to a lack of water and sanitation infrastructure in slums and other areas. In the future, cities will place greater importance on digital infrastructure.
- The topics are moving from the "logic of mobility" to the "logic of accessibility." Circular models need to be applied to reduce waste and change consumption patterns.
- There is the concept of the "15-minute city." When building new urban infrastructure, proximity must be considered as a new lifestyle.
- COVID-19 revealed the importance of public spaces for storing beds, supplies, medical equipment, and so on.

After the three discussions, the following eight points were identified as specific findings and points that can be reflected in future policies.

(1) Response to Social Inequality

Vulnerable and marginalized populations are not only at high risk for infection, but also have

difficulty implementing infection prevention measures. Since the virus containment cannot be realized if these people are left unchecked, infection control measures need an inclusive approach. The same approach is also required for new normal.

(2) Emergency response of Cities and Localized Recovery

In emergency response to the pandemic, the central government generally takes the lead and local governments implement the policy. However, local governments that are closer to the people are having difficulty disseminating the information to the entire citizenry. It is important to involve citizens and localities, especially youth, when developing recovery plans or improving emergency plans.

(3) Strengthened Investment in Public Services

COVID-19 has reaffirmed the importance of public services, such as public spaces, health services, water supply, public transport, and education. A sustainable future and safe life in cities depend on robust public services, especially in times of crisis and emergency. Instead of relying on the private sector, investments should be made in good and inclusive public services.

(4) Livable Cities Prioritizing People

Recovering from the pandemic is an opportunity to envision a better future, and this raises a question about how to invest in people's well-being. Concepts for this include public spaces that foster entrepreneurship and innovation, 15-minute cities that promote livability and social cohesion, semi-public/semi-private spaces allocated for people's lives, and appropriate management of population density.

(5) People's Unity with Culture and Creativity

Cities are centers of culture, and understanding the value of culture makes cities more inclusive. Cultural industries were severely affected by COVID-19, but at the same time, their value has been reaffirmed by citizens and expected to be noticed by decision-makers. Likewise, the creative industries contribute to making cities, urban life, and public spaces more inclusive.

(6) City as a Place of Connection

The role of cities in connecting various spaces, functions, and people has enhanced their prosperity and attractiveness, but the pandemic has hampered these roles. In order to resume these functions after the pandemic, especially tourism, the safety and security of people is important.

(7) Investment in Greener and Climate-Resilient Cities

Climate change is another crisis the world is facing. Cities with high population density have been considered environmentally efficient since many live in small areas. However, the pandemic caused widespread telecommuting, and this undermined such an advantage of the cities. The pandemic should be regarded as an opportunity to transform cities into more resilient and greener through investments in public spaces, sidewalks, bicycle lanes, localized supply chains, etc.

(8) Localized and Diversified Urban Tourism

The tourism industry was severely affected by COVID-19. Tourism has been strongly linked to the global economy, but COVID-19 provides an opportunity to change this toward harmonization with local people and diversification through smaller-scale initiatives. It is necessary to develop tourism on a smaller scale to offer safe and competitive tourism.

3.1.5 Organization for Economic Co-operation and Development (OECD)

1) Cities policy responses (July 2020)

Cities have been at the forefront of the COVID-19 response in developing countrywide measures and new recovery strategies. COVID-19 has accelerated the shift to a new urban paradigm toward inclusive, green, and smart cities. The following are the (ten) lessons learned to build cities back better from the pandemic.

- Although the pandemic has differing impacts, the policy response is uniform and not specific to a location. A people-centered approach is required in line with the needs of each location.
- The health crisis has turned into an economic and social shock. The exposure of cities to viruses and recovery from the pandemic depends on their industrial composition and openness of the labor market.
- The rediscovery of proximity has rapidly transformed the goal of enhanced mobility into improved accessibility. Public space and urban design and planning would need reassessment.
- The COVID-19 crisis exposed inequalities among people and places. Vulnerable groups, such as immigrants, the poor, women, and the elderly, were affected particularly in large cities.
- Health and sanitation problems are less related to urban density but rather to structural inequalities and the quality of urbanization. The benefits of agglomeration will continue, and “urban premium” will not become “urban penalties.”
- While the potential for teleworking varies in each country and within countries, digitalization will remain an important element of the new normal.
- Environmental awareness is increasing, and clean mobility and circular economy are becoming more politically and socially acceptable.
- COVID-19 contains implications for governments. Citizens' trust in government (especially local politicians) has increased in some countries and decreased in others.
- A greater focus on resilience is needed. Preparing for future crises requires managing who, what, and to what extent to build such resilient cities.
- International agenda, such as the SDGs, the New Urban Agenda, and the Sendai Framework, are timely and appropriate for reshaping plans, policies, strategies, and budgets.

After short-term crisis responses such as support for vulnerable populations, local service providers, businesses, and civic engagement, cities are developing long-term recovery strategies to become more inclusive, green, and smart.

- In reducing disparities and addressing structural inequalities, cities are taking some inclusionary measures, such as local business support and employment, the construction and repair of affordable housing, and support for vulnerable populations.
- Many cities have already made various investments to balance economic recovery and environmental sustainability, with a focus on cleaner forms of urban transport and energy efficiency.
- Digitalization has played a key role in emergency responses to the pandemic, and many cities are using smart city tools permanently. As information, civic engagement, cultural resources, and administrative services become digitalized, virtual spaces have become indispensable.

However, cities alone cannot handle the scale of this challenge, and governments at all levels must share responsibilities. Governments must provide opportunities for all to transform cities into low-carbon and climate-resilient cities and promote improved health and inclusive growth for their citizens through economic resources and good governance.

3.1.6 World Bank (WB)

1) From COVID-19 Crisis Response to Resilient Recovery - Saving Lives and Livelihoods while Supporting Green, Resilient and Inclusive Development (GRID) (March 2021)

The world is facing two crises: COVID-19 and climate change. COVID-19 has caused economic and social damage to many people, making the effects of climate change more severe. Unprecedented and rapid action is required to adapt to the post-pandemic reality while addressing these crises. Responding to these crises could be an opportunity for green, resilient, and inclusive recovery against poverty and inequality while addressing the adverse effects of COVID-19 and the long-term challenges of climate change. GRID strategies are needed to repair the structural damage caused by COVID-19, accelerate climate change mitigation and adaptation measures, and restore momentum to poverty reduction and shared prosperity.

The pandemic has exacerbated the adverse aspects of economic growth in developing countries over the past decade (e.g., investment, scrutiny, employment, and slower pace of poverty reduction). COVID-19 has also exacerbated existing vulnerabilities, making a recovery from the crisis a major challenge.

GRID is a long-term framework to enable needed economic and social innovation and increase resilience and inclusiveness in all aspects of the economy and society in the face of even greater vulnerability and inequality. It will help rebuild stronger, greener, and more equitable economies and institutions by taking unprecedented steps in response to digitization, local/regional supply chains, ecological strengthening, and pandemic-induced changes in consumer demand. This also contributes to the private sector.

2) COVID-19 and the Urban Poor - Addressing those in slums (May 2020)

The negative effects of urban overcrowding are mainly seen in slums, where drainage, street lighting, electricity, water supply and sewage, security, solid waste management, and health care are lacking. Overcrowding also increases the risk of infectious diseases and makes it difficult to implement infection control measures such as quarantine. The poor with

symptoms are reluctant to be tested due to social rumors, lack of awareness, fear of unemployment, and lack of access to healthcare. Women, immigrants, refugees, the physically challenged, and the homeless are especially badly affected.

In the fight against COVID-19, the only short-term strategy is to control transmission. However, social distancing and movement restrictions are difficult to implement, especially in slums. Medium- and long-term strategies focus on economic recovery and strengthening resilience. To achieve this goal, several priority measures that can be taken to reach the urban poor.

The WB identifies the following as priority measures for the short, medium-, and long-term.

Table 3.1.2 Priority Measures Proposed in COVID-19 and the Urban Poor - Addressing those in slums

Term	Priority measure
Short-term: Measures to control infection spread and continue urban services	<ul style="list-style-type: none"> • Identify hot spots with high priority • Short-term water supply: Ensure social distancing through community involvement when fetching water, etc. • Handwashing, e.g., raise awareness about handwashing with soap, distribute disinfectants • Community involvement: Community involvement is important in prevention, response, treatment, and post-recovery care • Waste collection: Ensure that waste does not accumulate and cause other health problems, even during the quarantine period • Access to medical services: deploy community health workers and mobile health services • Targeted social security schemes: including cash provision, etc. • Vaccination for slum dwellers when vaccines are developed • Financial support to local government
Mid-term: Financial support to resume economic activities and infrastructure development for long-term resilience	<ul style="list-style-type: none"> • Investments in low-income and , community-based projects and labor-intensive industries • Development of slum upgrading • Investments in housing improvements: e.g., funding for home improvements or low-interest micro-loans. • Investments in urban agriculture: Effective as a source of income and as a means of providing inexpensive food. • Guarantee of a safety net for the urban poor
Long-term: Response to the challenges of urban poor	<ul style="list-style-type: none"> • Promoting economic inclusion and resilience, e.g., access to the labor market through education, and improved transport services • Spatial inclusion and affordable housing: Spatial planning integrated with transportation to reduce inequalities in accessing services and amenities and improve resilience in high-risk areas. Slum upgrading also effectively provides basic services and encourages a sense of social belonging.

Source: JICA Study Team based on WB (2020)

3.1.7 Asian Development Bank (ADB)

1) COVID-19 and Livable Cities in Asia and the Pacific Guidance Note (December 2020)

COVID-19 is having an unprecedented impact on cities around the world, especially on the poor and vulnerable.

- Inequitable urban and social infrastructure: Urban infrastructure, such as transport, water, sewerage, solid waste management, energy, and communications, as well as social

infrastructures like healthcare, education, public and community facilities, and affordable housing, have been an issue even before the pandemic. The COVID-19 shutdown has further highlighted these inequalities.

- Severe impact on vulnerable groups: The urban poor and vulnerable groups living in overcrowded environments are the most severely affected due to increased risk of infection and reduced/lost means of income generation due to economic restrictions.
- Inefficient information and communication technology (ICT): The underdeveloped or unequal ICT systems required to deal with large-scale crises make it impossible to disseminate correct information and collect data sets.
- Urban economic crisis at both the macro and micro levels: Micro-, small-, and medium-sized enterprises of the poor are unable to telecommute and have been badly affected. Local government revenues and remittances from abroad have declined, and value chains have been hampered. Although these resulted in stagnating the economy, the support measures needed to revive the economy have been limited.
- Local government capacity for planning and management: Local governments were the front line in dealing with the crisis and were required to take emergency action. However, in some cases, the challenges were beyond their capacity to handle the crisis.

Cities affected by the aforementioned should look at both immediate responses to the crisis and short- to medium-term responses to rebuild better while adapting to the new normal. The possible approaches that cities can take include:

- Since the impact and capacity for COVID-19 are different from city to city, it is necessary to develop countermeasures tailored to the conditions of each city (e.g., socioeconomic and political factors, geographical characteristics, regulatory framework) while referring to the examples of other cities.
- Cities are making decisions regarding immediate infection prevention and protection measures (e.g., strengthening testing systems, food and supplies aid) and long-term measures for recovery.
- Long-term efforts should be considered as an extension of the immediate response to achieve strategic goals for better recovery.
- In response to the pandemic, cities have seen innovations with online tools and digital technologies such as IoT, artificial intelligence, blockchain, mobile apps, telework and network management technologies.
- Cities need to plan and prioritize inclusive and immediate responses that consider the needs and potential of vulnerable populations. Local governments can provide public health and safety measures to vulnerable populations through various initiatives.
- Cities must balance health and well-being in consultation with the private sector and civil society. Both economic development and control/restriction for infection prevention must be considered.
- Cities must work with the central government to effectively implement national/statewide measures and develop specific responses tailored to each city within that framework.

Based on the above, the ADB proposes the following immediate and short- to medium-term

responses based on the three pillars of livable cities it has advocated.

(1) Immediate response

- (i) Improve coverage, equity, efficiency, and reliability of services in urban areas
 - Addressing the special needs of informal settlements and vulnerable groups: Through dialogues with residents, NGOs, and others, implement measures and policies, such as support and information dissemination in line with the physical and social environment.
 - Continuation of the smooth operation of water supply and sewage systems: Provide continuous and quality services while responding to needs to ensure a safe and healthy environment.
 - Provision of water and sanitation (WASH) services: Provide continuous and adequate WASH services essential for preventing infectious diseases, such as COVID-19, through coordination among government agencies, free water access, and financial and technical support to service providers.
 - Effective use of information and communication technologies (ICT) and digital technologies: Data collection, management, and analysis are required to develop countermeasures and use them to continue urban services during action restrictions.
 - Support for people's mobility needs: Mobility demand is now limited to essential travel, and physical distance needs to be ensured. Resumption of public transportation, promotion of non-motorized transport (NMT) use through spatial reorganization, and utilization of micro-mobility are required.
- (ii) Strengthen urban planning and the financial sustainability of the city
 - Modification of commercial, business, and industrial spaces: Reorganize spaces so infection control measures are by adopting a spatial structure that facilitates social distancing, rules for cleaning and disinfection, and architectural planning that considers public health and social security.
 - Adaptation of public facilities (e.g., religious institutions, museums, community centers): measures to prevent the spread of infection include identifying non-essential facilities, changing hours of operation, adopting online services, and monitoring admission protocols and the number of people entering.
 - Re-use public spaces (e.g., open spaces, government buildings): Convert to medical, commercial, or temporary housing/workplaces, extend sidewalks and bike lanes, and control admissions.
- (iii) Improve urban environment, climate resilience, and disaster management of cities
 - Solid waste management: Infection control measures should be taken, especially during the collection, transportation, and treatment phases of medical waste, and for informal recyclers.

(2) Short- to medium-term response

For cities to make a healthy, resilient, and environmentally sustainable recovery, they need to build cities that are resilient not only to pandemics but also to natural disasters and climate change, in each city's context.

- (i) Improve coverage, equity, efficiency, and reliability of services in urban areas

- Improving inclusion of vulnerable groups through social safeguards: Identify the needs of vulnerable groups and provide them with needed programs (e.g., employment/entrepreneurship assistance, affordable urban services, a combination of public transport and affordable housing) and resources.
 - Improving urban services and infrastructure using science and technology: Promote the smart city movement using data and digital technology in urban planning and development. At the same time, share knowledge about digital technologies among cities and address privacy protection and data security.
- (ii) Strengthen urban planning and the financial sustainability of the city
- Rethinking the urban planning system: Promote emergency response planning based on collaboration with various agencies, development of small and medium-sized cities as alternative economic centers to large cities, reevaluation of open spaces, and real estate and infrastructure development for sustainable urban growth.
 - Strengthening the financial sustainability of local governments and the capacity of urban governing entities: Utilize data to increase local government revenues and optimize expenditures, enhance the capacity of urban authorities, and promote innovation through collaboration with external stakeholders and communities.
- (iii) Improve urban environment, climate resilience, and disaster management of cities
- Focusing on healthy and environmentally sustainable cities: Develop and mainstream the idea of healthy and environmentally sustainable cities according to the context of each city; improve energy efficiency using renewable energy; re-evaluate risky land use management, nature-based solutions, circular economy, low carbon society to promote flexible, mixed-use urban development.
 - Building resilient cities that can absorb shocks: Develop and mainstream the idea of cities are resilient to natural disasters, climate change, and economic failure according to the context of each city; promote climate-resilient urban services; develop preparedness for natural disasters and emergency response plans, and utilization of public land and deteriorated facilities.

ADB prepares the same amount of budget for urban sectors in 2020 as before the pandemic and will continue to support cities in developing countries to become healthier, more inclusive, and more resilient, as well as to develop local economies and increase employment opportunities for their citizens, through its livable cities project. While cities are being forced to respond immediately, it is important to align with short- and medium-term goals and broader agenda (e.g., national development plans and SDGs) to rebuild better.

2) Accelerating Climate and Disaster Resilience and Low-carbon Development through the COVID-19 Recovery Technical Note (October 2020)

Developing countries are providing emergency assistance in the form of public health initiatives and social security and business support to ease the economic blow. ADB is also investing USD20 billion in these responses.

At the same time, countries need to plan for medium- and long-term recovery. In the medium-term, economic activity stimulus measures are needed, and in the long-term, step-by-step measures are needed to achieve national development policies and future visions,

considering the impact of COVID-19. While a better and green recovery is being requested, recovery from COVID-19 must be balanced with addressing the climate change crisis. Restrictions on the movement due to the pandemic and slowing economic activity have reduced greenhouse gas emissions in the short term, and this must be sustained to achieve the goal of the Paris Agreement. This direction towards low-carbon and resilient societies must be incorporated in terms of the recovery from the pandemic. Many measures can contribute to addressing climate change and improving resilience while generating socio-economic benefits for the recovery goals.

This Technical Note was prepared by ADB to strengthen developing countries' resilience to climate change and natural disasters and accelerate low-carbon development through medium-term recovery and long-term transformation from the pandemic. If the recovery package includes measures to address the inequalities and vulnerabilities exposed by the pandemic, countries can achieve sustainable economic recovery, reduce inequality, strengthen resilience, and contribute to the SDGs.

While each country should take different measures, the following can be considered as characteristics of economic stimulus packages for a good recovery from a pandemic.

- Create jobs and stimulate economic activity.
- Implement measures in a short time so funds for economic revitalization can be distributed quickly and promptly.
- Implement labor-intensive measures, especially in the initial phase.
- Facilitate capacity building for sectors significantly affected by the pandemic or for sectors that can contribute to low-carbon development.
- Build supply chains that are localized or more diversified in the source.
- Have a high degree of spillover effects.

3.1.8 International Urban Cooperation European Union-Latin America and the Caribbean

1) Open Dialogues IUC-LAC – 2020 Europe and Latin America Rethink Post COVID-19 Cities (September 2020)

This report summarizes the seven discussions held by the International Urban Cooperation (IUC) Program. It organizes the following seven perspectives on cities in light of COVID-19.

(1) Tourism cities in the post-pandemic era

In Málaga, Madrid, Genoa, and Rome, participants in the webinar, the following measures are being implemented:

- safety assurance through certification by public agencies,
- proximity tourism initiative,
- use of sidewalk terraces by restaurants (tax exemption for terrace areas), and
- use of apps to monitor temporal and spatial dispersion of tourists and direct them to vacant tourist spots.

The post-pandemic urban tourism would be transformed by government decisions, changes on the demand side, improvements in the quality of tourist destinations and experience, and

enhancement of comfort, sustainability, and respect for the locality.

(2) Urban planning and public spaces

While recent urban planning has prioritized the concepts of higher density, mixed-use, and proximity, COVID-19 and the need to maintain social distancing have raised questions about the expected mobility and public space. The following issues were discussed during the webinar:

- Possibility of a shift in direction toward compact cities: The compact city model is the most sustainable urban model. Mixed-use allows the city to meet the needs of many people without large-scale movement. On the other hand, excessive growth in large cities may be curtailed by increased telecommuting and migration from urban centers to suburbs. Furthermore, ideas such as 15-minute city and decentralized city are likely to become prevalent. Housing will also be converted to facilitate telecommuting or outdoor activities like gardening. These changes should be viewed as opportunities to improve the quality of urban life.
- The role of public space in fostering social cohesion: public space is indisputable and irreplaceable but now necessary to consider its layout in a way that balances demand and use. The City of Vilnius maintains this balance through discussion and coordination among various stakeholders.
- Necessary change of public spaces to continue promoting recreation while maintaining distance: Brussels argued that the pandemic should be an opportunity to rethink and enhance the resilience of public spaces while ensuring safety since they play a central role in urban life. In Buenos Aires and Arequipa, public spaces are seen as a place to meet all needs, and superblocks and commercial and farmers' markets are being arranged. In Madrid and Vilnius, the city has taken on the role of balancing conflicts and debates over public space.

(3) Urban transport and mobility

The pandemic saw a worldwide movement to reconfigure roads for safer public transport and mobility, including bicycle lanes, pedestrianizing pathways, widening sidewalks, and expanding green spaces. The following issues were discussed during the webinar:

- Changes worldwide as a new model for sustainable cities: Cities had sustainable urban transportation plans since before the pandemic but accelerated the implementation of these plans. It is an opportunity to improve quality of life in terms of health, economy, education, and access to services. The expansion of bicycle highways, micro-mobility, and permanent changes in mobility choices are expected.
- Cities' responses to COVID-19: European cities have taken measures that prioritize bicyclists and pedestrians, which have been effective in improving air quality and health and reducing commute times. Turin and Rosario (Argentina) are using data for traffic management and are promoting the use of hybrid cars and biodiesel. In Armenia (Colombia), public transportation use is declining, and government subsidies are being sought.
- Superblocks as a solution to the current mobility and transportation crisis: Vitoria-Gasteiz (Spain), which promotes superblocks, says it will have a positive impact on both

infection control and climate change.

(4) Green recovery

COVID-19 had a significant impact on the economy. The webinar discussed whether a green economic recovery is possible with a focus on environmental protection.

- Greener urban future in response to the pandemic: Although the pandemic reduced greenhouse gas emissions, it is difficult to envision a greener urban future because of the many social, economic, environmental, and political aspects involved in the crisis. In Latin America, economic policies are not aligned with environmental policies, and economic recovery is likely to be a classical approach. COVID-19 exposes not only structural flaws in economic and social systems but also environmental vulnerabilities and the difficulties of achieving a green economy.
- Possible measures to promote a green economy: Ibagué (Colombia) suggested improving the efficiency of agricultural transport and eliminating prejudice by strengthening urban-rural connections. Pavlos Melas (Greece) proposed public investment in all sectors to improve the environment and support private companies and local governments. Viana do Castelo (Portugal) and São Leopoldo (Brazil) mentioned investments in energy efficiency improvements, low environmental impact energy, and transport.

(5) Smart recovery

During the pandemic and the lockdown measures, digital technology played a major role in the local economy and people's lives. The webinar discussed whether digital technology also influences the city's economic recovery.

- Effectiveness of smart and digital technologies in the pandemic: Smart and digital technologies helped cities better cope with the pandemic through quick response, efficient use of resources, and dialogue with citizens. The experience taught cities the need to invest in platforms that share data among relevant agencies for developing, implementing, and monitoring measures.
- Measures to accelerate digital use: Porto (Portugal) and Benedito Novo (Brazil) have shared data with relevant institutions and private companies to efficiently address urban issues and disseminate information to citizens. These cities have also implemented initiatives for digital inclusion. In Barranquilla (Colombia) and Spanish cities, smart city planning and implementation is underway.

(6) Public services and natural resources

Cities were at the forefront of the COVID-19 response and played an important role in the provision of basic public services, such as water supply and solid waste management. These public services have recently emphasized principles, including citizen participation, transparency, innovation, and sustainability, and lack of access to such services can lead to inequality, poverty, and social and environmental vulnerability. The webinar discussed the following aspects of sustainability and equity in service delivery:

- Considerations to ensure sustainability and equality in the provision of basic services: reduction of ecological footprint and waste volume, a continuation of service provision

to those who cannot bear the costs, citizen participation, improved service quality, and adequate waste management are required. In Latin America, the lack of equitable provision of public services and natural resources (such as piped water) has been a challenge. The pandemic has also led to the development of solid waste management methods with sanitation measures.

- In San Pedro de la Paz (Chile), efforts are being made to protect wetlands and tidal flats and to conserve water in greenbelts. In Chile, the private sector controls natural resources such as water, and the lack of equitable distribution calls for constitutional reform at the national level.
- In Italy, strategies at the regional level are required for proper waste management. In the region of Lazio (Italy), a public-private consortium involving many regions and stakeholders has been established.
- Public participation, awareness raising, and communication campaigns are effective in balancing good service provision and sustainable use.
- Natural resources cannot be tackled on a city-by-city basis, and solid waste management and service provision should be shared among cities. A long-term vision for projects beyond political directives remains an issue for local governments in Latin America, and strategic alliances are needed to advance this vision for citizens.

(7) Climate change initiatives and solutions

COVID-19 has increased health and extreme weather risks and worsened the relationship between humans and nature. The following perspectives on addressing climate change and solutions were discussed during the webinar.

- Changes and opportunities local governments can facilitate to advance climate change efforts: Local governments are best suited to take a collaborative and integrated approach, as the issues highlighted in the climate change agenda are now occurring at the local level. Localizing the agenda provides an opportunity to rethink strategies and plans. Smart cities should also be linked to the climate change agenda.
- Integration of inclusive climate change efforts into urban planning and decision-making: In Zagreb (Croatia), climate change initiatives have become one of the axes of public policy, including the conservation of agricultural land and forests and the optimization of green infrastructure through the promotion of green spaces. In Pereira (Colombia), a strategy to address climate change has been developed since 2013. It is important to participate in international programs and to incorporate citizen participation.
- The role of local and regional governments in complying with international climate change arrangements: In Viña del Mar (Chile), citizenship through knowledge-sharing, training, and education in simple and easy-to-understand forms is effective. Almada (Portugal) says that the climate change agenda should be designed and embodied at the local level and that it can be more effective if it is flexible enough to be adapted to each locality.

3.2 Initiatives for Post COVID-19 Cities by Developing Countries and Cities

3.2.1 Indonesia

1) Ministry of Agrarian Affairs and Spatial Planning/ National Land Agency

A new goal for urban and spatial planning in Indonesia is to be a "healthy city." In realizing healthy cities, it is necessary to design healthy environments and plan and prepare resilient cities that can recover quickly while minimizing the impact of a pandemic. To this end, it is essential to locate public facilities appropriately and strengthen linkages with communities. Furthermore, implementing land use demarcation that incorporates housing, trade and services, offices, and industry within city blocks will limit the spread of COVID-19 infection and make it easier to take lockdown measures at the district or neighborhood levels. These policies will not necessarily change existing spatial patterns but will focus on groupings.

2) Ministry of National Development Planning

An ideal concept for dealing with pandemics is the compact city. A compact city would increase productivity, promote activities at home, and efficiently provide basic services, such as health care, electricity, water supply, and sanitation. In addition, smart cities are also a means to overcome urban problems and promote health, resilience, and sustainability. Here, urban resilience can be enhanced by digitizing urban services, providing the data needed to trace infected people, and measuring government and community capacity. On the other hand, fears of high density and the rise in teleworking would encourage people to move from the city center to suburban areas, which may accelerate urban sprawl. This trend must be halted.

3) Special Capital Region of Jakarta

With changes brought about by COVID-19, there has been an increase in non-contact interactions and free time and space due to changes in activity patterns. In response to these changes, the Special Capital Region of Jakarta Capital is reforming urban planning, improving public services, and shaping Jakarta's prototype. The government is considering the introduction of transport- and digital-oriented development (TOD+DOD). This will promote TOD that is district-based, high-density, compact, and pedestrian-oriented, as well as digital communities and self-sustaining neighborhoods.

In addition, the government plans to redefine urban planning to performance-based planning to address the impacts of COVID-19 and reduce urban sprawl. This concept is used in special zoning areas within the urbanization promotion zone and allows for flexible customization of land use plans as long as they meet performance levels.

3.2.2 Philippines

In Manila, public transport services, including railways, buses, and jeepneys, were suspended while the enhanced community quarantine (ECQ) and modified enhanced community quarantine (MECQ) measures were in effect. Combined with demands to ensure social distancing, the use of bicycles increased rapidly in Manila. According to a July 2020 survey targeting all people in the country by the Department of Labor and Employment, 78% of all respondents said they would prefer to commute by bicycle even if other modes of

transportation were available. In response to this situation, the Department of Transportation (DOTr) announced in August 2020 a plan to invest approximately PHP1 billion to construct a total of 644 km of bicycle lanes in Metro Manila. In addition, the Department of Labor and Employment launched the Free Bisikleta Project in October 2020 to provide bicycles free of charge to those who lost their jobs due to COVID-19 to secure their livelihoods through delivery and other services.

DOTr also plans to construct bus lanes on EDSA, Manila's main thoroughfare. The work on the installation of bus lanes was expedited due to the reduced traffic during the curfew period.



Source: DOTr, Philippines

Figure 3.2.1 DOTr's Road Section Realignment Plan for EDSA (May 2020)



Source: Greenpeace

Figure 3.2.2 Bicycle lanes in EDSA (August 2020)

3.2.3 Colombia

Bogota, the capital of Colombia, originally had 550 km of bicycle lanes. But the mayor announced a plan to build an additional 280 km of bicycle lanes in February 2020 and increase the bicycle use sharing ratio from the current 7% to 50% in the long term.

To prevent the further spread of COVID-19, the maximum number of passengers on a bus was limited to 35% of capacity. As a response to this situation, in March 2020, temporary bicycle lanes were established along a 117-km stretch (Figure 3.2.3), with bicycle use promotion measures such as tighter bicycle speed limit regulations (50 km/h), allocation of more than 20% of parking spaces for bicycle parking, a bicycle registration system to prevent theft (linkage between bicycle serial number and owner's information), and campaigns.

Prior to the pandemic, the number of bicycles in use was approximately 880,000 per day. These efforts to promote bicycle use have resulted in about half of the normal bicycle use, even during teleworking and school closures.



Source: Smart Cities World

Figure 3.2.3 Bicycle lanes in Bogota (March 2020)

3.3 Initiatives for Post COVID-19 Cities by Developed Countries and Cities

3.3.1 Paris: Paris en Commun

In Paris, since Anne Hidalgo was elected mayor in 2014, the city has been promoting the banning of old diesel vehicles from entering the city, pedestrianization of the banks of the Seine River, tree planting on streets, and expansion of sidewalks. In the 2020 mayoral election, Hidalgo was reelected on the promise of "Paris En Commun," including a 15-minute city. The 15-minute city is an urban model proposed by Carlos Moreno from Sorbonne University, in which each person can equally meet their daily needs (living, working, shopping, medical care, education, entertainment, etc.) within 15 minutes by bicycle or on foot, no matter their location (Figure 3.3.1). The application of this model to the urban level is expected to improve the equitable distribution and diversity of urban functions.

While 15-minute cities were intended to reduce traffic congestion and mitigate climate change by reducing the demand for automobile travel, this attracts attention as a post-pandemic city model. This is because there is a need to curb car use caused by avoiding public transport during the pandemic, and compact lifestyles are becoming popular due to the lockdown measures and promotion of teleworking. While responding to the new normal brought about by COVID-19, this approach is also in line with recent urban planning goals of diversity, equality, and people-centered cities.

In Paris, there are proposals to further expand the city's network of bicycle lanes, planned even before the pandemic but has been accelerated as an emergency measure to meet the demand for bicycle commuting in the wake of the pandemic. In addition, a ban on through traffic in central Paris is planned for 2022 (Figure 3.3.2).



Source: Pisano (2020)

Figure 3.3.1 Diagram of 15-Minute City in Paris



Source: paris.fr

Figure 3.3.2 Area to be cleared of through traffic by 2020 (central Paris)

3.3.2 Milan: Milano 2020

The City of Milan presented an urban strategy titled Milano 2020 upon the resumption of urban activities (phase II) after lifting the lockdown (Phase I). The modal share of public transport was 55% before the pandemic, but the city saw a shift to private transport due to the lockdown and infection control measures taken by public transport. Milano 2020 is an adaptation to this new normal "to prepare for any future crisis that may occur later on and, therefore, to plan a 'pre-lockdown containment' phase and foresee the possibility of new lockdowns, in the light of the experience gained during Phase I." Milano 2020 aims to promote rapid recovery to previous levels and strong environmental change focusing on equality, vulnerability, and poverty, based on five strategies of (i) government, rights, and inclusion; (ii) economy, resources, and value; (iii) labor; (iv) time, space, and services; and (v) sustainability.

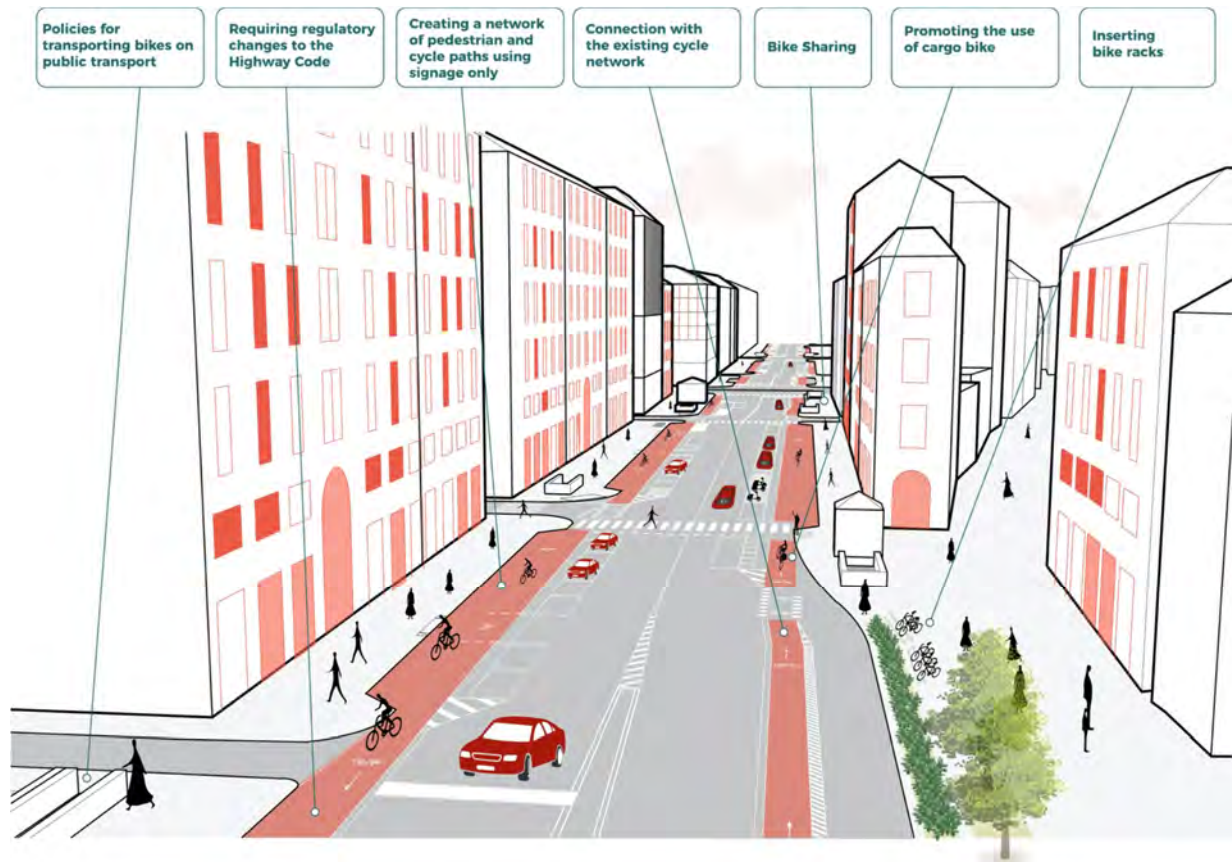
The strategies, action plans, and projects addressed in Milano 2020 are as follows.

(i) Boosted flexibility: rhythm and time

Reschedule public services and production activities to avoid congestion, promote telework in public institutions, adjust office hours, encourage telework and staggered commuting for large and medium-sized businesses, and expand business hours.

(ii) Mobility: Reducing travel and diversifying mobility options

Reduce the amount of travel and encourage public transport, bicycling, and walking, limit public transport (e.g., signage to maintain social distancing), limit car use, and develop sidewalks and bicycle lanes (Figure 3.3.3).

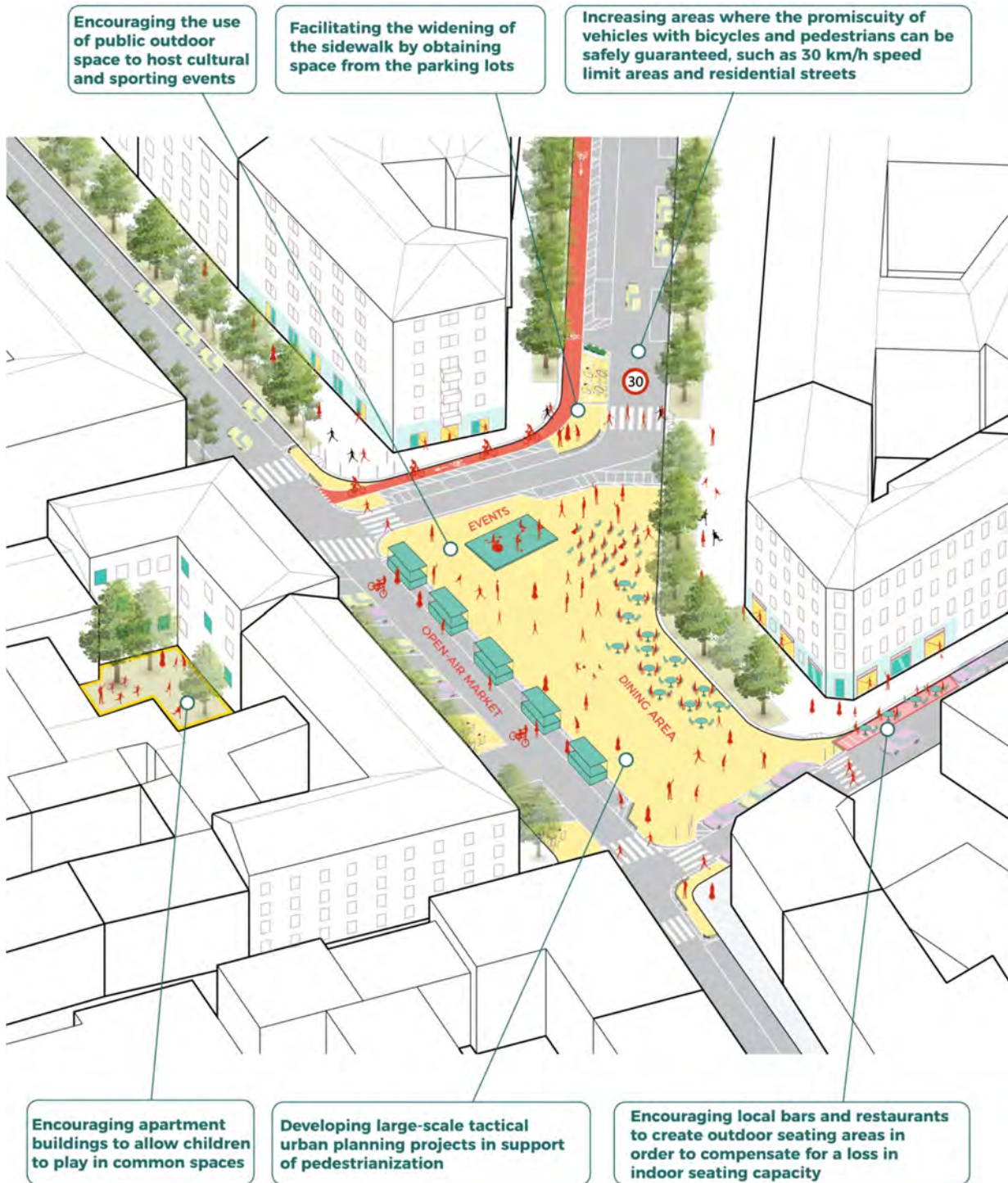


Source: Milano 2020

Figure 3.3.3 Road Space Planning to Encourage Bicycle and Walking (Milan)

(iii) Public space and well-being: reclaiming space for exercise

Promote the use of public and outdoor spaces and sports facilities to resume economic, cultural, and physical activities while maintaining distance and monitoring entry, developing plazas in all neighborhoods, limiting travel speed to 30 km/h on city center streets, and promoting the use of sidewalks for restaurants (Figure 3.3.4).



Source: Milano 2020

Figure 3.3.4 Development and Utilization Planning of Public Spaces (Milan)

(iv) Digital services: Expansion and accessibility

Simplify and expand digital services for citizens, while building the necessary platforms and networks, and provide broadband, data integration, apps for citizens, and digital education.

(v) Neighborhoods and services: Everything within a 15-minute distance

With the goal of reducing disparities between districts and reducing travel, strengthen public and online services to ensure all basic needs are met within a 15-minute walk.

(vi) Culture: Disseminating culture

Locate cultural facilities, such as libraries and movie theaters, in each district to diversify and (physically) spread culture, reopen cultural facilities, activities, and events with limited capacity.

(vii) Businesses: Innovation and inclusion

Support social innovation and start-ups, especially from the viewpoint of economy, work with the tourism and commercial sectors to promote a safe city with health protocols, such as changing the layout of commercial facilities as a preparation for receiving domestic and international visitors.

(viii) Infrastructures, construction, and public works: streamlining procedure

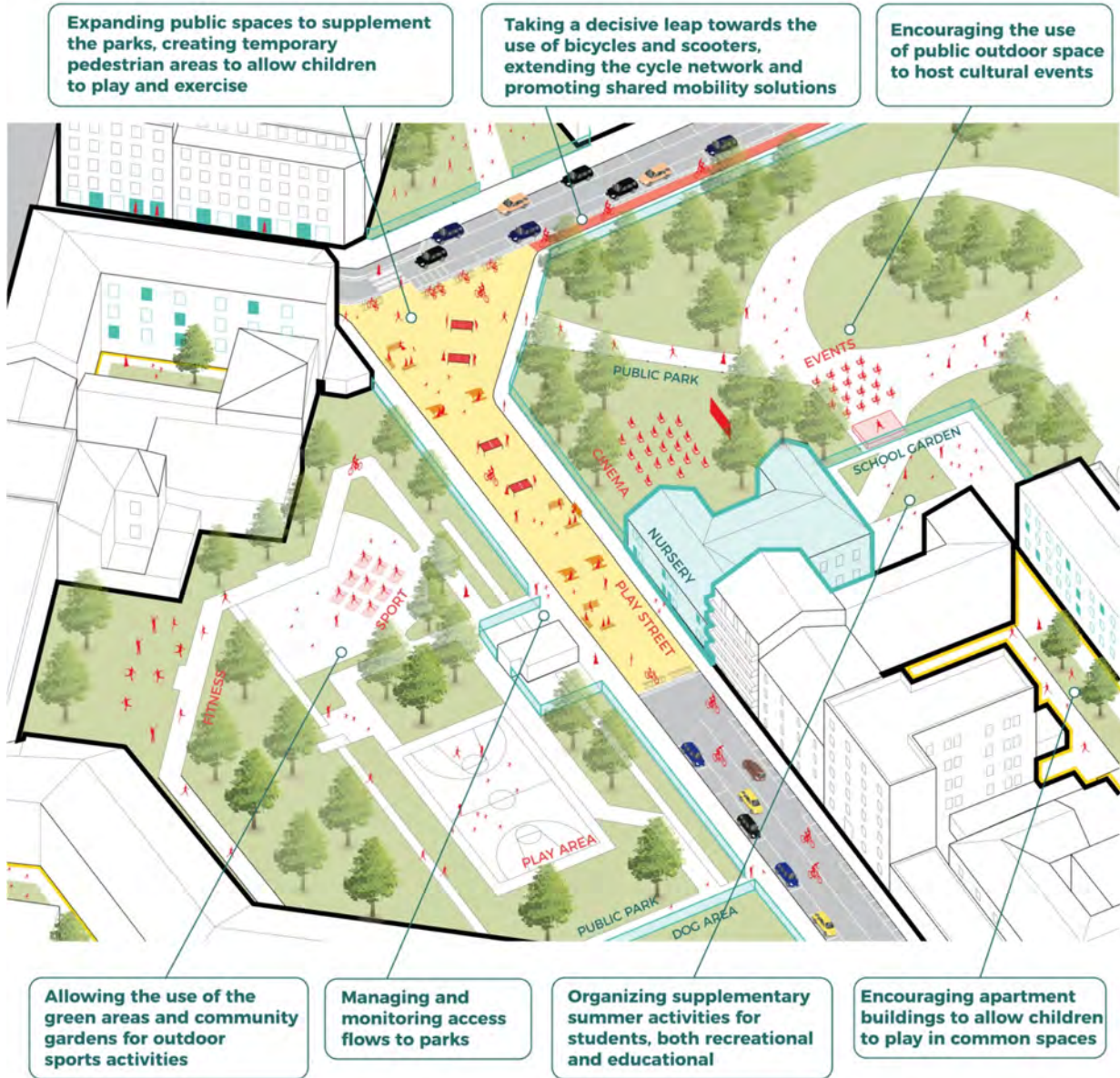
Facilitate the recovery of the construction sector through repair and redevelopment projects, streamline procurement procedures for smooth construction projects and allow local governments to plan and finance large public works projects, and facilitate emergency response, particularly through temporary conversion of infrastructure and buildings to other uses.

(ix) Cooperation and inclusion: Restoring a collaborative spirit

Build a coordinated economic system through the provision of services by volunteers and businesses, accelerate food assistance systems, and support for each community.

(x) The city of children: Open and accessible schools

Gradually open plazas, green spaces, and other open spaces as places for children to learn and socialize, promote stronger ties between schools and communities, while providing devices and promoting Internet access as an educational aid, and establish a network of open spaces for these purposes (Figure 3.3.5).



Source: Milano 2020

Figure 3.3.5 Development and Utilization of Open Spaces for Children (Milan)

Milano 2020 states that public transport can be a hotbed for spreading COVID-19; therefore, it plans to reduce the subway capacity to two-thirds, build bicycle lanes, and set the maximum speed for cars in the city center at 30 km/h (Figure 3.3.6).



Source: Pisano (2020)

Figure 3.3.6 Bicycle Lanes and Speed Limit for Cars Proposed in Milano 2020

In addition, Milano 2020 will focus on ensuring all citizens can access most services within walking distance. It plans to enhance the accessibility of public services, reduce disparities among neighborhoods, take advantage of the characteristics of each neighborhood, and reduce inter-district travel. In addition, the city will work with the Province of Lombardy to provide health care services focusing on neighborhoods with higher population densities and with more elderly residents.

3.3.3 Melbourne: 20-Minute city neighborhood

Melbourne (Australia) is a city that has long advocated a concept similar to the 15-minute city. It has positioned the concept in its urban master plan and is implementing pilot projects.

Plan Melbourne 2017–2050, developed in Victoria (the state to which Melbourne belongs) in 2017, sets the following seven outcomes.

- 1 Melbourne is a productive city that attracts investment, supports innovation, and creates jobs.
- 2 Melbourne provides housing choice in locations close to jobs and services.
- 3 Melbourne has an integrated transport system that connects people to jobs and services and goods to market.
- 4 Melbourne is a distinctive and livable city with quality design and amenities.
- 5 Melbourne is a city of inclusive, vibrant, and healthy neighborhoods.
- 6 Melbourne is a sustainable and resilient city.
- 7 Regional Victoria is productive, sustainable, and supports jobs and economic growth.

Among these outcomes, Goal 5 aims to enable all Melbourne residents to live locally, i.e., to have nearly all their daily needs (e.g., kindergarten, elementary, and secondary schools, parks, sports facilities, medical centers) met within a 20-minute walk, bicycle, or public transport ride from their homes (20-minute neighborhood, Figure 3.3.7). The background behind this concept is the fact that the population of Melbourne is simultaneously aging and growing, a variety of housing needs to be provided while increasing accessibility to services, and the urban sprawl in the suburbs causes dependence on cars and social inequality. In this context, it is important to introduce the 20-minute neighborhoods to:

- create a walkable environment to improve the health and well-being of citizens,
- provide affordable housing for low- and middle-income residents in highly accessible neighborhoods,
- plan and develop neighborhood activity centers to meet community needs locally,
- ensure coordination among agencies through place-based planning, and
- strengthen community partnerships.

The directions and policies related to Outcome 5 are shown in Table 3.3.1.



Source: DELWP, Victoria State Government

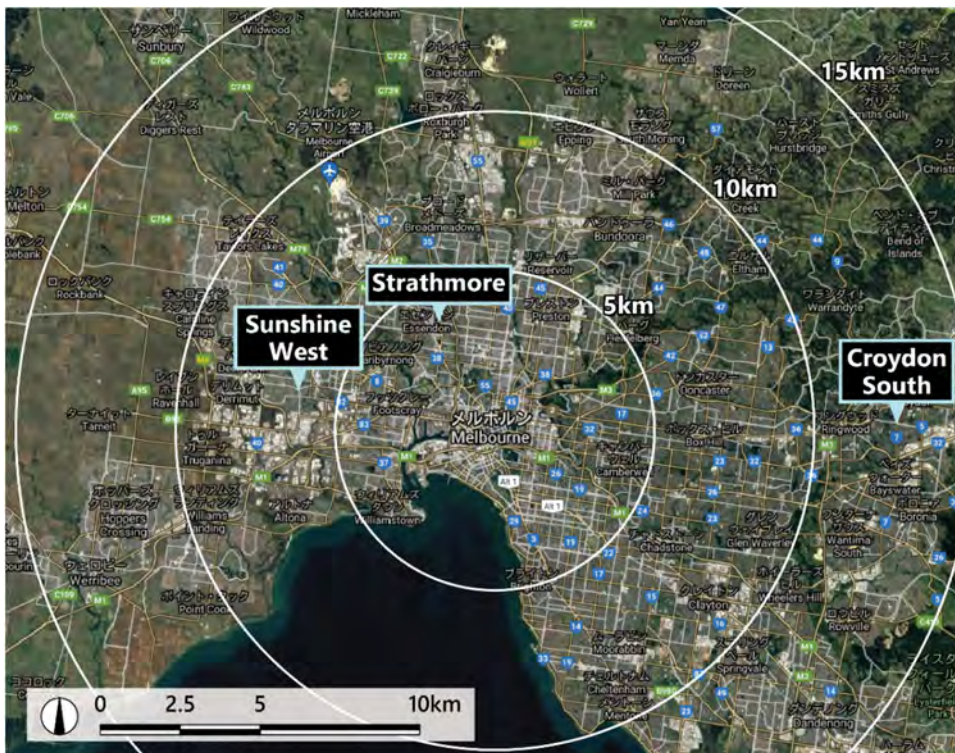
Figure 3.3.7 Features of 20-Minute Neighbourhood (Melbourne)

Table 3.3.1 Directions and Policies Related to Outcome 5 (Melbourne)

Directions	Policies
Create a city of 20-minute neighborhoods	<ul style="list-style-type: none"> • Create mixed-use neighborhoods at varying densities • Support a network of vibrant neighborhood activity centers
Create neighborhoods that support safe communities and healthy lifestyles	<ul style="list-style-type: none"> • Improve neighborhoods to enable walking and cycling as a part of daily life
Deliver social infrastructure to support strong communities	<ul style="list-style-type: none"> • Facilitate a whole-of-government approach to the delivery of social infrastructure • Create health and education precincts to support neighborhoods • Support not-for-profit community services to build social capital and stronger communities • Provide and protect land for cemeteries and crematoria
Deliver local parks and green neighborhoods in collaboration with communities	<ul style="list-style-type: none"> • Develop a network of accessible, high-quality, local open spaces • Support community gardens and productive streetscapes

Source: JICA Study Team based on DELWP, Victoria State Government

Based on this, the Victoria Department of Environment, Land, Water and Planning (DELWP) implemented the 20-minute neighborhood pilot program in collaboration with the city government and NGOs. As a result of a public call for applications, the three neighborhoods shown in Figure 3.3.8 were selected as target sites. The pilot program in Strathmore, Moonee Valley is discussed below as a case study.



Source: JICA Study Team based on DELWP, Victoria State Government, Google map

Figure 3.3.8 Pilot Program Sites of 20-Minute Neighborhood

MV2040 Strategy, the urban master plan of the City of Moonee Valley, has divided the city area into 13 walkable neighborhoods based on the 20-minute neighborhood concept described in Plan Melbourne 2014–2050. These neighborhoods are based on daily travel

patterns and geographical boundaries, such as arterial roads, rivers, and elevations, and are different from suburbs, which are officially defined by the provincial government (Figure 3.3.9). Strathmore is one of 13 neighborhoods defined by the city. Plans described in the MV2040 Strategy include the placement of community anchors that serve as neighborhood centers for activities, events, and recreation; the development of parks; and improvements in the walking environment (Figure 3.3.10).



Source: Moonee Valley City Council

Figure 3.3.9 Neighborhood (left) and Suburb (right) of the City of Moonee Valley



Source: Moonee Valley City Council

Figure 3.3.10 Development Plan of Strathmore Neighbourhood in the MV2040 Strategy

Based on this strategy, the 20-minute neighborhood pilot program was implemented in three phases.

(i) Community participation

Workshops with local community clubs (e.g., sports clubs, walking groups), middle and high schools, events in front of train stations, and online platforms were used to collect residents' ideas and issues for the neighborhood.

(ii) Technical assistance

Assessments of urban design that encourage physical exercise, walkability, use of street space, housing development, green cover, and thermal environment were conducted by government agencies and NGOs.

(iii) Discussion of Future Possibilities

Based on the results of (i) and (ii), the future development potential of Strathmore is shown in Figure 3.3.11.



Source: Victoria State Government

Figure 3.3.11 Future Development Potential of Strathmore

3.4 Academic Literature

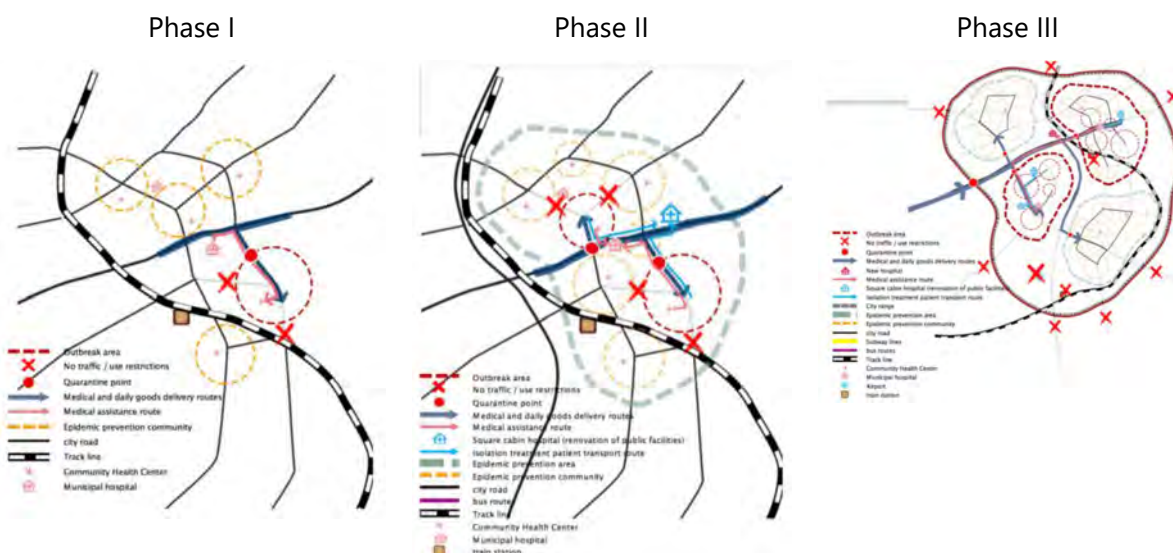
3.4.1 Urban Function-Spatial Response Strategy for the Epidemic – A Concise Manual on Urban Emergency Management (Southeast University, China, March 2020)

Based on the experience in China, where the COVID-19 outbreak occurred first in the world, the paper describes the urgent functional-spatial responses that cities should take in response to the pandemic. The following six issues were identified as problems faced by many cities in the pandemic.

- Inadequate medical facilities: Particularly, primary health care facilities at the community level are inadequate or unequally distributed.
- Excessive urban population density: Densely populated cities have difficulty restricting people's movement and sever transmission routes and have a severe impact on other urban systems during the lockdown.
- Traffic congestion: Transport of medical personnel, patients, and emergency supplies is hampered.
- Inadequate open space: Open spaces that could serve as temporary storage or patient receiving facilities are scarce or unequally distributed.
- Low level of public services: Large public service facilities such as gymnasiums, exhibition halls, and schools, which could serve as temporary medical facilities, are scarce or unequally distributed.
- Lack of people awareness: Lack of understanding of infectious diseases prevents the normal functioning of the city's functional-spatial emergency response.

Addressing these problems requires both rapid collection and appropriate use of necessary information and the health care system and the system that supports livelihoods (e.g., ensuring the supply of daily necessities). In particular, the linkage between the two systems should be consistent from the city level to the community level to facilitate the severing of transmission routes. Based on these ideas, this report proposes the Epidemic Prevention Area (EPA) as a model of the functional-spatial pattern of a city. This is a concept that applies the existing functional-spatial system of a city to infectious disease response. The formation of EPAs can be divided into the following three levels, depending on the stage of the infection spread (Figure 3.4.1).

- Early stage of infection spread (Phase I): Lockdown and disinfection are conducted for individual buildings where infection was confirmed and transport patients to designated hospitals.
- Infection increments period (Phase II): District-based EPAs are quickly formed. The basic concept of an EPA is to control the spread of infection in as limited a time and space as possible. District-based EPAs are operated and managed relatively independently.
- Infection explosion period (Phase III): In the event of further spread of infection, a more extensive emergency medical care system is established, and multiple district-based EPAs are combined to form a city-based EPA. To restrict traffic flow, the secondary and lower road networks that serve as entry and exit points to each EPA will be blocked.



Source: Southeast University, et al (2020)

Figure 3.4.1 Formation Process of EPA in Line with Infection Spread

During the infection spread, urban public service facilities should be treated as follows:

- Construction of temporary medical facilities: With the anticipated tightening of hospital functions, public green spaces, sports facilities, and abandoned schools should be converted into temporary medical facilities to receive minor or asymptomatic patients.
- Specification of public spaces and facilities: Public facilities at the district level should be converted into other usages such as distribution centers and testing facilities.
- Ensuring child safety: Kindergarten and elementary schools in the EPA should be closed and converted to temporary medical facilities.
- Securing accommodation facilities: If there is an influx of people to the cities, hotels and other accommodations should be provided as accommodation facilities for them.
- Strengthening warehousing and distribution facilities: Cooperate with logistics companies to ensure smooth storage, transport, and distribution of daily commodities and medical supplies.
- Attention to community care facilities: Special attention should be paid to community care facilities for the elderly, as they are more likely to become seriously ill. Likewise, the focus should be on preventing the spread of infection in mental hospitals, prisons, and other facilities that tend to be closed situations.

In China, a centralized health care system and epidemiological surveys conducted by community social workers and volunteers have been effective in controlling the spread of infection. On the other hand, in developing cities with inadequate medical and spatial resources, the allocation of temporary medical facilities is inadequate or unequal, making it difficult to establish an ideal system for preventing the spread of infection. However, those countries can take short-term responses by (i) setting up a simple EPA system by involving not only major medical institutions but also temporary medical facilities and community-level medical facilities and (ii) increasing diagnostic capacity in each community and quickly diagnosing and isolating patients, while strengthening coordination among the EPAs.

3.4.2 Others

Sharifi, et al. (2020)² summarizes research publications related to COVID-19 and cities as of August 2020.

(i) Environmental quality

- While air pollution has improved due to changes in transport means and factory shutdowns, side effects such as increased ozone concentrations have also been reported. Some studies suggest that improved air pollution reduces the risk of infection with COVID-19.
- Other environmental factors affecting COVID-19 are unknown, although some studies have found a negative correlation between humidity and infection rates.
- Water quality has improved due to plant shutdowns and other factors. The virus has been detected in sewage systems as well.

(ii) Socioeconomic Impact

- COVID-19 and the response to it have highlighted existing inequalities and social disparities, making it difficult to prepare for, respond to, and recover from the pandemic. Fostering a sense of community can help to reduce social tensions and promote community-led initiatives.
- Declining tax revenues may cause national and local governments to de-prioritize investments in the urban sector. Collaboration in inter-city networks would be important.

(iii) Management and Governance

- Top-down and multi-layered governance can be observed, both of which need to be combined with city-level governance.
- Increasing attention is being paid to smart cities, where digital technologies are being used to identify infected persons, predict infection status, contact tracing, and monitor social distancing and isolation. At the same time, privacy issues must continue to be addressed.

(iv) Transport and Urban Design

- Travel restrictions can be effective in controlling the spread of infection. Public transport is still important, although it tends to be avoided. NMT, such as walking and bicycling, is also gaining attention.
- Compact cities should be encouraged as a sustainable urban form.
- High-density areas have higher levels of services, including health care, while exposure to wildlife-borne infectious diseases is a problem on the fringes.

² Ayyoob Sharifi, Amir Reza Khavarian-Garmsir (2020). The COVID-19 pandemic: Impacts on cities and major lessons for urban planning, design, and management. *Science of The Total Environment*. Volume 749.

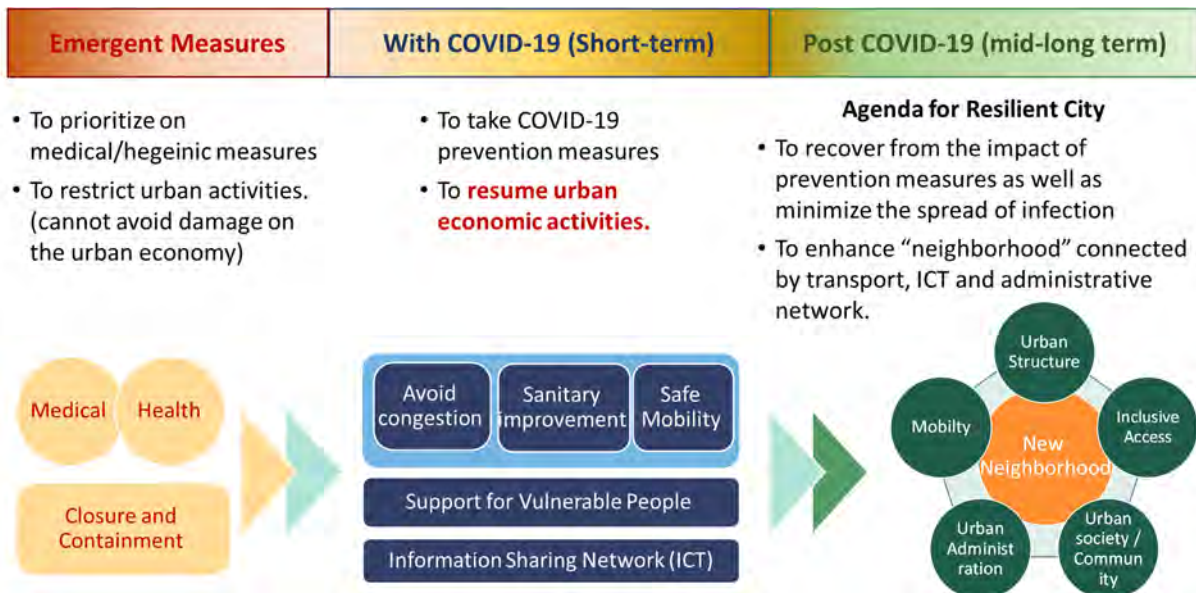
4 Expected Direction of Urban Development in with COVID-19 and Post-COVID-19 Eras

4.1 Discussion Points

Chapter 2 analyzed how COVID-19 spread in cities (2.2), how cities took measures against the spread of COVID-19 (2.3), and how urban factors affected the infection spread (2.4). Furthermore, based on the analysis of the impacts of COVID-19 on cities (2.5) and the changes in urban society and activities (2.6), it summarized how the challenges facing cities in developing countries have changed during the pandemic in terms of urban structure, urban transport, water environment, and socio-economic aspects (2.7). Based on the previous analysis, this chapter summarizes the challenges in the urban sector and expected directions of urban development with COVID-19 and post-COVID-19.

As of July 2022, the spread of the disease has not been curbed, and there is no denying that the pandemic might continue over the next 1–2 years or even several years. As an emergency response, medical and sanitation measures to prevent the spread of the disease have been the priority, and urban socioeconomic activities have been restricted. However, severe damage caused by restrictions on socio-economic activities and the prolonged spread of the disease has made some countries move toward full resumption of urban activities. In the short term, it is necessary to respond to these trends and consider how to resume urban activities while taking measures to prevent the spread of COVID-19.

Furthermore, as urban activities resume in the mid- to long-term, it is necessary to form cities to become resilient against infectious diseases, such as COVID-19, that can not only prevent widespread infection but also minimize the impacts of infection prevention measures and recover quickly by addressing the vulnerabilities of cities identified in the pandemic.



Source: JICA Study Team

Figure 4.1.1 Topics for Expected Status of Cities in With- and Post-COVID-19 Eras

4.2 Short-Term Initiatives for Resumption of Urban Activities

4.2.1 Five Perspectives for Resumption of Urban Activities

As the COVID-19 infection situation repeatedly worsens and improves in each country, the short-term challenge is how to resume urban activities while maintaining certain restrictions on movement, maintaining social distancing, and preventing infection. The following are perspectives to be considered for this purpose.

1) Avoidance of Congestion

In order to resume urban activities while containing the spread of COVID-19, it will be essential to avoid crowding in buildings and facilities. To this end, it will be necessary to continue the measures introduced during the pandemic to ensure social distancing in facilities and diversify the demand for urban facilities so people can walk around while avoiding crowding. Considering e-commerce (EC) and online banking services that have been widespread during the pandemic, the digitalization of administrative services (online procedures) will help people to avoid crowding.

2) Water Supply and Sanitary Improvement

When resuming urban activities, people must continue basic hygiene practices, such as handwashing and gargling, which are necessary to prevent infection. In informal settlements, there are many difficulties in improving the sanitary environment. The first step should be to understand the actual conditions and issues. The following are measures that need to be taken.

- Ensure access to adequate water supply services
- Develop adequate toilet facilities and human waste/sewage disposal
- Establish proper hand washing practices
- Collect and dispose of waste properly
- Identify and improve informal settlements

3) Ensuing Safe Mobility

During the pandemic, measures have been taken to restrict the movement of people to deter virus expansion, including suspension of public transport services and reduction in the capacity to avoid overcrowding. During these restrictions, people have become aware of the infection risks associated with mobility, which has led to a tendency to avoid travel or public transport. As the infection situation has settled down, there are many cities where the demand for public transport has not returned despite the recovery of the traffic volume. In other words, the shift to private transport (e.g., private cars) and semi-public services (e.g., ride-hailing) has been progressing, especially among middle- and upper-income groups. This has created a situation where low-income groups are forced to walk or bicycle.

In order to resume urban activities in the future, it is essential to ensure a safe and secure environment for people to move around. In addition, providing public transport services is essential to ensure mobility in developing country cities, and the continuance of safe public transport businesses is a major challenge. Furthermore, walking and bicycle use are being reviewed in the pandemic for various reasons, such as avoiding infection risks, mobility

restrictions, and health, and securing the environment for NMT would be a short-term challenge.

4) Information Sharing

As the pandemic restricts the movement of people, information sharing, contactless service provision, and the alleviation of congestion using ICT will be essential to maintain urban activities and services. In addition to disseminating and sharing information, the use of information collected every day will enable the provision of services that match needs.

5) Support for Vulnerable Groups

COVID-19 had a significant social and economic impact on the urban vulnerable groups, such as day laborers working in the informal sector, domestic servants, and migrant workers. They are the economic players in each city, and support for these vulnerable groups is essential in restarting urban activities.

In addition to direct assistance, such as cash transfers, a combined approach is required, including job assistance for the unemployed, correction of educational inequalities, short-term financial assistance, and sanitation improvement. As for public assistance by the government, the role of self-help activities by communities and residents has been reaffirmed not only in preventing the spread of infection but also in providing economic and social support to vulnerable groups. Efforts are needed to expand such initiatives.

4.2.2 Short-Term Program

Based on the five perspectives outlined in the previous section, the following five programs summarize the measures that should be taken in the short term.

1) Program for Strengthening Neighborhood to Avoid Congestion

The program aims to ensure neighborhoods, where a variety of urban services are available and urban social and economic activities, can take place in a city so social and economic activities can be resumed while minimizing the travel to the urban center.

Table 4.2.1 Program for Strengthening Neighborhood to avoid Congestion

ProgramS-N01			
Distributed Provision of Administrative Services			
Project S-N01- 01		Scope of Project	Matters to be Considered
Expansion of administrative service branches	Construction	<ul style="list-style-type: none"> • Establish branch offices providing administrative services in each city district to prevent concentration of people. • Given the local government structure is a city (population: millions) <ul style="list-style-type: none"> - District (hundreds of thousands) - Sub-District (tens of thousands), the service provision will be enhanced at the Sub-District level, while it 	<ul style="list-style-type: none"> • Ensure that services can be provided at branch offices (ProjectS-N01-03)

		depends on the administrative unit of each city.	
Project S-N01- 02		Scope of Project	Matters to be Considered
Strengthening ICT collaboration between city hall and branch offices (Figure 4.2.1)	Technical cooperation	<ul style="list-style-type: none"> • Increase the access points to the services by introducing a simple system to centralize information by connecting city hall, district, and sub-district branch offices via an Internet connection. • Disclose the congestion level and provide online services via the web to reduce the load and queues for counter services. 	<ul style="list-style-type: none"> • Secure Internet connection between city hall and branch offices (use existing services) • Establish an online system (application)
Project S-N01- 03		Scope of Project	Matters to be Considered
Staffing and capacity building	Technical cooperation	<ul style="list-style-type: none"> • Secure human resources at branch offices. • Strengthening cooperation with the community. (Understanding residents' needs, cooperative response to emergencies) 	<ul style="list-style-type: none"> • Since it is difficult to increase human resources in the short term, consider appointing community personnel.
Project S-N01- 04		Scope of Project	Matters to be Considered
Expansion of urban service facilities/ utilization of existing facilities	Construction	<ul style="list-style-type: none"> • Expand facilities that are not fully functional due to the inability to avoid congestion. • Increase classrooms in elementary and secondary schools • Expand community health centers 	<ul style="list-style-type: none"> • Collaborate with community organizations to identify needs, operation, and management

Program S-N02			
Utilization of Open Spaces			
Project S-N02-01		Scope of Project	Matters to be Considered
Promotion of multi-purpose use of road space	Maintenance and operation	<ul style="list-style-type: none"> • Utilize road space by roadside stores • Secure walking space by redistributing existing road spaces 	<ul style="list-style-type: none"> • Relax related regulations/special temporary measures
Project S-N02-02		Scope of Project	Matters to be Considered
Multi-purpose use of existing parks/ public open space	Maintenance and operation	<ul style="list-style-type: none"> • Develop markets • Develop public water taps • Utilize open spaces as evacuation/ isolation areas in case of disaster • Effectively utilize space by disclosing vacancy information and reservation status via the web 	<ul style="list-style-type: none"> • Establish rules for residents and stakeholders • Improve the environment to facilitate use by citizens
Project S-N02-03		Scope of Project	Matters to be Considered
Securing new open spaces	Development, maintenance, operation	<ul style="list-style-type: none"> • Develop and utilize unused open space 	<ul style="list-style-type: none"> • Utilize unused public land

Program S-N03			
NMT environment development			
Project S-N03-01		Scope of Project	Matters to be Considered
Pedestrian space improvement	Construction, maintenance, operation	<ul style="list-style-type: none"> Secure pedestrian space Improve pedestrian space (roofs, pavement, crosswalks, barrier-free access) 	<ul style="list-style-type: none"> Manage on-street parking and street vendors
Project S-N03-02		Scope of Project	Matters to be Considered
Bicycle lane improvement	Construction, maintenance, operation	<ul style="list-style-type: none"> Secure bicycle lanes Develop bicycle-exclusive lanes road crossings and signals for bicycles only Secure bicycle parking 	<ul style="list-style-type: none"> Reallocate existing street space (Project S-N02-01)

Source: JICA Study Team

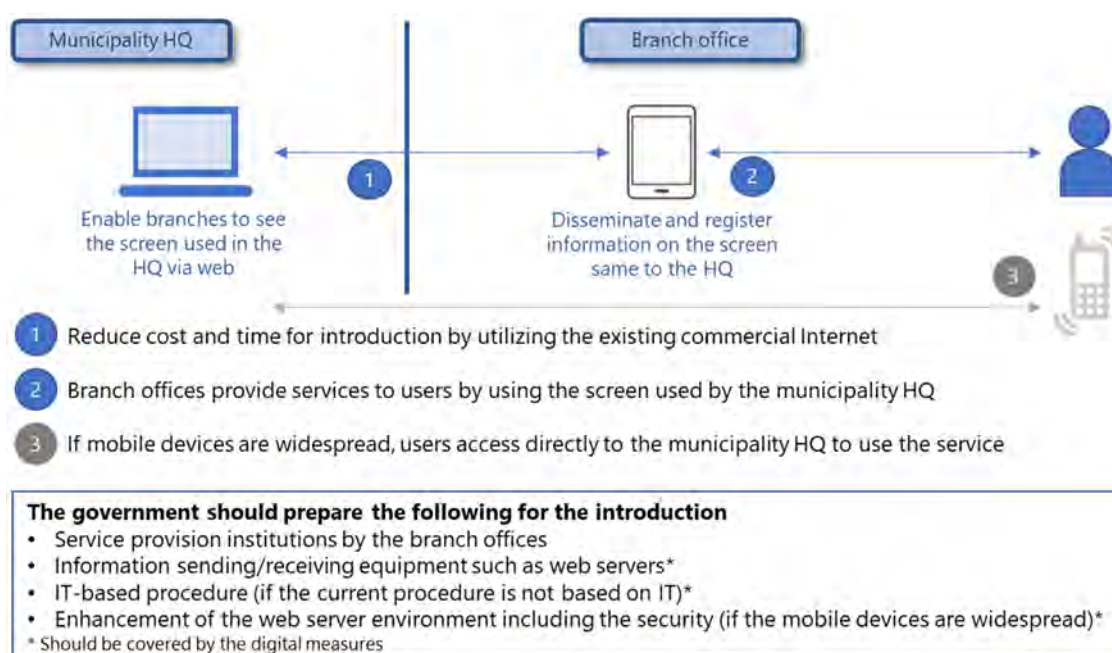


Figure 4.2.1 Use of Digital Technology for Distribution of Administrative Service

2) Program for Water, Sanitation, and Hygiene Improvement

Reducing vulnerability to infection will be essential for resuming urban activities during the pandemic. To this end, a water supply system that reflects the needs of residents and the community should be established for the habits of hand washing and gargling. Specifically, the location and the specifications of public taps should reflect the needs of residents, and a water supply system should support these public taps. In conjunction with establishing the water supply system, educational activities are necessary to familiarize residents with the habit of handwashing and establish the maintenance system. To improve sanitation, urban solid waste management, including infectious waste, and sewage management and treatment systems should be introduced. The vulnerable areas and sectors in terms of urban sanitation and their issues for long-term improvement should be identified.

Table 4.2.2 Program for Water, Sanitation, and Hygiene Improvement Program

Programs WSH-01			
Water Supply Business Support Program			
Project WSH-01-01		Outline of Project	Matters to be Considered
Water distribution and water supply facility development	Construction	<ul style="list-style-type: none"> • Confirm current water supply status • Construct well as a new water source • Rehabilitate existing facilities • Rehabilitate or construct chlorine disinfection facility • Extend water distribution pipeline • Rehabilitate and install new public water taps 	<ul style="list-style-type: none"> • Distribute water equally • Ensure residual chlorine • Select public taps based on residents' needs • Set appropriate hydrant specifications
Project WSH-01-02		Scope of Project	Matters to be Considered
Support for water distribution and water supply facility operation	Operation, management	<ul style="list-style-type: none"> • Supply water with water truck to areas where distribution pipelines have not yet been installed • Establish water distribution control system • Establish or renew customer information system • Establish or renew fee collection system 	<ul style="list-style-type: none"> • Distribute water equally • Reduce water distribution energy (electricity consumption) • Reduce non-revenue water • Improve fee collection rate

Programs WSH-02			
Sanitary Environment Improvement Program			
Project WSH-02-01		Scope of Project	Matters to be Considered
Development of human waste collection and treatment facilities	Construction, operation, management	<ul style="list-style-type: none"> • Confirm the current status of human waste collection and treatment • Procure human waste/septic tank sludge collection equipment and establish regular sludge collection system • Install human waste/ septic tank sludge treatment facilities 	<ul style="list-style-type: none"> • Set appropriate toilet and putrefaction tank specifications • Strengthen crackdown on illegal dumping of human waste/decomposing sludge
Project WSH-02-02		Scope of Project	Matters to be Considered
Solid waste management improvement	Operation, management	<ul style="list-style-type: none"> • Confirm current status of waste collection and disposal • Establish appropriate waste separation and discharge system • Procure collection and transportation equipment, improve collection and transportation system 	<ul style="list-style-type: none"> • Establish a separation system for each source (households, businesses, hospitals, communities)

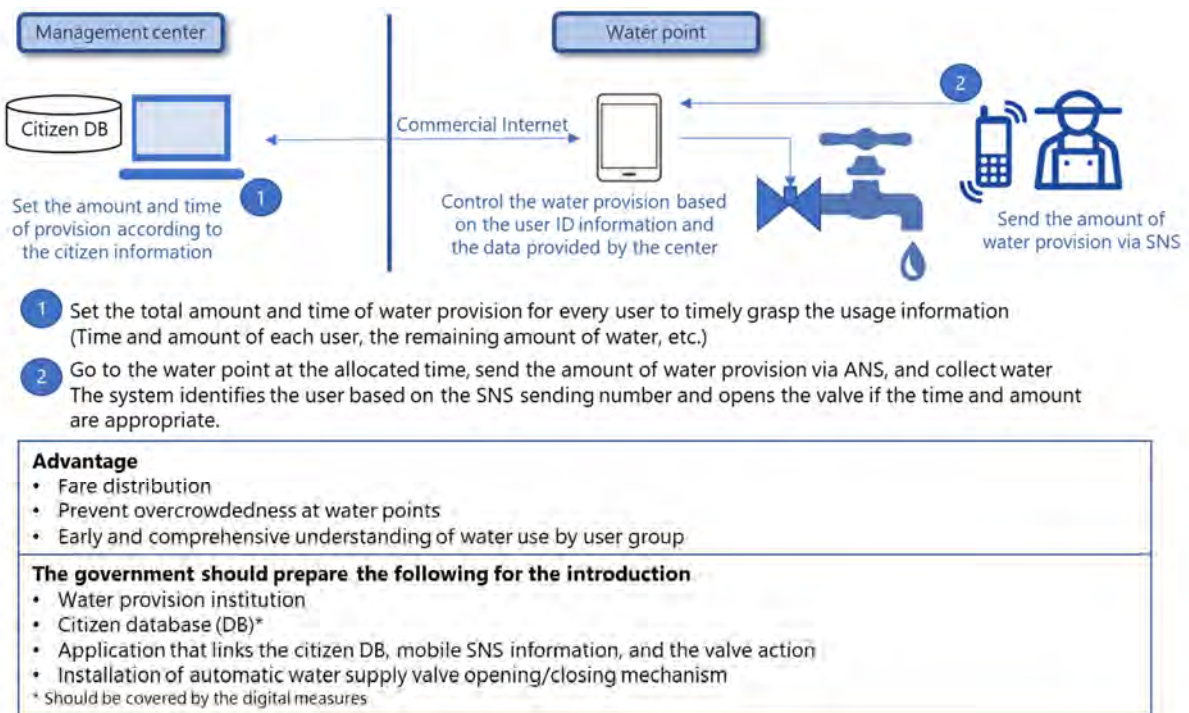
		<ul style="list-style-type: none"> Distribute PPE (personal protective equipment) to collection workers 	
Project WSH-02-03		Scope of Project	Matters to be Considered
Establishment of hand washing and hygiene habits	Operation	<ul style="list-style-type: none"> Conduct awareness-raising and public relation activities for hand washing and hygiene practices in schools and communities Establish soap supply system 	<ul style="list-style-type: none"> Develop easy-to-understand content Involve various media Support soap supply chain

Programs WSH-03			
Sanitary Environment Improvement Program in Slum Areas			
Project WSH-03-01		Scope of Project	Matters to be Considered
Identification of target areas and their actual conditions	Survey	<ul style="list-style-type: none"> Identify slum areas Identify actual living conditions and needs for support 	<ul style="list-style-type: none"> Grasp the current situation and needs for support by mapping for the entire city and building a database
Project WSH-03-02		Scope of Project	Matters to be Considered
Installation of public water taps and development of operational systems	Construction, operation, management	<ul style="list-style-type: none"> Install public taps and yard taps Procure and operate water trucks Support formation of water supply cooperatives Establish digital ticket system for water supply (Figure 4.2.2) 	<ul style="list-style-type: none"> Select location of public taps based on residents' needs Set appropriate public faucet specifications Cooperate with government authorities Ensuring fairness through electronic ticketing
Project WSH-03-03		Scope of Project	Matters to be Considered
Toilet improvement	Construction, operation, management	<ul style="list-style-type: none"> Convert to sanitary toilets Procure human waste collection equipment Establish toilet maintenance and human waste collection system 	<ul style="list-style-type: none"> Create a standard design suited to local conditions Establish maintenance and management system by the community Collaborate with government authorities
Project WSH-03-04		Scope of Project	Matters to be Considered
Awareness-raising and practice of water and sanitation	Operation	<ul style="list-style-type: none"> Promote understanding of sanitation and behavior change Support measures to secure water using rainwater and solar disinfection (SODIS) 	<ul style="list-style-type: none"> Develop easy-to-understand content Develop a standard design suitable for local conditions Collaborate with government authorities
Project WSH-03-05		Scope of Project	Matters to be Considered
Improvement of waste management system	Operation	<ul style="list-style-type: none"> Separate collection of waste in the community and establish a collection system by the government 	<ul style="list-style-type: none"> Cooperation with informal associations of waste pickers and the government

		<ul style="list-style-type: none"> • Separate collection of medical waste • Develop infection prevention guidelines and implement infection prevention measures for waste pickers 	
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Source: JICA Study Team

Figure 4.2.2 illustrates water supply through digital ticketing using DX. By setting the total amount of water provided and the time of use in advance with the electronic ticket system, fair distribution and avoidance of congestion at water supply stations can be achieved and fairness can be ensured.



Source: JICA Study Team

Figure 4.2.2 Use of Digital Technology for Water Supply

3) Program for Safe and Secured Mobility

Fear of the spread of infection led to a shift from public to private transport during the pandemic. This trend continues, and there is concern about the widening mobility gap. In order to ensure mobility for those without private vehicles, it is essential to provide safe and secured public transport services. The table below lists the initiatives needed to achieve this goal.

Table 4.2.3 Program for Safe and Secured Mobility

Program S-SM-01			
Infection Prevention Program for Public Transport			
Project S-SM01-01		Scope of Project	Matters to be Considered
Public transportation infection control	Management, operation	<ul style="list-style-type: none"> • Create and disseminate infection prevention guideline • Conduct disinfection in trains/vehicles • Check temperature of passengers • Manage health of drivers/conductors • Promote IC cards 	<ul style="list-style-type: none"> • Wear masks, maintain social distance, prohibit conversation, etc.
Project S-SM01-02		Scope of Project	Matters to be Considered
Promoting off-peak commuting	Management, operation	<ul style="list-style-type: none"> • Level peak demand • Limit ridership during peak hours 	
Project S-SM01-02		Scope of Project	Matters to be Considered
Dissemination of congestion information (Figure 4.2.3)	Management, operation	<ul style="list-style-type: none"> • Quantify and disseminate congestion information using existing ticketing system and camera images 	<ul style="list-style-type: none"> • Establish online platform
Program SM-02			
Support for Public Transport Operators			
Project SM02-01			Matters to be Considered
Improvement of public transport accessibility	Management, operation	<ul style="list-style-type: none"> • Enhance the convenience of public transport, including transit discounts, accessibility to stations, and multi-modal linkages 	
Project SM02-02		Scope of Project	Matters to be Considered
Business support	Management, operation	<ul style="list-style-type: none"> • Assist with expenses related to infection control • Compensate for reduced revenues • Increase fares 	
Project SM02-03		Scope of Project	Matters to be Considered
Relaxation of regulation	System	<ul style="list-style-type: none"> • Relax regulation for passenger carriers to start home delivery services 	
Program S-N03			
NMT Environment Improvement			
Project S-N03-01		Scope of Project	Matters to be Considered
Pedestrian space maintenance	Construction, operation, management	<ul style="list-style-type: none"> • Secure pedestrian space • Improve pedestrian space (roof, pavement, crosswalk, barrier-free access) 	<ul style="list-style-type: none"> • Manage on-street parking and street vendors
Project S-N03-02		Scope of Project	Matters to be Considered

Bicycle lane maintenance	Construction, operation	<ul style="list-style-type: none"> Secure bicycle lanes Develop bicycle-exclusive lanes road crossings and signals for bicycles only Secure bicycle parking 	<ul style="list-style-type: none"> Reallocate existing street space (Project S-N02-01)
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Source: JICA Study Team

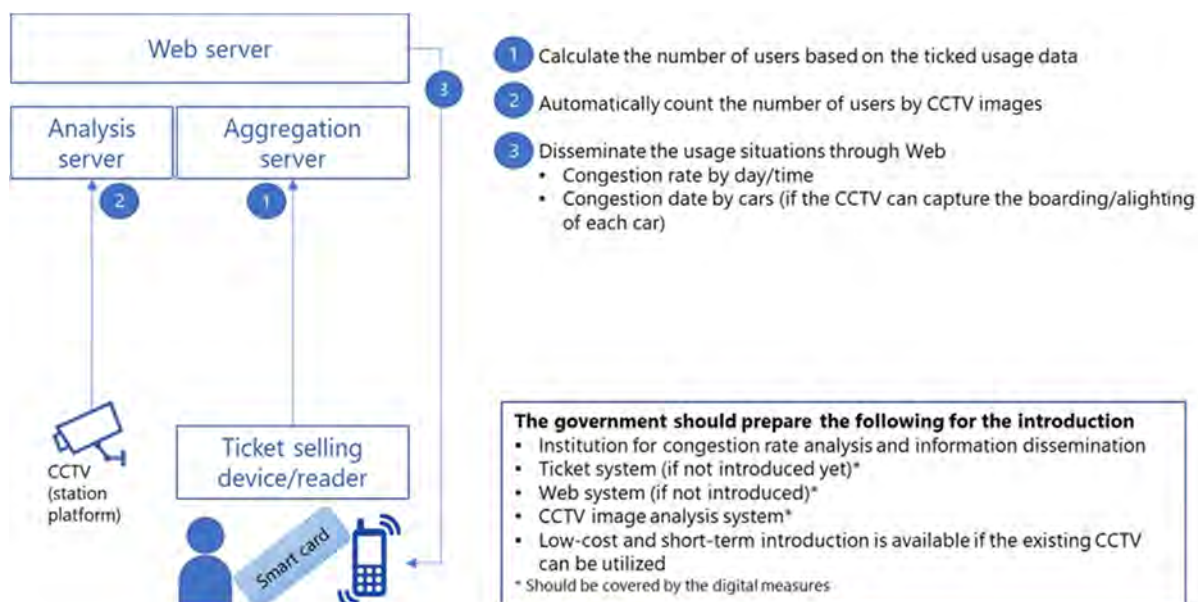


Figure 4.2.3 Use of Digital Technology for Grasping Congestion Status

4) Program for Quick Support for Vulnerable Group

COVID-19 has reaffirmed urban vulnerability not only risk to the spread of infection itself due to poor sanitary conditions but also economic vulnerability, such as unemployment due to lockdown measures, and social vulnerability, such as loss of educational opportunities and social isolation. These vulnerabilities must be identified first before efforts are made to provide relief to vulnerable groups in the short term.

The urban vulnerable groups severely hit by COVID-19 include day laborers in the informal sector, domestic servants, and migrant workers. Supporting these vulnerable groups is essential to resuming urban activities. In addition to direct assistance, such as cash transfers, combined activities will be needed, such as providing job assistance to the unemployed, providing educational opportunities, short-term financial assistance, improving sanitation, and so on.

Table 4.2.4 Program for Quick Support for Vulnerable Group

Program S SV-01			
Identification of Vulnerable Groups			
Project S SV-01-01		Scope of Project	Matters to be Considered
Resident Survey	Survey	<ul style="list-style-type: none"> Conduct livelihood survey (family structure, income, expenditure) 	<ul style="list-style-type: none"> Identify vulnerable areas by vulnerability assessment - Assess based on SDGs

		<ul style="list-style-type: none"> • Conduct household survey (house structure, area of house per capita) • Conduct infrastructure coverage survey (water, toilet, electricity, transport means) • Conduct water use survey, sanitation survey (toilets) 	6.1 and 6.2 <ul style="list-style-type: none"> - Securely manage water supply - Safely manage toilets - Handwashing facilities with soap and water
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Program S SV-02

Program to Improve Sanitation in Slum Areas

Implemented in Program WSH-03: Sanitary Environment Improvement Program in Slum Areas**Program S SV-03**

Emergency Assistance Program for the Needy

Project S SV-03-01		Scope of Project	Matters to be Considered
Employment Programs	Operation	<ul style="list-style-type: none"> • Promote employment for the unemployed in public projects (sanitation improvement programs in slum areas) • Create employment opportunities through matching applications 	<ul style="list-style-type: none"> • Cooperate with government authorities
ProjectS SV-03-02		Scope of Project	Matters to be Considered
Short-term in-kind and financial support	Operation	<ul style="list-style-type: none"> • Introduce instantaneous payment using mobile money (identify eligible recipients based on user registration information on mobile money and transfer funds to the relevant accounts) • Give financial assistance to the poor (cash, rent subsidies, unemployment benefits) • Extension of mortgage or rent repayment deadlines • In-kind support (food, coupons) 	<ul style="list-style-type: none"> • Cooperate with government authorities • Request cooperation from landlords (extend mortgage repayment deadlines, prevent price hikes, prevent evictions, etc.)
ProjectS SV-04-02		Scope of Project	Matters to be Considered
Support for Social Isolation	Operation, maintenance	<ul style="list-style-type: none"> • Provide support through community 	

Program S SV-04

Programs to Reduce Social Disparities

Project S SV-04-01		Scope of Project	Matters to be Considered
Support for water fee	Operation	<ul style="list-style-type: none"> • Give subsidy for water connection fees and water charges for residents in slum areas 	<ul style="list-style-type: none"> • Adopt subsidy method to secure income for the water utility

		<ul style="list-style-type: none"> Prevent water supply withholding 	
Project S SV-04-02		Scope of Project	Matters to be Considered
Support for public services	Operation	<ul style="list-style-type: none"> Give subsidies for electricity, public transport, and so on. for residents of slum areas Free education Provision of ICT equipment Broadcasting of class programs via TV and radio 	<ul style="list-style-type: none"> Adopt subsidy method to secure income for the public utility

Source: JICA Study Team

5) Program for Information Collection and Sharing Using ICT

Although the COVID-19 data is updated daily at the country level, the actual number of infected people is not known or disclosed on a district-by-district basis in many cities. In order to prevent the spread of infection and resume urban activities, the priority is to accurately grasp the infection status and share this information with relevant organizations daily. In addition, data on the movement and congestion of people can be collected and made public in real-time to encourage the dispersal of people and travel demand. Using ICT would make it possible to disperse service delivery points and share the information with residents to prevent the concentration of various urban services, such as administrative services, medical care, and education. Furthermore, by collecting and sharing user information, it would be possible to improve services more, for example, by proposing new mobility services based on traffic movement data.

Table 4.2.5 Program for Information Collection, Sharing and Utilization with ICT

Programs ICT-01			
Collection and Dissemination of COVID-19 Infection Status			
Projects ICT01-01		Scope of Project	Matters to be Considered
Introduction and dissemination of contact tracing app	Operation, management	<ul style="list-style-type: none"> Introduce contact tracing app Monitor infection status Raise awareness on infection prevention 	1. Avoidance of congestion
ProjectS ICT01-02		Scope of Project	Matters to be Considered
Regulatory measures according to the actual infection situation	Operation, management	<ul style="list-style-type: none"> Implement isolation and closure according to the infection status 	
Remote response for infected patients		<ul style="list-style-type: none"> Provide remote diagnosis for those who are unable to come to the hospital (medical interview via web conferencing) Provide real-time monitoring applications and devices for those who are waiting for isolation 	

ProgramS ICT-02			
Collection and Release of People's Movement and Congestion Status			
ProjectS ICT02-01		Scope of Project	Matters to be Considered
Provision of real-time information on public transport	Operation, management	<ul style="list-style-type: none"> Identify and disclose real-time information on congestion of public transport services (using data from existing ticketing systems and cameras) 	3. Safe mobility
ProjectS ICT02-02		Scope of Project	Matters to be Considered
Check-in/out app	Operation, management	<ul style="list-style-type: none"> Optimize the number of users in the facility by grasping and disclosing the real-time congestion status in the facility through the check-in/out app 	1. Avoidance of congestion
ProjectS ICT02-02		Scope of Project	Matters to be Considered
Advanced Use of Street Cameras	Operation, management	<ul style="list-style-type: none"> Measure traffic volume automatically from image data acquired from street cameras 	

Programs ICT-03			
Integration and Dissemination of Administrative Services			
Projects ICT03-01		Scope of Project	Matters to be Considered
Strengthening ICT collaboration between city hall and branch offices (Figure 4.2.1)	Technical cooperation	<ul style="list-style-type: none"> Increase the access points to the services by introducing a simple system to centralize information by connecting city hall, district, and sub-district branch offices via an Internet connection. Disclose the congestion level and provide online services via the web to reduce the load and queues for counter services. 	1. Avoidance of congestion
Projects ICT03-02		Scope of Project	Matters to be Considered
Integration of administrative services		<ul style="list-style-type: none"> Health Information System: Integrate information on immigration, hospitals, health centers, etc. Provide appropriate support based on personal IDs (immediate identification of persons eligible for support using IDs, immediate deposit into mobile money accounts linked to ID information, etc.) 	
Projects ICT03-03		Scope of Project	Matters to be Considered
Collection and		<ul style="list-style-type: none"> Grasp issues based on 	

grasping of information on usage of administrative services		analysis of usage of public services	
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Source: JICA Study Team

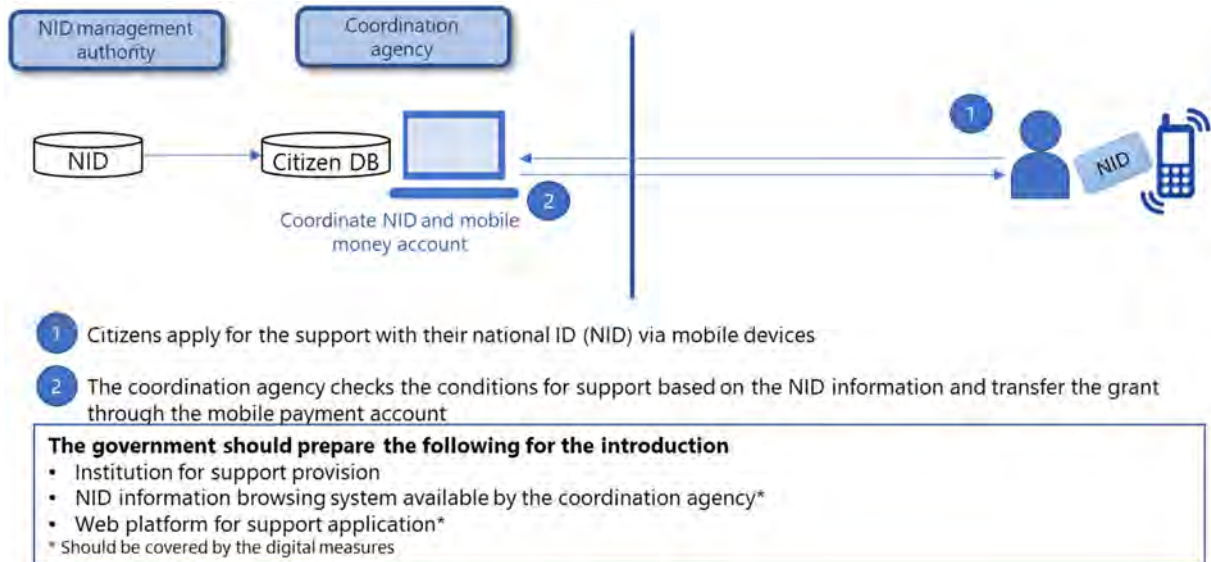


Figure 4.2.4 Use of Digital Technology for Integration of Public Services

4.3 Mid- and Long-Term Initiatives towards Post COVID-19 Cities

4.3.1 Post COVID-19 Resilient City and New Neighborhood

Even after the pandemic has been contained, it is highly likely that COVID-19 will reemerge or that a different infectious disease will spread globally in the future. Famous infectious diseases that have spread worldwide include the bubonic plague in the 1300s and the Spanish flu in 1918–1919. Meanwhile, the White Paper on Health, Labor, and Welfare of Japan and other reports point out that, since the 2000s, the outbreaks of infectious diseases have become more frequent and faster, including severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), and new influenza (H1N1).

The spread of such infectious diseases is mainly due to the growth of the urban population and ecological changes resulting from urbanization. Therefore, various urban measures have been taken, such as improving urban sanitation through the construction of sewer networks and promoting more sanitary facilities.

As analyzed in Chapter 2, COVID-19 has had a serious impact on the city's socio-economy due to lockdowns and movement restriction measures, in addition to the impact of the disease itself. In the mid- to long-term, after the pandemic has been curbed, efforts should be made to create cities that are more resilient to the resurgence of infectious diseases, not only by strengthening areas vulnerable to infectious diseases but also by minimizing the impact and enabling rapid recovery even under movement control and quarantine policies.

The COVID-19 pandemic has reaffirmed the need for multipolar decentralized cities where multiple socially and economically self-sustaining neighborhoods are formed and linked by transport and ICT networks to balance infection control and urban activities. In developed countries, discussions became more active on the enhancement of walkable neighborhoods, such as 15-minute and 20-minute cities (see 3.3). Such a concept was originally aimed at reducing the demand for car travel, eliminating traffic congestion, and thereby mitigating climate change. However, as movement was restricted during the pandemic, there was a growing need for more compact living and avoidance of overcrowded situations. In this context, this neighborhood-based concept has attracted attention as an image of post-pandemic cities. This concept is also expected to reduce the disparities by creating mixed-use neighborhoods.¹

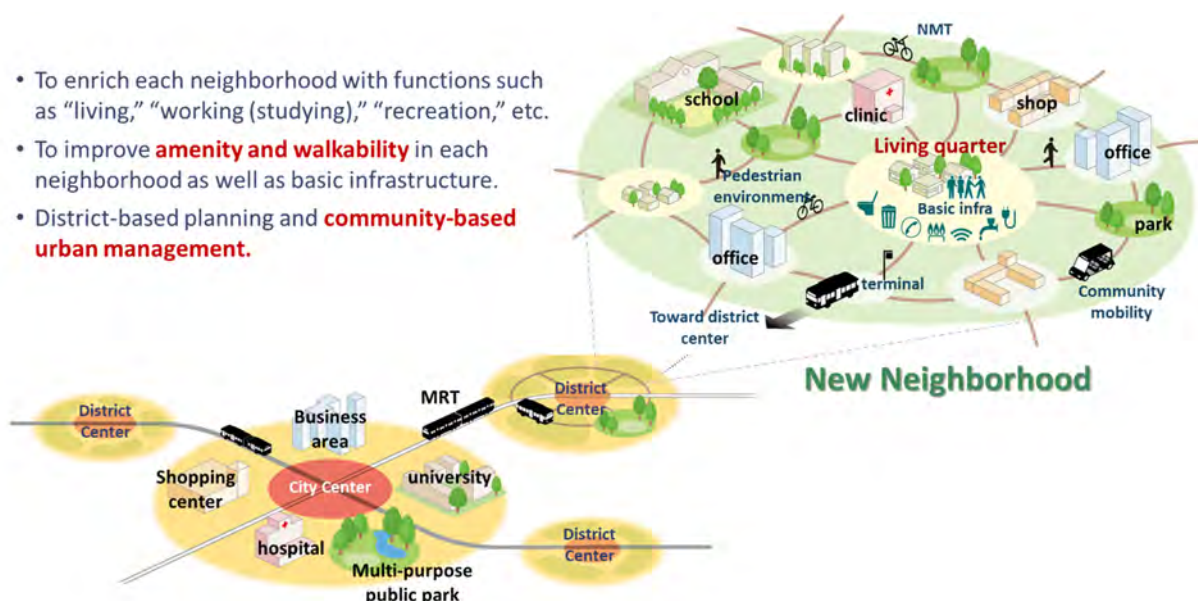
Since cities in developing countries are still in the mid of urban expansion, it is essential to develop basic infrastructure and at the same time to enhance the functions of "living," "working (studying)," and "recreation" in each living area to form socially and economically self-sustaining living areas. In this concept, the neighborhood is assumed to be within a 15-to-20-minute radius by bicycle or on foot, or an 800 m to 1 km radius. In addition to expanding basic infrastructure at the living quarter level, this concept incorporates the improvement and development of urban facilities such as schools, hospitals/clinics, and

¹ UN-HABITAT points out that redeveloping existing overcrowded urban areas or the development of suburban residential areas can lead to increased disparities within the city and that neighborhood planning is a method for building back better after the pandemic, as it prevents overcrowding, maintains proximity to houses, workplaces, services, and social life, and provides mobility for the poor.

stores, an NMT-friendly environment to enhance walkability, and recreational places such as parks and open spaces in each neighborhood.

In order to realize this concept, it is necessary to position neighborhood development in the overall urban planning of each city. Since the neighborhood is different from the administrative divisions, it is necessary to develop a plan based on the neighborhood concept, implement infrastructure improvements, and collaborate with the community at the lower administrative unit level (hereinafter referred to as the district). In developing countries, there are many cases where planning and administrative capacity is not sufficiently developed even at the city level, and district-level planning is not developed in some cases. It is necessary to improve planning and project management capacity at the district level or to incorporate district-level considerations into city-level planning.

- To enrich each neighborhood with functions such as “living,” “working (studying),” “recreation,” etc.
- To improve **amenity and walkability** in each neighborhood as well as basic infrastructure.
- District-based planning and **community-based urban management**.



Source: JICA Study Team

Figure 4.3.1 Concept of New Neighborhood accommodating Self-sustaining Urban Livelihood

In this context, "**Post-COVID Resilient City and New Neighborhood**" has been proposed as a medium- to long-term urban agenda for post-COVID-19. In order to realize this concept, five urban agendas have been set, as described in the following sections.

Post-COVID Resilient City and New Neighborhood

to become a **resilient city** that can recover from the impact of containment measures as well as minimize the spread of infection



Source: JICA Study Team

Figure 4.3.2 Post-COVID Resilient City and New Neighborhood

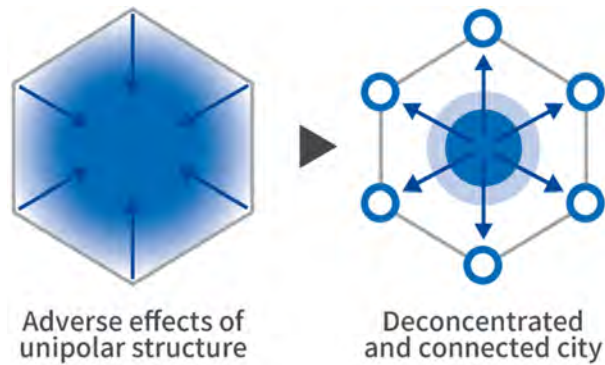
1) Urban Structure: Deconcentrated and Connected City

With the unipolar structure, various urban functions and most economic activities in the metropolitan area are concentrated in the central area. It has caused various urban issues, particularly traffic congestion due to the concentration of commuting movements during rush hours. Many spatial plans have been proposed so far to shift from a unipolar to a multipolar structure with the main objective of alleviating traffic congestion, but many cities have failed to realize it. In some cities, the urban functions have not been relocated even after the transport infrastructure connecting the city center to the sub-center was developed.

On the other hand, the pandemic made people unable to move to city centers, creating a strong need for deconcentrating urban services and functions. In order to prevent COVID-19 infection, avoiding the concentration of people and mobility has become essential. It has brought about the momentum toward a multipole deconcentrated structure. During the pandemic, using ICT has been rapidly advancing in all areas, which would also help promote deconcentrated structures.

As a Deconcentrated and Connected City, the urban functions, administrative services, and urban services will be deconcentrated and coordinated with each other, which requires the following measures.

- To avoid the concentration of urban functions such as commercial and business in the city center and some large facilities, and promote such services provided by small- and medium-scale facilities.
- To form a self-sustaining neighborhood, realize deconcentrated urban structure and reduce the over-concentration of travel demand to/from the city center.
- To strengthen connectivity to support such deconcentrated structure, with a hierarchical transportation network and ICT networks.



Source: JICA Study Team

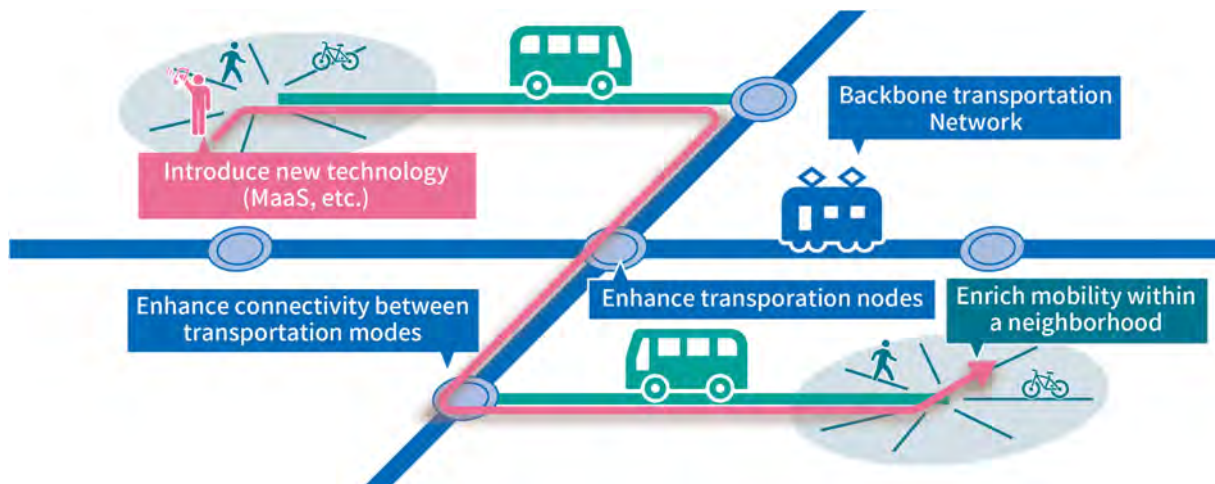
Figure 4.3.3 Concept of Deconcentrated and Connected City

2) **Mobility: Transport Network with Diversified Mobility Services**

Conventional urban transportation planning has assumed the increase of traffic volume along with urbanization as a basis of traffic demand forecasts. It mostly focuses on developing arterial roads and mass rapid transit systems to accommodate morning and evening peak hour transportation. As a result, many cities in developing countries have developed their road networks to catch up with the rapid urban expansion.

In order to realize the “New Neighborhood” concept in the post COVID-19 era, it is important to ensure walkability and mobility with various public transport services within a neighborhood as well as to develop a backbone transportation network to support “the Deconcentrated and Connected City” proposed in the preceding section.

While there has been a shift from public to private transportation due to fears of infection, the latter is essential to ensure the mobility of the poor, women, children, and the elderly. In cities of developing countries, there is a trend toward diversification of traffic demand, such as geographic and temporal dispersion and increased demand for pedestrians and bicycles. In this context, it has become more and more necessary to provide public transportation services for all and to enhance the connectivity between transportation modes. Specifically, while centered on mass rapid transit, low-speed and short-distance mobility must be ensured.



Source: JICA Study Team

Figure 4.3.4 Transport Services with Diversified Mobility Services

3) Inclusive Access: Inclusive Cities with Universal Access of Urban Services

The pandemic highlighted vulnerable groups in many ways. Informal settlements without access to basic urban services, such as water supply and urban sanitation, were considered at high risk for infectious diseases, although no quantitative data was showing this. These issues have been well recognized even before the pandemic but not adequately addressed. Lockdowns and other measures that cities took to prevent infection had an impact not only on informal settlements but also on the socio-economy of cities. This has led to reaffirming the need to address vulnerable urban population.

In order to remove vulnerability to these infectious diseases, it is essential to ensure universal access to urban services. Specifically, WASH (water supply, sanitation, and hygiene) is needed. On the other hand, improving physical facilities such as communal water stations, urban sanitation facilities, and drainage ditches, is not enough to improve the living environment in informal settlements. This intervention might result in the deterioration of these facilities due to the lack of economic capacity to maintain them, or the eviction of residents without legal basis for land ownership and living, which may lead to the formation of another slum. In addition, there are many difficulties in improving slum areas with a single-sector approach. For example, when trying to improve water supply facilities, stand-alone approach cannot improve the water supply system efficiently and effectively. For example, unclear legal status of informal settlement prevents the development of public facilities; it is necessary to integrate water pipes with road maintenance to improve them; lack of reliable information on population hampers the forecast of water demand; and coordination with informal water sellers would be needed.

In order to address urban vulnerability toward post COVID-19 era, it will be essential to undertake comprehensive efforts to improve the living environment, including social and economic aspects. It includes not only physical facilities improvement such as water supply, roads, and urban sanitation, but also securing social rights and economic empowerment. To this end, the improvement of informal settlements should be clearly positioned as a part of urban policies. Slum support program should be combined with the strengthening of residents' social security and economic empowerment such as job creation through close coordinated with the various sectors responsible for the development of water supply and urban sanitation facilities.



Source: JICA Study Team

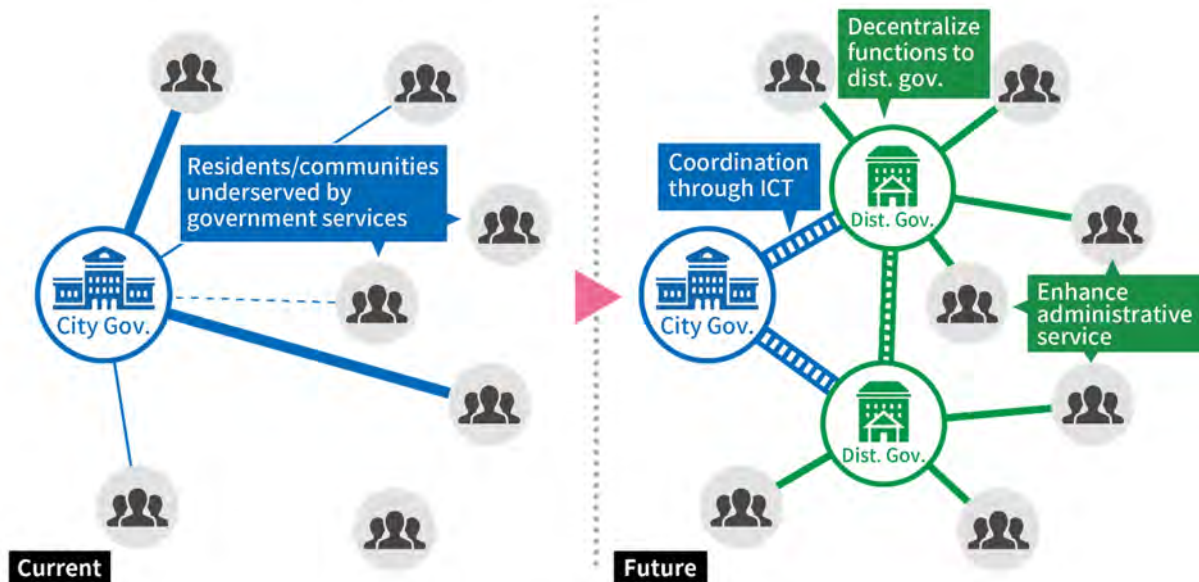
Figure 4.3.5 Inclusive Cities with Universal Access of Urban Services

4) Urban Administration: Accessible Service Points by ICT Network

In many cases, urban administrations in developing countries do not function well at either the district or ward level, and only the city hall headquarters manage administrative services for the entire city in practice. The uniform administrative services through such a centralized structure cannot meet local needs attentively and left some inconvenient areas. During lockdowns, some people could not access the administrative services and over-concentration in the municipal hall increased the risk of COVID-19 infection.

The Deconcentrated and Connected City, presented in Agenda 1 as a spatial urban structure, can also be applied in urban administration. Deconcentrated and well-coordinated urban administrative networks can provide services attentively to meet local needs. It will enhance resilience against and responsiveness to disasters and pandemic periods.

Developing an ICT network will be essential to strengthen coordination among administrative units. It is expected that the ICT network would provide information about available administrative services and provide online administrative and public services. Collected data can be analyzed to improve urban administrative services.



Source: JICA Study Team

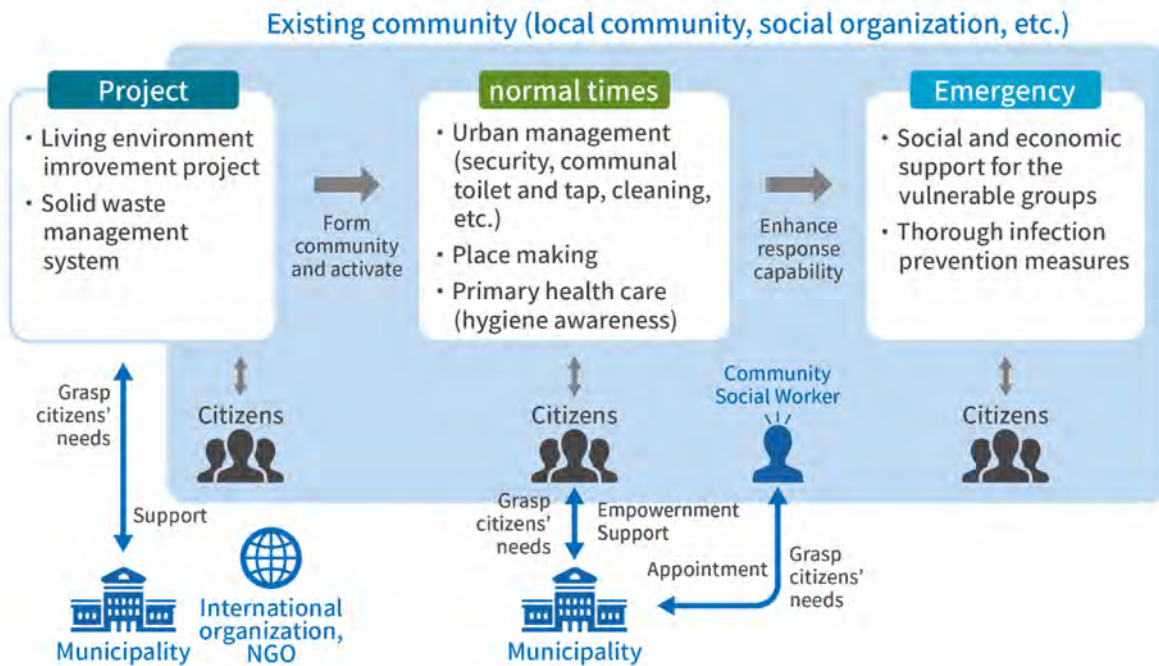
Figure 4.3.6 Accessible Service Points by ICT Network

5) Urban Society and Community: Self-supportive and Responsive Community

During the pandemic, urban society and communities played a significant role in preventing the spread of infectious diseases and mitigating social and economic impacts of quarantine measures. In developing countries, the government cannot reach all areas adequately. The pandemic clarified the differences in community responsive capacity; communities that have been well established and active before the pandemic can respond independently and flexibly to emergencies during the COVID-19 pandemic. As such, the role of communities in urban management is reaffirmed.

In existing communities with strong local ties, there are voluntary urban management activities, including security, cleaning, and infrastructure management, as well as primary health care and empowering of environmental consciousness among community residents. The government can support these voluntary activities to enhance the community's daily response. In some cities, Community Social Workers and Village Health Volunteers are deployed as part of the administration with responsibility for understanding the needs of residents and connecting administrative measures and support to the community, and they played a similar role during the pandemic.

In cities without existing communities or with communities not functioning well, it is expected to form and revitalize communities through project implementation. Specifically, international organizations and NGOs involve communities from the planning and implementation stage of a settlement improvement project to understand their needs. This would help form communities and encourage them to carry out daily urban management activities even after the project is over.



Source: JICA Study Team

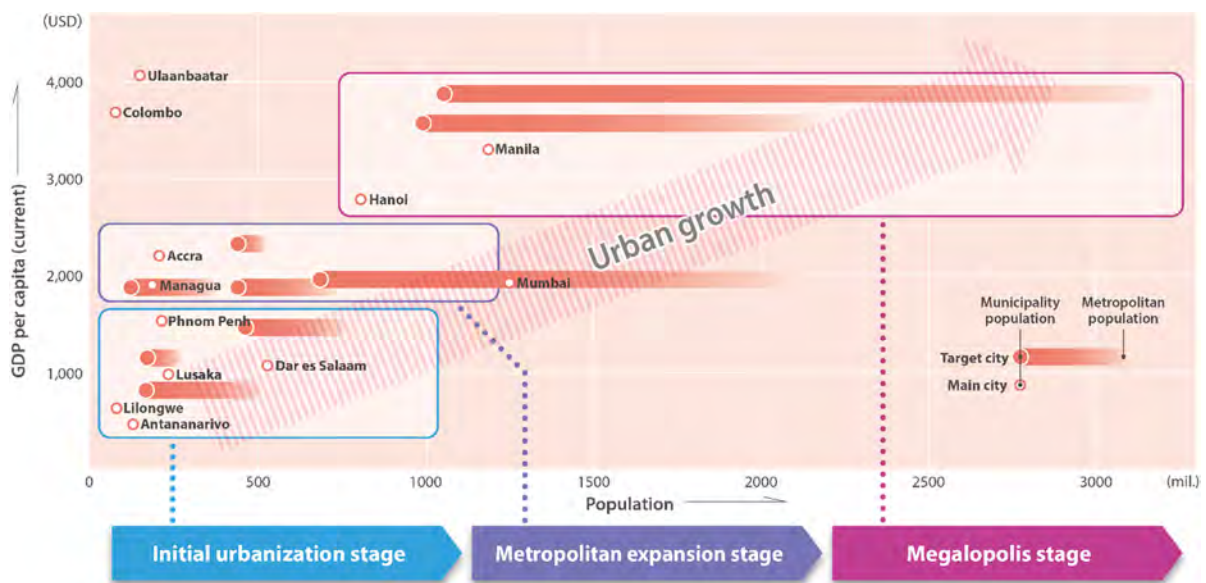
Figure 4.3.7 Self-supportive and Responsive Community

4.3.2 Mid- and Long-Term Program

Urban development programs in the mid- to long-term are proposed based on the New Neighborhood concept with five agendas. The proposal will differ depending on the size, economic level, and administrative structure of each city. For example, in a mature metropolitan area like Jakarta, the emphasis should be on how to allocate functions to sub-centers and how to form neighborhoods in highly urbanized suburban areas while considering the urban structure within the existing metropolitan area. On the other hand, for rapidly urbanizing cities like Kampala and Abidjan, it is necessary to develop a decentralized structure to accommodate the growing urban population and consider how to strengthen the functions of self-sustaining neighborhoods.

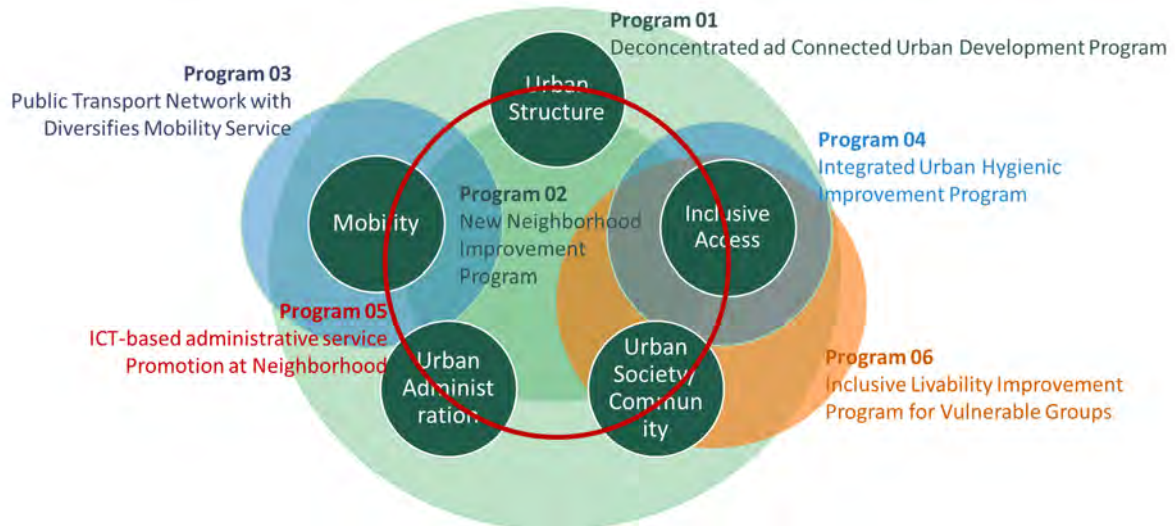
In addition, when considering the urban administration system, it is necessary to consider the administrative status of the metropolitan area, such as the existence of a wide administrative entity for the metropolitan area, the position of the central city in the metropolitan area, the position of surrounding municipalities, and the actual status of smaller administrative units (see 1.4.2).

The specific project formulation for each focus city is summarized in the following chapter, and this chapter organizes a proposal for post-pandemic programs in cities in developing countries according to the characteristics of each city.



Source: CUREIP Team based on WDI, UN World Urbanization Prospects (2018), and other materials

Figure 4.3.8 Population and GDP per Capita of Target and Main Cities



Source: JICA Study Team

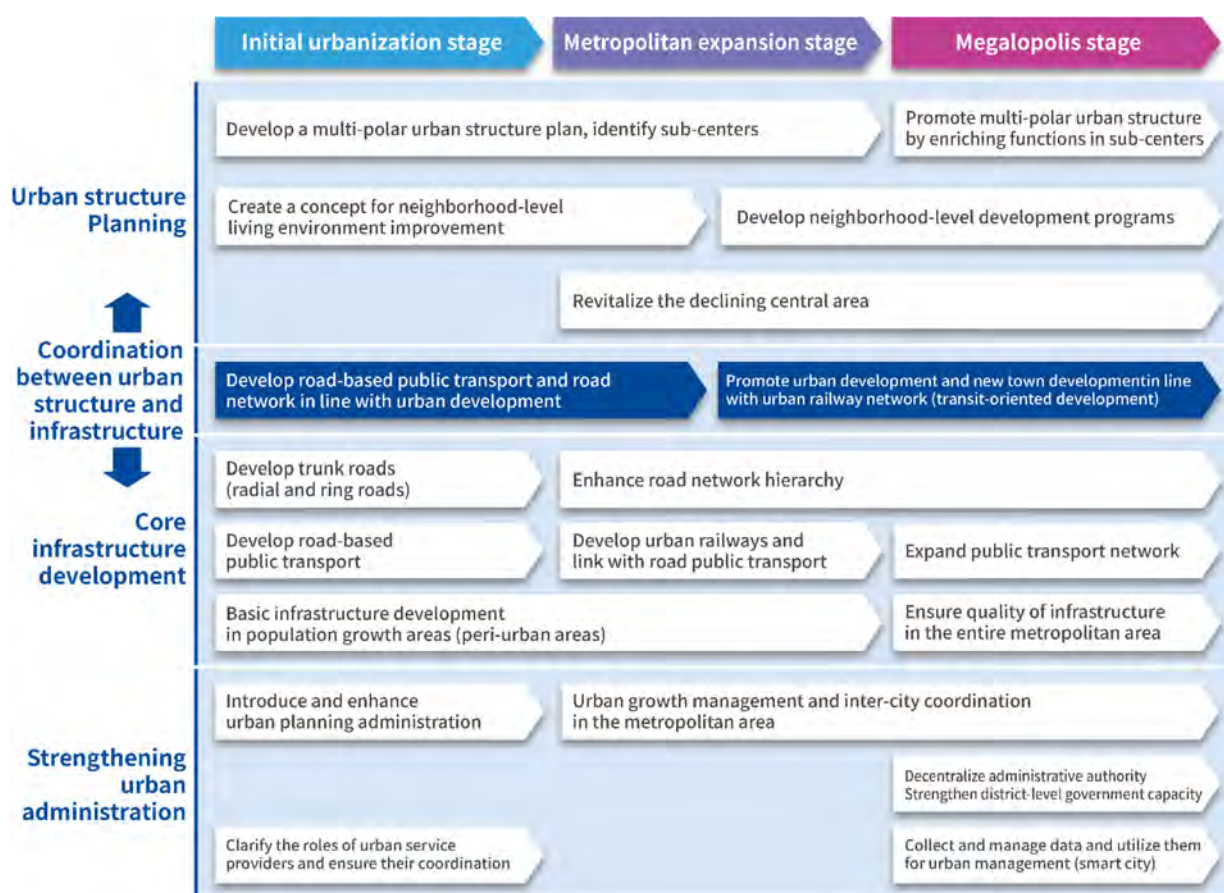
Figure 4.3.9 Program Formulation Based on 5+1 Agenda

1) **Deconcentrated and Connected City Development Program**

The following three elements are required to form a multi-polar, deconcentrated urban structure.

- (i) **Program DC-01:** Multi-polar decentralized urban structure planning program
- (ii) **Program DC-02:** Basic infrastructure development program
- (iii) **Program DC-03:** Strengthening of metropolitan administration program (institutions and capacity)

Since the components of each program vary depending on the size and characteristics of the city, they are organized according to the development stage of the metropolitan area as follows.



Source: CUREIP Team

Figure 4.3.10 Deconcentrated and Connected City Development Program

Table 4.3.1 Deconcentrated and Connected City Development Program by the Development Stage of Metropolitan Area

	[Initial urbanization stage] Metropolitan population: approx. 3 million Kampala, Kathmandu, Mombasa	[Urban expansion stage] Metropolitan population: more than 5 million Abidjan, Nairobi, Yangon	[Megalopolis stage] Metropolitan population: more than 10 million Dhaka, Cairo, Jakarta
(1) Program DC-01			
Multipolar decentralized urban structure planning program	(1) Project DC01-01		
	Formulation of urban structure plan		
	<ul style="list-style-type: none"> Develop a multi-polar urban structure plan for the urban center and hubs Identify population growth areas (urban expansion areas) and new hub areas, and urban infrastructure development plans 	<ul style="list-style-type: none"> Develop a multi-polar decentralized urban structure plan for the urban center and hubs Identify hub development planning areas from existing urbanization areas 	<ul style="list-style-type: none"> Select hub areas and plan hierarchical division of functions Share and strengthen the function of each district and lower-level administrative units
	Relevant agencies <ul style="list-style-type: none"> Urban planning department of municipalities Metropolitan administration entity 		
(2) Program DC-02			
Trunk and core infrastructure development program	(1) Project DC02-01		
	Core Transportation Network Improvement Project		
	<ul style="list-style-type: none"> Plan and construct the inner and outer ring roads 	<ul style="list-style-type: none"> Start development of a mass transit system 	<ul style="list-style-type: none"> Expand mass transit network

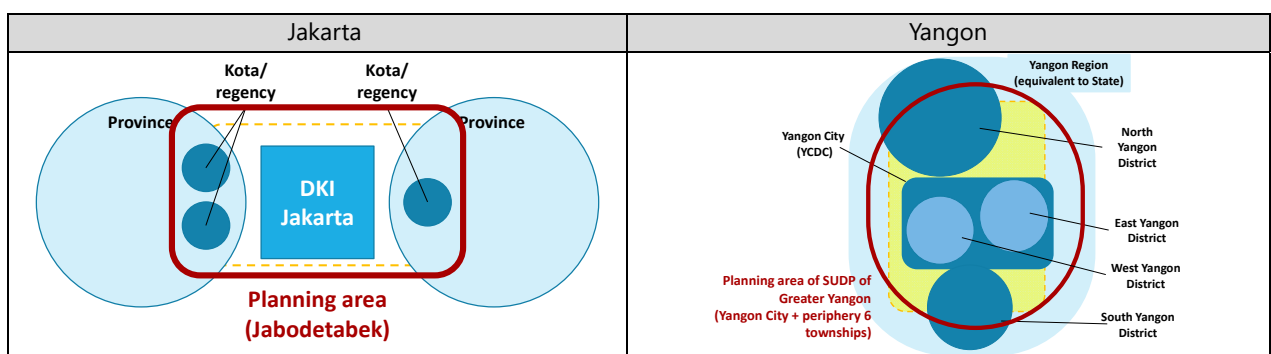
	<ul style="list-style-type: none"> in the suburban area Develop a public transportation network connecting the suburban hubs to the city center 	<ul style="list-style-type: none"> connecting the city center with the hub Strengthen existing railways Strengthen the linkage between mass transit and buses/smaller modes 	<ul style="list-style-type: none"> Promote public transport-oriented development
	Relevant agencies		
	<ul style="list-style-type: none"> Transport department of municipalities Ministry of Transport (railway department) Ministry of Public Works (road department) 		
	(2) Project DC02-02		
	Urban basic infrastructure (water, electricity, etc.) development projects		
	<ul style="list-style-type: none"> Improve basic infrastructure such as water supply, and electricity distribution, in the suburban areas 	<ul style="list-style-type: none"> Address the lack of infrastructure in existing urban areas 	<ul style="list-style-type: none"> Improve infrastructure penetration in the entire metropolitan area
	Relevant agencies		
	<ul style="list-style-type: none"> Relevant department of municipalities (water supply department, sanitary management department, etc.) Ministry of Public Works Public service utility (water supply authority, etc.) 		
	(3) Program DC-03		
Strengthening of metropolitan administration program (institutional and human capacity)	(1) Project DC03-01		
	Establishment of organizational/institutional structure		
	<ul style="list-style-type: none"> Introduce urban planning administration Clarify and coordinate with urban service providers 	<ul style="list-style-type: none"> Manage urban growth in the metropolitan area 	<ul style="list-style-type: none"> Cooperate with neighboring municipalities through a metropolitan area administration
	Relevant agencies		
	<ul style="list-style-type: none"> Municipalities Metropolitan administration entity Public service utility (water supply authority, etc.) 		
	(2) Project DC03-02		
	Capacity development		
	<ul style="list-style-type: none"> Strengthen the capacity of city-level administrative officials 	<ul style="list-style-type: none"> Strengthen city and district coordination and decentralized administrative capacity (planning, management) 	<ul style="list-style-type: none"> Strengthen district government capacity
	Relevant agencies		
	<ul style="list-style-type: none"> Municipalities (city office and district branch officials) 		
(3) Project DC03-03			
Information coordination among administrative agencies			
<ul style="list-style-type: none"> Develop a database for web-based information linkage between administrative offices 	<ul style="list-style-type: none"> Develop a database for linkage with external services such as mobile payment 	<ul style="list-style-type: none"> Develop an information coordination infrastructure based on national IDs (this will serve as a basis for coordinating information with various services via the Web) 	
Relevant agencies			
<ul style="list-style-type: none"> Ministry of Communications, etc., (in charge of e-government) Municipalities (city office and district branch officials) 			

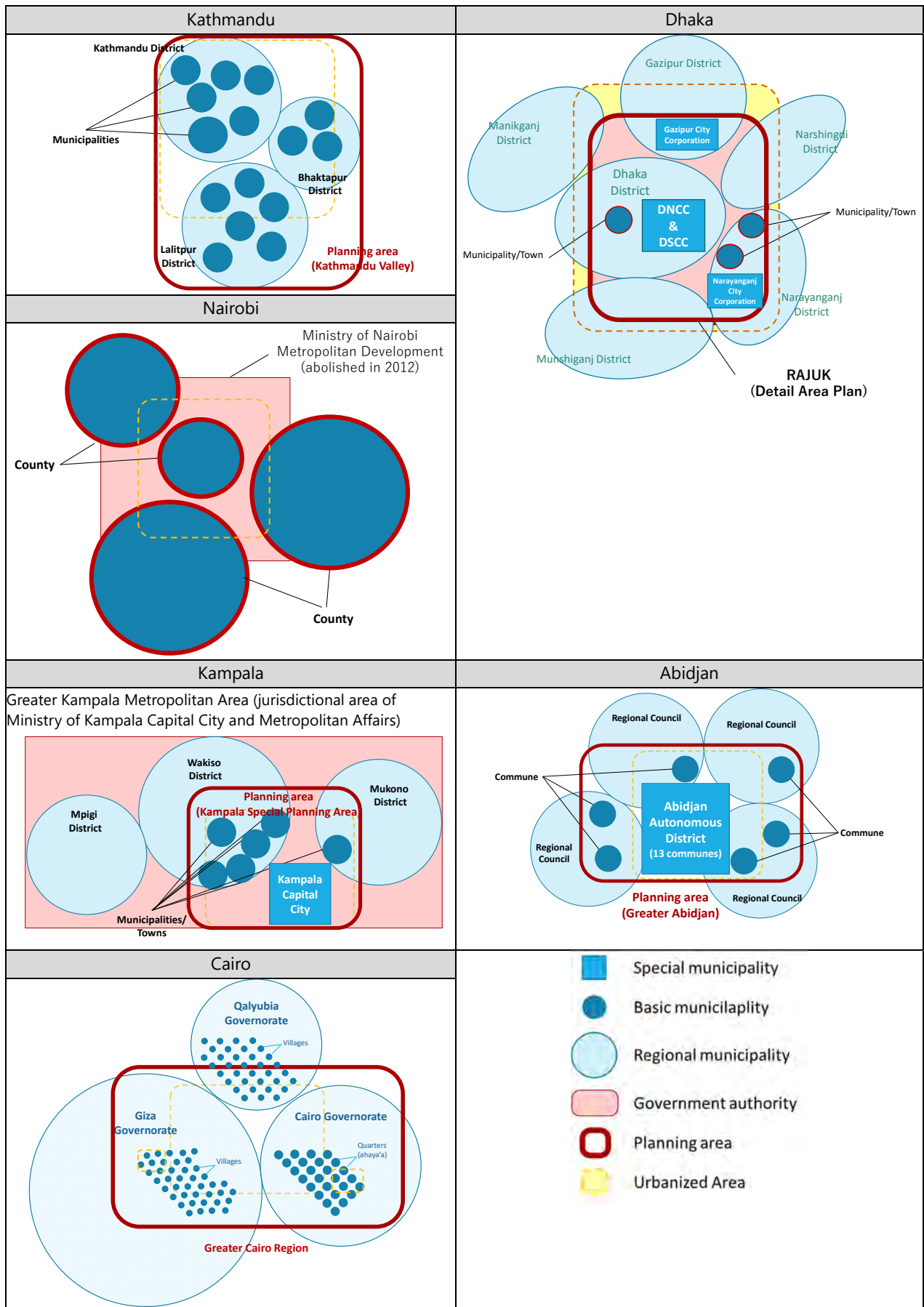
(4) Project DC03-04		
Capacity development for information coordination		
<ul style="list-style-type: none"> Strengthen the capacity of staff for administrative services based on information linkage 	<ul style="list-style-type: none"> Strengthen the capacity of public administration to design data coordination (planning and management) 	<ul style="list-style-type: none"> Strengthen the capacity of the public administration to design data based on national IDs
Relevant agencies		
<ul style="list-style-type: none"> Urban planning department of municipalities Metropolitan administration entity 		

Source: JICA Study Team

Metropolitan Urban Management Improvement Program: The formulation of a multipolar, decentralized city depends on the relationship between the extent of its metropolitan area and the urban administration system. Figure 4.3.11 shows a schematic image of metropolitan areas and urban administration in the nine focus cities in this study. Since the urban areas expand beyond their administrative boundaries as urbanization progresses and the megalopolis is shaped, it is necessary to formulate an urban structure plan for the entire metropolitan area. On the other hand, even if such a plan is formulated, growth management for the metropolitan area and infrastructure development supporting the metropolis will not be ensured if the urban planning management and development of backbone and basic urban infrastructure are implemented only on the scale of municipalities. One possible structure for a wide metropolitan area administration is shown below.

- Planning and infrastructure development by metropolitan administrative entities:** Metropolitan urban planning beyond the administrative boundaries should be legally defined. This planning should be a basis for the prioritization and development of wide-area infrastructure. Strategic areas should be prioritized for the development of infrastructure for daily lives to avoid urban sprawl and form “poles” that supports the metropolitan areas.
- Coordination with surrounding municipalities with the central city as a core:** In the absence of a metropolitan administrative entity, the central government should lead in planning the metropolitan area while the central city takes the lead in strengthening coordination with surrounding municipalities. In many cases, there is a gap in capacity between the central city and surrounding municipalities, especially if the central city is a special municipality, there is also a difference in authority between them. When raising the level of infrastructure development in a metropolitan area, support is needed for the central government to coordinate among stakeholders and for the surrounding municipalities to promote basic infrastructure development and provide urban services.

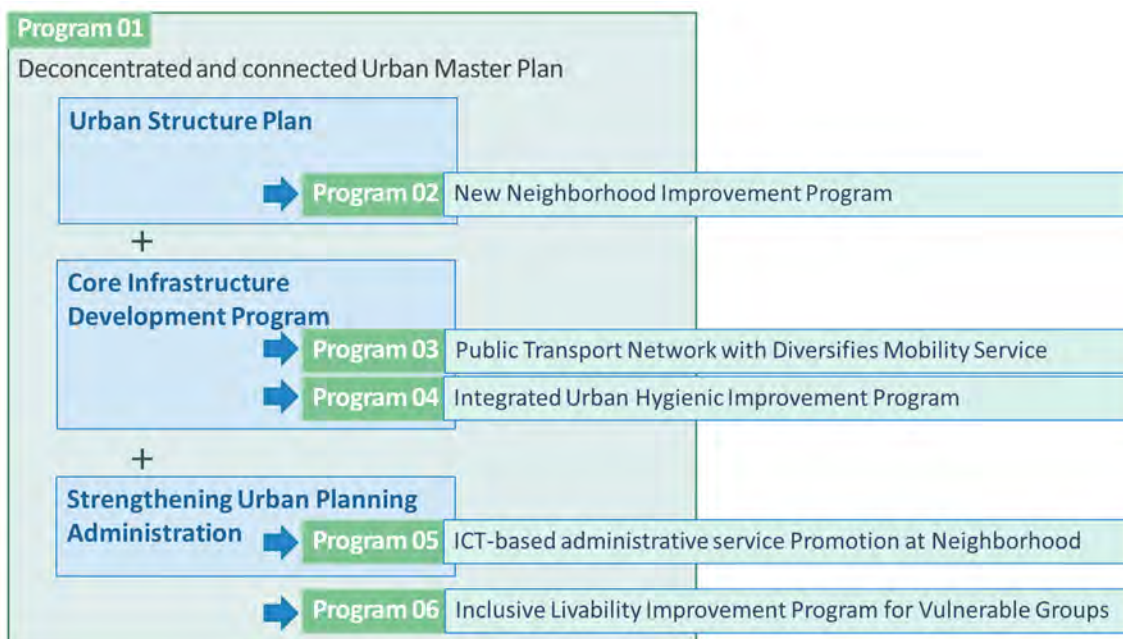




Source: JICA Study Team based on materials in each country

Figure 4.3.11 Urban Administration System in Target Cities (Reiterated)

The concept of Deconcentrated and Connected City will be a basis for the overall urban development of each city, based on which various programs can be proposed, as shown in Figure 4.3.12 and the following sections.



Source: JICA Study Team

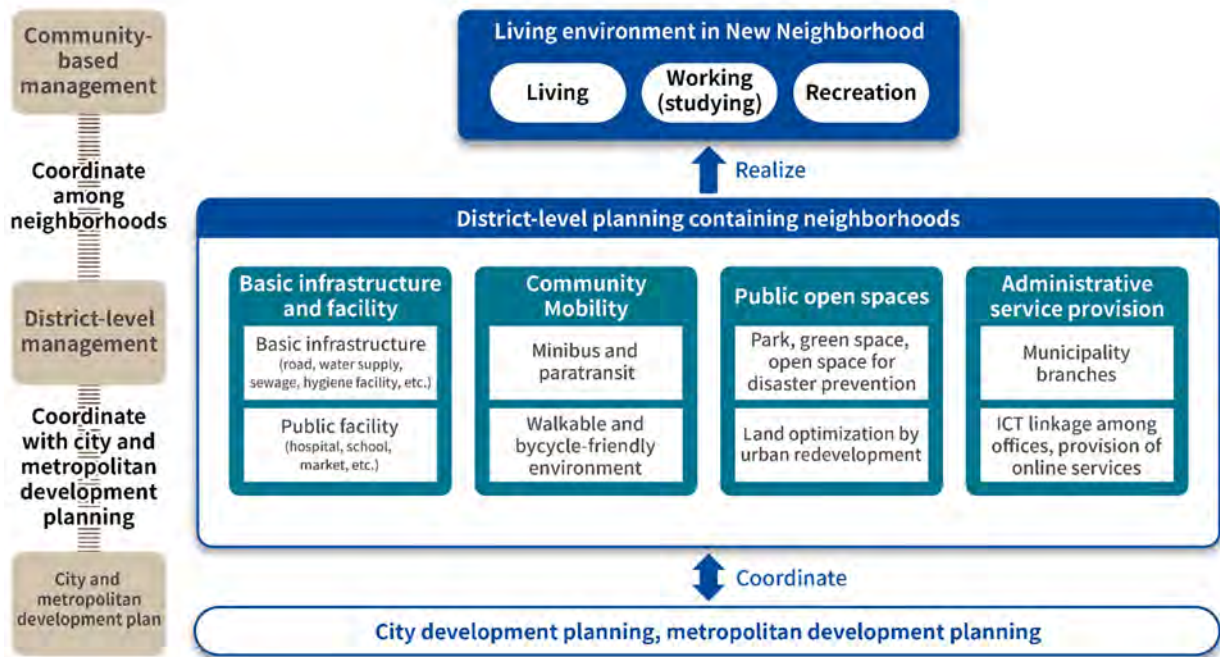
Figure 4.3.12 Sub-component of Decentralized and Connected City Program

2) New Neighborhood Improvement Program

The New Neighborhood Improvement Program is proposed to improve living environment at the neighborhood level. A self-sustaining neighborhood will be a part of the aforementioned urban structural planning and will also lead to realizing a “Deconcentrated and Connected City.”

The components required at the neighborhood level vary greatly by city and by district within a city. It is necessary to establish a common concept of socially and economically sufficient neighborhood at the city or metropolitan level and to share it with relevant authorities, including necessary services and living environment to be provided in each neighborhood. Based on such a common concept, the basic infrastructure and facilities required for each district, the enhancement of mobility within the district, the development of public open spaces, and the provision of administrative services should be systematically planned and developed.

In order to achieve such a neighborhood concept, it is necessary to strengthen the operation and maintenance at the neighborhood level and community ownership of it. Furthermore, it is essential to link city/metropolitan level planning with neighborhood-level improvement, which requires urban management capacity improvement of lower-level administrative units such as districts between the two levels.

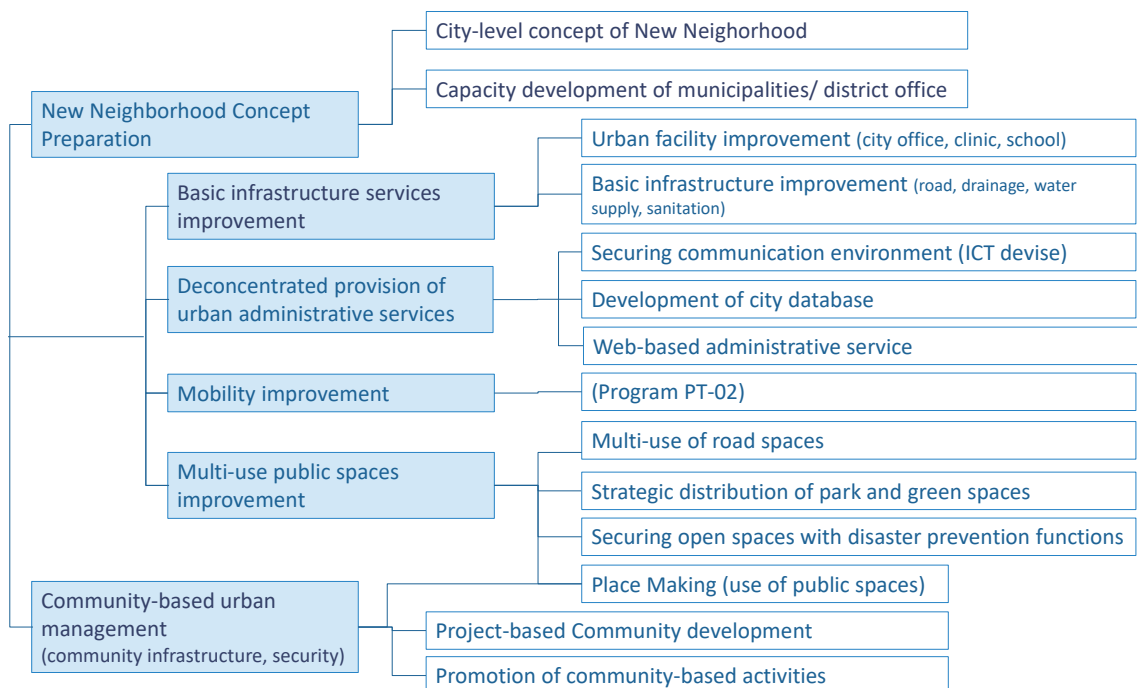


Source: JICA Study Team

Figure 4.3.13 New Neighborhood Improvement Program

- (i) **Program NN-01:** New neighbourhood concept formation program
- (ii) **Program NN-02:** Basic infrastructure/service development program
- (iii) **Program NN-03:** Deconcentrated provision of urban administrative services
- (iv) **Program NN-04:** Walkability improvement program (proposed as Program PT-02)
- (v) **Program NN-05:** Multi-purpose public space development program
- (vi) **Program NN-06:** Community-based urban management program

Necessary programs for each program are shown in Figure 4.3.14.



Source: JICA Study Team

Figure 4.3.14 New Neighborhood Improvement Program

Table 4.3.2 New Neighborhood Improvement Program Profile (1)

(1) Program NN-01	
New neighborhood concept formation program	
(2) Background and Objectives (including relevance to CUREIP Output)	
<p>The socio-economically independent neighborhood differs by area even within one city, such as in the city center, along a mass rapid transit system, or in the suburbs. It is necessary to create a neighborhood concept tailored to the actual conditions of each city to determine what functions and what services should be provided at the neighborhood level.</p> <p>Furthermore, since a neighborhood is even smaller than the smallest administrative unit, the concept requires to be integrated urban planning and infrastructure development planning, as well as management by the entity responsible for its implementation. Although the administrative system and planning/implementation authority vary greatly from country to country and city to city, it is necessary to strengthen the lower-level administrative units of municipal governments (District, Ward, etc.) toward the realization of Neighborhoods.</p> <p>On the other hand, in many cities in developing countries, it is difficult for the lower levels of municipal government to conduct substantive planning and project management, and there is a need to promote capacity building at the district level while taking on district-level planning administration at the municipal level.</p>	
(3) Project NN1-01	Scope of Project
Incorporation of neighborhood concepts into city-development planning	<p>Introduce the concept of neighborhood formation into the city-level planning and organize the components to be considered.</p> <ul style="list-style-type: none"> • Share the image of a new neighborhood (a living area where people can live in 15–20 minutes). • Functions that the neighborhood should have (by district) • Urban facilities to be secured at the neighborhood level • Role of the community
	Relevant agencies
	<ul style="list-style-type: none"> • Urban planning department of the municipality • Urban planning department of district offices • Lower-level government organizations • Community support organizations • Community
(4) Project NN1-02	Scope of Project
Capacity development of district-level management	<p>Secure the urban functions and strengthen the urban service provision system under the conditions and needs of each district to realize the neighborhood concept.</p> <ul style="list-style-type: none"> • Increase the number of staff in the district offices • Establish operational manuals and training • Reinforce networks within the administration through ICT • Collaborate with communities and utilize community human resources
	Relevant agencies
	<ul style="list-style-type: none"> • Urban planning department of the municipality • Urban planning department of district offices • Lower-level government organizations • Community support organizations • Community

Table 4.3.3 New Neighborhood Improvement Program Profile (2)

(1) Program NN-02	
Basic infrastructure/service development program	
(2) Background and Objectives (including relevance to CUREIP Output)	
<p>Urban facilities and basic infrastructure need to be developed to ensure “living,” “working (studying),” and “recreation” functions in each neighborhood.</p> <p>Cities in developing countries tends to prioritize the development of core infrastructure, leading to the expansion of urban areas along arterial roads and urban sprawl without sufficient basic infrastructure. In order to form new urban areas to accommodate the growing population, there is an urgent need to rapidly promote the expansion of basic infrastructure development.</p> <p>In addition, urban facilities should be arranged according to each neighborhood, rather than uniformly within the city, as the required urban functions differ from area to area.</p>	
(3) Project NN2-01	Scope of Project
Hierarchical development of urban facilities	<p>Develop facilities according to the functions required for each neighborhood, based on city-level and district-level plans.</p> <ul style="list-style-type: none"> • Arrange city hall, district offices, and branch offices • Develop elementary and junior high schools • Develop regional hospitals, city hospitals, and clinics.
	Relevant agencies
	<ul style="list-style-type: none"> • Municipality and relevant agencies
(4) Project NN2-02	Scope of Project
Basic infrastructure development	<p>Implement necessary infrastructure improvements in phases based on an understanding of the current level of infrastructure in each neighborhood.</p> <ul style="list-style-type: none"> • District road maintenance (drainage network) • Water supply network (in coordination with Program 4): access to the main pipe and communal water taps • Sanitation facilities (in coordination with Program 4): improvement of toilet facilities (from shared to an individual, ventilated pit latrines, etc.)
	Relevant agencies
	<ul style="list-style-type: none"> • Municipality and relevant agencies • Central government (transport ministry, public works ministry, water supply utility, etc.)

Table 4.3.4 New Neighborhood Improvement Program Profile (3)

(1) Program NN-03	
Deconcentrated provision of urban administrative services	
(2) Background and Objectives (including relevance to CUREIP Output)	
<p>In preparation for the post-pandemic era, there is a growing need for online administration services. In order to provide such services at the neighborhood level, the central municipality, district-level, and lower-level branches must be connected by an ICT network.</p> <p>Since the level of ICT development differs from country to country and city to city, it is necessary to promote the development of telecommunication infrastructure and the introduction of applicable online administrative services according to the level of development.</p> <p>Furthermore, to improve the living environment at the neighborhood level, it is essential to understand the actual conditions of the area. In developing countries, although city-level data is available, data on the infrastructure and living environment at the district level is not available in most cases. Efficient project management can be achieved by managing and understanding the supply-side data, such as access rates to water supply and road maintenance rates at the district level.</p> <p>In order to build and utilize these databases, it is important to expand the communication environment. Such an environment is necessary to make available the ICT-enabled services that have expanded rapidly during the pandemic, such as online services, services using smartphone apps, and telecommuting.</p> <p>Meanwhile, by collecting data from users through online services, it would be possible to grasp the living environment in each area in real-time and identify people's needs.</p>	
(3) Project NN3-01	Scope of Project
Telecommunication environment development	<ul style="list-style-type: none"> Enhance accessibility to the Internet (ICT devices) Develop communication network among hubs
	Relevant agencies
	<ul style="list-style-type: none"> Municipality Communication ministry Telecommunication company
(4) Project NN3-02	Scope of Project
Urban database development	Grasp the status of living environment in each neighborhood
	<ul style="list-style-type: none"> Socioeconomic indexes (population, sex, elderly rate, etc.) Road ratio Access rate to piped water Coordination with sanitation facilities
	Relevant agencies
	<ul style="list-style-type: none"> Municipalities and relevant agencies Central government (transport ministry, public works ministry, water supply utility, etc.)
(5) Project NN3-03	Scope of Project
Provision of urban services through the Internet	Grasp the usage status
	<ul style="list-style-type: none"> Usage status of online services Grasp the health status of citizens and suggest responses according to their status (e.g., web-based medical interview -> medical interview by a doctor via web -> appointment at a medical facility -> Physical medical examination) <p>Dialogue with citizens through the Internet</p> <ul style="list-style-type: none"> Public hearing through the Internet Information dissemination through SNS
	Relevant agencies
	<ul style="list-style-type: none"> Municipalities and relevant agencies Community organizations

ICT Level	ICT Structure	Usage				Case
		Admin service (counter)	Health	Education	Water, etc. (In-kind support)	
Low (Minimum information provision and collection)		<ul style="list-style-type: none"> Reception at decentralized counter E-ticket system to mitigate congestion Rental devices 	<ul style="list-style-type: none"> Health awareness (verbal or text explanation of importance of hand washing, etc.) Grasp health status 	<ul style="list-style-type: none"> Distribute booklets Grasp scholarly ability (unified exam and fast tabulation) 	-	Indonesia (raise awareness and grasp health status)
Middle (Certain level of information provision)		<ul style="list-style-type: none"> Reception at decentralized counter E-ticket system to mitigate congestion Rental devices Free wi-fi 	<ul style="list-style-type: none"> Health awareness (movie) Remote diagnosis 	<ul style="list-style-type: none"> Remote education (group education with diverse and new contents) Grasp scholarly ability (unified exam and fast tabulation) 	-	India (screening by remote diagnosis) https://www.worldometers.info/india/coronavirus/covid-19-screening-by-remote-diagnosis/
High (Service provision based on national profile)		<ul style="list-style-type: none"> Reception at decentralized counter Disperse queue with national ID Rental devices Free wi-fi Services based on national ID 	<ul style="list-style-type: none"> Remote diagnosis (e-medical record) 	<ul style="list-style-type: none"> Remote education (group education with diverse and new contents) Grasp scholarly ability (unified exam and fast tabulation) 	<ul style="list-style-type: none"> Grasp demand and supply of items 	Chile (Early provision of monetary support based on national ID) https://www.undp.org/press-releases/2020/04/2020-04-20-chile-early-provision-of-monetary-support-based-on-national-id

Source: JICA Study Team

Figure 4.3.15 Image of Efficient Urban Administration According to ICT Level

Table 4.3.5 New Neighborhood Improvement Program Profile (5)

(1) Program NN-05	
Multi-purpose public space development program	
(2) Background and Objectives (including relevance to CUREIP Output)	
<p>During the pandemic, attention was paid to the use of open spaces to avoid density, and the use of public spaces such as parks were promoted in the short term. On the other hand, cities in developing countries do not have sufficient green spaces and parks except in some urban centers, and the remaining urban open spaces in suburban areas are often closed for development.</p> <p>Public spaces not only enhance the amenity level of daily lives but also serve as places for community activities and evacuation sites in case of a disaster. In order to create a resilient city, appropriate public space should be secured at a neighborhood scale.</p>	
(3) Project NN5-01	Scope of Project
Strategic arrangement of parks and green spaces	<ul style="list-style-type: none"> Proactively develop parks and green spaces in new urban development projects (measures to incentivize private-sector projects) Incorporate parks and green spaces in urban redevelopment projects Secure and redevelop unused open spaces as green spaces and parks
	Relevant agencies
	<ul style="list-style-type: none"> Urban planning department, municipality Developer
(4) Project NN5-02	Scope of Project
Promotion of use of existing open spaces, parks, and green spaces	<ul style="list-style-type: none"> Utilize public spaces by the community (place making) Utilize the parks as evacuation sites in case of a disaster Establish an O&M system for parks (maintenance and management, the establishment of rules for event utilization, etc.)
	Relevant agencies
	<ul style="list-style-type: none"> Urban planning department, municipality Community organizations Local merchants

Table 4.3.6 New Neighborhood Improvement Program Profile (6)

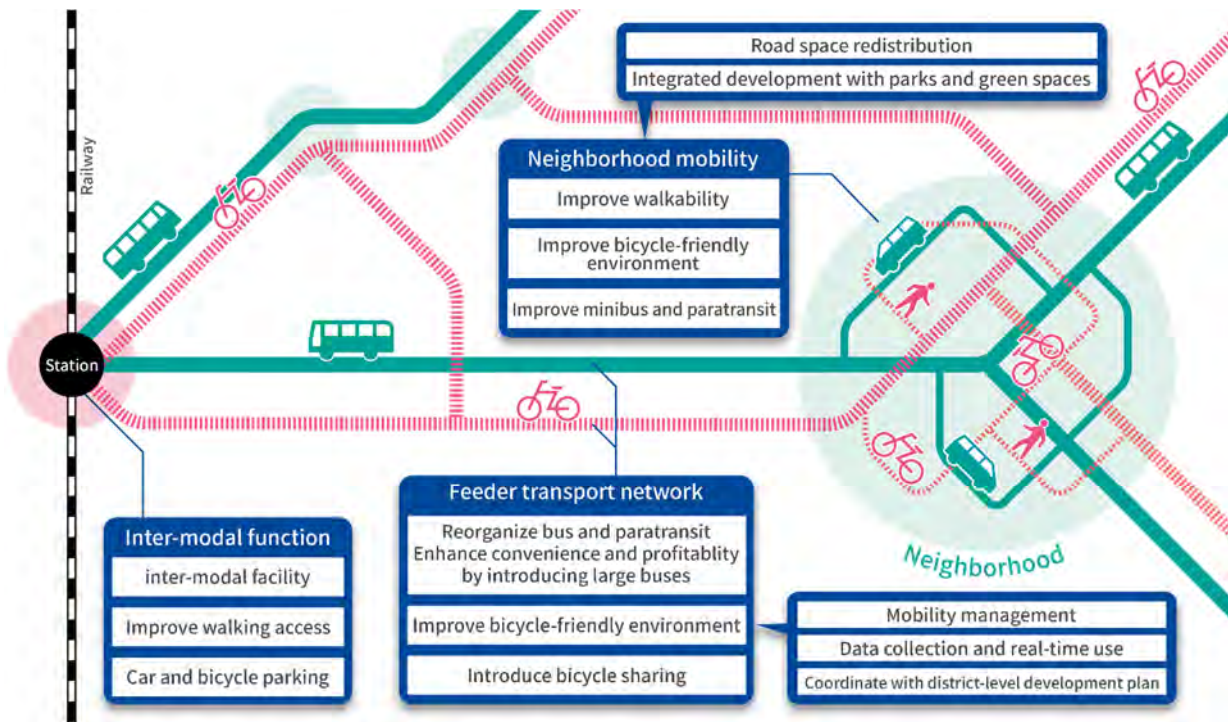
(1) Program NN-06	
Community-based urban management program	
(2) Background and Objectives (including relevance to CUREIP Output)	
<p>Communities play a crucial role in strengthening their ability to respond to the emergencies such as the spread of COVID-19 and disasters. To make a resilient city, communities should be involved in urban management from normal times.</p> <p>Support for infrastructure maintenance and security activities at the community level should be provided, and a system to coordinate with the government should be established.</p> <p>In areas without existing communities, communities could be formed and strengthened as groups responsible for the planning, implementation, and maintenance of such infrastructure, through the Basic infrastructure/service development program (NN-02).</p>	
(3) Project NN6-01	Scope of Project
Promotion of community activities	<ul style="list-style-type: none"> • Support and outsourcing of infrastructure management at the community level • Security activities • Support for community activities such as place-making (including the use of public spaces) • Establish the coordination system between the administration and communities (primary health care system, the response system in case of an emergency)
	Relevant agencies
	<ul style="list-style-type: none"> • Community promotion department, municipality • Urban sanitary department, municipality (water supply, sanitation facilities, solid waste management) • Community organizations
(4) Project NN6-02	Scope of Project
Formulation and strengthening of community	<ul style="list-style-type: none"> • Encourage communities to participate in infrastructure improvement in living quarters (reflection of residents' needs and establishment of maintenance and operation system) • Establish community-based solid waste segregation and collection system
	Relevant agencies
	<ul style="list-style-type: none"> • Community promotion department, municipality • Urban sanitary department, municipality (water supply, sanitation facilities, solid waste management) • Community organizations • Local stakeholders such as merchants, schools, experts, and experts.

3) Public Transport Network with Diversified Mobility Services Program

Under the deconcentrated and connected city program, the core infrastructure development program includes the development of a transport network centered on arterial roads. On the other hand, there is concern that a road-centered network would lead to a loss of mobility for the carless population. In order to ensure mobility for all people, including the elderly, women, and children, it is essential to expand public transport services.

Conventional transport networks have been based on the peak traffic demand of arterial corridors. However, in the post-pandemic era, it is important to form a hierarchical transport

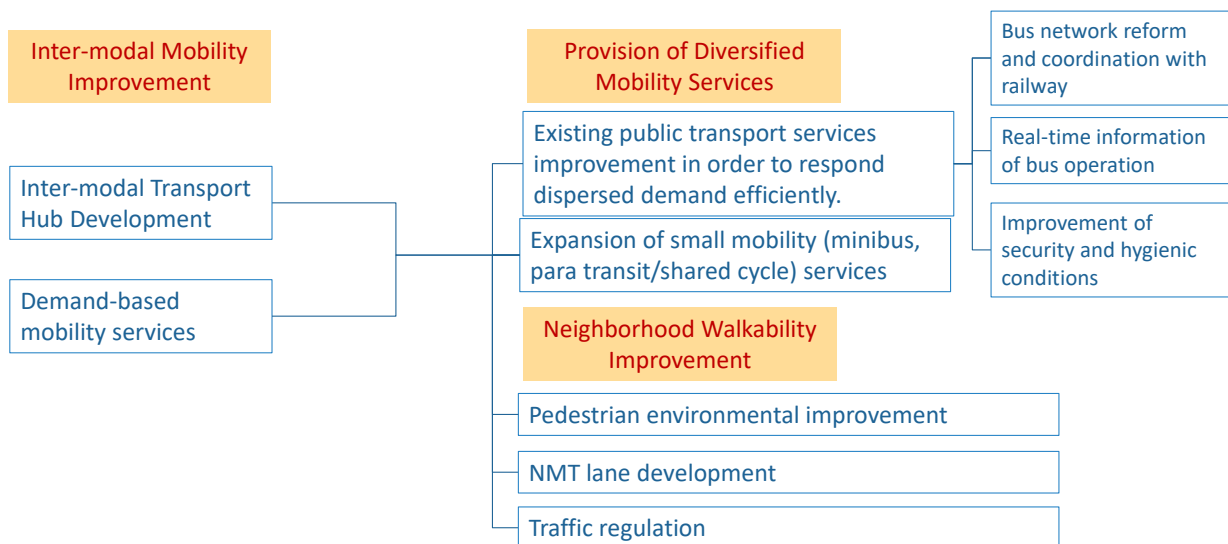
network, including short-distance mobility, and enhance the connectivity among transport modes to respond to geographically and temporally diverse travel demands.



Source: JICA Study Team

Figure 4.3.16 Concept of Diversified Mobility to support Neighborhood

- (i) **Program PT-01:** Diverse transport mode development program
- (ii) **Program PT-02:** Walkability improvement program
- (iii) **Program PT-03:** Inter-modal mobility improvement program



Source: JICA Study Team

Figure 4.3.17 Public Transport Network with Diversified Mobility Services Program

Table 4.3.7 Public Transport Network with Diversified Mobility Services Program Project (1)

(1) Program PT-01	
Diverse transport mode development program	
(2) Background and Objectives (including relevance to CUREIP Output)	
<p>As support for the deconcentrated and connected city, diverse public transport modes that satisfy more diversified travel demands are required, in addition to the public transport that serves arterial corridors connecting the city center and suburb areas.</p> <p>Existing paratransit systems operate informally, and government regulatory frameworks often only cover conventional public transport such as railways and buses. In the future, the emergence of new public transport services such as ride-hailing, on-demand transport, and medium-distance electric small buses is expected. This requires revisions to existing regulations for public transport services.</p>	
(3) Project PT1-01	Scope of Project
Improvement of operational efficiency and demand leveling of existing bus routes and systems	<ul style="list-style-type: none"> • Reorganize bus routes • Coordinate with arterial railways • Provide real-time bus information • Enhance hygiene and safety
	Relevant agencies
	<ul style="list-style-type: none"> • Transport department of the municipality • Transport operator
(4) Project PT1-02	Scope of Project
Enhance small mobility services	<ul style="list-style-type: none"> • Improve existing paratransit services • Introduce new services for short-distance mobility (bicycle and kickboard sharing), online reservation and payment services • Provide integrated services on railways and buses (app, integrated payment) • Improve walkability • Introduce autonomous cars for large urban and commercial facilities
	Relevant agencies
	<ul style="list-style-type: none"> • Transport department of the municipality or transport ministry • Transport operator • Mobility service provider • Developer
(5) Project PT1-03	Scope of Project
Amend regulations and system for public transport services	<ul style="list-style-type: none"> • Respond to new mobility (relaxation of entry conditions, fare regulations) • Avoid conflict between existing and new mobility services
	Relevant agencies
	<ul style="list-style-type: none"> • Transport ministry

Table 4.3.8 Public Transport Network with Diversified Mobility Services Program Project (2)

(1) Program NN-04	
Walkability improvement program	
(2) Background and Objectives (including relevance to CUREIP Output)	
<p>The new neighborhood concept is to create a socioeconomically self-sustaining living area within a 15–20-minute walking distance. It is an urgent task to improve the mobility and walkability within neighborhood to make it easier and more comfortable to go around inside the area.</p> <p>In addition to improving walkability and NMT-friendly environment, there is also a need to ensure a variety of short-distance, low-speed mobility, traffic regulations such as vehicle flow restrictions and one-way streets, as well as the enhancement of street furniture such as greenways and benches. .</p>	
(3) Project NN4-01	Scope of Project
Improvement of pedestrian network	<ul style="list-style-type: none"> • Improve sidewalk network among major facilities • Redistribute road space to secure sidewalks
	Relevant agencies
	<ul style="list-style-type: none"> • Municipality • Road department
(4) Project NN4-02	Scope of Project
Development of NMT lanes	<ul style="list-style-type: none"> • Develop bicycle lanes on existing roads • Develop new bicycle paths • Define rules for bicycles • Prepare bicycle parking lot
	Relevant agencies
	<ul style="list-style-type: none"> • Municipality • Road department • Traffic police
(5) Project NN4-03	Scope of Project
Traffic regulation	<ul style="list-style-type: none"> • One-way traffic regulation • Introduction of humps (e.g., speed hump) • Restriction of through-traffic • Restriction of logistics traffic
	Relevant agencies
	<ul style="list-style-type: none"> • Municipality • Traffic police
(6) Project NN4-02	Scope of Project
Walkability improvement	<ul style="list-style-type: none"> • Street tree, green way development • Bench
	Relevant agencies
	<ul style="list-style-type: none"> • Municipality

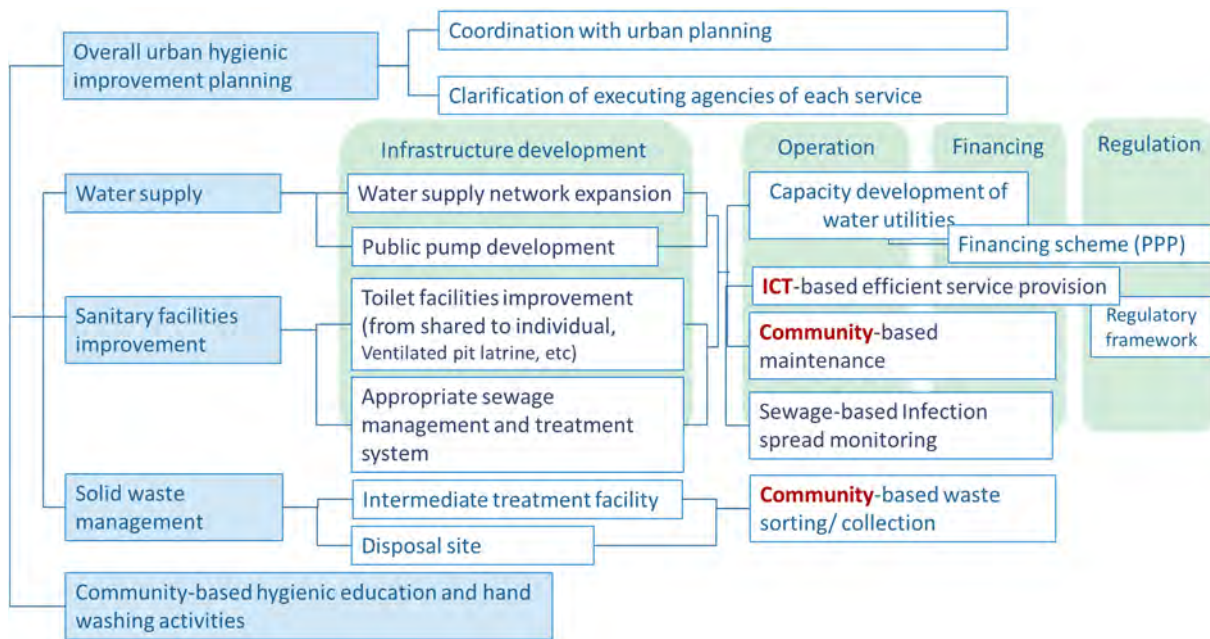
Table 4.3.9 Public Transport Network with Diversified Mobility Services Program Project (3)

(1) Program PT-02	
Inter-modal mobility improvement program	
(2) Background and Objectives (including relevance to CUREIP Output)	
Connectivity among transport modes is essential to improve the convenience of short-distance public transport services. In addition to tangible interventions such as development of inter-modal facilities, ICT-enabled new mobility services should be introduced to coordinate among multiple transport nodes or to provide integrated services involving commercial and tourism services.	
(3) Project PT2-01	Scope of Project
Modernization of inter-city bus terminals	<ul style="list-style-type: none"> • Coordinate with intra-city public transport • Introduce ICT ticketing • Mitigate congestion in the waiting area by providing departure information via app or electric signboards
	Relevant agencies
	<ul style="list-style-type: none"> • Transport department • Road department • Transport operator • Developer
(4) Project PT2-01	Scope of Project
Development of inter-modal facilities	<ul style="list-style-type: none"> • Develop inter-modal facilities at railway stations (bus terminal, micro-mobility) • Enhance connectivity between intra-city bus and micro-mobility (strengthen the network between major corridors and feeder services)
	Relevant agencies
	<ul style="list-style-type: none"> • Transport department • Road department • Transport operator • Developer
(5) Project PT1-02	Scope of Project
Introduction of mobility services using ICT (MaaS)	<ul style="list-style-type: none"> • Enhance public transport services by disclosing the data (let private companies develop an app by providing operation and real-time location data) • Introduce on-demand mobility services • Introduce ride-hailing services • Integrate and coordinate arterial public transport (urban railways and buses) and feeder public transport
	Relevant agencies
	<ul style="list-style-type: none"> • Transport department • Transport operator • Mobility service operators • Developer

4) Integrated Urban Sanitary Improvement Program

Improving urban sanitation requires comprehensive efforts to improve water supply, sanitation facilities, and waste management. These urban infrastructures must be coordinated with urban planning, including the road network and urban development projects; thus, an integrated response is required in an urban sector. The provision of sustainable services requires the enhancement of the maintenance and management systems and the financial capacity of the project entities. It is also essential to raise people’s hygiene awareness in communities or schools to ensure hygiene behavior, such as hand washing and garbage segregation at the source of emissions.

- (i) **Program UH-01:** Urban sanitary improvement planning program
- (ii) **Program UH-02:** Water supply development program
- (iii) **Program UH-03:** Sanitation facility development program
- (iv) **Program UH-04:** Sewage system development program
- (v) **Program UH-05:** Solid waste management system improvement program



Source: JICA Study Team

Figure 4.3.18 Integrated Urban Sanitation Improvement Program

Table 4.3.10 Integrated Urban Sanitation Improvement Program (1)

(1) Program UH-01	
Urban sanitation improvement planning program	
(2) Background and Objectives (including relevance to CUREIP Output)	
<p>Based on the issues identified during the pandemic, such as insufficient water supply and lack of access to sanitation facilities, a comprehensive urban sanitation improvement plan should be developed to effectively improve urban sanitary infrastructure.</p> <p>The water supply improvement plan includes forecasting service supply volume based on the existing and mid- and long-term projected population and coordinating with urban planning or urban development projects. For example, the plan ensures the linkage between road network development and water pipeline development projects.</p> <p>In the sewerage development plan, densely populated areas are treated as sewage development areas supported by sewage collection facilities and off-site treatment facilities, and on-site treatment facilities such as septic tanks are installed in less densely populated areas.</p>	
(3) Project UH-01-01	Scope of Project
Basic survey project on urban sanitary	<ul style="list-style-type: none"> • Establish an urban sanitary improvement committee consisting of relevant agencies and headed by the public health department • Urban planning study (check existing and developing city plans) • Sanitation survey (check water supply and access to sanitation facilities in each area) • Existing plan survey (check existing and planned water supply, sewerage, and sanitation facilities)
	<p>Relevant agencies</p> <ul style="list-style-type: none"> • Urban planning department • Public health department • Water supply and sewage department, solid waste management authority (general and industrial waste, human waste treatment)
(4) Project UH-01-02	Scope of Project
Urban sanitary basic plan formulation project	<ul style="list-style-type: none"> • Formulate a basic sanitation improvement policy by the urban sanitary improvement committee and check relevance with urban planning • Formulate a water supply development plan (basic policy and plan) • Formulate sanitation facilities (sanitary toilet) development plan, and human waste collection and disposal plan • Formulate sewage development plan (basic policy and plan) • Formulate a solid waste management plan (basic policy and plan)
	<p>Relevant agencies</p> <ul style="list-style-type: none"> • Urban planning department • Public health department • Water supply and sewage department, solid waste management authority (general and industrial waste, human waste treatment)

Table 4.3.11 Integrated Urban Sanitation Improvement Program (2)

(1) Program UH-02	
Water supply development program	
(2) Background and Objectives (including relevance to CUREIP Output)	
<p>The establishment of a water supply system is essential for promoting the prevention of COVID-19 infections, and it must be a sustained effort in building post COVID-19 resilient cities. Particularly in developing countries, the number of households with access to water supply is limited, and many households use communal taps or purchase drinking water. In addition, the actual sanitation condition is not fully understood or incorporated into formal planning such as urban planning, especially in informal settlements.</p> <p>In the short term, the situation can be addressed by developing communal water taps and providing water trucks. However, in the medium to long term, it is essential to increase the water supply system coverage rate. Based on an understanding of the current situation in cooperation with other sectors, an integrated development plan should be implemented that includes water supply development, communal taps, securing the water supply system, and maintenance and management systems.</p>	
(3) Project UH-02-01	Scope of Project
Water supply facility development program	<ul style="list-style-type: none"> • Formulate water source securing plan and facility development plan based on the water supply development plan developed in Project UH-01-02 • Map existing water distribution and supply facilities • Formulate facility development implementation plan (rehabilitation of existing facilities or new construction) under the land use planning • Implement facility development (design and construction) • Select sites and construct communal taps with community organizations • Plan and implement water connection works in each household • Renew mapping of water distribution and supply facilities
	Relevant agencies
	<ul style="list-style-type: none"> • Water authority • Water source management department • Urban planning department • Water supply and sewage department and water supplier • Community organization
(4) Project UH-02-02	Scope of Project
Water utility capacity building program	<ul style="list-style-type: none"> • Review legal system on water supply business and discuss amendment • Review existing water utility and discuss its reorganization • Study needs for capacity building • Implement capacity building program <ul style="list-style-type: none"> ➢ Planning and management of implementation plan (including revision of water charge) ➢ Facility development planning and design ➢ Supervision on construction works ➢ Maintenance of facility operation ➢ Water quality management ➢ Water leakage management ➢ Customer management (including the introduction of ICT) ➢ Risk management (formulation of business continuity plan (BCP), establishment of emergency water supply system, coordination with community organizations) ➢ Increase in service centers for sufficient service system
	Relevant agencies
	<ul style="list-style-type: none"> • Water authority • Water supply and sewage department and water supplier • Community organization

Table 4.3.12 Integrated Urban Sanitation Improvement Program (3)

(1) Program UH-03	
Sanitation facility development program	
(2) Background and Objectives (including relevance to CUREIP Output)	
<p>As a countermeasure against COVID-19, the urgent issue was to ensure hand washing by improving the water supply system. In order to cope with further infectious diseases expected in the future, it is necessary to improve sanitation facilities to properly manage and dispose of human waste that can be a source of infection.</p> <p>For this purpose, shared toilet facilities should be changed to individual ones, and more safely managed hygienic public health services should be promoted. This includes the conversion from pit latrine to ventilated pit latrine and pour flush latrine.</p> <p>One of the requirements for safe management is the proper treatment and disposal of human waste or septic tank sludge. To achieve this, a system and facilities for regular pumping, collection, and disposal of human waste/septic tank sludge must be in place. Also, the community needs to be educated about the hygiene activities, such as routine cleaning of shared toilets by the community and encouraging hand washing.</p>	
(3) Project UH-03-01	Scope of Project
Toilet facility improvement project	<ul style="list-style-type: none"> • Develop shared toilets and eradicate open defecation • Establish maintenance system of shared toilets by community • Improve individual toilets: from pit latrine to ventilated pit latrine, and pour-flush latrine • Develop septic tanks for on-site disposal
	Relevant agencies
	<ul style="list-style-type: none"> • Urban planning department • Public health department • Community organization
(4) Project UH-03-02	Scope of Project
Human waste/sludge treatment system development project	<ul style="list-style-type: none"> • Establish a system for regular pumping, collection, and disposal of human waste/septic tank sludge <ul style="list-style-type: none"> ➢ Procure collection equipment ➢ Establish collection organization • Monitor illegal dumping of human waste/sludge • Develop disposal facilities of human waste/septic tank sludge in accordance with the land use plan and sanitation facilities development plan developed in Project UH-01-02 • Establish an operation system for human waste/septic tank sludge disposal facilities • Conduct routine cleaning of shared toilets by communities, and hygiene education
	Relevant agencies
	<ul style="list-style-type: none"> • Urban planning department • Public health department • Community organization

Table 4.3.13 Integrated Urban Sanitation Improvement Program (4)

(1) Program UH-04	
Sewage system development program	
(2) Background and Objectives (including relevance to CUREIP Output)	
<p>In improving urban sanitation, it is necessary to keep excreta away from residents through proper toilet maintenance. Further improvement of sanitation requires the construction of sewerage facilities for the collection and treatment of domestic wastewater and septic tank effluent.</p> <p>Since the construction of sewage systems requires a large amount of money and a long time, their construction is not a priority in accordance with the economic level of the city. However, especially in the capital city, the construction should be planned and promoted by designating areas with high population density as maintenance zones.</p> <p>The sewage system should deal with the rainwater in addition to sewage (domestic wastewater, septic tank effluent, and flush toilet wastewater). Therefore, it is necessary to consider whether to use a combined sewerage system (sewage and rainwater flow in the same pipeline) or a separate system (sewage and rainwater flow in separate pipelines) and adopt an appropriate system. Furthermore, the sewerage system needs connections to each household, and it is necessary to improve the legal system and strengthen the capacity of sewerage entities.</p>	
(3) Project UH-04-01	Scope of Project
Sewage facility development project	<ul style="list-style-type: none"> • Formulate sewage collection plan based on the topography survey and the sewage development plan developed in UH-01-02 • Formulate sewage disposal facilities development plan in accordance with the land use plan • Formulate implementation plan for sewage facilities development • Implement sewage facilities development (design and construction) • Plan and implement construction work to connect the sewage system with each household • Disseminate the connection construction work in coordination with community organizations
	Relevant agencies
	<ul style="list-style-type: none"> • Urban planning department • Public health department • Community organization
(4) Project UH-04-02	Scope of Project
Sewage utility capacity enhancement project	<ul style="list-style-type: none"> • Review legal system on sewage business and discuss amendment • Review existing sewage utility and discuss its reorganization • Study needs for capacity building • Implement capacity building program <ul style="list-style-type: none"> ➢ Planning and management of implementation plan (including revision of sewage charge) ➢ Facility development planning and design ➢ Supervision on construction works ➢ Maintenance of facility operation ➢ Public relations on the promotion of sewage system connection with each household
	Relevant agencies
	<ul style="list-style-type: none"> • Urban planning department • Public health department • Community organization

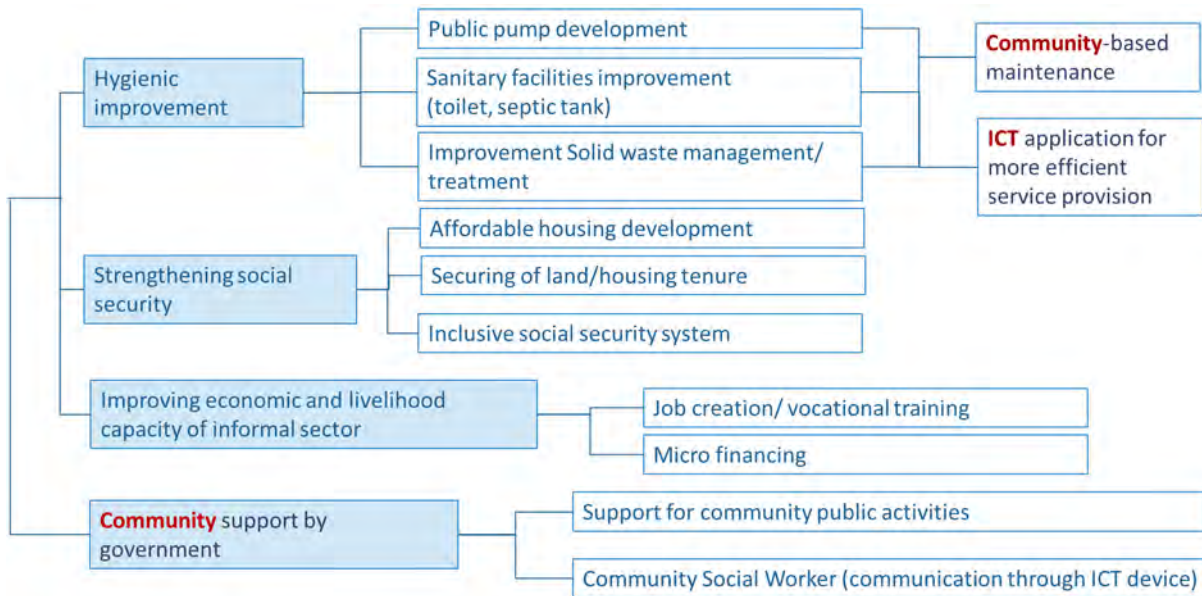
Table 4.3.14 Integrated Urban Sanitation Improvement Program (5)

(1) Program UH-05	
Solid waste management system improvement program	
(2) Background and Objectives (including relevance to CUREIP Output)	
<p>Regular collection and disposal (or treatment) of solid waste is essential for urban sanitation improvement. However, due to various constraints like funding and management capacity, developing countries do not have an adequate collection and proper disposal. The COVID-19 pandemic has dramatically increased the amount of infectious waste from medical and isolation facilities, which has increased the burden on municipalities for collection, transportation, and disposal, and has been posing health risks to the informal sector, including workers engaged in waste management and waste pickers.</p> <p>Therefore, there is an urgent need to establish an appropriate collection and transportation system suitable for each area and develop intermediate treatment facilities and final disposal sites that are financially and technically operational.</p> <p>In the short term, measures against infectious waste should include thorough source separation from general waste and its management and provision of personal protective equipment (PPE) to collection workers to address the increased risk of infection. In the mid- to long-term, as part of efforts to improve urban sanitation, the entire waste management and treatment system must be strengthened, including the treatment of infectious waste at the source of emissions, such as medical facilities using small incinerators, the development of large-scale intermediate treatment facilities, and improvements in collection and transportation efficiency.</p>	
(3) Project UH-05-01	Scope of Project
Collection and separation system improvement project	<ul style="list-style-type: none"> Establish collection and transportation systems based on the community as a smallest administrative unit Adopt collection and transportation methods per the characteristics of each area Develop separation management and collection system of medical or infectious waste Establish collection, transportation, and treatment systems considering the health risk of workers Involve waste pickers and informal recyclers in the waste management by registering them
	Relevant agencies
	<ul style="list-style-type: none"> Public health department Environment management department Community organization
(4) Project UH-05-02	Scope of Project
Intermediate treatment facilities development project	<ul style="list-style-type: none"> Select the type, capacity, and site of intermediate treatment facilities for general waste Formulate a business plan Develop small incinerators and gasification melting furnaces as a measure against infectious waste
	Relevant agencies
	<ul style="list-style-type: none"> Public health department Environment management department Community organization
(5) Project UH-05-03	Scope of Project
Final disposal sites development project	<ul style="list-style-type: none"> Select the technical level of final disposal sites per county/region/area Formulate management and monitoring plan of final disposal sites Establish an organization for managing and monitoring of final disposal sites
	Relevant agencies
	<ul style="list-style-type: none"> Public health department Environment management department

5) Integrated Informal Settlement Improvement Program

In order to realize the post-COVID-19 resilient city in developing countries, comprehensive efforts are required to address not only the physical hygiene environment but also the social and economic aspects of urban vulnerable groups. Although the social aspects vary depending on the actual conditions of informal settlements in each city, the land-related rights, and social security systems, projects such as those shown in Figure 4.3.19 need to be undertaken comprehensively. Hygiene environment improvement is included in Program UH as above.

- (i) **Program IS-01:** Sanitary environment improvement program (addressed in Program UH)
- (ii) **Program IS-02:** Social security enhancement program
- (iii) **Program IS-03:** Economy and livelihood capacity improvement program for informal sector



Source: JICA Study Team

Figure 4.3.19 Integrated Informal Settlement Improvement Program

Table 4.3.15 Integrated Informal Settlement Improvement Program (1)

(1) Program IS 01
Sanitary improvement program
(2) Background and Objectives (including relevance to CUREIP Output)
Described in Program UH

Table 4.3.16 Integrated Informal Settlement Improvement Program (2)

(1) Program IS 02	
Social security enhancement program	
(2) Background and Objectives (including relevance to CUREIP Output)	
<p>The urban poor residing in informal settlements often have no legal basis for land ownership or residency. Therefore, the physical living environment improvement often causes eviction of informal residents and the formation of another informal settlement. This process tends to be repeated. The lack of legal status makes it sometimes difficult to see them as the subject of public works projects.</p> <p>In order to improve sustainable living conditions and empower communities, programs to secure the rights of residents and their inclusion in social security systems should be promoted.</p>	
(3) Project ISI2-01	Scope of Project
Affordable housing development	<ul style="list-style-type: none"> Understand the current state of slums and overcrowded residential areas and create inventories Develop affordable housing in response to the infrastructure development or slum relocation projects Develop policies to promote affordable housing provision (mandate large urban development projects to provide affordable housing, give FAR bonuses, etc.) Develop integrated places for housing and employment
	Relevant agencies
	<ul style="list-style-type: none"> Construction ministry (in charge of urban planning) Housing department of the municipality Community organization
(4) Project ISI2-02	Scope of Project
Program for securing right to housing	<ul style="list-style-type: none"> Understand the current status of the right to housing in informal settlements Provide information for the poor and vulnerable groups (female, minority, etc.) Provide support for community based on residence-based rights in informal settlements
	Relevant agencies
	<ul style="list-style-type: none"> Municipality Community organization
(5) Project UH3-03	Scope of Project
Community empowerment	<ul style="list-style-type: none"> Promote community-based approach Provide support for public activities by community: Management of community infrastructure and community activities in open spaces Deploy community social workers Promote social business
	Relevant agencies
	<ul style="list-style-type: none"> Municipality Community organization

Table 4.3.17 Integrated Informal Settlement Improvement Program (3)

(1) Program IS-03	
Economy and livelihood capacity improvement program for informal sector	
(2) Background and Objectives (including relevance to CUREIP Output)	
As the living environment improves, the economic power of residents should be promoted to ensure their ability to pay for improved infrastructure services. Since the employment needs fluctuate due to the impact of COVID-19, a mechanism should be put in place to match employers and job seekers as early as possible, to maintain residents' economic power. In addition, the use of mobile payments should be utilized to increase the transparency and accuracy of corporations by visualizing the status of receipts and allowing for early credit setting for short-term borrowing.	
(3) Project ISI3-01	Scope of Project
Job creation program and job capacity enhancement	<ul style="list-style-type: none"> • Ensure proximity between housing and workplaces by forming mixed-use cities based on the concept of a new neighborhood • Introduce web service for job matching
	Relevant agencies
	<ul style="list-style-type: none"> • Housing department of a municipality • Community organization
(4) Project ISI3-02	Scope of Project
Support for financial access	<ul style="list-style-type: none"> • Diversify financial products (access to housing loans, microinsurance, etc.) • Introduce credit using the usage history of mobile payment
	Relevant agencies
	<ul style="list-style-type: none"> • Telecommunication authority • Municipality • Community organization

5. Formulation of Cooperation Project in Jakarta

5.1 Change of Urban Issues caused by COVID-19

5.1.1 Change of COVID-19 Cases and Urban Activities

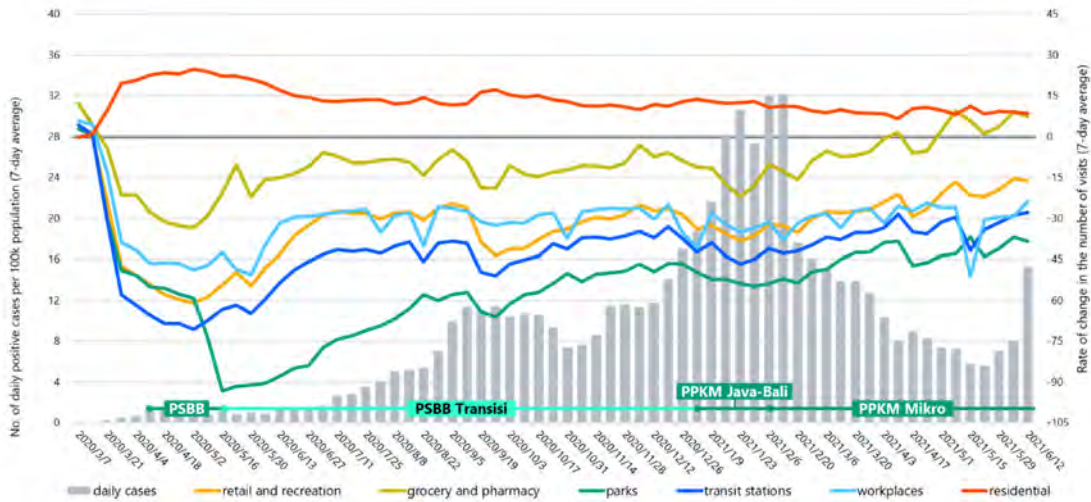
The number of daily infections in Jakarta increased after July 2020, hovering around 1,000–1,500, but then surged in December, reaching more than 4,000 in February 2021. Although the number has been decreasing since then, it has reached more than 10,000 due to re-expansion in June 2021.

The Indonesian government is trying to curb the behavior through "social restrictions." The central government was in charge of enforcing the restrictions from April 2020 until the end of 2020, but the initiative was shifted to the city and provincial governments in January 2021 and local governments and community organizations in February.

- PSBB (Large-Scale Social Restrictions, 4/10/2020-5/18/2020): Restrictions by the central government. Promotion of telecommuting. Restrictions on public activities, transportation operations, and religious and socio-cultural activities.
- PSBB Transisi (PSBB Transition, 5/19/2020 - 1/3/2021): Resumption of use under capacity restrictions in offices, public areas, restaurants, and places of worship. Operation under 50% capacity limitation in public transport.
- PPKM Java-Bali (Community Activity Restrictions, 1/11/2021-2/8/2021): Restrictions by city and county governments. Restrictions on offices, restaurants, public transport, and religious institutions (25% capacity). Shopping malls and restaurants are open until 7 p.m.
- PPKM Mikro (Small Public Activity Restrictions, 2021/2/9-present): Restrictions by community unit such as District, Sub-District, RTs (neighborhood associations with several households), and RWs (neighborhood associations, groups of RTs). Relaxed restrictions on offices, restaurants, public transportation, and religious institutions (50% capacity); zone classification of high risk of infection per RT; and restrictions such as blocking places of worship and curfews at night according to zones.

Looking at the number of urban activities during each period of social restrictions, in PSBB, the amount of urban activity decreased sharply, and the number of people at home increased due to the large-scale social restrictions. Subsequently, during the period of PSBB Transisi, the number of infected people is on the rise, but with the relaxation of social restrictions, the volume of activity has leveled off to a gradual increase. During PPKM Java-Bali, when authority was transferred from the central government to the local government, the volume of activity stagnated slightly due to the tightening of social restrictions; during PPKM Mikro, when community-based public activity restrictions were imposed, the volume of activity increased slightly.

The factors that generally contribute to the spread of infection are the movement of people, density, and sanitation, and the factors in Jakarta in terms of urban space and structure, transportation, urban sanitation, and urban socioeconomic are analyzed in this study.



Source: JICA Study Team based on Google

Figure 5.1.1 Change of Urban Activities in DKI Jakarta

5.1.2 Urban Space and Structure

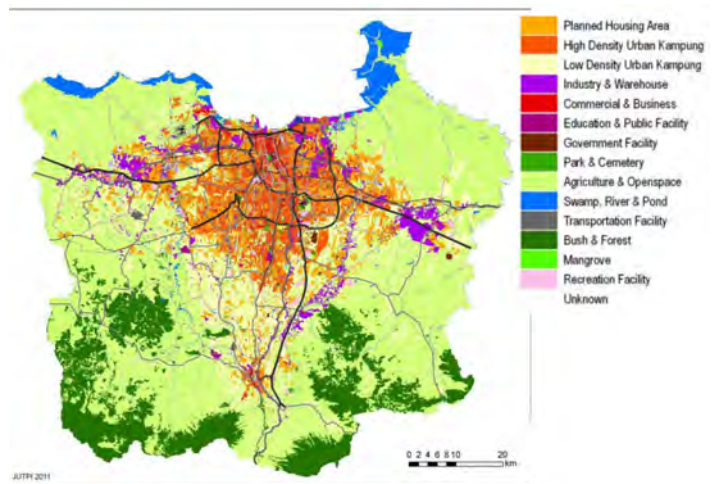
Urban Structure: The Jakarta Metropolitan Area called JABODETABEK comprises the Jakarta Special Capital Region and parts of West Java and Banten provinces, specifically the three regencies—Bekasi Regency and Bogor Regency in West Java, and Tangerang Regency in Banten. The area also includes the cities Bogor, Depok, Bekasi, Tangerang, and South Tangerang, all of which are not included administratively in the regencies. The population of JABODETABEK is 31 million, of which DKI Jakarta has about 10 million.

The basic urban functions are concentrated in DKI Jakarta, with no clear sub-centers in the suburban areas, and the land use of DKI Jakarta is mostly residential, commercial, and industrial areas, with a high population density of 14,464 persons/km².



Source: JICA Study Team

Figure 5.1.2 Location of DKI Jakarta in JABODETABEK



Source: ATR/BPN

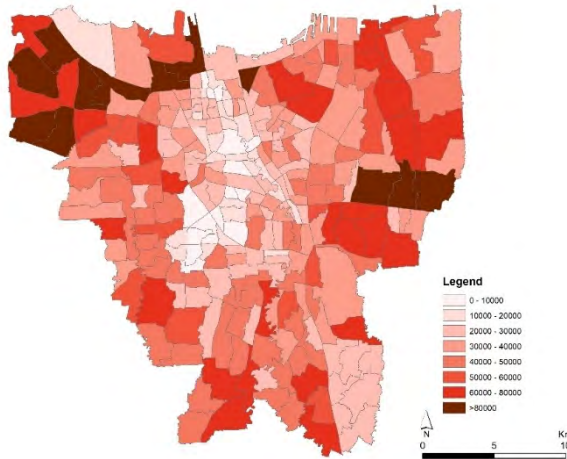
Figure 5.1.3 Land Use Plan of JABODETABEK

Relationship between population density and spread of infection (see Figure 5.1.4): Population density is lower in urban centers and higher in suburban areas; the number of

positive cases per 10,000 people for COVID-19 is higher in urban centers, and no correlation between population density and spread of infection was confirmed.

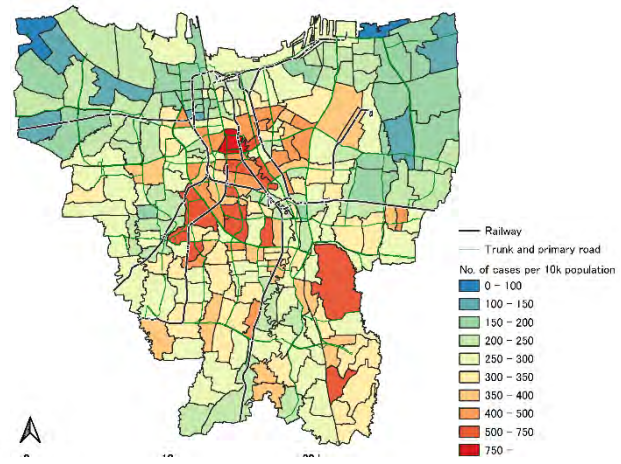
Correlation between population density and spread of infection (see Figure 5.1.4):

Population density is lower in urban centers and higher in suburban areas. The number of positive cases per 10,000 people for COVID-19 is higher in urban centers, and no correlation between population density and the spread of infection was confirmed.



Source: JICA Study Team

Figure 5.1.4 Nighttime Population by Kelurahan (2018 data)



Source: JICA Study Team

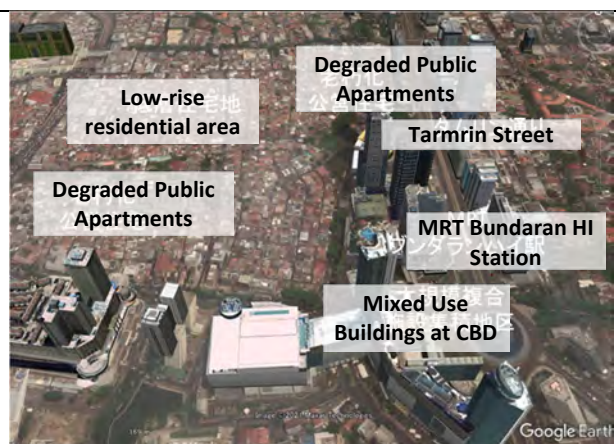
Figure 5.1.5 Number of infected cases per 1,000 people by Kelurahan (Mar 2020~Feb 2021, nighttime population based)

Clustering and spread of infection in the urban center: The number of positive cases on a residential basis from March 2020 to February 2021 is particularly high in the CBD. The areas around Monas and along Thamrin Street, where the number of infected people is high, have a high concentration of government agencies and commercial business facilities, which are cluster facilities and low-rise residential areas in the hinterland (see Figures 5.1.6 and 5.1.7). It is found that one of the factors of the spread of the infection is spread at large-scale facilities where a large number of people visit and gather.



Source: JICA Study Team (base map: Google Earth)

Figure 5.1.6 Location of CBD as a hotspot of COVID-19



Source: JICA Study Team (base map: Google Earth)

Figure 5.1.7 Large-scale buildings and low-rise buildings along Thamrin Street in CBD

Securing and Utilizing Open Space: Open space accounts for 17% of the total area of DKI Jakarta, but it is mostly forests and farmlands in the suburbs, and open spaces such as parks and green spaces in the built-up areas are limited. Fifty-six public parks in DKI Jakarta were closed for about a year after the spread of infectious diseases. In March 2021, 28 parks were opened to the public except for the elderly, children (0–9 years old), and pregnant women. As a result, as shown in Figure 5.1.1 Change of Urban Activities in DKI Jakarta, the amount of activity in parks among urban spaces was particularly decreasing, and the frequency of use of park green spaces during the social restriction period was very limited. It was one of the urban issues to ensure opportunities and spaces for exercise and recreation.

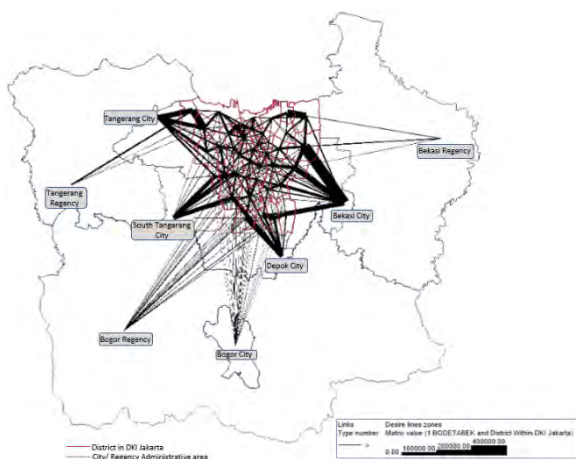
5.1.3 Urban Transport

Spread of infection due to concentration of citizen's movement to the city center: As mentioned above, the number of trips from outside Jakarta is high, especially concentrated in East and West Jakarta (districts with many industrial areas) due to the unipolar urban structure of the city (see Source: JICA Study Team

Figure 5.1.8). Within DKI Jakarta, there is also more movement from the periphery to the city center (see Source: JICA Study Team

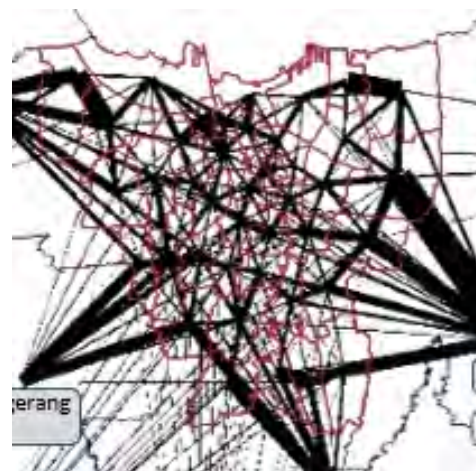
Figure 5.1.9).

As analyzed in Chapter 2, a positive correlation between the volume of movement and the rate of COVID-19 positive cases per population was observed in the early stages of the infection spread, suggesting that Jakarta's unipolar urban structure may have caused the spread of infection throughout the city (see Figures 5.1.5 and 5.1.6).



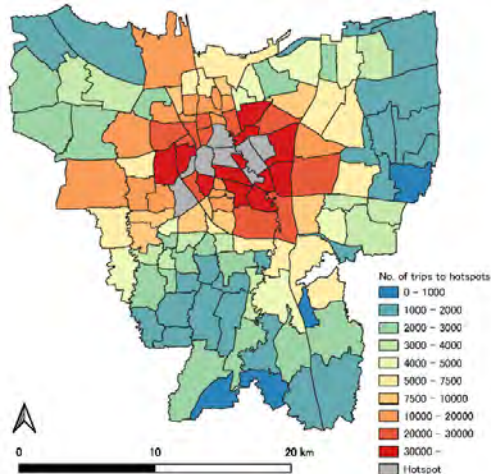
Source: JICA Study Team

Figure 5.1.8 Number of Trips from out of Jakarta to DKI Jakarta (coverage: JABODETABEK)



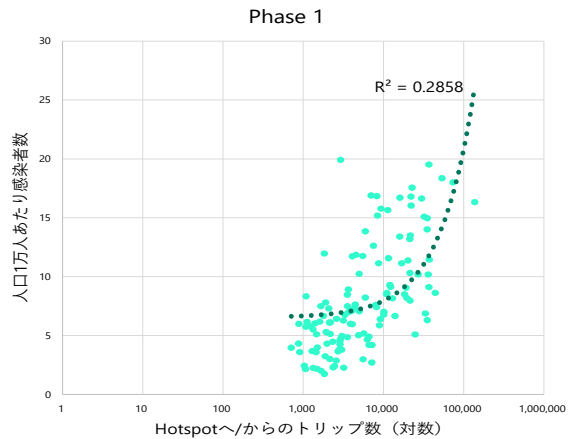
Source: JICA Study Team

Figure 5.1.9 Number of Trips from out of Jakarta to DKI Jakarta (coverage: DKI Jakarta)



Source: JICA Study Team

Figure 5.1.10 Number of Trips to the hotspot Kelurahan (initial period of infection spread)



Source: JICA Study Team

Figure 5.1.11 Correlation between number of trips to hotspot and infected people per 10,000

Changes in public transport usage: Chronic traffic congestion has been a serious urban issue in Jakarta, but social restrictions have temporarily reduced serious traffic congestion. On the other hand, the main mode of transport has shifted to private transport, and there has been a marked decline in the number of public transport users.

MRT Line 1 was fully operational in April 2019, with 2.5 to 3 million passengers per month. But with the spread of the infection beginning in March 2020, public transport service hours were shortened, the frequency was reduced, and vehicle capacity was limited. Furthermore, concerns about the risk of infection have led to a sharp decline in the number of passengers to just under 500,000 per month, or about 1/5 to 1/6 compared with before the pandemic, regardless of the increase or decrease in the number of infected passengers. The LRT and BRT have also seen a similar decline in users, with overall public transport fare revenues down 73% from the previous year, and citizens have become increasingly disconnected from public transport.

In 2020, BPTJ established the "Technical Guidelines for Public Transport Regulation in the JABODETABEK to Prevent the Spread of the New Coronavirus."

Increased demand for bicycles: While there has been a shift away from public transportation, the demand for bicycles has increased three to four times in the wake of the coronavirus (Source: Apsindo (Asosiasi Pengusaha Sepeda Indonesia, Indonesia Association Bicycle's Entrepreneur). The DKI Jakarta government launched a bicycle sharing service in June 2020 and has expanded bicycle paths, including a portion of Thamrin Street, a major arterial road, into a dedicated bicycle path.



Source: MRTJ

Figure 5.1.12 Number of Monthly MRT Passengers



Source: website

Figure 5.1.13 Shared Bicycle Stand at Thamrin Street

5.1.4 Urban Sanitation

Efforts to improve the living environment: In Indonesia, spontaneous urban areas known as kampungs are widespread, and they are often undesirable living environments. The program included the construction of communal water and toilet facilities, the construction of health centers, and the establishment of garbage dumps, all with the participation of residents. As a result, the program was implemented in Jakarta covering approximately 10,000 ha or 16.9% of the total area and 3.81 million people and has now been implemented in almost all kampungs. Since then, measures to improve living conditions in informal urban areas have continued.

Penetration of sanitation facilities: According to the DKI Jakarta Central Bureau of Statistics in 2018, almost all households in DKI Jakarta use adequate sanitation facilities; more than 90% of households in DKI Jakarta use a tank/sewer system (SPAL) as a disposal site for urine, while the river, garden, ground holes, etc., there are still some households that use unsanitary disposal methods.

Waste management as a flood control measure: Previously, the Jakarta Special Provincial Government and the Jakarta Special Provincial Department of Sanitation had established a Technical Management Unit (UPT) for the removal of domestic waste and waste management in rivers and waterways in the capital city and had installed 126 garbage filters. Subsequently, to solve the flooding problem, the consensus-building organization (LMK) of each district developed measures for local garbage collection, and the installation of garbage bins, garbage collection, and repair activities of waterways are in progress. These activities have been approved by the DKI Jakarta Government and are now being funded and subsidized by the DKI Jakarta Regulation No. 165 of 2015 as a contracted staff of the wards called Public Facilities Management and Infrastructure Development Staff (PPSU).

Impact on the spread of COVID-19 infection: Due in part to the efforts described above, the COVID-19 spread did not identify any reports on the impact of poor sanitation on the spread of infection. Increased demand for water has been reported due to hand washing and disinfection needs (Regional Drinking Water Company). To meet the increased demand for water, hand washing equipment has been installed in 170 urban locations (as of November 2020), funded by local government, private sector, and community organizations. In addition,

sterilization facilities and installation in public facilities (hospitals, health centers, markets, train stations, etc.) were promoted by the University of Indonesia.



Figure 5.1.14 Water Tank for Handwash along Sidewalk



Figure 5.1.15 Sterilization facility in the station

5.1.5 Urban Socio-Economy

Increase of Poverty Rate: With the expansion of COVID-19, Jakarta's poverty population has reached approximately 4.97 million. This number represents 4.69% of the capital's total population (10.64 million). The vulnerable group (kalangan rentan) is said to be more than three times as large as the poor, accounting for 19%. This figure is the highest in the past decade and is almost the same as it was 20 years ago. In addition, the stagnation of economic activities due to the expansion of COVID-19 has resulted in a series of layoffs of residents who used to belong to the middle class, and the number of residents who fall into the vulnerable group is expected to increase in the future.

Cooperation between District Governments and Communities: In Indonesia, traditional community organizations called RT/RW have taken root, and efforts for community improvement have been made mainly by these communities. In response to COVID-19, efforts were made in collaboration with these local communities and the district government (Kelurahan). Specifically, based on the "Interior Circular No. 440, 2020 on Partnership between Local Governments and Community Organizations, Including NGOs, for the Rapid Handling of COVID-19," RT and RW are treated as the smallest administrative units and test, tracing, treatment (3Ts), as well as quarantine and isolation at the RT and RW levels, with the government taking the lead when it is not possible to respond, and measures to control the spread of infection have been implemented.

5.1.6 Urban Administration

Online public services: In Indonesia, the introduction of E-Government has led to the centralization and digitization of administrative services, enabling residents to directly access districts and provinces and apply for on-time administrative procedures.

Jakarta Smart City Initiatives: The Jakarta Smart City Unit (JSC), under the umbrella of DKI Jakarta's Communication and Information Department, manages various data and provides

ICT solutions. Data is collected directly from DKI Jakarta agencies, external organizations, and even citizens and is managed centrally by JSC. Data related to COVID-19 is also collected by JSC and used to make policy decisions such as improving vaccination efficiency and reopening schools. JAKI (Jakarta Kita), a mobile application, has been developed as a platform for collecting and disseminating such data to citizens and for making public services available online.

Promotion of Smart Businesses: The DKI Jakarta is leading the creation of a platform for the development of smart community businesses that have semi-formal organizations and cutting-edge technology and techniques that are profitable. In 2019, the development of businesses to boost the kampung and local economy will include No-deflux (a local community patrol business using security cameras), Botika (an online market business), DuitHope (a cashless payment business), Grab (car dispatch and delivery Delivery), Tokopedia (e-commerce platform), Bukalapak (e-commerce platform), Shopee (e-commerce platform), and Gojek (car delivery and home delivery).

5.1.7 Change of Urban Issues with COVID-19

Based on the characteristics of Jakarta and the changes in urban issues caused by COVID-19 infection, urban issues for postCOVID-19 are summarized in the table below.

Table 5.1.1 Characteristics of Jakarta and Urban Issues toward Post Corona

	Characteristics of Jakarta	Issues toward Post Corona
Urban Spatial Structure	<ul style="list-style-type: none"> • Overconcentration and overdependence on urban functions in the city center • Lack of sub-centers, lack of public facilities, and open spaces in living areas • Mixed development areas along the main road in the center of the city and low-rise residential areas in the hinterland 	<ul style="list-style-type: none"> • Diversification of urban functions with public transport improvement • Reinforcement of urban functions and improvement of the living environment in each neighborhood • Buffer space between commercial and residential areas • Securing, strengthening, and utilizing of open spaces
Urban Transport	<ul style="list-style-type: none"> • Decreased use of public transport (MRT, LRT, BRT, buses), impact on unsubsidized feeder service (Angkot) operations • Increased use of bicycles during the pandemic, and the development of dedicated bicycle spaces • Lack of public transit service on the periphery of the urban area 	<ul style="list-style-type: none"> • Data utilization of public transport for infection control and social awareness • Strengthening urban functions at transport nodes along MRT and LRT • Improvement of public transport services in municipalities around urban areas • Improve management of public transport (information provision, service management, terminals) • Improvement of bicycle and pedestrian space and promotion of universal design
Urban Sanitation	<ul style="list-style-type: none"> • Scattered poor urban areas along the coast and rivers • Inadequate supply of drinking water, improper disposal of medical waste, risk of infection to scavengers 	<ul style="list-style-type: none"> • Improvement of the infrastructure in degraded urban areas • Environmental education
Urban Socio-Economy	<ul style="list-style-type: none"> • Community-based health care system and educational activities 	<ul style="list-style-type: none"> • Enhancement and improvement of livelihood services and infrastructure in the community

	Characteristics of Jakarta	Issues toward Post Corona
	<ul style="list-style-type: none"> • Rapid growth of electronic payment systems • Lack of parks and open spaces within the living area 	<p>area</p> <ul style="list-style-type: none"> • Support for vulnerable groups • Strengthening resilience against disasters, infectious diseases, etc.; promoting safe and healthy communities • Utilization of digital technology

Source: JICA Study Team

5.2 Urban Development Program with and post Covid-19

5.2.1 Review of Existing Master Plans

1) Infrastructure development

Since the JABODETABEKPUNJUR Spatial Plan was legalized by Presidential Regulation No. 54 of 2008, the current issue is not only suburban area development and development of urban development areas in DKI Jakarta, which includes five satellite cities and four provinces, with Jakarta as the core city, but also "improvement of living environment" in existing urban areas.

The current Presidential Regulation No. 60 of 2020 incorporates a review of regional urban and residential land development methods, considering measures against land subsidence and flooding, and seeks ways to develop infrastructure to improve regional environmental capacity and the activities of citizen to maintain it.

2) JABODETABEKPUNJUR Spatial Plan

The development vision and orientation of DKI Jakarta are described in the JABODETABEKPUNJUR Spatial Plan as follows:

- Urban functions: center of the state, city, and district governments, trade and services, higher education services, sports, community health care, creative industries and manufacturing, plantations, fishing, forestry processing, national defense and security activities, tourism activities, MICE, and socio-cultural activities
- Urban space: utilization of medium- and high-density building space, development of urban hubs with environmental capacity and high-quality infrastructure and facility services, green and open spaces of 30% or more
- Transport system: road, river transport, rail, marine transport, air transport network

In compliance with it, the DKI Jakarta Spatial Plan sets forth nine goals, policies, and corresponding strategies with a vision of "prosperity, comfort, and sustainability (see Table 5.2.1).

Table 5.2.1 Vision, Objectives, Policies and Strategies of DKI Jakarta

Vision	Objective	Policy	Major Strategies
Prosperity	A. Spatial development for productive and innovative urban living	<ol style="list-style-type: none"> 1. Productive and innovative urban living 2. Infrastructure development for activity centers and between activity centers 3. Development of activity centers and inter-center utilities 4. Economic growth through trade and services, creative industries, high-tech and non-polluting industries, and tourism 	<ul style="list-style-type: none"> • Activity center development through transportation nodal and TOD • Mass transit development as a transportation framework • Water resource development and water service development that meets standards • Solid waste and environmental sanitation system expansion • Wastewater management system (diversion of wastewater and sewage) • Tourism infrastructure and MICE • Tourism development through rehabilitation of old town

Vision	Objective	Policy	Major Strategies
Comfort	B. Sustainable and accessible quality infrastructure and facility services	<ol style="list-style-type: none"> 1. Population in 2030: up to 10 million people, average population density of 150 people/ha 2. Integrated and hierarchical urban infrastructure and facilities development 3. Integrated and hierarchical utility development 	<ul style="list-style-type: none"> • Residential development and reorganization based on spatial patterns • Vertical and compact residential construction based on the direction of zone development • Feeder traffic with mass transit and integrated hierarchy • Traffic node development • Development of comfortable and safe pedestrian and bicycle paths • Development of disaster evacuation routes and spaces • Integrated infrastructure development
	C. Realization of integrated spatial planning		
	D. Disaster Risk Reduction	<ol style="list-style-type: none"> 1. Infrastructure and facility development for natural disaster risk reduction 2. Infrastructure and facilities development for human-induced disaster risk reduction 3. 30% reduction of greenhouse gas emissions 	<ul style="list-style-type: none"> • Flood control infrastructure and facility Improvements • Drainage system improvement • Improvement of disaster evacuation routes and spaces • Water surface enlargement for rainfall intensity • Access to emergency response in high density residential areas • Green space/open space expansion
Sustainability	E. Maximizing the use of cultivated land to increase urban productivity	<ol style="list-style-type: none"> 1. Development of cultivated land with economic value 2. Vertical and compact space utilization 3. Development regulations to ensure environmental capacity 4. Residential development in accordance with district characteristics 	<ul style="list-style-type: none"> • Formulation of mixed-use development zones with multiple functions within a single parcel or building. • Formulation of integrated development zones that allow for all socioeconomic classes within a single parcel or building. • Use of underground spaces to limit production activities • Restriction of ribbon (sprawl) construction • High-density residential development with access to mass transit
	F. Formulation of special regional functions as a capital city		
	G. Development and Regulation of Land, Sea,	<ol style="list-style-type: none"> 1. Conservation of water resources and green spaces for environmental balance 2. Expansion of green and open 	<ul style="list-style-type: none"> • Functional renewal and multifunctionalization of green spaces • Innovative maintenance of green spaces (rooftop/wall greening, mini parks)

Vision	Objective	Policy	Major Strategies
	and Air Space	spaces to improve the quality of urban life 3. Development of residential areas in accordance with district characteristics 4. Participation in climate change mitigation and adaptation measures	<ul style="list-style-type: none"> • Community participation in the improvement and maintenance of green spaces • High-density residential development accessible to mass transit • Development of disaster evacuation routes and spaces
	H. Sustainable spatial planning for coastal areas and islands		
	I. Formulation of Jakarta's Urban Culture on an Equal Footing with Other Major Cities	1. Formulation of an orderly and well-managed urban culture 2. Development of urban spaces that govern urban communities 3. Improving the quality of urban design and architecture	<ul style="list-style-type: none"> • Reduction of inappropriate use of public space and its use according to its function • Community discipline monitoring system facilities • Formulation of appropriate urban design guidelines for integrated corridor formation • Harmonization of buildings and public spaces • Enhancement and integration of paths, edges, districts, nodes, landmarks

Source: JABODETABEKPUNJUR Spatial Plan

3) DKI Jakarta Spatial Plan till 2040 (draft)

BAPPEDA is currently preparing a revised draft of the DKI Jakarta Spatial Plan (RTRW) until 2040, expected to be approved by the end of 2022 by the governor. Based on the revised spatial plan, a detailed spatial plan (RDTR) at the Kecamatan level will be prepared by Dinas Citata.

The RDTR will be based on the concept of a "Self-sufficient Neighborhood" and will promote TOD and digital urban development, new residential development along the public transport axis (multi-story residential, high density, walkable, and mixed-use), while new development out of public transport network is restricted.

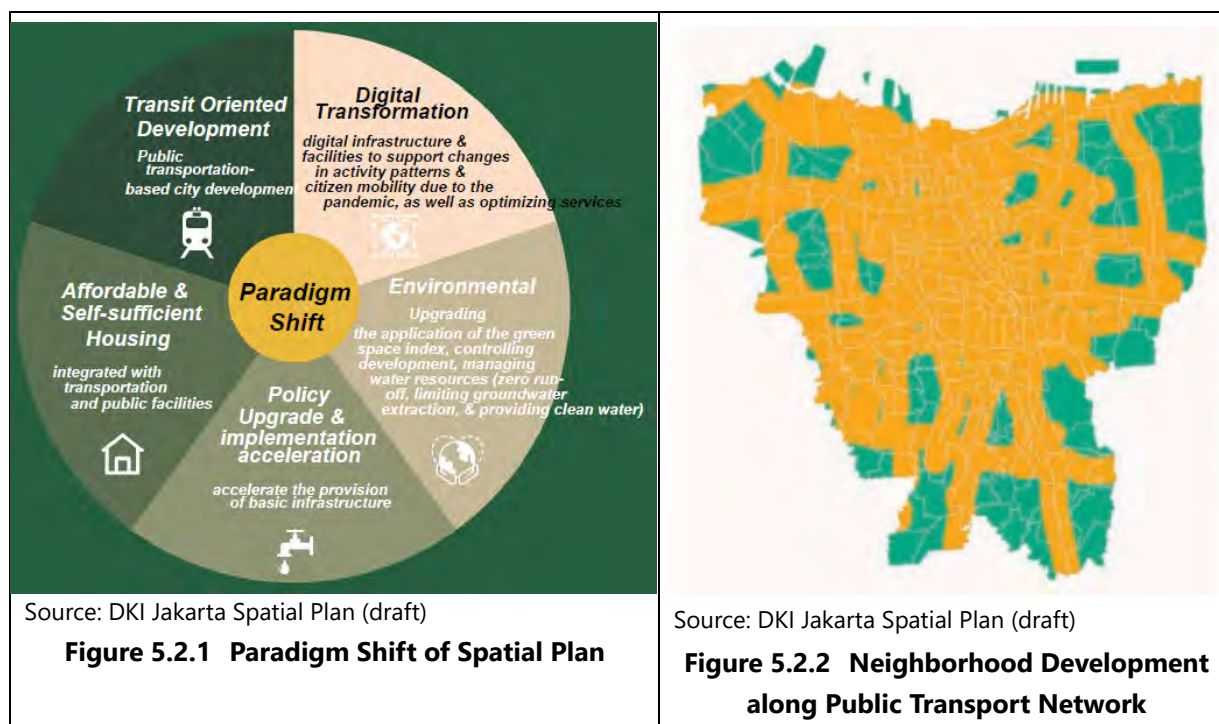


Table 5.2.2 Six Strategies, Objectives and Activities proposed in DKI Jakarta Spatial Plan (draft)

Strategies	Key target	Activities Plan
Development of transit-oriented and digital city	Achieve 55% of public transport mode share.	<p>“Switching Private to Public Transport”</p> <ol style="list-style-type: none"> 1. Expansion of pedestrian path and bicycle lane 2. Expansion and integration of public transport network 3. Traffic limitation program, including low emission zone 4. Provision of park and ride especially around border area to swift from private mode to public transport. 5. Development of TOD
	Concentration of activities and residents around transit points up to 70%. (People near transit/PNT)	<p>Concentration of public transport network plan (rail-based and BRT main corridor) within 400 meters. Within the delineation area, the area (as the transit point for public transport mode) can be developed as a transit-oriented area with a radius of 800 m, with some conditions:</p> <ol style="list-style-type: none"> 1. In line with technical criteria based on TOD concept within Ministry of ATR No. 16 Year 2017 and standard minimum service as mentioned in the RTRW (performance-based planning) 2. Development can be done around the transit node that has been established or is being constructed or has been decided as the station by the government. 3. The delineation area can be proposed by the candidate for a master developer or Local Government through Regional Spatial Planning Forum.
	Efficiency of space through shifting mobility and activity pattern towards digital platform	<ol style="list-style-type: none"> 1. Flexibility to organize the spatial planning Support self-sufficient neighborhood and efficiency of movement: supporting functions (work, trade and environmental services, recreation) can be developed in residential areas to support residents' main activities from home or residential neighborhoods (mixed-use). 2. Digital Infrastructure Support <ul style="list-style-type: none"> - City-scale Tech Commerce Centers in the form of community collaboration spaces (for example, Future City Hub, etc.) and Neighborhood Digital

Strategies	Key target	Activities Plan
		<p>Hub: in the form of digital space on the scale of residential environments (for example, Jakwifi coworking space, etc.)</p> <ul style="list-style-type: none"> - Ease of use of space for future technological infrastructure development activities: 5G micro cell tower, dana center. - Optimizing public services digitally: provision of digital platform (JAKI, etc)
Development of decent and equitable housing as well the self-sufficient neighborhood	Increasing the quantity and quality of urban affordable vertical housing	<ol style="list-style-type: none"> 1. Residential Development is directed in a vertical form 2. 20% of the provision of affordable housing from the total residential units in the SAUM corridor 3. Zone flexibility for decent and affordable housing
	Improving the quality of villages areas with participatory principles to achieve zero slum RW	<ol style="list-style-type: none"> 1. Improvement of the quality of in situ 2. Improvement of the quality of the ex situ 3. Guaranteed access to basic infrastructure 4. Access to the economic, social, and cultural rights of affected communities 5. Compensation based on agreement with affected communities 6. Collaboration between government, community, academics, NGOs, and BUMD 7. Participle principle (Community Action Plan, Collaborative Implementation Program) 8. Have a comprehensive study
	Achieving self-sufficient neighborhood: integrated utilities and infrastructures in every residential neighborhood	<ol style="list-style-type: none"> 1. Each neighborhood has a micro-scale city service function within a walking or cycling radius 2. Optimizing the function of space by encouraging density and mixed-use 3. Age and Gender Responsive, Diffable Friendly, and Resilient Neighborhood.
Development of urban space and services that are resilient and integrated with surrounding area of Jabodetabekpunjur.	Green Cities contributing to climate change to achieve 30% greenhouse gas reduction from 2020 base	<ol style="list-style-type: none"> 1. Limiting new development beyond the reach of mass transit points to balance the urban environment. 2. Green Space equivalent to 30% RTH 3. Green building 4. Industrial electric vehicle supporting infrastructure only for environmentally friendly industries 5. Incentives and disincentives for ecological services
	Water adaptive city towards flood-free based on water resource conservation	<ol style="list-style-type: none"> 1. Zero run-offs on buildings 2. Increasing the capacity of drainage, rivers, lakes, reservoirs, ponds, and lakes to accommodate rain for 100 years 79 polder points 3. Tidal flood control infrastructure on the north coast 4. 100% piped clean water 5. Conservation of water resources and water recycling 14 zones of municipal sewage treatment plants Cooperation with upstream areas
	Sustainable waste management	<ol style="list-style-type: none"> 1. Four ITF and Micro ITF in each sub-district 2. Environmentally friendly waste processing facilities in each sub-district 3. System for reduction, segregation of waste, and scheduled transport from source 4. Cooperation with Bantar Gebang Landfills and solar power plant
	Increased food security	<ol style="list-style-type: none"> 1. (Green Space) RTH and (Non-Green Space) RTNH as a forum for urban agriculture 2. Fisheries centers in North Jakarta 3. Urban farming in parcels of land and buildings

Strategies	Key target	Activities Plan
		4. Cooperation with buffer areas as food centers through the food security information system (SIKP)
	Resilience of cities to natural and man-made disasters, and the spread of disease	<ol style="list-style-type: none"> 1. Principles of disaster adaptation in environmental and building development 2. Evacuation routes and multifunctional rooms for disaster evacuation systems for detection, early warning, mitigation, and evacuation of disasters integrated with information technology 3. Access emergency response in dense settlements 4. Room standards are in accordance with health standards, especially in responding to the spread of disease outbreaks
Development of spatial planning that support Jakarta as a business global city.	Spatial planning that supports business and investment climate	<ol style="list-style-type: none"> 1. TOD Area Development 2. Digitalization of urban life 3. Development of environmentally friendly creative industries 4. Activity development 5. urban culture-based tourism
	Integrated and unified urban logistics system	Jakarta's urban logistics system prioritizes the integrated function of the Distribution Center (<i>PD-Pusat Distribusi</i>) as a supplier, distributor, and storage on a regional scale, as well as Distribution Network Infrastructure (<i>PJD-Prasarana Jaringan Distribusi</i>) as a distributor to consumers on a local service scale.
Development of coastal area, water area, as well as sustainable and equitable Thousand Islands (<i>Kepulauan Seribu</i>).	The concept of developing the coastal areas and waters of Jakarta, as well as the Thousand Islands which is integrative by paying attention to aspects of social justice, the environment and the maritime economy	<ol style="list-style-type: none"> 1. Increased connectivity and support for integrated infrastructure with the mainland by providing ports, transportation, and utilities, as well as increasing population access to public beaches. 2. Guarantee of living space and fishermen's access to the sea in the form of providing facilities for fishing activities and revitalizing fishing settlement areas. 3. Development of a sustainable blue economy center through mining activities, energy production and distribution, optimization of port of goods, and global scale fishing industry centers. 4. Preservation of coastal areas and waters through the development of Marine Protected Areas in the waters of the Thousand Islands, rehabilitation of beaches and islands, transplantation of corals, and fish restocking. 5. Development of global-scale sustainable maritime tourism in coastal areas, waters, and islands, in the form of historical tourism, seascape tourism, and coastal and island tourism.
Development of spatial planning that support Jakarta's role as the center of government and culture.	Jakarta Heritage	<ol style="list-style-type: none"> 1. Preservation, restoration, and rebranding 2. Development of socio-cultural strategic areas 3. Providing incentives as an effort to preserve cultural heritage objects and areas
	Jakarta Urban Culture	Optimization of existing places, as well as the flexibility of urban culture and tourism-based activities to be carried out in all zones

Source: DKI Jakarta Spatial Plan (draft)

4) Regional Mid-term Development Plan

Indonesia's national-level development plan (Socio-Economic Development Plan) consists of the National Long-Term Development Plan (20-year plan), the National Mid-Term Development Plan (5-year plan), and the Implementation Plan (Annual Plan) based on the

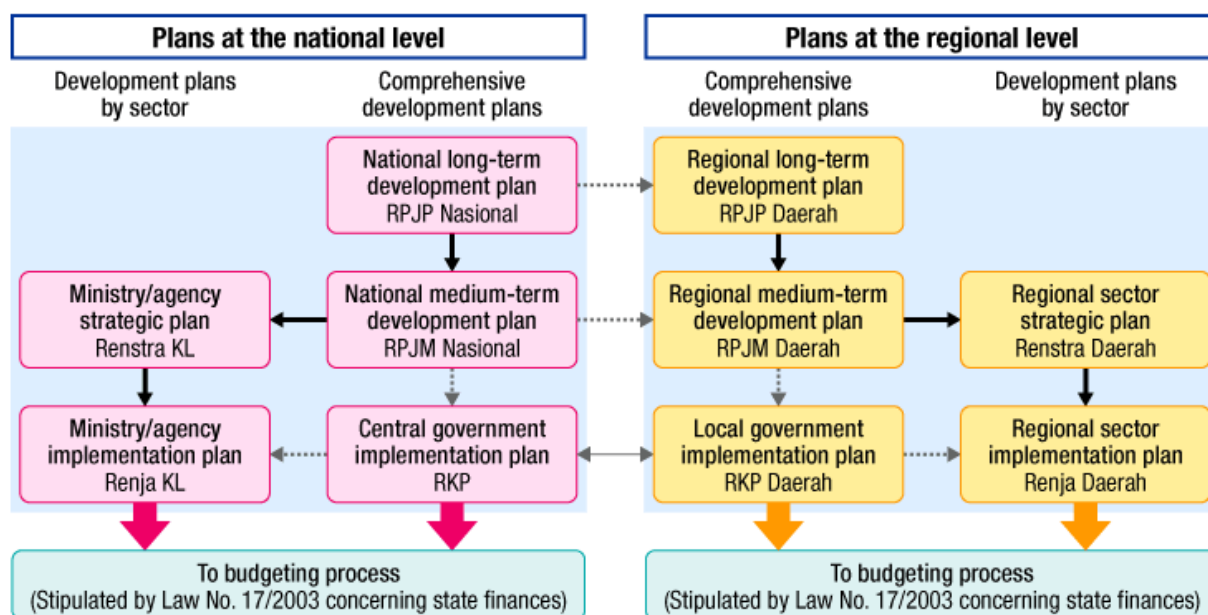
National Development System Law (Law No. 32, 2004). The Long-Term Development Plan is responsible for providing a development vision, mission, strategies, and other policy directions over 20 years. The Medium-Term Development Plan presents the national development strategy, macroeconomic frame, and priority measures for the next five years, taking into consideration the consistency with the Long-Term Development Plan.

These development plans are compiled by the National Development Planning Agency (BAPPENAS), but the National Medium-Term Development Plan also has a significant meaning as a political commitment by the President. In other words, the President, who, in accordance with his administrative policies, will indicate priority measures to be taken over a five-year period and the National Medium-Term Development Plan will be formulated within three months after taking office at the latest.

The regional-level medium-term development plans (RPJMD) are formulated by the Planning Bureaus of each local government (BAPPEDA). Based on the challenges and potentials of each region, the RPJMD establishes a vision, presents development policies, and identifies a development plan, including infrastructure and social sector, and its financing approach. Based on this development plan, an annual plan, the Regional Development Program Development Plan (RKPD), and sectoral strategic plans (Renstra) for each region are formulated, and budgets are secured based on these plans. RPJMD will also show guidance for BUMD (Badan Usaha Milik Daerah, local public enterprise) to prepare its long term plan, annual operation plan, and budget (RKAP).

DKI Jakarta has a medium-term development plan (RPJMD) for the period 2017–2022, consisting of the following chapters:

- I. Introduction
- II. General description of regional conditions
- III. Overview of regional finances
- IV. Regional strategic problems and issues
- V. Presentation of vision, mission, goals, and objectives
- VI. Strategy, direction of regional development policies and programs
- VII. Development funding framework and regional apparatus programs
- VIII. Performance of local government administration
- IX. Regional strategic activities
- X. BUMD Development
- XI. Closing.



Source: Prepared based on the National Development Planning System Law

Source: MLIT Website

Figure 5.2.3 Socioeconomic Planning System of Indonesia

5.2.2 Review of JICA Projects

The basic policy in Indonesia's Development Cooperation Orientation is to "support Indonesia's balanced economic development and improve its capacity to respond to international challenges. JICA's existing projects in Jakarta, which address development issues in the areas of urban transport, urban railway, sewerage, and disaster management, are mainly listed below.

Table 5.2.3 JICA's Project of Urban Sector in Jakarta

Development Issues	Cooperation Program	Project Name	Scheme	Period
1-1 High-quality infrastructure development	Logistics, Transportation, and Transit Infrastructure Development Program	MRT Project advisor	Expert	~2020
		Urban railway project (I),(II)	Loan	~2021
		Construction of Jakarta Mass Rapid Transit Project (Phase 2) (1).	Loan	~2023
		Jakarta Mass Rapid Transit East-West Line (E/S) Phase 1	Loan	~2021
		KPPIP Support Facility	TA	~2019
		Urban Transportation Policy Integration Project Phase 2 in the Republic of Indonesia (JUTPI2)	TA	2017~2020
2-1 Supporting Rural Development to Improve Quality of Life	Quality of Life Program	Sewage Management Advisor	Expert	~2021
		Jakarta Sewerage Development Project (Zone 1, Zone 6) (Phase 1)	Loan	~2024
		Environmental Policy Advisor	Expert	~2022
		Project for Promoting Countermeasures against Land Subsidence in Jakarta	TA	~2021
		Comprehensive Disaster Management Policy Advisor	Expert	2020~2022

		The Project for Strengthening Disaster Prevention Information System	Grant	~2023
		Disaster Resilience Enhancement and Management Program Loan	Loan	2020
		Project for Capacity Development for Land Appropriation System Improvement in Indonesia	TA	~2020
3-2 Support Program for Addressing Challenges in the Asian Region and International Society	Support Program for Addressing Challenges in the Asian Region and the International Community	Project for Strengthening Capacity for Early Warning and Response to Infectious Diseases	TA	2020~2024

Source: Indonesia’s Development Cooperation Orientation (as of August 2020), MOFA

JICA has implemented several projects in Jakarta in the areas of urban development, urban transportation, urban railroads, sewerage, and disaster management. The main projects are as follows:

(a) Urban Railway (MRT) Construction

The Phase 1 section of MRT Line 1 (North–South) (Bundaran HI to Lebak Bulus at 15.7 km, 13 stations in total: seven elevated and 7 underground) was opened in March 2019.

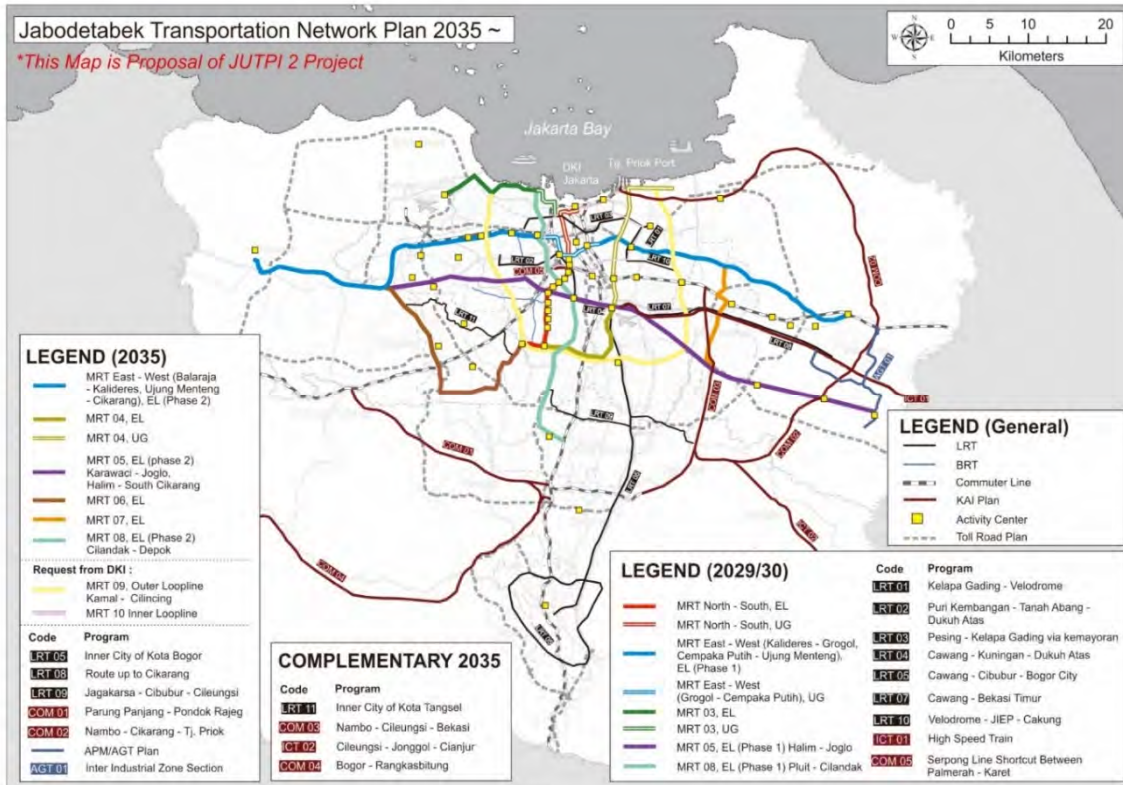
The Phase 2 section is divided into 2A (Bundaran Hi-Harmoni-Kota and Harmoni-Kota, 5.8 km, 7 underground stations) and 2B (Kota-Ancol Barat station and rail yard, 6 km, two underground stations), with section 2A currently under construction.

The FS of MRT Line 2 (East–West) by JICA in 2015, but the construction project was not completed. JICA's Engineering Services (ES) loan is currently provided to the Ministry of Transport of Indonesia.

(b) Urban Transport

JICA has been involved in the development and update of the Urban Transport Master Plan for the Jakarta Metropolitan Area through the "Jakarta Metropolitan Area Integrated Transport Planning Study (SITRAMP)" (Phase 1) (2001), (Phase 2) (2004), "Urban Transportation Policy Integration Project" (Phase 1) (2009–2012) (JUTPI) and (Phase 2) (2015–2019) (JUTPI2). These projects have made recommendations for the formation of a city based on public transport. In this process, the Greater Jakarta Metropolitan Transportation Agency (BPTJ) was established in 2015, and the Jakarta Metropolitan Transport Master Plan (RITJ) was made a presidential decree in 2018.

JUTPI2, completed in 2019, carried out activities to update the RITJ, and in the public transport plan in addition to the two MRT Line 1 (North–South) and Line 2 (East–West) that are currently under development, eight new MRT lines. The proposed public transport network includes eight new MRT lines in addition to the two MRT lines above. In conjunction with this, Outcome 3 included activities to strengthen the capacity of TOD (as described in the next section c).



Source: Final Report of JUTPI2

Figure 5.2.4 Jabodetabek Transport Network Plan 2035

(c) TOD and land rights

In JUTPI2, as indicated earlier, to strengthen the capacity for implementation of Outcome 3 TOD, workshops were held in model districts to develop TOD plans, and TOD guidelines were proposed. Based on the results of this project, the "Urban Transportation Policy Integration Project 3 (JUTPI3)" has been implemented starting in 2022, intending to strengthen TOD implementation capacity.

Under the "KPPIP Support Facility," the PMO of the Committee for Acceleration of Priority Infrastructure Delivery (KPPIP) was assisted in establishing a sustainable management system for the PMO by providing support for the improvement of infrastructure development policies and systems, including the preparation of guidelines for redevelopment projects, as part of support for land-related policies and systems.

The " Project for Capacity Development for Land Appropriation System Improvement in Indonesia " also provides support for land systems related to TOD.

(d) Sewerage improvement

JICA implemented the "Jakarta Sewage Management Capacity Enhancement Project through Reviewing Wastewater Management Master Plan in DKI Jakarta" (2020–2012) to improve the living environment through the development of a full-scale sewage system. The plan calls for the entire Jakarta area to be divided into 15 treatment zones to be developed in phases, with Treatment Zones 1 and 6 to be developed first, as they are densely populated and have many commercial facilities such as shopping malls.

Sewage treatment plants and sewer pipe networks (sewer pipes and manholes) are planned and designed. In addition, through the dispatch of "Sewage Management Advisor" (2014–

2020) and the "Project for improving planning capacity for the sewerage system in DKI Jakarta" (2015–2018), the implementation system of sewerage maintenance agencies are strengthened.

Subsequently, a loan agreement for the sewerage maintenance project was signed and is being implemented by the Ministry of Public Works and Housing (PUPR) for Treatment for Districts 6 and 1 in July 2019 and March 2020, respectively.



Source: "MUNDI No.81", June 2020, JICA

Figure 5.2.5 Current Status of Sewage in Jakarta (Domestic Wastewater Flowing into Rivers)

(e) Disaster Prevention

PUPR is the competent authority for flood control, and it implements flood control measures in river basins, mainly structural measures such as river rehabilitation, but also non-structural measures such as flood forecasting. The Indonesian government as a whole, including other ministries, is working to reduce flood risks by managing forests and agricultural land in river basins, acquiring assets, land use planning, building standards, and development planning regulations, as well as educating the public and providing early warning and emergency response.

JICA has supported the formulation of a master plan for flood countermeasures and support for the implementation of measures based on the master plan through financial assistance. In addition, JICA has also implemented technical cooperation projects focusing on operation and maintenance management at the field level, such as cooperation with relevant institutions in the basin and capacity building of river maintenance implementing agencies. In the future, a project on "Capacity Building for Flood Control Master Plan Development for Indonesian Disaster Prevention Advance Investment" is scheduled to be implemented.

- "Data collection survey of disaster risk reduction in Indonesia" (2019)
- "Project for Strengthening Disaster Prevention Information System" (2019): Grant aid for the development of disaster prevention information processing and communication system
- "Disaster Resilience Enhancement and Management Program Loan Phase 2"
- "Project for Promoting Countermeasures against Land Subsidence in Jakarta"

5.2.3 Urban Development Orientation based on New Neighborhood and Five Agenda

In the post-COVID era, the city needs to break away from the concentration of people in urban centers and chronic traffic congestion, restructure itself into a decentralized urban structure based on public transportation, and create autonomous neighborhoods and community-based living areas.

JABODETABEK is a megacity with a population of over 31 million, and the DKI Jakarta has a population equivalent to the 23 wards of Tokyo. TransJakarta (BRT) has an extensive network, while the MRT is limited to parts of the city center with a single north-south line, and the LRT has only partially opened, making the expansion of the mass transit network a medium- to the long-term goal. Furthermore, COVID-19 caused a sharp decline in demand for MRT, and demand has yet to recover even after social restrictions were eased.

While the restrictions on social activities due to COVID-19 have led to a demand for urban services in neighborhood sub-centers and living centers, Jakarta has not yet established such decentralized urban centers, and except for some shopping centers and parks, open spaces for leisure and recreation are still limited. The limited availability of open spaces for leisure and recreation, except for some shopping centers and parks, is also a challenge.

On the other hand, in Indonesia, traditional community and resident organizations such as RW/RTs have been functioning as the end of government and have been implementing various bottom-up social activities. In the corona response, the role of RW/RTs was also defined, and they played a major role in educating the public about infection prevention measures, establishing hand-washing facilities, and implementing isolation measures, in coordination with Kelurahan, the smallest administrative unit. In addition, compared to other developing cities, Jakarta has made progress in smart city and DX initiatives, and has an environment that provides easy access to infection information and awareness-raising activities for infection prevention.

During COVID-19 pandemic period, Jakarta observed the growing needs for various mobility options. BRT is exclusively used for essential workers during lock-down period. Bicycle use is spreading and bicycle paths are being developed in and outside of Jakarta.

Based on these challenges and potentials of Jakarta, the direction of Jakarta's urban development based on New Neighborhood and 5 agenda is as follows.

Development of New Neighborhoods: New Neighborhoods are defined as residential areas that can meet daily needs, such as living, working and recreation, have access to urban services such as medical care, education, entertainment, etc., a variety of mobility services, such as feeder services to MRT or LRT, sidewalks, and bicycle paths, and responsiveness in case of emergency. In order to formulate such neighborhood, urban management in each district should be strengthened by integrating the use of traditional communities and new technologies (DX, ICT, smart technologies, etc.).

Formation of decentralized urban structure connecting the urban hub: Sub-center or suburban hub of the JABODETABEK metropolitan area will be centered on MRT, LRT, and other stations. It requires business and commercial area development integrated with station area development and connectivity improvement with surrounding above-mentioned

neighborhood by providing a variety of mobilities such as buses, Angkot, and bicycle network. The linkages between these hubs will be strengthened by the mass rapid transit network of MRT, LRT, BRT, etc., which can realize a decentralized urban structure in the JABODETABEK metropolitan area.

Strengthening urban management capacity through inclusive and community participation: Kelurahan, the smallest administrative unit, is strongly connected to RW/RT, and these neighborhood associations and neighborhood associations are developing autonomous activities in many districts. Promote inclusive living environment improvement efforts not only in poor districts but also in each life base district to foster community, improve infrastructure, flood control, etc. Utilizing this administrative network of provinces, districts, towns, and local organizations (RT/RW), urban management and infrastructure management through the use of ICT, etc., will be promoted.

5.2.4 Proposals of Urban Development Program

Based on the above directions, the following urban development programs for post-pandemic are proposed:

(i) Development of a decentralized urban structure and neighborhood living areas: In DKI Jakarta, adverse effects of the existing conventional unipolar structure have been observed, such as the spread of infection due to the concentration of travel and reduced access to urban services and amenity facilities under lockdown to prevent the spread of COVID-19 infection. As the COVID-19 disaster continues, DKI Jakarta, like other cities, has seen an increase in telecommuting and greater use of online services, reiterating the need to create a distributed and coordinated urban structure. This calls for the formation of sub-centers in the metropolitan area and enhancement of the New Neighborhood to meet the needs for employment and recreational opportunities at the living area level.

(ii) Public Transport Service Improvement Program: The use of public transport, which declined rapidly at the onset of the spread of COVID-19, has not fully returned since, even when the outbreak was relatively contained, due to fears about the risk of spreading the disease. In order to maintain public transport services, infection-preventive measures must continue while promoting their use by providing safe mobility through information provision.

In order to support the above-mentioned decentralized urban structure, a hierarchical network of public transport and the expansion of public transport coverage areas with BRT and feeder services are required. Especially in the periphery of urban areas (surrounding municipalities), where adequate public transport services are not provided, the restructuring and improvement of public transport services are inevitable. Furthermore, efforts are also required to promote bicycle use, which is rapidly spreading, and to improve the walking environment.

(iii) Program for the development of an urban environment resistant to infectious diseases: DKI Jakarta has made progress in basic infrastructure and improved the quality of the living environment in line with economic growth, but flooding and other disasters continue to occur frequently, especially in poor urban areas. The changes in the COVID-19 agenda have led to greater demands for strengthening waste management systems, securing

open spaces, and establishing disaster prevention parks. In particular, infection prevention measures in collaboration with communities, such as RW/RT, or support for vulnerable groups, have been implemented during the pandemic, and the role of communities has been reaffirmed toward a resilient city, and the way of resilient city planning with resident participation and in collaboration with communities is required.

(iv) Promotion of DX: Indonesia has a high level of ICT literacy, partly due to its high economic level among the eight countries surveyed for this study. In the provision of public services, digitization had been in progress even before COVID-19, and after the pandemic, the need for decentralized provision of public services has become even more important. As for local government initiatives, the Jakarta Open Data Portal site has been established as part of DKI Jakarta's Smart City initiative, and the status of infrastructure is being collected online. In addition, a project (JakLingo) to build a platform for integrating information on public transportation (Commuter Line, MRT, LRT, TransJakarta) is underway, and further promotion of these efforts is required. On the other hand, there are many issues in the promotion of DX through the use of ICT, such as the lack of a database of base land information and the poor accuracy of collected data.

5.3 Formulation of JICA's Cooperation Project

The following cooperation projects are proposed to contribute to the realization of the urban development program and to promote the improvement of the urban environment in coordination with JICA's existing projects in urban transport and disaster management (MRT improvement, TOD capacity enhancement, disaster management capacity enhancement, etc.).

- Capacity Enhancement Project for Neighborhood Management in DKI Jakarta
- Buy The Service (BTS) Program
- Bus Terminal Management Improvement
- Reorganization of transportation network of surrounding municipalities in Jakarta metropolitan area
- Implementation of Low Emission Zone (LEZ)
- Dinas Perhubungan Big Data Management
- Grand Reform of Public Transport (Contract)

5.3.1 Capacity Enhancement Project for Neighborhood Management in DKI Jakarta

1) Need for Independent Neighborhoods

With the social restrictions and telecommuting recommendations during the pandemic, it became clear that JABODETABEK is vulnerable to a unipolar urban structure, with all functions concentrated in the CBD and very limited access to socio-economic services and amenities in the periphery of the DKI and surrounding municipalities. Even before the expansion of COVID-19, there were adverse effects of the unipolar urban structure, such as traffic congestion, etc. However, the need to shift from a unipolar to a multipolar decentralized urban structure and the enhancement of the New Neighborhoods that comprise it have been more strongly recognized in the post-pandemic.

The concept of a "walkable city" has been introduced by Melbourne as a 20-minute city and Paris as a 15-minute city, and DKI Jakarta has similarly recognized the need to ensure a living environment at the neighborhood level for the post-COVID-19. The Planning Department (BAPPEDA) of DKI Jakarta has set the realization of a "Self-sufficient Neighborhood" as one of the goals in its RTRW "Jakarta Spatial Plan 2040" for approval in 2022. The plan calls for more than 70% of the total population to be concentrated within a radius of 700 m from public transportation stations and bus stops, and for each walking and biking area (Neighborhood) to include (i) a communications and digital hub, (ii) public spaces, (iii) transportation and residential areas, (iv) medical facilities, (v) commercial facilities, (vi) basic infrastructure (water, sewage, waste, electricity, gas), (vii) educational facilities, (viii) disaster prevention systems, and (ix) administrative facilities and public services.

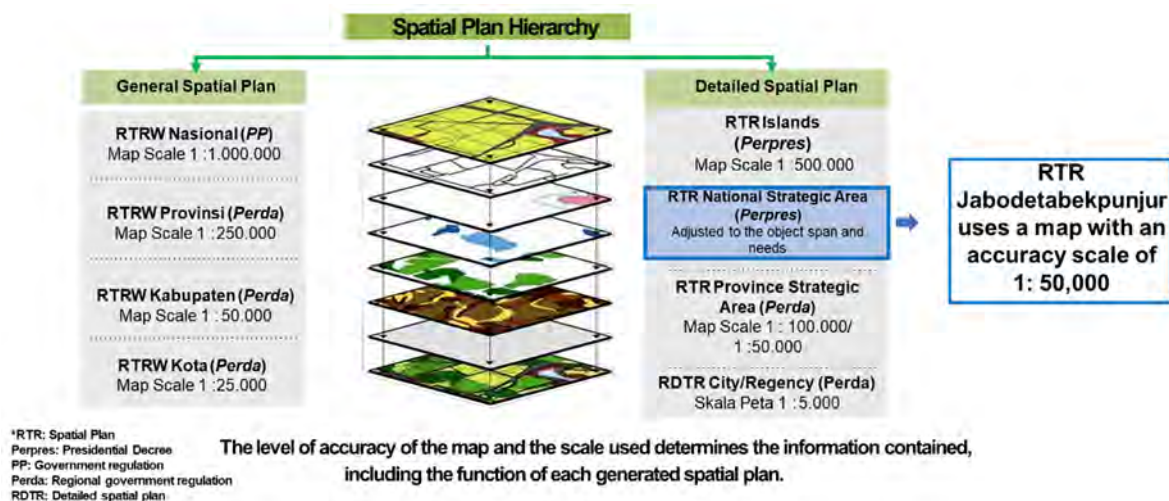
2) Urban Management Structure for Planning and Implementation in DKI Jakarta

Local Administration of Jakarta Urban Area: JABODETABEK consists of DKI Jakarta, five cities of Bekasi, Bogor, Depok, Tangerang, and Tangerang Selatan (Kota), and three provinces of Bekasi, Bogor, and Tangerang (Kabupaten), and the surrounding municipalities of Bekasi,

Bogor, and Tangerang. Comprehensive development plans, as well as urban spatial and sectoral development plans, are formulated by each municipality (DKI Jakarta and the surrounding Kota and Kabupaten), and no comprehensive plan for the entire metropolitan area has been formulated.

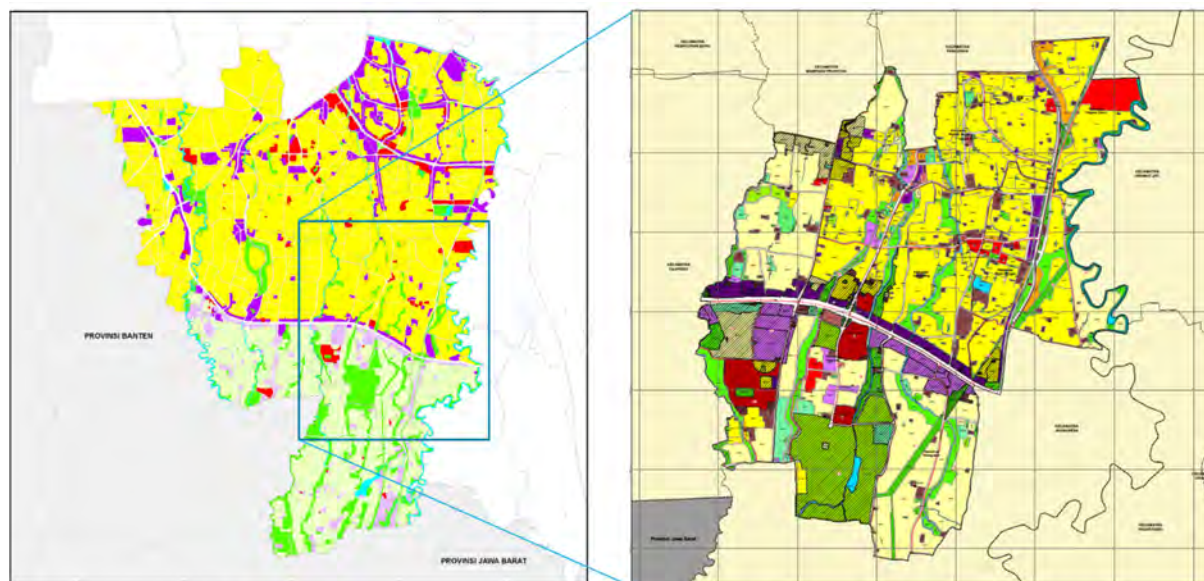
Within DKI Jakarta, there are five municipalities (Kota) as subordinate administrative units, under which there are counties (Kecamatan) and towns (Kelurahan). Kota within DKI Jakarta does not have an autonomous function and is positioned differently from surrounding Kota in terms of local autonomy.

Planning Framework: In DKI Jakarta, the Planning Department (BAPPEDA) prepares the Jakarta-wide long-term development plan (RPJPD), the medium-term development plan (RPJMD), spatial plan (RTRW), etc., based on which each department (Dinas) develops sector-specific plans. For example, the Department of Human Settlements, Planning and Land (Dinas Citata) prepares the detailed spatial plan (RDTR), which defines zoning regulations and the spatial layout of basic infrastructures, such as roads, water supply, etc. RTRW is prepared in units of Kota and RDTR in units of Kecamatan, respectively. The RDTRs are prepared in units of Kota and Kecamatan, respectively.



Source: ATR/BPN

Figure 5.3.1 RTRW and RDTR in Spacial Plan Hierarchy



**RTRW (Spatial Plan) by Kota
formulated by BAPPEDA**

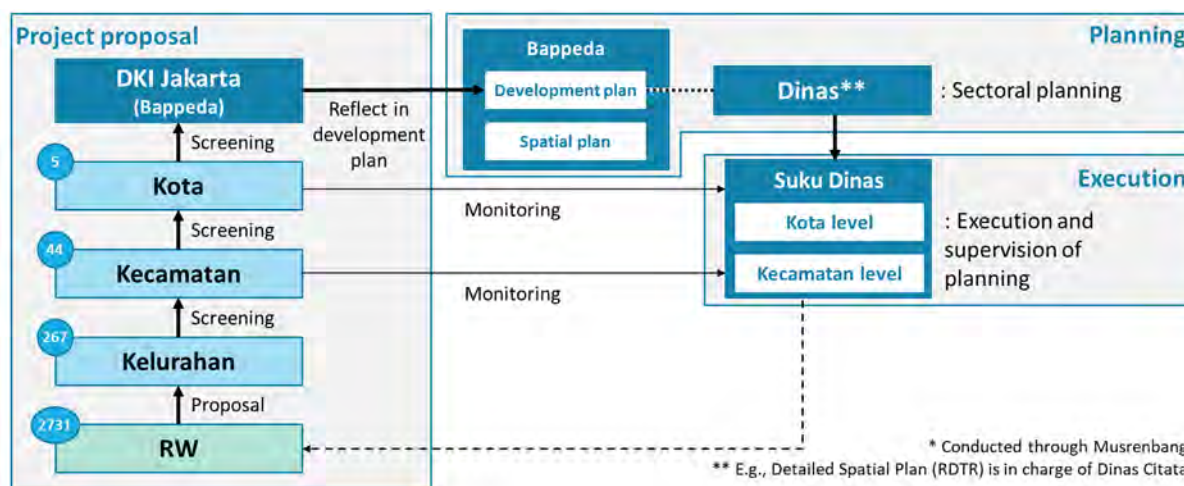
**RDTR (Detailed Spatial Plan) by Kecamatan
formulated by Dinas Citata**

Source: Bappeda, Dinas Citata

Figure 5.3.2 Examples of RTRW and RDTR

The comprehensive development plan of DKI Jakarta, formulated by BAPPEDA, has a mechanism called Musurenbang, in which improvements and project ideas suggested by the resident community (RW) are reflected in the plan. Musurenbang refers to the process of narrowing down priority projects at the Kelurahan, Kecamatan, Kota, and provincial levels with the involvement of the RWs. The ideas finally brought to the provincial level are reflected in the development plan. Based on this development plan, BAPPEDA prepares a spatial plan (RTRW), and Dinas Citata prepares a detailed spatial plan (RDTR).

Sector-specific planning is the responsibility of Suku Dina, an agency out of DKI Jakarta's Department (Dinas). For example, urban management based on detailed spatial planning, especially the development permit process, is handled by Suku Dinas Citata, an agency out of Dinas Citata. The Suku Dinas Citata exists at the Kota and Kecamatan levels, especially at the Kecamatan level. Suku Dinas Citata is responsible for monitoring the use of space and buildings, particularly in residential areas at the Kecamatan level and non-residential areas at the Kota level. Government offices in Kecamatan and Kota will also monitor the current situation and report back to Suku Dinas Citata sequentially.



Source: JICA Study Team

Figure 5.3.3 Planning Mechanism of Spatial Plan of DKI Jakarta

Thus, Jakarta has a system in place that utilizes traditionally formed community organizations to absorb projects from the bottom up and reflect them in the overall plan. In recent years, a system called E-Musrenbang has also been introduced to collect residents' opinions directly using ICT. It has great potential to realize the new neighborhood proposed in this study or the Self-Sufficient Neighborhood proposed in the spatial plan. On the other hand, the following issues need to be addressed to realize the living environment of each new neighborhood.

- **Realization of Self-Sufficient Neighborhood in Spatial Plan:** Within the urban management administration structure described above, no method has been defined to ensure consistency with the self-sufficient neighborhood concept. In addition, at this stage, the criteria for narrowing down priority projects in Musrenbang are unclear, and the selection process has not been established based on the issues of each district and Neighborhood. The process needs to be reviewed to ensure that it is reflected in project selection and included in development plans, spatial plans, and detailed spatial plans.
- **Ensuring implementation of sectoral and spatial plans:** Ensuring implementation of sectoral plans is essential to realizing self-sufficient neighborhoods. Suku Dinas are responsible for plan implementation, coordination with Kota and Kecamatan is essential, and capacity building of these institutions is required.
- **Implementation of the plan by Kota:** In 2022, a DKI Jakarta Governor's Decree will be issued, delegating some authority for plan implementation to the Kota level. In order to ensure the implementation of the plan, it is necessary to strengthen the capacity of the Kota level.

Based on these considerations, a technical cooperation project is proposed to improve Urban Management in DKI Jakarta. This project will lead to a new way of supporting urban management in metropolitan areas.

3) Project Outline

Project Name: Capacity Enhancement Project for Neighborhood Management in DKI Jakarta

Objectives:

- To improve urban management capacity for local development planning and implementation in DKI Jakarta
- To improve urban development project management capacity based on the "self-sufficient neighborhood concept" at the Kota level
- To improve project prioritization capacity based on the "self-sufficient neighborhood concept" at the Kecamatan level

Target Area: DKI Jakarta (Pilot Kota, Pilot Kecamatan)

Counterpart: BAPPEDA, Kota and Kecamatan officers of DKI Jakarta

Project Scope:

- Review status of DKI Jakarta's Neighborhood: Infrastructure development status, public facilities layout, and access to public services
- Review of DKI Jakarta's Urban Management System: Understanding the division of roles in planning, project selection, project implementation, and monitoring between DKI Jakarta and each department, Kota, Kecamatan, and Kelurahan
- Proposal for a self-sufficient neighborhood management program
- Implementation of a pilot project in Kota/Kecamatan
 - (i) Conduct participatory workshops in Kecamatan
 - (ii) Implementation of project selection and project implementation monitoring in collaboration with each Suku Dinas for comprehensive development at the Kota level
- Establishment of a self-sufficient neighborhood management program

(1) Project No.	(2) Country/City	(3) Sector		
JKT-01	Indonesia/ DKI Jakarta	Urban development and social development		
(4) Project Name				
Capacity Enhancement Project for Neighborhood Management in DKI Jakarta				
(5) Counterpart Agency		(6) Relevant Agency		
DKI Jakarta/ local government		ATR/BPN, BAPPENAS, PUPR, local government (Kerulahan), RT/RW, community organizations		
(7) Project Scheme/ Budgeting sources		(8) Project Period		
Technical Assistance/ JICA		2022–2024		
		Emergency	Short-term	Mid- long
			○	
(9) Background (including relevance to CUREIP Output)				
<p>In Jakarta , as a mega city, many economic activities and development activities accumulated in the CBD, and traffic congestion has worsened, especially in the city center.</p> <p>The pandemic revealed that urban infrastructure and services were fragile except for the CBD, and many citizens faced difficulties accessing socio-economic services and urban amenities in their neighborhoods.</p> <p>After the pandemic, it would be expected to shift the urban structure from a mono-centralized city to a multipolar decentralized and connected city with universal access to urban services. Walkable city concepts such as “the 20-minute neighborhood” of Melbourne in Australia and the “15-minute city” of Paris in France are popular as a new urban concept after the pandemic.</p> <p>In Indonesia, traditionally, slum upgrading and Kampung improvement programs have been implemented by governments and donors. These efforts were reflected in the infrastructure development of certain areas and housing policies but not in the urban planning system. At present, informal settlements, as well as residential areas, must tackle the pandemic and be resilient and independent to infectious diseases and emergencies. For this, central and local governments are now interested in applying “Performance-based planning” to customize land use planning to meet a performance standard in the “Special Zoning District.”</p> <p>While urban infrastructure and public services are limited in Jakarta, there is potential for the development of neighborhood units in each decentralized city, such as activities of RT/RW (local community organizations) and the application of ICT services, to promote a neighborhood planning approach in Jakarta.</p> <ul style="list-style-type: none"> For this, “neighborhood unit development planning” will be introduced and applied to fulfill standards of urban facilities and services within walking distance of each residential unit and establish a bottom-up and systematic planning system in Jakarta. 				
(10) Project Outline				
Objectives	Establishment of Neighborhood Unit development planning system for decentralized, connected and resilient city			
Project Location	DKI Jakarta			
Type of Project	<input type="checkbox"/> Construction <input type="radio"/> Technical Assistance <input type="checkbox"/> Basic Survey <input type="checkbox"/> Operation and Maintenance			
Scope of Project	<p><Output1> Establishment of neighborhood unit planning system</p> <ul style="list-style-type: none"> Review the existing urban planning system and infrastructure development plan at the district/ Kelurahan level Review the existing condition of urban infrastructure, public facilities, road network, etc. Assess satisfaction of accessibility to urban services for communities Formulate “Neighborhood Unit Development Planning (NUDP) Guidelines” <p><Output2> Capacity development of local governments and communities through pilot projects</p> <ul style="list-style-type: none"> Identify the size and location of the neighborhood unit with the potential to be a sub-center and other criteria <p>Analysis of the existing conditions (including stakeholder analysis, review of existing and future plans, location and conditions of existing public infrastructure and facilities, etc.)</p> <p>Assessment of public infrastructure and facility condition and establish a database</p>			

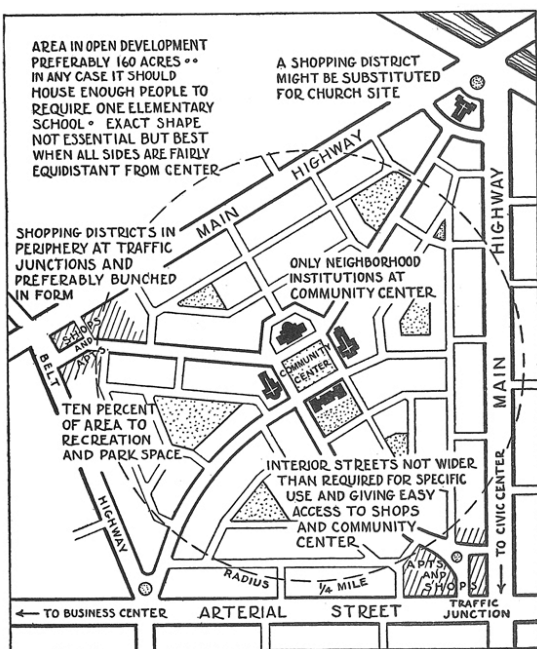
	<p>(infrastructure, housing, public service, transport, amenity, health care, disaster management, etc.)</p> <ul style="list-style-type: none"> Conduct a community meeting to assess the living environment Conduct pilot projects with community initiatives (c.f. community park with disaster preparedness facilities) <p><Output3> Institutional arrangement for NUDP</p> <ul style="list-style-type: none"> Review past and present policies, programs and plans for community development, slum upgrading, microfinance system, etc. Assess capacities of local governments, RT/RW, and other local organizations Establish an urban management system to connect urban services and establish an ICT network of local governments Identify major NUDPs to be sub-centers of Jakarta/ JABODETABEK and designate the Special Zoning District in the land use plan (spatial plan) to prioritize infrastructure development and urban development activities Standardize NUDP as an urban planning and community development system
Project Cost (estimated)	
Implementation Period	3 years

(11) Outcome and Impact	
Expected outcome	<p>Neighborhood Unit Development plans and guideline</p> <p>Database of neighborhood units</p> <p>Lessons learned from pilot projects</p> <p>Start-up businesses</p>
Beneficiaries	<p>DKI Jakarta (spatial plan agency, transport agency, smart city management unit, etc.)</p> <p>Local governments</p> <p>Community organizations</p>
Environmental and Social Impact	

(12) Necessary Input from Counterpart

(13) Relevant Projects

(14) Remarks (map, etc.)



Concept of "The 20 minute Neighborhood" of Melbourne

Original Concept of Neighborhood Unit

Table 5.3.1 Neighborhood Management Program (draft)

Category	Objective	Main Policy Action
Strengthening of New Neighborhood Management	To share New Neighborhood concept among relevant organizations	<ul style="list-style-type: none"> • A new neighborhood concept for DKI Jakarta is formulated (necessary urban services, basic infrastructure, amenities, etc.). • Role-sharing among central-Kota-District-Kelurahan-Community (RT/RW) is defined • The new neighborhood concept is formulated in several Pilot Kelurahan in Pilot Kota at the sub-center of DKI Jakarta through a community participation approach with RW/RT
	To establish ICT-based urban management system	<ul style="list-style-type: none"> • Priority projects in Pilot Kota are selected by utilizing Jakarta Open Data
Basic infrastructure development/improvement	To ensure accessibility to basic infrastructure for each New Neighborhood unit	<ul style="list-style-type: none"> • A prioritized infrastructure development program is selected based on the condition of Pilot Kota's infrastructure development. • Basic infrastructure improvement projects are selected and implemented. • Infrastructure maintenance program is formulated by RW/RT.
Resilience to disasters	To reduce/ mitigate damage in flood-prone areas	<ul style="list-style-type: none"> • Flood-prone areas are mapped in Pilot Kota. • Pilot Kelurahan are selected. • Community-based flood countermeasure projects are formulated by residents' organizations (RW/RTs) at the selected Kelurahan. • The projects are implemented with community initiatives.
Enhancement of urban services	To ensure access to various urban facilities and services within new neighborhood units	<ul style="list-style-type: none"> • Pilot Kota's urban service facilities are mapped. • A priority maintenance program is formulated for urban service facilities that do not meet the criteria. • Selected projects are implemented.
Mobility improvement	To ensure short-distance and various mobility services within districts	<ul style="list-style-type: none"> • In Pilot Kota, a public transport network plan is formulated for Pilot Kota, including feeder transport (bus, Angkot, motorcycle cabs, etc.) and mass transit (MRT, BRT, LRT, etc.) • Bicycle network plans for Pilot Kotas are formulated. • Pedestrian environment improvement programs for Pilot Kelurahan are formulated and implemented
Public space improvement	To ensure public spaces for each new neighborhood unit	<ul style="list-style-type: none"> • Urban public spaces (parks, open spaces, streets) in Pilot Kota are mapped. • Urban public space development and utilization programs in Pilot Kotas are formulated. • Urban public space development and utilization programs for Pilot Kelurahan are formulated through a public participation approach.

Source: JICA Study Team

5.3.2 Transport System Improvement Program

1) Needs in the Public Transport Sector in Each Local Government

The needs for public transport that are unique in each local government in Jakarta metropolitan area are summarized below.

(1) DKI Jakarta

In DKI Jakarta, various regulations have been applied as countermeasures to the COVID-19 pandemic. Although the problems related to traffic congestion and air pollution have temporarily decreased, the traffic volume is now increasing recently, and public transport usage is becoming less as a result of the pandemic. There is a remarkable increase in the traffic volume of private vehicles such as cars and motorcycles. Therefore, improving the mobility of citizens by improving public transport is highly needed. In addition, DKI Jakarta aims to develop mass transit such as MRT and LRT, as well as develop three integrations of the network, fare collection system, and schedule. As a result, PT. JakLingko Indonesia is established as a solution for integrating the fare collection system (ticketing), while PT. Transportasi Jakarta (Transjakarta) is proceeding with the network and schedule integration by switching from the existing Angkot to a better feeder service. Regarding the integration of networks and schedules, it is expected that the public transport data center, which has been established in 2021, will be useful for the integration. The details related to the public transport data center will be described later.

(2) Kota Bekasi

The population density of Kota Bekasi in the Jakarta metropolitan area is the second highest after DKI Jakarta, while wider roads are fewer than in DKI Jakarta. In addition, traffic congestion in Kota Bekasi is also a serious problem. Therefore, several toll roads are being developed, the Bekasi line of the commuter line has been improved to become a double-doubled track, and the Ministry of Transportation is also constructing an LRT line. Both mass transit lines run east to west, and Kota Bekasi focuses on improving the feeder transport and strengthening the transit nodes, mainly in the north-south direction. The feeder transport lines will connect mass transit stations such as the LRT and the commuter line. One is Transpatriot, a corridor that started full operations in January 2019 with a flat fare of IDR4,000. Then, two additional corridors operated since November 2019 with two types of fares, namely minimum and maximum fares, depending on the distance. However, due to the decrease in demand caused by the COVID-19 pandemic, these additional two corridors are currently out of service.

(3) Kota Bogor

In Kota Bogor, many Angkot vehicles stop on the roadside to wait for customers, reducing the road capacity and causing traffic congestion. Using Angkot, which involves cash payments and crowding of passengers on board, is avoided during the pandemic. The declining demand for passengers and the oversupply of Angkot services combined worsen the condition. Therefore, Kota Bogor is working to reduce the number of Angkot vehicles, enlarge the vehicle size, and rationalize routes to achieve certain results.

The BRT line at Kota Bogor, namely Transpakuan, has been operating since 2006 by a public

corporation (BUMD) from Bubulak Bus Terminal and Aeon Sentul City Mall. Transpakuan has no dedicated lanes but has shelters. A Transpakuan ticket since its opening has been a flat fare of IDR1,500, which was affordable until 2016 when operations stopped due to poor management of BUMD and the absence of subsidy from Kota Bogor. Without subsidy, the ticket increased to IDR6,000 from 2016–2021. Starting in 2021, BPTJ took over under the BTS Program with a free fare applied.

(4) Kota Depok

In Kota Depok, there is no feeder transport from residential areas or areas outside the city center. Residents prefer to use online motorcycle taxis to commute within the city and to access the commuter line station that runs north to south. Although large-scale apartments and commercial facilities are being developed massively in the city, public transport is insufficiently developed to accommodate trips generated by buildings along Margonda Raya Road. As a result, private transport, such as cars and motorcycles, is preferable. The only Transjakarta BRT bus line – D11 (Depok Baru Bus Terminal - BKN Cawang) is suspended due to low passengers during the pandemic.

(5) Kota Tangerang

Tangerang line of the Commuterline connects DKI Jakarta from city center of Tangerang. In reality, commuters should deal with traffic congestion when reaching mass transit stations even if they use existing public transport such as Angkot. Thus, most residents prefer using private transport such as cars and motorcycles to go to Jakarta directly, exacerbating traffic congestion. Therefore, public transport services, such as feeder transport from mass transit stations to around Kota Tangerang, should be provided.

Kota Tangerang has implemented Angkot conversion to a larger vehicle to improve public transport services, namely BRT TAYO (Tangerang Ayo), since 2017 by using Regional Budget. BRT Tayo is popular among citizens as it is a comfortable and reliable transport with a flat fare of Rp. 2.000. The local government intends to develop routes extension of BRT TAYO, but the project has not started yet due to budget limitations. In addition, there are also plans to install GPS for operation management and establish a data center, but procurement has been delayed.

(6) Kota Tangerang Selatan

Serpong line of the Commuterline is the only mass transit line within Kota Tangerang Selatan. Provision of feeder transport to five stations of Pondok Ranji, Jurangmangu, Sudimara, Rawa Buntu, and Serpong is the main challenge for public transport improvement within the city. Bad pedestrian access to these stations makes the situation worsen, only Jurangmangu has better pedestrian facilities. Existing Angkot at Kota Tangerang Selatan mostly provide short routes, while the distance from each station of Serpong line quite far from the residential area. As a result, commuters prefer to use online transport service and it lead to low passenger demand of Angkot. According to the Transportation Agency, about 70% of Angkot users have shifted to online motorcycles due to COVID-19 pandemic.

(7) Kabupaten Bogor

The Bogor commuterline within Kabupaten Bogor runs north to south. Three stations (Cibinong, Nambo, and Bojong Gede) and bus terminals are within this area. Currently,

residents prefer private transport, such as cars, motorcycles, and Angkot, in this limited area. The increasing volume of private vehicles and the number of bottlenecks have led to traffic congestion. Reflecting on this situation, it is important to provide sufficient public transport that accommodates Kabupaten Bogor.

(8) Kabupaten Tangerang

Serpong commuterline is in the southern part of Kabupaten Tangerang, and this is the only mass transit to DKI Jakarta. The access to stations is limited only to online transport services and Angkot. Commuters, who do not live in the south area, have no reliable public transport to reach transit stations. In the future, the MRT East–West Line is planned to be developed until Balaraja, but the development of feeder transport that connects to the mass transit is an important issue that urgently needs to be solved.

(9) Kabupaten Bekasi

Employee buses and online transport services are considered important transport modes at Kabupaten Bekasi. Angkot, with uncertain ticket fares, is chosen by passengers as the last option to commute within the city. For those using the commuterline and stopping at Cikarang Station, it takes one hour from the station to the industrial area. They will not choose Angkot since it does not provide comfort and punctual services. As a result, people prefer to use a motorcycle or other reliable transport mode even if it charges a higher price.

2) Project Proposals

Considering MRT and LRT construction projects in the future, it is necessary to expand the public transport network in DKI Jakarta and surrounding municipalities with good management, including data integration and bus terminal improvement projects for short-term development. Based on the result of interview with relevant organizations, the following six projects are proposed as a public transport system improvement program.

(1) Reorganization of Public Transportation in DKI Jakarta and Surrounding Municipalities

Many mass transits in the Jakarta metropolitan area, such as BRT, MRT and LRT, are all within DKI Jakarta. Commuters from surrounding municipalities (*Kota/Kabupaten*) go to DKI Jakarta to take public transport as an option. First and last transfer point before reaching mass transit locations are located near DKI Jakarta boundary. However, when reaching these transit centers, passengers will meet traffic congestion. In fact, there are 49 million trips per day in Jakarta metropolitan area that generated each day and 20 million trips come from the surrounding municipalities to DKI Jakarta. In JUTPI Phase 2, the project was about improving the Jakarta metropolitan area public transport network, including MRT network development. In the short- and medium-term, mass transit is expected will continue to be developed within DKI Jakarta. Therefore, it is necessary for the surrounding local government to improve the structure of the public transport network so trunk feeder transport will have a direct connection to the transit centers. In addition, it is also important to strengthen the transport connectivity at each transit center.

Regarding reorganization of the public transport in DKI Jakarta and surrounding municipalities, although the comprehensive transport data, including origin-destination (OD) data of the Jakarta metropolitan area, has been updated in JUTPI Phase 2, locations of

bottlenecks from each municipality to DKI Jakarta have not got any deeper studies to improve the situation. Detailing the hierarchical public transport system based on trunk and branch feeder lines is necessary to improve the service of feeder transport to mass transit in DKI Jakarta. Thus, this reorganization is proposed to develop each local government to have efficient and optimal public transport.

In the surrounding municipalities of the Jakarta Metropolitan Area, there are many problems in the Angkot system, such as overlapping routes, routes not been updated since the 1990s (which do not represent the current demand of passengers), and low-demand routes. Recently, BRT has been introduced in other cities in Indonesia, such as DKI Jakarta, Solo, and Semarang. According to some local governments, they do not have updated transport data like OD data to reorganize public transport routes. It may be because of transport database of the Jakarta metropolitan area from JUTPI Phase 2 is not fully utilized by them. Therefore, it is important to review the public transport plan at each Kota/Kabupaten and update the project to be included in the next five years' plan of each municipality, including following the most updated RPJMN (Rencana Pembangunan Jangka Menengah Nasional/National Mid-Term Development Plan) (currently 2020–2024).

(1) Project No.	(2) Country/City	(3) Sector		
JKT-01	Indonesia/ JABODETABEK	Urban Transport		
(4) Project Name				
Improvement of Public Transport Mobility and Connectivity in Surrounding Municipalities				
(5) Counterpart Agency		(6) Relevant Agency		
BPTJ		CMEA, Transportation Agency of DKI Jakarta, Transportation Agency of each Kota/Kabupaten, PT. Jaklingko Indonesia		
(7) Project Scheme/ Budgeting sources		(8) Project Period	Emergency	Short-term
Technical Assistance/ JICA		2023–2026		○
(9) Background				
<p>Mass transits in the Jabodetabek, such as BRT, MRT and LRT, are currently developed within DKI Jakarta. Commuters from surrounding municipalities (Kota/Kabupaten) go to DKI Jakarta to take public transport as an option. First and last transfer points before reaching mass transit locations are near the DKI Jakarta boundary. When reaching these transit centers, passengers will meet traffic congestion. In fact, according to BPTJ in 2018, 49 million trips per day in Jabodetabek are generated each day, and 20 million come from the surrounding municipalities to DKI Jakarta. In JUTPI 2 short- and medium-term development plan, the mass transit project is expected will continue to develop within DKI Jakarta. Public transport connectivity for the surrounding municipalities should be improved to connect feeder transport with transit centers in the boundary within DKI Jakarta.</p> <p>In the surrounding municipalities of the Jakarta Metropolitan Area, there are many problems in the Angkot system, such as overlapping routes, routes not been updated since the 1990s (which do not represent the current demand of passengers), and low-demand routes. As a result, Angkot, which is the main mode of feeder transport in the surrounding municipalities of DKI Jakarta, has been unreliable due to its characteristics. According to some local governments, they do not have updated transport data, such as the OD data, to reorganize the public transport (Angkot) route. It may be because of transport database of Jabodetabek from JUTPI Phase 2 is not fully utilized by them.</p> <p>DKI Jakarta aims to develop three integrations of a network, fare collection system, and schedule. Then, PT. JakLingko Indonesia is established as a solution for integrating the fare collection system). In order to support a seamless transport project that was promoted by BPTJ, it is necessary to restructure the local transport network as trunk and branch feeder lines. Additionally, to support mobility and connectivity in their living neighborhood, it is important to ensure good access to the transfer nodes from the surrounding areas, especially to the transit centers. Thus, implementing a barrier-free system to support good connectivity is also important.</p>				

(10) Project Outline	
Objectives	To develop an integrated trunk and branch feeder lines with mass transit network in surrounding municipalities of DKI Jakarta
Project Location	Jabodetabek
Type of Project	<input type="checkbox"/> Construction <input type="checkbox"/> Technical Assistance <input type="checkbox"/> Basic Survey <input type="checkbox"/> Operation and Maintenance
Scope of Project	<ul style="list-style-type: none"> Review the existing short and medium-term transport network plan as well as public transport data policy. Consider and implement supplementary transport surveys based on the current status of transport data within each local government. Improve the transit nodes in terms of service and capacity. Propose a hierarchical public transport network system by distinguishing the trunk and branch feeder lines based on the passenger demand of each local government. Examine and evaluate the optimal traffic management to give priority of the trunk feeder transport.
Project Cost (estimated)	
Implementation Period	3 years
(11) Outcome and Impact	
Expected outcome	<ul style="list-style-type: none"> Achieve a hierarchical public transport system in the trunk and branch feeder lines that are affordable, integrated, efficient, and optimal. Improve mobility and connectivity of public transport within DKI Jakarta and surrounding municipalities.
Beneficiaries	<ul style="list-style-type: none"> BPTJ Local Transport Agencies Transport operators Communities Transport users
Environmental and Social Impact	<ul style="list-style-type: none"> Affordable, Integrated, efficient, and optimal public transport network in the Kota/Kabupaten Increase of public transport mode share and decrease of private trips within Kota/Kabupaten
(12) Necessary Input from Counterpart	
Current condition of public transportation service and future plan	
(13) Relevant Projects	

(14) Remarks (map, etc.)

- Local public transportation services, which currently function as first/last miles in suburban areas, are still dominated by angkot services. The management of Angkot services is still done individually and conventionally. In the current pandemic, the number of passengers for angkot is highly reduced since it is considered less safe and risky for the spread of COVID-19.
 - a. Transactions still use paper money
 - b. Small vehicle space makes it difficult to keep distance between passengers
 - c. Lack of supervision of health protocols
 - d. There is no standard of cleanliness because the management is still individual.

Restructuring and improvement of services, as well as the management of local public transport as a feeder network, can increase users' confidence in the safety and security of traveling.

- To support the restructuring of feeder services, a transit center is needed to be integrated with the main transportation services. Some of the potential locations have the area to build as a transit center, but many will need a land acquisition to get the proper area.
- In the Jakarta area, several Transjakarta bus stops located near the border areas have the potential to become transit centers to improve services and passengers from outside Jakarta.
 - a. Halte Pinang Ranti in East Jakarta
 - b. Halte Ragunan in South Jakarta
 - c. Halte Lebak Bulus in South Jakarta
 - d. Halte Kalideres in West Jakarta
 - e. Halte CBD Ciledug in Ciledug, Tangerang

Pinang Ranti bus stop is the last stop on corridor 9 in East Jakarta, which borders Bekasi. There is already a terminal beside the bus stop but not optimally used. It can be used as a transit center.

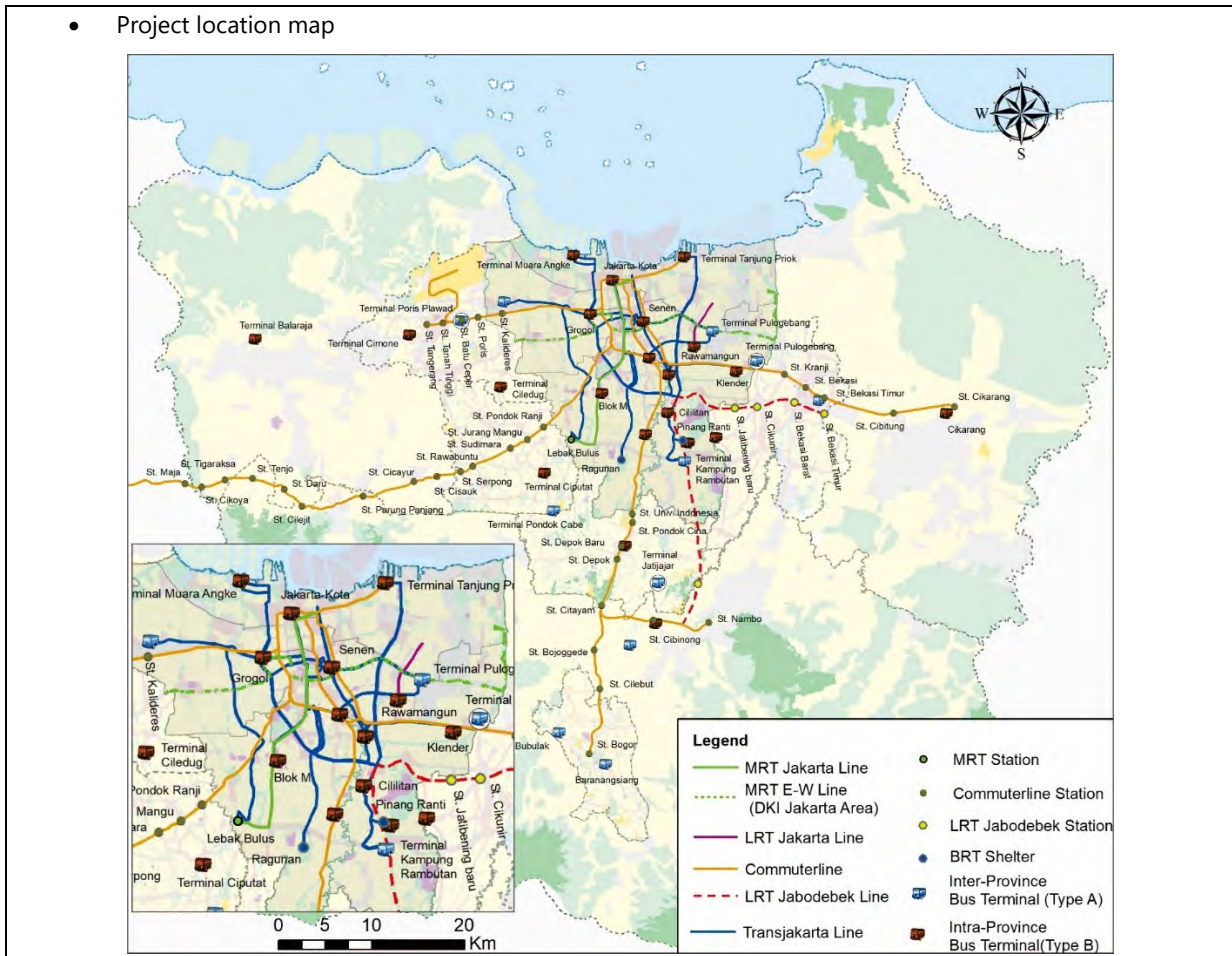
- In Bekasi, several commuter line stations can potentially become transit centers, such as:
 - a. Cakung Station
 - b. Kranji Station
 - c. Bekasi Station
- In addition, there is a Jabodebek LRT station that will operate next year which is located at a strategic point in the Bekasi area. This station is built elevated that that will have the possibility to develop a transit center below the station. the LRT Jabodebek is located in
 - a. Jatibening Station
 - b. Cikunir Station 1
 - c. Bekasi Barat Station
 - d. Bekasi Timur Station

LRT Jabodebek station is planned to operate next year. LRT Jatibening Station is elevated, so there may be space under the station.

- In the Depok area & Bogor district, commuter line stations can potentially become transit centers to facilitate the integration with feeder network services such as:
 - a. Pondok Cina Station
 - b. Depok Station
 - c. Citayam Station
 - d. Bojong Gede Station
 - e. Cilebut Station

Commuter stations that are currently operating, such as the Pondok Cina station in Depok, are located in the satellite cities. As for Pondok Cina, it will need land acquisition.
- In addition, there is also Harjamukti Station, which is the LRT Jabodebek Station located within the boundaries of Jakarta, Depok, and Kabupaten Bogor.
- In Tangerang, the commuter line stations that have the potential to become transit centers are:
 - a. Kalideres station
 - b. Poris Station
 - c. Ceper Stone Station
 - d. Tangerang Station

- Project location map



(2) Promoting the Buy the Service Program (Ensuring the Minimum Service Standard of Public Transport)

BTS is a program of Angkot shifting to larger vehicles to improve service under BPTJ with a subsidy from the National Budget for three years. Within the program, operators of Angkot will have a contract for public transport operators with the local government (service paid by the local government based on rupiah/kilometers). Within the BTS program, the local government will be responsible for providing service standards for public transport, and the contract contains service concessions to operators. There are concerns from passengers about using Angkot, which are payment is only received in cash, the uncapacious vehicle makes passengers stay close on board, and hygiene protocols do not meet the standard. As a result, decreased demand for passengers to use Angkot was remarkable during the COVID-19 pandemic. Therefore, this project aims to restore the public’s trust by providing safe and secure public transport services that meet minimum service standards and eventually restore the public transport mode share.

In DKI Jakarta, introducing the BRT system (Transjakarta) and converting Angkot and buses to MicroTrans and MetroTrans as feeder transport have been conducted earlier than in other cities in Jakarta Metropolitan Area. However, similar programs were not implemented well in the surrounding municipalities, and various issues have occurred. Under the guidance of BPTJ, BTS in Kota Bogor has been conducted since October 2021, and a free fare is applied from the national subsidy for a limited period. It is unclear whether a certain number of passengers

can be secured when there is a charge for the ticket fare in the future. Until now, the implementation of BTS has not been evaluated yet. In other municipalities, there are high hurdles to introducing the BTS program to receive assistance from BPTJ. Some criteria are applied, such as the routes should meet a certain level of occupancy, etc. In addition, some local governments are uncertain about how to start BTS and the required facilities. Thus, in responding to issues related to public transport operation and service of each municipality, having practical knowledge of public transport service optimization and BTS in each municipality regarding experiences with BTS implementation in DKI Jakarta and other cities in Indonesia is essential. In addition, examination about which type of contract that suitable with public transport operator is necessary.

DKI Jakarta has been BTS since 2006, while BTS in Kota Bogor is being implemented under BPTJ's assistance. Kota Tangerang and Kota Bekasi are also implementing BTS independently with the local budget. These two local governments are applying for BPTJ's BTS program but would like to review and evaluate the implementation of BTS in their authorities to consider a better BTS implementation in the future. In addition, local governments that have not implemented BTS are also motivated, but with certain considerations such as which route is appropriate, occupancy rate that meets the BPTJ's standard, candidates of transport operators for bidding, etc. Thus, a feasibility study of BTS is highly recommended.

(1) Project No.	(2) Country/City	(3) Sector		
JKT-02	Indonesia/ JABODETABEK	Urban transportation		
(4) Project Name				
Promoting the Buy the Service (Ensuring the Minimum Service Standard of Public Transport)				
(5) Counterpart Agency		(6) Relevant Agency		
BPTJ		CMEA, Local Government in Jabodetabek, Transport Operators		
(7) Project Scheme/ Budgeting sources		(8) Project Period		
Technical Assistance/ JICA		2023-2026		
		Emergency	Short-term	Mid- long
			○	
(9) Background (including relevance to Output)				
<p>BTS is a program of Angkot shifting to larger vehicles to improve service under BPTJ with a subsidy from the National Budget for three years. Within the program, operators of Angkot will have a contract for public transport operators with the local government (service paid by the local government based on rupiah/kilometers). Within the BTS program, the local government will be responsible for providing service standards for public transport, and the contract contains service concessions to operators.</p> <p>BTS was initially conducted in 5 big cities in Indonesia (Palembang, Surakarta, Medan, Yogyakarta, and Denpasar). In the scope of Jabodetabek, Kota Bogor is the first city for the pilot project before applying to other cities in Jabodetabek. Angkot is converted by the ratio of 3:1 so that three angkot will be replaced by a bus. It is planned, that at the end of the project, 147 units of angkot will be converted to 49 minibusses in 4 corridors. This service is provided by BPTJ named Bus Kita Trans Pakuan. BTS in Kota Bogor has been conducted since October 2021, and a free fare is applied from the national subsidy for a limited period. It is unclear whether a certain number of passengers can be secured when there is a charge for the ticket fare in the future. Until now, the implementation of BTS has not been evaluated yet.</p> <p>There are concerns from passengers about using Angkot, which are payment is only received in cash, the uncapacious vehicle makes passengers stay close on board, and hygiene protocols do not meet the standard. As a result, decreased demand for passengers to use Angkot was remarkable during the COVID-19 pandemic. Therefore, this project aims to restore the public's trust by providing safe and secure public transport services that meet minimum service standards and eventually restore the public transport mode share.</p> <p>In DKI Jakarta, introducing the BRT system (Transjakarta) and converting Angkot and buses to MicroTrans and</p>				

MetroTrans as feeder transport have been conducted earlier than in other cities in Jabodetabek. In other municipalities (except Kota Bogor), there are concerns about introducing the BTS program to receive assistance from BPTJ. Some criteria are applied, such as the routes should meet a certain level of occupancy, etc. In addition, some local governments are uncertain about how to start BTS and the required facilities.

DKI Jakarta has been conducting BTS since 2006, while BTS in Kota Bogor is implemented under BPTJ's assistance. Kota Tangerang and Kota Bekasi are also implementing BTS independently with the local budget. These two local governments are applying for BPTJ's BTS program, but they would like to review and evaluate the implementation of BTS in their authorities to consider a better BTS implementation in the future. In addition, local governments that have not implemented BTS are also motivated, but with certain considerations such as which route is appropriate, occupancy rate that meets the BPTJ's standard, candidates of transport operators for bidding, etc. Thus, a feasibility study of BTS is highly recommended.

(10) Project Outline

Objectives	Promotion of public transport use and ensuring of the operation of public transport to meet the minimum standard service
Project Location	Jabodetabek, Kota Bogor as a location for pilot project
Type of Project	<input type="checkbox"/> Construction <input type="checkbox"/> Technical Assistance <input type="checkbox"/> Basic Survey <input type="checkbox"/> Operation and Maintenance
Scope of Project	<ul style="list-style-type: none"> Analyze current BTS implementation, including precedent cases outside Jabodetabek (including system/organization/financial status). Identify BTS target routes by considering post-pandemic conditions and passenger demand. Propose operation and monitoring plan for BTS route (basic specifications of the system). Develop good coordination related to roles and functions of BPTJ and other organizations related to funding, fare collection, and proposal of business plans for public transport authorities of each local governments. Create BTS implementation promotion guidelines. Implement BTS based on the proposed plan. Propose activities to improve the image of public transport.
Project Cost (estimated)	
Implementation Period	3 years

(11) Outcome and Impact

Expected outcome	<ul style="list-style-type: none"> Evaluation on the existing BTS Guideline on public transport service for the BTS system
Beneficiaries	<ul style="list-style-type: none"> BPTJ Local Transport Agencies Transport operators Communities Transport users
Environmental and Social Impact	<ul style="list-style-type: none"> Increase the public transport passengers and better arrangement of public transport services Develop afford, comfort, and reliable public transport

(12) Necessary Input from Counterpart

- Information related to administration and willingness to conduct transport master plan study and user benefit survey
- Current condition of public transportation service and existing plan

(13) Relevant Projects

- World Bank (Indonesian Mass Transit Program Support Project)
- GIZ (Indonesian Bus Rapid Transit Corridor Development Project/INDOBUS)
- ITDP ("Building the Capacity and Action Plan to Scale-Up Transjakarta E-bus")
- Jak Lingko (Tariff integration service)
- Local Government of Kota Bogor (Reduction and conversion of angkot)

(14) Remarks (map, etc.)

* BTS in Bogor is a trans-Pakuan bus that operated from 2006-2016 and served the Bubulak-Aeon Sentul city route. Due to the financial problems of BUMD and the absence of subsidies from the Bogor City Government, the service stopped in 2016, and the services continue independently with a flat tariff rate of IDR6000 (previously IDR1500) with a very minimum number of fleet and service. In November 2021, BPTJ took over the service through the BTS program with no service rate.



After the service taken by BPTJ, BPTJ set criteria for selecting the BTS with high-demand passengers routes. Through the tendering mechanism, the winner of BTS in Kota Bogor is a regional-owned company, namely Perusahaan Daerah Jasa Transportasi. The company collaborates with a business entity KODJARI/Koperasi duta jasa angkutan Kota Bogor, consisting of an existing driver and angkot owner. The project duration is three years with free fare applied in the 1-year implementation, and the financing scheme is based on rupiah/kilometer, and the operator provides the fleet in the form of medium buses and drivers. To ensure the service is sustained, the operator who joins the tendering process has to provide a good financing track record.

* BTS in Kota Bekasi is called Transpatriot. Transpatriot conducted a trial service in November 2018 and officially operated in January 2019, during which Transpatriot only served one corridor with a flat tariff IDR4,000. In November 2019, Transpatriot Bus added two new corridors with different fare schemes (based on distance traveled). Transpatriot bus is operated by a public corporation named Regional Company Mitra Patriot that receives subsidies from the city only in corridor 1, while two other corridors do not. Due to the operator's poor management, Transpatriot stopped its operation several times and reopened services on corridor 1 by now. However, the two other corridors have not opened yet

* BTS in Kota Tangerang is called by Trans Tangerang Ayo or Trans Tayo. Trans Tayo has been conducted since 2017. Currently, 4 corridors out of 6 corridors with 40 buses serving inner-city and 8 feeder corridors out of 20 corridors with 80 buses are operated. The objective is to convert conventional bus with ratio 5:1 for the inner-city bus and 1:1 for the feeder bus. The tariff for using the bus is Rp. 2,000, and the operation of BTS under regional budget with the allocation Rp. 37 billion in 2022. PT. Tangerang Nusantara Global is the operator since 2020, and before that it was UPTD/ Regional Technical Implementation Unit in 2017 - 2019. Kota Tangerang is proposing to the Central Government through BPTJ to finance additional one corridor.



* Other countries that applied similar types of contracts with BTS are Ahmedabad's JanMarg, Cape Town's MyCiti BRT, Johannesburg's Rea Vaya, Santiago's TranSantiago, and Nantes Semitan. For example in Nantes, Nantes Métropole built and owns all of the BRT infrastructure and the public transport vehicles. The compensation paid to the operator is a fixed amount, agreed upon at the beginning of the contract, based on a specified number of kilometers, and integrates inflation and fare increases. The operator collects and keeps all fares collected and is then paid a subsidy on top of that. The operation cost is covered by fares, Nantes Métropole subsidy, and non-fare box revenue. In addition, the operator received around €7.6 million per month from Nantes Métropole as a service provision (as of 2012).

* In accordance with Presidential Regulation No 55/2019, Indonesia now focuses on accelerating the Battery Electric Vehicle (BEV) implementation. In this regulation, it is stated about the utilization of E-bus with a target of 2,350 by 2025. Transjakarta has initiated the implementation of e-buses, as also stated in the Governor of DKI Jakarta action plan. In addition, under central or local government authorities, several locations (Surabaya, Bandung, and Medan) intend to use electric buses under BTS. Implementing e-buses in the surrounding municipalities of DKI Jakarta can be a good example. E-bus pilot routes can be one of the trunk bus lines for public transport users and also could be supported by the government's program.

* Digital Video Recorder (DVR) is a device from a whole CCTV to store video record from the camera and proceed it digitally.

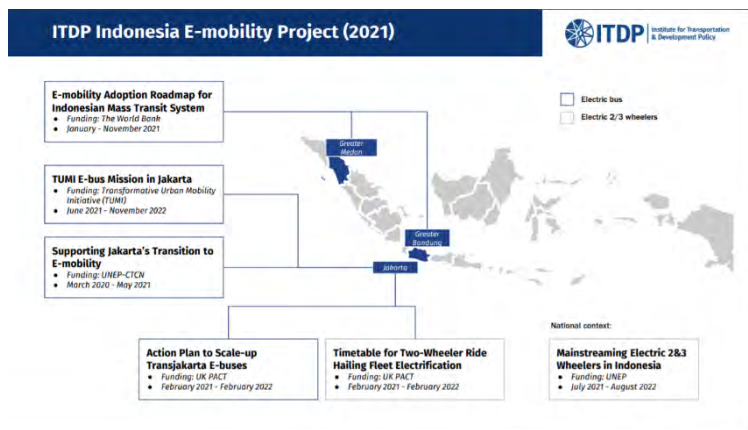
* Channel Protocol (CP) 4 is the world's smallest and most advanced 4-channel mobile DVR that connects up to 4 cameras and an optional LCD monitor for full protection. Built-in GPS and cellular connectivity enable the CP4 to be used for real-time vehicle tracking, video/ image transfer, and driver behavior reporting.

CP4



* Indonesian Mass Transit Program Support Project by World Bank aims to improve urban mobility and accessibility high-priority corridors in selected cities of Indonesia and strengthen institutional capacity for mass transit development. This project has two main components: institutional development and capacity building and support implementation of safe, resilient, green, and integrated mass transit in selected cities (Bandung and Medan). In Bandung, the project is LRT and commuter rail, while BRT corridor development will be conducted in Medan.

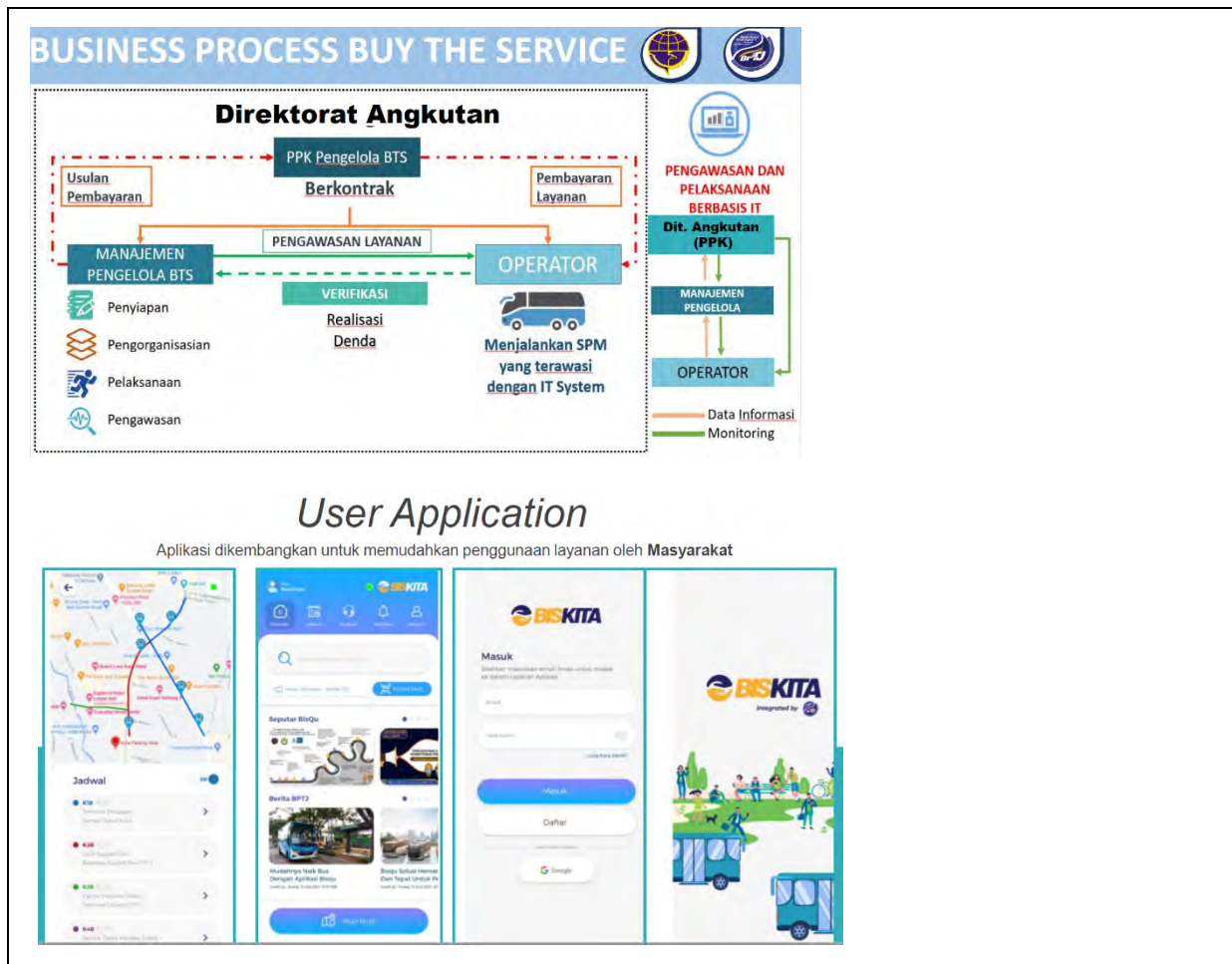
* Indonesian Bus Rapid Transit Corridor Development Project (INDOBUS) is a project by GIZ to promote a bus rapid transit system in Indonesian Cities. This project was conducted from 2017 to 2022 in five cities as the pilot, Pekanbaru, Batam, Bandung, Semarang, and Makassar.



* Building the Capacity and Action Plan to Scale-Up Transjakarta E-bus project is part of the big map of E-Bus Implementation in Indonesian Cities by ITDP. This plan for Transjakarta is funded by UK PACT from February 2021–2022 toward 10,000 electric bus fleet operations in 2030.

* Jak Lingko is an integrated transport system in terms of route, management, and payment that covers big, medium, and small buses, including railway-based transit such as MRT and LRT. It is a new payment integration company set up by all public transport operators to design, coordinate, and implement ticket and fare integration, including the study of the new fare policy.





(3) Grand Reform of Public Transport (Contract)

Regarding bus operation in the Jakarta metropolitan area (regardless of vehicle size or inter/intra-province routes), the driver should deposit a daily vehicle usage fee (minimum target of fare collection) to the bus vehicle’s owner. At the bus terminal, it is common that buses do not depart on time because the drivers want to board as many passengers on the bus as possible, which leads to unpredictable departure times. Moreover, there was a problem with the passenger decrease due to the COVID-19 pandemic, so improving the contract between transport operators and the government related to the operation of buses is necessary.

To have public transport services that depart on time regardless of the number of passengers on board, a suitable contract must be considered. For example, a contract that manages concession of public transport service in which government pays the operating cost per kilometer to the operator. It is necessary to reorganize the government and private sector roles for improved public transport services. Thus, six dimensions of public/private sector participation (regulation, financing, planning, ownership, operation, and maintenance) will be analyzed for role determination. In addition, discussions and examinations on public transport in each municipality will be conducted, while considering the cases from other cities. The method of distributing fare revenue between government and transport operators will be analyzed to determine the optimal method per situation in the Jakarta metropolitan area. In Jakarta Metropolitan Area, DKI Jakarta’s BRT system (Transjakarta) and the feeder transport

of MicroTrans and MetroTrans are operating on a contract basis with the government of DKI Jakarta. The contract is the gross cost in which the price for the services of operators is paid based on the rupiah per kilometer. It is important to monitor properly whether public transport operates based on the minimum service standards specified in the contract and transport authorities will pay for this. Provision of various public transport services such as Angkot and intercity buses, not only in DKI Jakarta but also in surrounding municipalities, is proposed to switch in the future into gross cost contract. However, considering the situation of each route in the Jakarta metropolitan area, the other method that may be possible is a net cost contract, in which the authorities do not collect fare collection, and transport operators provide services based on contract but retain all revenue. Therefore, it is necessary to consider the suitable type of contract.

(1) Project No.	(2) Country/City	(3) Sector		
JKT-03	Indonesia/ JABODETABEK	Urban Transport		
(4) Project Name				
Improving the Management of Bus Operator and Reviewing the Type of Contract				
(5) Counterpart Agency			(6) Relevant Agency	
Transport Agency within Jabodetabek			BPTJ, CMEA, Local Government in Jabodetabek, Transport operators	
(7) Project Scheme/ Budgeting sources		(8) Project Period		
Technical Assistance/ JICA		2023-2026		
		Emergency	Short-term	Mid- long
			○	
(9) Background (including relevance to the Output)				
<p>In the bus terminal at Jabodetabek, the passenger bus for inter/intra-province routes will frequently find the condition that buses do not depart on time because the drivers want to board as many passengers on the bus as possible, which leads to unpredictable departure times. It is known as "ngetem." This is because the driver should deposit a daily vehicle usage fee (minimum target of fare collection) to the bus vehicle's owner. As a result, the passengers may find uncertainties when waiting for a bus for time departure and arrival.</p> <p>For public transport services to depart on time regardless of the number of passengers on board, a suitable contract must be considered. For example, a contract that manages the concession of public transport service in which government pays the operating cost per kilometer to the operator. It is necessary to reorganize the government and private sector roles for improving public transport services. Thus, it is important to include the six dimensions of public/private sector participation (regulation, financing, planning, ownership, operation, and maintenance) in role determination. The method of distribution of fare revenue between government and transport operators will be analyzed to determine the optimal method per situation in Jabodetabek. This type of model should be considered as a countermeasure if there is a problem with passenger decrease due to the COVID-19 pandemic.</p> <p>DKI Jakarta's BRT system (Transjakarta) and the feeder transport of MicroTrans and MetroTrans are operating on contract basis with government of DKI Jakarta. The contract is the gross cost in which the price for the services of operators is paid based on the rupiah per kilometer. It is important to monitor properly whether public transport is operated based on the minimum service standard as specified in the contract, and this cost will be paid by transport authorities. Provision of various public transport services, such as Angkot and intercity buses, not only in DKI Jakarta but also in surrounding municipalities, is proposed to switch in the future into gross cost contract. However, considering the situation of each route in the Jakarta Metropolitan Area, the other method that may be possible is a net cost contract, in which the authorities do not collect fare collection, and transport operators provide services based on contract but retain all revenue. Therefore, it is necessary to consider the suitable type of contract.</p>				
(10) Project Outline				
Objectives		Develop a model of six dimension of public/private participation to manage private operators for the operation of public transports.		
Project Location		JABODETABEK		

Type of Project	<input type="checkbox"/> Construction <input type="radio"/> Technical Assistance <input type="radio"/> Basic Survey <input type="checkbox"/> Operation and Maintenance												
Scope of Project	<ul style="list-style-type: none"> Analyze models (including the type of contract) and experiences related to the model transition in other cities. Develop an examination of model transition for public transport (intercity buses, feeder transport, etc.) in the Jakarta Metropolitan Area (or in specific municipalities) where the concession method or contract type is expected to be reviewed. Develop a contract based on six dimensions of public/private sector participation (regulation, financing, planning, ownership, operation, and maintenance), including determining the role of the government and the private sector. Analyze the contract details and bidding methods based on the existing condition of each route in the Jakarta Metropolitan Area (Gross Cost contract, Net Cost contract, etc.) 												
Project Cost (estimated)	-												
Implementation Period	3 years												
(11) Outcome and Impact													
Expected outcome	<ul style="list-style-type: none"> Well-developed public private participation model that will manage bus operators under a contract between a public authority. Improvement of the citizens' trust in public transport in Jakarta metropolitan area 												
Beneficiaries	<ul style="list-style-type: none"> Ministry of Transportation BPTJ Transport agency within Jabodetabek Private operators within DKI Jakarta Communities 												
Environmental and Social Impact													
(12) Necessary Input from Counterpart													
(13) Relevant Projects													
(14) Remarks (map, etc.)													
Regulated Competition	Yes	Yes	PR	PR (& PU)	PU & PR	PU & PR	PR	PU	PR	PU & PR	PR	PU & PR	Malta, Buenos Aires (Argentina)
Unregulated Competition	Minimum	Yes	PR	PR	PR	PR	PR	PR & PU	PR	PR & PU	PR	PR & PU	Manchester (UK), Buckinghamshire (UK), Colombo (Sri Lanka)
<p>Six Dimensions for Public/Private Partnership (Sector demarcation)</p> <p>Provision Regulation Regulations for: safety, environment, entry to the system, routes, levels of service, fare, employment, etc. While regulations may inhibit the benefit of sound competition, these regulations are necessary to provide services required to meet certain social objectives.</p> <p>Financing Closely related to subsidization. Publicly owned transport is usually subsidized. For operational financing, some modest aid may be provided, e.g., as exemption of fuel and other taxes, while the form of capital financing may be the provision of government-purchased vehicles and facilities.</p> <p>Planning Defined as an activity that formulates the appropriate actions and measures to meet the short- or long-term goals. Divided into three types: capital planning, operational planning, and city-wide service planning (coordination</p>													

with other transport modes, network expansion, and reorganization). **The private sector can take partial responsibility** while government should still be involved in the planning tasks because the private sector has different objectives which may not be optimal for society.

Production

Ownership

- Ownership covers **vehicles** and **infrastructure**, including all facilities. The most common scheme for public transport service provision is a **mixed system of public and private ownership**, where the vehicles are owned by the private sector while some facilities such as bus terminals are owned by the public sector

Operation

- Can be done by the public or private sector, or a mixture of both, e.g., **with partial contracting out**, where the public sector can **contract out operations by route**, while the remaining services are operated by the public sector. In the case of a “mixed economy” company, the general assembly of public and private shareholders is responsible for the operation.

Maintenance

Maintenance includes cleaning, repair, and preventive inspection of **vehicles**. Maintenance also covers all **infrastructure** such as terminals, garages, and roads. Sometimes imported vehicles from donor countries are not built to standards suitable for the recipient country. Secondhand imported vehicles also may not function efficiently. The need for **better maintenance and equipment plans and programs** adapted to local operating conditions should be emphasized.

Public-Private Partnership Model Cases in several Cities

Some cities have adopted a public-private partnership model for supporting the operation of transport operators.

1. Singapore

The Government of Singapore adopts a contracting model to improve public bus services for passengers. Starting in 2016, under the contracting model, bus operators are involved in a competitive tender for the right to operate services while with the Land Transport Authority (LTA) as the central planner, setting service levels and service standards. The LTA retains ownership of bus, depot, and fleet management system assets. Operators that win a tender for a bus package are paid a fixed fee to operate the services. By doing this mechanism, LTA claims that bus commuters will benefit from less waiting time for buses. All bus services will run at intervals of not more than 15 minutes, and feeders will run at even shorter intervals at 6 to 8 minutes. LTA manages the tender packages with differences in the contract period, services, and lines.



2. Zurich

Zürcher Verkehrsverbund (ZVV) as the transport regulator in Zurich as a broker and purchases a level of service from each of the 42 transit operators. For example, the ZVV creates contracts annually with Zürich's transit operator (the VBZ, the bus operator) to operate a given level of service and pays the VBZ an agreed amount for the service. All the ticket revenues are paid to the ZVV, and ZVV in turn, receives a subsidy from cities in the Canton to make up the difference between what is collected in fares and what is paid to transit agencies to operate the service. From the transit operator's perspective, the fact that the ZVV contracts for a given level of service from all operators take away the need to negotiate formulas and procedures for splitting ticket revenues. This allows transit operators to focus on service and efficiency.

3. Seoul

Seoul suffers from serious transport-related problems induced by the increasing number of registered automobiles, including single occupancy vehicles (which led to heavy traffic) and the scarcity of parking space in 2004. After the transportation reform, the government secured the right to adjust bus lines and pursued the public welfare of bus services as well as the improvement at the service level. In addition, bring competition elements in some of the management systems to enhance operational efficiency. By jointly managing revenue and redistributing it based on operational performance, bus operation and revenue management are separated. Fare collector is applied. The government gave reimbursed bus companies whose expenses exceeded income for their losses, and others. In other words, the surplus in profitable routes is used to compensate for deficits in unprofitable lines.

4. Bangkok

In 1976, Bangkok Mass Transit Authority (BMTA) was formed to combine all bus operations under one umbrella. Now, BMTA is the sole bus owner for the city. It operates part of the bus itself and also gives licenses out to private companies. The service contracts between the BMTA and private operators cover bus routes, frequency, and payment and fees. It does not stipulate drivers' working hours and conditions.

5. Cebu

Passenger transport in the Philippines is regulated through franchises issued by the central government Department of Transport and Communications (DOTC) and its agencies. DOTC's agency, Land Transportation Franchising and Regulatory Board (LTFRB), a regulatory body for land transport to regulate route, issue the certificate franchise the operation of public land transport services. In addition, LTFRB is also responsible for fare adjustment.

Several private bus operators in Jabodetabek

Agra Mas:



Agra Mas is one of the companies engaged in road transport with competitive ticket fares and provides good facilities to prioritize passenger satisfaction.

PO Agra Mas serves inter-city and inter-provincial routes within Java Island. The destinations of this bus from Tangerang are Pasar Rebo, Cikarang, Cibinong, Cilandak, and Fatmawati.

If from Bogor or more precisely from Baranangsiang Terminal this bus will go to Kampung Rambutan, Kali Deres, Lebak Bulus, and Karawang.

This intercity bus operates at night from Tangerang, Jakarta, Bekasi, and Bogor to Pacitan, Wonogiri, Madiun, Solo, Ponorogo, Purwatoro, and Giribeli.

In addition, this bus also serves bus rentals for tourism and special express packages, with a fleet of chassis-type buses made by Mercedes Benz OH1526, Hino RK8, and Hino RN.

MGI (Maya Gapura Intan)



MGI serves road transport services with a bus fleet. Currently, MGI Buses serves several major route in West Java Province, such as Bandung, Garut, Depok, Sukabumi, and Bogor. MGI uses large buses and medium buses.

Route:

1. Kampung Rambutan-Bandung (Leuwipanjang) PP (AC Bisnis)
2. Depok-Bandung (Leuwipanjang) PP (AC Business)
3. Cileungsi-Bandung (Leuwipanjang) PP (AC Bisnis)
4. Cibinong-Bandung (Leuwipanjang) PP (AC Bisnis)
5. Leuwiliang-Bandung (Leuwipanjang) PP (AC Bisnis)
6. Bogor-Port Ratu PP (AC Economy / Economy)
7. Bogor-Bandung (Leuwipanjang) PP (AC Bisnis)
8. Bogor-Garut PP (AC Business)
9. Pelabuhan Ratu-Sukabumi PP (AC Ekonomi)
10. Sukabumi-Bandung (Leuwipanjang) PP (AC Bisnis)

(4) Bus Terminal Management Improvement

Although the problem related to bus terminals is mentioned in point (3), bus terminals in the Jakarta metropolitan area do not comply with the Standard Operating Procedure (SOP). Technical Implementation Unit (UPT: Unit Pengelola Terminal) for Terminal under the Transportation Agency of each local government, which is a responsible agency for the bus terminal management, has not been able to establish an appropriate monitoring and management system due to a lack of budget allocation (except for DKI Jakarta). Even the Pulo Gebang bus terminal, which is managed by DKI Jakarta, has a relatively large budget allocation and is not used properly. For example, most passengers board and alight outside the terminal (shadow terminal). Therefore, in this project, the selection of a Type A (interprovince) bus terminal will be considered a pilot project. A monitoring room will be set up, a pedestrian-vehicle separation system will be introduced, departure and alighting platforms will be improved, and sufficient information will be provided to users. Regarding thorough SOP, UPT's role should be strengthened as SOP enforcement organization, for example, imposing a penalty on the violating transport operators.

Not only surrounding municipalities but also DKI Jakarta have shown great interest in the above issues. DKI Jakarta intends to take the Type A bus terminal, which under its jurisdiction as a pilot project. Meanwhile, local governments are interested in the Type B or Type C bus terminals, which in general both these types of terminals are under their jurisdiction as pilot projects. Regarding the existence of shadow terminal, this problem has not been fixed due to limitation of personnel's capacity and fund shortage in UPT. Regarding these problems, the operation of the bus terminal by Public Private Partnership (PPP) scheme and the development of the bus terminal by Build Operate Transfer (BOT) are considered to be one of solutions. Although there is no on-going project in Indonesia, there is a plan in some local governments in the Jabodetabek to implement this scheme. Therefore, partnership scheme is one of the issues to be analyzed.

(1) Project No.	(2) Country/City	(3) Sector		
JKT-04	Indonesia/ DKI Jakarta	Urban Transport		
(4) Project Name				
Bus Terminal Management Improvement				
(5) Counterpart Agency		(6) Relevant Agency		
BPTJ		CMEA, Transportation agency of each <i>Kota/Kabupaten</i> , Bus Terminal management unit/UPT Terminal (Terminal Technical Implementation Unit)		
(7) Project Scheme/ Budgeting sources		(8) Project Period	Emergency	Short-term
Technical Assistance/ JICA		2023-2025	○	Mid- long
(9) Background (including relevance to the Output)				
Bus terminals in the Jabodetabek have tendency to not comply with the Standard Operating Procedure (SOP). Technical Implementation Unit (UPT: Unit Pengelola Terminal) for Terminal under Transportation Agency of each local government, which is a responsible agency for the bus terminal management, has not been able to establish an appropriate monitoring and management system due to lack of budget allocation (except for DKI Jakarta). Even Pulo Gebang bus terminal, that is managed by DKI Jakarta, which has a relatively large budget allocation, is not being used properly. For example, most passengers board and alight outside the terminal (shadow terminal). Therefore, in this project, selection a Type A (interprovince) bus terminal will be considered as a pilot project. A monitoring room will be set up, a pedestrian-vehicle separation system will be introduced, departure and alighting				

platforms will be improved, and sufficient information will be provided to users. Regarding thorough SOP, UPT's role should be strengthened as SOP enforcement organization, for example, imposing a penalty on the violating transport operators.

Not only surrounding municipalities but also DKI Jakarta have shown great interest in the above issues. DKI Jakarta intends to take the Type A bus terminal, under its jurisdiction as a pilot project. Meanwhile, local governments are interested in Type B or Type C bus terminals, which in general are under their jurisdiction as pilot projects. Regarding the existence of the shadow terminal, this problem has not been fixed due to the limitation of personnel's capacity and fund shortage in UPT. Regarding these problems, the operation of the bus terminal by the Public Private Partnership (PPP) scheme and the development of the bus terminal by Build Operate Transfer (BOT) is considered to be solutions. Although there is no ongoing project in Indonesia, there is a plan in some local governments in the Jabodetabek to implement this scheme. Therefore, a partnership scheme is one of the issues to be analyzed.

(10) Project Outline

Objectives	Develop a system for management of bus terminals.
Project Location	Type A and Type B (Type C) bus terminals in Jabodetabek
Type of Project	<input type="checkbox"/> Construction <input type="checkbox"/> Technical Assistance <input type="checkbox"/> Basic Survey <input type="checkbox"/> Operation and Maintenance
Scope of Project	<ul style="list-style-type: none"> Identify various problems related to bus terminal management and investigate the causes. Analyze the operation of bus terminal using PPP and collect information on precedent cases. Select pilot projects, dividing into three categories of type A and type B (type C) bus terminal. Enhance the capacity of BPTJ as an authority for Jakarta metropolitan area public transport management. Install a monitoring and control room for bus arrivals and departures at pilot projects' locations. Implement and evaluate pilot projects.
Project Cost (estimated)	-
Implementation Period	3 years

(11) Outcome and Impact

Expected outcome	<ul style="list-style-type: none"> Well managed bus terminal in the location of pilot projects Improvement the users' convenience, safe and comfort when using bus terminal Improvement the role of UPT Establishment of BPTJ as an authority for Jabodetabek public transport management
Beneficiaries	BPTJ Transport agency of Kota/Kabupaten UPT Terminal (Terminal Technical Implementation Unit) Communities
Environmental and Social Impact	

(12) Necessary Input from Counterpart

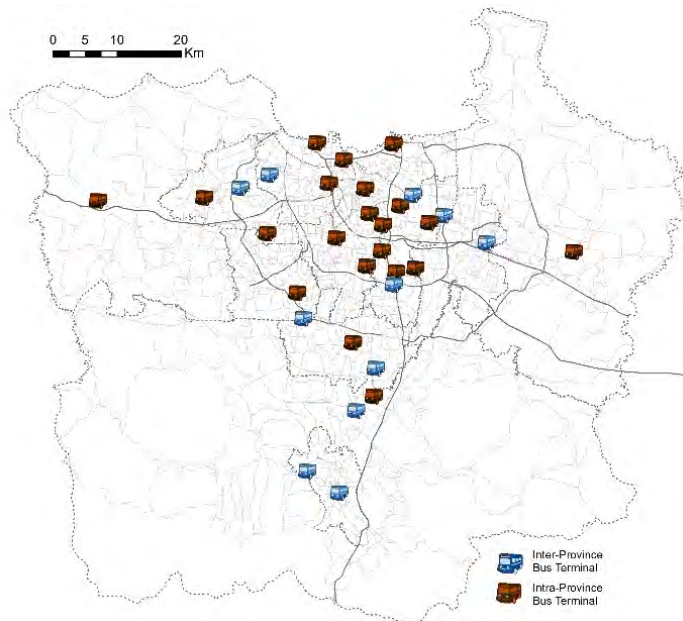
(13) Relevant Projects

-

(14) Remarks (map, etc.)

- Inter-province bus terminal (Type A) in Jabodetabek is managed by the central government (Ministry of Transport/BPTJ), and the operation of the terminal is done by the UPT under the regional government (Dinas perhubungan of each local government). Inter-province bus terminal is serving:
 - a. Inter-province transportation (operated by Putramulya, Agramas, and other private operators)
 - b. Cross-border countries transportation (operated by Damri)
 - c. Intra-province transportation (operated by Transjakarta, Agramas, PPD, other several private operators)
 - d. Inner-city transportation (operated by Transjakarta, Transayo, Transanggrek, other public operator)
 - e. Rural transportation (operated by Transjakarta, and several private operators)
- Intra- province bus terminal (Type B) in Jabodetabek is managed by the Regional Government (Dinas Perhubungan of each local government), and the operation of the terminal is done by the UPT under the regional government (Dinas perhubungan of each local government). Intra-province bus terminal is serving:
 - a. Intra-province transportation
 - b. Inner-city transportation
 - c. Rural transportation
- Bus operations in Jabodetabek are managed by BPTJ, and, as described in “Ministry of Transportation Regulation No.15 of 2019 regarding Implementation of in route public transportation for people, article 75 for the operating license,” operation licenses are issued by:
 - a. Directorate General of Land Transport, Ministry of Transportation for Inter-province and Cross border countries transportation
 - b. BPTJ for Intra-province within Jabodetabek area
 - c. Dinas Perhubungan for Inner-city and rural transportation

- Project Location



- Poris Plawad - Inter-province Bus Terminal



- Jatijajar - Inter-province Bus Terminal



- Pulo Gebang - Inter-province Bus Terminal



List of bus terminal location:

No.	Inter-city Terminal	City
1	Kampung Rambutan	DKI Jakarta
2	Pulogebang	DKI Jakarta
3	Kalideres	DKI Jakarta
4	Poris Plawad	Tangerang
5	Pondok Cabe	Tangerang Selatan
6	Jatijajar	Depok
7	Pulogebang	Bekasi
8	Baranangsiang	Bogor
9	Bubulak	Bogor

No.	Intra-city Terminal	City
1	Blok M	DKI Jakarta
2	Rawamangun	DKI Jakarta
3	Pinang Ranti	DKI Jakarta
4	Muara Angke	DKI Jakarta
5	Pasar Minggu	DKI Jakarta
6	Grogol	DKI Jakarta
7	Senen	DKI Jakarta
8	Tanjung Priok	DKI Jakarta
9	Cililitan	DKI Jakarta
10	Kampung Melayu	DKI Jakarta
11	Klender	DKI Jakarta
12	Manggarai	DKI Jakarta
13.	Cibinong	Kab. Bogor
14.	Ciledug	Tangerang
15.	Cimone	Tangerang
16.	Ciputat	Tangerang Selatan
17.	Balaraja	Kab. Tangerang
18.	Pondok Gede	Bekasi

(5) Implementation of Low Emission Zone

According to WHO, air pollution is considered a serious problem in the Jakarta Metropolitan Area. The air pollution is classified as unhealthy with PM 2.5 and reaches 20–70 µgram/m³. Together with World Research Institute, DKI Jakarta has introduced the LEZ in the Kota Tua area by restricting vehicles to enter this area except for Transjakarta buses, electric vehicles, NMT, and pedestrians. In order to expand LEZ to surrounding municipalities in the future, some studies such as analyzing the current situation, examining the impacts of LEZ, interviewing related stakeholders, and conducting social experiments are highly required.

DKI Jakarta, as an initiator for LEZ implementation in Jakarta metropolitan area, has no future plans. There are various issues to be solved in the implementation, such as Indonesian's preference to not walk and long consensus periods with residents and tenants in the target area. Currently, local governments are only conducting emission inspections on public transport vehicles as a countermeasure for reducing air pollution. In addition, LEZ is not described in the local government's transport master plan, requiring a deeper study related to LEZ implementation. Local governments are expected to support this study since there is no objection from the local government.

(1) Project No.	(2) Country/City	(3) Sector		
JKT-05	Indonesia/ JABODETABEK	Urban Transport		
(4) Project Name				
Implementation of Low Emission Zone				
(5) Counterpart Agency		(6) Relevant Agency		
DKI Jakarta/ local government		ATR/BPN, BAPPENAS, CMEA, BPTJ, Dinas Citata, Dishub, Dinas Lingkungan Hidup		
(7) Project Scheme/ Budgeting sources		(8) Project Period		
Technical Assistance/ JICA		2023-2026		
		Emergency	Short-term	Mid- long
			○	
(9) Background				
<p>According to WHO, air pollution is considered a serious problem in Jabodetabek. The air pollution is classified as unhealthy with PM 2.5 and reaches 20-70 µgram/m³. Together with World Research Institute, DKI Jakarta has introduced the LEZ in the Kota Tua area by restricting entry to vehicles in this area except for Transjakarta buses, electric vehicles, NMTs, and pedestrians. In order to expand LEZ to surrounding municipalities in the future, some studies like analyzing the current situation, examining the impacts of LEZ, interviewing related stakeholders, and conducting social experiments are highly required.</p> <p>DKI Jakarta, as an initiator for LEZ implementation in Jabodetabek, has no future plans. There are various issues to be solved in the implementation, such as Indonesian's preference to not walk and long consensus periods with residents and tenants in the target area. Currently, local governments are only conducting emission inspections on public transport vehicles as a countermeasure for reducing air pollution. In addition, LEZ is not described in the local government's transport master plan, requiring a deeper study related to LEZ implementation. Local governments are expected to support this study since there is no objection from the local government.</p>				
(10) Project Outline				
Objectives	Promotion of Low Emission Zone in Jabodetabek area by integrating public transportation mode, and the zoning regulation.			
Project Location	JABODETABEK			
Type of Project	<input type="checkbox"/> Construction <input type="radio"/> Technical Assistance <input type="checkbox"/> Basic Survey <input type="checkbox"/> Operation and Maintenance			

Scope of Project	<ul style="list-style-type: none"> Identify suitable locations in the Jabodetabek area to be a low emission zone, as well as the coverage area and charging time. Analysis of the existing conditions (including stakeholder analysis, review of existing and future plans, location and conditions of existing public infrastructure and facilities, etc.) Assessment of public infrastructure and facility condition and establish a database (infrastructure, housing, public service, transport, amenity, health care, disaster management, etc.) Setting up standards for the types of vehicles allowed to enter LEZ through the establishment of regulations concerning vehicle emission standard types allowed entering LEZ. Analyze the impact of LEZ on the air quality by forecasting some measurements (NO2, NOX, PM10, NH3, and CO2)
Project Cost (estimated)	
Implementation Period	3 years
(11) Outcome and Impact	
Expected outcome	<ul style="list-style-type: none"> Identified locations in JABODETABEK which suitable as LEZ Low Emission Zone plans and guideline Database of LEZ infrastructure condition Forecasted of the air quality due to implementation of LEZ
Beneficiaries	<ul style="list-style-type: none"> ATR/BPN BAPPENAS DKI Jakarta (spatial plan agency, transport agency, smart city management unit, etc.) Local governments Community organizations
Environmental and Social Impact	
(12) Necessary Input from Counterpart	
(13) Relevant Projects	
- World Resources Institute	

(14) Remarks (map, etc.)**World Resource Institute (WRI)**

WRI is a global research organization non-profit organization that works with governments, businesses, multilateral institutions, and civil society groups to develop practical solutions that improve people's lives and protect nature. WRI organizes our work around seven global challenges: Food, Forests, Water, Energy, Climate, the Ocean, and Cities. WRI analyzes these issues through the lenses of our four Centers of Excellence: Business, Economics, Finance, and Equity. WRI works across a global network to develop practical solutions that improve people's lives and protect nature. WRI has more than 1,200 staff and offices in 12 countries: Brazil, China, Colombia, Ethiopia, India, Indonesia, Kenya, Mexico, the Netherlands, Turkey, the United Kingdom, and the United States. WRI works with partners in more than 50 countries.¹

Implementation of LEZ Kota Tua DKI Jakarta

On 8 February 2021, Kota Tua implemented LEZ with the open and closed road scheme for 24 hours. The area applies on Jl. Pintu Besar Utara - Jl. Kalibesar Barat sisi Selatan - Jl. Kunir sisi Selatan - Jl. Kemukus - Jl. Ketumbar - Jalan Lada. This implementation is per Government Regulation of DKI Jakarta No. 36 of 2014 regarding the Kota Tua master plan and Government Regulation of DKI Jakarta No. 32 of 2011 regarding management and engineering, traffic management, and traffic needs management. In addition, Dishub DKI Jakarta is in charge of the implementation, along with Dinas Lingkungan Hidup as a supporting unit for the low emission zone regulation.

To reduce the pollution rate in LEZ area, the government of DKI Jakarta set up criteria for vehicles permitted to enter the Kota Tua area, consisting of pedestrians, cyclists, public transport, and low emission car with special labels stickers. The implementation of LEZ is a big commitment of DKI Jakarta to reduce emissions by 26%, as targeted by the Central Government.²

Impact of LEZ in European Cities

LEZs have had a positive impact on air quality in many European cities, it reduces emissions of vehicles, particularly diesel particulates. The level of impacts that LEZs depends on³:

- The emissions standard set,
- How well the LEZ is enforced (controlled),
- Which vehicle types are affected,
- The geographical area of the LEZ,
- How vehicle operators choose to comply (for example, whether they choose to buy a new vehicle, retrofit a full diesel particulate filter, or buy a second-hand vehicle that meets the standard, change fuel type)
- The vehicle fleet before the LEZ was implemented (for example, age, types of vehicles, and percentage of diesel and petrol vehicles)
- The importance of different pollution sources in that city
- How extreme the air quality problems.

Several cities have been adopting LEZ, and the number of reductions is in positive impact. Below are the examples of the city which adopting LEZ and their impacts:

1. London

- Black Carbon has been reduced by 40-50%
- NO₂: Average concentrations were reduced by 0.12 µg/m³, and peak concentration reductions up to 0.16 µg/m³ on polluted streets.
- PM₁₀: Average concentrations reduced 0.03 µg/m³, peak concentration reductions up to 0.5 µg/m³ on polluted streets.
- Emissions of PM₁₀ were reduced by 1.9% (28 tonnes)
- Emissions of NO_x were reduced by 2.4% (26 tonnes)
- The feasibility study predicted a gain of 5200 years of life, and 310,000 fewer cases of lower respiratory symptoms, 30,000 fewer cases of respiratory medication & 231,000 fewer restricted activity days.

¹ <https://www.wri.org/>

² <https://smartcityjakarta.go.id/blog/646/zona-rendah-emisi-untuk-kota-tua-yang-bebas-polusi>

³ <https://urbanaccessregulations.eu/ulinks-all/127-europe/main-pages/background/background-low-emission-zones>

- The Cost Benefit Analysis gave a £250-670 million benefit, £90-250 of which are outside Greater London.

2. Berlin

Berlin has undertaken extensive impact assessments of the LEZ, isolating the impact of the LEZ from other measures and influences. The LEZ has reduced PM10 exceedances of the EU PM10 air quality standard from 28 to 24 per year, diesel particulate concentrations by 14–22%, & PM10 concentrations by 3% on main roads. Berlin has reduced 58% of diesel particles, the most dangerous part of particulate matter.

3. Netherlands

- The LEZs started in January 2007. In summer 2008, the actual air quality improvements were slightly less than predicted, with improvements between 0–2µg/m³.
- The impact was limited by gradual enforcement and the fact that there were many exemptions for vehicles where diesel particulate filters were not available.
- Both were expected to improve and increase the air quality impact by a factor of 1.5–2. The LEZ second phase will also have a greater impact.
- The Dutch enforcement of the LEZ is stricter now. After the enforcement campaign, in Den Bosch, 83% (up from 70%) of lorries complied, and 91% of vehicles in Eindhoven complied. Vehicles that did not comply and did not have exemptions must pay a €150 fine.

(6) Integration of Public Transport Information System through a Data Center

According to Governor of DKI Jakarta Regulation No. 68 of 2021, it requires the installation of transport data information system at the Transportation Agency (*Dinas Perhubungan/Dishub*). Dishub has established a public transport data center (PUSDATIN: *Pusat Data dan Informasi/Data and Information Center*) for developing real-time information in the future. Currently, within DKI Jakarta, the Automatic Traffic Control System (ATCS) is only the system that Dishub has. Per the regulations, the integrated data should have at least 18 data consisting of static data such as fleet information and timetables as well as dynamic data such as OD, headway, number of passengers, and real-time position information of the vehicle. The installation of not only GPS but also CCTV cameras is considered to be placed in various places to collect all the required data, but the system configuration has not been decided yet. In general, it should be an open platform system with good system maintenance. This project is considered a large-scale project.

The real-time location information of public transport can be used to manage the operation of public transport in DKI Jakarta and inform about traffic conditions. For example, information to passengers in a bus shelter during peak hours about real-time bus location. Transportation Agency is possible to analyze additional required fleets to reduce excessive queues during peak hours. In addition, these data can be used during the COVID-19 pandemic for policy decisions such as the limitation of passengers' capacity and operating hours.

PUSDATIN is also trying to integrate real-time data such as Transjakarta, Commuterline (KCI), MRT, and LRT. It is expected that the target area for public transport data integration and its utilization will be used for the entire Jakarta metropolitan area in the future. Therefore, DKI Jakarta welcomes this support for the new organization of PUSDATIN. Regarding the public transport data collection, BTS has particularly required this information since the data is important for assessing and evaluating each transport operator. Transjakarta collects real-time information, but they are reluctant to share this information with PUSDATIN. On the

other hand, in the surrounding municipalities, establishing an integrated public transport data center requires a large amount of capital expenditure, such as the provision of CCTV, software, and a monitoring control room. In addition, lack of human resources and knowledge as well as financial resources are obstacles that should be considered.

(1) Project No.	(2) Country/City	(3) Sector		
JKT-06	Indonesia/ DKI Jakarta	Urban Transport		
(4) Project Name				
Integration of Public Transport Information System through a Data Center				
(5) Counterpart Agency		(6) Relevant Agency		
Transport Agency of Kota/Kabupaten		BPTJ, CMEA, Implementation Unit for Information and Data Center (UPT Pusdatin)		
(7) Project Scheme/ Budgeting sources		(8) Project Period		
Technical Assistance/ JICA		2023-2025	Emergency	Short-term
			<input type="radio"/>	Mid- long
(9) Background (including relevance to the Output)				
<p>According to Governor of DKI Jakarta Regulation No. 68 of 2021, it requires the installation of transport data information system at the Transportation Agency (Dinas Perhubungan/Dishub). Dishub has established a public transport data center (PUSDATIN: Pusat Data dan Informasi/Data and Information Center) for developing real-time information in the future. Currently, within DKI Jakarta, the Automatic Traffic Control System (ATCS) is only the system that Dishub has. By the regulation, the integrated data should have at least 18 data consisting of static data such as fleet information and timetables as well as dynamic data such as OD, headway, number of passengers, and real-time position information of the vehicle. The installation of not only GPS but also CCTV cameras are placed in various places to collect all the required data, but the system configuration has not been decided yet. In general, it should be an open platform system with good system maintenance. This project is considered a large-scale project. The real-time location information of public transport can be used to manage the operation of public transport in DKI Jakarta and inform about traffic conditions. For example, information to passengers in a bus shelter during peak hours about real-time bus location. Transportation Agency is possible to analyze additional required fleets to reduce excessive queues during peak hours. In addition, these data can be used during the COVID-19 pandemic for policy decisions such as the limitation of passengers' capacity and operating hours.</p> <p>PUSDATIN is also trying to integrate real-time data such as Transjakarta, Commuterline (KCI), MRT, and LRT. It is expected that the target area for public transport data integration and its utilization will be used for the entire Jakarta metropolitan area in the future. Therefore, DKI Jakarta welcomes this support for the new organization of PUSDATIN. Regarding the public transport data collection, BTS has particularly required this information since the data is important for assessing and evaluating each transport operator. Transjakarta collects real-time information but is reluctant to share this information with PUSDATIN. On the other hand, in the surrounding municipalities, establishing an integrated public transport data center requires a large amount of capital expenditure, such as the provision of CCTV, software, and a monitoring control room. In addition, lack of human resources and knowledge as well as financial resources are obstacles that should be considered.</p>				
(10) Project Outline				
Objectives	Develop a data information system to be used by Dishub to make necessary adjustment related to daily operational of public transport in DKI Jakarta.			
Project Location	DKI Jakarta			
Type of Project	<input type="checkbox"/> Construction <input type="radio"/> Technical Assistance <input type="checkbox"/> Basic Survey <input type="checkbox"/> Operation and Maintenance			
Scope of Project	<ul style="list-style-type: none"> Collect real time data from all public transport within DKI Jakarta, currently only Transjakarta is one of the road transports that have real-time data Developing a data management system together with PUSDATIN in order to make further real time analysis as a countermeasure for daily operational of public transport 			

Project Cost (estimated)	-
Implementation Period	3 years
(11) Outcome and Impact	
Expected outcome	<ul style="list-style-type: none"> Well-developed bus management system Well-developed a data management system within DKI Jakarta
Beneficiaries	<ul style="list-style-type: none"> DKI Jakarta (Transport agency) Communities Transport Operators
Environmental and Social Impact	
(12) Necessary Input from Counterpart	
(13) Relevant Projects	
-	
(14) Remarks (map, etc.)	
<p>Based on the discussion with Director of PT. Jaklingko Indonesia dated 29 October 2021, about the improvement of Jaklingko Application, he informed about the importance of integrating road traffic information since real time location data of Transjakarta's buses are missing. In addition, for a longer term, he added the importance of transport information database. These big data will be utilized by Dishub (in this case <i>Pusat Data dan Informasi</i>/Center of Data and Information) to conduct necessary adjustment (i.e., response of accident, traffic engineering) on daily traffic management and operational of public transport, as well for further analyzing by Dishub. In the future, ERP is considered one of the features within JakLingko.</p> <p>PUSDATIIN has been established within Dishub DKI Jakarta, however, the data management system has not provided yet. According to Governor Regulation No. 68/2021, the data should consist of at least:</p> <ul style="list-style-type: none"> Number of available fleets for operation Realization of available fleets for operation Number of available infrastructures for operation Kilometers of each operating fleet Frequency of each operating fleet Number of passengers in each route Number of passengers boarding and alighting Number of intermodal passengers Real-time location of the operating fleet Travel time Headway Timetable Data of origin and destination of travel Data of accident and violation Public opinions and complaints Passenger information system Changes to operating plans; and Publication. <p>To control traffic conditions, DKI Jakarta established the Automatic Traffic Control System. ATCS connected with several CCTV located at several intersections and main roads. The community also can utilize this CCTV via the website to see real-time traffic conditions. The original idea of using ATCS is to monitor BRT and traffic conditions. However, until now, the utilization is limited to monitoring traffic conditions and responding to some trouble related to traffic.</p>	

3) Reorganization of Public Transport Project in Jakarta Metropolitan Area

The project components from (1) to (6), which are proposed in the previous section and examined based on the result of meetings with local governments, are summarized as follows: the implementation of project (5) was immature, and it should have a new approach from urban planning study. Due to its specific content and large-scale peculiarities, project (6) is considered a single project. Project components from (1) to (4) are related to each other and can be combined as one project, which has four activities as a technical cooperation project with the name of the project is Improvement of Public Transport Project in Jakarta Metropolitan Area.

(1) Background

In JUTPI Phase 2 (2017–2020), proposals were developed to improve the Jakarta metropolitan area public transport network, which focused on developing of MRT network. In the short- and medium-term, it is expected that the mass transit networks will continue within DKI Jakarta, except for commuter line and LRT lines while mass transit networks to connect surrounding municipalities will be completed after 2035. Therefore, changes in the public transport network structure in surrounding municipalities are highly required by developing trunk feeder transport that covers surrounding municipalities to connect to the nearest mass transit within Jakarta metropolitan area. Currently, there is a tendency to use private vehicles to avoid the crowd inside/outside public transport as an effect of the pandemic. Thus, at the local government level, it is important to improve minimum service standards to make good quality of public transport to recover the public's trust in public transport after the pandemic. Furthermore, transit centers such as bus terminals in DKI Jakarta, do not comply with the Standard Operational Procedure (SOP). The issue of improvement of SOP compliance has been pointed out not only by local governments but also by DKI Jakarta. The SOP must be obeyed by the bus operators to regain people's willingness to use public transport.

The role of governments is important for this project. Thus, this project is also targeted to strengthen the capacity of the Greater Jakarta Transportation Authority (BPTJ) and each local government to improve public transport planning and management and coordinate among stakeholders to respond comprehensively to the abovementioned issues.

(2) Implementation System

The executing agency is as follows.

- Ministry of Economic Affairs (CMEA): Responsible for coordinating and implementing formulas, plans, and policies between central and local governments in the economic and industrial sector.
- Greater Jakarta Transport Authority (BPTJ): An organization under the Ministry of Transport to implement and draft transport plan, policies, and regulation in Jakarta Metropolitan Area.
- Each local governments: Transportation Agency (*Dishub/Dinas Perhubungan*) of each local government, including DKI Jakarta. Some local governments establish a regional entity for public transport operators and implement public transport plans within their authorities, including regulating the operation of transport operators.

(3) Activity Contents

As a result of above-mentioned information, four activities are considered to conduct as a future project, which are :

(a) Improvement of Public Transport Mobility and Connectivity in Surrounding Municipalities

- To review the existing short- and medium-term transport network plan as well as public transport data policy.
- To consider and implement supplementary transport surveys based on the current status of transport data within each local government.
- To improve the transit nodes in terms of service and capacity.
- To propose a hierarchical public transport network system by distinguishing the trunk and branch feeder lines based on the passenger demand of each local government.
- To examine and evaluate the optimal traffic management to give priority to the trunk feeder transport.

(b) Promotion of Buy the Service Program (Ensuring the Minimum Service Standard of Public Transport)

- To analyze the current BTS implementation, including precedent cases outside Jabodetabek (including system/organization/financial status)
- To identify BTS target routes by considering the post-pandemic condition and passenger demand
- To propose an operation and monitoring plan for the BTS route (basic specifications of the system).
- To develop good coordination related to roles and functions of BPTJ and other organizations related to funding, fare collection, and proposal of business plans for public transport authorities of each local government.
- To create BTS implementation promotion guidelines.
- To implement BTS based on the proposed plan.
- To propose activities to improve the image of public transport.

(c) Improving the Management of Bus Operators and Reviewing the Type of Contract

- To analyze models (including the type of contract) and experiences related to the model transition in other cities.
- To develop an examination of model transition for public transport (intercity buses, feeder transport, etc.) in the Jakarta metropolitan area (or in specific municipalities) where the concession method or contract type is expected to be reviewed.
- To develop a contract based on six dimensions of public/private sector participation (regulation, financing, planning, ownership, operation, and maintenance), including determining the role of the government and the private sector.
- To analyze the contract details and bidding methods based on the existing condition of each route in the Jakarta metropolitan area (gross cost contract, net cost contract, etc.)

(d) Improvement of Bus Terminal Management

- To identify various problems related to bus terminal management and investigate the causes.

- To analyze the operation of bus terminal using PPP and collect information on precedent cases.
- To select pilot projects, dividing into three categories of type A and type B (type C) bus terminal.
- To enhance the capacity of BPTJ as an authority for Jakarta metropolitan area public transport management.
- To install a monitoring and control room for bus arrivals and departures at pilot projects' locations.
- To implement and evaluate pilot projects.

(4) Implementation period

Since there are various activity items and considerations to conduct knowledge and technology transfer, activities (1) and (2) are considered more effective if the implementation are based on some transport surveys. Thus, the implementation period is proposed to be three years.

6. Formulation of Cooperation Project in Yangon

6.1 Change of Urban Issues by COVID-19

Based on the analysis of Yangon, the changes of urban issues before and after COVID-19 are described below.

6.1.1 Urban Structure

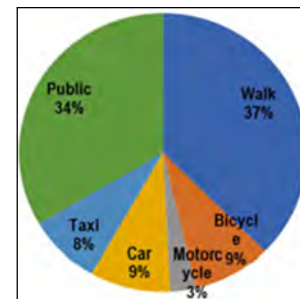
In Yangon, even before the spread of COVID-19, there was a concentration of urban functions in the CBD, and chronic traffic congestion and deterioration of the living environment were pointed out. During the COVID-19 epidemic, although there were positive impacts such as temporarily easing traffic congestion and improving air quality by the stay-at-home order and various regulatory restrictions, the lack of open space in dense residential areas made it difficult for people to live in close quarters and created a lack of opportunities for outdoor activities. In particular, under the spread of COVID-19, behavioural restrictions on certain Townships and on people's activities at the Ward level made it difficult for people to access effective open spaces for recreation, health promotion, and mental health maintenance.

Based on the above, the challenges for Post COVID-19 include reviewing the layout of public spaces such as green spaces, parks, and open spaces at the Township level, and changing the use of existing public spaces and unused land so that they can be used as open spaces.

6.1.2 Mobility

Pre-COVID-19, it was pointed that there was severe traffic congestion during the morning and evening peak hours in the CBD and on the arterial roads connecting to the major intersections of the CBD according to the project for the Strategic Urban Development Plan of Greater Yangon (SUDP). On the other hand, during the period when the Stay-at-home Order was issued, the traffic volume was drastically reduced and the chronic traffic congestion was alleviated.

In terms of road use, although two-wheeled vehicles have been banned in Yangon since 2007, the YCDC has been deregulating bicycle use, and bicycle paths have been constructed in the CBD and South Okkalapa township. The modal share of bicycles in Yangon is 9% as shown in the figure. However, various improvements need to be made in consideration of the potential increase in demand. Specifically, the development of bicycle paths and the design of a system to improve convenience can be mentioned.



Source: YUTRA (2019)

Figure 6.1.1 Modal Share in Yangon City in 2016

6.1.3 Inclusive Access

There are 423 informal settlements in Yangon City, with about 73,000 households and 400,000 residents (UN-HABITAT, 2016). Many informal settlements lack water supply, storm water drainage, and sewerage systems, and are at high risk of spread of infection. The

importance of comprehensive urban environmental improvement was pointed out in The Project for the Strategic Urban Development Plan of Greater Yangon (SUDP) even before the spread of COVID-19 and increasing under the pandemic. In the suburban areas of Yangon, where many low-income people and informal settlements are, rainwater and common reservoirs are used for household cooking and drinking water, and these areas with inadequate water sanitation are extremely vulnerable to infectious diseases.

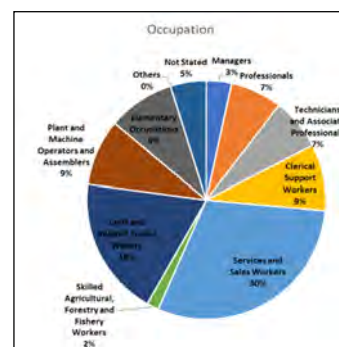
In addition, local interviews and media reports indicate that people go to semi-open-air markets to buy daily necessities at the height of the COVID-19 pandemic, implying the risk of infection in places where infrastructure and sanitation are not sufficiently developed.

As for issues related to waste disposal, the increase in infectious waste from medical facilities and general waste from households in the COVID-19 vortex has dramatically increased the risk of infection among collection and transportation workers, which has become a burden on the city. In addition, infectious wastes exceed the capacity of the Yangon Waste to Energy Plant and small batch incinerators owned by the city to handle them.

6.1.4 Urban and Socio Economics, Community

As shown in Figure 6.1.2, service and sales occupations in Yangon account for 30% of the workforce, which is the highest among all categories, and tertiary industry workers account for the majority. It is expected that COVID-19 influences on the GDP reduction by 9.8%¹. In addition, the economic impact of COVID-19 is greater on workers in poor households. UN-HABITAT's survey in informal settlements reported that 81% of the respondents reported that they had a family member who lost their job in the past 30 days, and 88% reported that the purpose of their debt in the past 30 days was to buy food (UN-HABITAT 2021). Challenges exist in providing financial support to vulnerable groups in urban areas, including residents of informal settlements.

Regarding telecommunication, it was promoted under Stay-at-Home Order, newspapers and other media reported that it is difficult to establish a home environment due to chronic poor Internet access and frequent power outages in Yangon. These are issues that have been faced even before the spread of COVID-19 infection, but in light of the acceleration of ICT use due to the prolonged response to COVID-19 and the expansion of demand for EC and courier services, there is still a high need to improve the communication network and ICT use environment to enhance the work environment.



Source: Ministry of Labour, Immigration (2017)

Figure 6.1.2 Type of Work in Yangon city

6.1.5 Changes of Urban Issues under COVID-19 Pandemic

As noted above, changes were observed in each sector as a result of COVID-19, and are

¹ According to ADB Economic indicators (released in April 2021). Subsequently, World Bank released a forecast that the economic impact of the political changes and COVID-19 would amount to an 18% decline in GDP. (released July 2021).

summarized in the table below along the five urban issues. Note that in Myanmar, the political change (from 1 February, 2021) and COVID-19 occurred at the same time, so it is difficult to analyze them separately. It should be noted that each change is related to multiple factors.

Table 6.1.1 Changes of Urban Issues in Yangon

Classification of the five agenda	Changes and issues under COVID-19 pandemic	Issues
Urban Structure	<ul style="list-style-type: none"> Lack of open space makes it difficult for people to live away from the crowds and lack of opportunities for outdoor activities. 	<ul style="list-style-type: none"> Review the layout of public spaces such as green spaces, parks, and vacant lots at the township level Need to convert existing public spaces and unused lands to new uses.
Mobility	<ul style="list-style-type: none"> Traffic congestion has temporarily eased during the restriction of Stay at Home Order and various restrictions on activities. Demand for Non-Motorized Transportation (NMT), especially bicycles in Yangon are increase. 	<ul style="list-style-type: none"> Need to design a system to improve bicycle paths and convenience.
Inclusive access	<ul style="list-style-type: none"> Poor sanitation in informal settlements has become more critical since the outbreak of the COVID-19. The risk of infection is particularly high in markets, public taps, toilets, etc., where infrastructure and sanitation are inadequate. The increase in infectious waste and household waste has become a risk and burden for collection workers, and large quantities of waste are delivered to waste incineration facilities. 	<ul style="list-style-type: none"> Improvement of sanitation in informal settlements and public facilities has become unavoidable issues after the COVID-19. Establishment of waste collection and transport systems with low risk of infection, and proper treatment and disposal of infectious waste
Urban and Socio Economics, Community (including ICT use)	<ul style="list-style-type: none"> The Stay at Home Order has resulted in a sharp decline in job opportunities and customers due to curfews and closures of commercial establishments. The economic impact has been felt most severely by workers from poor households, leading to increased unemployment. 	<ul style="list-style-type: none"> Economic support for vulnerable urban populations, including residents of informal settlements.

Source: JICA Study Team

6.2 Urban Development Program during and after Pandemic

This section of the report organizes the urban development programs based on the changes in the urban agenda described above. Firstly, it reviews the vision and direction of the urban development of Yangon in SUDP, then organizes infrastructure development and socio-economic support projects and describes the direction of urban development based on the five agendas.

6.2.1 Review of Yangon MP (SUDP) and Related Plans

The vision for the future of the Yangon metropolitan area is "Attractive International Port & Logistics HUB - A city of Blue, Green and Gold" as shown in Figure 6.2.1. The four pillars supporting the vision are: To be an International HUB City, To be a Comfortable City, To be a Well-Managed Infrastructure City, and To be a City of Good Governance.

Since the SUDP 2013, which has been updated and each priority program monitored in 2018 and 2021, the planning areas related to urban development are specifically listed in Table 6.2.1.



Source: SUDP (2013)

Figure 6.2.1 Vision of Yangon MP (SUDP)

Table 6.2.1 Planning Areas of Urban Development Listed in Yangon MP (SUDP)

Planning Area	Direction of urban planning development and methodology
City center	<ul style="list-style-type: none"> • Plan of Secondary CBD in Mindama area • Form 4 sub-centers within 10–20 km of the existing CBD to promote decentralization of urban functions
New town	<ul style="list-style-type: none"> • Development of three New City Cores
Railway station area development	<ul style="list-style-type: none"> • Promotion of TOD development around seven stations to break away from dependence on automobiles and relieve traffic congestion

Planning Area	Direction of urban planning development and methodology
Industrial Park	<ul style="list-style-type: none"> Development of an industrial park and the SEZs of approximately 8,400 ha to boost manufacturing and industry (e.g., Thilawa SEZ, Hlaing Tharyar, and Shwe Pyi Thar)
Housing	<ul style="list-style-type: none"> Supply of affordable housing for low-income families (especially around the Yangon side, where there are many informal settlements) Job security in relocated areas
Urban landscape and traditional buildings	<ul style="list-style-type: none"> Preservation of traditional architecture in the CBD Creation and management of guidelines incorporating prohibitions and regulations
Urban parks and green spaces	<ul style="list-style-type: none"> New park construction in the development area New park construction in CBD
Water supply and sewerage	<ul style="list-style-type: none"> Improvement and expansion of water supply to achieve the 73% coverage Capacity building for the reduction of non-revenue water (NRW) and achievement of a 15% NRW rate Improvement of sewerage as well as its expansion to non-service area Expansion of sewerage service network to Kyeemyindaing, East Dagon, and New Dala area
Urban sanitation and environment	<ul style="list-style-type: none"> Introduction of waste treatment facilities in line with Yangon Solid Waste Management Master Plan Adequate management of industrial and hazardous wastes Promotion of "Reduce, Reuse, Recycle" or 3 Rs and encourage participation among government, private and civil society
Social services	<ul style="list-style-type: none"> Provide equal education, sanitary living conditions, employment, and mobility opportunities

Source: Summarized by JICA Study Team based on SUDP (2013)

A summary of transportation-related plans is also included in the Comprehensive Urban Transport Plan of the Greater Yangon (YUTRA), which is a transportation MP. YUTRA has been updated, and each program has been monitored since 2014 and 2019. It specifically includes road maintenance, highways, public transport (buses), traffic management and road safety, railroads, inland water transport, logistics, ICT, TOD, and organizational systems.

6.2.2 Overview of Related Plans based on Urban Issues under COVID-19 Pandemic

Based on the urban issues under COVID-19 pandemic, priority projects in SUDP relevant to the five agendas of this study are identified and organized, as shown in the table below.

Table 6.2.2 SUDP's Priority Projects and Its Relationship to Five Agendas

Priority Projects in SUDP	Project Scope	Relationship to Five Agendas
<input type="checkbox"/> Project in CBD		
<ul style="list-style-type: none"> 10 projects in CBD Sule Pagoda and Environs Project/Bank Street Project /Kanner (Strand) Road Project Waterfront Project Circular Railway Multi-modal Facility Development Project Thein Phyu Multi-modal Facility Development Project Road Pricing and Parking System Establishment Project/ Bus System Improvement Project /Car Parking under Parks Project 	<input type="checkbox"/> No remark in SUDP	<input type="checkbox"/> Inclusive/ Universal Access <ul style="list-style-type: none"> ➤ Securing and maintaining sidewalk space and improving the management and environment of hawker stores (sanitation considerations) <input type="checkbox"/> Urban and Socio-Economics, Community <ul style="list-style-type: none"> ➤ Mobility ➤ Reduce on-street parking, install

Priority Projects in SUDP	Project Scope	Relationship to Five Agendas
<ul style="list-style-type: none"> Yangon Heritage Strategy Implementation Project 		<ul style="list-style-type: none"> underground parking, smart parking <input type="checkbox"/> Improvement of bus services
<input type="checkbox"/> Project for Yangon City		
<ul style="list-style-type: none"> Urban Poor Assistance Project 	<ul style="list-style-type: none"> <input type="checkbox"/> Survey on the existing living condition, education, and health status of poverty group. <input type="checkbox"/> Promotion of human development programs. <input type="checkbox"/> Supporting home-based income-generating activities. <input type="checkbox"/> Implementation of micro-finance scheme. <input type="checkbox"/> Support system to connect the urban services, etc. 	<ul style="list-style-type: none"> <input type="checkbox"/> Inclusive/ Universal Access <ul style="list-style-type: none"> ➢ Survey for urban vulnerable people (collaboration with UN-HABITAT survey) ➢ Human resource development programs, microfinance schemes
<ul style="list-style-type: none"> Financing Low-cost Urban Housing Program 	<ul style="list-style-type: none"> <input type="checkbox"/> Establishment of a revolving fund for long-term housing loans at low interest rates under CHDB. <input type="checkbox"/> Capital injection to CHDB in a form of "Two-Step Loan" financed by concessional loans in order to provide housing loans of long-term and low interest rates. <input type="checkbox"/> Capacity development for CHDB in lending management of loans and financial management of a revolving fund. <input type="checkbox"/> Technical cooperation for Department of Urban & Housing Development (DUHD) to improve the rules and regulations, including "Condominium Law," allowing "collective property right" to expand the scope of target population for housing loans. 	<ul style="list-style-type: none"> <input type="checkbox"/> Urban structure, Inclusive/ Universal Access <ul style="list-style-type: none"> ➢ Formulation of the guideline for implementation, Improvement of capacity of MDB and DUHD
<ul style="list-style-type: none"> New Parks Construction Project 	<ul style="list-style-type: none"> <input type="checkbox"/> Conduct of a survey and F/S of a suitable site for new public parks in new development areas to be developed. <input type="checkbox"/> Conduct of land reclamation by making a pond to supply soil. <input type="checkbox"/> Harmonization of the development with the natural environment. <input type="checkbox"/> Development of basic infrastructures, and construction of pedestrians' path and wood deck. <input type="checkbox"/> Provision of park equipment (playground equipment, benches, small arbors, toilets, lightings, signboards, etc.). 	<ul style="list-style-type: none"> <input type="checkbox"/> Urban and Socio Economics, Community <ul style="list-style-type: none"> ➢ Consideration on the participatory management method

Priority Projects in SUDP	Project Scope	Relationship to Five Agendas
	<ul style="list-style-type: none"> <input type="checkbox"/> Planting of large trees to provide shady spaces at the parks. <input type="checkbox"/> Conduct of a capacity development for management of public parks. 	
<ul style="list-style-type: none"> • Kokkowa WTP and Transmission /Distribution Pipeline Construction Project 	<ul style="list-style-type: none"> <input type="checkbox"/> Construction of Kokkowa WTP together with Supervisory Control and Data Acquisition (SCADA) <input type="checkbox"/> Construction of new WTP (60 MGD) <input type="checkbox"/> Civil work (landfill) for WTP <input type="checkbox"/> Construction of Intake pump facilities from Kokkowa river and conduct pipeline <input type="checkbox"/> Construction of transmission/ distribution pipeline 	<ul style="list-style-type: none"> <input type="checkbox"/> Inclusive/ Universal Access ➤ Construction of Kokkowa WTP, etc.
<ul style="list-style-type: none"> • Zone 1 Distribution Pipe Network Renewal Project • Zone 9 Distribution Pipe Network Renewal Project 	<ul style="list-style-type: none"> <input type="checkbox"/> Renewal of distribution pipe network <input type="checkbox"/> Rehabilitation of the existing reservoirs <input type="checkbox"/> Installation of the distribution pumps for higher area etc. 	<ul style="list-style-type: none"> <input type="checkbox"/> Inclusive/ Universal Access
<ul style="list-style-type: none"> • CBD Sewerage System Improvement Project • W1 Sewerage System Improvement Project 	<ul style="list-style-type: none"> <input type="checkbox"/> Creation of a clean environment <input type="checkbox"/> To improve existing/ develop sewerage collecting system <input type="checkbox"/> To expend/develop of the existing WWTP 	<ul style="list-style-type: none"> <input type="checkbox"/> Inclusive/ Universal Access, Urban administration
<ul style="list-style-type: none"> • Drainage Improvement Project 	<ul style="list-style-type: none"> <input type="checkbox"/> Improvement of creeks in the priority area of CBD Zone and other three creeks such as the Thamine Creek, Thebyu, Kyaikkasan Creek <input type="checkbox"/> Construction of rainwater storage facilities and pumping stations. <input type="checkbox"/> Procurement of maintenance machineries for rainwater storage structures. <input type="checkbox"/> To develop capacity of Department of Road and Bridge staffs for O&M of drainage facilities. Etc. 	<ul style="list-style-type: none"> <input type="checkbox"/> Inclusive/ Universal Access
<ul style="list-style-type: none"> • Collection Equipment Supply for SWM Project • Existing FDSs Improvement Project • Waste to Energy Promotion Project • Hazardous Waste Management Improvement Project 	<ul style="list-style-type: none"> <input type="checkbox"/> Procurement of waste vehicle and maintenance too enhance waste collection and transportation capacity <input type="checkbox"/> Construction of sanitary landfill and procure necessary equipment for landfill management <input type="checkbox"/> Construction of an incinerator for hazardous waste treatment as a pilot project and procurement of necessary tools 	<ul style="list-style-type: none"> <input type="checkbox"/> Inclusive/ Universal Access

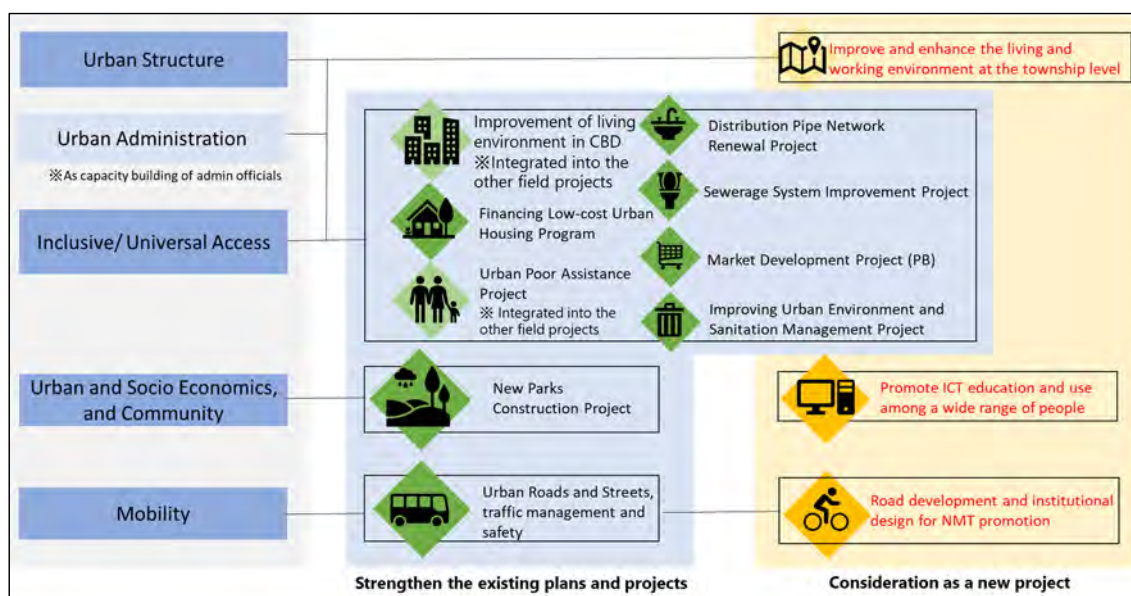
Source: JICA Study Team

6.2.3 Direction of Urban Development based on New Neighborhood and 5 Agenda

In organizing the direction of urban development, the report summarizes the concept of New Neighborhood in Yangon. In the overall study of this project, the New Neighborhood is positioned as a space where the urban structure is reorganized from a mono-centralized structure to a decentralized and coordinated structure, and where the socio-economic response to further outbreaks of infectious diseases is strengthened in a socially and economically self-reliant living area. In Yangon City, the political change and pandemic had large impacts to the society. Townships issued stay-at-home order were forced semi-lockdown during the COVID-19 pandemic, and people's activities were reduced and reorganized, especially at the ward level, which is the administrative unit below the township level. Moreover, the political upheaval called Civil Disobedience Movement (CDM) led to the disorganization of government offices. Under these circumstances, there is difficulty to investigate the possibility of collaboration between the community and the administration and the further urban management. Hence, the survey team decided not to conduct a study on the state of the New Neighborhood.

Therefore, the direction of urban development with COVID-19 and post-COVID-19 in Yangon City has been organized in Figure 6.2.2 by applying the project areas organized in the previous section to the five agendas. The improvement and enhancement of the living and working environment at the township level, which is the urban administration, is not proposed as a stand-alone program, but rather as a program to be incorporated into other programs proposed in other areas of the city.

Then, as a combined approach on 1) urban structure, 2) urban administration, and 3) inclusive/ universal access, programs such as environmental improvement of CBD, provision of low-income housing, assistance to urban vulnerable people, water and sewerage improvement, and market redevelopment are considered. In terms of 4) urban and socio economics, community, new park development, ICT education and promotion, and road improvement and system building programs to improve roads and transportation environment to promote NMT will be positioned. In proposing specific programs along the five agendas, it is effective to add proposed scope toward With COVID-19/ Post COVID-19 in areas that have already been positioned in SUDP. For those programs not identified in priority projects in SUDP, JICA Study Team proposes new projects. For programs that are already positioned as priority projects in SUDP, the nine items are listed as shown in Table 6.2.3.



Source: JICA Study Team

Figure 6.2.2 Direction of Proposed Program toward With COVID-19/ Post COVID-19


Table 6.2.3 Projects listed in SUDP


Five Agendas	Project Name (Provisional)
Urban Structure	N.A.*
Mobility	Urban roads and streets improvement, traffic management and safety
	Acceleration of Non-Motorized Transportation in the city
Inclusive/ Universal Access	Financing Low-cost Urban Housing Program
	Distribution Pipe Network Renewal Project
	Sewerage System Improvement Project
	Market Development Project
Urban and Socio Economics, Community (including ICT use)	Improving Urban Environment and Sanitation Management Project
	New Parks Construction Project
	Improvement of ICT system and expansion of e-service


*Note: Regarding urban spatial structure, the development of the 2nd CBD and sub-center development projects are listed in the SUDP, however they are led by the private sector and government does not directly control.

Source: JICA Study Team

Based on each of the above programs, a long list of specific priority projects (summarized in Figure 6.2.3) would be developed. The same contents were also discussed with the JICA Myanmar office during the study period, and the cooperation projects were identified.

Project on inclusive/ universal access (1)	
• Project name	<input type="checkbox"/> Financing Low-cost Urban Housing Program 
• Background and importance toward post COVID-19	<input type="checkbox"/> The spread of COVID-19 has increased the need for infrastructure improvement in informal settlements and new housing to eliminate urban issues in high-density living areas in Yangon City.
• Existing plan	<input type="checkbox"/> Proposed in SUDP (SUDP Priority Project)
• Expected activities	<input type="checkbox"/> Prepare the guidelines for implementation and capacity building of Myanmar Economic Bank (MEB) and DUHD for management <input type="checkbox"/> Facilitate the capacity building and support the implementation of the planned low-cost housing <input type="checkbox"/> Utilize low-cost housing as a shelter for the homeless
• Counter parts (provisional)	<input type="checkbox"/> Project owner: Ministry of Construction <input type="checkbox"/> Implementing agencies: Department of Urban & Housing Development (DUHD) & JICA <input type="checkbox"/> Main sector: Urban Development <input type="checkbox"/> Sector-2: Housing
※ Items in blue are not in the existing plan and are proposed in this study	

Project on inclusive/ universal access (2)	
• Project name	<input type="checkbox"/> Distribution Pipe Network Renewal Project 
• Background and importance toward post COVID-19	<input type="checkbox"/> The spread of COVID-19 has increased the water supply demand for sanitation improvement, including handwashing facilities.
• Existing plan	<input type="checkbox"/> Proposed in SUDP (SUDP Priority Project) <input type="checkbox"/> Undergoing
• Expected activities	<input type="checkbox"/> Renew water supply and distribution pipeline network and improve distribution reservoirs <input type="checkbox"/> Install drainage management areas (30 locations) and water distribution pumps for high areas <input type="checkbox"/> Install hand washing facilities in informal settlements
• Counter parts (provisional)	<input type="checkbox"/> Project owner: Yangon City Development Committee (YCDC) <input type="checkbox"/> Implementing agencies: Yangon City Development Committee (YCDC) <input type="checkbox"/> Main sector: Urban Development <input type="checkbox"/> Sector-2: Public Park & Green
※ Items in blue are not in the existing plan and are proposed in this study	

Project on inclusive/ universal access (3)	
• Project name	<input type="checkbox"/> Sewerage System Improvement Project 
• Background and importance toward post COVID-19	<input type="checkbox"/> In addition to the undergoing sewerage system improvement for the CBD and W1 area, the installation of the sewerage system for the entire Yangon City is required
• Existing plan	<input type="checkbox"/> Proposed in SUDP (SUDP Priority Project) <input type="checkbox"/> Undergoing
• Expected activities	<input type="checkbox"/> Improvement of sewage pipe network <input type="checkbox"/> Construction, improvement and expansion of sewage treatment plants <input type="checkbox"/> Improvement of storm drainage systems
• Counter parts (provisional)	<input type="checkbox"/> Project owner: Yangon City Development Committee (YCDC) <input type="checkbox"/> Implementing agencies: YCDC and JICA <input type="checkbox"/> Main sector: Infrastructure/Utilities Development <input type="checkbox"/> Sector-2: Sewerage

Project on inclusive/ universal access (4)

- Project name Market Development Project 
- Background and importance toward post COVID-19 The market was reported as a cluster area of infection, and the improvement of the aging infrastructure of facilities is required.
- Existing plan Proposed by YCDC (Project Bank)
- Expected activities Redevelop existing public markets and infrastructure.
 Assess existing public markets and strengthen the management structure of YCDC.
- Counter parts (provisional) Project owner: Yangon City Development Committee (YCDC)
 Implementing agencies: Market Department
 Main sector: Urban Development
 Sector-2: Commercial/Market


※ Items in blue are not in the existing plan and are proposed in this study

Project on inclusive/ universal access (5)

- Project name The Project for Improving Urban Environment and Sanitation Management in Yangon City, Myanmar 
- Background and importance toward post COVID-19 The role of urban sanitation in preventing the spread of infectious diseases, such as COVID-19, has been widely acknowledged by the public.
- Existing plan The increase in waste collection coverage is described in the Solid Waste Management Master Plan for Yangon City (Draft)
 In addition to the expansion of sewerage coverage prioritized in the SUDP, the improvement on onsite sanitation facilities can create a synergy in improving a overall urban sanitation in Yangon City
- Expected activities Expand and improve waste collection and transportation service coverage within the boundary of YCDC administration (33 townships)
 Improve public/community hygiene by diminishing environmental pollution in water and soil caused by improper management of onsite sanitation facilities outside the Yangon City CBD
- Counter parts (provisional) Project owner: Yangon City Development Committee
 Implementing agencies: Urban Environmental Conservation and Cleaning Department (UECCD), Water and Sanitation Department (WSD), and YCDC
 Main sectors: Urban Sanitation, Solid Waste Management

※ Items in blue are not in the existing plan and are proposed in this study

Project on urban and socio economics, and community

- Project name New Parks Construction Project 
- Background and importance toward post COVID-19 With the semi-lockdowns severely limiting urban activities, the demand for parks for urban health care and recreation is increasing.
- Existing plan Proposed by Yangon Region Government (Project Bank)
- Expected activities Review the layout of parks and related facilities in the township units
 Develop basic infrastructure and construct pedestrian paths, wooden decks, and landscaping
 Implement capacity building for park management
- Counter parts (provisional) Project owner: Yangon City Development Committee
 Implementing agencies: Playgrounds, Park & Garden Department (YCDC)
 Main sector: Urban Development
 Sector-2: Public Park & Green

※ Items in blue are not in the existing plan and are proposed in this study

Project on mobility (1)	
• Project name	<input type="checkbox"/> Urban roads and streets improvement, traffic management and safety
• Background and importance toward post COVID-19	<input type="checkbox"/> Restrictions on urban activities under semi-lockdown have increased the need for road maintenance and safety at the township level
• Existing plan	<input type="checkbox"/> Proposed in YUTRA
• Expected activities	<input type="checkbox"/> Road management and improvement <input type="checkbox"/> Eliminate bottlenecks and missing links <input type="checkbox"/> Improve walking environment <input type="checkbox"/> Improve traffic control center management and intersections, etc. <input type="checkbox"/> Enforce and educate on traffic safety, including accident database, and post-accident measures <input type="checkbox"/> Parking management
• Counter parts (provisional)	<input type="checkbox"/> Project owner: Yangon Regional Government (YRG) <input type="checkbox"/> Implementing agencies: Yangon City Development Committee (YCDC) <input type="checkbox"/> Main sector: Urban Development <input type="checkbox"/> Sector-2: Roads
Project on mobility (2)	
• Project name	<input type="checkbox"/> Acceleration of Non-Motorized Transportation in the city (new topic)
• Background and importance toward post COVID-19	<input type="checkbox"/> Demand for NMT implementation is increasing due to the changes in traffic policy in Yangon under the semi-lockdown and spread of COVID-19.
• Existing plan	<input type="checkbox"/> N.A.
• Expected activities	<input type="checkbox"/> Review existing transportation plans, laws, and institutions for NMT introduction <input type="checkbox"/> Plan and design priority areas and capacity building of relevant agencies
• Counter parts (provisional)	<input type="checkbox"/> Project owner: Yangon Regional Government (YRG) <input type="checkbox"/> Implementing agencies: Yangon City Development Committee (YCDC) <input type="checkbox"/> Main sector: Urban Development <input type="checkbox"/> Sector-2: Roads
※ Items in blue are not in the existing plan and are proposed in this study	
Urban administration, urban and Socio Economics, and Community (including telecommunication/ICT)	
• Project name	<input type="checkbox"/> ICT
• Background and importance toward post COVID-19	<input type="checkbox"/> In response to the semi-lockdown, the necessity of teleworking heightened the trend toward strengthening communication networks and accelerating ICT use even since before the spread of COVID-19. The communication environment and other related services must be improved.
• Existing plan	<input type="checkbox"/> N.A.
• Expected activities	<input type="checkbox"/> Develop high-speed and highly reliable information and telecommunications network <input type="checkbox"/> Enhance e-government, e-education, and various services that use information and telecommunications network (include vulnerable groups in the support targets)
• Counter parts (provisional)	<input type="checkbox"/> Project owner: Yangon Regional Government (YRG) <input type="checkbox"/> Implementing agencies: Ministry of Transport and Communications*, University of Computer Studies Yangon <input type="checkbox"/> Main sector-1: Information Technology and Cyber Security Department <input type="checkbox"/> Main sector-2: Information Technology and Cyber Security Department *Under structural plan in Myanmar as of August 2021. Formally, it was under the Ministry of Communications and Information Technology in NLD government.

Source: Summarized by JICA Study Team based on SUDP (2021) and Yangon Project Bank (2019)

Figure 6.2.3 Candidate for Priority Projects

6.2.4 Proposed Urban Development Program

The status of the urban sanitation sector in Yangon City and the ongoing water supply and sewerage projects are described further below, and new two projects as future potential projects are proposed.

1) Water and Sewerage Sector

Current Status of Urban Sanitation Sector in Yangon City

The urban planning studies titled “The Project for the Strategic Urban Development Plan of the Greater (SUDP)” and “The Project for Updating the Strategic Urban Development Plan of the Greater Yangon (SUDP2)” were conducted in 2013 and 2017, respectively, by JICA and YCDC.

For the urban sanitation sector, the water supply and sewerage and drainage master plan in Yangon City with the target year of 2040 was developed by JICA and YCDC in 2014 in the study “Preparatory Survey on the Project for the Improvement of Water Supply, Sewerage and Drainage System in Yangon City.”

Developing the water supply and sewerage system in Yangon City is being conducted in line with the said master plan. Furthermore, the draft guidelines for regulation and approval procedure of development activity in Yangon City are being drafted by JICA and YCDC.

Water Supply Development

In line with the said water supply master plan, Greater Yangon Water Supply Improvement Project (Phase-1) was implemented from 2014 to 2020 with the financial support of a yen loan. It constructed water supply facilities, such as water treatment plants, water transmission and distribution facilities, water meters, and chlorination facilities.

Following Phase-1, the Phase-2 project was formulated in 2017 and implemented in 2018. The water supply facilities sourced from Kokkowa River will be constructed, and the water supply network will be expanded in Yangon City by the Phase-2 project. In addition, the construction of a new raw water conveyance pipeline from the existing water source using ADB funding was planned in 2019 with technical assistance from ADB. The construction project is currently under preparation.

In addition to the construction project, JICA has implemented the technical assistance project for technology transfer to YCDC from 2015 to 2021. It aimed to strengthen the management capacity of YCDC in improving the water supply service. Furthermore, YCDC is exploring, with technical and financial assistance from JICA and IFC, the possibility of expanding and operating the water supply facility through a PPP scheme.

Sewerage Development

In 2019, JICA conducted the project preparation study for “Yangon Sewerage System Development Project,” which focused on the CBD. The Loan Agreement (L/A) of the project was signed in January 2020. The construction of a wastewater treatment plant and sewer will be implemented with the financial support of a yen loan.

Proposed New Project

In parallel with the sewerage development project, the implementation of the technical assistance project for strengthening the YCDC’s management capacity of sewerage service is proposed. The technical assistance project was proposed to include:

- establishing the operation and maintenance organization of sewerage work,
- establishing a monitoring system of wastewater for assessing the epidemic of infectious diseases, and
- establishing an efficient sewerage service system using ICT.

2) Urban sanitation and hygiene

On-site sanitation facility management improvements (water and sanitation sector assistance)

It is known that many onsite sanitation facilities in Yangon are not regularly emptied, and the tanks often overflow in the event of a flood. Consequently, wastewater would be discharged into open channels, which can cause great public hygiene risk.

While various types of assistance for sewerage system expansion have been provided, as previously mentioned, there has been almost none on improving the management of onsite sanitation facilities. Water and Sanitation Department (WSD) in Yangon has services for sludge withdrawal services and Septic Tank installation with limited personnel and resources.

Urban waste management

Regarding municipal waste management, improvements should be made to realize efficient collection and transportation, proper intermediate treatment, and sustainable final disposal. Although providing these waste management services is a responsibility of the local authority in Yangon City, regular waste collection is not provided in informal settlements.

In addition, given the estimated waste collection rate of 89%² within the jurisdiction of Yangon City (33 townships), most of this collected waste is directly disposed of without effective reduction and intermediate treatment, and the existing final disposal sites (four sites) have a remaining lifespan of only 2–5 years.

Furthermore, the importance of the regular collection, transport, and proper intermediate treatment of waste in the COVID-19 has been well recognized by Urban Environmental Conservation and Cleaning Department (UECCD) in Yangon City.

As the expert in this field, the Ministry of the Environment and JICA have various studies on introducing waste incineration power generation facilities and supporting the formulation of a waste management master plan for Yangon City.

Necessity of inclusive urban sanitation and hygiene management

Given the above background, a candidate priority project, "Capacity Building for Strengthening Collection and Transportation of Waste, Including Infectious Waste, Treatment Systems and Management of On-site Sanitation Facilities to Improve Urban Sanitation," is proposed.

² YCDC

6.3 Cooperation Project Formulation

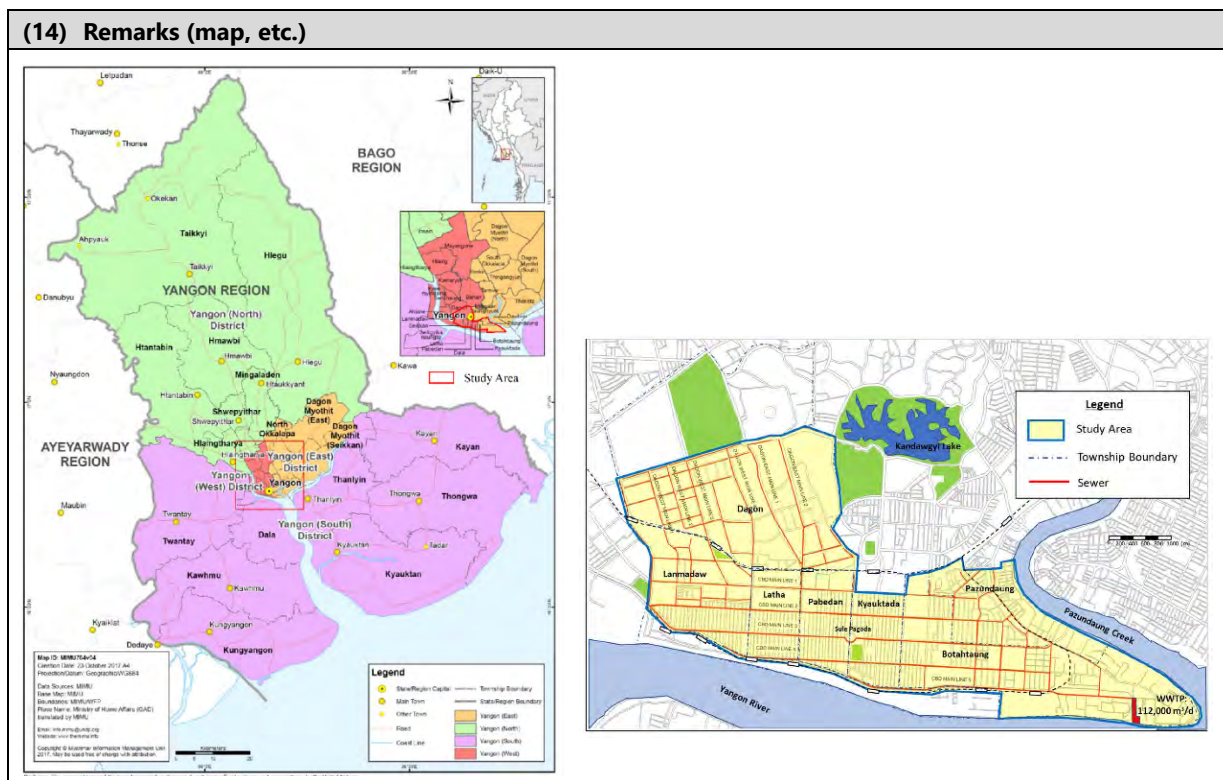
For the project formulation of the cooperation project, the draft programs for strengthening the capacity of sewerage service of YCDC and improving the urban environment and sanitation management are prepared in the following tables.

Table 6.3.1 Proposed New Project for Sewerage Sector

(1) Project No.	(2) Country/City	(3) Sector		
Yan-01	Myanmar / Yangon	Sewerage/Sanitation		
(4) Project Name				
The Project for Strengthening Capacity of Sewerage Service of YCDC				
(5) Counterpart Agency		(6) Relevant Agency		
YCDC		Urban and Housing Development Department, Ministry of Construction		
(7) Project Scheme/ Budgeting sources		(8) Project Period		
Technical Assistance/JICA Grant		-		
		Emergency	Short-term	Mid- long
				○
(9) Background (including relevance to CUREIP Output)				
<p>There is no sewerage system in Yangon City (with an area of 829 km² and a population of 5.2 million). Untreated wastewater is being discharged to the river, pond, or drainage canal. During the rainy season, the wastewater, including night soil, overflows in the city area, degrading the sanitary environment of the city.</p> <p>In 2014, a master plan for water supply and sewerage system with the target year of 2040 was formulated with the assistance of JICA. In line with the master plan, a sewerage development project was initiated in 2020 with the financial assistance of a JICA loan. The project area is mainly in the central business district with an area of approximately 10 km². The wastewater is planned to be collected by a separate sewer system and transported to the sewerage treatment plant with a planned capacity of 102,000 m³/day.</p> <p>For securing the proper operations of the sewerage system constructed by the project and “inclusive access” to the sewerage service for the citizens in the project area, strengthening the capacity of YCDC on sewerage service management is required.</p>				
(10) Project Outline				
Objectives	Strengthening the capacity of YCDC for sewerage service management			
Project Location	Yangon City			
Type of Project	<input type="checkbox"/> Construction <input type="radio"/> Technical Assistance <input type="checkbox"/> Basic Survey <input type="checkbox"/> Operation and Maintenance			
Expected outcome of the Project	<ul style="list-style-type: none"> ➤ Organizational and institutional setup for development and management of sewerage system ➤ Capacity development for operation and maintenance of the sewage treatment plant ➤ Capacity development for operation and maintenance of sewage collection facility as well as promoting the property connections ➤ Capacity development of financial management of sewerage service operation 			
Project Cost (estimated)	JPY1,215 million (45 MM/year × 6 years × JPY4.5 million/MM)			
Implementation Period	6 years			
(11) Planned Output of the Project				
	<ul style="list-style-type: none"> - Organizational and institutional setup for the development and management of the sewerage system <ul style="list-style-type: none"> ➤ Organization development plan for the management of sewerage system 			

	<ul style="list-style-type: none"> ➤ Institutional development plan for the management of sewerage system ➤ Long-term plan for sewerage development in Yangon City ➤ Promoting public awareness for sewerage development - Capacity development for operation and maintenance of the sewage treatment plant <ul style="list-style-type: none"> ➤ Workshop/seminar for operation and maintenance of sewage treatment plant ➤ Conducting OJT using operation and maintenance manual of sewage treatment plant developed in the JICA loan project ➤ Establishing water quality standards for the discharged wastewater from specified users to the sewerage system, as well as conducting OJT for water quality monitoring ➤ Study for effective use of sewage sludge - Capacity development for operation and maintenance of sewage collection facility as well as promoting the property connection <ul style="list-style-type: none"> ➤ Workshop/Seminar for operation and maintenance of sewage collection facilities ➤ Developing the operation and maintenance manual of sewage collection facilities and conducting OJT using the manual ➤ Pilot project for property connection to the sewer ➤ Developing a facility ledger for sewerage management - Capacity development of financial management of sewerage service operation <ul style="list-style-type: none"> ➤ Workshop/Seminar for the financial management of sewerage service operation ➤ Developing sewerage tariff structure and connection fee ➤ Establishing sewerage tariff collection system ➤ Developing mid-term business plan for sewerage service operation
(12) Necessary Input from Counterpart	
	<ul style="list-style-type: none"> ➤ Organization setup for the sewerage management section in YCDC ➤ Appointing counterpart staff in the sewerage management section ➤ Logistic arrangement/support for the project activity ➤ Providing necessary data/information for the project activity ➤ Procuring equipment/facilities other than the JICA Loan Project
(13) Relevant Projects	
	<ul style="list-style-type: none"> - The Project for the Improvement of Water Supply, Sewerage & Drainage System in Yangon (2014) - Data Collection Survey for Sewerage System Development in Yangon (2019) - The Project for Improvement of Water Supply Management of YCDC (2021)

(14) Remarks (map, etc.)



Source: JICA Study Team

Table 6.3.2 Proposed New Project for Urban Sanitation and Hygiene Sector

(1) Project No.	(2) Country/City	(3) Sector		
Yan-02	Myanmar / Yangon	Sanitation/ Solid Waste Management		
(4) Project Name				
The Project for Improving Urban Environment and Sanitation Management in Yangon City, Myanmar				
(5) Counterpart Agency		(6) Relevant Agency		
YCDC		UECCD WSD		
(7) Project Scheme/ Budgeting sources		(8) Project Period		
Technical Assistance/JICA Grant		-		
○				
(9) Background (including relevance to CUREIP Output)				
<p>Yangon Region, the commercial hub of Myanmar with a population of 5.2 million, has been going through rapid economic and social development for the past decade. As such development takes place drastically, urban issues such as water and sanitation and waste management are becoming the unavoidable urgent agendas for the city.</p> <p>It is estimated that municipal solid waste generation volume in Yangon is approximately 2,500 tons per day, and it is expected to rise by around 14,000 tons per day between 2018 and 2040. Although YCDC provides basic waste management services, several difficulties are being faced, such as insufficient waste segregation and inefficient waste collection and transportation, absence of large-scale waste treatment, and open dumping without soil covering. The outbreak of the COVID-19 (in 2020) has further deteriorated the situation and put an extra burden on waste management operations, making smooth waste collection and transportation difficult.</p> <p>The Project for Sustainable Planning and Improvement of Solid Waste Management, launched in 2019 by JICA, assists YCDC in formulating the first comprehensive master plan for municipal solid waste management in Myanmar. Alongside the above project, there is still a crucial need to improve the present waste management system with the development of the capacity of YCDC. In this sense, it is proposed to enhance the capacity of waste collection and transportation services, emphasizing collection efficiency and safe transportation of healthcare waste.</p> <p>As well as solid waste, the management of wastewater and sludge remains a severe challenge for many households in Yangon as the current sewerage only covers six townships in the CBD, and the rest is treated by sanitation</p>				

facilities, namely septic tanks and cesspools, or otherwise no treatment facility. While onsite sanitation facilities play a great role in treating wastewater, particularly blackwater, several studies indicate the facilities are usually not regularly maintained unless a problem occurs, and consequently, overflow contaminates soil, surface, and groundwater. One of the critical issues is that those onsite facilities are not regularly emptied and accumulate sludge, often causing malfunctions. Proper maintenance of onsite sanitation facilities is necessary not only in terms of urban sanitation but also to prevent the transmission of infectious diseases, including COVID-19 or waterborne diseases. As the management of onsite sanitation facilities is under the supervision of Water and Sanitation Department of YCDC Engineering Department, it is proposed to strengthen the capacity of the authority with a particular focus on improving sludge emptying and supervision of facilities.

(10) Project Outline

Objectives	(1) Improve the capacity of YCDC for enhancing solid waste management service, particularly waste collection and transportation (2) Improve the capacity of YCDCC for service provision for onsite sanitation facilities
Project Location	Yangon City Boundary (33 townships)
Type of Project	() Construction (○) Technical Assistance () Basic Survey () Operation and Maintenance
Expected outcome of the Project	<ul style="list-style-type: none"> ➤ Waste collection and transportation services by YCDC is streamlined and efficiently conducted ➤ Waste collection coverage is reasonably extended to the socially vulnerable population and those not currently served with collection service ➤ The existing onsite sanitation facilities outside the CBD areas are regularly monitored, emptied, and managed under the responsibility of YCDC ➤ Internal coordination between UECCD and WSD is enhanced and promoted for integrated management of urban sanitation
Project Cost (estimated)	JPY247.5 million (25MM/year × 3 years × JPY3.3 million/MM)
Implementation Period	3 years

(11) Planned Output of the Project

	<ul style="list-style-type: none"> - Waste collection and transportation services by YCDC is streamlined and efficiently conducted <ul style="list-style-type: none"> ➤ Establishing an efficient waste collection and transportation systems with an allocation of reasonable personal and technical resources ➤ Establishing an adequate collection system for healthcare waste, including infectious waste from healthcare facilities ➤ Developing a maintenance and procurement plan in line with the YCDC Solid Waste Management Master Plan - Waste collection coverage is reasonably extended to the socially vulnerable population and those not currently served with collection service <ul style="list-style-type: none"> ➤ Expanding waste collection service to those not served, especially informal settlements ➤ Necessary training program, such as waste segregation at source and proper disposal, by a service provider - The existing onsite sanitation facilities outside the CBD areas are regularly monitored, emptied, and managed under the responsibility of YCDC <ul style="list-style-type: none"> ➤ Regular monitoring of onsite sanitation facilities is conducted by YCDC with necessary onsite technical support ➤ Improving organizational setting to enable the above service: resource allocation, technical training, and reasonable price setting for emptying service ➤ Necessary guidance is provided by YCDC for the users on the management of onsite sanitation facilities - Internal coordination between UECCD and WSD is enhanced and promoted for
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	<p>integrated management of urban sanitation</p> <ul style="list-style-type: none"> ➤ Knowledge and know-how sharing is promoted between UECCD and WSD for the integrated management of sludge and waste
(12) Necessary Input from Counterpart	
<ul style="list-style-type: none"> ➤ Appointment of counterpart staff in UECCD and WSD respectively ➤ Logistics arrangement/support for the project activity ➤ Providing necessary data/information for the project activity ➤ Organizational setting necessary and allocation of staff with engineering background 	
(13) Relevant Projects	
<ul style="list-style-type: none"> - The Project for Sustainable Planning and Improvement of Solid Waste Management for Yangon City(2019-2022) - The Project for the Improvement of Water Supply, Sewerage & Drainage System in Yangon (2014) - Data Collection Survey for Sewerage System Development in Yangon (2019) 	
(14) Remarks (map, etc.)	
33 townships under the YCDC administration boundary to be covered by the scope of this project	

Source: JICA Study Team

**Table 6.3.3 Draft Project Paper
(The Project for Strengthening Capacity of Sewerage Service of YCDC)**

Country	Myanmar	Sector	Infrastructure
Development Issue	Water Resources Urban/Rural development	Program No.	

	Category	<input checked="" type="checkbox"/> Project Type Technical Assistance <input type="checkbox"/> After care of Technical Assistance <input type="checkbox"/> Expert dispatching <input type="checkbox"/> Research collaboration	
	Project Name	The Project for Strengthening Capacity of Sewerage Service of YCDC	
	Executing Agency	YCDC	
	Location:	Yangon City	Distance from capital: 380 km
	Line Agency	YRG	
Background of Application	Present Situation and Necessity of Technical Assistance	<p>The population of Yangon City, the former capital city of Myanmar, was 5.21 million in 2014. It is the center of the national economy and consists of 33 townships. The first sewerage system of the city was built in the central business area, the southern part of the city, in the 1880s, during the British colonial period. In 1929, it was expanded, and in 2005, a government-funded wastewater treatment plant (WTP) with a capacity of 140,000m³/day was constructed. However, the existing sewage collection system (vacuum collection system covering six townships) is deteriorating. The amount of sewage inflow is 630 m³/day, which is 4% of the design capacity of WTP. In the other 27 townships, the black water (night soil) of 80% of the population is discharged into septic tanks, while 15% is discharged to the drainage ditch. Greywater and industrial wastewater are also discharged into the drainage ditch. Therefore, the water quality of rivers and lakes is declining. Moreover, during the rainy season, the stormwater, including night soil, overflows into the city, deteriorating sanitary conditions.</p> <p>In 2014, a water supply and sewerage master plan for Yangon City with the target year of 2040 was formulated with the technical assistance of JICA. In line with the master plan, the construction projects of water supply facilities are being implemented mainly with yen loans. That would improve the water supply situation in the city. The amount of sewage generation is expected to increase accordingly. Thus, if the current sewage treatment conditions continue, not only will living conditions deteriorate, but potential health risks will also increase.</p>	
		<p>Under these circumstances, the YRG requested JICA's cooperation in developing sewerage facilities. After a preparatory study in 2019, a L/A for the yen loan project (Yangon Sewerage System Development Project) was signed in January 2020. The sewerage project will replace the existing sewerage system. Its coverage area is 9.9 km² with a daily average treatment capacity of 100,000 m³. The target year of the project is 2040, and it is expected to greatly improve the sewerage system in Yangon City.</p> <p>However, this project does not include the construction of connections from each household to the sewer pipe network. YCDC needs to initiate promoting house connections. Moreover, it is necessary to develop an operation and maintenance management system for the new sewerage system, secure a budget for operation and maintenance management, and develop a legal system for project implementation to realize the benefits of this project and ensure its sustainability.</p>	
		<p>The plan for these institutional and organizational developments was proposed in the said preparatory study. In order to implement the development plan, technical assistance to YCDC is required.</p>	
	Current status of government action on the above issues	<p>The consultant contract for the above yen loan project has not yet been signed. Due to political changes in February 2021, the project implementation schedule has become uncertain. Since this project is indispensable for the development of Yangon, it is hoped to start as soon as possible. It is expected that YCDC will start working on the above-mentioned organizational strengthening and institutional development once the project starts.</p>	

	Relation with the national policy and development plan	The sewerage works in Yangon City are under the jurisdiction of the Water Supply and Sanitation Department of YCDC. However, Myanmar has no laws and regulations as a basis in developing and maintaining the sewerage system. Moreover, quality standards of influent wastewater and effluent from WTP have not been established. Regarding stormwater drainage, the main drainage channels are under the jurisdiction of the road and bridge department of YCDC. The Ministry of Agriculture Development (MOAI) is responsible for the rivers and other waterways which receive the discharges from the main drainage channels.
Project Goals and Outputs		<p>(Overall Goal) Sewerage projects in Yangon City are implemented properly and managed and operated sustainably.</p> <p>(Project Target) The long-term plan is established for achieving a 100% sewer connection ratio in the yen loan sewerage project area in Yangon City by 2040, the target year of the project. The achievement rate of annual planned values (number of new connections, planned sewage volume, fee collection rate, water quality compliance rate, etc.) during the last year of the project will be at least 95%.</p> <p>(Output) Output 1: Organizational and institutional setup for development and management of sewerage system in Yangon city Output 2: Capacity development of YCDC for operation and maintenance of the sewage treatment plant Output 3: Capacity development of YCDC for operation and maintenance of sewage collection facility as well as promoting the property connections Output 4: Capacity development of financial management of sewerage service operation</p> <p>(Planned Activity)</p> <p>【For Output 1】 1.1 Preparing an organization development plan for the management of the sewerage system 1.2 Preparing an institutional development plan for the management of the sewerage system 1.3 Preparing a long-term plan for the sewerage development in Yangon City 1.4 Promoting public awareness of sewerage development</p> <p>【For Output 2】 2.1 Workshop/Seminar for operation and maintenance of sewage treatment plant 2.2 Conducting OJT using the operation and maintenance manual of the sewage treatment plant developed in the JICA loan project 2.3 Establishing water quality standards for the wastewater discharged from the specified users to the sewerage system, as well as conducting OJT for water quality monitoring 2.4 Study for effective use of sewage sludge</p> <p>【For Output 3】 3.1 Workshop/Seminar for operation and maintenance of sewage collection facilities 3.2 Developing operation and maintenance manual of sewage collection facilities and conducting OJT using the manual 3.3 Pilot project for property connection to the sewer 3.4 Developing facility ledger for sewerage management</p> <p>【For Output 4】 4.1 Workshop/Seminar for the financial management of sewerage service operation 4.2 Developing sewerage tariff structure and connection fee 4.3 Establishing sewerage tariff collection system 4.4 Developing mid-term business plan for sewerage service operation</p>

Preparatory Study on Urban Environment Improvement against COVID-19 (CUREIP)

Final Report

Inputs	Japanese side Period: 6 years (April 2024–)	<p>(Experts: Areas of expertise)</p> <p>Chief advisor/administration of sewage work</p> <p>Deputy chief advisor / Sewerage planning and monitoring, financial management, Institution, and policy, public awareness, wastewater treatment, water quality control, sludge treatment, O&M of sewer pipeline, Mechanical equipment, electrical equipment, sewer ledger system, GIS, Tariff collection</p> <p>Project coordinator</p> <p><u>Total: 15 experts</u></p>
		<p>(Training program: Area of training, no. of trainees)</p> <p>Administration of sewage work: 10 persons</p> <p>O&M of WTP: 10 persons</p> <p>O&M of sewer pipelines and house connections: 10 persons</p> <p>Financial management: 10 persons</p>
		<p>(Equipment)</p> <p>Water quality test equipment: 10 million Yen</p> <p>Sewer cleaning equipment: 100 million Yen</p> <p>GIS software: 1 million Yen (including 10 years license)</p>
	Myanmar side	
		<p>(Counterpart personnel)</p> <p>Output 1: 5 persons (full time: 1, part time: 4)</p> <p>Output 2: 20 persons (full time: 15, part time: 5)</p> <p>Output 3: 20 persons (full time: 15, part time: 5)</p> <p>Output 4: 10 persons (full time: 5, part time: 5)</p> <p><u>Total 55 persons (full time: 36, part time: 19)</u></p>
		<p>(Facilities for activities)</p> <p><input type="checkbox"/> Utilization of existing facility</p> <p><input checked="" type="checkbox"/> Construction of new facility</p> <p>Water quality laboratory, warehouse for O&M equipment</p>
Application for Grant Aid Project		No
Relevance for project Implementation	Beneficiaries	<ol style="list-style-type: none"> Counterparts (C/P) and trainees C/P: 55 persons, trainees: approx. 100 persons Project beneficiaries 273,000 persons (planned service population of the yen loan project) Number of beneficiaries in case the overall goal is achieved Population of Yangon in 2040 (target year of the master plan): 8.52 million
	Implementation capacity of the executing agency	<p>- Present budget and number of staff Water Supply and Sewerage Department of YCDC (2017)</p> <p>Number of staff: 2,152</p> <p>Annual Budget: MMK13,323 million</p> <p>Recurring Expenses: MMK18,143 million</p> <p>Capital expenditures: MMK36,733 million</p> <p>- Relevance of the overall goal and the jurisdiction of the executing agency Sewage works in Yangon city is the jurisdiction of YCDC.</p>
	Risks in Project Implementation	No
Related	Japanese Government	Yen loan project: Yangon Sewerage System Development Project (L/A signature: January 2020, L/A amount: JPY45,900 million)

	Other and Multilateral corporation	No
	Security situation	Administrative and judicial authorities are under the control of the military regime. The situation is uncertain.
	Availability of local consultant	Yes
	Living environment for the expert	No particular problem.
	Priority	
	Comments from Japanese Embassy	

Source: JICA Study Team

7. Formulation of Cooperation Project in Kathmandu

7.1 Emerging Urban Problems Revealed by COVID-19

7.1.1 Urban Structure in Kathmandu Valley

1) Rapid Population Increase in Kathmandu Valley

Democratization since 1990 and Maoist insurgency since 1996 significantly impacted on a large influx of migrant population from regions to Kathmandu Valley. As a result, the population of Kathmandu Valley of three districts (Kathmandu, Lalitpur, and Bhaktapur) increased by 450,000 (at an average annual growth rate of 3.5%) in 1991–2001 and by 950,000 (at an average annual growth rate of 4.9%) in 2001–2011. Then in 2011, the population of Kathmandu Valley reached 2.51 million.

From 2011–2022, the average annual growth rate of Kathmandu Valley dropped to 1.68%. However, the population growth rates in the suburban areas maintained at high rates around 3.5–4% per year. See Table 7.2.1.

Table 7.1.1 Population Changes of Kathmandu Vally and Population Distribution within Kathmandu Valley

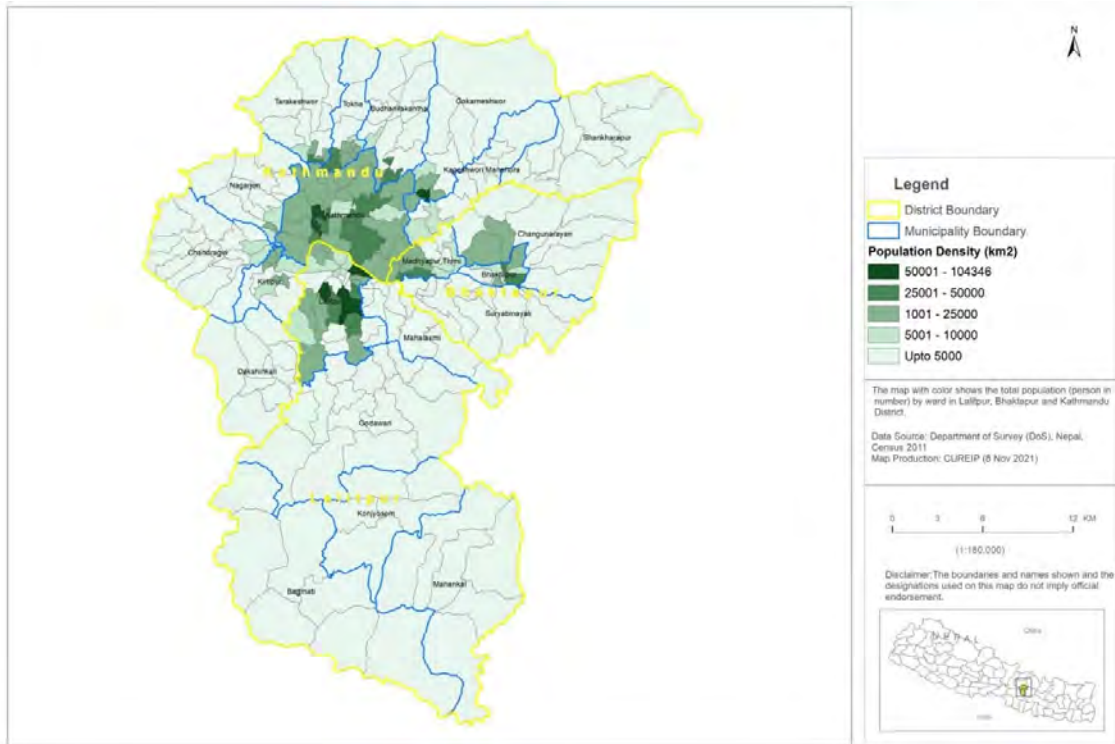
Districts/ Municipality	Total Population*				Annual Average Population Growth Rate (% p.a.)		
	1991	2001	2011	2021	1991-2001	2001-2011	2011-2021
Kathmandu District	675,341	994,379	1,744,240	1,988,606	3.94%	5.78%	1.32%
Lalitpur District	257,086	336,627	457,606	547,624	2.73%	3.12%	1.81%
Bhaktapur District	172,952	225,461	304,651	425,392	2.69%	3.06%	3.39%
Total of 3 Districts	1,105,379	1,556,467	2,506,497	2,961,622	3.48%	4.88%	1.68%
Kathmandu Metropolitan City	431,258	671,846	1,003,285	845,767	4.53%	4.09%	-1.69%
Outside Kathmandu Metropolitan City	674,121	884,621	1,503,212	2,115,855	2.75%	5.45%	3.48%
KMC+LMC	-	871,866	1,288,207	1,145,610	-	3.98%	-1.17%
Outside KMC+LMC	-	684,601	1,218,290	1,816,012	-	5.93%	4.07%

Source: JICA Study Team using the data of Nepal Population Census 1991, 2001, 2011, and 2021

2) Concentration of Population in the Core Area of Kathmandu Valley: Monocentric Pattern of Urban Spatial Structure

The map of population densities by ward in Kathmandu Valley reveals a high concentration of population in the core area (KMC and LMC) of Kathmandu Valley.

While an inner ring road was constructed in the 1970s, radial roads are spreading from the inner ring road toward surrounding suburban areas. This spatial pattern of road network has spurred the development of the monocentric pattern of the spatial structure of Kathmandu Valley.



Source: JICA Study Team using the data of Nepal Population Census 2011

Figure 7.1.1 Distribution of Population Densities in Kathmandu Valley: Monocentric Spatial Pattern



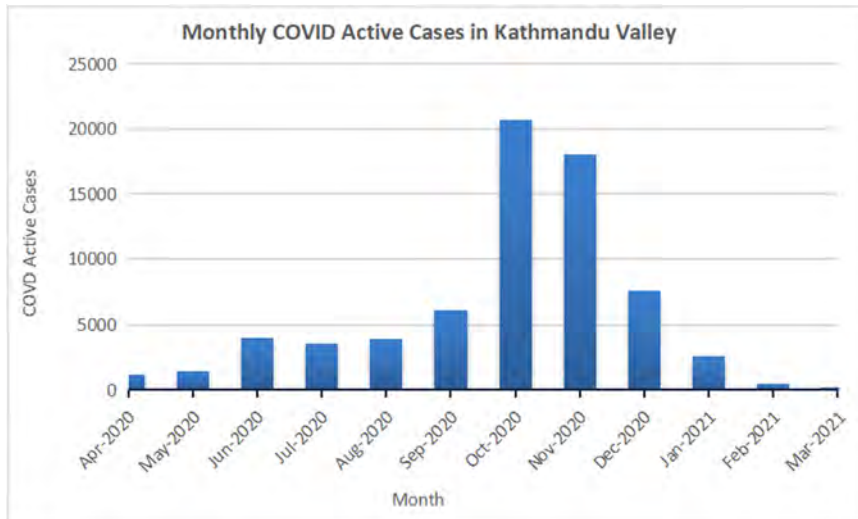
Source: Survey Department, Nepal

Figure 7.1.2 Distribution of Population Densities in Kathmandu Valley: Monocentric Spatial Pattern

7.1.2 Trends in COVID-19 Cases

1) First Wave of Infections

The COVID-19 pandemic arrived in Nepal in April 2020, when a number of immigrant workers returned to its provinces (mainly Terai Region in southern Nepal) due to the lockdown in neighboring India, and gradually spread from the provinces to the Kathmandu Valley.



Source: Prepared by the JICA Study Team based on data from the Ministry of Health and Population

Figure 7.1.3 Monthly COVID-19 Cases from April 2020 to March 2021 (Kathmandu Valley)

As shown in Figure 7.1.3, the first wave of the pandemic occurred from October to November 2020, coinciding with the Dasain Festival, which hit the headlines by attracting huge crowds to local markets. This overcrowding caused the spread of COVID-19 in Kathmandu, like in other regions of the world, and raised awareness about the importance of avoiding crowding.



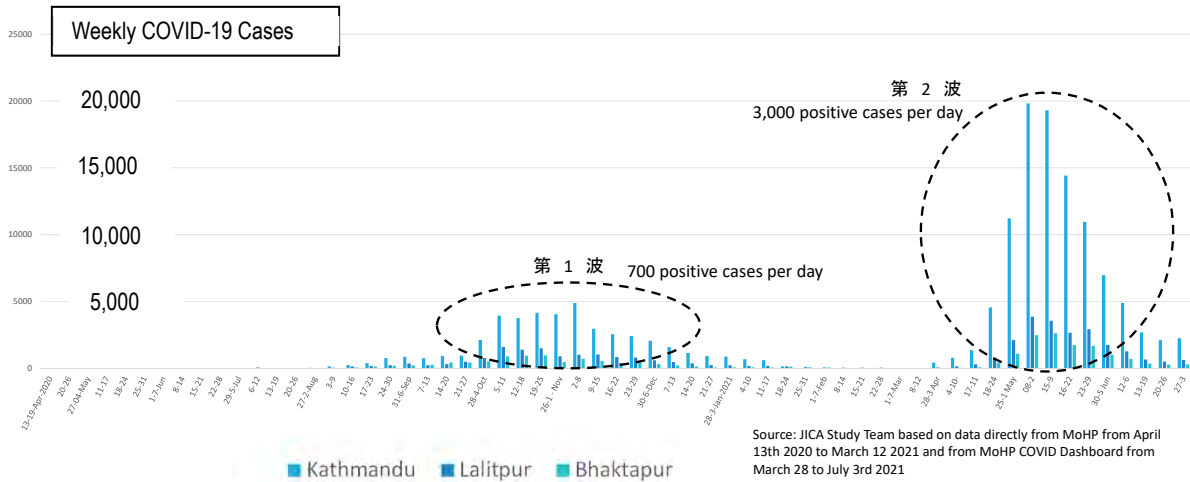
Source: The Record (online news site)

Figure 7.1.4 New Road Market during the Dasain Festival in 2020

2) Second Wave of Infections

The second pandemic wave hit the Kathmandu Valley from May to June 2021, bringing four times as many confirmed cases as the first wave did from October to December 2020. During the second wave, the number of PCR tests increased, and so did hospitalizations, which raised

public concerns about the availability of respirators and hospital beds for COVID-19 patients.

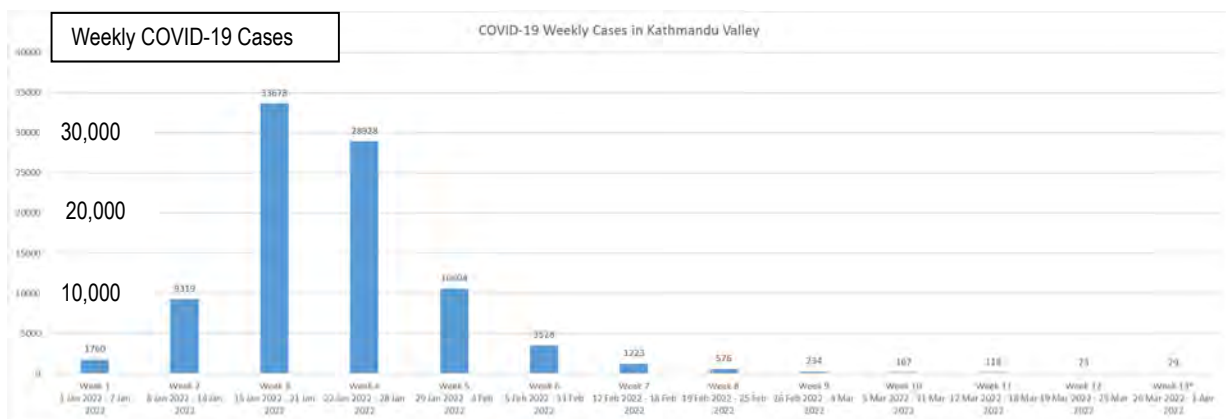


Source: Prepared by the JICA Study Team based on data from the Ministry of Health and Population

Figure 7.1.5 Weekly COVID-19 Cases from April 2020 to June 2021 (Kathmandu, Lalitpur, and Bhaktapur Districts)

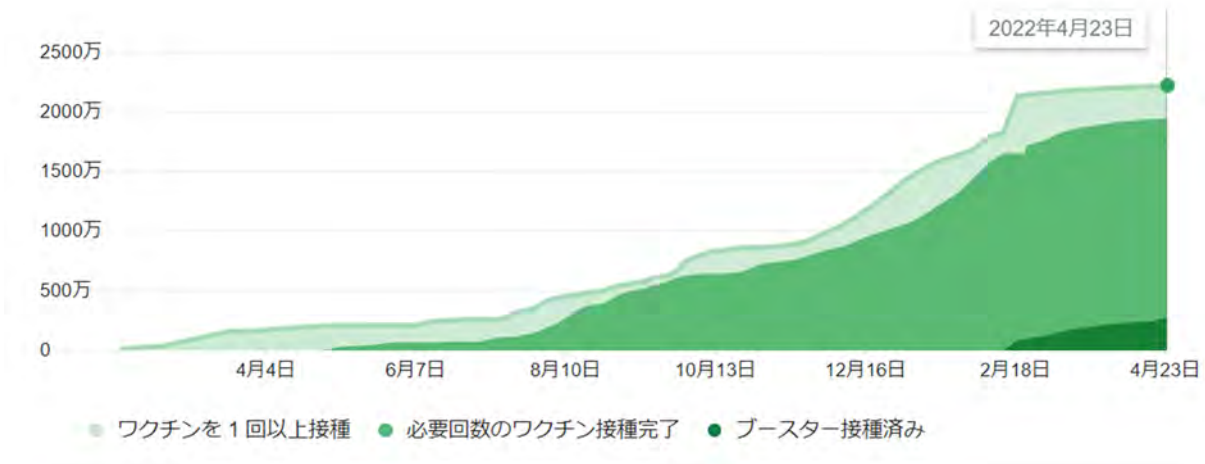
3) Third Wave of Infections

The third wave of infections struck Nepal at the beginning of 2022, driven by the Omicron variant but subsided in four to five weeks. At that time, COVID-19 vaccination campaigns conducted by the government significantly increased vaccination coverage. As of the end of March 2022, the first- and second-dose coverage of COVID-19 vaccines among the over-18 population reached 93.4% and 82.3%, respectively.



Source: Prepared by the JICA Study Team based on data from the Ministry of Health and Population

Figure 7.1.6 Weekly COVID-19 Cases from January to March 2022 (Kathmandu Valley)



Source: Our World Data

Figure 7.1.7 Trends in COVID-19 Vaccinations from April 2021 to April 2022

7.1.3 Analysis of Correlations between COVID-19 Cases Per Capita and Different Factors

Figure 7.1.8 shows a map of the distribution of COVID-19 cases per 1,000 population from April 2020 to February 2021 (shown by ward for Kathmandu District and by municipality for the remaining two districts).

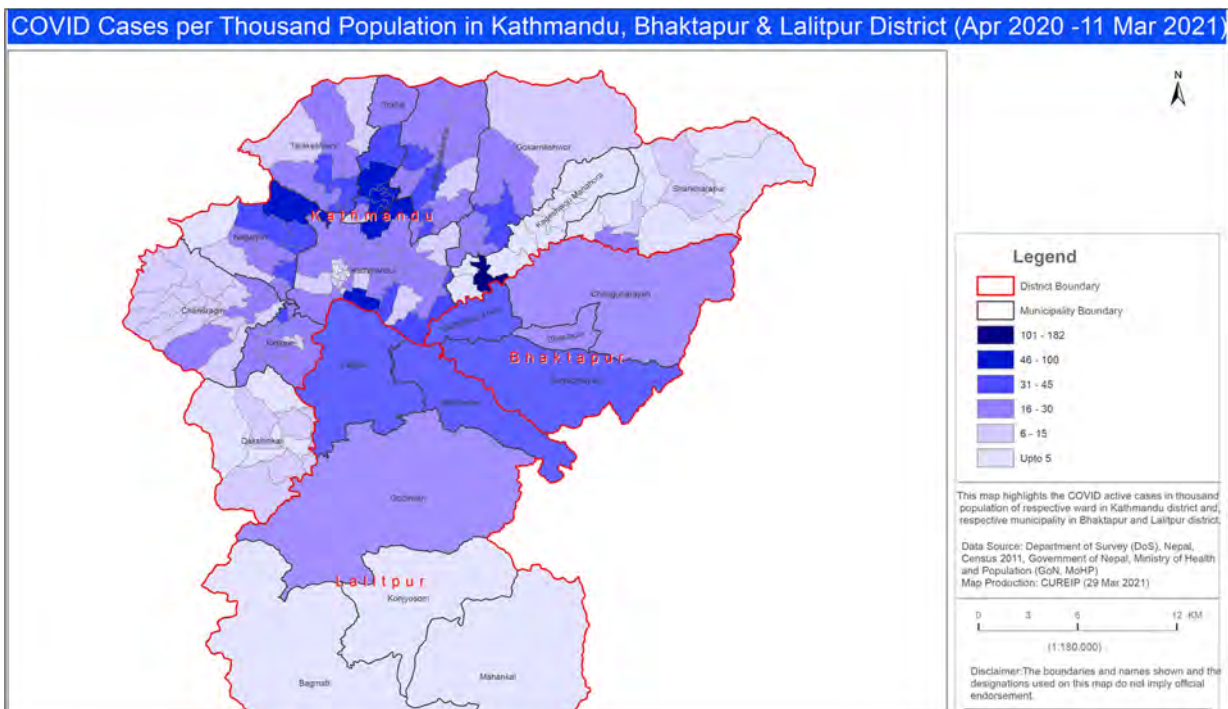


Figure 7.1.8 COVID-19 Cases Per 1,000 Population from April 2020 to March 2021 (Kathmandu Valley)

This map shows that the number of COVID-19 cases per 1,000 population was higher in peripheral municipalities around Kathmandu Metropolitan City (KMC). Also called “New Areas,” these peripheral municipalities are emerging as new residential communities for the middle class.

The above analysis of the distribution of COVID-19 cases was followed by an examination of correlations between the number of positive cases per capita and different factors, but no

significant relationships were found between any combinations.

- Positive cases per capita by ward vs. population density by ward
- Positive cases per capita by ward vs. population per building footprint area by ward
- Positive cases per capita by ward vs. population per building floor area by ward
- Positive cases per capita by ward vs. proximity to squatter areas
- Positive cases per capita by ward vs. water supply points

It seems that the spread of COVID-19 was affected by factors not identified in the abovementioned data analysis, such as:

- Crowd density in public facilities (e.g., hospitals, public offices, and transport facilities)
- Crowd concentration in public facilities (e.g., hospitals, public offices, and transport facilities)
- Concentration of public facilities (e.g., hospitals, public offices, and transport facilities) at the center of the Kathmandu Valley

Therefore, this study examined how to reflect the following WHO-recommended infection control precautions in urban sector projects:

- Wearing masks
- Sterilizing hands
- Keeping social distancing
- Avoiding 3Cs (closed spaces with poor ventilation, crowded places with many people around, and close-contact settings such as short-range conversations and loud vocalizations)

It is also noted that these practices should be accompanied by efforts to mitigate the negative impact of lockdowns and other COVID-19 restrictions on the society and economy.

7.1.4 People's Awareness and Behavior Changes

1) Awareness Changes

In Nepal, the first wave of the COVID-19 pandemic in 2020 hardly affected public awareness, but the large second wave in 2021 changed people's awareness about health and life risks. An increasing number of people started to comply with government restrictions on activities, keep social distancing, wear masks, wash hands, and take PCR tests. In addition, the Delta variant, a major contributor to the second wave, caused more severe symptoms and increased demand for hospitalization and, in turn, quarantine facilities. COVID-19 vaccination coverage also increased in 2022.

2) Behavior Changes

The COVID-19 pandemic not only caused people to follow new practices, such as social distancing, wearing face masks, and handwashing, as mentioned above, but also encouraged people to voluntarily adopt the following practices to protect themselves from being infected with the virus:

- Transition to remote work
- Use remote learning

- Use e-money, e-commerce, and online banking
- Use e-government services
- Avoid public transport

Some of these behavior changes are effective in infection prevention, but others are not. Effective practices should be further promoted to make a bigger impact. On the other hand, new practices that are not so effective or cannot be made effective enough to curb infections should be complemented so people left behind by these changes can be protected from the pandemic.

7.1.5 New Urban Sector Issues

1) Necessity of Preventing Crowding (Short-term)

Past developments

Before the COVID-19 pandemic occurred, the monocentric urban structure with all urban functions concentrated in a single center was recognized as the cause of urban problems. Because extreme traffic concentration prevented cities from working efficiently and extreme population concentration deteriorated the living environment, the Government of Nepal made a medium- to a long-term commitment to transitioning to a decentralized and polycentric urban structure. As for the Kathmandu Valley, the Vision 2035 and Beyond: 20 Years Strategic Development Master Plan (2015–2035) for Kathmandu Valley, adopted in 2014, also included measures to make the urban structure more decentralized and polycentric.

Future challenges: short-term necessity of preventing crowding

The pandemic did not change the government's medium- to long-term commitment to transitioning to a decentralized and polycentric urban structure but created the need to control crowds in existing urban facilities for activities to resume safely and quickly in cities while taking urgent containment during the pandemic. For example, the picture in Figure 7.1.7 shows a crowd of patients waiting for their turn in the outpatient reception area at Bir Hospital in Kathmandu. Crowds in closed spaces like in the picture are one of the causes of infection spread.



Source: Local newspaper (Photo by the JICA Study Team)

Figure 7.1.9 Crowd Waiting to Receive Tickets in the Outpatient Reception Area at Bir Hospital (National Academy of Medical Sciences) in Kathmandu

Below is a description of behavior changes resulting from the pandemic and related future challenges.

Latest developments and future challenges regarding the spread of e-money, e-commerce, and online banking

In the Kathmandu Valley, some people who have recognized the abovementioned problems have changed their behavior. In fact, more and more people have been inclined to adopt the following behaviors in order to avoid visiting banks, markets, commercial facilities, and other places subject to crowding for their daily needs:

1. Increasing use of e-money
2. Increasing use of online banking
3. Increasing use of e-commerce

Financial institutions are also developing ICT-based settlement platforms. According to Nepal Rasta Bank, a monthly transaction value during the COVID-19 pandemic reached USD10 million. While the pandemic is economically affecting many people, e-commerce is expected to continue its steady expansion as a new home-based economic activity.

Meanwhile, the risk of infection has remained high for those who have no access to e-commerce and gather in crowds at local markets. Therefore, additional measures are required to control crowds at local markets.

In general, physical measures are taken to control the flow and concentration of people in local markets. However, such measures are difficult to take in unwallied markets typical to the Kathmandu Valley. Given the fact that physical crowd control is not effective in local markets in the short run, a medium- to long-term approach should be taken to develop and disperse attractive local markets.

In the short run, it is also necessary to make local markets accessible for tenants and

customers through e-commerce (e.g., developing and operating e-commerce platforms).

Moreover, as online banking has yet to be widely adopted, it is still necessary to prevent long lines from forming for money withdrawal at ATMs.

Latest developments and future challenges regarding the spread of remote work

Internet coverage has increased since before the COVID-19 pandemic. The national internet coverage rate rose from 9.5% in mid-December 2013 to 38.1% in mid-December 2014. The smartphone penetration rate has also been high since pre-pandemic. Therefore, internet infrastructure is considered robust enough, especially in Kathmandu, to support remote work. However, because remote working positions are limited to a small number of people, such as administrative officers and university faculty members, it is unlikely that the spread of remote work will contribute to infection control across the city in the short run.

Therefore, containment measures for infectious diseases like COVID-19 should be designed not only to promote remote work by restricting people's activities (e.g., imposing lockdowns) but also to resume social and economic activities in a safe and controlled manner while preventing crowding.

Latest developments and future challenges regarding the spread of e-learning

The closure of schools and transition to e-learning has raised concerns about growing educational disparities between students with and without access to the internet and digital devices. It was reported that only 12% of public schools offer online education in Nepal.¹

Going forward, support should extend to public schools to facilitate remote teaching as well as reduce the risk of infection in schools to avoid complete reliance on e-learning. Such risk-reduction measures include not only avoiding 3Cs (closed spaces, crowded areas, and close-contact settings), wearing masks, washing hands, maintaining social distancing in classrooms, using shielding devices between teachers and students, and ensuring effective ventilation in classrooms but also expanding school buildings. The COVID-19 pandemic has heightened the urgency to expand schools though it was already present, especially in urban areas with rapid population growth.

Latest developments and future challenges regarding the spread of e-government services

The federal government has taken steady steps to promote digital transformation for government services (online government services). At present, the following services are available online:

4. Registration of residential address changes (population movement registration)
5. E-passport
6. Vehicle registration renewal
7. Drivers' license renewal
8. Water and electricity payment
9. Citizenship application
10. Application for election identity card

¹ Ministry of Finance, Nepal (2020)

It is considered that the stay-at-home orders and restrictions on using public transport during the COVID-19 pandemic will gradually encourage people to use e-government services.

Meanwhile, the district and local (metropolitan and municipal) authorities under the federal government have lagged in digital transformation for their services (online government services). At present, few district and local governments use computers for their operations. The district and municipal governments should gradually increase online services to mitigate crowding and congestion in their offices and reception areas.

Moreover, federal government-run hospitals, which are mostly located in Kathmandu, tend to attract patients from not only around the Kathmandu Valley but also around Nepal. In order to prevent crowding in these hospitals, control measures including online appointment systems should be developed as soon as possible.

2) **Necessity of Making Transport Systems Resilient to Pandemics (Short- and Medium-term)**

Past developments

Before the COVID-19 pandemic broke out, urban transport systems did not necessarily need to reduce the risk of infection. Local authorities, including those in the Kathmandu Valley, acknowledged the importance of pedestrian and bicycle paths, especially in recent years, but did not invest sufficient efforts or resources in their development.

Future challenges: short- to medium-term development of transport systems resilient to pandemics

However, the COVID-19 pandemic has increased the importance of developing pedestrian and bicycle paths as short-term alternatives to public transport until the pandemic subsides. This is also expected to allow poor people who have lost jobs or incomes to travel on foot or bicycle and maintain their geographical mobility.

Latest developments and future challenges regarding the increasing avoidance of public transport

Subject to crowding and limited space, public transport was suspended during the lockdown. The service resumed during the pandemic with passenger capacity limited to 50% onboard to avoid crowding and operated on a reduced schedule. These restrictions were inconvenient enough to discourage passengers from using the transit system. In fact, the number of public transport passengers decreased drastically.

At the same time, some people started to avoid public transport to protect themselves from the risk of infection. Some middle-class people started using a ride-share system as an alternative to public transport. Middle-class passengers may continue to transition to ride-sharing and motorbikes, but most low-income passengers who have stopped using public transport have no choice but to walk or bicycle to work, shops, and other destinations. This trend may be further intensified by another COVID-19 wave or another COVID-19-like pandemic.

However, the development of spaces to build pedestrian and bicycle paths has yet to start

or just started in Kathmandu Metropolitan City (KMC), Lalitpur Metropolitan City (LMC), and Kirtipur Municipality. Some bicycle lanes have been routed or are at the preparation stage of construction. It is desired to develop pedestrian and bicycle paths near settlements for low-income residents (squatter settlements).

Given the fact that the COVID-19 pandemic has caused quite a few middle-class people to lose jobs or incomes and move to inconveniently located smaller houses or continue to use public transport to reduce costs, it is expected that more people will transition to walking and cycling. This will increase the need to develop and operate safe and uncrowded public transport systems (e.g., by using large buses, operating buses with a system to monitor and share their locations and crowdedness).



Source: JICA Study Team

Figure 7.1.10 Bicycle Lanes (Marked by Signs on the Roads) and Cyclists in the Kathmandu Valley

3) Importance of Facilitating the Efforts of the City Administration to Involve Community-level Stakeholders and Establish Cooperative Relationships with Communities (Short- and Medium- to Long-term)

Past developments

During the first wave of the COVID-19 pandemic in 2020, top-down containment measures were taken under the leadership of the central government centered on the Federal Ministry of Health and Population (MoHP) and the Federal Ministry of Home Affairs (MoHA) while district governments played an important role at lower levels.

However, the containment measures, including delivering healthcare services, temporarily closing stores and markets directly related to people's lives, and restricting religious gatherings, were taken without much public announcement and often confused the front lines. Moreover, when the country entered the second wave of COVID-19 in April 2021, outbreaks disrupted healthcare services and caused some patients to get oxygen cylinders by themselves before visiting medical institutions.

Moreover, some communities and residents could not get correct information or understand the risk of COVID-19 infection. Coupled with the above-mentioned factors, the lack of support for the impact of those economically affected by the lockdown has increased public distrust in the government and administration.

During the second wave of COVID-19, with the Delta variant causing a rapid surge in new infections, the government adopted micro-containment measures to decentralize authority from the national to the local level to intensify containment efforts at the municipal and ward levels.

Meanwhile, an increasing number of people made self-help efforts especially during the second wave of infections, seemingly partly because of the healthcare resources shortage, and more people learned how to continue with their lives while taking preventive measures as a year had already passed since the pandemic began. A ward office of Kathmandu Metropolitan City has received requests from resident groups and responded to their requests based on the results of discussions with the city office since before the COVID-19 pandemic. Such relationships between ward offices and residents can further reflect resident needs in the government policies and facilitate resident activities. Positive support for resident activities can enable the authorities to reach out to hard-to-reach people and places.

Future challenges

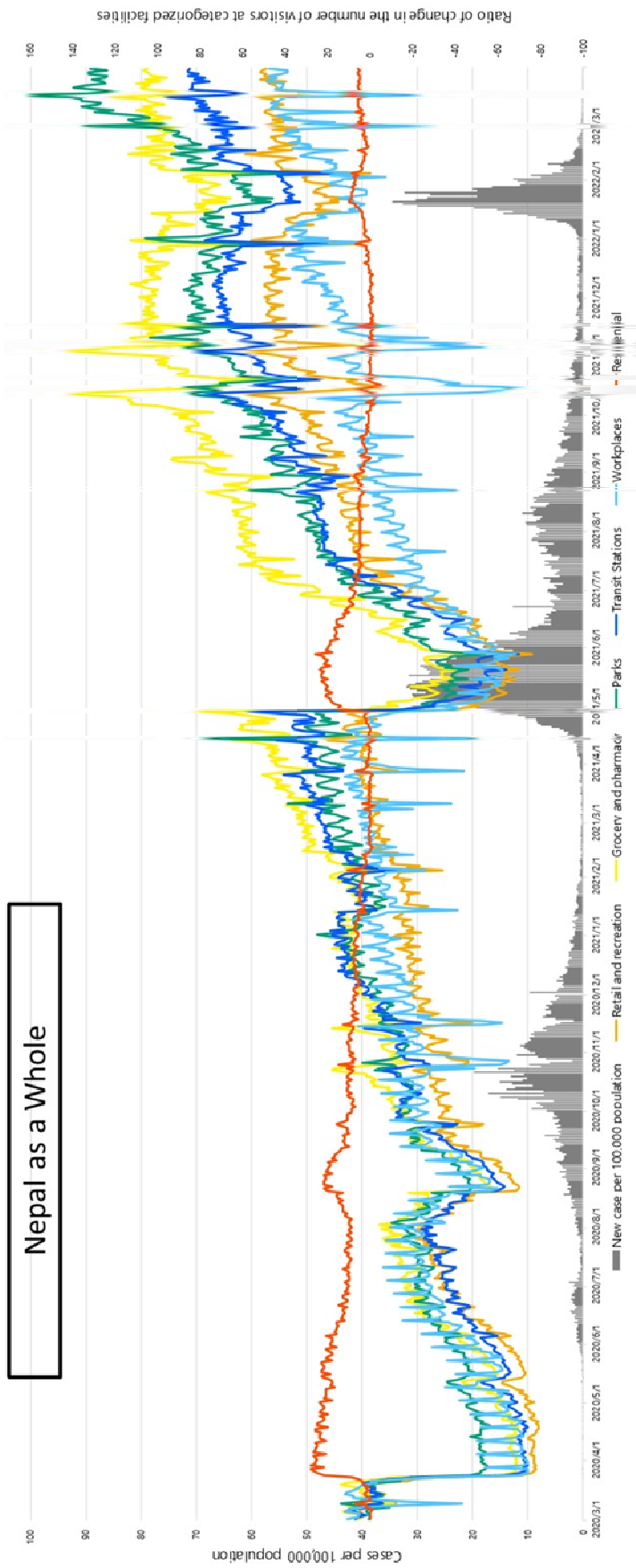
In addition to the top-down measures led by the MoHP and the MoFAGA, residents, and communities can be more actively involved in containment efforts by developing the capacity of municipalities and lower administrative units in urban areas (e.g., municipal and lower ward levels in the case of the Kathmandu Valley) to deliver public services. The active involvement of residents and communities can, in turn, strengthen their knowledge and understanding of COVID-19 containment measures. These measures, including not only support for the vulnerable but also information, education, and communication (IEC) measures to distribute proper information on COVID-19 and its transmission, can be taken at a level below the municipal level. It will be important to deliberate how to approach and

involve communities, provide relevant training, and strengthen administrative capacity at the ward level in Nepal.

4) Necessity of Developing Spaces to Lure People out of Their Homes and Responding to the Increasing Demand for Parks and Open Spaces in Cities (Short- and Medium-term)

Past developments

Nepalese cities have a custom where residents visit parks and open spaces along rivers and around Hindu temples for a morning walk or holiday recreation. However, during the COVID-19 lockdowns, the government closed these parks and open spaces to prevent people from going out or crowding. After the release of lockdown restrictions, the number of visitors to parks and open spaces increased substantially, as shown in Figure 7.1.9 (note: the graph shows the trend for the whole of Nepal). The prolonged pandemic and repeated lockdowns have created the necessity for outdoor spaces for people to walk around and refresh themselves.

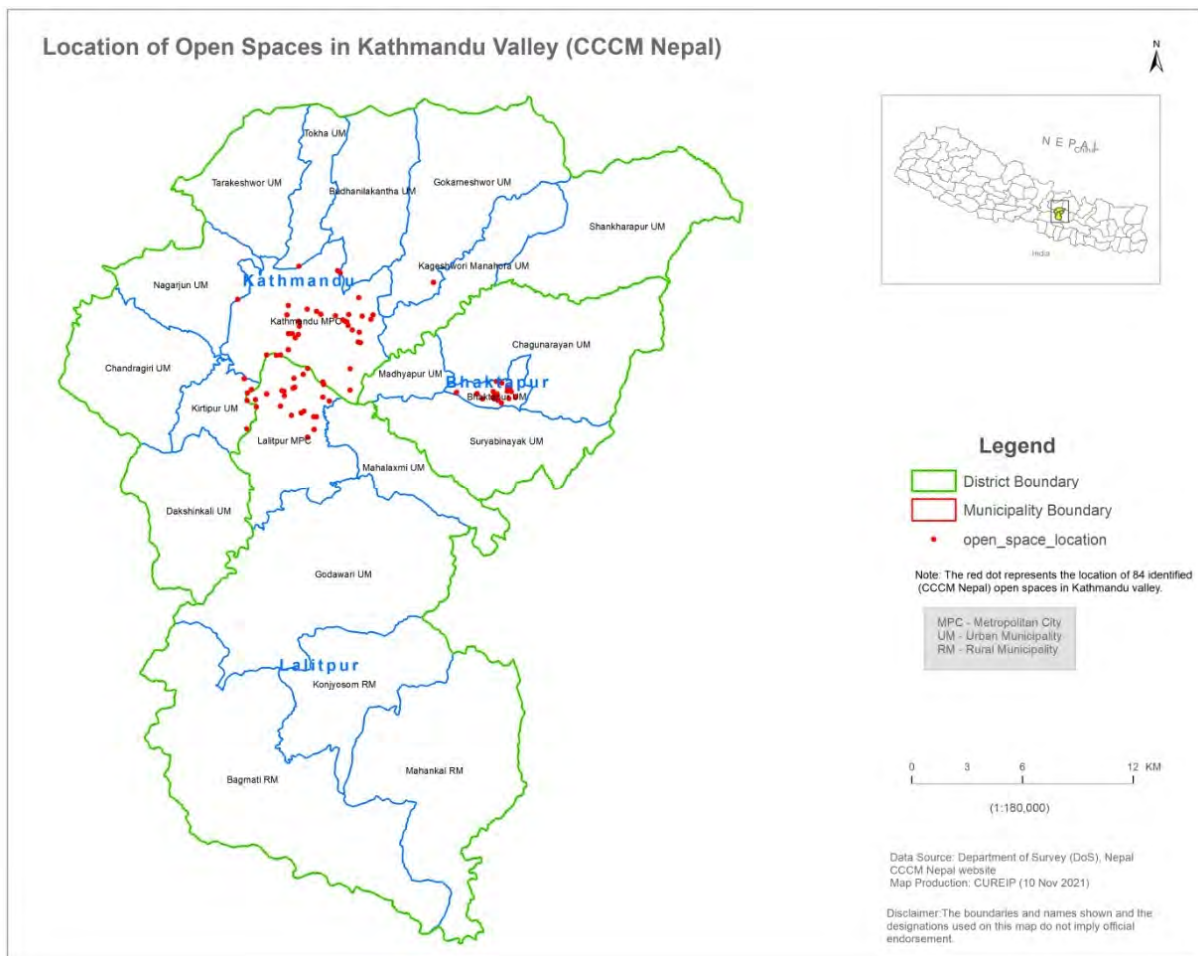


Source: Google, March 2022, Our World in Data, Google Community Mobility Reports

Figure 7.1.11 The Ratio of Change in the Number of Visitors at Categorized Facilities under COVID-19 Pandemic

Prolonged confinement at home during lockdowns caused various social problems. In addition to extended confinement at home, growing unemployment due to the COVID-19 pandemic also caused mental health problems. The number of suicides during the lockdown from late March to early June 2020 was higher at 16.5 per day compared to 2019 at 15.8 per day. It has become essential to strengthen social security for unemployed people during the pandemic as well as provide mental health support (e.g., developing open spaces for relaxation in residential neighborhoods).

As for open space development, the Government of Nepal developed a database on open spaces in the Kathmandu Valley in 2013 with support from the USAID to secure disaster evacuation sites. The locations of open spaces contained in the database are shown in Figure 7.1.12.



Source: Prepared by the JICA Study Team based on the database of open spaces created by MoHA and MoUD (with assistance from USAID)

Figure 7.1.12 Locations of 84 Open Spaces in Kathmandu Valley

In fact, when a huge earthquake occurred in 2015, many people evacuated from buildings at the risk of collapse and stayed in shelters in open spaces in their vicinity. This experience also led to exploring measures to develop and maintain databases on open spaces to protect them from disappearing with urbanization.



Exercise in the UN Park by the Bagmati River



People relaxing in Tudikhel in Kathmandu Metropolitan City

Source: Photo by the JICA Study Team

Figure 7.1.13 Use of Parks and Open Spaces in the Kathmandu Valley

Future challenges

Stringent infection control measures are expected to be in place not only during the recent prolonged COVID-19 pandemic but also when another COVID-19-like pandemic breaks out, requiring people to stay in crowded houses in densely populated cities with their movement restricted.

In this situation, it is important to make urban society more resilient by providing people with safe places to visit and walk in during repeated lockdowns. These parks and open spaces should be connected by safe sidewalks and bicycle lanes as well as designed to offer opportunities for low-income people to conduct economic activities, such as allowing them to open stalls while preventing overcrowding.

Open spaces in urban areas should be properly maintained and sustained in case of disasters and public health emergencies. The development and maintenance of open spaces should be guided by a short- to medium-term strategy.

Although some spaces are left undeveloped in the suburbs in the Kathmandu Valley because urbanization is spreading rapidly, it is desired to develop parks and open spaces as well as

access roads in a systematic way in suburban cities.

5) **Necessity of Increasing the Capacity of Testing, Healthcare, and Medical Quarantine Facilities (Short- and Medium- to Long-term)**

Past developments

The second wave of infections driven by the Delta variant in 2021 has induced awareness and behavior changes regarding health and life risks. People began wearing masks and washing hands as well as taking PCR tests, visiting medical facilities, getting hospitalized when the symptoms got severe, and getting quarantined as necessary. Still, people sometimes gather in crowds inside and outside testing and healthcare facilities for COVID-19 cases due to the limited capacity of these facilities, resulting in an increased risk of infection.

Future challenges

While new coronavirus variants are continuing to emerge, such as the Delta variant, which causes severe symptoms, and the Omicron variant, which is highly infectious, urban areas are likely to face more waves of infections before a large majority of residents get fully vaccinated (in the short run). Waves of infections are expected to drive people to take tests and go to healthcare facilities.

Testing, healthcare, and medical quarantine facilities may swarm with crowds not only during the recent COVID-19 pandemic but also during another outbreak of a similar highly infectious disease.

In the short run, preventing people from rushing to or gathering in crowds within healthcare and testing facilities is necessary.

Also, in the long run, developing and dispersing testing, healthcare, and medical quarantine facilities is essential.

Short-term measures should focus on improving medical equipment and facilities at urban health clinics built for primary health care at the ward level in many cities in the Kathmandu Valley. In particular, it is urgent to develop a safe outpatient pathway and secure space to accommodate a sufficient number of isolation rooms for outpatients suspected of COVID-19. In addition, the capacity building of medical staff is also required.

From both short- and medium- to long-term perspectives, it is essential to increase the capacity of testing, healthcare, and medical quarantine facilities by expanding or converting existing facilities.

6) **Urgent Necessity of Transitioning to a Decentralized and Polycentric Urban Structure to Prevent Crowding (Medium- to Long-term)**

Past developments

Conventionally, the monocentric urban structure with all urban functions concentrated in a single center was recognized as the cause of urban problems. Because extreme traffic concentration prevented cities from working efficiently and extreme population concentration deteriorated the living environment, urban development authorities made a medium- to a long-term commitment to transitioning to a decentralized and polycentric urban structure. The pandemic did not change this recognition and medium-to long-term

commitment.

Future challenges

In the Kathmandu Valley² and other urban areas in developing countries with rapid economic development, the short-term measures at preventing crowding will have no sustainable effect. To respond to the situation, the medium- to long-term measures at transforming the spatial structure should be put into action as quickly as possible and continued steadily. It is important to substantiate specific measures for implementation, besides setting general goals.

However, since the external debt of Nepal is increasing, like in many other countries, due to the COVID-19 pandemic, costly projects, such as transforming the urban structure into a decentralized and polycentric shape, are likely to fall behind schedule. Therefore, adequate support is required to promote medium- to long-term efforts to reform the urban structure while facilitating short-term measures to prevent crowding.

7) Urban Sanitation and Environment

Past developments

The COVID-19 pandemic has raised hygiene awareness, increasing the wearing of face masks, hand washing, and hand sanitization. According to data from the Central Bureau of Statistics of Nepal³, more than 90% of households in Kathmandu have access to a hand washing facility. However, constant water shortages have increased the importance of securing water sources and water supply in Nepal.

Future challenges

Given their sanitary living environment, including housing density and reliable access to water, informal settlement residents are considered to have a higher risk of COVID-19 infection. Improving the living environment in informal settlements, including reducing housing density and securing access to safe water, is the key to creating a resilient urban structure because it is essential to controlling infectious diseases like COVID-19.

7.1.6 Summary of Urban Issues and Their Changes

Based on the analysis of correlations between the number of COVID-19 cases and different factors, the results of interviews with local experts, and information collected from local newspapers, this report describes behavior changes due to the COVID-19 pandemic and challenges emerging from the behavior changes. They are compared to the conventional urban issues identified in the Vision 2035 and Beyond: 20 Years Strategic Development Master Plan (2015-2035) for Kathmandu Valley, as shown in the table below.

² According to the Vision 2035 and Beyond published by KVDA in 2014, the population is estimated to increase from 2.5 million in 2011 to 6 million in 2035.

³ Multiple Indicator Cluster Survey 2019

Table 7.1.2 Conventional Urban Issues and New Challenges Caused by the COVID-19 Pandemic in the Kathmandu Valley

	Conventional issues identified in the Kathmandu Valley MP	Behavior changes and emerging challenges caused by COVID-19	Challenges caused by COVID-19 (new and prioritized challenges)
Urban spatial structure	<ul style="list-style-type: none"> • Rapid urbanization and population growth • Monocentric urban structure • Uncontrolled development (no system to restrict land use according to the land use plan) • Delays in the development of the Outer Ring Road and satellite cities for population decentralization • Development of open spaces not only as places of recreation but also as evacuation shelters in the case of disasters 	<ul style="list-style-type: none"> • Increasing remote working <ul style="list-style-type: none"> ○ Limited to industries suited to remote working • E-Learning <ul style="list-style-type: none"> ○ Limited access to ICT for e-learning, especially in public schools • Prolonged lockdown during the second wave of the pandemic <ul style="list-style-type: none"> ○ The operations of stores and the use of parks are restricted during lockdowns. • Increasing use of e-commerce and online banking <ul style="list-style-type: none"> ○ Despite increasing opportunities for e-commerce, many market tenants and customers use traditional markets, so additional measures are required to prevent crowding in markets. 	<ul style="list-style-type: none"> • Distribution of buildings and sufficient indoor space to avoid crowding and maintain social distancing • Introduction of online ticketing systems in facilities such as hospitals, public offices, and intercity bus terminals, to prevent crowding • Development of open spaces and parks as places of recreation for walkers, exercisers, and those seeking refreshment (crowd control conducted during lockdowns) and evacuation shelters in the case of disasters • Actual/Accelerated transition from a monocentric to a polycentric urban structure • Development of uncrowded and contactless environments using ICT
Transport	<ul style="list-style-type: none"> • Extreme traffic concentration due to the monocentric urban structure and road network • Congestion and crowding in public transport terminals • Low coverage of public transport 	<ul style="list-style-type: none"> • Public transport vulnerable to the risk of infection • Increasing use of shared rides and private vehicles (automobiles and motorcycles) for transport • Increasing use of walking and bicycles for transport <ul style="list-style-type: none"> ○ Measures are still required to protect a large number of public transport passengers from the risk of infection. 	<ul style="list-style-type: none"> • Improvement of public transport environments (e.g., regulating passenger capacity and creating a better hygienic environment) • Introduction of larger vehicles for public transport to prevent overcrowding • Introduction of ICT systems to monitor and disperse crowds • Development of transport means having low infection risks and affordable for the low-income population • Development (extension and networking) of pedestrian and bicycle paths • Prevention of crowding for buying inter-city bus tickets

	Conventional issues identified in the Katmandu Valley MP	Behavior changes and emerging challenges caused by COVID-19	Challenges caused by COVID-19 (new and prioritized challenges)
Urban administration & healthcare	<ul style="list-style-type: none"> • Limited administrative capacity at the local (metropolitan and municipal) levels • No description available about healthcare 	<ul style="list-style-type: none"> • Rising call for capacity building of local administrative units • Increasing needs for government support for economically vulnerable people • Raising awareness about the healthcare situation • Falling confidence in the government due to limited healthcare facilities and resources • Crowding due to the concentration of outpatients in some hospitals • Increasing home quarantine and home care 	<ul style="list-style-type: none"> • Coordination between the central and local governments and administrative capacity development at the local level • Enhanced support for economically vulnerable people • Delivery of public services in a contactless and dispersed way using ICT (to prevent crowding for public services) • Increasing investments in medical facilities and resources (e.g., hospital beds, medical equipment) • Capacity building of healthcare facilities at the local level (e.g., urban health centers)
Urban society & community	<ul style="list-style-type: none"> • Promotion of gender equality and social inclusion • Safer cities • Promotion of youth participation 	<ul style="list-style-type: none"> • Increasing suicides and gender-based violence (GBV) • Increasing opportunities for e-learning <ul style="list-style-type: none"> ○ There are increasing disparities in access to e-learning depending on the financial status and ICT knowledge and experience of schools and students. Only a few public schools are ready for e-learning. • Active support of resident groups for those infected with and affected by COVID-19 (especially after the second wave of infections) 	<ul style="list-style-type: none"> • Enhanced economic/mental health support • Places of exercise and recreation during lockdowns • Development of e-learning environments for schools and students • Creation of opportunities to support community activities (in the public and private sectors)
Urban sanitation & environment	<ul style="list-style-type: none"> • Limited urban infrastructure that cannot meet the increasing needs of the growing population • Unreliable quality and quantity of water supply • Poor living environment in slums <ul style="list-style-type: none"> ○ Obstacles resulting from the government policy of relocating informal settlement residents rather than trying to improve their living environment 	<ul style="list-style-type: none"> • Rising hygiene awareness • Increasing handwashing frequency (use of handwashing and disinfection gel) <ul style="list-style-type: none"> ○ Using water for handwashing and other hygienic practices is increasing, leading to serious water shortages. 	<ul style="list-style-type: none"> • Increasing importance of reliable water supply • Increasing importance of stable 24-hour water supply • Increasing importance of affordable housing

	Conventional issues identified in the Katmandu Valley MP	Behavior changes and emerging challenges caused by COVID-19	Challenges caused by COVID-19 (new and prioritized challenges)
	<ul style="list-style-type: none"> • Environmental conservation to increase resilience to natural disasters • Improvement of the urban environment (e.g., noise, air, and water pollution) 		

Source: JICA Study Team

7.2 Urban Development Program for the With/Post COVID-19 Era

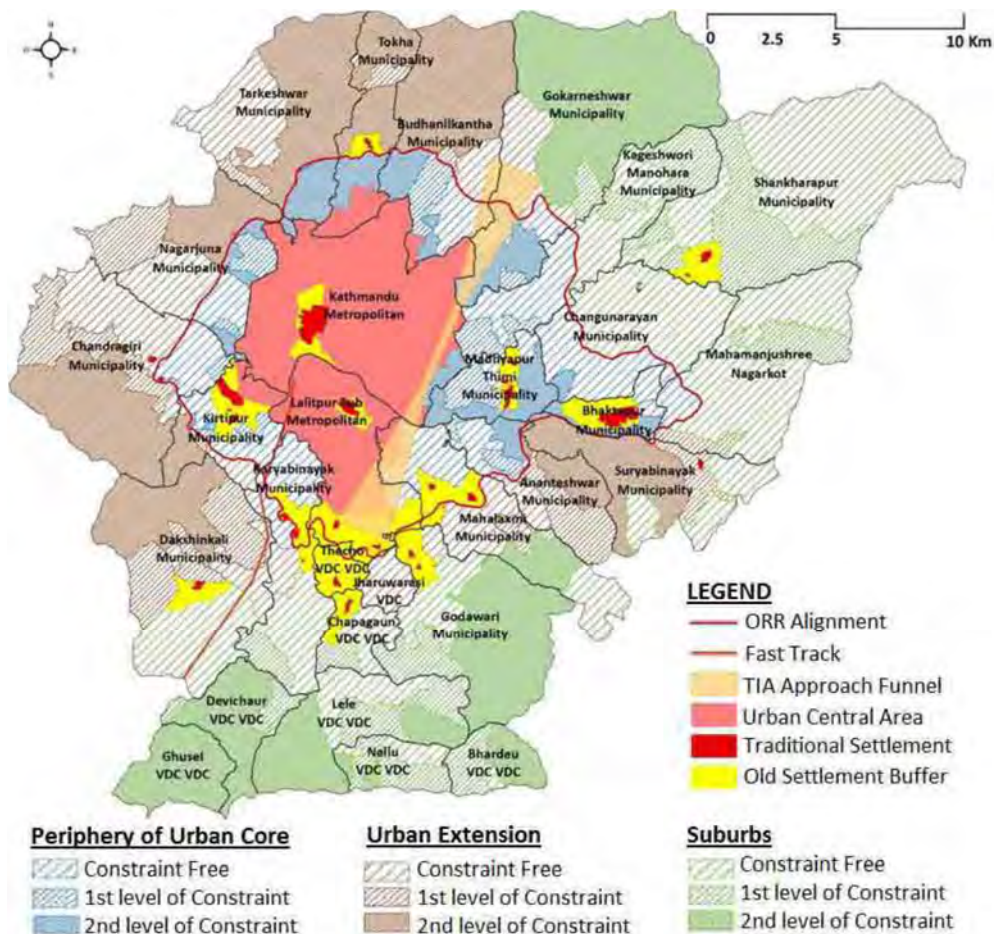
7.2.1 Review of Existing Urban Development Master Plans, Relevant Development Plans, and Relevant Infrastructure Programs

1) Existing Urban Development Master Plan in the Kathmandu Valley

The Vision 2035 and Beyond: 20 Years Strategic Development Master Plan (2015–2035) for Kathmandu Valley was developed by Kathmandu Valley Development Authority (KVDA) in 2014 to articulate an urban development plan for the Kathmandu Valley (Urban Area).

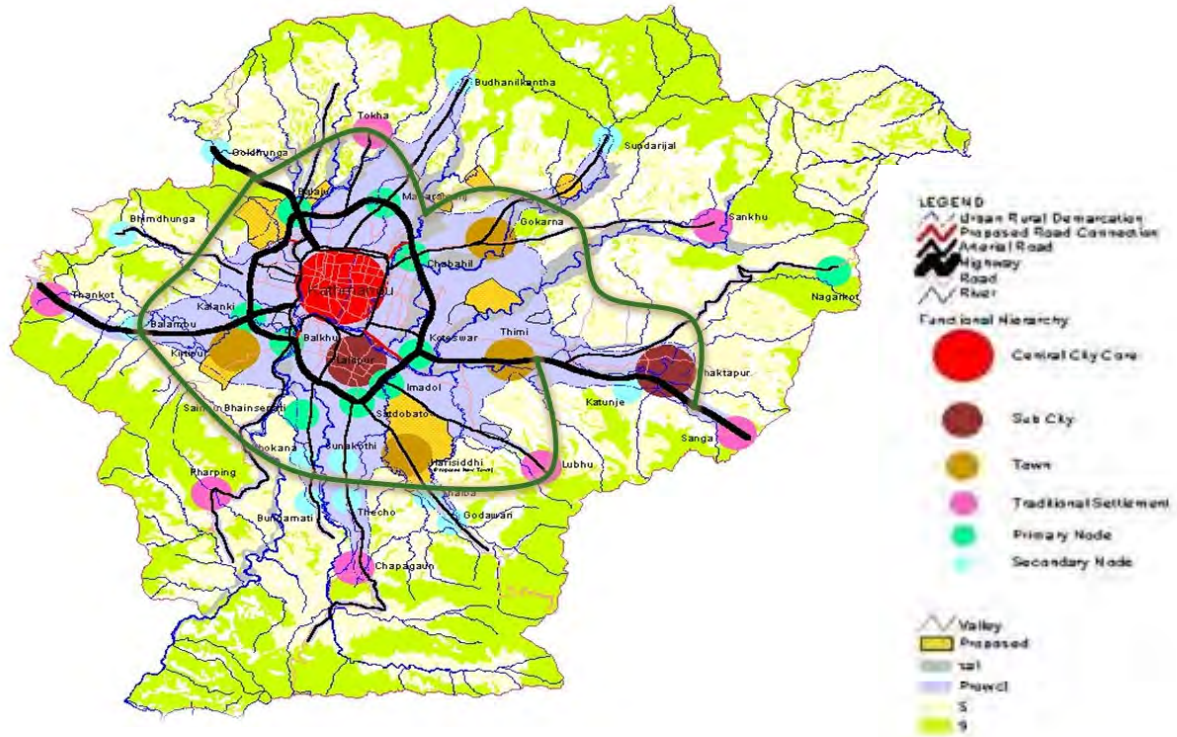
This ongoing master plan has set general development objectives and policies (strategies) that will be put into action by developing individual infrastructure development projects and environmental management plans and land use plans (zoning plans) for the 21 local authorities (municipalities) constituting the Kathmandu Valley after the master plan is officially adopted by the cabinet of the federal government. This adoption process is still underway.

This urban development master plan is characterized by the following two features: (i) recognizing the vulnerability of the Kathmandu Valley to natural disasters and reflecting disaster hazard areas in the development plan (see Figure 7.2.1) and (ii) aiming to develop a polycentric urban spatial structure (see Figure 7.2.2).



Source: KVDA (2014), Vision 2035 and Beyond: 20 Years Strategic Development Master Plan (2015–2035) for Kathmandu Valley

Figure 7.2.1 Proposed Land Use Plan for Disaster Risk Management in the Kathmandu Valley



Source: KVDA (2009), Why Outer Ring Road?

Figure 7.2.2 Development Plans on the Outer Ring Road and Urban Centers in the Kathmandu Valley

The Vision 2035 and Beyond estimates future population numbers as follows.

Table 7.2.1 Future Population Numbers in the Kathmandu Valley

	2015	2020	2025	2030	2035
Population (million)	2.9	3.5	4.3	5.1	6.1

Source: KVDA (2014), Vision 2035 and Beyond: 20 Years Strategic Development Master Plan (2015–2035) for Kathmandu Valley

2) Satellite Town Development Project

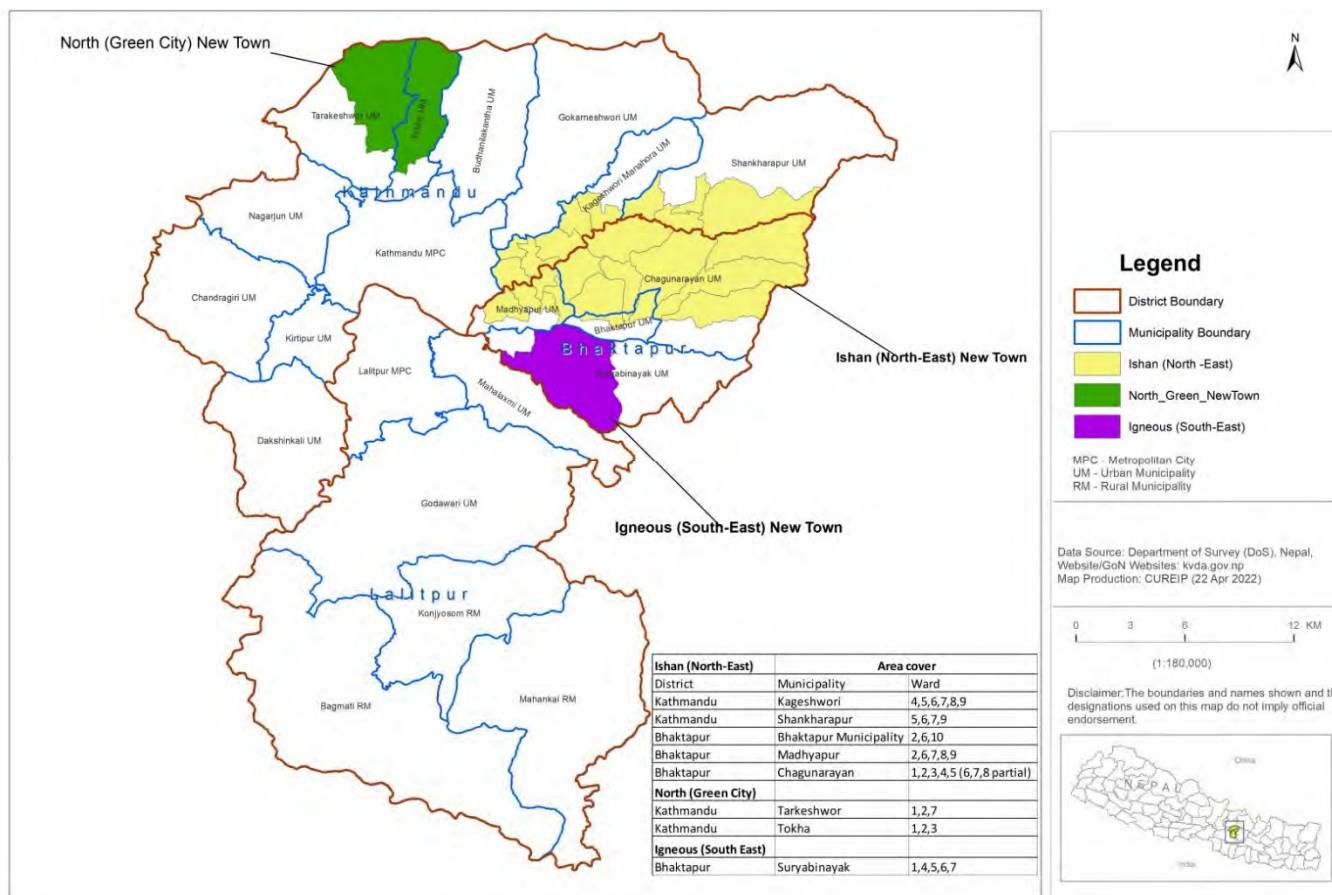
In order to develop a polycentric urban spatial structure, as envisioned in Vision 2035 and Beyond, KVDA planned to develop four satellite towns but decided to withdraw from one of them because of the strong opposition from local residents. At present, three satellite town (new town) projects are under preparation. The scale and location of these projects are shown in Tables 7.2.2 and 7.2.3, respectively.

The three satellite town (new town) projects will not only create suburban residential areas but also establish commercial and service functions and industrial hubs to provide services and create employment opportunities in the local suburbs. This plan will create the need to further develop roads (radial and outer ring roads) and public transport systems, including Mass Rapid Transit (MRT), to improve connectivity between the satellite towns and existing CBDs).

Table 7.2.2 Proposed Development Plans for 3 Satellite Towns (New Towns) in the Kathmandu Valley

		Gross area of project site (ha)	Gross area by land use type (ha)
1	Kathmandu Igneous (Eastern South) New Town	905 ha	Road: 186 ha Open space: 41 ha Forest: 27 ha Development site: 651 ha
2	Kathmandu Ishan (Eastern North) New Town	5,270 ha	Road: 882 ha Open space: 670 ha Development site: 3,718 ha
3	Kathmandu North (Green City) New Town	681 ha	Road: 141 ha Open space: 35 ha Development site: 505 ha

Source: KVDA



Source: KVDA

Figure 7.2.3 Locations of 3 Satellite Towns (New Towns) in the Kathmandu Valley

3) Development of Outer Ring Road and Radial Roads

Outer Ring Road

The concept of developing the outer ring road (with a total length of 72 km) in the Kathmandu Valley, as shown in Figure 7.2.2 above, has been discussed for the following

purposes for years:

- Resolve traffic issues in the Kathmandu Valley
- Improve access to the eastern and southern parts of the Kathmandu Valley
- Improve access to traditional settlements on the periphery of the Kathmandu Valley
- Control the sprawling of urban areas
- Develop infrastructure and settlements in a systematic manner
- Develop arterial roads to connect the Kathmandu Valley to the northern and eastern parts of Nepal
- Provide economic development opportunities

The Outer Ring Road will also connect to the three satellite towns mentioned above.

At present, the outer ring road development project is being regularly discussed by a steering committee consisting of 40 to 50 officials from relevant ministries. The project is designed to use the land pooling scheme to acquire land for road development and is therefore supervised by the MoUD. In addition, the steering committee is considering putting the project into action, along with detailed urban development planning for communities along the outer ring road (corridors).

The Government of China was expected to support the road project but has so far made no commitment.

Radial Roads

The Kathmandu Valley mainly has the following radial roads:

- Kathmandu-Bhaktapur Road (an arterial road to the west)
- Kathmandu-Chandragiri Road (an arterial road to the east, branched into two major routes, one of which will connect to Nagdhunga Tunnel under construction)
- Trishuli Highway (a primary road to the northeast)
- Kathmandu-Godawari Road (a primary road to the southwest)

In addition, the Kathmandu-Nijgadh Fast Track is under construction to connect the Kathmandu Valley and the provincial capital of Hetauda (located 150km south of Kathmandu).

The three satellite towns to be developed as sub-centers of the polycentric Kathmandu Valley Urban Area should be connected by radial roads to the center of the Kathmandu Valley Urban Area in the future.

7.2.2 Division or Roles among Different Government Levels in the Period of Transition to the Federal Government System

1) Federal Government System

According to the new constitution promulgated in 2015, a federal government system has been established consisting of three layers of federal government, provincial governments, and local governments since 2017.

In the new constitution, Nepal is administered under seven provinces (pradesh), 77 districts (jilla), and 775 municipalities (palika). Municipalities are classified into four categories, namely

(i) metropolitan/ mahanagarपालिका, (ii) submetropolitan/ उपमहानगरपालिका, (iii) urban municipalities/ नगरपालिका, and (4) rural municipalities गाउँपालिका. Under these municipalities, wards/wada, which are the smallest units of government administration in Nepal, is established.

2) Division of Roles for Infrastructure Development and Urban Development

In Nepal's federal government system, the federal-level ministries and authorities are responsible for formulating laws, policies, and technical guidelines and for implementing them in guiding provinces and local governments. For infrastructure development, at the federal government level, the Department of Roads is in charge of federal highways and feeder roads in a strategic road network. On the other hand, the provincial Transport Infrastructure Directorate is responsible for constructing and maintaining provincial highways and feeder roads. Together with MoFAGA, local governments are to play the role of constructing and maintaining urban roads within their local governments' territories.

The Federal Ministry of Urban Development is responsible for planning, designing, and constructing urban roads, water supply facilities, and bus terminals in local government areas. At the same time, local governments could construct and maintain municipal infrastructures. On the other hand, local governments are to prepare and implement physical development plans for their municipal areas. Local governments are also in charge of land development programs (by land pooling) and are responsible for improving and developing open spaces.

In this situation of division of roles in infrastructure development, the Federal Ministry of Urban Development is to prepare integrated urban development plans for urban areas, in which local governments are also responsible for some infrastructure provision, and provincial governments are to formulate physical development plans in some provincial capitals and cities. On the other hand, local governments are responsible for formulating and enforcing development regulations and building regulations in their municipal areas.

3) Division of Roles among Different Government Levels in Management of Urban Transportation

Before the transition to the Federal Government System, Ministry of Physical Infrastructure and Transport (MoPIT) was responsible for managing public transportation, including permits for urban bus operations. Since the establishment of the Federal Government System, the Department of Transport Management of MoPIT of the federal government is in charge of formulating laws, policies, and plans at the national level.

On the other hand, the following functions and responsibilities of substantial management of transportation have been transferred to the provincial government.

- Provincial-level laws, policies, regulations, and plans
- Registration of vehicles and issuing of driving licenses
- Issuing of licenses of operating routes for public transportation,
- Preparation of regulations of fares, road safety, security of motor vehicles and passengers of public transportation
- Planning and implementation of examination of exhaust gas from motor vehicles

In fact, the responsibilities for such management of public transportation in Kathmandu

Valley have been transferred to Bagmati Provincial Government. In Bagmati Provincial Government, Labor, Employment, and Transport Ministry is in charge of the management of public transportation, including issuing licenses for urban bus operations.

Although the introduction of common IC cards for urban buses has been considered by the Federal Department of Transport Management under MoPIT, this issue is now in the hands of the Ministry of Labor, Employment, and Transport of Bagmati Province.

7.2.3 Present Situation of Detailed Land Use Plans and Land Use Regulations/Building Regulations for Local Governments and Integrated Urban Development Master Plan for Kathmandu Valley

1) Detailed Land Use Plans for Local Governments and Integrated Urban Development Master Plan for Kathmandu Valley

In the Kathmandu Valley, detailed municipal land use plans are developed to specify land use regulations (to regulate the use of buildings) and building regulations (to regulate the form of buildings, including setback distances and building coverage and floor area ratios).

On the other hand, an urban development master plan should be formulated and implemented from a perspective of an overall and integrated urban area of Kathmandu Valley to promote and regulate urban development toward a better future because Kathmandu Valley is a large urbanizing area extending from the urban core (KMC and LMC).

2) Detailed Land Use Plans and Land Use Regulations/Building Regulations

Before the transition to the federal system, bylaws on Settlement Development, Urban Planning, and Building Construction were instituted and published for specific land use and building regulations by the Kathmandu Valley Development Authority (KVDA) under the supervision of the Ministry of Urban Development (MoUD) of the central government in 2007. These bylaws were supposed to be enforced by local authorities (metropolitan and municipal authorities) to regulate land use and building construction. In 2015, after the transition to the federal system, the Department of Urban Development and Building Construction (DUDBC) published revised bylaws for local authorities to follow.

Meanwhile, the Ministry of Federal Affairs and General Administration (MoFAGA)⁴ instructed local authorities (metropolitan and municipal authorities) to develop their land use and building regulations. In response, the Kathmandu Metropolitan City (KMC) government developed its land use bylaws and building bylaws.

Thus, both federal and municipal bylaws have been in effect the moment after the transition to the federal system. This has sparked a dispute between the federal and KMC governments, which has ended up in court.⁵

⁴ Formerly known as the Ministry of Local Government.

⁵ The settlement of the lawsuit cannot necessarily solve this dispute or lead to the appropriate development of the Kathmandu Valley (Urban Area). The federal government's victory in the lawsuit will not necessarily mean that the federal authority can proceed with the urban development by coordinating all the matters related to the development of the entire urban area and individual municipalities. It will be difficult for the MoUD and KVDA to grasp both the needs of the entire urban area and the different features and perspectives of the local municipalities. On the other hand, even if the KMC government wins the lawsuit, the local authorities in the Kathmandu Valley

At present, Nepal is still in the period of transition to the federal government system. In this transition, the roles of different government levels are not so well understood each other, and those roles have not been well divided and coordinated by different government levels.

Moreover, since Kathmandu Valley is composed of 21 local governments, the federal government, provincial government, and local governments must collaborate and coordinate in formulating an integrated urban development master plan. Furthermore, local governments need to formulate detailed land use plans for guiding development and building regulations. However, at the moment, local governments do not have sufficient capacity for these tasks.

In fact, after the 2015 transition to the federal government system, an integrated urban development master plan has neither been formulated nor approved for Kathmandu Valley. Moreover, most local governments have not finished preparing detailed land use plans, by which development and building regulations are to be formulated.

Under the federal system, KVDA should, as a federal government agency, create a framework to coordinate the metropolitan and municipal authorities to achieve comprehensive development in the Kathmandu Valley, and the local authorities (metropolitan and municipal authorities) should regulate land use and building forms and structures under the federally established framework. The local authorities should also play a complementary role as constituent members of the urban area and collaborate with the federal authorities to achieve integrated development.

3) MoUD, KVDA, and Local Governments

In the period of transition to the federal system, it seems that MoUD and KVDA might have some concerns and anxieties about their roles in the formulation and implementation of an Integrated Urban Development Master Plan for Kathmandu Valley.

On the other hand, through the COVID-19 Pandemic, local governments have gained and appealed to the capabilities of playing substantial roles in responding to local difficulties to local people.

Since KVDA is a bureaucratic organization not headed by political leaders, KVDA's roles and responsibilities are not clear yet under the federal government system concerning provincial and local governments.

On the other hand, local governments have not yet sufficiently gained the basic capacities to properly handle land use regulations and building regulations and to promote sustainable urban development. It is partly because they do not conceive any incentives to formulate and utilize development and building regulations by formulating detailed land use plans.

However, if land use plans are not formulated as they are at present and development continues without enforcement of land use regulations and building permit procedures, urbanization will proceed without appropriate infrastructure development, resulting in a

cannot necessarily develop or enforce land use and building regulations by themselves (without coordinating the integrated development of the entire urban area and the individual needs of neighboring municipalities) given the complicated strategy for the integrated development of the entire urban area and the different needs of municipalities.

deteriorated urban environment. Furthermore, it is feared that the land use regulation and the construction permit system will not be accepted by people.

4) Necessity of formulating "an Integrated Urban Development Master Plan for Kathmandu Valley" and capacity development of related organizations through collaboration and coordination among federal ministries, provincial ministries, and local governments under the federal government system

Over many years of "Royal Government," "Maoist conflicts," and "transition to the federal government system," urban development master plans (formulation/ approval/ implementation) and detailed city planning (formulation/ approval/ implementation) have been largely neglected.

Also, the ability to coordinate between the Kathmandu Valley level and the local government level is required for formulating and implementing urban development plans (at the macro and local levels) during the transition to the federal system. However, it is not currently available to the federal government and local governments of Nepal.

There is a need to restructure a mechanism of coordination and coordination involving the federal and local levels of government institutions.

From a medium- to long-term perspective, it is essential to strengthen capacity for urban development and urban planning from the following perspectives at both the Kathmandu Valley level and the local government level.

- Kathmandu Valley level: Transforming the urban spatial structure of the Kathmandu Valley into a multipolar distributed pattern
- Local government level: To start efforts aimed at forming New Neighborhoods

Now, if efforts are not undertaken to properly guide urban development, both at the metropolitan and local levels, urbanization will continue to progress without land use or building regulations, and people and businesses will never comply with land use plans, land use regulations, and building regulations.

If the situation continues, the deterioration of the urban environment will not be stopped, and the monocentric urban spatial structure will be spurred and will not be possible to solve.

In this sense, a Kathmandu Valley Urban Development Master Plan and the detailed land use plans of local governments are required to be formulated in collaboration and coordination among related organizations, including the local governments, and a system to promote the implementation will be established and the plan of the local government will be formulated. There is an urgent need to utilize assistance from international development partners to improve the capacity to promote sustainable and resilient urban development in Kathmandu Valley.

7.2.4 Review of JICA's Cooperation Policy and Past and Ongoing Projects

Nepal is a mountainous, landlocked country with geographical constraints and long-lasting political instability that have greatly impeded infrastructure development and governance. Agriculture, the prime industry of Nepal, has also lagged in productivity. In addition, the

economy has been slowed down by the devastating earthquake that struck Nepal in April 2015 and caused more than 9,000 casualties and building damages in and around the Kathmandu Valley at the center of the country. Moreover, the COVID-19 pandemic over the last two and a half years has had a significant negative impact on the inbound tourism sector, the country's main source of foreign exchange, and made it likely that it will take several more years for Nepal to move out of the low-middle income status defined by the World Bank.

With this recognition, Nepal is now accelerating its efforts to recover from the earthquake and increase national resilience, and JICA is supporting these efforts mainly through building projects.

In the meantime, a new constitution was enacted in September 2015 in the peace and democratization process, turning the country into a federal system. However, because the roles of ministries and local authorities have not been fully defined under the federal system, JICA is planning to help the federal system and democracy, both fundamental to the new Constitution, take root in the country while supporting the promotion of development projects.

1) Japan's Financial Assistance in the Kathmandu Valley

JICA carried out the following Grant Aid and ODA Loan projects in the urban transport and road, post-earthquake recovery and reconstruction, water supply, power, airport, and health sectors, among others, in Kathmandu Valley over the two decades before the COVID-19 pandemic.

Table 7.2.3 Japan's Financial Assistance in the Kathmandu Valley

		Approval Year	Commitment Amount
Grants: Urban Transport and Road Sector			
1	Project for Improvement of Intersections in Kathmandu City	2001	1,062 million JPY
2	Project for the Improvement of Kathmandu-Bhaktapur Road	2008	2,689 million JPY
ODA Loans: Road Sector			
4	Nagdhunga Tunnel Construction Project	2016	16,636 million JPY
Grants: Post-earthquake Recovery and Reconstruction (Health, Water Supply, and Road/Bridge Sectors)			
5	Program for Rehabilitation and Recovery from Nepal Earthquake (i) Reconstruction of Bir Hospital (Kathmandu Valley) (ii) Reconstruction of Paropakar Maternity & Women's Hospital (Kathmandu Valley) (iii) Water pipe rehabilitation (Sindhupalchowk District) (iv) Bridge reconstruction (Gorkha District)	2016	4,000 million JPY
ODA Loans: Post-earthquake Recovery and Reconstruction (School Sector)			
6	Emergency School Reconstruction Project (Reconstruction and seismic retrofitting of school facilities affected by the earthquake and improvement of relevant equipment)	2015	14,000 million JPY
Grants: Water Supply Sector			
7	Project for Improvement of Kathmandu Water Supply	2001	1,040 million JPY

		Approval Year	Commitment Amount
	Facilities (Phase 1)		
8	Project for Improvement of Kathmandu Water Supply Facilities (Phase 2)	2002	927 million JPY
9	Project for Improvement of Kathmandu Water Supply Facilities (Phase 3)	2003	277 million JPY
Grants: Power Sector			
10	Project for the Extension and Reinforcement of Power Transmission and Distribution System in Kathmandu Valley (Phase 3)	2002/2003	1,396 million JPY
Grants: Transport (Airport) Sector			
11	Tribhuvan International Airport Modernization Project (Construction of air-route surveillance radar facilities)	2012	989 million JPY
Grants: Health Sector			
12	Project for Improvement of Medical Equipment in Tribhuvan University Teaching Hospital	2016	754 million JPY

Source: JICA Study Team

2) Japan's Technical Cooperation for Capacity Development in the Kathmandu Valley

At present, JICA is implementing the following three Technical Cooperation Projects for capacity development in the Kathmandu Valley.

Table 7.2.4 Japan's Technical Cooperation for Capacity Development in the Kathmandu Valley

Technical Cooperation for Capacity Development: Water Supply, Disaster Risk Management, and Transport Sectors		Approval Year	Project Duration
1	Project on Capacity Development of KUKL to Improve Overall Water Supply Service in Kathmandu Valley	2018	5 years
2	Project for Strengthening Disaster Risk Governance for Resilience in the Kathmandu Valley	2021	4 years
3	Project for Introduction of Urban Transport Management in Kathmandu Valley (Improvements in traffic management, especially in traffic signal control at intersections)	2022	3.5 years

Source: JICA Study Team

3) Future Prospective Projects in the Kathmandu Valley

The priority list of the MoPIT includes the following two flyovers (or underpass) construction projects in the southern section of a ring road in Kathmandu Valley. JICA is also considering formulating ODA Loan Projects related to these two junctions.

- Tinkune Koteshwor Junction
- Maitigher Junction

7.2.5 Other International Development Partners' Assistance Activities

1) World Bank

In September 2020, the World Bank decided to provide a loan of 200 million USD to the financial sector in Nepal under the shadow of the COVID-19 pandemic to channel funds to private sector players in need of financing.

The World Bank's COVID-19-related assistance in the health sector of Nepal has been mainly the financing of to purchase of COVID-19 vaccines. In February, it decided to

provide a concessional loan of 18 million USD to the Government of Nepal for the COVID-19 Emergency Response and Health Systems Preparedness (CERHSP) Project, including comprehensive COVID-19 vaccination campaigns for children over five.

Moreover, the World Bank conducted a study to assess the impact of the COVID-19 pandemic and post-COVID-19 recovery needs in 20 cities around the world (including Kathmandu Valley, Nepal). Following the diagnostic phase, which is expected to complete around June 2022, the World Bank will formulate and prepare specific COVID-19 recovery projects for some municipalities in the Kathmandu Valley.

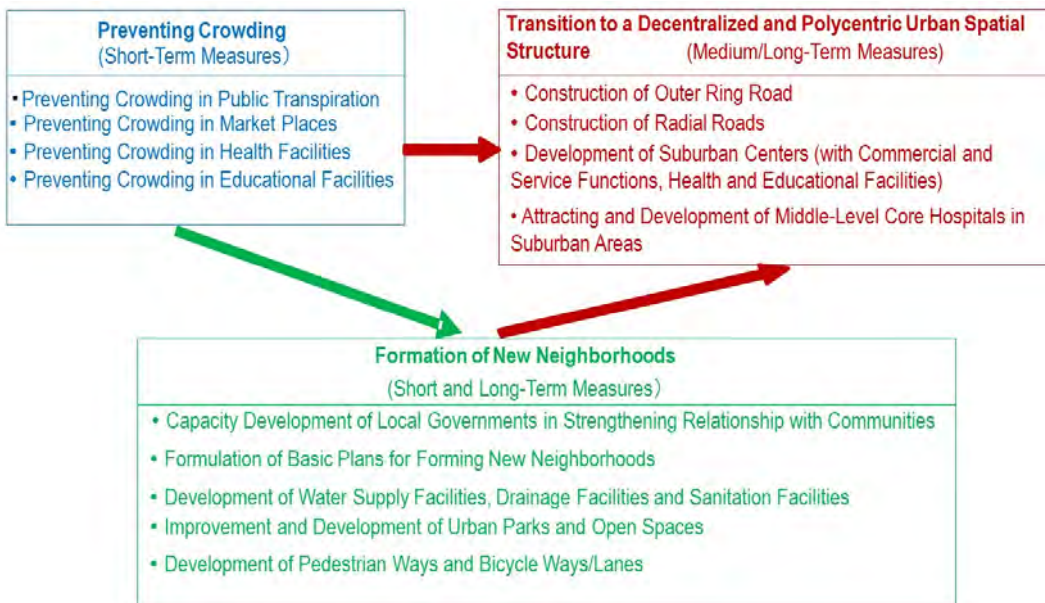
2) Asian Development Bank (ADB)

Just like the World Bank, the ADB provided a loan of 165 million USD to allocate relief funds to small businesses as well as cover necessary expenses for COVID-19 response activities (especially COVID-19 vaccinations). The ADB is providing continued support for a water supply project in urban areas in Nepal, including the Kathmandu Valley, and conducting a study of the transport sector.

7.2.6 Urban Development Strategies Built around New Neighborhoods and Five Pillars

Among the five pillars and the concept of new neighborhoods suggested in this study, the most important concepts in urban development in the Kathmandu Valley are illustrated in the figure below. As shown in this figure, the urban development plan is built around three pillars to increase resilience to infectious diseases like COVID-19, in addition to the sustainability, inclusiveness, and disaster resilience of cities, based on lessons learned from the COVID-19 pandemic.

- (i) Prevent crowding
- (ii) Transition to a decentralized and polycentric urban spatial structure
- (iii) Create new neighborhoods



Source: JICA Study Team

Figure 7.2.4 Three Pillars for Urban Development to Achieve Higher Resilience, Sustainability, and Inclusiveness in the Kathmandu Valley

Necessity of making a rapid transition from emergency responses to longer-term efforts to strengthen urban resilience

It was essential to provide medical equipment at the early stage of the COVID-19 pandemic and provide vaccines and develop a vaccination system at the middle stage of the pandemic; however, these emergency responses alone cannot protect urban society from the outbreaks of the infectious disease or enhance resilience forever.

Necessity of taking short-term measures to prevent crowding in cities

Vaccination is, so far, the only effective way to protect whole cities from pandemics, but it will take a while before a large majority of residents get fully vaccinated. In the meantime, it is essential to resume normal urban activities safely. A short-term solution to this is to prevent crowding in public places and public transport. More importantly, effective emergency response plans and short-term crowd control procedures should be established based on lessons learned from the latest COVID-19 pandemic before another COVID-19 like pandemic occurs. Crowd control procedures have been put into place by public authorities and service providers (e.g., launching online appointment systems for federal government hospitals and installing ticket vending machines in municipal offices) as well as private companies (e.g., launching online ticket booking systems for inter-district bus services) over the last two years of the pandemic but should be further extended.

Necessity of making a strategic transition from short-term to medium- and long-term measures

As illustrated in the above figure, urban development is implemented in different timeframes, such as short-term, medium- to long-term, and short-, medium-, to long-term.

In the short run, crowd control through restrictions on entry to public places can cause their capacity shortages. In order to satisfy the growing needs of urban residents while preventing crowds, it is critical to increase accommodation and service capacity and reduce the geographic concentration of facilities and services. Their locations should be adapted to the future polycentric urban spatial structure. In summary, the more short-term crowd control measures are taken, the more medium- to long-term efforts will be required to transition to a polycentric structure.

Necessity of making efforts to transition from a monocentric to a polycentric urban spatial structure

The development policies and plans of the federal and local governments suggest that efforts should be made to prevent overcrowding and congestion and make the urban spatial structure more polycentric. Vision 2035 and Beyond also aims to develop a polycentric urban spatial structure.

In fact, major polycentric development projects, such as satellite town and outer ring road development projects, have been in the pipeline. The COVID-19 pandemic is forging a consensus on the necessity of launching and accelerating these projects to develop a polycentric spatial structure.

However, over the past years, the federal and local governments did not work very much on polycentralization but worked on major infrastructure projects to meet the increasing

demand for various infrastructure services in the Kathmandu Valley, which rather strengthened the monocentric urban spatial structure.

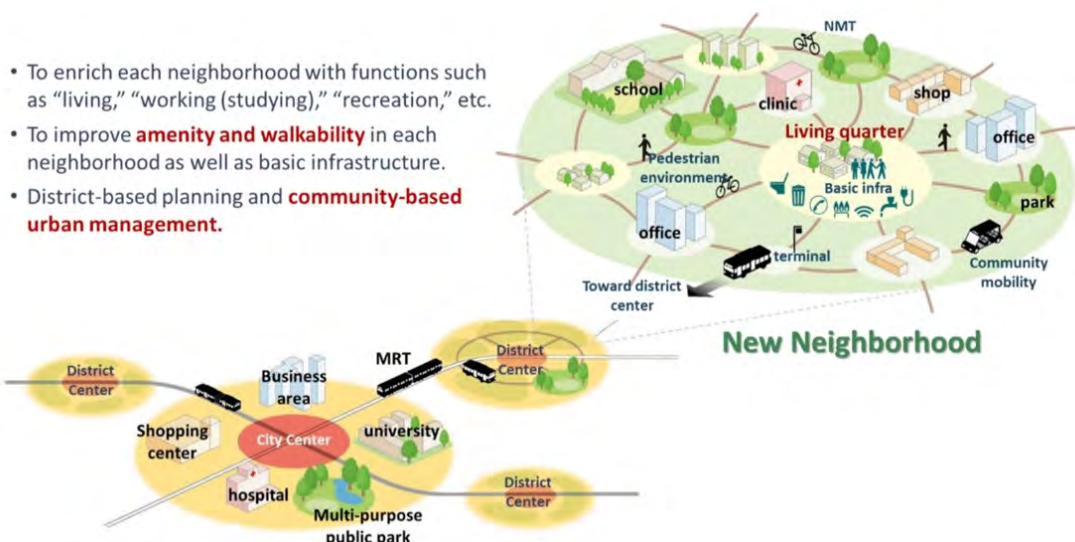
Against this backdrop, the COVID-19 pandemic has highlighted the necessity of moving away from the monocentric spatial structure, which is subject to the geographic concentration of urban functions and the congestion of people in facilities, and transforming it into a decentralized and polycentric model in order to strengthen resilience to COVID-19 pandemics.

Creation of new neighborhoods

The Government of Nepal took the COVID-19 pandemic seriously when it spread to other countries, imposed lockdown orders in March 2020, before the country was struck by an outbreak of COVID-19, and restricted movement and social and economic activities depending on the number of infections in each region and the whole country. These government containment measures had a huge negative impact on the economy and lives of people in the Kathmandu Valley. This indicates that lockdown and containment measures should be accompanied by efforts to mitigate their negative impact and enable people to resiliently continue their lives and economic activities in urban society.

The COVID-19 pandemic has highlighted the importance of individual wellbeing, family relationships, and local communities (local areas, localities, and communities) and, in particular, the necessity of creating an individual-, family-, and community-based safe and healthy living environment and revitalizing communities in growing metropolitan suburbs with population growth and economic expansion.

In addition to the global challenge of building sustainable and inclusive cities, as reflected in the Sustainable Development Goals (SDGs), building resilient cities (physically and socially resilient cities) to natural and health disasters is becoming increasingly important, and the concept of new neighborhoods proposed in this study is considered as a potential solution to the challenge.



Source: JICA Study Team

Figure 7.2.5 Concept of New Neighborhoods

7.2.7 Overview of the Proposed Urban Development Program

It is suggested that the Urban Development Program should be built around the following three pillars of urban development as mentioned above.

(a) Prevent crowding (Short-term approach)

1. Capacity building of Urban Health Clinics (UHCs) for community-level COVID-19 response toward building a resilient urban structure (short-term)
2. Introduction of online appointment systems in public hospitals toward building a resilient urban structure (short-term)
3. Development of pedestrian and bicycle lanes along the Bishnumati River toward building a resilient urban structure (short-term)
4. Development of Balkumari Park in Sunakothi Ward toward building a resilient urban structure (short-term)
5. Integrated development of open spaces in Siddha Pokhari, Bhajya Pukhu, and Na Pukhu of Bhaktapur Municipality toward building a resilient urban structure (short-term)
6. Feasibility study on the introduction and operation of ICT in urban public transport systems toward building a resilient urban structure (short-term)

(b) Create new neighborhoods (Short-, medium-, to long-term approach)

7. Formulation of basic plans for the creation of new neighborhoods in the suburbs toward building a resilient urban structure (medium- to long-term)
8. Formulation of a master plan for the development of pedestrian and bicycle paths in Kathmandu Valley toward building a resilient urban structure (medium- to long-term)
9. Formulation of a master plan and implementation plan for the development of open spaces in Kathmandu Valley (short- and long-term)
10. Administrative capacity building of municipalities in coping with COVID-19 (strengthening of coordination with ward offices and community organizations) toward building a resilient urban structure (medium- to long-term)

(c) Transition to a polycentric urban spatial structure (Medium- to long-term approach)

11. Formulation of a master plan and feasibility study on the development of the outer ring road and satellite towns (medium- to long-term)
12. Development of roads along the Godawari River Corridor (medium- to long-term)
13. Capacity building of infection isolation facilities through the development of multi-purpose facilities

7.3 Cooperation Project Formulation

7.3.1 Possible Cooperation Projects

Based on the above-mentioned perceptual changes in urban issues and the information gathered by site visits and in line with the three pillars of urban development discussed in the previous section, we have created a list of possible projects as shown below. The implementation may take place by combining two or more of these projects.

Table 7.3.1 Potential Cooperation Projects: Short-term Crowding Prevention, Short- to Medium-term New Neighborhood Development, and Medium- to Long-term Transformation to Polycentric Spatial Structure

Short-Term Approach: Prevent Crowding				
No.	Project name	Background		
1 ⊙	Capacity building of Urban Health Clinics (UHCs) for community-level COVID-19 response toward building a resilient urban structure (short-term)	<p>KMC comprises 31 wards, each of which has an Urban Health Clinic (UHC) to deliver primary healthcare services focused mainly on vaccination for children and disease prevention. The UHCs have no physicians, but each is staffed with several health workers and equipped with basic pharmaceutical supplies for treating minor conditions. Although seven Central Hospitals are concentrated in KMC, none of them are operated by KMC, and the residents have to rely on private hospitals/clinics or Central Hospitals that provide advanced medical services.</p> <p>Each UHC has only one room to perform healthcare services for all patients, which is not suitable for treating those who are or might be infected with COVID-19 or other highly communicable diseases. Accordingly, UHCs are conducting COVID-19 vaccination in nearby schools and open spaces.</p>		
	Implementation structure	Impact (overall goal)	Outcome (project purpose)	Output (activity)
	<ul style="list-style-type: none"> Executing agency: Urban Health Department of KMC Relevant agency: MoHP 	Help enhance the capacities of local healthcare providers and communities to respond to and control infectious diseases toward building a resilient city to COVID-19-like infections from a community level.	Curb the spread of COVID-19 from a ward level by enabling UHCs to provide basic knowledge and response to infectious diseases, etc., interactively on a community level.	<ul style="list-style-type: none"> Status survey of UHCs in KMC Development of a selective UHC upgrade plan. Expansion of indoor space for UHCs (by creating an additional room in each building of UHCs, since they currently use one single room divided with partitions). Training of health workers for examining outpatients with fever. Training of health volunteers to promote reach-out activities in communities.
No.	Project name	Background		
2	Introduction of online appointment systems in public hospitals toward building a resilient	<p>Eight Central Hospitals in the urban center of the Kathmandu Valley provide advanced medical services and attract outpatients from all over the country beyond the Kathmandu Valley who have to wait for hours in a long queue in the reception area from early in the morning. This kind of concentration and overcrowding is considered one of the factors spreading infection under the COVID-19 pandemic.</p>		

urban structure (short-term)				
Implementation structure	Impact (overall goal)	Outcome (project purpose)	Output (activity)	
<ul style="list-style-type: none"> • Executing agency: Central Hospital run by federal government • Relevant agency: MoHP 	Enhance the resilience of the entire Kathmandu Valley to COVID-19-like infections through the provision of ICT-based contactless/anti-crowding type healthcare services to the Central Hospitals in the urban agglomeration of Kathmandu Valley.	<ul style="list-style-type: none"> • Create an environment where outpatients can seek medical services safely without waiting in crowded places. • Prevent hospitals from being crowded with patients and becoming a breeding ground for COVID-19-like infections. 	<ul style="list-style-type: none"> • Review of points to consider in building an appointment system for outpatients in consultation with the hospitals and health workers. • Develop an online appointment system application for outpatients. • Operate and maintain the application. 	
No.	Project name	Background		
3	Development of pedestrian and bicycle lanes along the Bishnumati River toward building a resilient urban structure (short-term)	<p>During the COVID-19 pandemic, people showed an increasing tendency to avoid using public transport systems. In addition, lockdown and other restrictive measures compelled city bus and other public transport operators to reduce passenger capacity and service frequency, which encouraged medium- to high-income residents to drive their own 4- or 2-wheel vehicles or share such vehicles with others while low- and lower-medium-income groups increasingly traveled on foot or by bicycle.</p> <p>To connect residential areas to workplaces and open spaces, bicycle roads/lanes need not only to be extended but also networked within the Kathmandu Valley.</p> <p>Some municipalities have already begun creating bicycle lanes by painting marking on road pavement. These lanes can be networked by utilizing the river corridors (space along the river) with little ups and downs to create the main arteries of bicycle roads/lanes in the Kathmandu Valley (Urban Area).</p> <p>Since the High Power Committee for Integrated Development for Bagmati Civilization (HPCIDBC) is currently developing bicycle roads in the river corridors along the Bagmati River, the development of bicycle roads/lanes along the Bishnumati River, which connects to the Bagmati River, will facilitate the expansion of bicycle network in the Kathmandu Valley.</p>		
Implementation structure	Impact (overall goal)	Outcome (project purpose)	Output (activity)	
<ul style="list-style-type: none"> • Executing agency: KMC • Relevant agency: MoFAGA 	Proceed to enhance the resilience of the city to COVID-19-like pandemic through the reduction of infection risk by preventing crowding in public transport, providing low-income residents access to affordable transport with low infection risk, and promoting low carbon transport, with a view to future medium- to long-term initiatives.	Develop a transport system affordable to low- to lower-medium-income groups who tend to avoid using public transport and save money on travel during the COVID-19 pandemic. Expand bicycle access to workplaces, commercial facilities, parks, etc., by networking the bicycle (+ pedestrian) lanes with existing ones.	<ul style="list-style-type: none"> • Review of different ideas of KMC for developing bicycle (+ pedestrian) lanes along the Bishnumati River. • Site survey • Feasibility study • Pre-FS and detailed design study • Development of pedestrian and bicycle lanes. 	

No.	Project name	Background		
4	Development of Balkumari Park in Sunakothi Ward toward building a resilient urban structure (short-term)	<p>The experience of the COVID-19 pandemic revealed that living in lockdown or under other restrictions for an extended period causes mental distress to people living in densely populated and built-up urban/suburban areas.</p> <p>Rapidly urbanized areas lack accessible, user-friendly, and well-developed open spaces and parks where people can refresh by taking a walk, exercising, etc. There used to be unmanaged vacant lots in these suburban areas, which the residents could use for playing sports, exercising, or walking but are quickly disappearing due to rapid urbanization. Balkumari Park in Sunakothi Ward has sports and picnic grounds developed with the effort of Ward No. 27 and is situated in an area dotted with Hindu temples. However, the boundaries of the park and open spaces are not clearly delineated by fences or other structures, making them increasingly susceptible to informal encroachment and settlement along with the urbanization of the surrounding areas.</p> <p>To prepare for a future COVID-10-type pandemic, it is vital to permanently secure the well-developed public open grounds and parks on a permanent basis by improving the usability of and access to the remaining spaces.</p> <p>At the same time, it is crucial to develop these open grounds and parks to function as disaster relief areas as substantiated by the fact that many people lived in vacant lots for two to three months after the great earthquake in 2015 in fear of being crushed by collapsing houses.</p>		
	Implementation structure	Impact (overall goal)	Outcome (project purpose)	Output (activity)
	<ul style="list-style-type: none"> • Executing agency: Lalitpur Municipality, Ward No. 27 • Relevant agency: MoFAGA 	Enhance the resilience of the urban area by creating parks and open spaces in the suburb where the residents can gather and entertain themselves during normal times; take a refreshing walk, exercise, play, etc. during a pandemic; and use them as emergency shelter sites when an earthquake or other disaster occurs.	Develop a public open space and park, which the neighborhood residents can use for walking, exercising, playing, etc., even under COVID-19 restrictions, as well as for emergency shelters at the time of disaster.	<ul style="list-style-type: none"> • Exchange of ideas between the municipality and ward regarding the development of open space and park • Site survey • Drafting of Master Plan • Detailed design • Improvement of the use environment of open space and park • Development of parks, including access roads
No.	Project name	Background		
5	Integrated development of open spaces in Siddha Pokhari, Bhajya Pukhu, and Na Pukhu of Bhaktapur Municipality toward building a resilient urban structure (short-term)	<p>The experience of the COVID-19 pandemic revealed that living in lockdown or under other restrictions for an extended period causes mental distress to people living in densely populated and built-up urban/suburban areas.</p> <p>Rapidly urbanized suburban areas lack accessible, user-friendly, and well-developed open spaces and parks where people can refresh by taking a walk, exercising, etc. There used to be unmanaged vacant lots that the residents could use for playing sports, exercising, or walking, but they are quickly disappearing due to rapid urbanization. To prepare for future COVID-19-like pandemics, it is vital to begin improving the accessibility and usability of the remaining sites.</p> <p>Fortunately, there are many Hindu temples and ponds with some vacant lots around them in Bhaktapur, the suburban center of the eastern Kathmandu Valley. By redeveloping and interconnecting these empty lots, it is possible to satisfy the residents' needs for public open spaces for refreshment in the middle of the densely populated suburb.</p>		
	Implementation structure	Impact (overall goal)	Outcome (project purpose)	Output (activity)

	<ul style="list-style-type: none"> Executing agency: Bhaktapur Municipality Relevant agency: MoFAGA 	Enhance the resilience of the urban area by creating parks and open spaces in the suburb where the residents can gather and entertain themselves during normal times, take a refreshing walk, exercise, play, etc., during a pandemic; and use them as emergency shelter sites when an earthquake or other disaster occurs.	Develop public open spaces and parks, which the neighborhood residents can use for walking, exercising, playing, etc., even under COVID-19 restrictions, as well as for emergency shelters at the time of disaster.	<ul style="list-style-type: none"> Site survey Drafting of Master Plan Detailed design Improvement of the use environment of open spaces and parks <p>Development of parks, including access roads</p>
No.	Project name	Background		
6 ©	Feasibility study on the introduction and operation of ICT in urban public transport systems toward building a resilient urban structure (short-term)	<p>In the Kathmandu Valley, city bus services were stopped or reduced in frequency or passenger capacity every time it was hit by a new wave of COVID-19, which not only made the bus less convenient but also made people aware of the risk of infection, driving people away from using city buses.</p> <p>In response to this situation, an initiative is under consideration to introduce a “smart card” system to city bus services in the Kathmandu Valley that allows smooth and contactless bus fare payment.</p> <p>Introducing the smart card was being considered by the government before the COVID-19 pandemic as a measure to streamline city bus operations and accurately record the revenue from passengers. However, it was prevented from realization due to a delay in coordination among stakeholders.</p> <p>Since Nepal became a federal republic, it has been unclear which administrative organ is responsible for the licensing and management of city bus operations in the Kathmandu Valley. After some coordination, it is now agreed that the Ministry of Labour, Employment and Transport (MoLET) of Bagmati Province will assume the role.</p>		
	Implementation structure	Impact (overall goal)	Outcome (project purpose)	Output (activity)
	<ul style="list-style-type: none"> Executing agency: Bagmati Provincial Government, MoLET Relevant agency (Chair of the Steering Committee): MoPIT 	Help enhance the resilience of the urban area by introducing and operating ICT-based contactless/anti-crowding-type services in urban public transport systems.	<p>The following effects can be expected through the introduction of a common smart card:</p> <ul style="list-style-type: none"> Smooth and quick fare payment. Less contact at the time of fare payment. <p>This will help reduce the avoidance of using public transport systems for fear of infection during the COVID-19 pandemic. By combining the practice of proper air ventilation, the resilience of public transport systems to COVID-19-like infections can also be enhanced.</p>	<ul style="list-style-type: none"> Collect information and creation of a database regarding city bus routes, number of buses in service, and owners Feasibility study on introducing and operating a common smart card (IC card) system for the payment of city bus fares Implement a pilot project to experimentally introduce a common smart card system for paying city bus fares
Short-, Medium-, and Long-Term Approach: Create New Neighborhoods				

No.	Project name	Background		
7 ©	<p>Formulation of basic plans for the creation of new neighborhoods in the suburbs toward building a resilient urban structure (medium- to long-term)</p>	<p>Transformation of the Kathmandu Valley (Urban Area) from the current monocentric spatial structure to a polycentric spatial structure has been considered for many years. The democratization movement and Maoist insurgency that began in 1990 and 1996, respectively, induced an influx of people into the valley (its population increased by 0.8 million from 1.65 million in 2001 to 2.45 million in 2011). Although the population growth during the subsequent decade between 2011 and 2021 remained around 0.5 million, the growth took place mostly in the suburban areas as opposed to the preceding decade (2001–2011), which saw a population growth in urban and suburban areas. Since the suburban population is expected to continue growing at a high pace, it is necessary to decentralize the urban functions of the Kathmandu Valley and disperse them into suburban areas to maintain their efficiency. Suburban areas require not only the provision of housing but also the development of suburban centers that provide various administrative/commercial services and serve as homes to businesses, etc. The COVID-19 experience revealed that the concentration of urban functions in the central district invites overcrowding of the residential population and economic activities, encouraging the spread of highly contagious viruses such as COVID-19. To counter this issue from a medium- to long-term perspective, the idea to form a decentralized and polycentric urban area that has long been put on the back burner is now being reconsidered. At the same time, people began to accept the fact that lockdown and other restrictions are inevitable to curb COVID-19 infections and that they need to find ways to secure necessary commodities, refresh their minds by walking or exercising, and engage in economic activities within their respective localities. For the restructuring of the urban area from both perspectives of economic efficiency (the decentralization concept since the pre-COVID era) and resilience (the “new neighborhood” concept for building localities that are resilient to COVID-19-like pandemics, comfortable to live in, and supplied with various commodities), formulation of an urban development master plan is called for. In addition, in formulating and implementing the master plan while reinforcing the transition to a federal republic, it is crucial to establish an institutional mechanism/platform in which the federal and provincial governments provide ample support to the stakeholders, especially the local governments (metropolitan cities and municipalities), of the Kathmandu Valley and enable them to take initiatives. In particular, urban projects previously led by KVDA to develop the Kathmandu Valley as a whole now need to be approached from the perspective of each of the 21 local governments with lessons learned from the COVID-19 pandemic to create new neighborhoods.</p>		
	<p>Implementation structure</p>	<p>Impact (overall goal)</p>	<p>Outcome (project purpose)</p>	<p>Output (activity)</p>
	<ul style="list-style-type: none"> • Executing agency: 21 local governments (metropolitan cities and municipalities) • Relevant agency (policy-making): MoUD • Relevant agency (technical) 	<p>As part of the effort for decentralization of the Kathmandu Valley (Urban Area), comprehensively improve the area’s sustainability, inclusiveness, and resilience by creating “new neighborhoods” in the suburbs to facilitate urban development refocused on health, livelihood, and local</p>	<p>Manage urban development by harnessing the capacity of the municipalities comprising the Kathmandu Valley in line with Vision 2035 as the basic guidelines. As part of this endeavor, formulate and implement infrastructure</p>	<ul style="list-style-type: none"> • Formulate a basic plan for urban development for the suburban areas that aims for sustainable and inclusive development and incorporates measures to enhance resilience to COVID-19-like infections for the entire Kathmandu Valley in line with Vision 2035 and Beyond.

	guidance): DUDBC and KVDA	communities, as well as resilience to COVID-19 like infections.	development and land-use plans as a tool for creating new neighborhoods in the suburbs and enhancing their sustainability, inclusiveness, and resilience to infectious diseases and earthquake disasters.	<ul style="list-style-type: none"> Formulate an infrastructure development plan focused on establishing suburban centers as a result of polycentralization. Formulate a land use plan that enables the suburban municipalities to impose land use restrictions and process construction permit applications.
	Project name	Background		
8	Formulation of a master plan for the development of pedestrian and bicycle paths in Kathmandu Valley toward building a resilient urban structure (medium-to long-term)	<p>The COVID-19 pandemic impelled more residents in the Kathmandu Valley (Urban Area) to use bicycles for commuting, recreation, etc. To aid such people, Lalitpur Metropolitan City (LMC) has also created bicycle lanes by painting marking on road pavement. Kirtipur Municipality began creating bicycle lanes and rolling out a shared-bicycle initiative to expand the network of bicycle lanes and the areas of use of shared bicycles in collaboration with the neighboring municipalities.</p> <p>KMC has decided to build a bicycle lane on a sidewalk along the newly widened Madan Bhandari Road and is in the process of procurement for construction. In addition, the High Power Committee for Integrated Development for Bagmati Civilization (HPCIDBC) under the Ministry of Urban Development is currently constructing pedestrian and bicycle lanes along the Bagmati River with finance from the Asian Development Bank.</p> <p>It is high time to unite these efforts of Kathmandu's municipalities by networking their bicycle lanes to make traveling between adjacent municipalities and across the Valley more convenient for cyclists.</p> <p>The creation of such bicycle roads/lanes is considered one of the essential elements in the creation of new neighborhoods and needs to be approached comprehensively along with the development of open spaces and parks from the perspective of each municipality and that of the whole Valley.</p>		
	Implementation structure	Impact (overall goal)	Outcome (project purpose)	Output (activity)
	<ul style="list-style-type: none"> Executing agency: 21 local governments (metropolitan cities and municipalities) Relevant agency (policy-making): MoUD Relevant agency (technical guidance): DUDBC and KVDA 	<p>Provide alternative transport means to avoid crowded public transport in times of COVID-19 like pandemic.</p> <p>Secure affordable transport for people who suffer from unemployment or income loss under COVID-19-like pandemic situations.</p> <p>Realize a network of pedestrian/bicycle lanes around each node of the urban area, which will be poly-centralized in the future.</p>	<p>Link the communities in a large area by creating a network of bicycle/pedestrian lanes that encompasses the 21 municipalities of the Kathmandu Valley and connects not only between residential zones and business/commercial zones for livelihood but also between open spaces and parks for recreation.</p>	<p>Formulate a master plan for comprehensively developing bicycle roads/lanes and pedestrian spaces targeting the entire Kathmandu Valley, aiming to improve the convenience of cyclists and pedestrians in a larger area by integrating the bicycle-lane initiatives of different municipalities into a comprehensive plan.</p>
No.	Project name	Background		

9	<p>Formulation of a master plan and implementation plan for the development of open spaces in Kathmandu Valley (short- and long-term)</p>	<p>The experience of the COVID-19 pandemic revealed that living in lockdown or under other restrictions for an extended period causes mental distress to people living in densely populated and built urban/suburban areas.</p> <p>Rapidly urbanized suburban areas lack accessible, user-friendly, and well-developed open spaces and parks where people can refresh by taking a walk, exercising, etc. There used to be unmanaged vacant lots that the residents could use for playing sports, exercising, or walking, but they are quickly disappearing due to rapid urbanization. To prepare for future COVID-19-like pandemics, it is vital to begin improving the accessibility and usability of the remaining sites.</p> <p>Open spaces and parks also play an important role as emergency relief areas once a major earthquake occurs. In fact, there used to be many vacant lots, as well as open spaces and parks managed by specific organizations, in the Valley before the 2015 earthquake. MoHA and MoUD took notice of this fact and, with the assistance of USAID, created a database of such open spaces, parks, and vacant lots (83 sites in total), which are expected to be utilized as temporary residences (for a few weeks to months) and shelter from buildings with a risk of collapse. Under the COVID-19 pandemic situation, these sites are also being recognized as places for walking, exercising, or other recreational activities.</p> <p>In addition to the 83 sites included in the database, each municipality and ward has ideas as to how to develop their open spaces and parks. In order to designate such sites as official open grounds and parks and begin developing them systematically, it is necessary to formulate a master plan by reviewing the database and the ideas from a comprehensive viewpoint.</p> <p>The development of such open spaces and parks is considered one of the essential elements for the development of new neighborhoods and needs to be approached comprehensively along with the development of pedestrian/bicycle paths from the perspective of each municipality and that of the whole valley.</p>		
	Implementation structure	Impact (overall goal)	Outcome (project purpose)	<ul style="list-style-type: none"> Output (activity)
	<ul style="list-style-type: none"> Executing agency: 21 local governments (metropolitan cities and municipalities) Relevant agency (policy-making): MoUD Relevant agency (technical guidance): DUDBC and KVDA 	Maintain the resilience of cities in preparation for future COVID-19-like crises and disasters by securing spaces that can be used as parks under pandemic restrictions and temporary residence and shelter after major earthquakes.	Develop parks and recreational grounds and offer them to the residents as places for maintaining their physical and mental wellbeing by securing and utilizing land lots, which would otherwise be converted into other uses or illegally encroached by nearby residents due to the pressure of urbanization.	<ul style="list-style-type: none"> Based on the database of 82 sites created after the major earthquake in 2015, identify improperly managed areas and their usability as open grounds and parks, and develop a park development plan for each area. In addition to the above database, formulate open-space/park development plans based on the land properties and ideas held by each municipality.
No.	Project name	Background		
10 ©	<p>Administrative capacity building of municipalities in coping with COVID-19 (strengthening of coordination with ward offices and community)</p>	<p>During the early phase of the COVID-19 pandemic (in 2020), the transmission of relevant information and the implementation of infection control measures took place in a top-down manner under the central government in Nepal as was the case in many other countries. During the second wave in 2021, however, out of dissatisfaction with the central (federal) government's inadequacy, the local governments (metropolitan cities and municipalities) took initiative and began taking their own actions with funding from the federal government. The metropolitan cities and municipalities in the Kathmandu Valley began conducting PCR tests, contact tracing, isolation, and COVID-19 vaccination.</p>		

	organizations) toward building a resilient urban structure (medium- to long-term)	<p>In Nepal, no election was held to appoint the heads of local governments for nearly two decades from 1997 to 2017 due to strife between the Royal Nepalese Army and the Maoist wing of the Communist Party of Nepal and the ensuing political instability. For this reason, the capacity of each local government has not been developed to an adequate level. However, after undergoing the experience of the COVID-19 pandemic, people began to expect the local governments to play a larger role, and the local governments began making efforts to meet such expectations.</p> <p>To prepare for COVID-19-like pandemics along with decentralization of authority under the federal system, it is necessary to facilitate the efforts of local governments (metropolitan cities and municipalities) in reaching out to their communities and residents in collaboration with subordinate ward offices by developing a system and conducting programs for providing support and solidifying their interrelations to harness the strength of the communities and residents and build the capacity of relevant human resources.</p>		
	Implementation structure	Impact (overall goal)	Outcome (project purpose)	Output (activity)
	<ul style="list-style-type: none"> • Executing agency: MoFAGA • Relevant agency: 21 local governments (metropolitan cities and municipalities) 	Enhance the resilience of the cities to COVID-19-like pandemics by building the administrative capacity at municipality and ward levels to promote community activities.	Establish a system in which each ward office can collaborate with its communities in identifying the residents' needs and take response measures in emergencies.	<ul style="list-style-type: none"> • Create of an inventory of resident groups active in each ward. • Set up periodic information exchange meetings between ward office and resident groups. • Establish of a mechanism for officially allocating a certain portion of the budget for resident-initiated programs. • Establish of a cooperative framework among municipalities, wards, and communities that can work during a pandemic and other emergencies.
Medium- to Long-Term Approach: Transition to a Polycentric Urban Spatial Structure				
No.	Project name	Background		
11 ©	Formulation of a master plan and feasibility study on the development of the outer ring road and satellite towns (medium- to long-term)	<p>The idea to transform the Kathmandu Valley (Urban Area) from the current centralized spatial structure to a decentralized, polycentric spatial structure has been considered for many years.</p> <p>The democratization movement and Maoist insurgency that began in 1990 and 1996, respectively, induced an influx of people into the Valley (its population increased by 0.8 million from 1.65 million in 2001 to 2.45 million in 2011). Although the population growth during the subsequent decade between 2011 and 2021 remained around 0.5 million, the growth took place mostly in suburban areas as opposed to the preceding decade (2001 – 2011), which saw population growth in urban and suburban areas.</p> <p>Since the suburban population is expected to continue growing at a high pace, it is necessary to decentralize the urban functions of the Kathmandu Valley and disperse them into suburban areas to maintain their efficiency. To facilitate such transformation, the outer ring road, satellite towns, and radial roads need to be developed in an integrated and systemic manner.</p> <p>From the COVID-19 experience, the Nepalese government and people have learned that the use of crowded public facilities and transport systems contribute to the explosion of</p>		

		infection cases and have begun taking steps to prevent crowding in hospitals, inter-district bus terminals, public buildings, etc. by adopting an on-line ticketing system or installing a numbered ticket dispenser. These ICT-based approaches may be effective for preventing crowding in buildings in the short run. However, considering the population growth and expansion of economic activities that are expected to continue in the future, the government now recognizes the importance of medium- to long-term policy-making toward decentralization of urban functions and transition to a polycentric urban spatial structure.		
	Implementation structure	Impact (overall goal)	Outcome (project purpose)	• Output (activity)
	<ul style="list-style-type: none"> • Executing agency: MoUD, KVDA • Relevant agency: MoPIT 	Facilitate the transition of the Kathmandu Valley (Urban Area) from a monocentric to a polycentric urban structure by constructing the ring road and satellite towns, thereby enhancing its resilience to COVID-19-like pandemics.	Facilitate the Kathmandu Valley's shift from centralized to decentralized arrangements by strengthening the linkage between the new towns in the suburb and the urban center.	<ul style="list-style-type: none"> • Formulate a master plan and conduct a feasibility study on the development of the outer ring road. • Formulate a master plan and conduct a feasibility study on the development of satellite towns. • The above two projects may be implemented in conjunction with each other.
No.	Project name	Background		
12	Development of roads along the Godawari River Corridor (medium- to long-term)	<p>In order to ensure a steady transformation of the Kathmandu Valley (Urban Area) into a polycentric urban spatial structure, it is important to develop arterial roads extending radially from the urban center to its suburbs along with the outer ring road linking the outer parts of the suburbs. The existing Ring Road in the Kathmandu Valley was completed in the late 1970s, and various outer ring road projects have since been on the table. Major radial roads in the Valley include the Kathmandu-Bhaktapur Highway (westward), Kathmandu-Chandragiri Highway (eastward), Trishuli Highway (northeastward), and Kathmandu-Godavari Highway (southwestward), which, however, are insufficient in terms of quantity and functionality.</p> <p>To compensate for the insufficiency, roads were constructed using the space along rivers (river corridors), such as those along the Bagmati and Bishnumati Rivers.</p> <p>The Godawari River flows from the southeastern suburb to the urban center. A river corridor along this route can serve as a radial road that will facilitate the urban area's transformation into a polycentric urban spatial structure.</p>		
	Implementation structure	Impact (overall goal)	Outcome (project purpose)	Output (activity)
	<ul style="list-style-type: none"> • Executing agency: MoPIT • Relevant agency: KVDA 	Facilitate the transition from a monocentric to polycentric urban structure.	Improve the connectivity of Kathmandu's urban center to its suburbs and develop the suburbs to function as sub-centers.	<ul style="list-style-type: none"> • Construct a radial road along the Godawari River that connects the urban center and the suburbs.
No.	Project name	Background		
13	Capacity building of infection isolation facilities through the development of multi-purpose facilities	<p>During the second wave of the COVID-19 pandemic, the need to isolate PCR-positive people increased in the Kathmandu Valley. However, due to a lack of facilities with enough capacity to accommodate such people, many of them were forced to isolate themselves at home.</p> <p>To prepare for the future pandemic of highly contagious diseases like COVID-19, it is crucial to secure sufficient accommodations by, for example, signing an agreement in advance with</p>		

	(medium-term)	existing large facilities (e.g., gymnasiums of universities, reception halls of local governments, conference halls of the federal government, etc.) to enable their use as isolation facilities in times of pandemic. Since the existing facilities may become overflowed, new facilities also need to be constructed in advance and operated as multipurpose facilities that can also be used as isolation facilities.		
	Implementation structure	Impact (overall goal)	Outcome (project purpose)	Output (activity)
	<ul style="list-style-type: none"> • Executing agency: MoHP • Relevant agency: KVDA 	Enhance the resilience of cities to future COVID-19-like pandemics by ensuring sufficient isolation capacity by newly constructing multipurpose facilities that can be used as isolation facilities and/or by coordinating with existing facilities in advance.	Expand the capacity and enhance the quality of isolation facilities by constructing new facilities and/or utilizing existing public buildings.	<ul style="list-style-type: none"> • Identify areas where new isolation facilities need to be constructed and the design of the facilities. • Establish guidelines for using existing public buildings as isolation facilities. • Identify existing public buildings that have the potential to be used as isolation facilities and coordinate with the operators of such buildings.

Source: JICA Study Team

Note: ◎ indicates high priority in terms of feasibility, effectiveness, efficiency, impact, and sustainability.

7.3.2 Formulation of Cooperation Projects

After reviewing the possible projects listed in the previous section from the implementation perspective, we have decided to combine some projects to maximize their benefits. Accordingly, we propose to formulate the following three cooperation projects.

(a) Grant aid project (comprehensive package)

We propose to implement Nos. 1, 2, 3, 4, and 5 in a single comprehensive grant aid package:

1. Capacity building of Urban Health Clinics (UHCs) for community-level COVID-19 response toward building a resilient urban structure) → Implement this project in Ward No. 16 of KMC on a pilot basis.
2. Introduction of online appointment systems in public hospitals toward building a resilient urban structure
3. Development of pedestrian and bicycle lanes along the Bishnumati River toward building a resilient urban structure
4. Development of Balkumari Park in Sunakothi Ward toward building a resilient urban structure
5. Integrated development of open spaces in Siddha Pokhari, Bhajya Pukhu, and Na Pukhu of Bhaktapur Municipality toward building a resilient urban structure

(b) Technical cooperation project for development planning (urban development studies)

We propose to combine Nos. 7, 8, 9, and 11 and carry them out under a single technical cooperation project “Urban Development Master Plan Study for Polycentric Spatial Transformation and New Neighborhood Formation for Resilient City Building in Kathmandu Valley under the Federal System”

7. Formulation of basic plans for the creation of new neighborhoods in the suburbs toward building a resilient urban structure
8. Formulation of a master plan for the development of pedestrian and bicycle paths in Kathmandu Valley toward building a resilient urban structure
9. Formulation of a master plan and implementation plan for the development of open spaces in Kathmandu Valley)
- 11 Formulation of a master plan and feasibility study on the development of the outer ring road and satellite towns)

Table 7.3.2 Proposed Project: Urban Development Master Plan Study for Polycentric Spatial Transformation and New Neighborhood Formation for Resilient City Building in Kathmandu Valley under the Federal System (Medium- to long-term)

Background	<p>There was a long-standing discussion about transforming the Kathmandu Valley (Urban Area) from the current monocentric spatial structure to a polycentric one.</p> <p>The democratization in 1990 and the Maoist insurgency started in 1996 caused a large shift in population from rural areas to the Kathmandu Valley (increasing the population of the Kathmandu valley by 800 thousand from 1,650 thousand in 2001 to 2,450 thousand in 2021). The population growth over the following decade, from 2011 to 2021, remained relatively low, with an increase of 500 thousand people, in the Kathmandu Valley. However, while the population growth from 2001 to 2011 took place both in the metropolitan and suburban districts, the population growth from 2011 to 2021 was mainly seen in the suburbs. These suburbs are expected to see a continuous rapid population increase. Therefore, urban functions should be decentralized into suburbs to maintain the functional efficiency of the Kathmandu Valley as a whole.</p> <p>The development of suburbs should not only focus on providing housing for residents but also on building suburban centers (administrative, commercial/service, and industrial centers) to create a polycentric urban system.</p> <p>Meanwhile, the recent COVID-19 pandemic raised concerns that the monocentric urban structure can increase the concentration of homes and economic activities and promote indoor crowding, which will raise the risk of transmission of highly contagious infectious diseases like COVID-19. These concerns gave more importance to the long-discussed concept of transforming the Urban Area into a polycentric structure in the medium to long term.</p> <p>Simultaneously, people started to get daily necessities from local stores and explore opportunities for physical exercise (e.g., walking), mental recreation, and economic activities in their localities as they got used to lockdown and other restrictive measures during the COVID-19 pandemic.</p> <p>All these factors raised the need to develop an urban development master plan to restructure the Urban Area as a whole with an eye on the pre-pandemic concept of polycentric transformation (to improve economic efficiency) and the post-pandemic</p>
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	<p>concept of new neighborhood development (to make the localities resilient to COVID-19, livable, and rich with amenities).</p> <p>Before the transition to the federal system, the Kathmandu Valley Development Authority (KVDA), a technical agency under the control of the Ministry of Urban Development (MoUD), took the initiative in planning urban development in the Kathmandu Valley (Urban Area) as a whole. However, under the federal system, the Bagmati provincial government and local authorities (metropolitan and municipal authorities) within the Kathmandu Valley need to take the initiative in planning urban development while referring to the political and technical guidelines provided by the MoUD and KVDA. Nevertheless, the provincial government and local authorities (metropolitan and municipal authorities) have limited experience and capacity to plan land use and infrastructure development and therefore need support from the federal government and KVDA and institutional mechanisms/platforms for coordination and collaboration with relevant ministries and among local governments until the federal system takes root. In particular, development projects taking into account the entire Kathmandu Valley (Urban Area) under the initiative of KVDA will continue to need coordinated and integrated support covering the entire urban area. In the meantime, the COVID-19 pandemic has revealed the necessity of aligning the urban development plan to allow the 21 local authorities to create new neighborhoods for their respective needs.</p> <p>The urban development plan will also need to be reviewed from the perspectives of the individual local authorities and the urban area as a whole to develop parks, open spaces, and pedestrian and bicycle paths as identified as necessary during the COVID-19 pandemic.</p>
Implementation structure	<ul style="list-style-type: none"> • Executing agency: KVDA and 21 local governments (metropolitan cities and municipalities) (an urban group consisting of these local authorities) • Relevant agency (policymaking and coordination): MoFAGA and MoUD • Relevant agency (technical guidance): DUDBC and MoPIT
Impact (overall goal)	<p>While the Kathmandu Valley (Urban Area) is being transformed into a polycentric spatial structure, new neighborhoods are formed in the suburbs, and urban development is promoted with focus on health, quality of life, and localities. During this process, the Urban Area is made more sustainable, inclusive, and resilient to threats of all kinds, including not only earthquakes but also COVID-19-like pandemics.</p>
Outcome (project purpose)	<ul style="list-style-type: none"> • Urban development management is strengthened by involving municipalities across the Kathmandu Valley while using Vision 2035 and Beyond as a general guide. In this process, infrastructure and land use plans are formulated and implemented as tools to make the Kathmandu Valley more sustainable, inclusive, and resilient to earthquakes and pandemics while facilitating the formation of new neighborhoods in the suburbs. • Wide areas are linked to one another by developing not only transport networks that connect business and commercial districts to residential districts but also networks of pedestrian and bicycle paths and recreation places such as parks and open spaces across the 21 municipalities in Kathmandu Valley. <p>Open spaces that would be otherwise used for purposes other than recreation due to urbanization and illegally occupied by local residents are developed into parks and recreation spaces. Outdoor spaces are maintained for physical and mental health promotion.</p>
Output (activity)	<p><u>Phase 1</u></p> <ul style="list-style-type: none"> • Develop a spatial development plan for the suburbs, as envisioned in Vision 2035 and Beyond, to promote the sustainable and inclusive development of the Kathmandu Valley as a whole and articulate measures to increase resilience to COVID-19-like pandemics.

	<ul style="list-style-type: none"> • Develop a spatial and infrastructure plan for integrated development, including the following elements to create a polycentric urban spatial structure <ul style="list-style-type: none"> • Outer ring road plan • Radial road plans • Satellite town plans, etc. <p><u>Phase 2</u></p> <ul style="list-style-type: none"> • Develop development plans to create new neighborhoods <ul style="list-style-type: none"> • Land use plans for suburban municipalities (for land use restrictions and construction permit procedures) • Development plans for suburban centers that constitute the polycentric structure • Infrastructure plans to facilitate the development of suburban centers • Open space plans <p>Bicycle path/lane plans</p>
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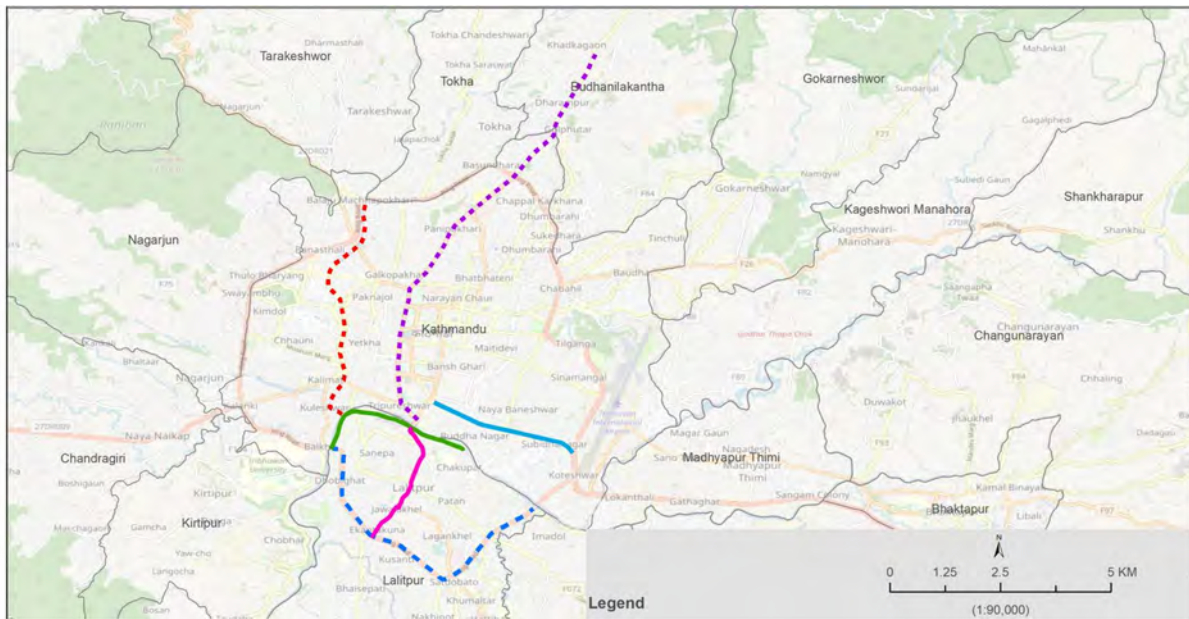
Source: JICA Study Team

(c) Technical cooperation project for Capacity Development (including the introduction and operation of ICT) for Urban Public Transport System Development and Management (mainly consisting of city buses) to Create a Resilient Urban Area(Short- to medium-term)

By incorporating Project No.6 listed in the preceding section into the technical cooperation project Capacity Building for Public Transport Management in the Kathmandu Valley as a component related to the adoption and operation of ICT-based systems, we can support Nepal’s initiatives for introducing and operating a smart card system in city buses while eyeing the whole issues of public transport in the Kathmandu Valley, thereby ensuring sustainability and scalability, including sustained use of the smart card system in city buses and its introduction and integrated use in intercity buses.

Background	<p>In Kathmandu Valley, the city bus service, a major public transport system, was suspended or operated with significantly reduced schedules and capacity in each wave of infections during the COVID-19 pandemic. This not only made the city bus service inconvenient but also raised concerns about the risk of transmission on buses, discouraging people from using the service. These developments around the COVID-19 pandemic provoked a discussion about introducing an IC card (smart card) payment system on the city bus fleet in the Kathmandu Valley to make payments contactless and smoother.</p> <p>The introduction of this IC card will ensure transparency in reporting the amount of revenue of the individual urban bus vehicles. While this effect contributes improvement of urban bus service management as a whole,, it is not necessarily favorable to the drivers and conductors of individual urban bus vehicles, and thus requires persistent discussions and negotiations with stakeholders to gain widespread understanding from those involved in urban bus operations.</p> <p>There had been discussions since before the COVID-19 pandemic about improving the operational efficiency of the city bus service, modifying bus routes to meet the needs of the expanding Urban Area, expanding terminals, replacing the bus fleet with modern, large buses, and introducing an IC card payment system to allow the administrative agency to monitor fare revenue, but none of these discussions reached consensus or turned into action.</p> <p>Since the transition to the federal system, the Bagmati Provincial Ministry of Labour, Employment and Transport (MoLET) has taken responsibility for permit issuance and</p>
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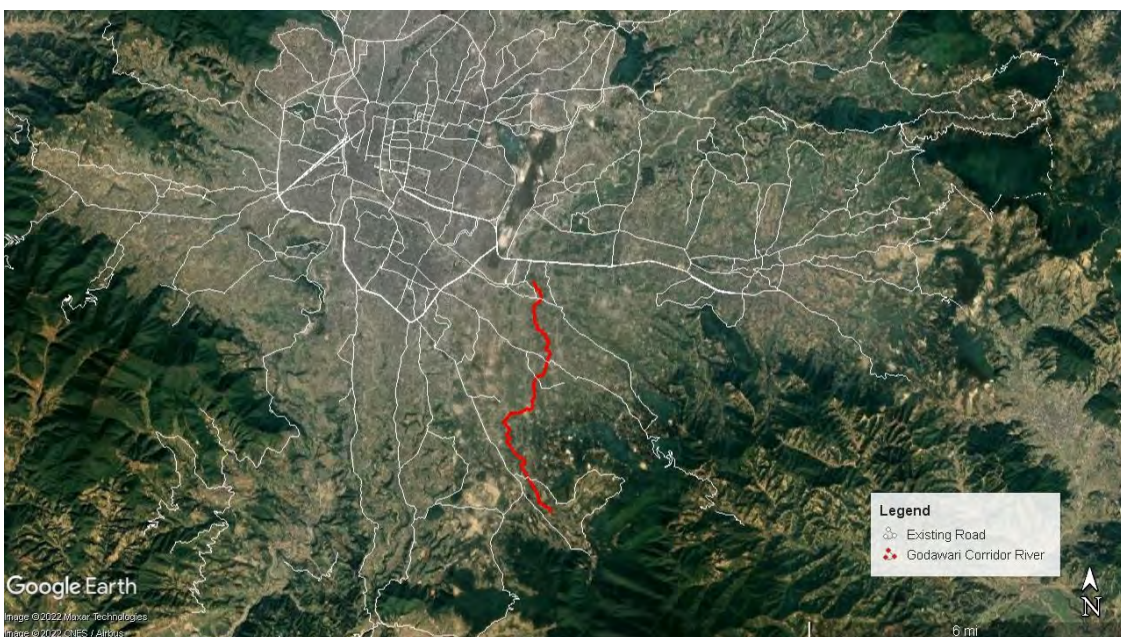
	<p>operational management of the city bus service in the Kathmandu Valley. Because the MoLET is just beginning to manage public transport services in the Kathmandu Valley by taking over tasks and data from the Federal Ministry of Transportation Management (MoTM), the MoLET needs to develop its institutional and human capacity.</p> <p>Although it is urgent to launch a common IC-card payment system on the city bus fleet, it is also desired to further deliberate the IC-card payment system with an eye on developing and managing urban public transport systems in Kathmandu Valley while strengthening the capacity of the MoLET.</p>
Implementation structure	<ul style="list-style-type: none"> • Executing agency: Bagmati provincial government, MoLET • Relevant agency (Steering committee chair): MoPIT and KVDA •
Impact (overall goal)	<p>Expanding the entire Kathmandu Valley (urban area) will be covered by the urban public transport system in the future.</p> <p>The resilience of the urban area is increased by introducing and operating contactless/crowd-free services using ICT to help avoid crowding and close-contact settings.</p>
Outcome (project purpose)	<p>The urban public transport system develops sustainably and inclusively by assisting both the regulatory body and operator in developing and managing urban public transport. The following outcomes are produced by introducing a common smart card payment system as part of efforts to develop and manage urban public transport:</p> <ul style="list-style-type: none"> • The fare payment process becomes quicker and smoother. • The fare payment process becomes contactless. <p>These outcomes can stop people concerned about the risk of transmission from avoiding public transport during the COVID-19 pandemic and, coupled with proper ventilation, increase the resilience of the public transport system to COVID-19-like pandemics.</p>
Output (activity)	<ul style="list-style-type: none"> • Design and plan the setting up of a regulatory body responsible for intra-city bus routes • Assist in designing and implementing the plan of setting up a regulatory body responsible for intra-city bus routes • Develop a database about the intra-city bus service, including bus routes, numbers of buses in operation, and owner information • Develop plans to modify the intra-city bus routes and adjust the number of intra-city buses in operation • Assist the intra-city bus operator in developing and implementing a transition plan • Conduct a feasibility study on the introduction and operation of the common smart card (IC card) payment system for the intra-city bus service • Implement a pilot project for the social experiment of the common smart card payment system to be introduced for the intra-city bus service



- Bicycle Lane Demarcation on Kupandol-Jawalakhel-Ekanakuna Road (already Demarcated by LMC
- Bicycle Lane and Walking Lane along the Bagmati River Corridor (In KMC and LMC, Balkhu-UN Park under Construction by ADB Support)
- Bicycle Lane on the Widened Road of Maitighar-Tinkune (in KMC, KMC is in Procurement for Construction of Bicycle Lanes on the Road)
- Balkhu-Balkumari Bicycle Lane (in LMC, LMC has a Plan for Demarcation)
- Bicycle Lane Demarcation on Thapathali-Lazimpat-Bansbari Road (Idea Proposed by KMC)
- Proposed Bicycle Lane on Bishnumati River Corridor (KMC, Proposal by JICA CUREIP KV Team)

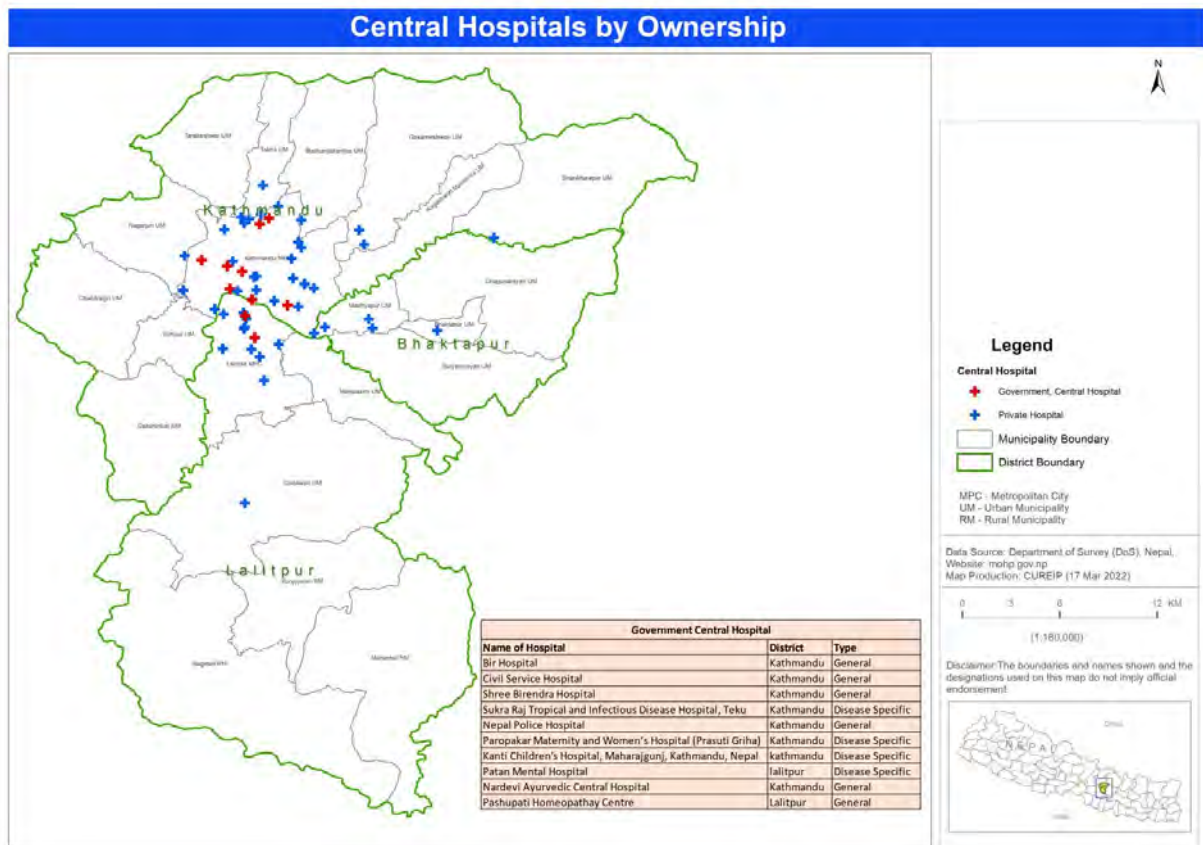
Source: JICA Study Team

Figure 7.3.1 Network of Bicycle Lanes under Construction and in Planning/Proposal Stages in KMC and LMC



Source: JICA Study Team

Figure 7.3.2 Development of Radial Road in Kathmandy Valley: Godawari Corridor River (red line)



Source: JICA Study Team

Figure 7.3.3 Locations of Government Central Hospitals and Private Hospitals in Kathmandu Valley

8. Formulation of Cooperation Project in Dhaka

8.1 Changes in urban issues in COVID-19

8.1.1 Increased awareness of public health and urban environment (interview, news)

1) Established hygiene actions.

Hygiene measures have been promoted by the government to limit the spread and reduce the pressure on the national health system, like enforcement of compulsory mask-wearing and safe hygiene practices (hand washing facilities), technology-enabled epidemiological health surveillance, community-based prevention practices, maintenance of social distancing regulations along with the empowerment of frontline health workers and other essential workers through communications and behavioral change.

2) Increased health consciousness.

Initiatives from governments, NGOs, and individuals to increase health awareness through telemedia, other social media, news articles, and written publications on healthier lifestyles motivated many people. People have developed habits of cleaning hands by handwashing with soap or using hand sanitizer. In urban areas, people have also started practicing social distancing and avoiding unnecessary gatherings, and doing lifestyle changes to boost their immunity against COVID-19, for example, exercise, a healthy diet, procuring temperature and oxygen level measuring devices, and consulting with doctors

3) Increased concern on safety in terms of dense conditions.

COVID-19, forcing social distancing, has posed challenges especially in the denser areas. Some kitchen markets shifted to open areas in some places. E-commerce and food delivery has increased at a significant rate to avoid dense conditions.

4) Increased awareness on urban environmental issues.

COVID-19 caused people to have an awareness of urban environmental issues.

- Frequent handwashing increased the need for clean water supply in terms of quality and quantity.
- The increased volume of medical and infectious wastes like used face masks requires a proper management system to avoid further health hazards.
- An increased need for more spacious public transport vehicles along with safer bicycle lanes.

8.1.2 Avoidance of crowded places

1) Increased telework.

Telework and telemedicine were not popular in Bangladesh before the pandemic. Many jobs cannot be performed remotely. However, both private and public employers adopted policies to delineate the responsibilities of both parties to the arrangement, including compliance protocols for timekeeping and employee oversight for remote works during the COVID period. Employees will be entitled to their salaries throughout this period. This would likely continue even post-COVID-19 to some extent, especially at some private offices. Employees' man-hours are not spent in traffic while commuting to work, and the employer saves major

office operating costs such as power and other overheads.

2) Increase of on-line services (various types of services, from food-delivery to educational services).

Online services were not popular among city dwellers before the pandemic. The number of smartphones and daily internet users was low, and the internet service quality was lower compared to international standards. During the pandemic, the number of users of online services dramatically increased in online interconnection like work, education, and shopping. For example, an increase of online food orders at around 15%–20%, an increase in online shopping, increase in telemedicine beneficiaries by 31%. Despite lots of barriers in online education in the early stage of pandemic, the percentage of beneficiaries of online education has increased day by day. However, the changing trend of online service requires:

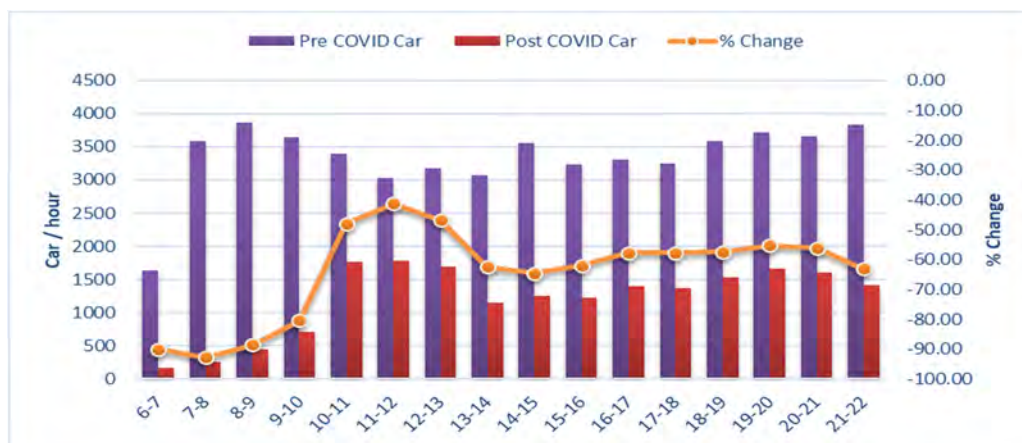
- safety to online payments, and
- developing an address system for most of the residential areas in Dhaka.

8.1.3 Change in Mobility

1) Reduction in Traffic Volume

Due to restrictions on movement, the number of trips decreased in urban areas. Major impacts are:

- drastic decrease in the number of recreational and shopping purpose trips;
- decrease in the use of public transport, yet rapid increase in private vehicles (25%), NMTs, and bicycle users (21.33%);
- increase in personal delivery traffic;
- increase in accident rate due to overspeeding on roads (the average car travel speed increased after COVID-19 at 4.10 km/h);
- huge number of unemployment among transport workers (drivers, helpers, etc.).



Source: RSTP 2016 and data received from different website

Figure 8.1.1 Car in Mohakhali area Reduce Significantly in a Post-COVID-19 Situation

2) Off-peak to avoid rush hours.

Most companies did a roster and shift policy for their employers for maintained sufficient distance in office space. Due to flexible working hours that many companies have adopted, allowing employees to report to the office at not strict times. It gives employees a choice to

come to work when traffic has gradually reduced. It has enabled many to save hours lost in traffic on normal operation days.

The adoption is likely to persist post- COVID-19 due to the benefits it accrues for both companies and employees.

3) Shift from public transport to private transport by the middle-income class

Buses contribute approximately 64% of the passenger trips in Dhaka (Banglanews24.com, 2020); hence, the public transport system cannot cater to the normal number of public service vehicle daily users. Consequently, the private transport system expanded to supplement the public system, and car-sharing soared in drive-to-work scenarios. Also, most middle-class and upper-class individuals opted for the private transport system as means to reduce coronavirus exposure, as the public transport system is deemed a higher risk for COVID-19 infection.

Analyses of travel mode choice show that the majority used public transport for work before the pandemic, and their preference shifted to the private vehicle (25%) and non-motorized vehicles (NMVs) (21.33%) since the onset of the pandemic (Exploring the travel behavior changes caused by the COVID-19 crisis: A case study for a developing country, 2021). This is an indication that people tried to avoid public transport during the pandemic.

4) Increase use of bicycle and personal mobility.

After the onset of COVID-19, most people have shifted from public transport to other modes, such as walking, bicycles, and private cars, to avoid exposure to groups. Bicycle users significantly increased. A three-fold increase has been noticed in the capital during the lockdown imposed to contain the spread of coronavirus. With e-commerce and food delivery services emerging in the city, the number of delivery companies is growing at a fast pace. In most cases, bicycles are used as the mode of transport to complete deliveries. The coronavirus fueled bicycle sales in Dhaka City. City dwellers prefer bicycles for social distancing purposes in the outback and flexibility of movement.



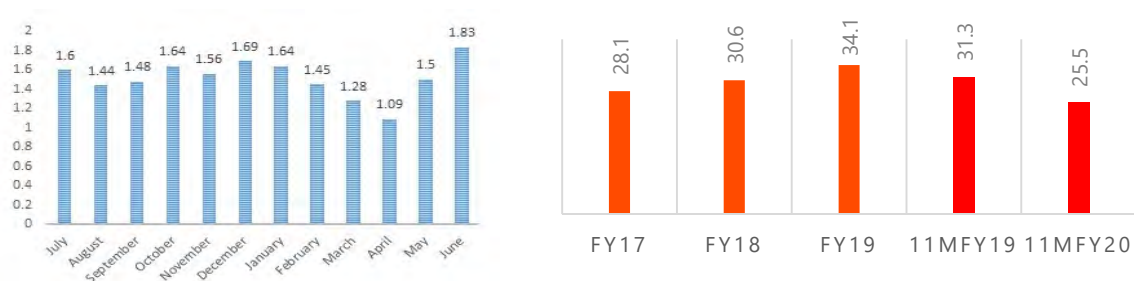
Source: RSTP 2016

Figure 8.1.2 Traffic Flow Comparisons Implying Increased Use Of Bicycle

8.1.4 Economy

1) Decreased number of migrant workers.

A decrease in the number of migrants flying into the country as a result of COVID-19 and international travel ban. More than 60% of migrant workers work in Middle East, Malaysia and Singapore (IOM, 2020). According to different NGOs estimation, around half a million workers work in various countries from Bangladesh and pump \$5.0 billion flows annually as remittance (Ahmed, 2020). However, about 95,062 overseas workers mostly lost their jobs due to the pandemic and returned to Bangladesh during April 1 to August 30 (IOM, 2020). Upgrading the diplomatic relation with these country for hiring the migrant workers from Bangladesh should be one of major concern of Government. Experience of migrant workers can be utilized by government in Bangladesh. Low interest rate loan to skilled but unemployed migrant workers can increase investment and supply chain and demand of local market. Migrant workers will be able to take loan for restarting their previous job in native country.



Source Amin et. Al. 2020

Figure 8.1.3 Remittance Inflow (in USD billion) and b. Yearly RMG Export (USD billion)

2) Avoidance to visit crowded facilities

After the onset of the pandemic, the Bangladesh government canceled public events, such as Pohela Boishak (1st day of the Bangla calendar), fairs, workshops, and events, and restricted the number of individuals in religious facilities and shopping malls. During the pandemic, people who preferred the over-the-top platform rather than movie theaters to avoid gatherings, workplaces, and other open spaces that only allowed several individuals at a time are likely to proceed with this practice.

8.1.5 Urban issues pointed out in Dhaka

Dhaka's rapid population growth and urbanization are affecting adjacent agricultural lands, water bodies, forested areas, wetlands, and drinking water, sanitation, and drainage systems. The risks associated with Dhaka's unplanned urban development are further exacerbated by climate change, rapid industrialization, slum formation, fragmented transportation, and other infrastructure. Furthermore, the city's public transportation system is inadequate. Dhaka's bus industry is poorly regulated and suffers from a number of problems, including irregular bus fare structures, overlapping bus routes, different sizes of bus ownership, inexperienced and unlicensed bus drivers, and governance and regulation of traffic rule violations (especially unregulated bus parking and unauthorized stops).

8.1.6 Change of urban issues by COVID-19

The denser areas can contribute more to spreading the disease, for example, infection from restaurants, mosques, kitchen markets, shopping malls, etc.; however, public transport infection is unconfirmed.

- The relationship between congestion and infection is high.
- There is potential for further expansion due to economic activity and mobility.

Based on the changes in social and economic activities, changes in the urban issues and needs are compiled in the table below.

Table 8.1.1 Changes in Urban Issues in Dhaka

	The urban issue Before COVID	The urban issue With COVID
Urban structure	<ul style="list-style-type: none"> ➤ Unplanned patterns of land use with narrow roads and inadequate urban facilities; ➤ Inadequate and unhygienic walkway with lack of open space ➤ Crowded kitchen market ➤ People in slum/ informal settlements are usually in vulnerable situations ➤ Lack of community-based awareness. 	<ul style="list-style-type: none"> ➤ Congestion indoor and outdoors has to expend COVID infections; Limited/ no space for mental refreshments, physical exercise, or open-air recreation. ➤ More use the walkways for walking and cycling to get nearby service facilities. ➤ Crowded kitchen market has the risk for infections, but lack of open space for a temporary shift of kitchen market to reduce density. ➤ Covid spread in slum area due congestion. ➤ No community-based awareness system can not control infections.
Mobility	<ul style="list-style-type: none"> ➤ Public transport system is in dominating mode and lack of proper management and services. ➤ Inadequate facility for Non-Motorized Vehicle like bicycle user. ➤ Telework works and online shopping was not common ➤ The increasing travel time, inappropriate modal mix and mix traffic are reducing average travel speed. ➤ Lack of facility in transport hub ➤ Lack of traffic control capability and management system ➤ Congestion in urban streets due to insufficient walkways, ➤ Inadequate and lack of facility of bus stoppage and bus bay. ➤ 	<ul style="list-style-type: none"> ➤ Lack of management and service make people avoid public transportation. ➤ Bicycle users increased rapidly ➤ Telework, online shopping and food delivery increased, So accident risks of personal deliveries vehicle such as bicycle, motorcycle would be increased. ➤ Decrease in the number of motorized vehicles on roads. ➤ Increase in positive cases due to missing proper and hygienic interchange facilities among modes ➤ Increase of accident rate at the time ➤ Users of walkways increased, but COVID-19 most often spreads in crowds due to congestion and discontinuity of walkways ➤ COVID-19 spread due to congestion of unspecified bus stoppage
Social Economy	<ul style="list-style-type: none"> ➤ Online shopping was not common. ➤ Remittance inflow is one of the major sources of boosting the economy. ➤ Public transportation was a common place of employment. ➤ Educational institutional lessons 	<ul style="list-style-type: none"> ➤ People avoid window shopping, and online shopping has become popular. ➤ Decline of remittance inflow at a significant rate, so remittance earners are going to be unemployed. ➤ Income from public transport decrease with the decrease of users. ➤ School closed due to COVID, and students

	The urban issue Before COVID	The urban issue With COVID
	<p>were carried out in classrooms.</p> <ul style="list-style-type: none"> ➤ Hotels have witnessed occupancy rates of 80% in usual times. ➤ Lively community with fewer cases of mental illness compared to the developed cities. ➤ Housing market struggles to supply affordable housing around. 	<p>who could not handle online classes dropped out</p> <ul style="list-style-type: none"> ➤ Hotel occupancy rates have plunged to an average of 30%. ➤ COVID-19 attenuates community activities, increasing depression, anxiety, and stress. ➤ Income reduction hit housing affordability the hardest.
Health and Environment	<ul style="list-style-type: none"> ➤ Lacks appropriate medical waste management system. ➤ Poor water quality and limited water service to informal settlements, as well as poor sanitation and hygiene facilities. ➤ Lack of unattended waste treatment methods and recycling method ➤ In hospitals, there are inadequate beds, supply of medicines, oxygen, and protection kits ➤ Lack of facilities in community clinics 	<ul style="list-style-type: none"> ➤ Increase of environmental pollution due to lacking medical waste processing operations. ➤ Increase in water supply demand to prevent potential risk for COVID-19 infection from unhygienic informal settlements ➤ Lack of unattended waste treatment methods and recycling method reduces waste treatment capacity at the onset of the pandemic. ➤ Medical equipment was very hard to supply due to huge demand. ➤ Community clinics could not provide the initial treatment.

Source: JICA Study Team

8.1.7 The Expected Status of Cities in the Post COVID-19 Period

1) Newly emerging urban issues/social issues.

The following are some social issues emerging as a result of the COVID-19 infections:

- Loss of employment affected the socio-economy hardest.
- Long-term effects on housing and real estate sector through changing consumer behavior at the micro-level and also hit the economy at macro-level through labor crisis and declining real estate sector’s contribution.
- Data implying increasing tension, arguing, violence, domestic violence, school dropouts, and child marriage altogether indicate disruption of social life. A study on 1066 respondents reveals that around 46% of the respondents suffer from the fear of the coronavirus, causing anxiety and depression (Source: Tanvir, et al. 2020; Yeasmin, et al. 2020 and data collected by the team).
- Mobility restrictions and the cost of healthcare fees impacted disproportionate access of women to seek health services than men.
- Highlighted significant inadequacies and inefficiencies in the healthcare sector and social protection schemes.
- Many are pavement-dwellers living in densely populated informal settlements in cities that lack proper basic services and other amenities, including health services.
- Amount of medical waste bumped up all over the world as well as in Dhaka City.

2) Change of urban development projects Cancellation of urban development projects.

According to the Planning Commission, the government has decided to accelerate all first track projects. Despite various measures taken by the government, its mega projects are still facing impediments in getting back on track and thus are set to miss the deadlines for completion. Apart from an extension of project tenure, many projects will get costlier because of the suspension of all activities due to Covid-19 last year and the other associated problems. There is a slowdown in the construction, design, and study of several mega projects in Dhaka, such as MRT Line-6, MRT Line-1, MRT Line-5 North, and bus route rationalization project.

3) Government Policies toward Post COVID-19.

According to statements released by the president, the Government of Bangladesh did not take any long-term policy yet toward post-COVID-19. However, significant immediate responses and strategies were identified to combat the coronavirus impact. These emergency responses and strategies include allocating funds to improve the prioritized sectors to ensure that the economy is restored after the pandemic.

8.2 Organizing an Urban Development Program for With and Post-COVID-19

8.2.1 Review of Existing MP (Review of Detail Area Plan [DAP])

Rajdhani Unnayan Katripokkho (RAJUK) formulates Detail Action Plan (DAP) based on the Dhaka Metropolitan Development Plan (DMDP). The general objective of the DAP is to implement the provisions of the Dhaka Metropolitan Development Plan (DMDP) Structure Plan (SP) and Urban Area Plan (UAP) policies and recommendations. The duration of the DAP is about 20 years (2016–2035), and it has the option to update four times every five years.

DAP provides more detailed planning proposals along with implementation guides that integrate the development policies, guidelines, and framework set by the SP.

The DAP provides planning proposals for specific sub-areas for the provision or improvement of the road network, access roads, community facilities, utilities and services, and a detailed pattern of land uses. It is prepared at a community scale, considering community participation is an important tool for both planning and implementation; thus, the plan is more likely to be implemented, respected, and followed by the community.

Considering the trends of existing growth, the existing pattern of development, population density, existing land use, socio-economic condition, etc., the DAP proposes the following.

(1) Physical infrastructures:

Analyzing the gaps between existing conditions and future demands, for example, proposed building structures, height, widening of existing roads, footpaths, street lights, drainage, etc.

(2) Community Facilities:

By analyzing population projection, the following are the existing demands by setting the demand standards:

1. number of schools, the college required for per capita people;
2. the amount of open space, playground, parks required for per capita people;
3. number of hospitals needed for per capita people;
4. number of community centers needed for per capita people; and
5. percentage of area needed to be allocated for the road.

Examples: Proposed for health/clinics, primary schools (for 3,000)/colleges (30,000 population), parks (at least 1 acre and 1 per 12,500 population), playground (at least 2 acres and 1 for per 12,500 population), community center (at least in 0.3 acres and 1 for each of the wards), and graveyard (1 for each zone).

(3) Waste Management System:

Analyzing the decentralized management system of local government institutions.

(4) Drainage Management System:

Analyzing catchments, existing retention and detention ponds, etc.

8.2.2 Changes of Planning Issues after COVID-19 Period

The most important issue now is to keep the safety of our health and the surrounding environment. Otherwise, the situation will surely get worse. With the spread of coronavirus

as one of the important things, awareness of personal hygiene has been developed. The temporary shutdown of industries and transportation has had positive impacts on the environment, but maintaining it would be difficult. General life must resume, but strategies can be planned as well as plans to reduce impacts on health and the environment.

According to the trend of development, proposal changes of planning issues are shown in Table 8.2.1.

Table 8.2.1 Changes of planning issues

Sector	Urban problems	Planning issues	Changes of planning issues/priorities and newly emerging issues
Urban planning	Demand supply gap in the housing sector Unplanned growth of the city	Unplanned patterns of land use Lack of design standard Lack of development control	Increase in demand for amenities
Urban transportation	Inadequate road and transport modes	Poor management Missing integrated transport system	Increased bicycle user Increased Online delivery
Urban environmental infrastructure (water supply, sanitation)	Poor water quality Unhygienic in informal settlements Water scarcity at informal settlements Limited sewerage coverage	Poor waste management High dependence on groundwater Water loss in the service chain Lack of treatment and recycling plan	Increased water supply demand Increased medical waster Potential health risks at informal settlements
Urban governance	Less institutional Capacity Less monitoring and control over situation and development	Poor planning and lack of integration in different sectors	Increased capacity for online workshops and webinars Increased coordination and collaboration among authorities.

Source: JICA Study Team

8.2.3 Review of ongoing JICA Project

Ongoing projects of JICA in Bangladesh and its relevant impacts have mentioned in the table below

Table 8.2.2 Relationship with ongoing JICA projects

Program name	Related On-going JICA Projects	Contents to be reflected	Impact on reflection (Issue that can be resolved)
Improvement of public transport services	<ul style="list-style-type: none"> ✓ MRT Yen Loan Business ✓ MRT Line 6 Safety Management System Construction Support Project ✓ Policy formulation support project for public transport-oriented development along the MRT ✓ Dhaka Urban Transportation Management Project ✓ Dhaka Road Safety 	<ul style="list-style-type: none"> ✓ During the construction of the MRT, necessary facilities such as a Bus-Bay will be constructed. ✓ Awareness raising for traffic improvements for the MRT users ✓ Proposals for Bus network improvement 	<ul style="list-style-type: none"> ✓ Proper integration among the modes ✓ Provide facilities for pedestrian

Preparatory Study on Urban Environment Improvement against COVID-19 (CUREIP)

Final Report

	Project		
Model town/satellite town development	✓ Project for Development of Policy and Guidelines for Transit-Oriented Development (TOD) along mass transit corridors	✓ Creating township development guidelines ✓ Support for some facilities through pilot projects ✓ Promoting Walking and Cycling etc.	✓ Dispersion of urban functions ✓ Improvement of sanitary environment ✓ Improvement of densely populated residential areas
Create open space centered under urban redevelopment projects	✓ Policy formulation support project for public transport-oriented development along the MRT	✓ Creation of redevelopment guidelines ✓ Support for some facilities through pilot projects	✓ Improvement of sanitary environment ✓ Improvement of densely populated residential areas ✓ Securing open space in the city center
Establishments of COVID Hospital in suitable location	✓ Health service enhancement plan	✓ Further strengthening of insurance services in Dhaka	✓ Collaboration with primary and secondary medical institutions
Consultancy Service for urban Waste Management	✓ Providing consultancy service in water, air, and waste management	✓ Capacity building of concerned ministries and authorities in managing urban environment	✓ Overall improvement or the capacity of urban environmental management to contribute to improving urban sanitation

Source: JST

8.2.4 Direction of urban development based on New Neighborhood and 5 Agendas

As noted in the previous chapter, COVID-19 has emphasized urban issues in Dhaka City. These urban issues are summarized from the perspective of five agendas, and the direction of urban development is shown below.

Table 8.2.3 Five Agendas and Directions for Urban Development

Post-COVID-19 5 Agenda	Direction of Urban Development
Urban Structure	<ul style="list-style-type: none"> • Make planned patterns including sufficient space, and increase demand for urban amenities and service facilities within a short trip distance (especially within walking distance) • Re-plan the walkway to meet new demand and not cause congestion • Land use needs to be integrated to get more open space • Maintain affordable housing for those in slums / informal settlement • Decentralization of urban function to meet the city demand • Need to develop community-based awareness system
Mobility	<ul style="list-style-type: none"> • Public transportation system should be improved and restructured to meet the current demand • Increase the demand for cycling and pedestrian lane will be continued • Need to develop sufficient facility for new normal • Should prevent more congestion on roads, footpaths, etc. • Increase the requirement of sufficient Modal integration facility in the transportation hub • Establish ITS traffic management to reduce congestion and safe movement. • Uninterrupted footpath for comfortable movement • Specific bus bay and stoppage in the optimum location
Urban Society/ Community	<ul style="list-style-type: none"> • Increase demand for management and control in online shopping by ensuring a proper digital payment system. • Ensure overseas jobs for the jobless people and need to create more opportunities for remittance earners • Review the structure of public transportation and re-employ the unemployed. • Implement economic policies for the heavily damaged tourism industry. • Providing housing for financially unstable people.
Inclusive / Universal Access	<ul style="list-style-type: none"> • Reduce depression, anxiety, and stress by resuming community activities and mutual aid for the people. • Implementation of a curriculum that incorporates both online and face-to-face for adopting a digital platform.
Urban Management	<ul style="list-style-type: none"> • Waste management capabilities need to be strengthened so medical waste can be properly treated. • Increase the capacity of the freshwater supply system and measure water loss issues for city dwellers • Build a waste treatment system that enables un-attended waste and lack of waste treatment and recycling methods. • Increase the demand for constructing core advanced medical facilities • Strengthen community clinics to deal with infectious diseases

Source: JST

8.2.5 Project Proposal Approach

Based on the DAP, Revised Strategic Transport Plan (RSTP), a cooperation project plan is proposed as a program based on the changes in urban issues caused by COVID-19. The concept of studying and selecting cooperative projects is shown below.

1) Priority concepts

- Improvement of urban public transport and cycling in response to changing travel behavior and lifestyle of residents.
- Urban redevelopment, especially in congested areas, considering the emerging urban need.
- Support that contributes to shortening travel time and distance (urban structure, mobility)
- Urban infrastructure development that may contribute to the hygiene of the city, including waste management, sanitation, and water supply.
- Technical assistance and IT infrastructure development in response to the new online-based academic system.

2) Relationship between Proposed Project and DAP

The proposed projects mentioned here aim to revitalize open space, especially in the old and congested part of Dhaka, increase mobility through pedestrian and cycling-friendly integrated public transport, develop a new town to reduce the pressure from the city center, and overall ensure livability considering the new emerging issues after the pandemic. The proposed project could be linked with the proposal in DAP as well.

The new draft DAP is an integrated and holistic future development plan for land use, housing, transport, drainage, economic activities, environment, education, healthcare, recreation, social and civic amenities, and so on, in 1,528 km² of Dhaka and its adjacent areas. The plan must be assessed as a whole, not in parts. DAP includes certain factors that will ease the lives of the city denizens, such as metro station-based TOD, block development, community-based development plans and decentralization of services, transfer of development rights (TDR), ward-based healthcare, quality government educational institutions, recreation centers, etc. It also strongly promotes pedestrian-friendly infrastructure and bicycle lanes and non-motorized transport. There is a plan in the DAP on creating a 202 km cycle lane and 574 km of waterways. It includes land readjustment and re-development to develop unplanned areas according to the plans. It recommended maintaining a population density of 200 people per acre in central Dhaka and 250 per acre in the Old Dhaka areas. The DAP has also proposed a population density of 180 people per acre in Gazipur, Narayanganj, Savar, Purbachal, and Jhilmil urban areas and 150 people per acre for other urban areas. Density control is a core concern for DAP to ensure livability of the city. DAP has identified 54 locations for lower and lower middle-class housing where flats with a size of 650–700 square feet will be made to tackle the housing affordability issue. There have been several complaints about old Dhaka in DAP. These include preserving historical sites and facilities and turning them into tourism and recreation centers, creating cultural zones around the Buriganga River for old Dhaka, providing basic amenities in the area through land reclamation strategies in the process of cultural city restructuring. Besides, there will be open space with adequate vegetation park and playground.

However, now the population of old Dhaka is several times more than the standard. An ideal residential area is supposed to accommodate 120 people per acre. Now an average of 420 people are living in this area. Furthermore, for the first time, health services have been

incorporated into a strategic plan like DAP for 2016–2035 (which may be extended up to 2041) with a special focus on zone-based healthcare facilities.

3) **Concept of implementation frame**

(1) **For the short-term project, the period will be 3 years**

- Measures to meet urban needs: Changes in urban structure, provision of safe and efficient public transportation, and maintenance that contributes to improving the urban hygiene environment
- Narrowing down based on urban issues (urban structure, transportation/mobility, urban society/community, urban hygiene environment).

(2) **Long-term (10 years) (corresponding to 5 agendas)**

- Measures that contribute to the five agendas

8.2.6 **Proposal of the Program**

1) **Public Transport Network with Diversified Mobility Services**

(1) **Background**

Dhaka Metropolitan Area (DMA) has a population of 9.3 million within a 306 km² area. Greater DMA accommodates 10% of the total national population and 40% of the total urban population (RAJUK, 2015) ¹. This huge concentration of population causes inefficiency in managing urban infrastructure, especially in the transportation sector of Dhaka City. Currently, urban transportation in the DMA relies heavily on road transport, and traffic in the city is characterized by a chaotic mixture of cars, buses, auto-rickshaws, rickshaws, motorcycles, etc. This condition has resulted in serious traffic gridlocks and problems in the DMA, which in turn has added to the city's growing social and economic problems. Furthermore, poor-quality public transport poses health hazards, especially during the pandemic.

On an average working day, about 21 million trips take place in the DMA area (RAJUK, 2015). Buses contribute approximately 64% of the passenger trips in Dhaka, and the average length of a bus trip is 9.7 km². The public transport system could not cater to the normal number of daily users. A private transport system began to supplement the public system, hence the rise of car-sharing in drive-to-work scenarios. Also, most middle- and upper-class level individuals opted for the private transport system as a way of reducing exposure to COVID-19 as the public transport system is deemed a higher risk for exposure. Analyses of travel mode choice show that a majority used public transport for work before the outbreak, whose preference has shifted to the private vehicle (25%) and NMVs (21.33%) during the pandemic (Anwari et al., 2021³). It indicates that people try to avoid public transport during the pandemic due to a lack of management and service.

¹ RAJUK. (2015). Dhaka structure plan 2016-2035. Dhaka.

² Chowdhury, M. S. (2014). Sustainable Transportation Systems for Dhaka Metropolitan City: Issues and Opportunities. International Conference on Sustainable Infrastructure 2014..

³ Anwari, N.; Ahmed, M.T.; Islam, M.R.; Hadiuzzaman, M.; Amin, S. (2021). Exploring the travel behavior changes caused by the COVID- 19 crisis: A case study for a developing country. *Transp. Res. Interdiscip. Perspect.* 2021, 9, 100334. <https://doi.org/10.1016/j.trip.2021.100334>

Mode	Count (%) of Respondents Preferring the Particular Mode	
	Before Pandemic (X1)	During Pandemic (Y1)
Work		
Empty Cell		
Public transport	212 (37.06)	112 (19.58)
Online	45 (7.87)	58 (10.14)
Private vehicle	65 (11.36)	143 (25.00)
Paratransit	63 (11.01)	20 (3.50)
NMVs	100 (17.48)	122 (21.33)
On Foot	66 (11.54)	107 (18.71)
Others	21 (3.67)	10 (1.75)

Source: Anwari, et al. 2021

Figure 8.2.1 Change in Preference of Mode Choice for Work Purpose

Along with the spread of COVID-19 due to congestion of unspecified bus stoppage is the difficulty of maintaining social distancing in buses and the high number of transport mode interchange during trips. The spread of COVID-19 is due to missing proper integration with active modes in the bus around the bus stoppage. Although the public bus is the principal mode of travel, walking is the dominant last-mile travel in this city. The pandemic increases users of walkways, but COVID-19 spread due to congestion and inadequate and discontinuity of walkways. However, there is only 400 km of footpaths, of which 40% are illegally occupied and filled with dirt, and 1,868 km of roadways have no footpaths or sidewalk facilities (Chowdhury, 2014). On the other hand, bicycle users significantly increased even with missing supporting infrastructure. City dwellers prefer bicycles for social distancing purposes in the outback and flexibility of movement (Aljazeera, 2020).⁴

(2) Required Scope

- Technical support in the guidelines preparation for bus route permission procedure on actual demand response and reducing of routes overlapping.
- ITS for real-time information access to increase service efficiency, reduce waiting time, and smooth operation.
- Develop street design standard manual focusing on walkway, bicycle, and public bus facilities
- Analysis of the existing bus routes, reorganization of bus routes considering the missing links and MRT lines and determining optimum bus stoppage location in Dhaka city.
- Technical support for capacity building on controlling private bus operations

2) Program to create open spaces in city center utilized in case of disaster

(1) Background

Dhaka is a high -density populated area along with a lack of roads and a relatively low open space area (0.9%). Around 0.646 million people are living around 3,394 slums in Dhaka (Dhaka Tribune, 2019). Apart from the high density of population, shared kitchens, toilets, communal waste sources, one room per family living arrangements, open sewers, non-existent waste disposal system, and the slum residents' overall economic vulnerability made them the most

⁴ Coronavirus fuels bicycle sales in congested Bangladesh cities (Aljazeera, 19 Jun 2020); <https://www.aljazeera.com/news/2020/6/19/coronavirus-fuels-bicycle-sales-in-congested-bangladesh-cities>

vulnerable during the pandemic. It is well established that a congested place is more responsible for spreading COVID-19. Dhaka City solely hosts more than 50% of the infection cases among the total reported. Major hotspots for the reported cases in the city indicate large numbers of hospitals, markets, various public and private offices, etc. The pandemic has been urging cities all over the world to provide urban services and open spaces sufficiently and equally to avoid the “3Cs,” i.e., closed spaces, crowded places, and close-contact settings. At present, about 250ha (about 2.10%) of the land in Dhaka is used for recreational activities (DAP, 2021), which is significantly lower compared with other major cities of the world. Even the open space is not properly integrated with other different facilities. On the other hand, the road network of Dhaka does not maintain proper hierarchy and does not have open space and a city lifeline along the road. The DAP suggested that there was only 0.05 m² of green space per capita (Bari, 2009). To improve the situation, DAP (2015–2035) suggested 2,103.04 ha of open space by establishing 5 regional parks, 49 water-based parks, and 8 Eco Parks (DAP, 2021), though the per capita open space is still very low. Per the WHO recommendation per capita, the open space is 9.00 m² (WBB, 2015). The situation is more vulnerable in the slum area. Nearly 82% of the slum households are single-room dwellings, and 48% possess a dwelling area of fewer than 9.3 m². They have an acute shortage of basic infrastructures (Hasan, et al., 2021).

The CUREIP study also revealed the importance of the roles of communities and coordination between communities and the government for a resilient city in post-COVID-19 by distributing diverse and appropriate services for those in need.⁵

(2) Required Scope

- Policies, guides, and rules for revitalizing open spaces through land redevelopment and readjustment must be applied for place-making to contribute to ecological service, social and personal well-being, as well as ensuring physical activity through active recreation.
- Ensuring maximum utilization of open space need to be re-organized to utilize as playgrounds and for other recreation facilities, as well as ensuring the age-based opportunities for the community people, etc.
- Creating opportunities for access for all to the open space presently owned by different organizations and institutions.
- Improving walkways where congestion is likely to occur or occupied by the illegal establishment.
- Improving the community and age basis of different types of open spaces i.e. park and sports ground for city dwellers by proper land use integration and community participation

⁵ Bari, M. and Eferson, D. (2009) Detailed Area Plan (DAP) for Dhaka Metropolitan Development Plan: a critical review: Works for Better Bangladesh.

Cities, Crowding, and the Coronavirus: Predicting Contagion Risk Hotspots, World Bank, Apr. 2020

DAP. (2021). Detailed Area Plan (2015-2035), Rajdhani Unnayan Katripokkho (RAJUK).

Dhaka Tribune. (2019). Retrieved from: <https://archive.dhakatribune.com/bangladesh/dhaka/2019/06/16/minister-about-646-000-people-live-in-the-slums-of-dhaka>

Hasan, S.M., Das, S., Hanifi, S.M.A. et al. A place-based analysis of COVID-19 risk factors in Bangladesh urban slums: a secondary analysis of World Bank microdata. *BMC Public Health* 21, 502 (2021). <https://doi.org/10.1186/s12889-021-10230-z>

WBB. (2015). Parks and Playground in Dhaka: Taking stock and moving forward: Works for Better Bangladesh.

- Re-excavating water bodies like canals and ponds and recreation facility development, such as walkways and parks along water bodies.

3) Population dispersal programs to improve the density of the city center

(1) Background

The population of Dhaka City, the capital city of Bangladesh, has multiplied almost 6 times during this 40-year period. On an average annually, 0.12 million housing units are created annually for the city's 0.6 million migrants⁶. In 2015, deteriorated urban environments (increase in population that lead to unplanned urban growth) were responsible for 18,000 deaths and 0.58 million DALYs in Dhaka⁷. The declining quality of the urban environment also causes irreparable damage to natural ecosystems in cities and surrounding areas.

In addressing these, for improving the urban living condition and ensuring affordable housing, the 8th Five Year Plan⁸ suggests developing residential plots, vertical expansions, and constructing satellite towns. Also, encourage applying participatory approaches to land development to promote efficient and sustainable land development through techniques such as Land Pooling / Readjustment and Guided Land Development considering the smart city concept to make city authority promote regular developments in existing irregular development portion of the city. The Structure Plan, prepared by RAJUK, sets the objects for affordable and livable housing by increasing housing supply, ensuring maximum utilization of land, developing housing areas with easy access, and ensuring healthy and livable neighborhood development by using the contemporary smart techniques used in different cities of the world.

The CUREIP study also revealed the importance of the roles of communities and coordination between communities and the government for a resilient city in post-COVID-19 by distributing diverse and appropriate services for those in need.

(2) Required Scope

- Ensuring design standards to integrate land uses with required urban facilities
- Feasibility for establishing a satellite town near the MRT or BRT corridors to meet the housing demand of the increasing population and interlinked with ToD.
- Scope for vertical expansion by ensuring public participation through techniques, such as Land Pooling / Readjustment and Guided Land Development within the existing rules and regulations or preparing policy guidelines, if required.
- Affordable housing for low- and middle-income level people and also addressing the housing for the floating people
- Ensuring adequate infrastructure and services facilities to ensure the effecting development of the existing potential housing area
- Ensuring open space, walkways, bicycle facilities, integrated transport facilities, etc.
- Ensuring school-going facilities for children.

⁶ UNDP. (2019). Housing solutions for the urban poor in Bangladesh. <https://www.bd.undp.org/content/bangladesh/en/home/presscenter/pressreleases/2019/04/07/housing-solutions-for-the-urban-poor-in-bangladesh.html>

⁷ WHO. (2015). Number of years lost due to ill-health, disability or early death.

⁸GoB. (2020). 8th Five Year Plan, Bangladesh Planning Commission.

- Ensuring kitchen market and recreation facilities in the open space and ensuring the best utilization.

4) Establishment of Infectious Diseases Hospital and reformation of health sector

(1) Background⁹

The ongoing COVID-19 outbreak has unveiled the inadequacy, inefficiency, mismanagement, deeply ingrained poor governance, and unequal access in the healthcare system of many national jurisdictions. During COVID-19, hospitals have faced the worst situation due to high numbers of emergency patients against their limited capacity (Anwar, et al., 2020). The situation got worse as there were not enough resources or equipment to start treating patients. Initially, the testing capacity was also low considering the population, even the isolation facility capacity.

Bangladesh, with an ever-increasing population, has always depended on different actors like NGOs and community-based organizations (CBOs) to work alongside the government organizations (Baroi and Rabbani, 2011¹⁰). With the help of the government, different NGOs help to run and lead community-level activities. During this pandemic, no community participation was observed. The only dependable source is using social media to be informed about relevant health tips, the pandemic situation, directions to follow, etc. during this epidemic situation. The Bangladesh government has a health care system to provide services at the local levels from subdistricts to union parishad and community-level under the DGHS. But the system is inadequate to face a pandemic situation like COVID-19. Even pre-pandemic, it can be seen that a lot of people move to Dhaka just for treatments or health checkups, which should be available at community clinics or district hospitals. Dhaka City has only 208 ICU beds for COVID-19 patients for a population of 9 million (DGHS, 2021).

Table 8.2.4 Lack of hospital to combat the pandemic

Dedicated Hospital for COVID	Type	Total capacity	General bed	ICU bed
19	public-10, private-9	3,496	3,215	2,81

Source: DGHS 2021

It is needed to increase capacity building and training facilities and strengthen response capabilities in each tier of administration. Also, strengthening local community clinics with adequate doctors, nurses, and health workers and equipment will ease the initial pressure on the central structure. Developing an online healthcare facility with a referral system in between local community clinics and central hospitals can be introduced to track every patient and the service conditions. In addition, developing dedicated and well-equipped hospitals with all relevant facilities to serve a considerable number of patients will strengthen the health sector to fight against the rapid spreading of diseases. Specialized hospitals can also be used for research and special training stations for health personnel.

⁹ Anwar, S. Nasrullah, M. and Hosen, M. (2020). COVID-19 and Bangladesh: Challenges and How to Address Them, <https://www.frontiersin.org/articles/10.3389/fpubh.2020.00154/full>

¹⁰ Baroi, H. and Rabbani, G. (2019). Community Driven Development in Bangladesh: Factors Behind the Reality. https://www.researchgate.net/publication/326367462_Community_Driven_Development_in_Bangladesh_Factors_Behind_the_Reality.

(2) Required Scope

- Developing special hospitals
- Developing online healthcare facilities
- Developing guidelines and training programs for doctors and nurses

5) Program of Provide IT support in Education

(1) Background¹¹

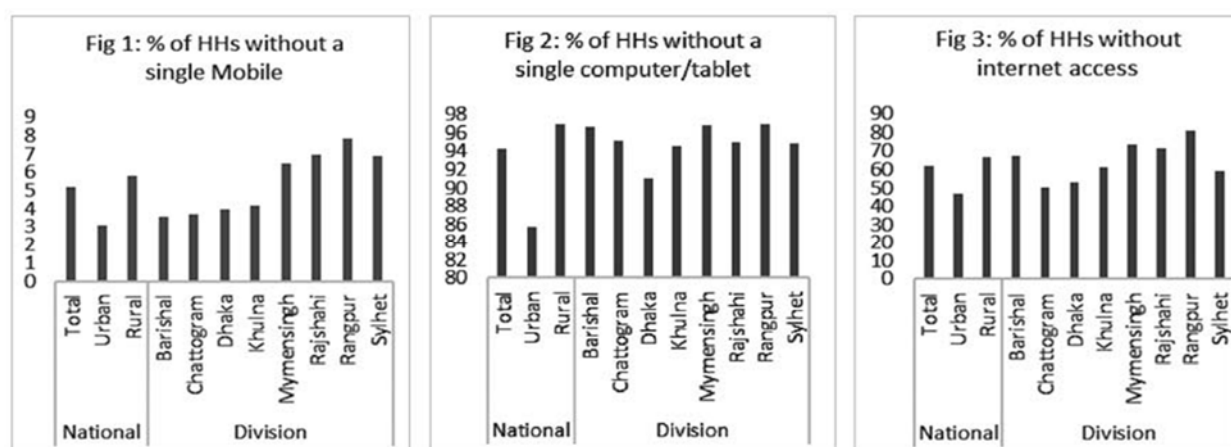
The sector in Bangladesh hit hardest by COVID-19 is education. The lack of adequate IT facilities and knowledge makes it difficult for the educational institutes of Bangladesh to conduct remote teaching effectively. According to the United Nations and other estimates, 48% of the total population of Bangladesh of around 160 million is below the age of 24, a staggering figure of potential human resources much needed to be skilled in ICT. However, the country is still in the first of the five-stage process of integrating the use of ICT in education. This stage is characterized by fear and suspicion of teachers. With providing CT infrastructure, the physical learning environment in some schools has slowly started changing, but the learning activities and supporting tools remain traditional. Progress of enhanced use of ICT in education is hindered by some extrinsic and intrinsic problems. Bangladesh has about 30,000 secondary and higher secondary academic institutions, and out of them are 23,000 secondary and higher secondary schools and madrasahs with an electricity connection, and 20,500 have multimedia classrooms. Among them, only 3,214 schools, on an experimental basis, provide IT labs (ADB, 2017). Almost all public and private educational institutions in the country are either at breakeven or suffer from a lack of human resources. About 60% of teachers consulted for this ADB study mentioned they would require time to learn how to use hardware and software and incorporate technology into the classrooms. Support is unavailable to help teachers in using ICT in their teaching. About 12,000 out of millions of teachers have been trained so far on how to use ICT in classrooms and develop digital content. However, most of these educational institutions have a traditional system.

Since educational institutions closed in March 2020, nearly 38 million students in Bangladesh have missed the opportunity to receive proper learning and interact with their peers, which has affected their education experience¹². Sixty percent of households in Dhaka don't have regular internet access, and around 91% of them don't have a single computer. Again, in the rural areas, the percentage decreases considerably. This immense digital divide is an obstacle to distance learning. Additionally, the 2020 BRAC survey of 5,000 students from urban slums and rural areas across Bangladesh indicates that the study hours of students have declined by 80% due to school closures. The Communities (BRAC) Rapid Assessment study found that 14% of students in their sample reported doing no study, while 56% didn't take part in online classes because of a lack of devices, skills, and so on.

¹¹ ADB, 2017. Innovative Strategies for Accelerated Human Resource Development in South Asia Information and Communication Technology for Education Special Focus on Bangladesh, Nepal, and Sri Lanka Innovative Strategies for Accelerated Human Resource Development in South Asia: Information and Communication Technology for Education—Special Focus on Bangladesh, Nepal, and Sri Lanka

¹² BIGD, 2020. Impact of COVID-19 on education in Bangladesh: A rapid assessment. Bangladesh Multiple Indicator Cluster Survey (MICS) Report, 2019.

Data from the Multiple Indicator Cluster Survey (MICS) 2019 shows that nearly 5% of households do not own a mobile phone and almost 50% do not own a television.



Source: MICS (2019)

Figure 8.2.2 The graph is representing devices and internet access inequality that underpinning the quality of e-learning

On the contrary, research shows that 42% of the students have not heard of any remote-based education activities. There are also controversies regarding the suitability of online, in terms of teaching-learning in the context of Bangladesh, as many universities do not have enough resources for running online education urgently.

(2) Required Scope

Technical Assistance

- Technical support in preparing guidelines to provide an e-library equipped with proper IT support.
- Developing a low-cost gazette for education support.
- Providing the necessary capacity development tools (training/guidelines) for online classes.
- Constructing infrastructure for providing health and cleaning facilities for schools.
- Constructing ICT lab in schools.

Basic Survey

- Surveying for construction project

8.3 Formation of Cooperation Projects

As a result of the discussions with related organizations regarding the proposed projects above, the following were selected as the most feasible, taking into consideration the desirability of the related organizations and the priority of the projects.

- Program to create open spaces in central city areas that can be utilized in times of disaster
- Population dispersal programs to improve the density of the city center

Although these two programs differ in terms of the project implementation targets (redevelopment in existing urban areas and new urban development in the suburbs), the competent authority in Bangladesh for both programs is RAJUK. The projects are also positioned as establishing a project system and improving the capacity of RAJUK to promote urban development in the DMA. Therefore, this study will be proposed as one technical cooperation project as the "Urban Area Development Capacity Improvement Project." It is expected that the project will be formed as an individual project in the future through discussions with RAJUK and others, based on more specific support needs and prioritized project contents.

8.3.1 Detail analysis of the projects

1) Analysis of the current status of related projects

(1) Practices related to projects in Dhaka

Urban development projects are undertaken by the private and public sectors. RAJUK, HSD, PWD, and other government organizations with development rights are implementing residential development, which is classified as new town development, on their own land and taking initiatives to acquire land when necessary. The implementation of these projects is also coordinated with relevant organizations, and local authorities, such as the DNCC and DSCC, are responsible for providing urban facilities and infrastructure.



Source: RAJUK

Figure 8.3.1 Uttara Model Town, Dhaka

On the other hand, in existing urban areas, projects similar to redevelopment are being implemented. Private real estate developers are involved in the development of privately-owned land through joint project development agreements. In some cases, landowners work with real estate developers to develop buildings, while in other cases, real estate developers propose to multiple landowners to develop a complex of buildings and share buildings

according to the percentage of common land.



Source: <https://www.wintechdevelopment2000ltd.com>

Figure 8.3.2 Multi Land Owner development Project by Wintech Developer 2000 Ltd.

(2) Laws and regulations related to urban development

Urban development management and controls are ensured by some rules and regulations. The major laws and regulations for urban development are as follows:

Town Improvement Act of 1953

The provision of this act is to prevent the haphazard construction of buildings and excavation of tanks, which are likely to interfere with the planning of certain areas in Bangladesh.

The Real Estate Development and Management Act, 2010

In safeguarding the interest of land owners against developers, the government enacted The Real Estate Development and Management Act in 2010. It provides the necessary provisions for the overall management of the real estate businesses in Bangladesh. It gives demarcation about how the land owner will be benefitted or compensated in case of delays in handover of the allotted portion of the apartment/ plot of land, dispute resolution between land owner and developer, punishable issues, and imprisonment options for filing to transfer the possession to the land owner as per the contract entered by the land developer and owner, etc.

Private House Land Development Rule (2004)

The rule (PRLDR 2004) support to set the standards on percentages of land that must be kept for community facilities, amount of land to be sold out, school sites, road hierarchy etc. for the private developers. The space standards for urban community facilities in acres by population size are enunciating for the initiator of the private land development project is explained under the section 3. Water bodies and flows within the project area should not be hampered and its area cannot be reduced.

Building Construction Act of 1953

This act aims to provide for the development, improvement, and expansion of the Capital of Dhaka, Narayanganj and Tongi cities, and certain areas in their vicinity. It provided regulations regarding setbacks, building heights, etc. in urban areas. Its main purpose is as follows:

- develop, improve, and expand the City of Dhaka by opening up congested areas;
- layout altering streets;
- provide open spaces for ventilation or recreation;

- demolish or construct buildings
- acquire land for the said purpose; and
- re-house persons displaced by the exclusion of improvement schemes.

Bangladesh National Building Code (BNBC) of 2006

The National Building Code instructs the minimum amount of quality control required during building construction. Its main purpose is to establish minimum standards for design, construction, quality of materials, use and occupancy, location, and maintenance of buildings within Bangladesh to safeguard, within achievable limits, life, limb, health, property, and public welfare.

Building Construction Rules of 2008

These rules seek to control development plot-by-plot and case-by-case by imposing conditions on setbacks, site coverage, construction of garages, access to plot, provision of lift, land use of that particular plot, and height of building. One of the most significant improvements is the introduction of the Floor Area Ratio (FAR). To manage the growth of the city, it provides rules of building coverage area, allowable floor space, and relations among building height, road width, and plot size.

Gazetted Master Plan for Dhaka, DAP 2004

The DAP for Dhaka needs to be authorized by the central government after the public hearing and the gazette notification is published.

DAP basically focuses on almost every development aspect of the city from land-use plans to a demarcation of canals and flood flow areas, etc. It has been prepared based on two major principles: inclusive planning and reconnecting urban people to the environment. It aims to achieve four goals, which complies with the SDG, 7th FYP, Dhaka structure plan, and these are (i) investment freedom, (ii) higher living standard, (iii) tolerant/progressive city, and (iv) eco-system conservation and restoration.

(3) Legal basis for the New Town development Practice

For town developments, the Town Improvement Act is the legal basis which gave the development authority special power like RAJUK for developments and improvements in their vicinity area by opening up congested areas, laying out or altering streets, providing open spaces for purposes of ventilation or recreation, demolishing or constructing buildings, acquiring land for the said purposes and the re-housing of persons displaced by the execution of improvement schemes, etc.

Other than the Town Improvement Act for new town developments, the same rules and regulations (mentioned above) will be applicable.

(4) Legal basis for the redevelopment Practice

Private companies are not always trustworthy for a joint venture partner for developing lands of multiple land owners. That is why a complex system needs to follow to develop the property.

The first document signed between the landowner, and the developer is the Joint Venture Agreement. The agreement defines the share percentage of developers and landlords, schedule, advance payable, delay, and penalty.

Under section 10 of The Real Estate Development and Management Act, 2010, the landowner is obligated to sign and execute this agreement, but there is no legal obligation to register the agreement. The landowner is also required to execute a Power of Attorney in favor of the developer.

Both landowners and developers are advised to carefully negotiate the terms of the developer agreement to avoid future disputes.

(5) Issues for government initiatives in promoting projects

In general, when the government leads urban development projects, there are two main categories: new town development and urban renewal. In both cases, Bangladesh has a legal framework in place.

In the case of new town development, RAJUK leads in implementing the project, but the supply is insufficient to meet the demand for development.

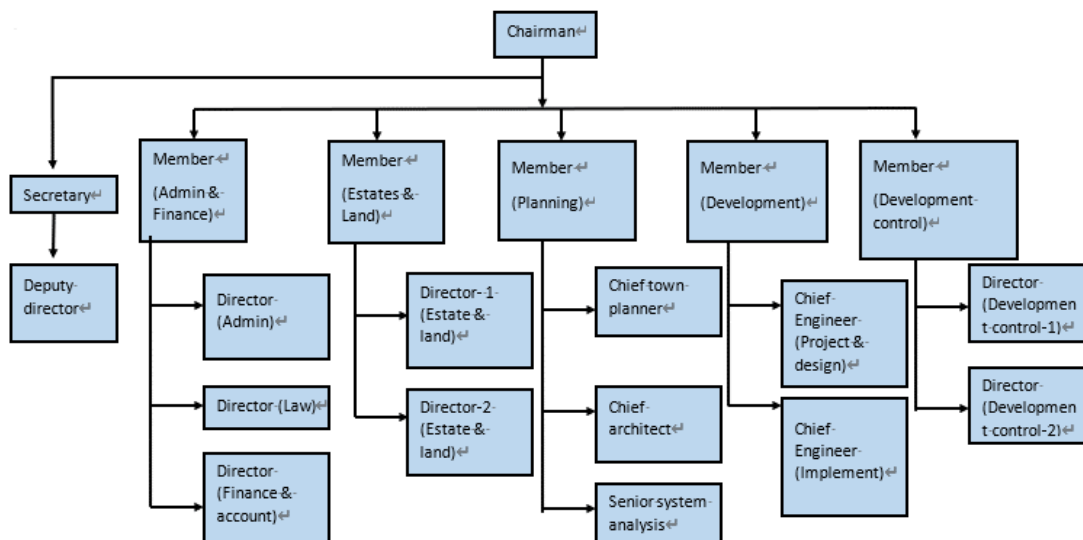
On the other hand, in the case of urban redevelopment, projects are being implemented under the initiative of the private sector. However, there are two major challenges for the government to promote projects in urban areas:

Existing methods are the basis for private sector projects, and the system is insufficiently prepared for government involvement.

Insufficient capacity on the part of the government to implement the project and insufficient credibility to conduct a joint project with existing rights holders when implementing the project.

(6) Overview of the RAJUK organization

RAJUK is the official coordinating organization for urban development in the DMA and is governed by a chairperson and a five-member committee appointed by the central government. RAJUK is also responsible for the planning and development management of the DMA. It comprises urban planning specialists, urban administration officials, civil engineers, and architects. RAJUK is involved in development planning, building planning, housing, real estate, land allocation, and building permits for some public and private buildings. It also conducts reviews based on the Bangladesh National Building Code, which corresponds to the Building Code of Japan. In addition, RAJUK is in charge of planning and construction of roads, bridges, and other structures. In addition, the Agency also manages development based on laws and regulations.



Source: RAJUK

Figure 8.3.3 RAJUK Organization Chart

2) Current Status of Potential Project Sites¹³

During the field survey, discussions with RAJUK and DNCC/DSCC indicated the areas that require immediate urban development. Since they are considered to be potential target areas in the cooperative project, they were analyzed.

(1) Redevelopment of Bangshal

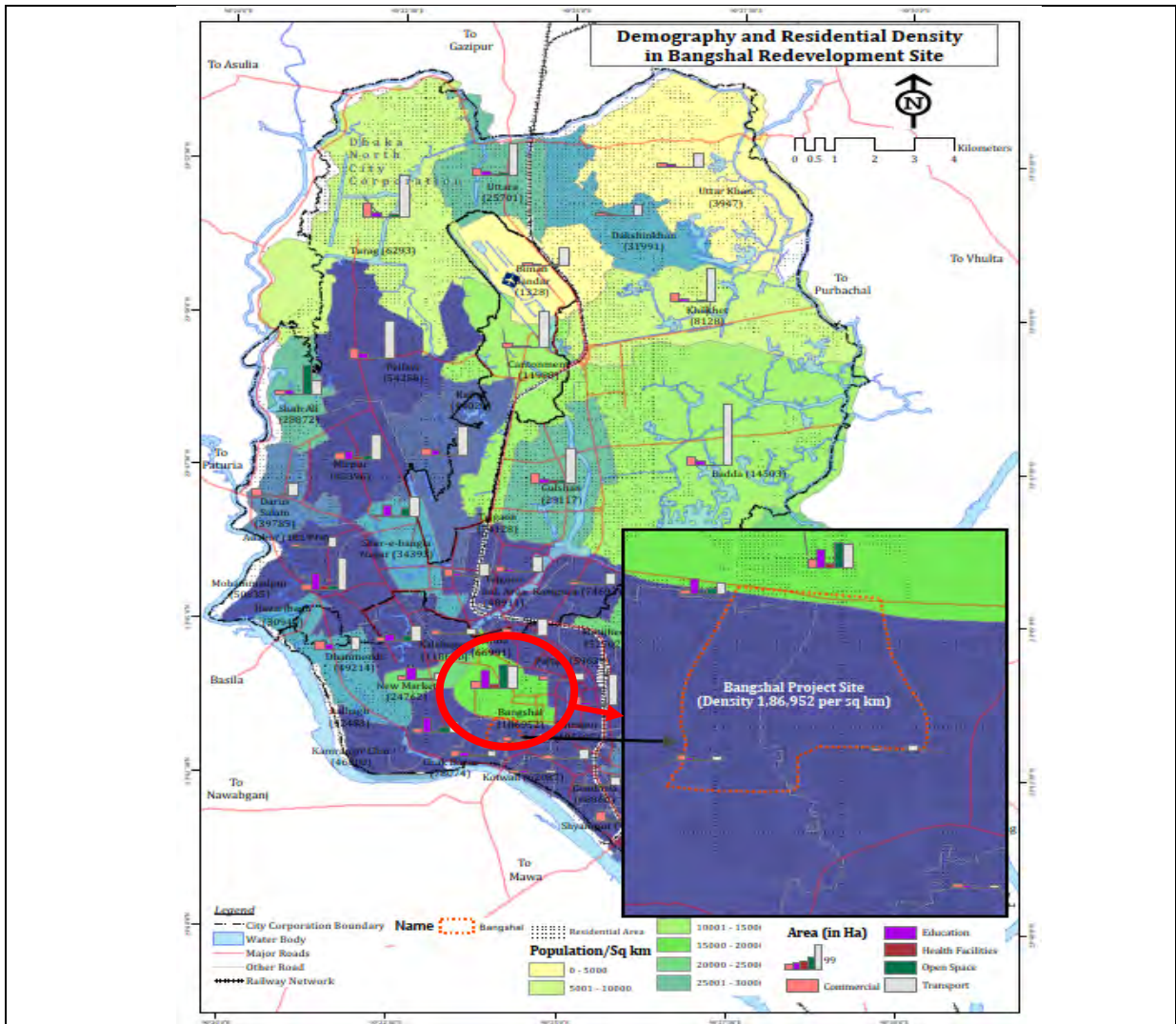
COVID-19 Impacts:

Bangshal is a small but one of the most populous areas of DMA. The settlement pattern of the area reflects irregular development and uncontrolled growth, with mixed land use and smaller but numerous concentrations of activity. Residential neighborhoods are clustered in the area in a very compact and dense manner, with a narrow and disintegrated road pattern. The existing population of the site is 82,169, making the population density about 186,952 per km², which is one of the highest in the world. Such a high population density even facilitated the transmission dynamics of COVID-19 in the area. By August 2022, the total COVID-19 infection rate in Bangshal thana was 326 per million. In the case of Dhaka, the infection rate increased from 11 per million on 22 April 2020 to 247 per million on 1 April 2021. The infection rate aggravated more by July 2021 (up to 193 per million) due to lacking appropriate measures. Bangshal also followed this ascensive trend of infection, and the sufferings of the residents had no bounds.

¹³ 1. Kozhenova, S. K. (2010). Quality of the Living Space Larger = better? https://www.hdm.lth.se/fileadmin/hdm/Education/Undergrad/ABAN05_2010/Kozhenova_Svetlana_-_Quality_of_the_Living_Space.pdf

2. An Outline Strategy for Old Dhaka Redevelopment. (2012). Sustainable Living Urban Model (S.L.U.M).

3. Tokey, A. I., Shioma, S. A., Munir, M. M., Hossain, D., Akther, M. S., & Islam, I. (2020). Redevelopment of a Dense Area: A Participatory Planning Approach for Regeneration in Old Dhaka, Bangladesh. *Journal of Regional and City Planning*, 31(3), 217–236. <https://doi.org/10.5614/jpwk.2020.31.3.1>

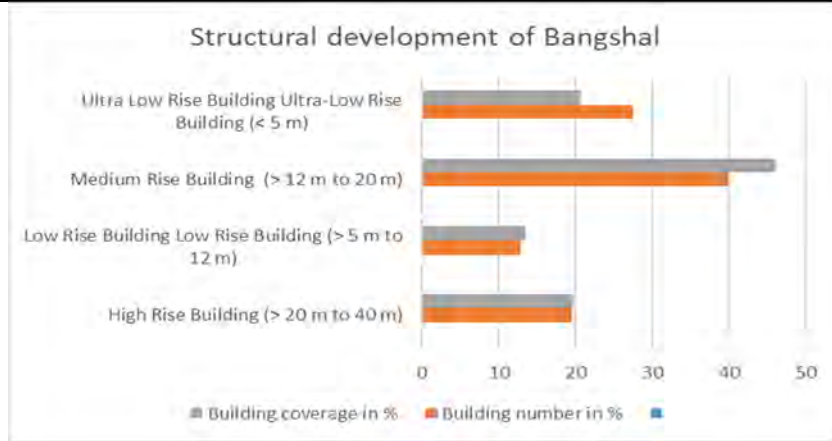


Source: Draft DAP (2016–2035)

Figure 8.3.4 Location Map and density profile of Bangshal

Existing Land Uses:

Along with the rest of the old Dhaka, Bangshal has developed irregularly without any planning framework for centuries. The primary land use of the area is mostly residential and commercial, with very few community facilities and public space. Relocating the Dhaka central jail in 2016 has opened up the possibility of repurposing a huge area of about 15ha into a public spaces. Currently, more than 70% of the land is used for residential, and it is followed by transport and communication (9.85%) and commercial area (5.57%). People of middle-income or high middle-income families here live in small tenement houses lacking personal space, privacy, and basic facilities only to preserve their family tradition. In the global context, the floor area per person is highly variable among countries, but the median reported floor area per person is 14.4 m² (Quality of the Living Space, 2010). But most dwelling units in the Bangshal area even lack the standard floor area per person of low-income countries (6 sq m). Inaccessible road networks force most people to commute by walking in the area. Figure 02 shows the building number and coverage from ultra-low to high rise. Data indicates the dominance of medium-rise and ultra-low buildings. High population density with low building rise indicates shanty-type development, which is a threat to a healthy living environment.

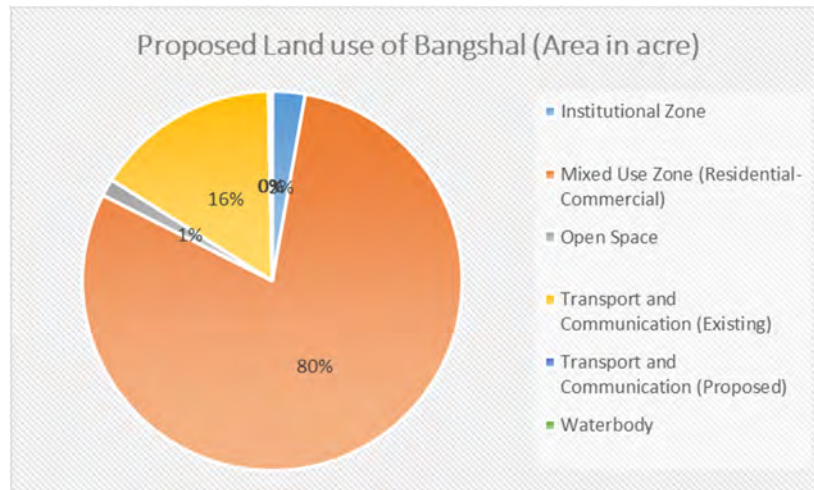


Source: Draft DAP (2106-2035)

Figure 8.3.5 Structural Development of Bangshal

Proposed Land Uses:

DAP proposes the area as mixed use residential which is around 80% of the total area with some institutional area. Dhaka central jail has been already moved to Keraniganj, the site has been proposed as open space will enrich the urban living standard of the project site.

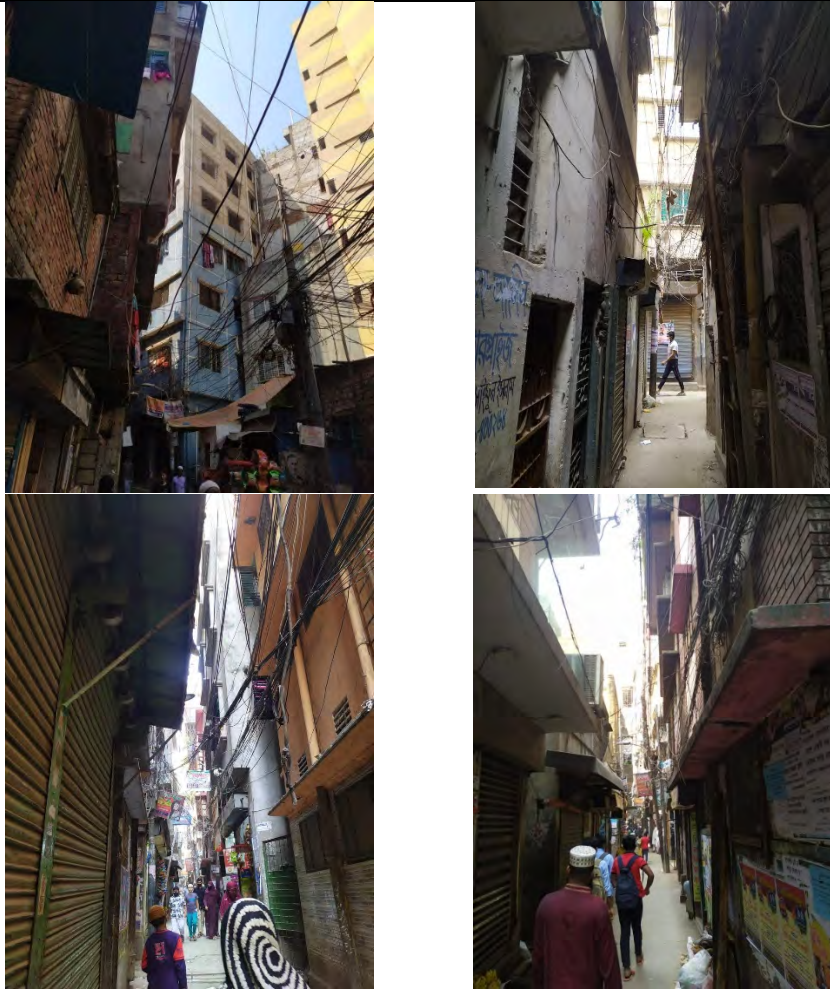


Source: Draft DAP (2106-2035)

Figure 8.3.6 Proposed Land Use of Bangshal Area

Development Trends:

This area has been a place of living for middle-income and high-middle-income families. The density of development and building is too high. Water logging is becoming a serious problem due to the low permeability of the soil. However, the load-bearing capacity of soil is comparatively good. Most people commute by walking within this area.



Source: JST

Figure 8.3.7 Narrow roads and chaotic development in Bangshal area

Development Demands:

Although accommodating such a huge population and providing them with all the basic facilities is quite challenging, the Bangshal area can be a potential site for land redevelopment to transform into a planned urban area with adequate urban facilities. Since the area possesses three distinct features, namely, high density, high commercial activity, and heritage, redevelopment of this area require consideration from multiple points of view.

The Dhaka Structure Plan (2016–2035) has formulated several policies to revitalize Old Dhaka through Selective Redevelopment, Rehabilitation, and Preservation of Traditional Heritages. As part of old Dhaka, this area can be declared and developed as a heritage zone. The proposed land use of the area is mostly a mixed-use zone (residential-commercial), with some institutional area (about 80%). The site of the former Dhaka central jail has been proposed as an open space, which is expected to bring positive changes to the project site. Potentially dangerous industries shall be shifted to somewhere else. Projects can be initiated to widen existing roads and create new link roads to open up congested areas.

Existing and Future Connectivity:

The project site of Bangshal will be near MRT Line 2, the Dhaka elevated expressway, and two bus routes proposed in the RSTP, which will increase the connectivity of the area with the other parts of

the city. If the routes and stations adjacent to the area are carefully planned and managed, they will eventually bring down the traffic pressure on the internal narrow roads of the area.

Table 8.3.1 Present and future connectivity of Bangshal

Present connectivity	Future connectivity
Narrow road with inadequate walkway, Length of existing road network: 17.66 km Average width: 2.4 m	Adjacent to MRT 2
Number of major road to connect: 1	Dhaka Elevated expressway
Number of existing bus routes: 6	Number of proposed bus route: 2

Source: JICA Study Team

Figure 8.3.8 shows the future connectivity of Bangshal. Although the current street pattern of the area is featured a narrow road lacking pedestrian or cycling facilities, there is huge potential for future accessibility improvement by MRT Line 2. Increasing accessibility to the station through a land redevelopment project may help the area to flourish more.

Suitability for Compact Township Developments:

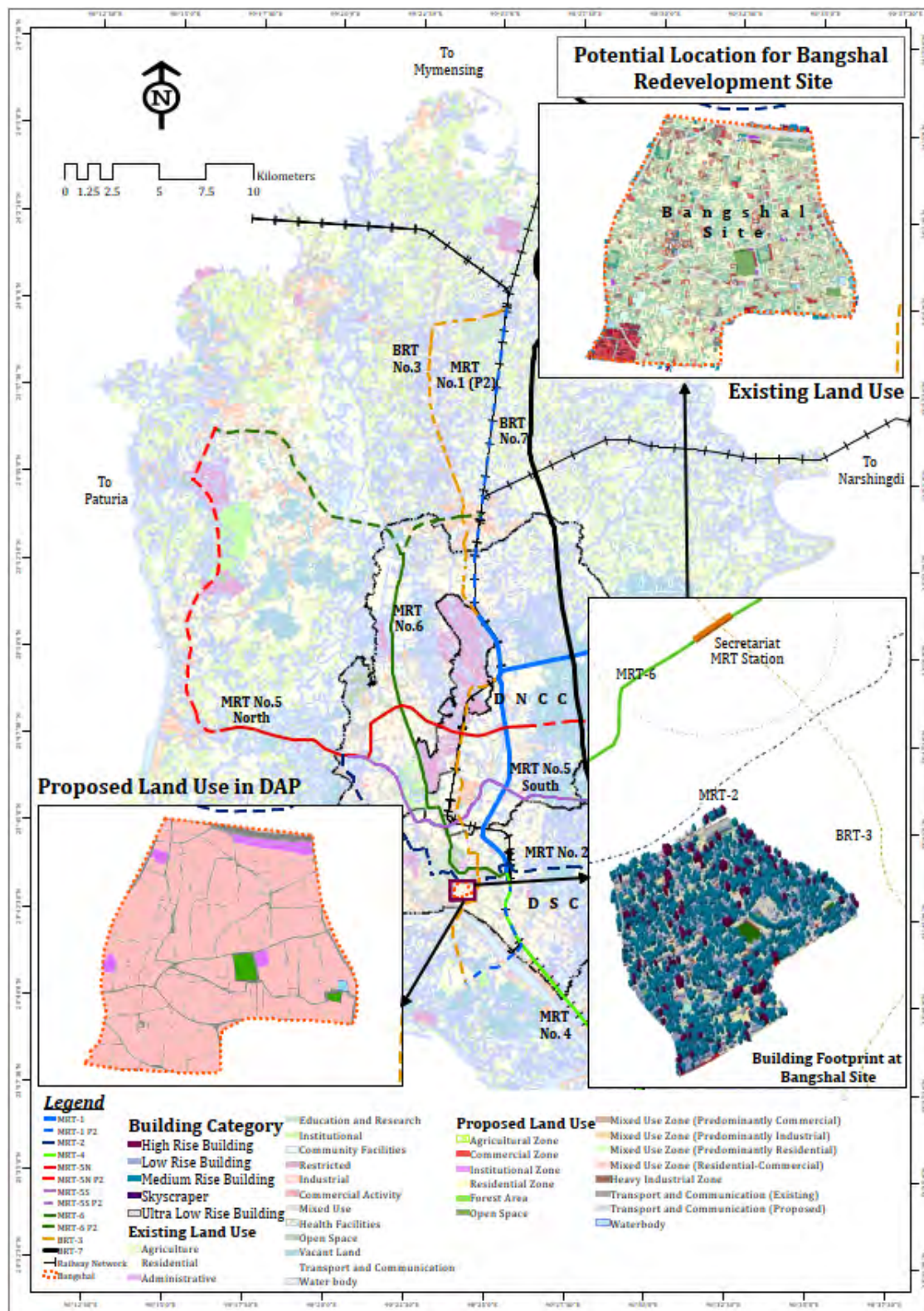
Accommodating the population which is more than 4 times than the standard design criteria and providing the facility as a compact township is quite challenging.

Suitability in-terms of Land Re-Developments:

Urban redevelopment is an effective tool to work with old or blighted areas that need to be revitalized. Bangshal area can be a potential site for land redevelopment to transform as planned urban area with adequate urban facility which is currently quite low as we seen from the DAP (2016-2035). In DSP policy has been given to Revitalize the Old Dhaka through Selective Redevelopment, Rehabilitation and Preservation of Traditional Heritages. Such programme and projects can be taken to widen existing roads and create new link roads to open up congested areas. Land use zones can be redefined, when necessary, to enable traditional economic activities. But in case of Bangladesh, revision or replacement of an existing land use and population distribution pattern through the acquisition of a predominantly built-up area is quite difficult. Complicated and illegal land ownership, lack of co-operation and awareness of the common people often make the process difficult for the policy makers. Sometimes, authorities also fail to understand and fulfil local needs. However, as the ultimate goal of redevelopment projects is to ensure sustainability and improve quality of life, authorities should involve local people and educate them about the benefit of redevelopment from social, economic and environmental perspective. Putting them in the center of discussion may ease the path of land clearance or revision for effective redevelopment.

Suitability in Terms of Land Re-Adjustments:

Considering the high density in Bangshal, it will be a bit complex to apply land readjustment techniques. The existing complex land ownership pattern, around 70% occupied by different infrastructures (building no. 4,071 and average building height 11.38 m), lacks free space for development and has very poor per capita open space and for other service facilities. If effective collaboration with the landowners and interlinking with proper policy guidelines for ensuring the benefit of different stakeholders. Ultimately, it will protect standard living conditions as well as enhance social, financial, and environmental benefits. By this approach, the irregular plot will be arranged into a regular shape and attractive shape, also providing adequate urban facilities and amenities.



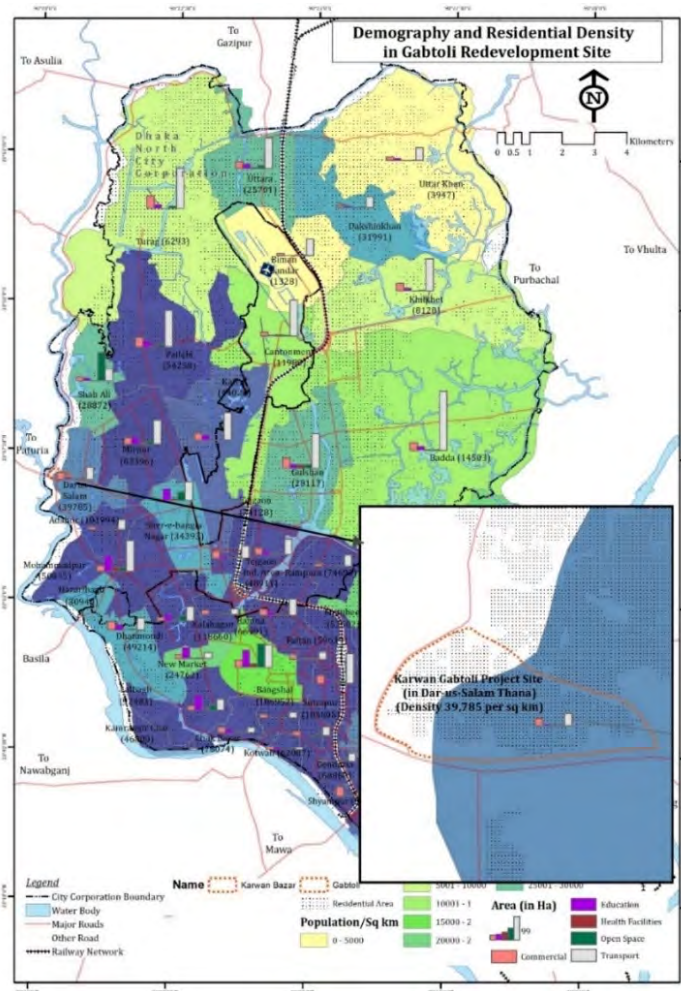
Source: Draft DAP (2016–2035)

Figure 8.3.8 Transport connectivity of Bangshal

(2) Gabtoli

COVID-19 Impacts:

Gabtoli is one of the most important multimodal transport hubs and gateway to the Dhaka City Corporation area, along with providing the primary link for people and freight in major proportion from surrounding districts. It is located in Dar-us-Salam Thana, which was one of the most COVID-19-infected areas of Dhaka City. Until August 2020, the COVID-19 infection in Darus-salam thana was 237 (1,489 per million). Considering the case of Dhaka City, the infection rate was about 89 per million up to April 2020. Over time, the infection rate increased rapidly due to the lack of appropriate measures. As a result, 13,515 cases per million were identified until April 2021, reaching 24,020 by end of July and 37,045 per million by end of February 2022. Following the infection trend in Dhaka City, the infection rate increased in the project area too. The total area of the project site is about 15ha, with a high population density of about 39,785 per km². The Dhaka Aricha National highway (N5) crosses along the southern border of the project area and is bounded by the Kaemichel Road in the north. Mirpur Beribadh Road and the Turag River are on the western side of the area. Gabtoli MRT stations are also within half a km of the site.



Source: Draft DAP (2106–2035)

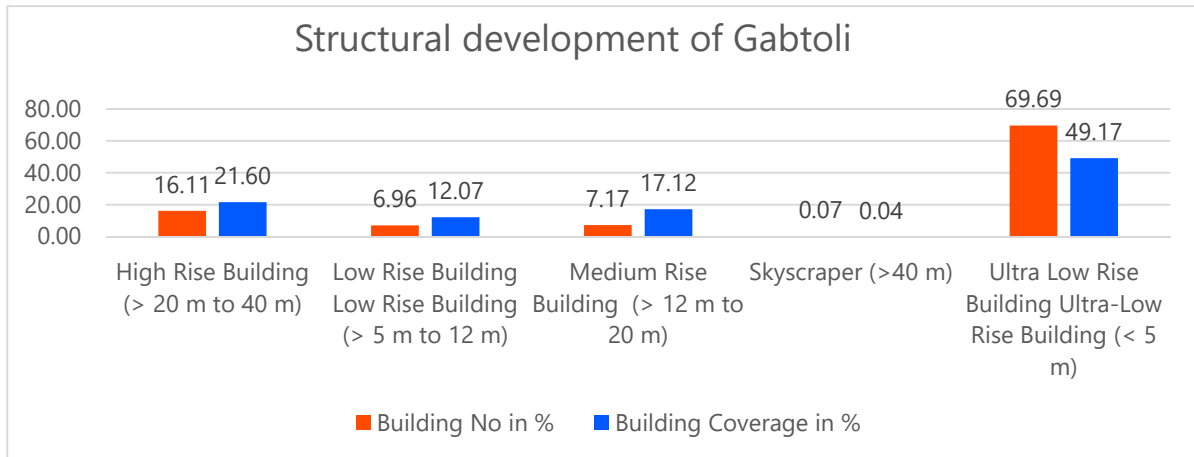
Figure 8.3.9 Location Map and Density Profile of Gabtoli

Existing Land Uses:

Typically, Gabtoli is known as the transition point between Dhaka city and the north-western districts of Bangladesh. The Gabtoli bus terminal is in proximity to the site, functioning as the gateway for

traveling to the north and west. As a result, some portion of the area is currently used for commercial. But the primary land use of Gabtoli has been identified as residential (62.45%), only it has very little community space (0.77 0.3ha) and no open space and kitchen market. A large water body can be seen adjacent to the south side of the Gabtoli bus stand. Overall, the area barely has any free land possible for development.

The figure below shows the building number and coverage from ultra-low to high rise. The data indicates dominance of ultra-low buildings in the area, and the high population density with low-rise buildings indicates shanty-type development, which is a threat to a healthy living environment.

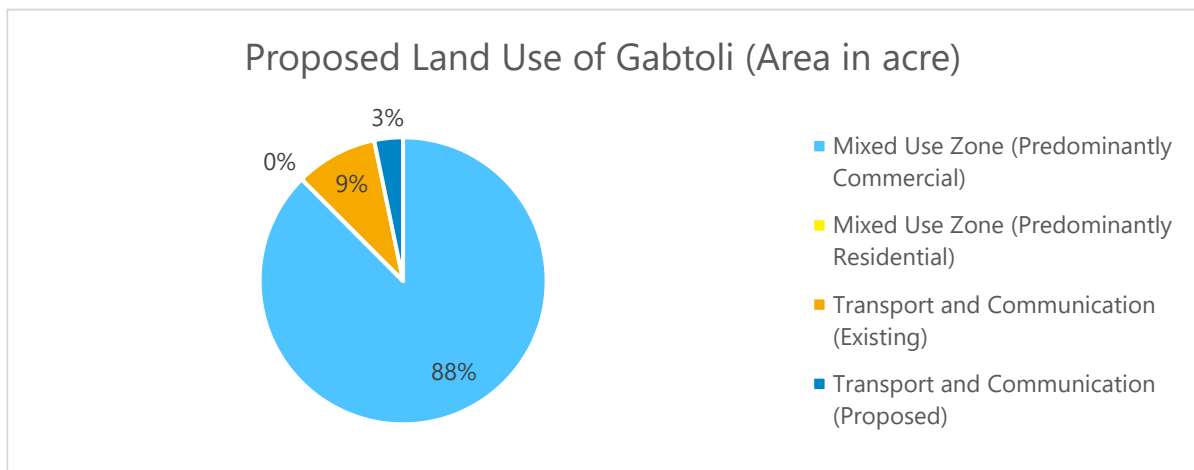


Source: Draft DAP (2106–2035)

Figure 8.3.10 Structural Development of Gabtoli

Proposed Land Uses:

In DAP (2016–2035), the project area has been proposed mostly as a mixed-use zone (predominantly commercial at 87.52%). The adjacent area along the Dhaka-Aricha Highway has also been proposed as mixed-use zone (commercial) and transport communication facility.



Source: Draft DAP (2016–2035)

Figure 8.3.11 Proposed land use of Gabtoli area

Development Trends:

Although a large portion of the area has been developed as residential, its main attraction force is the commercial and transport node along the main road. The west side has a geographic fault line, but the east side area is safe for high-rise development. Most of the connecting roads within the area are quite narrow, which creates hours-long traffic congestion. Naturally, people mostly

commute by using a rickshaw or by walking.

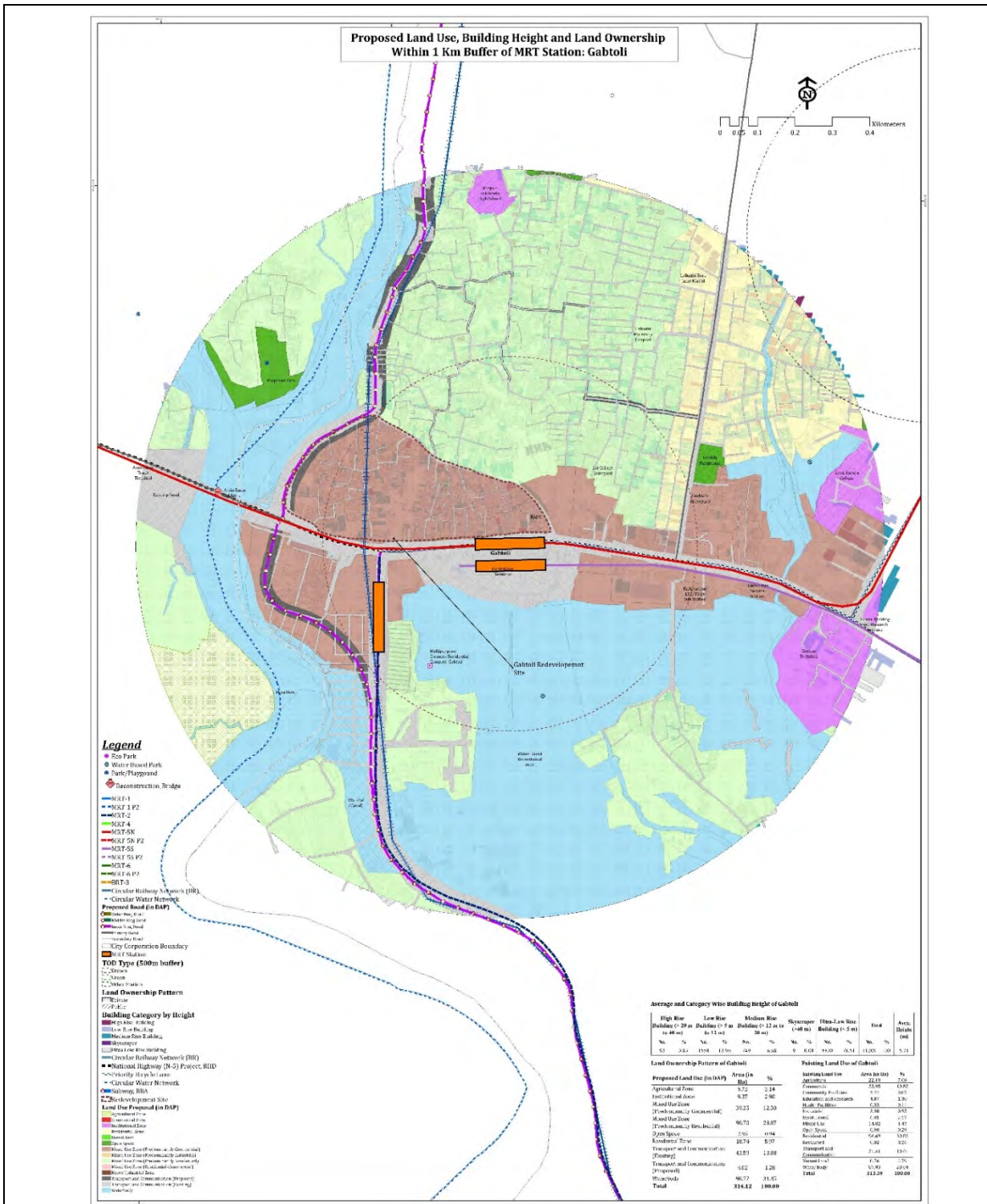


Source: JST

Figure 8.3.12 Narrow Roads and Chaotic Development in Gabtoli

Development Demands:

The project site of Gabtoli is considered suitable for TOD since three MRT stations are within half a kilometer of this site. The Gabtoli terminal can be developed as a multi-modal hub considering the waterway, roads, MRT Line 5 North, MRT Line 5 South, and MRT Line 2. Housing can be developed as a planned residential area for low-income people.



Source: Draft DAP (2016–2035)

Figure 8.3.13 Proposed Land Use, Building Height and Land Ownership Within 1 Km Buffer of MRT Station: Gabtoli

Existing and Future Connectivity:

The project site of Gabtoli will be nearby MRT Line 5 (north, south) and MRT Line 2 as proposed in the RSTP, which will increase the connectivity of the area with other parts of the city. Other TDM techniques are also being proposed, such as inner circular ring road, circular rail, waterway, reconstruction of Amin Bazar Bridge, redevelopment of the intercity bus terminal, etc. Successful

implementation and management of such projects are expected to bring down the traffic pressure on the internal narrow roads of the area as well as improve the traffic flow on the highway.

Table 8.3.2 Present and future connectivity of Gabtoli

Present connectivity	Future connectivity
Total length of the existing road network within the site 2.26 km Average width of these road is 1.84 m	MRT 5 (north and south), MRT 2
Intercity and intracity bus terminal with lack of bus operation system	Inner circular ring road Circular railway Terminal for circular waterway
Narrow road with inadequate walkway in the north side of terminal	Walkway along the riverbank
Number of existing bus routes: 26	Number of proposed bus route: 9
Number of major road to connect: 1	Reconstruction of existing aminbazar bridge, Redevelopment of intercity bus terminal, Expressway from aminbazar to nobinagor

Source: JICA Study Team

Figure 8.3.14 shows the future connectivity of Gabtoli. The current street pattern of the area features narrow roads with a lack of pedestrian or cycling facilities but has the potential for future accessibility improvement by MRT and BRT Lines. Increased accessibility to the stations and bus routes through land redevelopment projects may help the area to flourish more.

Suitability for Compact Township Developments:

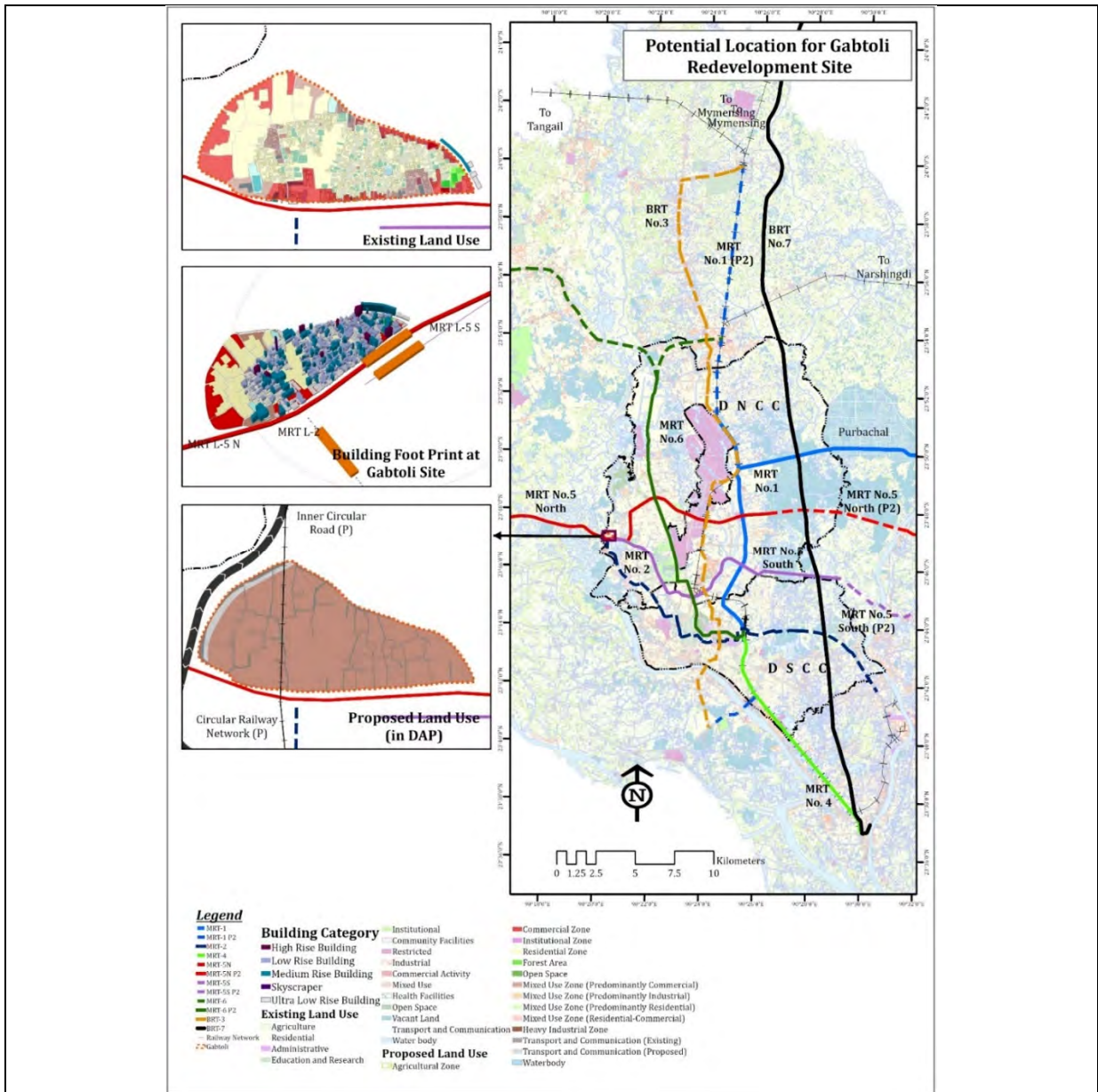
Being used as one of the primary nodes for transport hub, also as residential and commercial, this site can hardly be proposed as a compact township.

Sustainability in-terms of Land Re- Developments:

In the context of Bangladesh, the revision or replacement of an existing land use and population distribution pattern through the acquisition of a predominantly built-up area is quite difficult. Complicated and illegal land ownership and lack of cooperation and awareness of the common people often make the process difficult for the policymakers. Sometimes, authorities also fail to understand and fulfill local needs.

Considering the Gabtoli site is mainly used for residential, transport, and communication, land redevelopment in the area will be very complicated. It has 1,465 buildings with an average height of 4.92 m. Roads and buildings cover more than 59% of the total area. Considering this situation, providing an adequate community facility or urban amenities will be challenging due to high population density, existing low-income people housing areas, and zero open space.

However, as the ultimate goal of redevelopment projects is to ensure sustainability and improve quality of life, authorities should involve local people and educate them about the benefit of redevelopment from a social, economic, and environmental perspective. Putting them in the center of discussion may ease the path of land clearance or revision for effective redevelopment.



Source: Draft DAP (2016–2035)

Figure 8.3.14 Transport Connectivity of Gabtoli

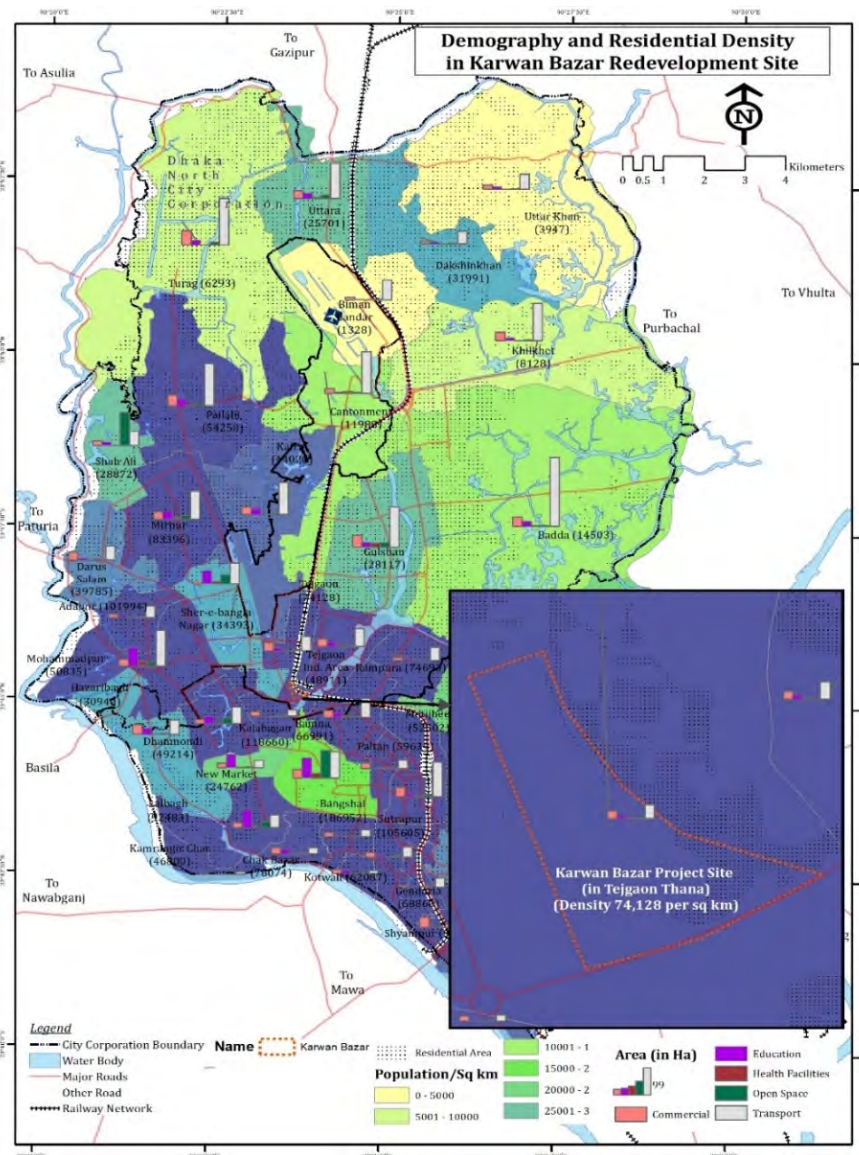
Suitability in Terms of Land Readjustments:

Considering the high percentage of residential use, a land readjustment tool can be introduced to accommodate the existing population in the planned area if the land owners agree to it. Effective collaboration with the landowners and interlinking with proper policy guidelines will improve standards of living conditions as well as enhance social, financial, and environmental benefits.

(3) Karwanbazar

COVID-19 Impacts:

Karwan Bazar is one of the biggest wholesale marketplaces in the center of Dhaka City. It is a designated commercial area of the Dhaka North City Corporation (DNCC) and is in the Tejgaon Thana, which is one of the most infected areas within the city. Until August 2020, the COVID-19 infection in Tejgaon Thana was 817 per million. Considering the infection cases in Dhaka City, the per million infection cases were 89 until April 2020. Over time, the infection rate increased rapidly due to the lack of appropriate preventive measures. As a result, 13,515 per million infections were identified until April 2021. By the end of July, it reached 24,020 and 37,045 per million at the end of February 2022. Following the infection trend in Dhaka City, the infection rate also increased in the project area. The total size of the Karwanbazar redevelopment site is 8.5ha. DNCC has taken up a master plan to set up a state-of-the-art business hub at Karwan Bazar in Dhaka. There are plans to remove the market and build seven-star hotels, entertainment centers, convention centers, and indoor playgrounds on 12 bighas of land.

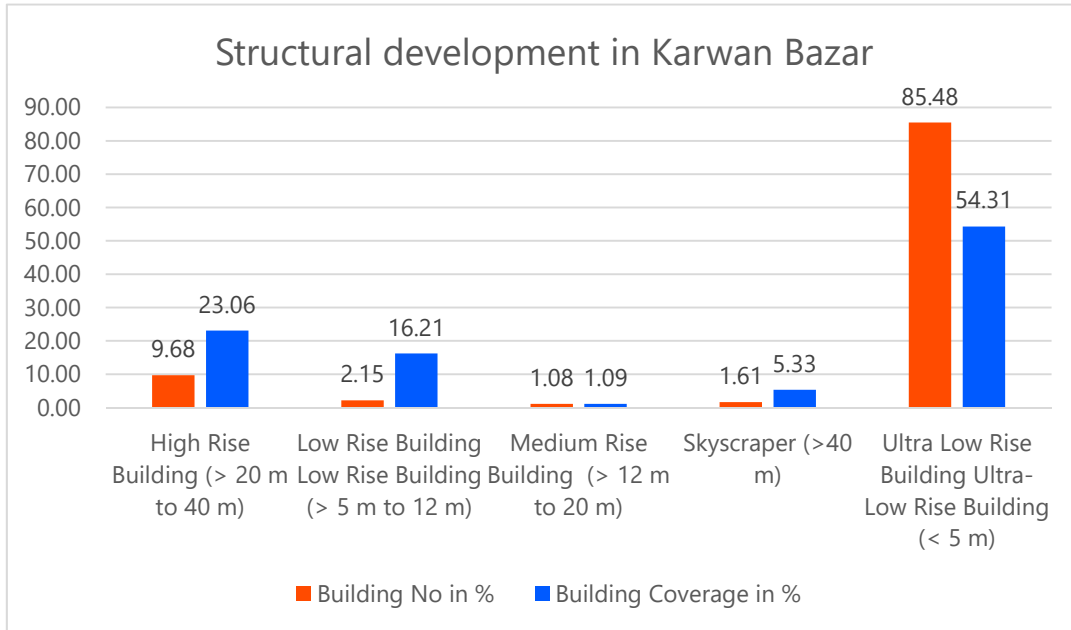


Source: Draft DAP (2016–2035)

Figure 8.3.15 Location Map and Density Profile of Karwan Bazar

Existing Land Uses:

Most of the land in the Karwan Bazar area is currently used for commercial (50.85%), with some mixed-use (11.53%) and residential use (12.92%). Vacant land and transport and communication land use cover 4.11% and 15.45% of the total land, respectively. Figure 8.3.16 shows the building number and coverage from ultra-low to high rise. Data indicates the dominance of ultra-low buildings in the area, and high population density with low building rise indicates shanty-type development, which threatens a healthy living environment.

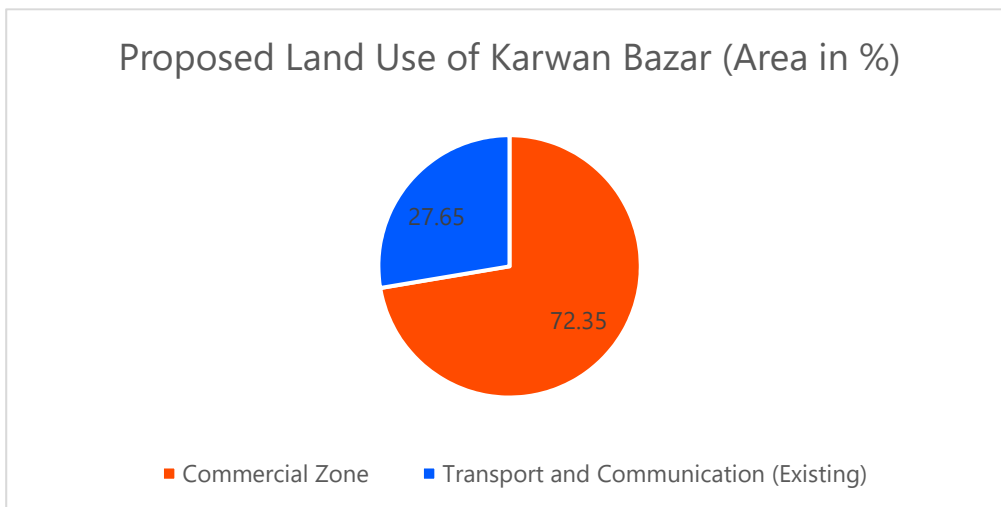


Source: Draft DAP (2016–2035)

Figure 8.3.16 Structural development of Karwan Bazar

Proposed Land Uses:

Preserving the primitive nature of the development of Karwan Bazar, almost all of the area has been proposed as a commercial zone and mixed-use zone (predominantly commercial, 72.35%). The rest of the area has been proposed for transport and communication facilities.



Source: Draft DAP (2016–2035)

Figure 8.3.17 Proposed Land Use of Karwan Bazar area

Development Trends:

The market area has induced different land use and development around the Kawran Bazar throughout the centuries. Most people commute by bus or auto rickshaw or by walking. Some also use private cars. Proximity to the hatirjheel area has instigated the development of the residential area as well. Though this area is under an earthquake zone, the soil load-bearing capacity is relatively high.

Development Demands:

One of the major points for development is the MRT Line 6, which is currently under construction, and there is a plan for an MRT Line 5 south. A large number of low-income people live around the Kawran Bazar market area. However, there is a plan to shift the market to another location. This makes an opportunity to develop the area as a modern business hub zone as the existing land use is mainly commercial around this place. The following map, Figure 8.3.18 shows the proposed master plan for Karwan Bazar.



Source: <https://contextbd.com/urban-regeneration-of-kawran-bazaar/>

Figure 8.3.18 Proposed Master Plan

Existing and Future Connectivity:

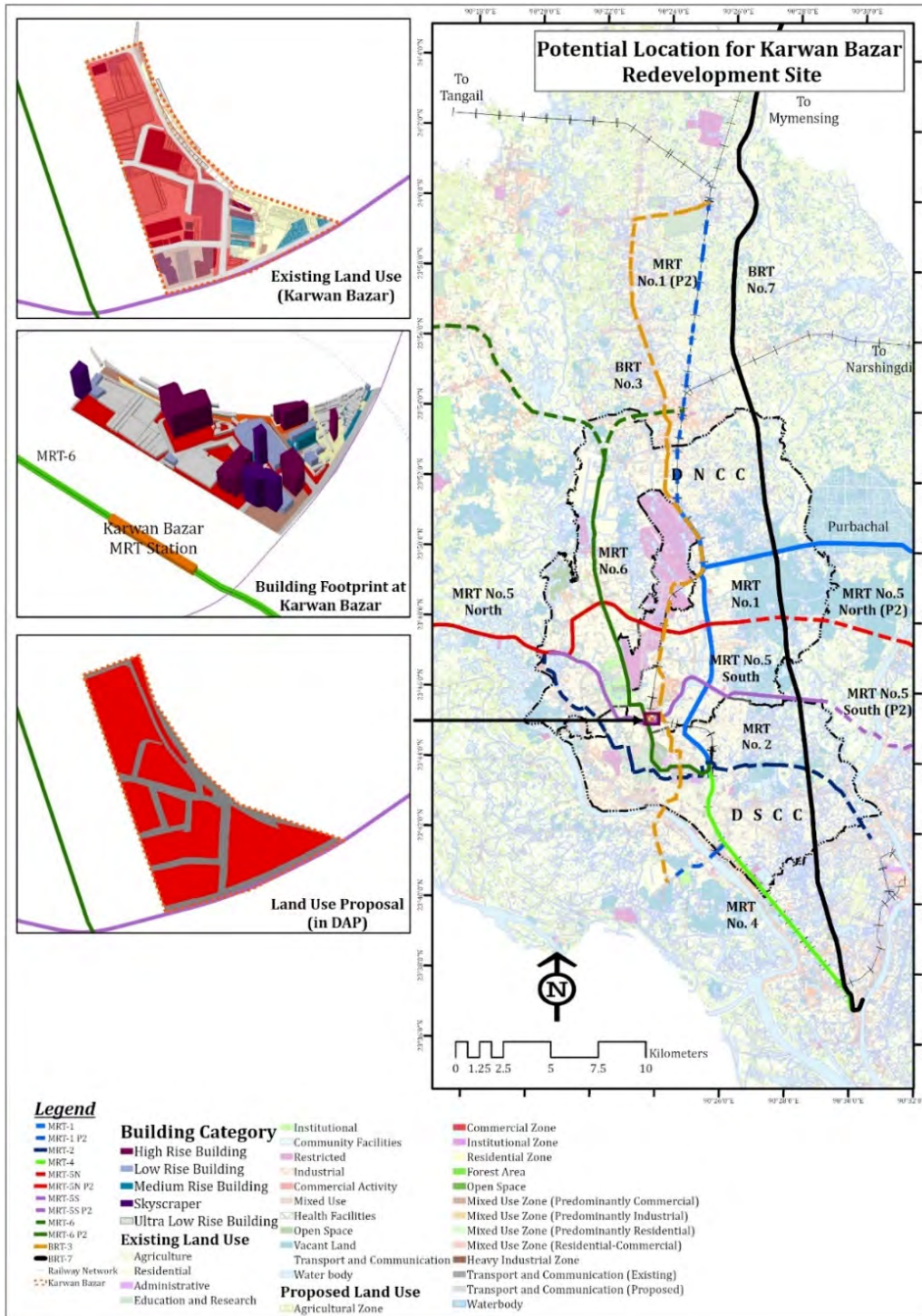
The project site of Karwan Bazar will be close to MRT Line 6 and MRT Line 5 (South). Dhaka elevated expressway and 10 other bus routes proposed in the RSTP will increase the connectivity of the area with the others parts of the city. If the routes and stations adjacent to the area are carefully planned and managed, they will eventually bring down the traffic pressure in the commercial hub.

Table 8.3.3 Present and future connectivity of Karwanbazar

Present connectivity	Future connectivity
Major Node in transport network with narrow connecting road, length of the existing road network within the site is 1.07 km.	MRT 6 and MRT 5 South
Number of existing bus routes: 22	Dhaka Elevated expressway
Number of major road to connect: 2	Number of proposed bus routes: 10

Source: JICA Study Team

The figure below shows the future connectivity of Karwan Bazar. With increased accessibility to stations through land redevelopment projects and creating a network of public spaces, the project site will improve economically and socially.



Source: Draft DAP (2016–2035)

Figure 8.3.19 Transport Connectivity of Karwan Bazar

Suitability for Compact Township Developments:

Since Karwan Bazar is now primarily used as a commercial area and, based on the DAP (2016–2035), more than 70% area has been used as commercial and the rest for transport and communication. Developing the area as a compact township will not be suitable considering the existing land use.



Source: Kabir, S. (2021, January 26). *Urban Regeneration of Kawran Bazaar*. Context BD. <https://contextbd.com/urban-regeneration-of-kawran-bazaar/>

Figure 8.3.20 Existing Karwan Bazar Kitchen Market

Suitability in Terms of Land Redevelopments:

Land redevelopment can be an effective tool to redesign the Kawaran Bazar area to make it a commercial hub. But in the context of Bangladesh, revision or replacement of an existing land use and population distribution pattern through the acquisition of a predominantly built-up area is quite difficult. Complicated and illegal land ownership, lack of cooperation, and awareness of the common people often make the process difficult for policymakers. Sometimes, authorities also fail to understand and fulfill local needs.

A large portion of the Karwan Bazar area is currently used as a wholesale kitchen market. However, there is already a plan to shift the kitchen market to a new location and develop the area as a hub for commercial use. Although DNCC has set up a plan to redevelop this site, it will be challenging to replace and relocate the market altogether. As the ultimate goal of redevelopment projects is to ensure sustainability and improve quality of life, authorities should involve local people and educate them about the benefit of redevelopment from a social, economic, and environmental perspective. Putting them in the center of discussion may ease the path of land clearance or revision for effective redevelopment.

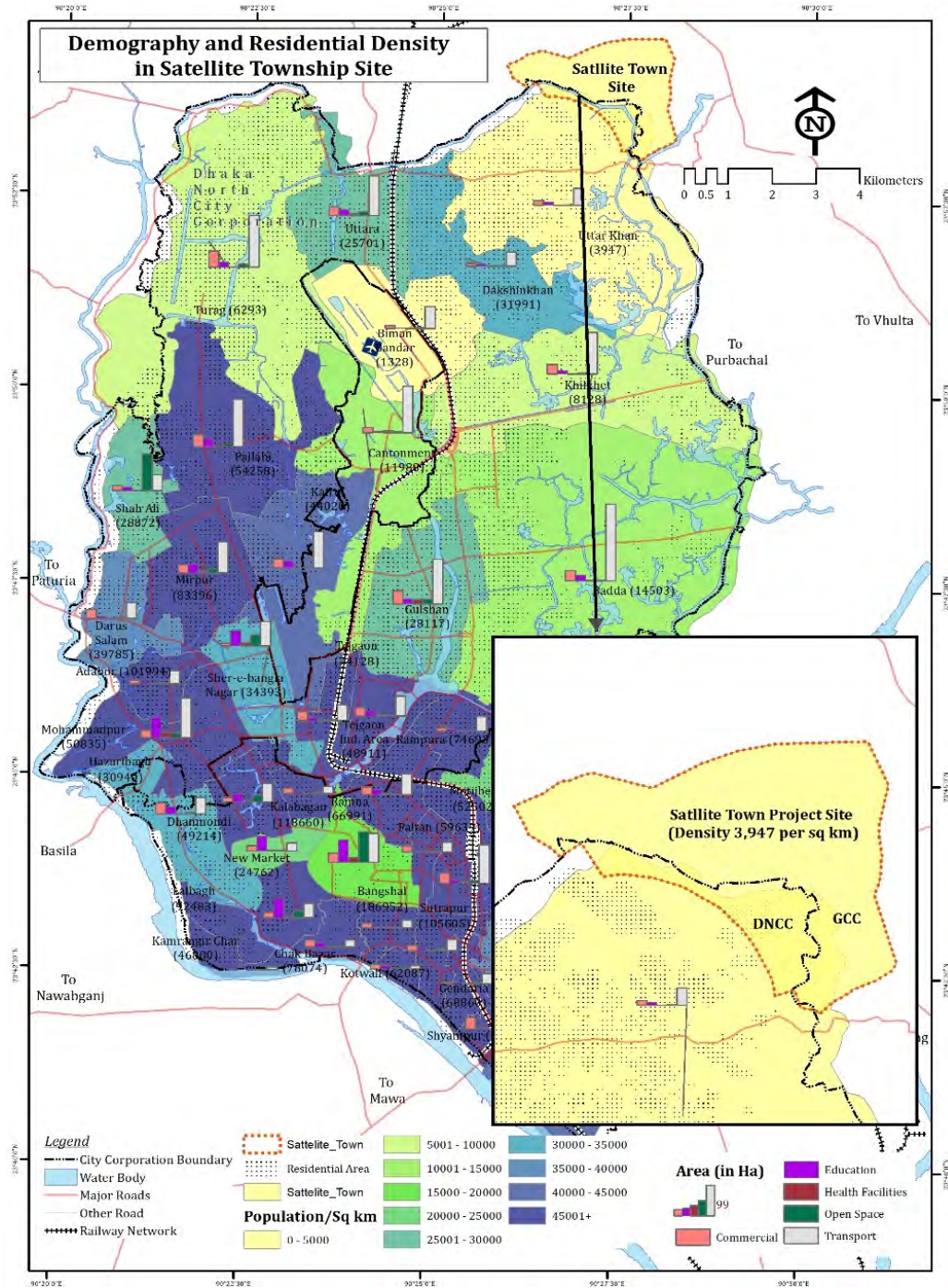
Suitability in Terms of Land Readjustments:

The land readjustment method is mainly used for isolated and irregular plots, so those can be arranged in a regular pattern, and infrastructure and facilities can be provided in a relatively efficient way. Most of Kawran Bazar is for commercial activities. Stakeholders must agree to implement this method.

(4) Uttar Khan

COVID-19 Impacts:

The proposed satellite town is at the southeast corner of the DNCC, mostly at Uttar Khan near to Trimukha bridge. The project area is 607.67 ha. Proposed BRT Line 7 passes through the western side of the proposed site, and the proposed inner ring road passes along the southern border. The existing population density is 3,947/km². At present, the COVID-19 infection rate at this site is comparatively low. By developing a satellite township on this site, it will be able to relieve the housing pressure from Dhaka City, ensure the standard urban living condition, and avoid haphazard development.

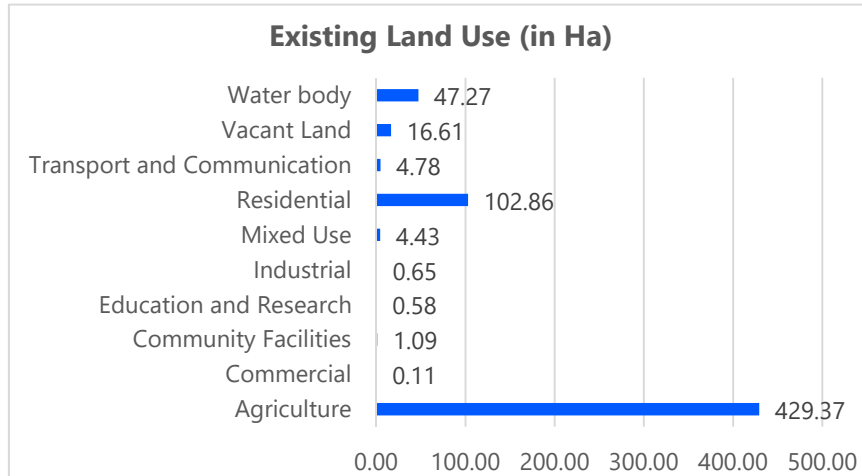


Source: Draft DAP (2016-2035)

Figure 8.3.21 Location Map and density profile of Township Site

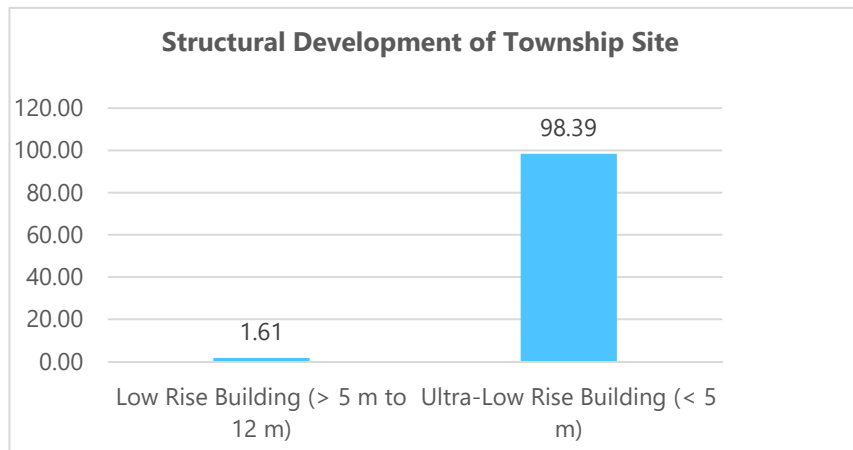
Existing Land Uses:

Most of the land is being used as an agriculture zone (around 430 ha), followed by a residential (at 103 ha) and a portion as mixed-use. Tongji canal and several water bodies are also present, about 47.27 ha. During the preparation of the satellite town, the town's existing water body will be preserved, and the existing residential area will be upgraded by using land readjustment techniques. The figure shows the dominance of ultra-low buildings in the area. High population density with low building rise indicates shanty-type development, threatening a healthy living environment.



Source: Draft DAP (2016–2035)

Figure 8.3.22 Existing land use of Township Site



Source: Draft DAP (2016–2035)

Figure 8.3.23 Structural Development of Township Site

Proposed Land Uses:

Most areas in the project site have been proposed as mixed-use zone (predominantly residential) and agriculture zone in DAP. According to the water and soil conditions, the area does not have enough strength to carry high-rise structures.

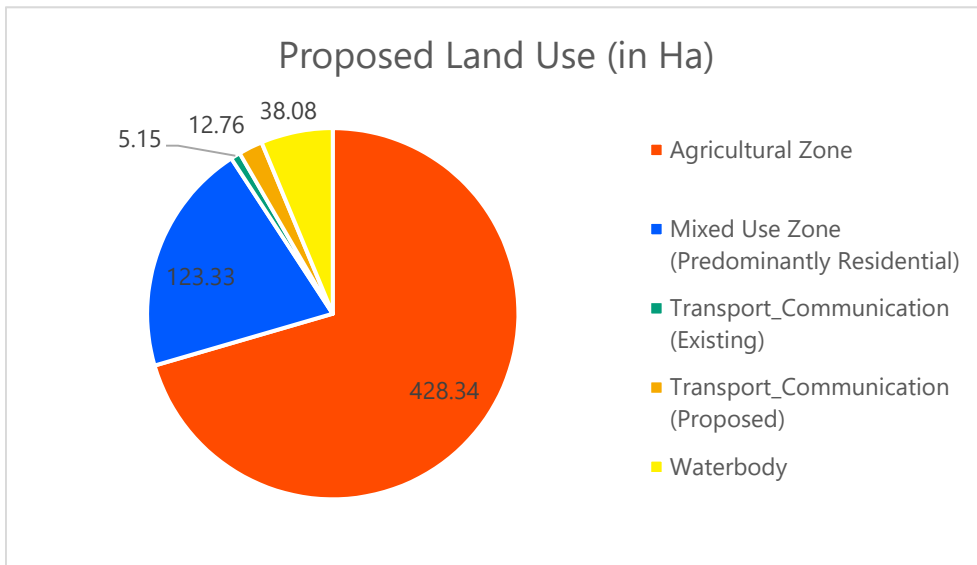


Figure 8.3.24 Proposed Land Use of Township Site

Source: Draft DAP (2016–2035)

Development Trends:

Though most of the area is under an agriculture zone, the establishment of proposed BRT 7 and ring road will bring various land uses for other purposes in the area.



Source: JICA Study Team

Figure 8.3.25 Congested Development in Township Site

Development Demands:

As the BRT 7, inner ring road, and circular waterway have been proposed around this area, proper development management is needed to effectively develop the area, as well as save the agricultural zone.

Existing and Future Connectivity:

The project site of Bangshal will be nearby BRT line 7 as proposed in the RSTP. The inner circular ring road, circular railway, and waterway will increase the connectivity of the area with parts of the city and bring down pressure on the road.

Table 8.3.4 Present and Future Connectivity of the Area

Present connectivity	Future connectivity
Narrow road with absent of walkway facility Road length: 18.24 Average road width: 2.20 m	Adjacent to BRT 7 Inner circular ring road, Circular railway, Terminal for circular waterway
Road network pattern not build yet	Reconstruction of existing teromukh bridge
Number of major road to connect: 2	Widening of connecting road from Abdullapur (major entry point in Dhaka)

Source: JICA Study team

Following map, shows the future connectivity of the satellite township site. Future connectivity with adjacent BRT stations and circular ringroad, railway and waterway is expected to increase accessibility throughout the area.

Suitability for Compact Township Developments:

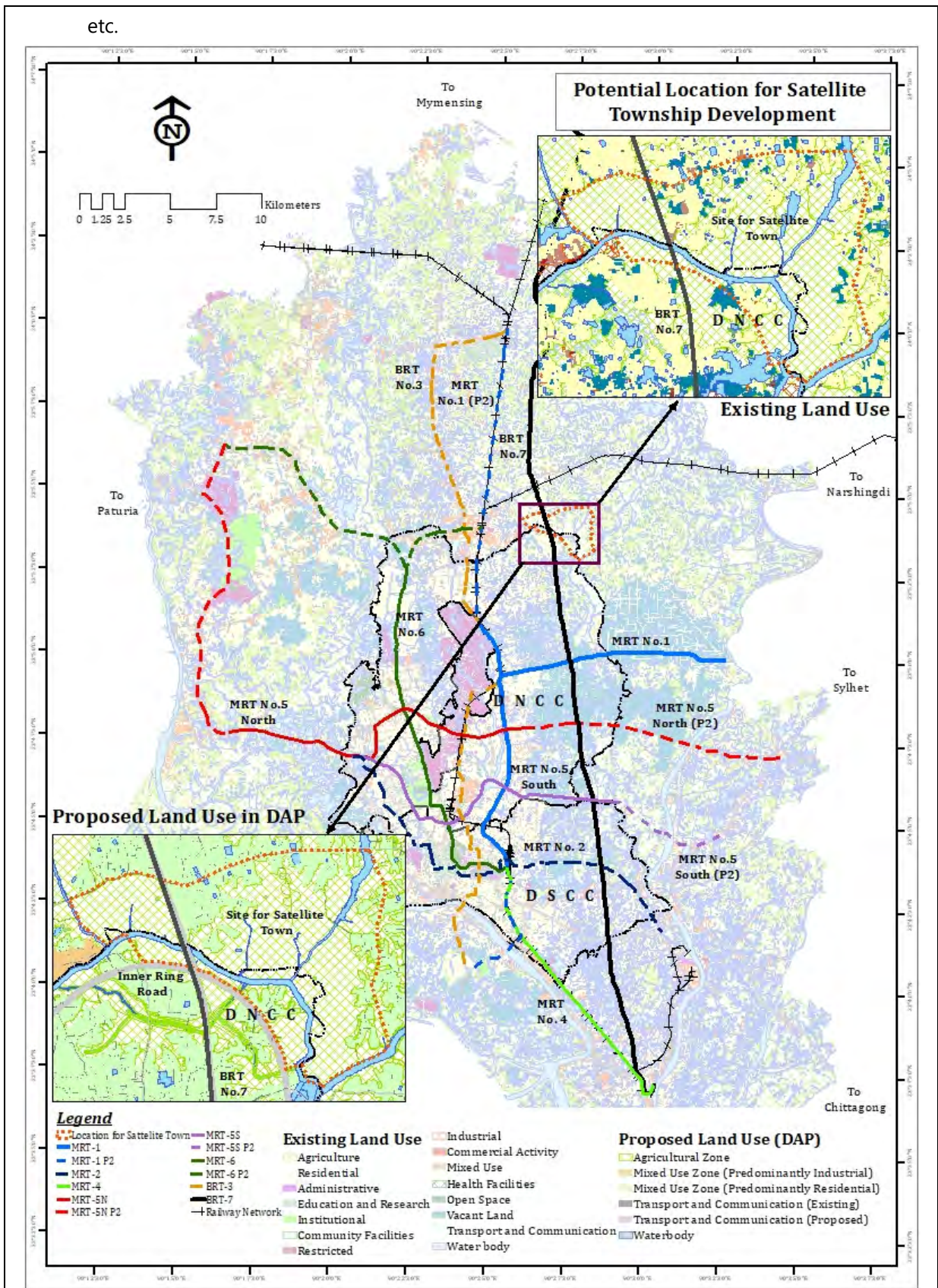
This site can be a suitable choice for compact township development due to low development at present, low density, agricultural use, and vacant space.

Suitability in Terms of Land Redevelopments:

Currently, around 71% of the total area is being used for agriculture, and after that mostly used for residential. The site is also close to both Dhaka bypass and the tongi industrial area, which will influence the development of this site. So there can be a great opportunity to develop this site in a planned way before unplanned and haphazard development already takes over the area. But in the case of Bangladesh, revision or replacement of an existing land use and population distribution pattern through the acquisition of a predominantly built-up area is quite difficult. Complicated and illegal land ownership, lack of cooperation, and awareness of the common people often make the process difficult for policymakers. Sometimes, authorities also fail to understand and fulfill local needs. However, as the ultimate goal of redevelopment projects is to ensure sustainability and improve quality of life, authorities should involve local people and educate them about the benefit of redevelopment from a social, economic, and environmental perspective. Putting them in the center of discussion may ease the path of land clearance or revision for effective redevelopment.

Suitability in terms of Land Readjustments:

Considering the local condition and natural growth of the area, it can also be given a pattern or shaped development through land re-adjustment technique. Of course, the land owners and stakeholders need to agree to the terms of development through land re-adjustment. This can also help providing the area with adequate open space, urban amenities, density development



Source: Map Prepared by JST team, data source from DAP (2016-2035)

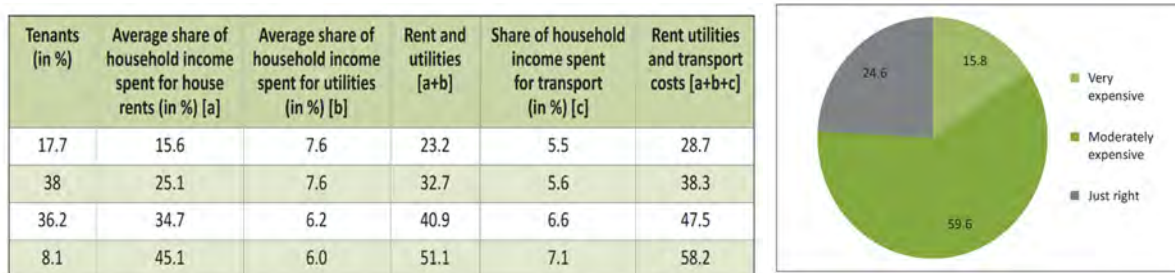
Figure 8.3.26 Transport Connectivity of Township Site

8.3.2 Proposed Cooperation Projects

1) Technical Assistance Project for the Establishment of Urban Area Development System for the Improvement of Existing Urban Areas

(1) Background

There is an acute shortage of land to accommodate the increase in the population of Dhaka City. During the last few decades, the price of land in urban areas of the country sky-rocketed, and the increase in the city was as much as 80 times. Most city dwellers don't own land (more than 56% of households don't), including the dwellers of slums and squatters. The figure increased to 70% (RAJUK, 2015). Government can meet only 7% of dwelling units. RAJUK is the leading public sector land development organization supplying 75% of the city's serviced housing and developed 13 townships /housing estate/site & services projects. But they are ignoring the housing for the poor; only 4.3%, 7.5%, and 1.2% of the total land of Purbachal, Uttara 3rd phase, and Jhilmeel Project, respectively, had been allocated for low-income housing. It is alarming that 3.5 million low-income people (BBS, 2011) are living in different slums and squatters.



Source: BIGD's State of Cities Survey 2017

Figure 8.3.27 showing the affordability scenario of housing sector in Dhaka

Dhaka is a high-density populated area, lacking roads and a relatively low open space area (0.9%). At present, about 250ha (about 2.10%) of the land is used for recreational activities (DAP, 2021) in Dhaka, which is significantly low compared with other major cities of the world. Even the open space is not properly integrated with other different facilities. On the other hand, the road network of Dhaka does not maintain proper hierarchy and does not have open space and a city lifeline along the road. The DAP suggested there were only 0.05 square meters of green space per capita (Bari, 2009).

In addition, the urban areas of Dhaka have deteriorated significantly and are considered hazardous in the event of a disaster.

On the other hand, in the country of Ba, the Town Improvement Act was formulated in 1953, and RAJUK, an organization for urban management, was formed to address urban development issues. It has established a framework for implementing urban development projects through the establishment of the Detail Area Plan, Building Construction Rules, Bangladesh National Building Code, and other regulations. In particular, the latest DAP, which addresses the aforementioned issues of insufficient housing supply and dense urban areas, presents new town development and redevelopment projects as a solution method, and a framework is in place to enable the implementation of such projects.

However, the implementation of these projects has not been promoted, and the following

issues are considered to be the reasons for this.

- Insufficient capacity of RAJUK, an administrative organization that can serve as the planning and implementation entity for urban development-related projects.
- Lack of sufficient harmonization among government organizations with jurisdiction over laws related to urban development, such as the "Land Law," "Urban Development Law," and "Construction Law.

Therefore, to implement the urban development projects covered in the DAP, technical assistance is needed, mainly from RAJUK, including related organizations such as DNCC, DSCC, NHA, and PWD, to resolve the above issues.

(2) Project Area

Dhaka Metropolitan Area

(Detailed study area is selected from candidates such as Banshar, Gabtoli, Karawang Bazar, etc.)

(3) Project Period

2025–2028 (3 years) (long-term)

(4) Outline of the Project

Overall Goal:

Urban development projects in Dhaka Metropolitan Area will be implemented, and the land use and living environment improvements proposed in the DAP will be facilitated.

Project Objective:

To develop the capacity of RAJUK to implement district-level urban upgrading and new urban development projects based on the DAP.

Outputs:

Output 1: Relevant institutional arrangements on urban development of Dhaka Metropolitan Area are organized.

Output 2: Role-sharing of relevant organizations related to urban development is organized and coordination mechanism for RAJUK's urban development project is established.

Output 3: Urban development project implementation mechanism for the selected pilot area is established.

Output 4: Guideline and manual for RAJUK to implement new urban development and redevelopment project is prepared and capacities of RAJUK staff in charge of urban development is enhanced.

Activities

Activity 1-1: Review the current institutional arrangement related to urban development, including the Urban Development Law, Land Law, Housing Law, and Construction Law and organize their related issues.

Activity 1-2: Organize the implementation mechanism of urban development projects, both of public and private sector, and their related issues

Activity 1-3: Review the actual operation of urban development projects and organize

operational issues

Activity 1-4: Summarize institutional arrangement applicable for new urban development / redevelopment projects in Dhaka Metropolitan Area

Activity 2-1: Organize the current status and issues of government organizations related to urban improvement and development projects in Dhaka

Activity 2-2: Based on the review of the institutional arrangement related to urban development projects in Dhaka, summarize jurisdiction of each organization which authorizes relevant laws and regulations.

Activity 2-3: Establish coordination mechanism among relevant organizations for RAJUK to conduct urban development projects.

Activity 3-1: Select pilot district

Activity 3-2: Establish project implementation structure for new urban development /urban redevelopment projects in the pilot district

Activity 3-3: Formulate urban development plan in the pilot district

Activity 4-1: Set the overall framework of the guideline for urban development project implementation of RAJUK.

Activity 4-2: Prepare the guideline for urban development project implementation of RAJUK through coordination with relevant organizations

Activity 4-3: Prepare implementation manual for RAJUK staff to implement urban development project

Activity 4-4: Conduct training programs (in Japan) to improve the capacity of RAJUK and related institutions to promote urban redevelopment projects.

(5) Stakeholders

RAJUK (main counterpart), DNCC, DSCC, NHA, PWD

9. Formulation of Cooperation Project in Nairobi

9.1 Change of Urban Issues by COVID-19

9.1.1 Increased Awareness to Public Health and the Urban Environment during COVID-19

1) Established hygiene actions

In the containment measures hygiene was promoted as the key to the fight against COVID-19. Efforts have been directed towards educating the masses on handwashing to avoid contamination. The established hand washing stations are likely to continue even in the post-COVID-19 period and high observance of hygiene, as well.

2) Increase health consciousness

There has been increased health awareness through TVs, social media, and written publications on the need to be of good health. Many people have adapted practices to boost their health, such as:

- exercising to boost their immunity against COVID-19,
- observing a diet that boosts immunity, and
- acquiring temperature and oxygen level measuring devices.

The government has also increased budgetary allocation to the health sector to address the health challenges arising from the pandemic.

Table 9.1.1 Investment in the Health Sector for COVID-19

No.	Facility	Pre COVID-19	During COVID-19
1.	ICU beds	108	>500%
2.	Medical oxygen	3 million L	32 million L

Source: Ministry of Health

In March 2020, Kenya had only one laboratory that could test notifiable diseases of international concern. Kenya has established several centers for testing and currently has over 95 well-equipped labs.

3) Increased concern about safety in terms of dense conditions

Due to the fact that COVID-19 spreads in crowded conditions, many members of the public try to avoid crowded public places. Small public spaces are likely to receive less traffic even after the COVID-19 pandemic. Owners of such premises are likely to earn less from their property.

4) Increased awareness of urban environmental issues

There is increased public education on the following urban environment issues:

- Use of water to wash hands, which increased the demand for clean water.
- Proper disposal of infectious wastes such as masks.
- Improved NMT to improve walking by members of the public.

- Increased need for more spacious public transport vehicles to allow for social distancing.

9.1.2 Avoidance of Crowded Places

1) Increased telework

It is recommended as one of the most effective approaches to reducing the spread of COVID-19. While many jobs cannot be performed remotely, if telecommuting is an option, the government, through the National Emergency Response against COVID-19 committee (NERC)¹ has encouraged employers to adopt policies to delineate the responsibilities of both parties to the arrangement including establishing compliance protocols for timekeeping and employee oversight for remote workers. Employees will be entitled to their full salaries throughout this period.

This work is likely to continue even in the post-COVID-19 era because the employees can reduce commuting hours, and the employer can save major office operating costs such as power and other running costs such as 10 o'clock tea.

2) Increase of online services (various types of services, from food delivery to educational services)

The adoption of shopping online by a majority of residents in Nairobi and Mombasa is observed. Mastercard did a survey that established that every 4 out of 5 persons used an online service during the COVID-19 pandemic.

Online services ranged from education, shopping, applying for government service, listening to music, and watching movies. This is likely to persist post-COVID-19 due to the convenience it offers users.

The following measures are required to ensure that the online industry grows in Kenya:

- Ensuring safety of online payments.
- Developing an address system for most of the residential areas in Nairobi and Mombasa.

9.1.3 Change in Mobility

1) Off-peak to avoid rush hours

Flexible working hours that many companies have adopted allow employees to report to the office at flexible times, allowing the employee to come in when traffic has eased out. It also enabled many to save time normally lost in traffic on normal operation days.

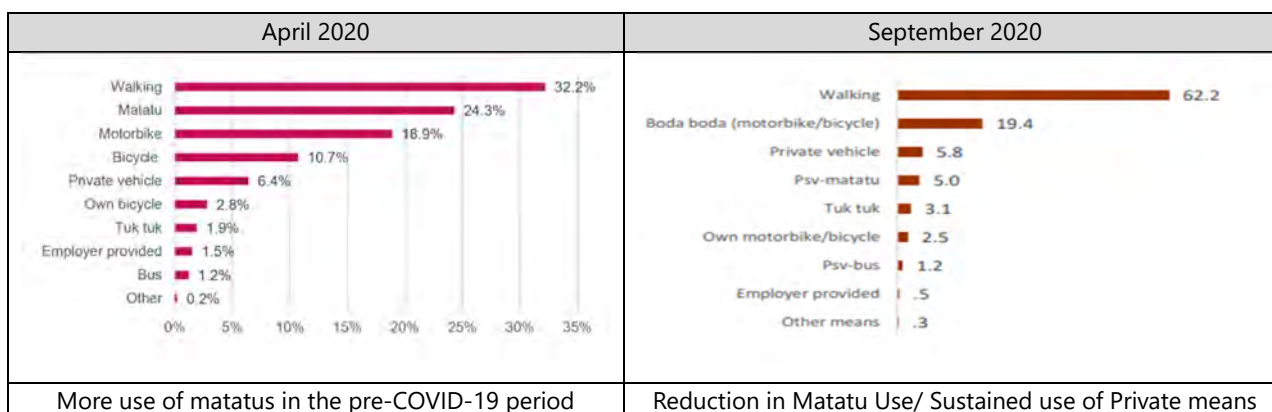
It will likely persist post-COVID-19 due to the benefits it accrues to both companies and employees.

2) Shift from public transport to private transport of the middle-income class

After the initial outbreak of the pandemic, many people opted for private transportation and taxis for safety measures, and even after the peak of the pandemic, most would still prefer such unless some major redesigning of seats in the public transport vehicles is done that could change public transportation services.

¹ NERC-National Emergency Response against COVID-19 committee

According to the Ministry of Transport, during the pandemic, the Government of Kenya decided to introduce the two-thirds rule in public and private transport systems to mitigate the spread of COVID-19, meaning every vehicle could only carry a maximum capacity of 66%. Hence, the public transport system could not cater to the normal number of daily users. It led to the rise of a private transport system to supplement public transport and a rise in car-pooling for commuting. Also, most middle-class and upper-class level individuals opted for the private transport system as a way of reducing their exposure to COVID-19 as the public transport system is deemed a higher risk for users to be infected by COVID-19.



Source: KNBS Socio Economic impact of COVID-19, 2020.

Figure 9.1.1 Modal Shift by COVID-19

3) Increase use of bicycle and personal mobility.

According to International Energy Agency (IEA), the use of oil-based machinery reduced because of people observing the stay-at-home measure issued by the government and increased fare charges in public transport. As a result of this, many people shifted to other modes of transportation, such as walking, bicycling, and using private cars to avoid exposure to crowds.

9.1.4 Change in Economic Behavior

1) Decreased number of migrant workers

The National Employment Authority reported a decrease in the number of migrants flying into the country because of the pandemic. Online meeting platforms, such as Zoom, Google Meet, Microsoft Teams, Skype, etc., have enabled remote working where people continue their normal jobs while at the comfort of their homes.

Most NGOs in Kenya discouraged their foreign employees from traveling into the country as a protective measure against exposure to COVID-19, which has become rampant in Kenya, especially the capital city of Nairobi.

2) Avoidance to visit crowded facilities

There has been an understanding that COVID-19 generally spread through packed spaces because of the chances of encountering droplets from infected persons.

Offices spaces and other public spaces that currently limit the number of people are likely to continue with this practice. Some restaurants reduced tables.

9.1.5 Change of urban issues by COVID-19

Based on changes in social and economic activities, the urban issues and needs are as follows.

1) Trend of Infection Spread

- Infections from dense areas such as slums (Kibera, Mathare)
- Infection from restaurants, bars, etc. (Westlands)
- Infection in public transportation (matatu) has not been confirmed

2) Relationship between the spread of infection and the urban environment

- Relationship between population density and infection is small
- Great possibility of expansion through economic activities and movement

Table 9.1.2 Change of Urban Issues (Nairobi)

	Impact and Change in Urban Needs	Needs for Urban Improvement
Urban Structure	<ul style="list-style-type: none"> <input type="checkbox"/> Relocating from CBD, accelerating the development around the CBD, and increasing the need for site development (reduced convenience, reduced travel time) <input type="checkbox"/> Increasing need for separation of functions such as commercial, residential, and hospital functions (prevention of infection) 	<ul style="list-style-type: none"> <input type="checkbox"/> CBD Regeneration <input type="checkbox"/> Subcenter Development <input type="checkbox"/> Enhanced buffering (urban, community) <input type="checkbox"/> TOD
Mobility	<ul style="list-style-type: none"> <input type="checkbox"/> Public transportation restrictions and relocation of bus terminals worsen convenience <input type="checkbox"/> Decrease in users due to increase in work from home, decrease in income of matatu related parties <input type="checkbox"/> Growing need for safe public transportation (not transparent rates) <input type="checkbox"/> Increasing need for efficient public transportation (reduced travel time) 	<ul style="list-style-type: none"> <input type="checkbox"/> Overall traffic environment improvements (roads, buses, railways, NMT) <input type="checkbox"/> Providing efficient and safe public transportation <input type="checkbox"/> NMT improvements
Society, Community	<ul style="list-style-type: none"> <input type="checkbox"/> Increasing service needs in areas where public services are not available (water supply, education, medical care) 	<ul style="list-style-type: none"> <input type="checkbox"/> Providing public services to slums and vulnerable people <input type="checkbox"/> Strengthening cooperation between government and community
Inclusive/ Universal Access	<ul style="list-style-type: none"> <input type="checkbox"/> Reforming areas where administrative services are not well-delivered <input type="checkbox"/> Widening disparities due to travel regulations and curfews <input type="checkbox"/> Development of well and common faucets as a countermeasure against COVID-19 Unmanaged, limited community engagement, environmental issues 	<ul style="list-style-type: none"> <input type="checkbox"/> Development and operation of community-involved infrastructure and utilities

	Impact and Change in Urban Needs	Needs for Urban Improvement
Administration	<ul style="list-style-type: none"> <input type="checkbox"/> Increasing need for strengthening urban guidance and control <input type="checkbox"/> Avoid moving to government offices <input type="checkbox"/> Online needs for administrative procedures <input type="checkbox"/> Increasing need for government services at the community level (especially slums) 	<ul style="list-style-type: none"> <input type="checkbox"/> Promotion of strengthening control to form urban structures (revised guidelines) <input type="checkbox"/> Accelerate e-government (IT) (reduce travel time, reduce labor) <input type="checkbox"/> Promoting the decentralization of administrative functions in the region <input type="checkbox"/> Strengthening cooperation between government and community <input type="checkbox"/> The creation of environmentally friendly cities

Source: JICA Study Team

9.1.6 The Expected Status of Cities in the Post COVID-19 Period

1) Newly emerging urban issues/social issues

The following are some social issues resulting from the onset of COVID-19.

- (i) Loss of livelihoods and employment due to COVID-19 effects and restrictions
- (ii) Households reported more tension, arguing, violence, or fear their partner would harm them; combined, these indicate an increased risk of household violence.
- (iii) Mobility restrictions and the cost of healthcare fees disproportionately limited the ability of women to seek healthcare.
- (iv) It was reported that at the height of the COVID-19 pandemic, about 40% of Nairobi residents could not afford to pay their rents due to loss of livelihood.

2) Change and Cancellation of urban development projects.

There is a slowdown in the construction of new offices in Nairobi's upper Hill and CBD. This has been occasioned by the reduction in the need for office space and reduction in the rent. Many workers have resorted to work from home.

3) Government Policies toward Post COVID-19

According to statements released by President, the government of Kenya has put forward a strategy to help recover from the impacts of COVID-19. It mainly focuses on prioritizing agriculture, water and sanitization, urban development and housing, transport, tourism, health, education, social protection, and gender and youth sectors.

These policies include allocating funds to improve the prioritized sectors to ensure that the economy is restored after the pandemic.

- (i) Shift of mass rapid transport development policy.

With the high population growth rate, Nairobi is expected to have 7 million people by 2030 as pointed out by *DownToEarth*.² By then, there will be a high population density, and this will cause a strain on the transport system. Due to this, in 2015, the government agreed to roll out a plan for mass rapid transport but use buses along the main corridors that service Nairobi CBD. The initial plan was to launch the BRT by December 2019. According to the

² Local Newspaper

Institute of Transportation and Development Policy in Kenya, currently, the country has acquired 32 buses from South Africa and 32 from local manufacturers.

The above policy is likely to be shelved because many people may adopt working from home or relocating outdoors because in-person work will be replaced by teleworking.

(ii) On-Demand transport services.

Mobility as a Service in recent times has shifted from the normal public transportation means to on-demand services such as Uber and Bolt. This is evident due to the fear of contracting COVID-19 in public vehicles.

According to a report by Nendo Ltd, on-demand transport services have had their best financial year since most people preferred taxis over matatu. This trend is likely to continue even beyond the COVID-19 period.

9.2 Urban Development Program during and after Pandemic

9.2.1 Review of Existing Master Plan

The changes concerning the Nairobi Integrated Urban Development Master Plan (NIUPLAN) due to the COVID-19 pandemic are presented below.

Table 9.2.1 Changes in need in consideration of NIUPLAN.

	Constraints	Planning issues	Changes in needs with COVID-19 / in response to COVID-19
City planning	<ul style="list-style-type: none"> Lack of sufficient urban infrastructure Expansion of sprawl and chaotic urban development Chaotic development by the private sector Underdeveloped public service facilities Excessive concentration of CBD 	<ul style="list-style-type: none"> Streamline infrastructure planning and ensure feasibility Renewal of master plan and strengthening of implementation system Dissemination of master plan and development rules Examination of future population based on land use plan Examination of integrated development plan considering cooperation between CBD and other regions 	<ul style="list-style-type: none"> Increasing needs of forming sub-centers Increased water demand, infrastructure development and maintenance, including communities Providing administrative services to vulnerable groups It is said that the spread of infection in slums is caused by underdeveloped infrastructure such as water. As a measure against COVID-19, maintenance of Hotta wells and joint faucets is not considered. Areas, where administrative services have not yet been provided, have been confirmed. Declining office demand for CBD Decreased appeal of CBD (aging facilities, lack of parking, reduced access due to bus terminal relocation) Increased demand for telecommunications Increased housing demand (with garden, for office) Government recommendations for telecommuting and online meetings Changes in residents' consciousness, recommendation of flexible working styles of companies Importance of buffers (hospital, commercial, residential) Increasing sense of crisis about the spread of infection from hospitals and commercial facilities
Urban transportation	<ul style="list-style-type: none"> International flow lines passing through the city center Rapid increase in privately owned vehicles Lack of effective urban transportation system Delays in road development and intersection improvement 	<ul style="list-style-type: none"> Improvement of road network and detour of transit traffic Strengthening the road maintenance system Applying an effective and appropriate transportation system Harmony with existing plans 	<ul style="list-style-type: none"> Acceleration of road construction by banning at night (elevated construction of Uhuru Highway, reduction of traffic restrictions) Improvement of public transportation services (harassment, fees, bus terminals, bus operation efficiency) Deterioration of convenience due to inconsistent traffic improvement Promotion of NMT: Deterioration of public transportation services, convenience, and access due to halfway measures (relocation of bus terminals, regulation of Matatu routes,

	Constraints	Planning issues	Changes in needs with COVID-19 / in response to COVID-19
			restrictions on the number of passengers) <ul style="list-style-type: none"> Increased needs for transfer and improved access to CBD
Socioeconomic	<ul style="list-style-type: none"> District safety and security Lack of housing according to income group Lack of public facilities Youth unemployment 	<ul style="list-style-type: none"> Appropriate planning, including land use and sub-centers Appropriate land use, development control, housing provision Population allocation and public facility allocation based on land use plan Fair urban development with sub-center development and industrial promotion 	<ul style="list-style-type: none"> Planned sub-center development Increasing tendency to avoid long trips, fear of infection on public transport Increased housing demand Increasing tendency to avoid long trips (commuting) Improvement of school and hospital facilities Patient influx from surrounding counties, impaired conventional medical care Decrease in academic ability due to school closure, increase in hope for facilities to avoid crowding Work-from-home environment Changes in residents' consciousness, recommendation of flexible working styles of companies.

Source: JICA Study Team

9.2.2 JICA Program in Kenya

The following is the Japanese ODA strategy in Kenya related to urban and transport development.

- Nairobi Urban Transport Improvement Program: Improving roads in Nairobi, strengthening road maintenance to reduce traffic congestion, reducing accidents and bottlenecks (road maintenance, Nairobi western bypass, Ngong road improvement, Nairobi urban development program, integrated transport plan/projects)
- Logistics Infrastructure Improvement Program: Improving corridor through infrastructure development and border trade (Mombasa port development, Mombasa Road development, Mombasa port cargo handling improvement, safety disaster mitigation, environment.

9.2.3 New Neighborhood and Five Agenda

The changes in need in relation to the JICA's 5 agenda issues is as presented table below.

Table 9.2.2 Changes in needs in relation to JICA's 5 agenda issues.

Urban Issues	COVID-19 Impact and Changes in Urban Needs	Need for urban improvement
Urban structure	<ul style="list-style-type: none"> Relocation from CBD, acceleration of development in the area around CBD, increased need for base development (decreased convenience, shortened travel time) Increasing needs for separation of functions such as commerce, housing, and hospitals 	<ul style="list-style-type: none"> Sub-center development Enhanced buffer function (urban function, community) TOD

Urban Issues	COVID-19 Impact and Changes in Urban Needs	Need for urban improvement
	(preventing the spread of infection)	
Transportation and Mobility	<ul style="list-style-type: none"> ▪ Deterioration of convenience due to public transportation regulations and relocation of bus terminals ▪ Decrease in users due to increase in telecommuting, decrease in income of Matatu-related people ▪ Increasing needs for safe public transportation (opaque rates) ▪ Increasing needs for efficient public transportation (shortening travel time) 	<ul style="list-style-type: none"> ▪ Comprehensive traffic environment improvement (roads, buses, railroads, NMT) ▪ Providing efficient and safe public transportation ▪ Improvement of NMT
Urban society / community	<ul style="list-style-type: none"> ▪ Increasing service needs for areas with poor public services (water supply, education, medical care) 	<ul style="list-style-type: none"> ▪ Providing public services to slums and the vulnerable ▪ Strengthening cooperation between government and community
Inclusive/ Universal Access	<ul style="list-style-type: none"> ▪ Reconfirmation of areas where administrative services are inadequate ▪ Widening disparity due to movement restrictions and curfew ▪ Maintenance of well moat and common faucet as a measure against COVID-19 ▪ Poor maintenance, limited community involvement, environmental issues 	<ul style="list-style-type: none"> ▪ Promotion of decentralization of administrative functions to regions
City administration	<ul style="list-style-type: none"> ▪ Increased needs for city guidance and control strengthening ▪ Avoiding movement to government offices ▪ Needs for online administrative procedures ▪ Increasing needs for administrative services at the community level (especially slums). 	<ul style="list-style-type: none"> ▪ Promotion of strengthening control to form urban structure (revision of guidelines) ▪ E-Government (IT) promotion (shortening travel time, reducing labor) ▪ Promotion of decentralization of administrative functions to regions ▪ Strengthening cooperation between government and community

Source: JICA Study Team

9.2.4 Urban Development Program Formulation

1) Approach to Formulate Urban Development Program

Based on the NIUPLAN, urban development programs/projects are proposed considering the change of urban issues by COVID-19. The following is a concept for selecting an urban development program.

(i) Priority

- Improvement of urban transportation and provision of safe public transportation in response to changes in urban structure (urban structure, mobility)
- Urban regeneration due to changes in urban needs (inclusive, urban management)
- Urban development integrated with urban transportation (urban structure, mobility)
- Support for shortening travel time and distance (urban structure, mobility)
- Urban infrastructure development (access) leading to improvement of sanitary

environment

- Proposals in line with the progress of MP implementation: Synergies and complements with ongoing projects

(ii) Development framework

Short-term (3 years): Measures to urban issues

- Measures to meet urban needs: changes in urban structure, provision of safe and efficient public transportation, and improvement of urban sanitation
- Focusing based on urban issues (urban structure, transportation and mobility, urban society and community, urban hygiene environment).

Long-term (10 years): Measures to five agenda

- Measures that contribute to five agenda

2) Proposed Urban Development Programs

Eight urban development programs are proposed, as shown in Table 9.2.3.








Table 9.2.3 List of Urban Development Programs with related Five Agenda


No.	Program	Related 5 Agenda
1	Transportation Improvement Program	Urban structure and mobility
2	Community Based Infrastructure Development and Management Improvement Program	Inclusive Access
3	Nairobi Water Supply Improvement Program	Inclusive access and urban structure
4	Urban Service Improvement Program	Urban administration
5	Public Markets Improvement Program	Urban society and community and urban structure
6	Nairobi CBD Revitalization Program	Inclusive access and urban Administration
7	Livelihood Improvement Program	Urban society and community and urban structure
8	Environment Quality Improvement Program	Urban society and community and urban structure

Source: JICA Study Team

3) Proposed Program

	Items	Description
1	Program Name	Transportation Improvement Program
2	Background	Impacts of COVID-19 have been seen all over the world, and Kenya is no exception. To curb the spread of COVID-19, the government introduced measures like encouraging work from home, cessation of movement in and out of some high-risk areas, including Nairobi, banning all passenger flights, and imposing curfew time. All these measures have been impactful on the urban transport sector. Some of the notable impacts on urban transport services include reduced travel and traffic volumes.

Items	Description				
	 <p>Source: Prepared based on the map prepared by the Railway Survey Team (JICA)</p> <p style="text-align: center;">Five Commuter Railway Lines in Nairobi</p>				
3	<p>Relationship with five agenda and challenges</p> <p>The project is under the urban structure and mobility among the five agenda issues.</p>				
4	<p>Relationship with NIUPLAN</p> <p>Proposed in the master plan and tends to develop the sector by formulating proper public transport policies and guidelines and activation of commuter trains.</p>				
5	<p>Sub-Components</p> <p>Commuter Railway improvement: Tracks (extension, upgrade), system, station, vehicle (long-term)</p> <ul style="list-style-type: none"> The COVID-19 pandemic has affected the transport sector in several ways. The introduction of measures like social distancing meant that various transport modes were not allowed to carry maximum capacity so as to minimize spread of the virus. This also highlighted the need to improve various transport mode like railway, which took fewer trips because of the slow speed. Due to restrictions, like 50% carrying capacity, imposed on train, the average daily ridership went from around 13,000 passengers per day to around 5,000, according to East Africa Business Week article. This meant that the corporation made loses. Some notable gaps in the Nairobi railway are the railway takes limited trips throughout the day, mainly in the morning and evening with DMU around noon, the long distance between the railway station and places of work; the railway has a single lane limiting the number of trains that can use the lane at a particular time; and, the location of the central train station is almost inaccessible because of the busy terminus. The existing railway line is a meter gauge with no optimum design of the curves; therefore, the commuter train cannot attain speeds above 40 km/hr. <table border="1"> <thead> <tr> <th>Plate 1</th> <th>Plate 2</th> </tr> </thead> <tbody> <tr> <td>  <p>Locomotive engine commuter train plying the Nairobi–Dagoretti line.</p> </td> <td>  <p>The existing meter gauge railway line used for commuter service.</p> </td> </tr> </tbody> </table>	Plate 1	Plate 2	 <p>Locomotive engine commuter train plying the Nairobi–Dagoretti line.</p>	 <p>The existing meter gauge railway line used for commuter service.</p>
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 <p>Locomotive engine commuter train plying the Nairobi–Dagoretti line.</p>	 <p>The existing meter gauge railway line used for commuter service.</p>				

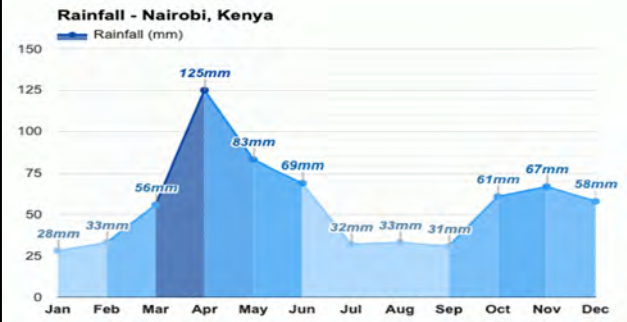
	Items	Description
		<p>Source: JICA Study Team</p> <p><u>TOD near Commuter Train Station: Matatu Station, Public space (short-term)</u></p> <ul style="list-style-type: none"> The matatu stations around the Nairobi commuter train are not in good condition, and most facilities are inoperational (other than not in a good state). Moreover, there is a high population of people using the train. TOD development will ease the movement of people around the station and also fulfill the needs of the people using the area. <p><u>Development of public transport policies: Rules, facilities and organizations (short-term)</u></p> <ul style="list-style-type: none"> Currently, in Kenya, there are no policies that govern the operation of public transport, such as the bus routes, the formation of Saccos, and the disciplinary to govern the behavior within the public transport and price regulation. Development of policies would organize the public transport sector and improve the conduct of conductors and drivers towards the passengers and pricing regulations to avoid exploitation of the passengers. <p><u>Improvement of the Bus park at Machakos country bus. Modernize the facility (short-term)</u></p> <ul style="list-style-type: none"> According to NMS, they were given the responsibility to improve the condition of parking facilities through automation and technology. The modernization of the Bus Park will therefore advance the park such that it would provide not only more parking spaces for vehicles but also help car owners to make informed decisions of whether the parking lot is full or not. Another advantage would be improved management and revenue collection from parking by the Nairobi County. The station serves mostly passengers travelling to western Kenya and is mostly crowded throughout the year. This forms a breeding ground for COVID-19 infections.  <p>Source: Nation newspaper, Kenya</p> <p style="text-align: center;">Machakos Country Bus Station</p>
6	Expected Outcome	<ul style="list-style-type: none"> Improved operations by improving the commuter rail environment (increased frequency of operations, increased speed of operations, and introduction of a fare system) Synergies between public transport (railway, bus): Junction, operation, station maintenance Integrated development of public transport and cities: TOD (station front and surrounding development) reduced travel time and distance
7	Related Organizations	<ul style="list-style-type: none"> Kenya Railway Corporation (KRC) Nairobi Metropolitan Area Transport Authority (NaMATA) Nairobi City County Government

Source: JICA Study Team

	Items	Description
1	Program Name	Community Based Infrastructure Development and Management Improvement Program
2	Background	Formulating a project under this category has been necessitated by the following factors: <ul style="list-style-type: none"> As COVID-19 countermeasures have been implemented, there have been efforts towards providing water to the slums through sinking boreholes. There are issues arising regarding maintenance and management of the water facilities established in the community areas, and it is necessary to establish a maintenance management system that includes the community. The COVID-19 infections are also transmitted from commercial facilities to homes in the community; therefore, there is a need to offer intervention measures in the community.
3	Relationship with five agenda and challenges	The program falls under the access and urban sanitation environment among the five agenda issues.
4	Relationship with NIUPLAN	Under the infrastructure improvement program, the Nairobi City Integrated Water Distribution Network Project was proposed to improve community infrastructure.
5	Sub Components	<p><u>Nairobi City Comprehensive water distribution Network planning (also implemented as a single project) (long term)</u></p> <ul style="list-style-type: none"> Daily water demand in Nairobi stands at 750,000 m³ with a total population of 4.6 million people in the supply area zone based on the WASREB 2019/2020 report. On the positive side, most people have private drinking water sources, such as boreholes which at least sums up the total water coverage to 79%. On the lookout is the quality of underground water, which is mostly hard water since there is a lot of untreated sewerage that seeps into the soil through leakages and improper disposals. This calls for a comprehensive water distribution network by the county government to ensure the water table is not exploited, as well as supply water to the low-income areas, such as slums, which depend on water vendors (kiosks). The project should focus on slums and public schools where water is unreliable. The analysis should be done using the water supply timetable by Nairobi City Water and Sewerage Company (NCWSC). <p><u>Development of community management system for joint water facility management (short term).</u></p> <p>A centralized and efficient water supply system could help reduce water loss through non-revenue water, standing at 49% per the WASREB report.</p> <p>Another challenge is the unequal distribution of water across the county, where fast developing areas have low connections of county-supplied water.</p> <p>A joint facility management system will ensure higher quality and better water standards provided by the county government, which is currently at 80%. Also, this will curb the rampant growth of water cartels who tend to cut off county government water supply only to cause shortage so that they can sell water to the residents.</p> <p>The GoK has sunk 93 boreholes that have been set up in the communities around Nairobi. This project would set up a management system for these facilities that have no proper setup community management system.</p> <p><u>Health-related awareness campaigns (short term).</u></p> <ul style="list-style-type: none"> Public awareness has proven in most cases to be an effective means of reducing the spread of infectious diseases and improving the health standards of people. This, in turn, causes a ripple effect of having a healthy nation ready to build the economy and having fewer cases of masses reporting to hospitals which may strain the health care facilities, as is evident with the COVID-19 pandemic. The awareness building is proposed to be carried out in collaboration with the Community Based Organisations (CBOs) working within the communities in Nairobi.
6	Expected Outcome	<ul style="list-style-type: none"> The effect of the program would be to establish a sustainable supply of water through community-run facilities
7	Related Organizations	<ul style="list-style-type: none"> Nairobi Metropolitan Service (NMS), Nairobi City County Government, Nairobi Water Supply Company and sub-county/ward administration

Source: JICA Study Team

	Items	Description
1	Program Name	Nairobi Water Supply Improvement Program
2	Background	The Government of Kenya has over the years tried to make reform in the sanitation and water sector. Some of the efforts by the GoK include improvement of customer service, reduced cost and water supply to all areas. COVID-19 threatens the effort made by the government. To help curb the spread of this virus several counter measures have been including USAID KIWASH project that aimed at improving water access to the vulnerable communities. During the COVID-19 peak, the GoK even issued a policy stressing the need to access to water and prohibited disconnection of water supply to vulnerable people.
3	Relationship with five agenda and challenges	The project is under the inclusive and universal access and urban structure.
4	Relationship with NIUPLAN	This was partly proposed in NIUPLAN as Infrastructure Improvement Program in the project Nairobi City Integrated Water Distribution Network Project and rainwater collection facilities in buildings.
5	Sub Components	<p><u>Nairobi City Integrated Water Distribution Network Plan: Pipes, topography, existing facilities, rehabilitation, and replacement. (Short term)</u></p> <ul style="list-style-type: none"> • Daily water demand in Nairobi stands at 750,000m³ with a total population of 4.6 million people in the supply area zone based on WASREB 2019/2020 report. During COVID 19 period there was the need to increase water supply so as to assist in maintenance of hygiene to prevent further spread of the virus. Nairobi City Water and Sewerage Company experienced 25% shortfall in supply of water to some area because of issues with old equipment. Some areas of the city also have harsh terrain that make access to water supply difficult. Lack of water affects the low-income residential area who spend a lot of time fetching water from distant points of collection. • The government emphasized the need to improve water supply not only during the pandemic but also before. The government also aim to improve sector coverage to meet the needs of almost everyone in the country. • As of 2021, water coverage in the city stood at 57% a decline of 2% from the previous year. One of the major existing gap is an inequality in water supply in the city with some neighborhoods having universal coverage while others having small to none coverage. Residents living in middle and high-income areas have high water connection coverage while low-income areas some do not have water connection. There is need to promote equality in terms of water distribution throughout the city regardless of the class. • Priority shall be given to pipelines leading to slum areas and major traffic attraction installations like Markets and public schools. <p><u>Building Rainwater Collection Facility (long term)</u></p> <ul style="list-style-type: none"> • Some areas in the city experience water shortage because of various reasons ranging from individuals altering water supply for profit to limited water supply. Ministry of Water and Irrigation through the Water Sector Strategic Plan aims to improve water catchment areas. • According to the 2019 KNBS statistics, only 0.3% derive their drinking water from rainwater harvesting. Building Rainwater Collection Facility will assist in provision of steady water supply. Rainwater is an available clean water supply source to the urban residential areas. The building of a collection facility will save a lot of money used to pay water bills. The facility will also play an important role in assisting the government attain its goal of water provision to almost all individuals according to the Vision 2030. • Rainwater harvesting also play an important role in achieving SDGs of safe access to drinking water and sanitation. Rainwater supply assist in improving hygiene in various households and can also be stored and used during various emergencies. • There is a gap in water supply and delivery to some places of the city which have poor to no connection from the Nairobi Water and Sewerage Company (body in charge of managing water and sewerage services in Nairobi). Setting up an rainwater facility will help bridge the gap in the water supply.

Items	Description
	<ul style="list-style-type: none"> The collection of rainwater shall focus on non-industrial areas in order to avoid tapping of rainwater that result from industrial activities. Nairobi experienced 600mm of rainfall per annum in the last decade.  <p>Source: Kenya Meteorological Department</p> <p style="text-align: center;">Nairobi Rainfall Pattern</p> <ul style="list-style-type: none"> Considerations should be taken on the long rains happen in April, May and June recording high rainfall with April having an average of 125mm. The dry months are between January-March and July-September.
6	<p>Expected Outcome</p> <ul style="list-style-type: none"> The implementation of this program would lead to stable water supply
7	<p>Related Organizations</p> <ul style="list-style-type: none"> Nairobi Metropolitan Service (NMS), Nairobi City County Government, Nairobi Water Supply Company, Sub-county/ward administration officers

Source: JICA Study Team

Items	Description
1	<p>Program Name</p> <p>Urban Service Improvement Program</p>
2	<p>Background</p> <p>COVID 19 has highlighted the need to have more administrative and business online services. Online services are also important because more of our daily lives is moving into the online realm. There is a need to improve the service delivery in urban areas, which will enhance opportunities for inclusive growth</p>
3	<p>Relationship with five agenda and challenges</p> <p>The program is closely related to city administration/urban governance among the 5 agenda issues.</p>
4	<p>Relationship with NIUPLAN</p> <p>The program was proposed in the NIUPLAN as Urban Development Management Enhancement Program (Urban Development Enhancement)</p>
5	<p>Sub Components</p> <p>Promotion online administrative procedures and acceleration of E-Government.</p> <ul style="list-style-type: none"> E-Governance is the delivery of government services or exchange of information through Information Communication and Technology. This type of service enables information sharing from government to government or government to citizen. According to the KNBS statistical report, Nairobi has the highest number of the population have an access to internet. With the current developing technology, pressure has been put on the government to ensure there are suitable measures to deliver services. During the COVID -19 pandemic, the government of Kenya and the Nairobi City County introduced this kind of system since there was restriction on going to the office. Although there have been tremendous to use this kind of system there are still gaps that are yet to be completed. The Ministry of ICT through the National Policy of ICT of 2019 aim to facilitate access to ICT infrastructure and services all over the county. This project will assist both the national government and the county government in achieving their set objectives. There has been an increase in mobile usage in Nairobi from 2020 to 2021 main attributed to the remote working. According to the KNBS census report, internet

	Items	Description
		<p>usage is low in low-income areas than in the high-income areas this is because of few ownership of ICT equipment.</p> <ul style="list-style-type: none"> The project will entail discussion with the ministry of communication on the gaps available and require support in order to enhance online service delivery. <p><u>Strengthening urban administrative services at the sub-county level (facilities, institutions and personnel).</u></p> <ul style="list-style-type: none"> Nairobi county government has an ICT department that is in charge of all matters relating to online services within the County and online payment. However, the sub counties in Nairobi lack an urban administrative facility hence pressure is put on the County ICT to serve all regions of the county. Nairobi County is further divided into 17 sub counties each headed by a member of parliament. Setting up an urban administrative services at the sub county will ease serve delivery and relieve pressure that has been put on the County Government. The data is same for the ownership and usage of mobile phones and computers. Internet penetration is also low in some sub counties with slum area that those with high income areas. Administration at the sub county level lack ICT services to serve the population in those areas.
6	Expected Outcome	<p>The following are some of the benefit that accrue from projects under this program:</p> <ul style="list-style-type: none"> Efficiency of administrative services. Preventing the spread of infection by accelerating E-Government.
7	Related Organizations	<ul style="list-style-type: none"> Nairobi Metropolitan Service (NMS). Nairobi City County Government

Source: JICA Study Team

	Items	Description
1	Program Name	Public Markets Improvement Program
2	Background	Public market are commercial nodes where many people gather thus acting as a spreading zone for COVID 19. The government have guidelines and protocol to help minimize the spread of COVID-19. Some of these guidelines include setting up hand washing points, fumigation of market with infrastructure, open air market to have a well laid out plan to ensure sellers observe social distancing among others
3	Relationship with five agenda and challenges	This program is under the urban society and community and urban structure among the 5 agenda issues
4	Relationship with NIUPLAN	Market improvement is not proposed in NIUPLAN.
5	Sub Components	<p><u>Improvement of access road, lighting and sanitation facilities to Burma market (short term).</u></p> <ul style="list-style-type: none"> Burma market is located in Kamukunji Sub County along Jogoo Road. The market is known for selling meat and it serves a great number of the Nairobi population. Burma market also has hotel that prepare food to serve those who come to sell and buy in the market. This area is usually congested almost every day. Roads leading to the market are in poor state and the situation worsens during rainy season making the market inaccessible Lighting inside the market is also poor and some traders have to close early because they cannot operate in darkness and for security issues posed by the lack of proper lighting. The market also lacks proper sanitation facilities. Improvement of these facilities in and around Burma market will promote safety and create more business opportunities. The current conditions of poor roads, pollution, inadequate facilities do not attract more investors to the area. <p><u>Improvement of sanitation facilities at Wakulima market (short term).</u></p> <ul style="list-style-type: none"> Wakulima market is located along Haile Selassie Avenue behind the Nairobi central bus station. The market was constructed in 1966 to hold around 300 vendors according to an article by Business Daily. This market is mainly for traders who sell

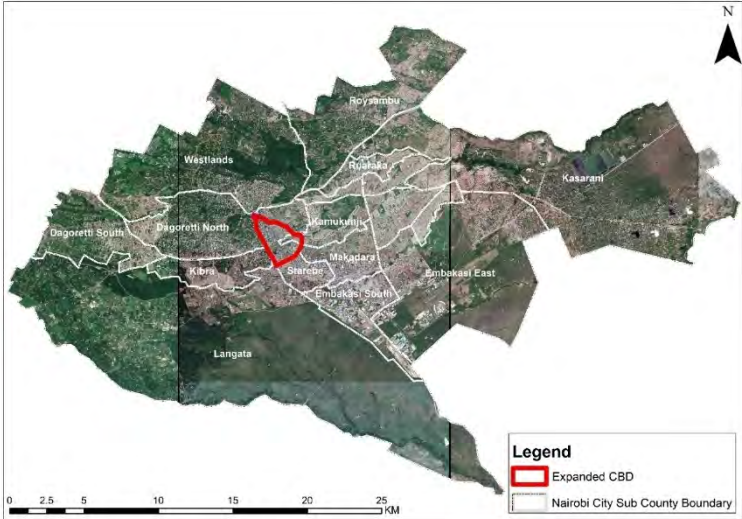
Items	Description
	<p>agricultural produce brought to the city from other parts of the country. It is a market node where many people visit on a day-to-day basis to look for groceries and other products.</p> <ul style="list-style-type: none"> • The sanitation facilities at this market are in poor state. The poor sanitation and hygiene is caused by garbage generated from spoilt food. This situation is likely to cause infectious disease that may lead to further spread of COVID 19. Inadequate sanitation facilities has put pressure on the existing ones and there is need for improvement to reduce pollution and waste generated from the market. There is need to for urgent repair, replacement, and/or rebuilding of existing sanitation facility. • There are improvement measures that has been proposed by the county government including relocation of the market to create more space and avoid encroachment by traders. The close proximity to the CBD has led to spillage of traders on the street. • There shall be short term installation of sanitation facilities (for instance hand washing basin and repair of washrooms) and fixing of lights awaiting relocation to eastern part of Nairobi. <div style="text-align: center;"> </div> <p>Source: Nationnewspaper (Nairobinews)</p> <p style="text-align: center;">Wakulima Market</p> <div style="text-align: center;"> </div> <p>Source: JICA Study Team</p> <p style="text-align: center;">Location of Public Market</p>

Preparatory Study for Urban Environment Improvement against COVID-19 (CUREIP)


Final Report

	Items	Description
6	Expected Outcome	<ul style="list-style-type: none"> The effects of these projects will be to enhance hygiene and access to these major urban markets. This would reduce rapid spread of infectious disease such as COVID-19 in future
7	Related Organizations	<ul style="list-style-type: none"> The Nairobi city county government should be involved in this program because public markets fall in its jurisdiction.

Source: JICA Study Team

	Items	Description
1	Program Name	Nairobi CBD Revitalization Program
2	Background	<p>Nairobi CBD is one of the busiest places in the city. The business district is at the core of the city, where various essential facilities are located. Over time the increase in population in the city has put pressure on the limited CBD resources like parking, water and sanitation, and pedestrian walkways. Currently, the pedestrian walkways are crowded and encroached by street hawkers, although there are efforts to relocate them. COVID-19 has put more pressure on the limited resources in the CBD. Furthermore, the situation has intensified because there is limited equipment like hand washing points that may help to counter the spread of COVID-19.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Source: JICA Study Team</p> <p style="text-align: center;">CBD Location</p>
3	Relationship with five agenda and challenges	The program is proposed under the inclusive/universal access and urban management among the five agenda issues.
4	Relationship with NIUPLAN	<p>There was a proposal of the following in the NIUPLAN meant to improve the conditions of facilities in the CBD:</p> <ul style="list-style-type: none"> Removal of long-distance bus terminals to outside the city center. Development of new terminal at the city center. Development of sub-terminal at the city sub-center. Development of new bus & matatu terminal in railway city.
5	Sub Components	<p><u>Multi story parking at sunken car park (Aga Khan Walk), Taifa Road parking, along Loita Street, next to city market (short-term).</u></p> <p>Nairobi CBD is congested and has limited parking space that does not meet the demand of the residents in the city. According to a survey done by IBM, Nairobi was ranked as the 8th most difficult city to find a parking space. The county government was even forced to increase the parking fee at one time to limit the number of cars coming to the CBD. However, this measure was overruled, and the initial parking fee was maintained. There is parking located at Aga Khan Walk sunken park along Harambee Avenue. The parking is small and can only allow a certain number of vehicles at a given time. Nairobi's population is growing at a faster rate, and there is a need to address the parking issue.</p>

Items	Description
	<p>The construction of a multi-story parking facility at Aga Khan and along Loita Street is favorable because the land uses at this place already support the construction. Multi-story parking consumes little space because it encourages upward construction rather than horizontal, which occupies a lot of space.</p> <p>At Holy Family Basilica church, a four-story parking bay has been set up with 536 parking slots, where before, it used to accommodate only 120 parking spaces.</p> <p>Propose a PPP project by Japanese investors for a parking silo at Aga Khan Walk.</p> <p><u>Development of New bus and Matatu terminal (short-term)</u></p> <ul style="list-style-type: none"> • Nairobi has several bus terminus, some of which are illegal. Some of the famous known termini in Nairobi are Central Bus Station, Machakos bus station, and railways bus terminus. These terminuses provide parking spaces for matatu, minibusses, and buses that serve almost 70% of the city's population. The existing matatu and bus terminus are congested, and some matatu and buses resort to on-street parking. In the existing terminus, there are no proper traffic circulation patterns, no designated bus and matatu arrival and departure bays, and existing facilities are inadequate. • Nairobi City County, through the NMS, plans to renovate the existing terminus as well as set up new ones to decongest the CBD. Developing a new terminal will assist the county government in attaining its goal and reduce the congested terminus occupied by over 20,000 matatus. • The present bus terminal is congested and lacks proper facilities to serve the users of this mode of transport. The existing bus and matatu terminal must be controlled by relevant authorities to try to reduce traffic. The recently constructed green park terminus is yet to be operational, but the three test runs have not been successful with the same case of congestion. Developing a new bus terminal will ease congestion in the CBD and reduce the number of buses and matatu that park along the streets of the CBD. <p><u>Removal of Long-Distance Bus Terminals to Outside the City Center (short-term)</u></p> <p>Nairobi City County plans to construct a multi-story intercity bus terminus outside the CBD to reduce the congestion in the city. There is only one major long-distance terminus inside the CBD. The easy coach bus terminal is near the Nairobi railway central station, and other long-distance buses park along the city street.</p> <p>Removal of long-distance bus terminals will go a long way in easing congestion in the CBD and provide a better environment for business and other activities.</p> <p><u>Development of Sub-terminal at the City Sub-center (short-term)</u></p> <ul style="list-style-type: none"> • In many cities, you are likely to find bus terminus located in a central area which is very convenient for the passengers who work near that or are interchanging routes. However, in the case of Nairobi, the terminuses locations are creating congestion in the surrounding areas. There are several sub-centers in Nairobi County. Setting up a sub-terminal at these centers is ideal as it will limit the number of buses coming to the CBD, hence, reducing traffic. • Some of the major sub-centers include Westlands, Makadara and Eastlands, Donholm, Dandora, Githurai, Dagoretti, Syokimau, Kasarani, Lang'ata Kabete, and Ruaka. These sub-centers serve a high population. Most of the existing bus terminals at these sub-centers are illegal and some have converted one road lane as a terminal causing traffic. Setting up a subterminal will reduce congestion in the CBD by limiting the number of trips taken to the core of the city. • These sub-terminuses will act as a link up to the central terminuses. These sub terminuses can be used by small capacity vehicles mostly to serve the residents in the areas they operate hence reducing traffic by personal vehicles. The subterminal will also open up other business opportunities for the residents as well as create employment.

	Items	Description
		 <p>Source: JICA Study Team</p> <p>Existing Matatu/Bus Terminal at Donholm Sub-Center</p>
6	Expected Outcome	The effect of this program will enhance the condition of the facilities at the CBD and therefore promote business activities through accessibility to various areas.
7	Related Organizations	The Nairobi City County Government is the main agency to be involved. NaMATA will also play a role in the transport sector.

Source: JICA Study Team

	Items	Description
1	Program Name	Livelihood Improvement Program
2	Background	COVID -19 has triggered one of the worse job loss crises all over the world. This has further caused an increase in poverty and inequality levels that is hard to recover from over the coming years. The containment measure put in place has led to inequalities, thus, making it hard to follow the set protocols to curb the spread of the virus. Containment measures like social distancing and wearing of face mask have proven difficult to observe in slum areas where congestion and poverty level is. The loss of jobs has led to an increased crime rate in the slum areas of Nairobi.
3	Relationship with five agenda and challenges	This program is closely associated with urban society and community and urban structure among the five agenda issues.
4	Relationship with NIUPLAN	Proposed as urban renewal program.
5	Sub-Components	<p><u>Slum upgrading project in Mathare and Kibera.</u></p> <ul style="list-style-type: none"> <li>• Rapid growth of slums has been attributed to increasing population in the urban area, rural-urban migration, high cost of living in urban areas, increased urban poverty, and inability to access land for housing. In Nairobi, with around 2.5 million people, around 60% live in the slums, which occupy about 6% of the total land of the city, according to an UN-Habitat report. The growth of slums in Nairobi is expected to grow over the coming years. <li>• Slums like Mathare and Kibera have a poor environment and limited infrastructure. These two slums are at high risk of COVID-19 due to the dense population. According to the last census by KNBS 2019, the population of Mathare was 206,564, while Kibera was 185,777. The pandemic has also worsened the living conditions of slum dwellers. <li>• Slum areas are usually congested and lack proper sanitation, and that is one of the reasons why containing COVID-19 in such areas is difficult. The slum areas also lack proper drainage infrastructure. Providing proper sanitation facilities, affordable

	Items	Description
		<p>housing, and a proper drainage system will help minimize the spread of not only COVID 19 but other infectious diseases as well as improve the living standards of the residents of those areas.</p> <ul style="list-style-type: none"> • Several initiatives have been done to try to improve the livelihood of slum dwellers, but there is yet to be a success in this area. Millennium Development Goals and Habitat Agenda both aim at improving the livelihood of slum dwellers. The Kenyan government is one of the governments that recognize the need to upgrade slum areas and improve the living standards of residents of these areas. Kenya Slum Upgrading Programme is a collaborative initiative between the national government and UN-Habitat to improve the slum area. This proposal will help achieve the various government goals for the slum areas. • The project should focus on low-cost housing with proper sanitation facilities. • The feasibility study shall focus on technology exchange by the government officers in the ministry of Transport infrastructure housing and urban development. <p>Building technical skills through training.</p> <ul style="list-style-type: none"> • The KNBS 2019 report indicates that the number of people working in Nairobi was 1,812,311. However, this has gone down since the onset of the pandemic because of the closure of some companies unable to make profits. The country's unemployment rate doubled by 10.4%, according to an article by Xinhua. The KNBS data also shows that the number of people who completed school in Nairobi was 1,921,640, while those who left school before completion was 505,807. • Due to the loss of income because of restrictions, many people have been stuck and have nowhere to move. Most unemployed are in the informal sector, and because of a lack of education documentation, many employers are hesitant to employ them. • The increase in the unemployment rate has made it necessary for people to be trained in basic skills to improve creativity and acquire job market skills and experience. This will boost the employment rate among Nairobi residents. Training various individuals will help nurture their innovation and create more employment opportunities. • The project will focus on offering technical skills to the youth (18–35 years) and, in turn, will result in gainful employment. Training should focus on science-based, which will equip youths with the required skills.
6	Expected Outcome	The project is likely to improve the living conditions and build resilience for future occurrences
7	Related Organizations	Nairobi City County Government

Source: JICA Study Team

	Items	Description
1	Program Name	Environment Quality Improvement Program
2	Background	According to the WHO, air pollution is the largest single environmental risk to health and is responsible for over 7 million premature deaths each year globally. Air pollution in Nairobi has been impacted by unsound environmental practices like emissions from vehicles and open burning of waste and household waste. Research shows that increased exposure to hazardous polluted air increases the death rate among COVID-19 patients. Long-term exposure to the polluted air is likely to cause respiratory diseases, which in turn, increases the vulnerability to COVID-19. Environmental quality improvement is important to minimize the rate of air pollution and vulnerability, hence achieving a clean environment.
3	Relationship with five agenda and challenges	This program is closely associated with the urban society and community and urban structure among the five agenda issues.
4	Relationship with	The project was proposed as air quality monitoring in the NIUPLAN.

	Items	Description
	NIUPLAN	
5	Sub Components	<p><u>Air quality monitoring</u></p> <ul style="list-style-type: none"> • According to the State of Global Air 2020 report, polluted air was responsible for the demise of around 5000 people in Kenya alone. It is considered one of the risk factors that cause disability and pre-mature death in the county. • As stated in an article written by IQAir, Nairobi City's air quality fluctuates on different days and times. The readings from the same article were between 4.8 µg/m³ up to 17.4 µg/m³, with the first reading representing good air quality while the last reading is poor quality. Air quality change can be attributed to several pollutants like during rush hours (mainly in the morning and evening) when several vehicles are stuck in traffic and emit gases at the same time. • The emission of gases like nitrogen dioxide and sulfur dioxide are dangerous and can cause breathing problems, which has been mentioned as one of the conditions that can lead to death if infected by COVID-19. Several attempts have been made to try and monitor the air quality of the city. The National Environmental Management Authority was put in place to try and assess the quality of air and advice on the necessary steps that are required to be taken. There is a gap in that the body does not provide regular reports on the issue of air quality. • There will be frequent monitoring of the air quality, for example, by using detector systems placed at strategic points to advise on appropriate measures that can be taken to prevent adverse effects. National Environmental Management Authority, in charge of environment management, formulated Air Quality Regulations in 2014, intending to control, prevent, and abatement pollution to ensure clean air. Improved air quality plays an important role in our today's health. <p><u>Greening the transportation and industry sectors can provide major air quality benefits (Electric powered commuter rail)</u></p> <ul style="list-style-type: none"> • The cause of increased carbon omission is an increased number of individually owned cars. The increased number has caused traffic congestion and air pollution. • Recent development plans do not consider greening as part of the solution to the poor air quality in Nairobi. NMT for short- and medium-term trips is the only solution proposed for improving air quality. The city has also hosted several events that aim to promote greening and improve air quality, for example, the Clean Air 4 Schools International Air hosted in 2018. • Greening the transportation and the industry sector will have a significant impact on the health and well-being of the general population of the city. This will also ensure a high productivity rate among employees in various sectors. Greening and transport and industry sectors will also help protect the vulnerable. • Greening transportation will also assist in achieving SDGs related to quality health care, sustainable cities, and mitigating the effects of climate change. SDG 3 aims to achieve good health and the well-being of an individual. The goals in section 3.9 also aim to minimize deaths that occur due to exposure to hazardous chemical gases and other pollutants. • There is a need for a feasibility study to identify a convenient location for the project.
6	Expected Outcome	The following program is likely to enhance the health of urban dwellers and improve lives.
7	Related Organizations	<ul style="list-style-type: none"> • Nairobi City County Government • NAMATA • Ministry of Transport

Source: JICA Study Team

9.3 Cooperation Project Formulation

9.3.1 Conditions of proposal of the projects

Projects are selected from the following conditions.

- Consistency with Kenya's Assistance Policy and Priority Areas:
 - Mombasa SEZ, Nairobi Metropolitan Area, Logistics, Infectious Diseases
- Possibility of cooperation with related support programs: yen loans, grant aid, technical cooperation, JOCV
 - Complementary relationship, the possibility of creating synergy effects
- Application of Japanese technology and the possibility of DX
- Relationship with ODA strategies such as Free and Open Indo-Pacific (FOIP)
 - Relationship with Economic Corridor Development and positioning of Mombasa
- Relevance to the post-COVID-19 environment:
 - Restrictions on movement (masks, curfews, opening hours of restaurants, etc.) have been lifted, but social distancing and sanitary conditions are recommended to continue
 - Public transport, handwashing
 - The number of tables in restaurants is still small
 - Impact on employment and income

9.3.2 Proposed Cooperation Projects

Projects to be implemented as JICA's cooperation are compiled below.

1) **Commuter railway operation and safety improvement project (TA, JOCV) (Transportation Improvement Program)**

(i) Background

- There have been reported cases of COVID-19 among people residing in Nairobi as they carry out their economic activities. There is also a change in work styles where the majority of people have adopted working from home. Changes in travel practices have already occurred occasioned by the fear of COVID-19. The effects of COVID-19 have been exacerbated by the deterioration in urban transport services, poor sanitary environment, and changes in regulations. Therefore, there is a need to improve the transport system in Nairobi City to meet the needs created as a result of the pandemic.
- Public transport is one of the areas which was affected by COVID-19 by operation restrictions, passengers restriction, and changing in working behavior (work from home), and shift preference of transport mode
- The Government of Kenya has been trying to improve the public transportation system in Nairobi, including the commuter railway and BRT. Kenya Railway Corporation prepared a master plan to improve commuter railway service through an increase in train

operation speed and frequency through facility renovation and development. Currently, four commuter lines are in operation. In addition, NaMATA (Nairobi Metropolitan Transport Authority) is trying to develop BRT.

- JICA has been supporting the improvement of the transport system in Nairobi including, road development (GA), bus operation improvement (TA), and a plan to support commuter railway infrastructure improvement. In order to maximize the impact of a variety of support for the transport sector, technical cooperation that strengthens the capacity of commuter railway operation is essential.

(ii) Project Area

Selected commuter lines in Nairobi County and surrounding area

(iii) Project Period

Three years

(iv) Outline of the Project

Overall goal: Commuter rail service including safety and efficiency improves which contributes to convenience of transport services to users and strengthening Northern Economic Corridor logistics

Project Purpose: Commuter train operation and maintenance capacity improves

Outputs:

Output 1: Operation and maintenance of rolling stock

Output 2: Operation and maintenance of signal and communication system improves

Output 3: Operation and maintenance of track improves

Output 4: Awareness of community on safety along the commuter line is enhanced (JOCV)

Activities:

Activity 1-1: Conduct the survey on rolling stock O&M and review existing condition and existing manual

Activity 1-2: Conduct training in Japan, prepare O&M manual on rolling stock maintenance

Activity 1-3: Conduct trial O&M based on the manual

Activity 2-1: Conduct the survey on signaling and telecommunication conditions and review existing manual

Activity 2-2: Conduct training in Japan, prepare signal and communication system O&M plan

Activity 2-3: Prepare manual on signal and communication system

Activity 2-4: Conduct trial O&M based on the manual

Activity 3-1: Conduct the survey on track conditions and review existing manual

Activity 3-2: Conduct training in Japan, Prepare O&M plan

Activity 3-3: Prepare manual on track O&M

Activity 3-4: Conduct trial O&M on track

Activity 4-1: Conduct railway safety awareness survey

Activity 4-2: Prepare education materials on safety

Activity 4-3: Conduct community workshop on safety awareness building

(v) Stakeholders

- Ministry of Transport, Infrastructure, Housing and Urban Development (MOTIHUD), State Department of Transport: Governing body
- Kenya Railway Corporation: Railway operator
- Nairobi Metropolitan Area Transport Authority: Governing body for public transport, particularly bus and BRT

2) Urban Service Improvement Program (TA)

(i) Background

- COVID-19 has highlighted the need to have more administrative and online business services. Online services are also important because more of our daily lives are moving into the online realm. There is a need to improve the service delivery in urban areas, which will enhance opportunities for inclusive growth.
- Nairobi County Government has been trying to improve administrative services by promoting the use of technology (i.e., government service). In addition, administrative service at the sub-county level is planned for improvement, and this effort has been accelerated after the COVID-19 pandemic.
- In addition, in order to develop a resilient city, the “multi-core development” proposed in the NIUPLAN has to be realized.

(ii) Project Area

Nairobi City County

(iii) Project Period

Three years

(iv) Outline of the Project

Overall goal: To improve the efficiency of administrative service at sub-county improves and the spread of infection is prevented through sub-county administration strengthening and promotion of multi-core development.

Project Purpose: Urban management capacity by the Nairobi County Government is strengthened

Outputs:

Output 1: Urban administration at sub-county level is strengthened

Output 2: Urban data management capacity is developed through district/detail plan preparation

Activities:

Activity 1-1: Stakeholder meeting with relevant NCCG officers to understand the subcounty administration

Activity 1-2: Assess administrative services at subcounty level

Activity 1-3: Assess the current county government service delivery

Activity 1-4: Carry out a public consultation meeting at estate level to get the views of the

residents on administrative service delivery

Activity 1-5: Proposal of improvement to extension of service to the subcounty level

Activity 2-1: Select pilot area for district plan preparation

Activity 2-2: Prepare district plan for the selected area

Activity 2-3: Prepare database of land related information (resilient district plan)

Activity 2-4: Disclosure of the proposal to the stakeholders (administration, residents)

(v) Stakeholders

- Nairobi City County Government
- Nairobi Metropolitan Service

10. Formulation of Cooperation Project in Mombasa

10.1 Change of Urban Issues by COVID-19

10.1.1 Change of traffic volume

1) Road traffic volume

The measures introduced by the government included banning all passenger flights, closing restaurants and bars temporarily, dusk to dawn curfew, and stopping any movement in and out of some high-risk areas, including Mombasa and Nairobi Metropolitan Areas. Some restrictions are still in place in one form or the other. The above measures have been shown to have significant impacts on travel and traffic volumes translating into economic impacts with reduced travel demands. With travel restrictions to Mombasa and Nairobi, cross-country travel essentially came to a halt. In addition, many people in urban areas resorted to working from home and are likely to continue doing so, even after COVID-19 pandemic. Recent traffic volume counts indicate up to a 15% reduction in traffic volumes along major highways in Nairobi.

2) Logistics volume

The Government of Kenya implemented a nationwide curfew on 7th April 2020 as one of the measures to slow down the spread of the virus. Logistics companies and postal and courier operators were among service providers classified as offering essential services and were exempted from the curfew and county lockdowns where the latter existed.

They have since embarked on instituting changes in their operations to ensure compliance and health and safety of their customers, staff, and goods collected for delivery, the fleet in use, facilities, and retail outlets. This has ensured that essential goods are transported from point A to point B across the country. These goods include pharmaceutical products, medical samples and supplies, consumer goods, packaged foods, agricultural inputs, spare parts and raw materials for manufacturers, sensitive bank documents, legal documents, shipping documents and customs clearance documents, documents that require hard copy signatures, computers, laptops, and accessories.

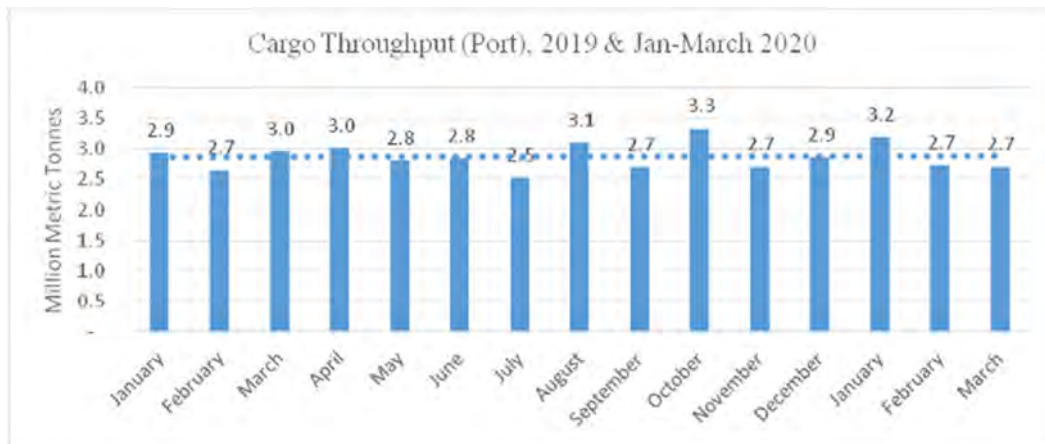
However, due to border closures, national lockdowns in different countries, and restrictions on people's movement, the volume of goods transported and processed for export and import into the country have gone down for air freight and sea freight shipments, as well as courier items.

The transport and logistics sector is heavily affected by the COVID-19 pandemic. The industry, driven by facilitating cargo movement to or from different geographical locations, supports key economic sectors, such as manufacturing, agriculture, aid and relief, construction, and education among others. However, the interventions to stop the spread of COVID-19 have made it challenging if not impossible to move goods from point A to B, thus affecting trade between regions.¹

¹ Shippers Council of Eastern Africa; Impact of COVID-19 on Logistics in Kenya-January -May 2020.

Decline of Mombasa Port Cargo Throughput

The cargo handled at port was 3.2 million tons in January 2020 and 2.7 million tons in March 2020 (Figure 9.1.1).

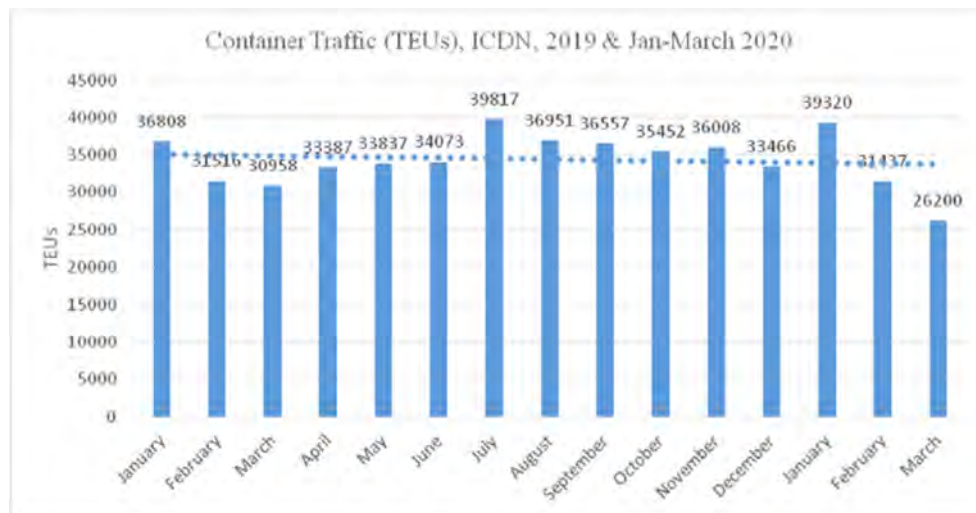


Source: Port Charter Report

Figure 10.1.1 Cargo throughput, January–March 2020

Decline of Container Traffic at ICDN

The number of Twenty Foot Equivalent Units (TEUs) handled at Inland Container Depot Nairobi (ICDN) declined from 39,320 TEUs in January 2020 to 26,200 TEUs in March 2020. This can be attributed to low imports observed during the review period owing to the COVID-19 pandemic that has affected the supply chain.



Source: Port Charter Report

Figure 10.1.2 Number of Containers during the Early Stages of COVID-19

Decline of cargo cleared within 4 days free period

Based on KPA’s weekly reports, it is noted that for March and April 2020, only about 46% and 39% of cargo, respectively, (on average) at the ICDN were cleared without entering storage between 0–4 free days.

Thus about 60% of importers using ICDN pay storage charges and other associated charges, such as marshaling. Shippers Council of East Africa (SCEA) has called to extend the free period to 8 days.

Increase of collected storage charges by KPA

The monthly average storage cost to importers at the Inland Container depot increased from USD73,006.875 in March 2020 to USD118, 245 in April 2020, respectively. Shippers are thus paying storage costs of between USD68,660–135,310 USD per week.

Decline of number of shipping lines calling at Mombasa Port

The number of shipping lines calling at Mombasa Port declined from 43 ships in January to 41 in March 2020.

Truck Turnaround Time at Port and ICDN

The average truck turnaround (for local imports) increased from 4.5 hours in January 2020 to 9.36 hours in March 2020.

Increase in Truck turnaround time for empties

Truck turnaround time for the return of empties has increased from an average of 3.5 hours in January 2020 to 8.9 hours in March 2020.

Increase of time after customs release and pass-release time

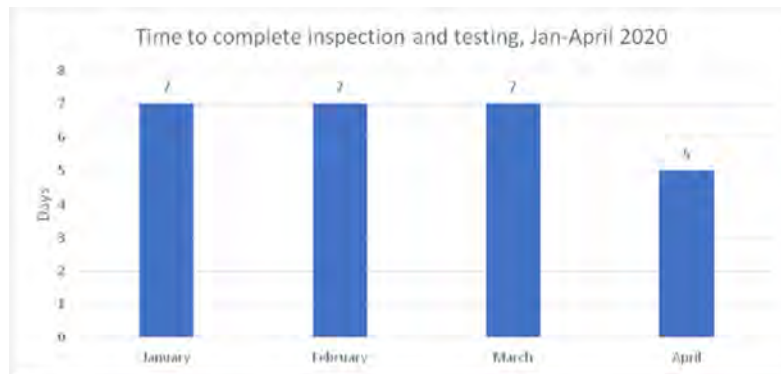
For February to March 2020, there was an increase in the time taken between pass and release and the time taken between releases. This has been attributed to the slow removal due to the staff mitigation measures adopted to protect against the infection of COVID-19.

Increase of Cargo uptake under Pre-arrival Processing (PAP)

There is an increase in imports under marine/sea cargo processed under PAP, which increased from 11.7% in January 2020 to 15.23% in March 2020. This is attributed to increased awareness of PAP by cargo owners and clearing agents, which includes the advantage of speedy clearance.

Decline of days taken by Kenya Bureau of Standards (KEBS) to Inspection and testing consignments

Completing the inspection and testing took seven days on average in January to March 2020 despite the decline in consignments released.



Source: Port Charter Report

Figure 10.1.3 Time taken to complete inspection and testing, January-April 2020

Decline of number Consignments Released by KEBS

The number of consignments released by KEBS declined from 11,499 in January to 7157 in April 2020.

Decline of Trains from Mombasa to ICDN (both local and transit)

There was a decline in the number of trains from Mombasa to ICDN from 242 to 187 (upward direction) for transit and 158 to 112 (downward direction) for January and April, respectively.

10.1.2 Economy

1) Decrease number of tourists

According to the Ministry of Tourism and Wildlife, 81.3% of respondents reported that the international tourist market received a massive cancellation of tickets due to COVID-19, followed by 38.3% of the respondents from regional tourist markets and 64.5% for the domestic market. It shows a high decrease in tourist visitation to the country, and as the pandemic continues, measures are put in place to stop the spread, which leads to an increase in the reduction of tourism activities in the country. Since the economy of Mombasa County relies heavily on tourism, the impact on the economy and urban environment is large, including changes in traffic flow and improving the natural environment.

2) Delays of construction projects

There are reports of a temporary closure of sites in Mombasa during the COVID-19, rendering many people jobless. The delays have also led to an increase in the cost of the projects. The following are some of the major projects in Mombasa that experienced a temporary delay:

- (i) Construction of the 2nd Container Terminal at Mombasa Port
- (ii) Construction of Mombasa Southern Bypass Package 2 and Package 3

3) Closure of Clearing and Forwarding Services (CFS) Companies

The reduced number of ships docking at Mombasa port has led to reducing the business to the CFS engaging in clearing some cargo. Some CFS had to close their businesses, which in turn has led to the loss of livelihood for their employees.

10.1.3 Urban issue

1) **Transportation system**

It has been established that public transportation can increase the transmission of COVID-19 infections taking the situation of Ferry crossing infrastructure in Mombasa. The place is highly crowded and poses a risk of high transmissions.

The public transportation system in Mombasa is also wanting with the passenger vehicle crowded. There are also unplanned bus stations and access paths. The county government of Mombasa has already initiated a project to encourage NMT through the construction of pedestrian paths.

2) **Urban design**

COVID-19 has exposed the vulnerability of the highly dense settlements in Mombasa like the Likoni area and slums like Owino Uhuru. There is a need for green areas and open spaces to meet the outdoor exercise and recreation demands for fulfillment and social distancing.

3) **Economic issues**

The COVID-19 situation has exposed Mombasa county's over-reliance on tourism as the major source of livelihood for the residents. Such a homogeneous economic structure increases vulnerability in the event of disruptions witnessed during the COVID-19 pandemic. It is therefore prudent to diversify the urban economic structure by engaging other areas apart from tourism.

There has been a rise in the cost of basic commodities such as cooking oil manufactured by palm oil, mainly imported from Singapore. This has been caused by the disruption of the supply chain in the shipping industry.

4) **Social issues**

The COVID-19 pandemic has exposed social inequalities in Mombasa county. There are very venerable areas such as slums that have been affected by the pandemic. The slums are crowded and lack basic sanitation facilities. There is, therefore, an urgent need to address this by having more inclusive actions and prioritizing the needs of the vulnerable groups. Upgrading slum areas should also be prioritized.

Due to increased stay-at-home by the entire family due to the restrictions in movement, there has been a reported increase in domestic conflicts amongst the family members.

10.1.4 The Expected Status of Cities in the Post COVID-19 Period

1) **Increase of the number of pedestrians walking**

There has been a need to avoid crowded places by the population and therefore resorting to walking instead of public transportation. The Mombasa County government has constructed pedestrian walking paths that have promoted walking by the masses. This is anticipated to continue in a post-COVID-19 period.



Source: Institute for Transportation & Development Policy.

Figure 10.1.4 Pedestrian paths developed in Mombasa

2) Increase of the number of cyclists

A considerable number of people in Mombasa have shifted to cycling during COVID-19, and this is likely to continue even post-COVID-19.

3) Improved medical systems to address respiratory diseases

There has been investment by the national government and international donors to address the issue of COVID-19 treatment. The county government of Mombasa has invested heavily in acquiring ICU beds, isolation beds, and accompanying equipment. The improved facilities are likely to be in the post-COVID-19 era.

4) Personal Health/hygiene consciousness

Due to the enhanced campaign to create awareness on the spread of COVID-19 and the need for hygienic conditions by washing hands and avoiding touching surfaces. This habit may persist in the post-COVID-19 era.

10.1.5 Change of urban issues by COVID-19

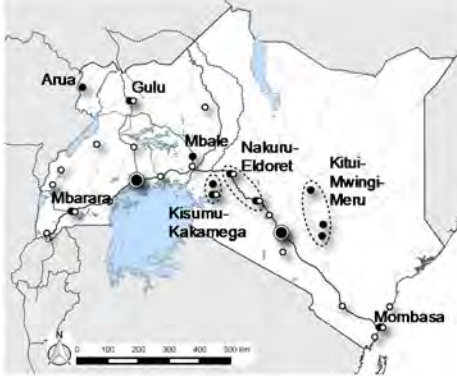
1) Trend of Infection Spread

- Expansion centered on commercial (Mvita) and logistics areas (Jomvu)
- Changes in the path of infection from the public spread (supermarkets, KPA, schools) to domestic infections
- Expansion in slums (Mombasa County Health Department)
- Collapse of medical institutions due to influx of patients from neighboring counties (interruption of other medical services)

2) Relationship between the spread of infection and the urban environment

- Human movement is spreading the infection
- The lack of infrastructure in the slum could have led to the spread of infection
- Community based on traditional housing (Swahili House), congestion

Table 10.1.1 Change of Urban Issues (Mombasa)

	Urban Trend 【Shift in Logistics Mode】	Impact of COVID-19 【Change in Logistics and Urban Functions】	Changes in the needs of urban structure
Urban	<p>【Logistics】</p> <ul style="list-style-type: none"> Positioning as the gateway to the Northern Corridor (Mombasa Island - Northern Corridor: Port Facilities, Roads, Warehouses and CFS, Factories) Shifting the mode of logistics with SGR: Decline of the surrounding area due to the decline of warehouses and CFS <p>【Tourism】</p> <ul style="list-style-type: none"> A city with a focus on tourism (coastline) <p>【Infrastructure】</p> <ul style="list-style-type: none"> Mombasa Gate Bridge, Southern Bypass, SEZ Development 	<p>【Logistics】</p> <ul style="list-style-type: none"> Reduced logistics volume due to COVID-19 Decline of cities along the Northern Corridor due to lockdown and curfews (accelerated demand decline due to SGR) <p>【Tourism】</p> <ul style="list-style-type: none"> Shrinking tourism industry due to the decrease in tourists <p>【Urban Environment】</p> <ul style="list-style-type: none"> Spread of infection in traditional forms of residence (Swahili House) and slums (infrastructure shortages) 	<ul style="list-style-type: none"> Reexamination of urban functions along the Northern Corridor (Nairobi-Mombasa, core city) Reorganization of Urban Functions in Mombasa City: Separation of Logistics, Industry, and Housing 
Trend	<ul style="list-style-type: none"> Changes in urban functions in logistics areas (Jomvu, Changamwe) 	<ul style="list-style-type: none"> Accelerating urban functional changes 	

Source: JICA Study Team

10.2 Urban Development Program during and after Pandemic

10.2.1 Review of Existing Master Plan

The change in urban needs in relation to Mombasa Gate City Master Plan (MGCMP) are presented in table 10.2.1.

Table 10.2.1 Changes in needs in relation to the MGCMP.

Sector	Development issues	Changes in Needs with COVID-19/ in response to COVID-19
Socioeconomic	<ul style="list-style-type: none"> ▪ Social equipment and insufficient basic education equipment ▪ Lack of cooperation between educational institutions and the labor market ▪ Lack of medical facilities ▪ Residential environment ▪ Lack of good quality housing for low-income earners ▪ Undeveloped high-quality living environment due to lack of management of development permission system 	<ul style="list-style-type: none"> ▪ School facilities / equipment, classrooms that are not crowded ▪ Increase in the number of medical staff ▪ Due to the influx of patients from outside Mombasa County, it is necessary to shift to COVID-19 compliant workers. ▪ As a result, medical and health services are usually unavailable. ▪ Raising awareness about medical care and health (especially in the surrounding area) ▪ Domestic infections are widespread, but residents are less conscious of preventing the spread of infections. ▪ Providing Affordable Housing (sanitary facilities) ▪ In addition to the dense traditional living style, it is one of the factors that spread the infection because the infrastructure such as water is in place.
Tourism	<ul style="list-style-type: none"> ▪ In the process of developing tourism products, the needs of tourists are not answered, tourism resources are not used effectively, there is a shortage of tourism products, and the capacity of tourism service providers is insufficient. ▪ Lack of interaction with local communities of tourists, impact on the environment, lack of capacity of tourism-related organizations, lack of cooperation between public and private sectors 	<ul style="list-style-type: none"> ▪ Decrease in tourism income due to decrease in tourists, increase in unemployment ▪ Shift to product development for domestic tourism ▪ The tourism industry is being affected by domestic lockdowns and a decrease in overseas tourists.
Urban development	<ul style="list-style-type: none"> ▪ Urban sprawl and lack of control ▪ Inadequate urban infrastructure and urban services ▪ Linkage with weak road network and land use ▪ Mixing urban and logistics functions ▪ Concentration of deteriorated infrastructure equipment in Mombasa Island Squatting ▪ Squatting is not legalized ▪ Slum movement / redevelopment / environmental improvement has not been carried out 	<ul style="list-style-type: none"> ▪ Increased risk of informal residence (increased poverty) ▪ Development of housing with well-developed infrastructure and utilities ▪ Providing environmentally friendly housing by clarifying land ownership ▪ A fundamental solution to the informal residence is needed: living environment, administrative services ▪ Formation of the road network ▪ Need a road network for base development, logistics environment, and industrial promotion ▪ Isolation of urban functions (logistics, commerce, housing)

Sector	Development issues	Changes in Needs with COVID-19/ in response to COVID-19
		<ul style="list-style-type: none"> ▪ Need a buffer to prevent the spread of infection
Transportation / Logistics	<ul style="list-style-type: none"> ▪ Traffic congestion caused by port logistics ▪ Deterioration of traffic congestion due to port expansion ▪ Further increase in traffic to the Simanji area ▪ Rail (standard gauge rail) is expected to reduce freight traffic by about 30% between 2020 and 2025 ▪ Kipevu Link, Southern Bypass, Northern Bypass: 95% of traffic from Mombasa Port through Kipevu Link to Nairobi ▪ There is no organization to solve traffic congestion caused by port logistics ▪ Road ratio gap between Mombasa Island and the continental side ▪ Focal points: (Example) Barclays roundabout, Nyali / Links (Kongowea) junction, Changamwe roundabout, and Miritini junction ▪ Since there is no ring road, the links between regions are thin ▪ Transportation policies that ignore the movement of low-income earners and pedestrians ▪ Does not consider the increase or decrease in traffic volume ▪ Lack of control over public transport 	<ul style="list-style-type: none"> ▪ Improvement of the public transportation system ▪ Formation of the road network ▪ Promotion of NMT ▪ Reconfirmation of the road network, transportation facilities, and public transportation by switching from truck to SGR
Urban infrastructure / facilities	<ul style="list-style-type: none"> ▪ Clean water ▪ Water quantity and quality: Expansion of capacity required for water resource development ▪ Water supply / water supply: Rehabilitation of pipes is effective for improving the non-revenue water rate. ▪ Less than water demand in 2035 (15%) (approx. 60,000 m3 / day) ▪ Sewage / drainage ▪ Only part of Mombasa Island is widespread ▪ Implementing a sewage drainage project is very costly and time-consuming ▪ Event and PR programs need to be formed ▪ Currently, only about 10% of the rainwater drainage channels are maintained, and especially unpaved roads are not equipped with drainage facilities. ▪ Floods are occurring due to garbage disposal in drains ▪ Stormwater discharge control is needed ▪ Waste management 	<ul style="list-style-type: none"> ▪ Improved access to water and water. ▪ Water shortages in slums have led to the spread of infection ▪ The traditional living style (Swahili House) is a factor in the spread of infection because the water environment is not well maintained. ▪ The rate of water trucks and water tanks is high, and the water supply penetration rate is low. ▪ Relies on Water Vendor (Mombasa County: 43%, Kenya Urban Area: 16%). A common faucet (Mombasa County: 20%, Kenya Urban Area: 15%) is a social gathering place for residents. ▪ Medical waste is properly managed.

Sector	Development issues	Changes in Needs with COVID-19/ in response to COVID-19
	<ul style="list-style-type: none"> ▪ Need a master plan for waste management ▪ Waste collection and transportation systems need to be improved (including maintenance of collection vehicles) ▪ Construction of new collection site and safe closure of existing collection ▪ Improvement of industrial waste collection and processing system ▪ Improvement of hazardous waste collection and processing system ▪ Promotion of recycling (3R) activities 	
Urban infrastructure / facilities	<ul style="list-style-type: none"> ▪ Electric power ▪ Frequent and long-term power outages ▪ Existing power distribution equipment needs to be upgraded ▪ Suburban power supply is inadequate: Jomvu and Likoni districts' communication ▪ Mobile communication ▪ Range does not reach the suburbs ▪ Insufficient promotion of electronic government system ▪ Disaster recovery center is not managed 	Construction of high-speed communication and networks to promote E-government
Urban development management	<ul style="list-style-type: none"> ▪ Urban development management ▪ Lack of management of development activities ▪ Law enforcement issues ▪ Land ownership issues ▪ Public-Private Partnership (PPP) ▪ Financing ▪ Political gap ▪ Legal system gap ▪ Funding gap ▪ Less feasible to pay beneficiaries ▪ Low possibility of payment of project implementation fund by PPP method ▪ Lack of incentives due to PPP law ▪ Insufficient ability of organization / staff 	Strengthening to realize the master plan

Source: JICA Study Team

10.2.2 New Neighborhood and Five Agenda

The change in needs due to the COVID-19 pandemic in relation to the JICA agenda issues is presented in the Table 10.2.2.

Table 10.2.2 Change in needs due to COVID-19 pandemic considering JICA's 5 agenda.

Urban Issue	COVID-19 Impact and Changes in Urban Needs	Need for urban improvement
Urban Structure	<ul style="list-style-type: none"> ▪ Logistics (warehouse, CFS), industrial, residential area separation needs ▪ Reduction of urban functions due to movement restrictions and curfew (Mombasa County, cities along the northern corridor) 	<ul style="list-style-type: none"> ▪ Sub-center development ▪ Enhanced buffer function (urban function, community) Urban regeneration along the northern corridor.
Transportation / mobility	<ul style="list-style-type: none"> ▪ Increasing needs for safe public transportation (opaque rates) ▪ Increasing needs for efficient public transportation (shortening travel time) 	<ul style="list-style-type: none"> ▪ Comprehensive traffic environment improvement (roads, buses, railroads, NMT) ▪ Providing efficient and safe public transportation ▪ Improvement of NMT ▪ TOD
Urban society / community	<ul style="list-style-type: none"> ▪ Increasing service needs for areas with poor public services (water supply, education, medical care) ▪ Infrastructure improvement in slum area (water, living style) ▪ Crisis of medical collapse in Mombasa County due to the influx of patients from surrounding counties 	<ul style="list-style-type: none"> ▪ Providing public services to slums and the vulnerable ▪ Strengthening cooperation between government and community
Urban hygiene environment	<ul style="list-style-type: none"> ▪ Reconfirmation of areas where administrative services are inadequate 	<ul style="list-style-type: none"> ▪ Maintenance and operation of infrastructure and utilities involving the community

Source: JICA Study Team

10.2.3 Urban Development Program Formulation

1) Approach to Urban Development Program Formulation

Based on NIUPLAN, urban development programs/projects based on the changes in urban issues by COVID-19 are proposed. The following is a concept of considering and selecting cooperative projects.

(i) Priority

- Development of urban transportation and provision of safe public transportation in response to changes in urban structure as a logistics base (urban structure, mobility).
- Urban development integrated with urban transportation (urban structure, mobility).
- Urban infrastructure development (access) leading to improvement of the sanitary environment.
- Proposals in line with the progress of MP implementation: Synergies and complements with ongoing projects.
- Strengthening its position as a core of regional medical care.

(ii) Development framework

Short-term (3 years) Measures to Urban Issues

- Measures to meet urban needs: Changes in urban structure, provision of safe and efficient public transportation, and improvement of urban sanitation
- Focusing based on urban issues (urban structure, transportation and mobility, urban society and community, urban hygiene environment)

Long-term (10 years): Measures to five agenda

- Measures that contribute to five agenda

2) Proposal of the projects

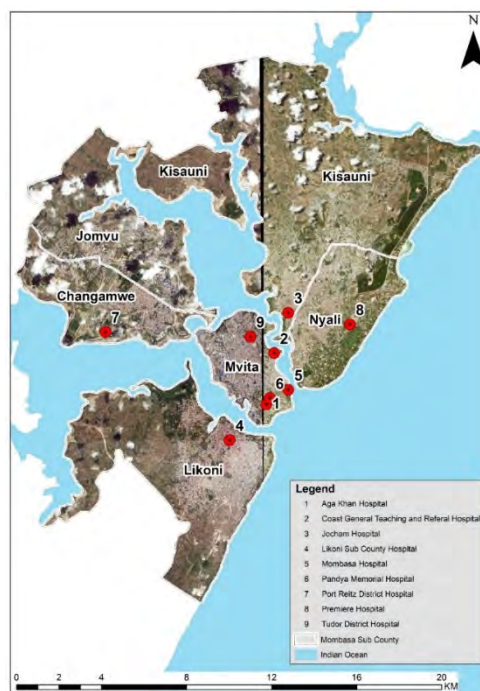
Eight Urban Development Program are proposed as shown in Table 10.2.3.

Table 10.2.3 Relationship between the proposed programs and the agenda

No.	Program	Related Agenda
1	Regional Medical System Improvement Program	Urban society and community
2	Housing Improvement Program	Urban society and community
3	Urban Environment Improvement Program along the Northern Corridor	Urban structure
4	Expansion and Repair Programs for Water Supply Systems	Urban society and community and urban structure
5	Bus station/terminus improvement program	Urban structure and urban society and community
6	Livelihood Improvement Program	Urban society and community and urban structure
7	Tourism Improvement Program	urban society and community

3) Program Details

Items	Description												
1	Program Name Regional Medical System Improvement Program												
2	<p>Background</p> <p>Mombasa County is situated along the coastline of Kenya and is a regional hub with a major port that not only serves Kenya but also regional landlocked countries.</p> <p>The available health infrastructure according to the “<i>Second Health Strategic and Investment Plan (CHSIP II), 2018–2022, A Healthy and Productive Community -Abridged Version August 2018</i>”.</p> <table border="1"> <thead> <tr> <th></th> <th>Hospitals</th> <th>Primary care</th> <th>Community Units</th> </tr> </thead> <tbody> <tr> <td>Current Number</td> <td>16</td> <td>343</td> <td>44</td> </tr> <tr> <td>Required Number</td> <td>20</td> <td>480</td> <td>210</td> </tr> </tbody> </table> <p>Mombasa county has a total of 206 functional facilities excluding community units (CU). Out of the total number, over 80% are privately owned. A bulk of the functional private/NGO facilities are medical clinics.</p>		Hospitals	Primary care	Community Units	Current Number	16	343	44	Required Number	20	480	210
	Hospitals	Primary care	Community Units										
Current Number	16	343	44										
Required Number	20	480	210										



Source: JICA Study Team

Map Showing the Available Dispensaries at The Mombasa Sub Counties (these hospitals need upgrading to meet the demands for health services)




According to the report, there are more private medical facilities across the county, in 4 out of 6 sub-counties, especially in Mvita, with medical clinics coverage per 10,000 persons at 339% and Kisauni medical coverage per 10,000 persons at 247%. The above statement does not necessarily mean that the health demand is met because the private facilities tend to be expensive and are only accessible to a few people. There is also an imbalance, particularly in the distribution of tier 2 (specialized public medical clinics) and tier 4 (sub-county referral hospitals). There is only one public specialized clinic in Changamwe with no referral hospitals in Nyali, Kisauni, and Jomvu. Mvita and Likoni have two referral hospitals each. Even though the number of community units (CUs) across all sub-counties is low, there is an almost equal distribution, with each sub-county currently having between 5 to 7 CUs. However, it was observed that most facilities do not meet the required minimum standards for providing services, especially specialized clinics, emergencies, life support, operative surgical cases, and other critical services.

It is suggested that to achieve the goal of health service at delivery points equitably, each sub-county must have at least one hospital and areas currently not served or underserved with health centers and dispensaries, prioritizing populous areas like Jomvu, Mlaleo, and Kisauni. Also, there are 4 public level four hospitals, 11 public healthcare facilities, and 26 dispensaries, according to Mombasa County Health Strategic and Investment Plan 2.

Since the outbreak of COVID-19 in Kenya, Mombasa was hit hard with high numbers of positive cases that saw the health care systems strain to attend to patients from all over the region. This calls for increased capacity empowerment of the medical system in Mombasa to serve the ever-increasing population and act as a dissemination center for other towns around the coastal region.

The World Bank, through "Kenya COVID-19 Health Emergency Response Project (CHERP)," has invested in Health facilities to build capacity to address the COVID-19 pandemic.


The following hospitals are considered for development in Mombasa, Likoni Subcounty Hospital, Port Reitz Hospital, and Tudor District.

Items	Description
	<div style="display: flex; justify-content: space-around;">    </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> Likoni subcounty Hospital Port Reitz Hospital Turdor District </div>
3	<p>Relationship with five agenda and challenges</p> <p>The program relates to the fourth agenda of urban society and community, aimed at improving social living standards of people.</p>
4	<p>Relationship with MGCMP</p> <p>This program is elaborated under social and public facilities development plan, which has a vision of “High Quality of Life (Social and Culture),” and to be achieved, the following policies were developed:</p> <ul style="list-style-type: none"> • Good access with equitable distribution - providing operational medical services in all sub-counties (5 hospitals). • Security of quality service– by recruitment of more health workers, regular training, and capacity building of the experts in order to ease pressure on the healthcare systems.
5	<p>Sub-Components</p> <p><u>Development of medical facilities.</u></p> <p>Currently there is only one Level 5 hospital, situated at the edge of the county, thus the need to develop more equally distributed and high-standard facilities to reach out to more residents as well as reduce caseloads in the referral hospital.</p> <p>The COVID 19 pandemic at hand has portrayed struggles with the number of ICU beds available within the county. This, to some extent, has caused fatalities in cases where people are in dire need of oxygen but could not be assisted in time, since the supply by health facilities is not enough.</p> <p>According to the Physical Planning Handbook of Mombasa county, it is projected that in 2040 there will be a huge gap in total medical centers needed to attend to the estimated over 2 million residents in Mombasa county.</p> <p>Gap: In August 2021, the county government banned home-based care treatment for COVID patients after it was discovered that health workers had turned the initiative into a business platform where they would offer ICU services at a cheaper rate compared to hospitals, which some ask for Kshs. 300,000 before being admitted.</p> <p><u>Human Resource development for healthcare Professionals.</u></p> <ul style="list-style-type: none"> • According to the Kenya Workforce Report, the number of healthcare workers, from doctors to nurses and pharmacists, is worrying since it is less than 20 per 10,000 people. This causes fatigue to the existing healthcare practitioners, especially in public hospitals, which receive more patients compared to private facilities. In turn, the quality of service in public hospitals deteriorates and causes disbelief from the public at large. • Apart from the number, advanced and current training could be conducted regularly to ensure that healthcare workers can combat the situations as they continue to emerge. • Collaborate with Kenya Medical Training College (KMTTC) in Mombasa to build the capacity of health care practitioners. This can be done through training using respiratory disease treatment equipment. <p><u>Public awareness of infectious diseases.</u></p> <ul style="list-style-type: none"> • Infectious diseases pose a main threat of rapid spread that could end up straining and, in worse cases, overrun the healthcare systems. The public at large is the main key to curbing such spreads and avoiding the overwhelming of hospitals. Public awareness on prevention matters through digital and physical media could play a vital role in ensuring there is little spread of infectious diseases. • For example, the county government has been urging its people to strictly adhere to the Ministry of Health guidelines to stop the spread of COVID-19, and it has proved to be effective since there was a drop-in rate of infection within the county. • The project will make use of the CBOs to create awareness in the areas of high populations. For Instance, Likoni, Bamburi, and others.

	Items	Description
6	Expected Outcome	<ul style="list-style-type: none"> Development of Medical Facilities: With new and modernized health facilities, more patients will be attended to as well as reduce the need to travel long distances to access advanced medical services. Human Resource development for healthcare Professionals: Up-to-date training will be the key for healthcare workers to be able to deal with emerging diseases and infections. An increased number of workers will also help reduce cases of workers being overwhelmed and fatigued. Public awareness of infectious diseases: Awareness will prevent spread and prevalence of infectious disease and help the public to practice healthier living standards.
7	Related Organizations	The Mombasa County Government (MCG) will be involved through the department of health services.

Source: JICA Study Team


	Items	Description
1	Program Name	Housing Improvement Program
2	Background	The major contributor to the spread of COVID-19 is the living environment. The locals in Mombasa live in Swahili-style houses, which are crowded and have poor sanitation facilities. Based on the Swahili culture, most people share meals by eating from the same plate ("Sinia"), and through this, there is too much close contact and interactions that tend to be a spreading hazard. The infections of COVID-19 have moved from economic establishments to the living areas of communities. Therefore, there is a need to develop the housing where the members of the public reside.
3	Relationship with five agenda and challenges	This project falls under the urban society and community agenda among the 5 agenda rule.
4	Relationship with MGCMP	The program relates with MGCMP under the social and public facilities and the subcomponents of this project are listed as top priority in the MGCMP under the housing sector development strategy.
5	Sub Components	<p>Establishment of Housing Supply Corporation.</p> <ul style="list-style-type: none"> Demand for well-planned housing in Mombasa is expected to increase in the years to come. According to the county's Department of Housing, there is a deficit of over 380,000 units, translating to a higher deficit in the future since the population growth rate of Mombasa is estimated to be at 3.9% per year. Low-income individuals and middle-class people are the ones with a higher demand for housing. Since COVID-19 was first discovered in the country, it has led to unemployment for many, leading to reduced income and eventually affecting housing affordability. More than 50% of Mombasa residents live in rental houses mostly owned by private individuals. During the COVID-19 period, many tenants were unable to pay their rent, causing turmoil between tenants and owners. It is therefore encouraged to construct more publicly-owned rental houses to meet the housing demand and have incentives that protect tenants in cases of pandemics. <p>Gap: The county government of Mombasa geared up to attain affordable housing in regards to the Big Four Agenda of Kenya by constructing 1,900 house units in the Buxton area. The project commenced in 2016 and was estimated to cost almost Ksh. 6 billion.</p>

	Items	Description
		 <p>Source: Standardnewspaper <i>An Architect impression of Buxton Point in Mombasa. Source: Construction Kenya.</i></p> <ul style="list-style-type: none"> • Due to the lack of a publicly-owned development agency, the county government sub-contracted the project to a private firm. Project completion was delayed, and there were too many legal issues as the developer was accused of not compensating those displaced to pave way for the construction. In the limelight, the project was to provide more than 3,000 jobs to the local youth whose jobs were affected by the pandemic. This calls for a competent government housing cooperation that will be used in developing housing infrastructure while simultaneously encouraging public-private cooperation for smoother and fast construction. • There shall be a technical corporation to support the improvement of the National Housing Corporation (NHC) to deliver the required housing at an affordable cost to the public. <p>Revision of Housing Construction Standards.</p> <ul style="list-style-type: none"> • Cases of building collapsing due to poor construction standards and situations of unhealthy sanitations in residential areas due to poor sewerage construction planning have been on the rise within Mombasa County. Most contractors also tend to acquire construction licenses through doubtful means that in the long run put people residing in the buildings at high risk. According to a report by National Construction Authority (NCA) which is responsible in setting standards and monitoring constructions works, pointed out that between 1990 and 2019 there were more than 200 deaths as a result of 87 cases of building failure and collapse. Out of the 87 cases Mombasa was ranked the third with five cases. • Better and up-to-date housing construction standards that involve follow ups and accountability will ensure improved houses are constructed as well as improve sanitation of Mombasa County by ensuring proper planning of sewerage emissions. • Building capacity of the Mombasa County Government’s building regulation department, through assessment of the areas of need. <p>Gap: Insurance of buildings remains optional, and most owners avoid paying the premiums as it is deemed less important. A comprehensive construction policy that encompasses all variations of building techniques, as well as a review of the current licensing criteria for contractors and construction workers, needs to be developed to ensure better standards of buildings.</p>
6	Expected Outcome	<ul style="list-style-type: none"> • The positive effect that will accrue from the program is the establishment of affordable housing, which is in line with the country’s Big Four Agenda of attaining safe and affordable homes.
7	Related Organizations	<ul style="list-style-type: none"> • Mombasa City County Government • Ministry of Transport, Infrastructure, Housing • Urban Development and Public Works (State Department for Housing and Urban Development)

Source: JICA Study Team

	Items	Description
1	Program Name	Urban Environment Improvement Program along the Northern Corridor
2	Background	The Northern Corridor runs from the Mombasa port and connects landlocked countries

	Items	Description
		to the sea. In recent years, there has been a change in logistics at the port city of Mombasa by the movement of transport of cargo from long-distance trucks to standard gauge railway (SGR). Due to this change, business along the truck route has declined considerably. This effect has been exacerbated by the COVID-19 countermeasures such as the lockdown and the night curfew. Improving the northern corridor is needed as a countermeasure to this effect.
3	Relationship with five agenda and challenges	The program lies under the first agenda of Urban structure among the 5 agenda issues.
4	Relationship with MGCMP	The project is clearly outlined in the section of Northern Corridor city as proposed in the MGCMP
5	Sub Components	<p><u>Study on the role and revitalization of cities.</u></p> <ul style="list-style-type: none"> • Before the standard gauge railway was constructed, the Northern Corridor was ever busy with cargo trucks and long-distance buses. Towns such as Mtito Andei and Voi were booming since they were stops for people to have a break as they traveled from Nairobi to Mombasa. Activities, such as small and medium enterprises for selling artifacts, food vendors, guest rooms, and petrol stations, were heavily used then. After the construction of SGR, there was a drastic drop in the number of people using buses to travel, thus satellite towns were left with fewer customers. Not only did passengers shift to SGR, but also a government directive was introduced in 2018 that all cargo should use the SGR. • With a reduced number of Northern Corridor users, it has caused most cities to turn into ghost towns as there were no profitable businesses anymore. This calls for a need to have a comprehensive study on how to revitalize those towns to restore their economic value and role. • The study will propose ways of revitalizing the towns along the Corridor. <p><u>Promotion of industry in the Promotion of tourism, agriculture, fisheries and textile.</u></p> <ul style="list-style-type: none"> • With reduced users of the Northern Corridor after most passengers opted for the cheap and fast standard gauge railway means of transport, the economic sectors of tourism, agriculture, fisheries, and textile were adversely affected by the change. • Moreover, the COVID 19 pandemic has worsened the situation, especially by limiting night travel, which was quite vital for long-distance travelers, as well as partial lockdowns introduced in the coastal region as mitigation to curb the spread of the virus. <p>The main target cities that need to be supported are:</p> <ul style="list-style-type: none"> • Voi: A resting town or relaxing area for long-distance travelers with issues in tourism, agriculture, and fisheries. • Mtito Andei: Surrounded by vast lands of sisal plantations where locals could make baskets and other sisal products for the Northern corridor users. Other sectors to be considered are the agriculture and textile industries.

	Items	Description
		 <p style="text-align: center;">Source: JICA Study Team Major Towns along Northern Corridor</p>
6	Expected Outcome	<ul style="list-style-type: none"> The positive impacts will be restoration of the towns and cities along the Northern Corridor, which have been greatly affected by the SGR and the COVID-19 pandemic.
7	Related Organizations	<ul style="list-style-type: none"> Ministry of Transport, Infrastructure, Housing Urban Development and Public Works (State Department for Housing and Urban Development) Counties along the Northern Corridor (Mombasa, Kwale, Taita Taveta, Makueni, Kajiado, Machakos)


Source: JICA Study Team

	Items	Description
1	Program Name	Expansion and Repair Programs for Water Supply Systems
2	Background	<p>Mombasa County has 1.2 million people around the water supply service area, but it is disheartening that only 30% have a water supply. Moreover, according to a report for the year 2019/2020 by the Water Services Regulatory Body (WASREB), 60% of total connections is dormant, and 51% of total supplied water is lost through non-revenue water. Mombasa, being a regional city, needs to improve the living environment, especially the water supply, to curb the spread of COVID-19 infections. This can be done by expanding the existing water supply infrastructure and reducing the non-revenue water (NRW) to meet the targets of less than 30% set by the country for Vision 2030 under the National Water Services Strategy (NWSS).</p>
3	Relationship with five agenda and challenges	<p>This program is under the urban society and community and urban structure among the 5 agenda issues.</p>
4	Relationship with MGCMP	<p>The program is associated with the MGCMP and is under urban infrastructure which is set to expand and restore old pipelines that cause water to be lost as NRW as well as sewerage systems for better sanitation of Mombasa county.</p>
5	Sub Components	<p><u>Water supply network.</u></p> <ul style="list-style-type: none"> The water demand in Mombasa county stood at 200,000 m³ in 2018 to serve a total population of 1.2 million people, but it gets only a supply of 3,500 cubic meters of water. This translates to more than half of the total population in Mombasa county lacking water supply is an alarming figure, especially during this COVID-19 pandemic where people are encouraged to wash their hands regularly. Also, with more than

	Items	Description
		<p>50% loss of total water supplied, this causes concern to the number of people that could receive a similar amount, thus raising the total water supply by half.</p> <ul style="list-style-type: none"> According to a statement by the Director of Mombasa Water Supply and Sanitation Company (MOWASCO), there are pipeline connections dated back to 1902, which have never been refurbished or maintained but are still in use. This causes lots of water leakages, as well as water quality, which is questionable on contamination by rust and metal components thus putting the life of Mombasa residents at risk. The 220 km Mzima pipeline network has been dilapidated, and repair efforts have been made by Coast Water Works Development Agency to boost water supply. Proper maintenance, restoration of old pipeline connections, and construction of the additional pipeline will help increase the total water supply within the county. <p>Gap: has limited freshwater resources, and the ocean water is expensive to desalinate to be fit for drinking. However, the county government signed an agreement with two foreign companies from Spain and Switzerland to put up four desalination plants worth 16billion shillings. They include:</p> <ul style="list-style-type: none"> Mombasa Mainland Desalination Plant - to be located on the mainland with an estimated output of 100,000 m³ daily. Mombasa West Desalination Plant – to be located on the western side of Mombasa mainland, with a planned capacity of 100,000 m³ daily. Likoni Major Desalination Plant -to be located in Likoni, with a planned capacity of 70,000 m³ daily. Likoni Minor Desalination Plant - to be located in Likoni, with a planned capacity of 30,000 m³ daily <p>Pump</p> <p>According to Mombasa County, there is inadequate water supply with the few boreholes available operated by private investors, non-governmental organizations (NGOs), and community-based organizations (CBOs) and hence only serve a small area. The water is from Mzima Springs, Baricho Wellfield, Marere Springs, and Tiwi Wellfield, and most water sources for Mombasa residents are obtained outside the county. Hence, the construction of various pumps will be able to supply water to various regions of Mombasa county where there is inadequate water supply, thus improving its sanitation to curb the spread of COVID-19.</p>
6	Expected Outcome	<ul style="list-style-type: none"> Increase in revenue by reduction of NRW. Improvement of living environment with a clean supply of water. Improving sanitation and economic activities.
7	Related Organizations	<ul style="list-style-type: none"> Mombasa County Government Coastal Water Service Board Mombasa Water Supply & Sanitation Company

Source: JICA Study Team

	Items	Description
1	Program Name	Bus station/terminus improvement program
2	Background	Public transport is the most used means of transport in Mombasa. It includes matatus, buses, and tuk-tuks. According to research, Nyali Bridge, Makupa causeway, and ferry terminus showed the highest population of passengers using the terminus to various locations since it is the entry point connecting Mombasa town to the south, west, and north of Mombasa. There has been congestion in the city center due to the lack of a proper bus terminus. The commuters do not have proper bus waiting areas, and the available points are congested and act as spreading zones for COVID-19. In order to address this problem, there is a proposal for a bus station program.
3	Relationship with five agenda and challenges	This program is under the urban structure and urban society and community
4	Relationship with MGCMP	The program was captured in the master plan as constructing proper facilities for matatus though this was to be inside the railway city. This program proposes the terminus at other

	Items	Description
		identified locations as well. The main goals were the development and improvement of main stations and intermediate stations.
5	Sub Components	<p><u>Bus Terminal Development at Buxton Roundabout (short-term)</u></p> <ul style="list-style-type: none"> • Bus Terminal Development at Buxton Roundabout. According to the County Government of Mombasa, there is no ample parking for the passenger matatus, which picks and drops passengers. Construction of the Bus terminal would be able to serve the population on the Nyali corridor serving as the entry point from the west in easing the congestion of matatus along the road and also a waiting bay to rest. • The construction will include the development of a bus station through the erection of passenger shade and a vehicle waiting bay. There is also an ongoing project that looks into the signalization of the Buxton roundabout to enhance the flow of traffic. <p><u>Bus Terminal Development at old railway station front (short-term)</u></p> <p>Bus terminal development at old railway station front. Currently, there is no proper bus terminal at the old railway station to facilitate the movement of people using the train to various destinations. The project would facilitate the transportation of people, and the facilities provided at the station would improve sanitation by decreasing the spread of COVID-19 among people.</p> <p><u>Bus Terminal Development at Likoni Ferry Roundabout</u></p> <p>Likoni Ferry has a high population of people from the south of Mombasa going to the city and vice versa. Development of the bus terminus would help ease the movement of people from and to Mombasa CBD. At the Likoni Ferry, over 250,000 passengers use the route per day, and to manage the population, a terminus would be important wherein it provides the basic facilities.</p>  <p>Source: JICA Study Team</p> <p>Major Transport Locations and Intersections</p>
6	Expected Outcome	This would improve the public transport facilities in Mombasa County. Easier access of public transport to various routes
7	Related Organizations	Mombasa City County Government

Source: JICA Study Team

	Items	Description
1	Program Name	Livelihood Improvement Program
2	Background	Mombasa is the second largest city in Kenya that experience mass movement of people from rural areas to the urban in search of a job. According to the 2019 census, Mombasa's population was 1,208,333, with a higher population of 58% being low-income earners

	Items	Description
		running their small businesses and others being unemployed. Due to high housing prices, most people opt to live in low-income houses and others in the slums. The COVID-19 pandemic has exposed the underlying issues of living in the slums and low-income houses enforcing social distancing, and other response measures have proved to be challenging in slums. Moreover, it has been the breeding area of crime as a majority of the dwellers have lost their livelihood sources since the pandemic. In Mombasa, some of the slums are relocated closer to the Indian Ocean and are a source of pollution due to the lack of proper wastewater/sewerage system.
3	Relationship with five agenda and challenges	It is closely related to urban society and community and urban structure in the 5 agendas
4	Relationship with MGCMP	This was proposed as a low-income housing project with the utilization of private developers, whereby they are allowed to construct housing units, including lower income if they construct more than a certain area.
5	Sub Components	<p>Upgrading of slums in Uhuru Owino</p> <ul style="list-style-type: none"> According to World Bank, 44% of people live under the poverty line. Slums contain a high population of individuals both low and middle-income earners. The conditions in the slums are not favorable such as inadequate health facilities, lack of proper housing and sanitation, and inadequate water. All these poor conditions facilitate the elevation of COVID-19 cases and thus the project needs to be undertaken to supply all these basic needs to the population to decrease the spread of COVID-19. Under Vision 2030, there is a slum upgrading program. The program started at Ziwa la Ng'ombe slum, with a population of about 20,000 in May 2007 is implemented by UN-HABITAT. Poor urban planning has facilitated the increase of densely populated areas and also a lack of land to improve the conditions of the dwellers as most people living in slums are tenants and not the real owners of the slum lands. Moreover, financial assistance to help upgrade the slums pose a big challenge as the government is mostly dependent on financial aid or private sectors to build the houses. The upgrade should incorporate technology that will result in low-cost and affordable housing. This is due to the limitation of old resources. <p>Building technical skills through training</p> <ul style="list-style-type: none"> As of 2020, the COVID-19 Pandemic rendered approximately 24,000 households jobless with no source of income and livelihood. According to 2019 data, the number of unemployed people was 46%, and due to the pandemic, it increased by 2%. Most migrants from rural areas to the urban areas end up living in slums due to unaffordable houses due to a lack of technical skills to perform various jobs apart from their specialized jobs. The development of a program to offer training would enhance various individuals with skills to operate various activities, thus earning a source of livelihood to meet their basic needs. The training should be mainly on technical courses that are in high demand in Mombasa and Kenya at large. This would ensure a steady source of livelihood for the trained youths.
6	Expected Outcome	<ul style="list-style-type: none"> The project would build resilience to the poor in the selected slums. The imparted technical skills will enable the selected persons to earn a livelihood
7	Related Organizations	Mombasa County Government

Source: JICA Study Team

	Items	Description
1	Program Name	Tourism Improvement Program
2	Background	According to the Ministry of tourism and wildlife, Kenya is the third country receiving tourists in Africa after South Africa and Nigeria. In 2019, the number of tourists arriving in Kenya with the main entry points being Jomo Kenyatta Airport and Moi international airport. Mombasa airport registered a substantial growth of 8.56%, while Nairobi

	Items	Description
		<p>registered an increased growth of 6.07%. Mombasa County and surrounding areas are originally famous for beautiful beaches, marine resources, activities, and natural sites such as Lamu old town and Fort Jesus. However, due to the outbreak of the COVID-19 pandemic, the Mombasa tourism sector was greatly affected to the point that most hotels were temporarily closed, and later on, to revive the tourism economy they encouraged domestic tourism. The main reasons for the decline are due to restrictions on movement, and most tourists feared being infected with COVID-19. This, therefore, calls for various strategies to be put in place to improve the tourism sector for the post-COVID recovery.</p>
3	Relationship with five agenda and challenges	<p>The program is under the urban society and community with the aim of improving the status and standards of the community through employment, good infrastructure and maintenance of environment</p>
4	Relationship with MGCMF	<p>This program is elaborated under the capacity development for marketing and Promotion whose vision is " to be a top ten tourist destination offering high-end, diverse, and distinctive visit experiences." This is through offering new products, expanding tourist expenditure per capita, and improving her international marketing strategies.</p>
5	Sub Components	<p><u>Capacity Development for Marketing and Promotion.</u></p> <ul style="list-style-type: none"> • Capacity Development for Marketing and Promotion. There is limited attraction and utilization of existing facilities that can promote tourism activities in the coastal region. Capacity development through assessment and research to identify the gaps in the marketing industry will enhance the ability of the tourism industry and market tourism endowments and develop tourism products that appeal to overseas, regional and domestic tourists and do promotions, and provide information as to where they can buy the offerings that they need, in turn receiving value. According to the Mombasa Master plan, most tourism sites are not known, there are limited tourist promotions, a lack of marketing and promotion plan, and a lack of proper distribution of tourist information. All these are the requirements that boost the tourism industry. • The capacity development should be done through corporation with the industry players such as the hotel owners, hotel workers, drivers and guides, and the local tourist sites' day-to-day caretakers <p><u>Developing a safe, efficient, simple-to-use mobility and transportation network in the tourist core zone in Mvita (Island)</u></p> <ul style="list-style-type: none"> • Developing a safe, efficient, simple-to-use mobility and transportation network in the tourist core zone in Mvita (Island). Currently, the county does not have an operating transportation network that would easily facilitate the movements of tourists. This program would help the easier movement of the tourist hence they would stay for a longer period. Improvement of the transport sector facilitates accessibility to remote areas whereby the local people can move from the destination origin to new places for tourism and leisure hence promoting the facilitation of domestic tourism. • This will be implemented through the involvement of all the tourism players in the region which include; hotel owners, transport company owners, drivers and other support facilities to the tourism industry such as shopping Malls. <p><u>Public Wi-Fi Installation</u></p> <ul style="list-style-type: none"> • Public Wi-Fi Installation. Mombasa County has not developed public access to Wi-Fi, only private Wi-Fi is available for various businesses, hotels, and offices. Installation of public wifi will be done at strategic points for easier connection by tourists moving around the region since they can access various tourist sites by online searching. • This will, in turn, improve/boost the tourism sector, especially during the post-COVID recovery. <p><u>Cultural Heritage Restoration (improvement of the facilities at Fort Jesus)</u></p> <ul style="list-style-type: none"> • Cultural Heritage Restoration (improvement of the facilities at Fort Jesus). As of now, the Fort Jesus building has deteriorated, and even some parts of the building are about to collapse so some places in the building cannot be accessed by tourists.

	Items	Description
		<ul style="list-style-type: none"> This project would facilitate the repair of some regions in the building to ensure accessibility and safety for the tourist to visit. <p><u>Natural environment improvement (beach, water)</u></p> <ul style="list-style-type: none"> Natural environment improvement (beach, water). The environment around the ocean is not favorable since various basic sanitary facilities such as toilets are not available, and most industries dispose of their raw waste in the ocean. This project would facilitate the development of basic sanitary facilities and ensure good waste management by restricting raw waste disposal. The beach Management Units, the tourist guides, and hotels will also be involved in addition to the government agencies.
6	Expected Outcome	<ul style="list-style-type: none"> Improve the attractiveness of tourism resources in Mombasa, including cultural heritage and natural conditions. The program will give impetus to the recovery of tourism from the effect of COVID-19.
7	Related Organizations	<ul style="list-style-type: none"> Mombasa County Government Ministry of Tourism

Source: JICA Study Team

10.3 JICA Project Formulation

10.3.1 Conditions of proposal of the projects

The programs/projects to be implemented as JICA programs are as follows, which were selected based on the stated conditions.

- Consistency with Kenya's Assistance Policy and Priority Areas:
 - Mombasa SEZ, Nairobi Metropolitan Area, Logistics, Infectious Diseases
- Possibility of cooperation with related support programs: yen loans, grant aid, technical cooperation, JOCV
 - Complementary relationship, the possibility of creating synergy effects
- Application of Japanese technology and the possibility of DX
- Relationship with ODA strategies such as Free and Open Indo-Pacific (FOIP)
 - Relationship with Economic Corridor Development and positioning of Mombasa
- Relevance to the post-COVID-19 environment:
 - Restrictions on movement (masks, curfews, opening hours of restaurants, etc.) have been lifted, but social distancing and sanitary conditions are recommended to continue
 - Public transport, handwashing
 - The number of tables in restaurants is still small.
 - Impact on employment and income.

10.3.2 Proposed JICA Cooperation Projects

The programs/projects to be implemented as JICA programs are as follows:

1) Regional Medical System Improvement Program (Technical Cooperation)

(i) Background

- Mombasa County is situated along the coastline of Kenya and is a regional hub with a major port that serves Kenya and regional landlocked countries.
- During the COVID-19 pandemic, patients from other counties gathered in the hospital in Mombasa and disturbed regular medical service.
- COVID-19 spreads through household members
- The development of medical staff and human resources will significantly impact the delivery of services to available hospitals. The number of staff at the facilities is few, and some lack the necessary training. The training will improve the service offered to COVID-19 patients at the facilities.
- This will enable the public to be aware of the best available methods to prevent infectious diseases. This, in turn, will create awareness on COVID-19 infections and the do and don'ts, therefore, reducing infections and building the resilience of the community.

(ii) Project Area

Mombasa County

(iii) Project Period

Three years

(iv) Outline of the Project

Overall Goal: Risk of spreading infectious diseases is reduced

Project Purpose: Capacity on health management is strengthened

Outputs:

Output 1: Public awareness of infectious diseases improves

Output 2: Capacity building of health worker on virus preventive measures improves

Activities

Activity 1-1: Conduct a public consultation meeting to confirm the needs identified

Activity 1-2: Prepare manual on public awareness on infectious diseases

Activity 1-3: Conduct social awareness workshop

Activity 2-1: Conduct a key stakeholder meeting of health care practitioners

Activity 2-2: Collection of information on health-related matters

Activity 2-3: Prepare manual on health workers on management of infectious diseases

Activity 2-4: Conduct a workshop to carry out induction of the manual

(v) Stakeholders

- Mombasa county government
- Hospital (Subcounty hospitals: Changamwe, Jomvu, Kisauni, Nyali, Likoni and Mvita)

2) Regional Medical System Improvement Program (Grant Aid)

(i) Background

- Mombasa county is situated along the coastline of Kenya and is a regional hub with a major port that not only serves Kenya but also regional landlocked countries.
- Facilities are not enough to cover patients outside Mombasa.

(ii) Project Area

Mombasa County

(iii) Project Period

Three years

(iv) Outline of the Project

Overall goal: Risk of spreading infectious diseases is reduced

Project Purpose: Referral medical services improves

Outputs:

Output 1: Subcounty hospitals buildings are constructed/renovated.

Output 2: Medical equipment is provided

Activities

- Carry out an audit of the health facilities selected. The information to be analyzed is the available number of HCW, beds in ICU and general ward beds, and health care equipment. The audit shall also take an inventory of the number of patients attended to and the time taken to attend to a patient from the point of registration to the point of being attended to by a doctor.

- Design and construction and equipment procurement

(v) Stakeholders

- Mombasa County Government
- Hospital (Subcounty hospitals: Changamwe [Port Reitz], Likoni, Tudor)

3) Urban improvement program along the Northern Corridor (Technical Cooperation)

(i) Background

- The Northern Corridor runs from the Mombasa port and connects landlocked countries to the sea. In recent years, there has been a change in logistics at the port city of Mombasa by the movement of transport of cargo from long-distance trucks to standard gauge railway (SGR). Due to this change, business along the truck route has declined considerably. This effect has been exacerbated by the COVID-19 countermeasures such as the lockdown and the night curfew.
- The promotion of tourism sites and activities, agriculture, fisheries, and textile while diversifying their economic activities is essential to revitalize the economic activity along the Northern Economic Corridor.

(ii) Project Area

Major towns along the Northern Economic Corridor (between Mombasa and Nairobi): Konza, Mito Andei, Voi

(iii) Project Period

Three years

(iv) Outline of the Project

Overall goal: Economic activity along the Northern Economic Corridor is accelerated

Project Purpose: Urban and economic plan preparation capacity is strengthened

Outputs:

Output 1: Understand the current economic situation of selected urban areas

Output 2: Prepare plan of the selected urban areas (sectoral plan and spatial plan based on County Government Act)

Output 3: Prepare detail on priority projects

Activities

Activity 1-1: Conduct a kickoff meeting with key stakeholders in the identified towns

- Activity 1-2: Conduct survey on economic and social situation
- Activity 1-3: Prepare base map
- Activity 2-1: Prepare development strategy
- Activity 2-2: Prepare land use plan
- Activity 2-3: Prepare infrastructure plan
- Activity 2-4: Prepare urban development projects
- Activity 2-5: Prepare promotion plan
- Activity 3-1: Select priority project
- Activity 3-2: Conduct meeting with key stakeholders for views on priority projects
- Activity 3-3: Prepare detail on priority projects
- Activity 3-4: Disclosure of the projects to the relevant government agencies

(v) Stakeholders

- Ministry of Transport, Infrastructure, Housing and Urban Development
- Urban Development and Public Works (State Department for Housing and Urban Development).
- Counties of towns along the Northern Corridor (Mombasa, Kwale, Taita Taveta, Makueni, Kajiado, Machakos).
- Northern Corridor Transit and Transport Coordination Authority (NCTTCA)

4) Tourism Development Plan and Implementation of Capacity Development Project (Technical Cooperation)

(i) Background

- Tourism worldwide has been affected by the COVID-19 containment measures involving restrictions on movement. The tourists are also afraid of exposure to COVID-19, limiting their movement.
- Persons working in the tourism sector were greatly affected. The skills should be technical to increase their earning levels, therefore, building resilience in future.
- It is critical to improving the status of the tourism attraction facilities to boost them in the recovery phase in a post-COVID-19 era.

(ii) Project Area

Mombasa county, Kilifi County, Kwale county

(iii) Project Period

Three years

(iv) Outline of the Project

Overall goal: Economic activity in Mombasa is accelerated

Project Purpose: Tourism plan and implementation capacity is strengthened

Outputs:

Output 1: Tourism promotion capacity is strengthened

Output 2: Tourism products development capacity is strengthened

Output 3: Tourism infrastructure development capacity development is strengthened

Activities

Activity 1-1: Conduct a kickoff meeting with key stakeholders in the tourism industry

Activity 1-2: Conduct marketing survey

Activity 1-3: Prepare tourism marketing strategy

Activity 1-4: Prepare tourism promotion material

Activity 2-1: Identify tourism resources

Activity 2-2: Develop tourism products (beach, natural, cultural)

Activity 2-3: Conduct pilot project for developing tourism products

Activity 3-1: Conduct survey on tourism infrastructure

Activity 3-2: Conduct tourism infrastructure demand analysis

Activity 3-3: Prepare tourism infrastructure development plan sign board, pedestrian path, old town renovation

Activity 3-4: Disclosure of the plan to key stakeholders and updating to incorporate the views

(v) Stakeholders

- Mombasa County Government as implementing agency
- Kwale County Government as implementing agency
- Kilifi County Government as implementing agency

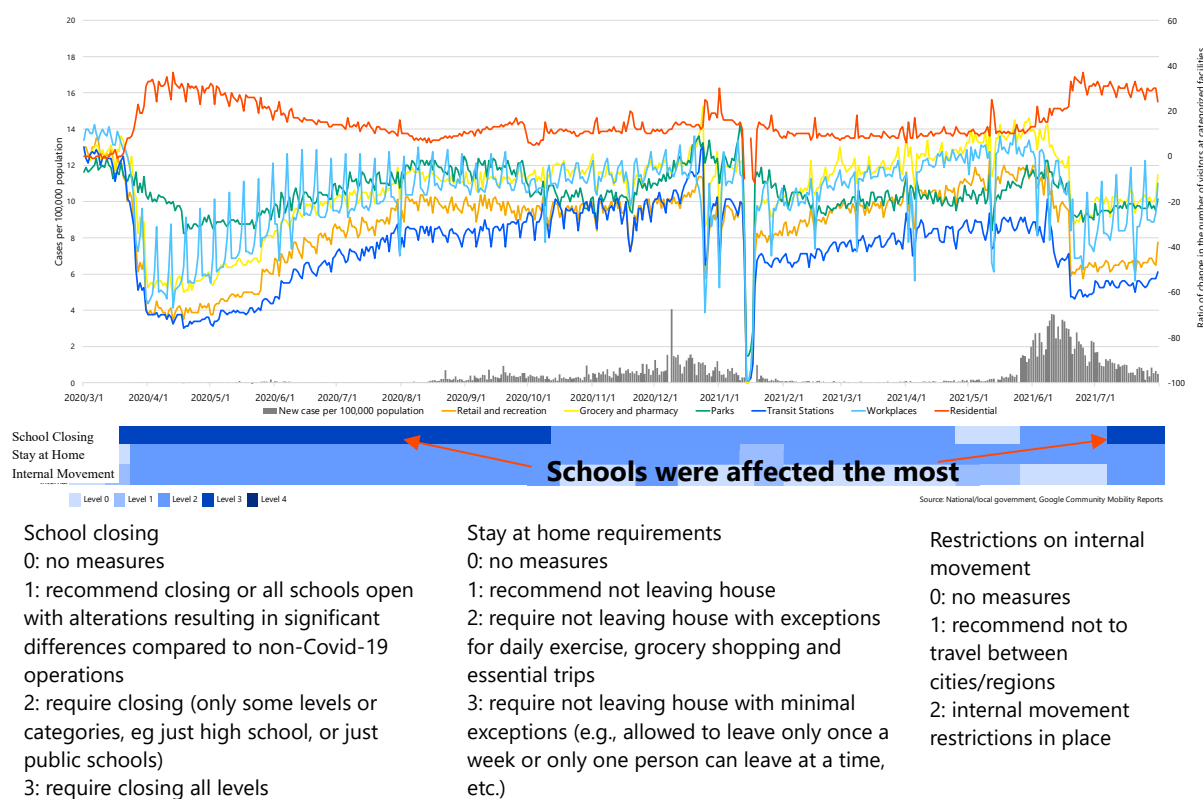
11. Formulation of Cooperation Project in Kampala

11.1 New Urban Problems Revealed by COVID-19

11.1.1 Overview of COVID-19 Pandemic

Uganda saw a surge in COVID-19 cases in October 2020 since being hit by the pandemic. After it subsided at the beginning of 2021, the number of new cases remained extremely low, even dropping below 100 per day from February onwards, but it rebounded in May 2021 with the arrival of the Delta variant. Intensified control measures reduced the number of new infections once again to around 200 per day in August. Then, the Omicron variant brought a new wave of infections in December 2021, though it ended in mid-January 2022.

Uganda's stringent containment measures remained in place from March 2020 to January 2022, regardless of the number of infections. In particular, schools were fully closed for months, from April to September 2020 and from July to December 2021 (see Figure 11.1.1).



Source: Prepared by the JICA Study Team based on data collected from Google and the University of Oxford

Figure 11.1.1 COVID-19 Pandemic in Uganda

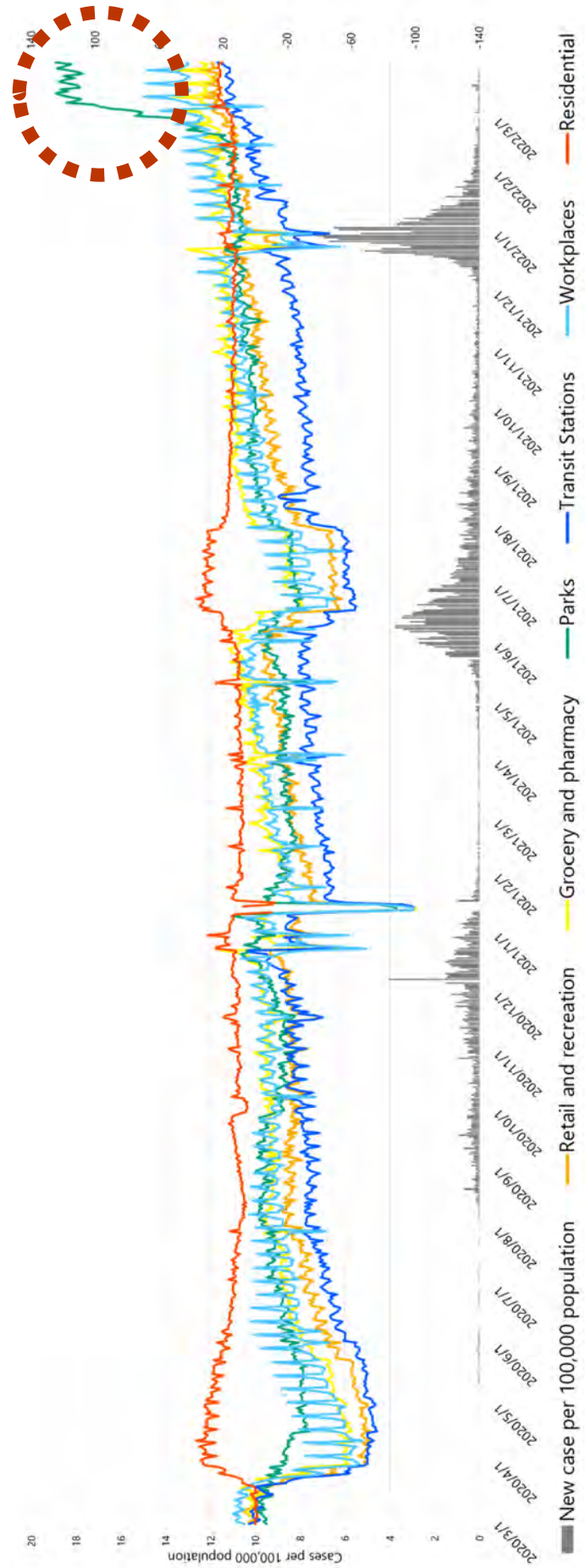
According to the Government of Uganda, the main reasons for keeping infection control measures in place for such a long period include underdeveloped infrastructure, poor urban sanitary conditions, and difficulties in social distancing.

On 10th January 2022, the Government of Uganda decided to lift its curfew, which was put in place for almost two years while the infection cases due to the Omicron variant were still high.

Other restrictions were also gradually lifted on that day, including school reopening. However, for the reopening of bars, the presentation of vaccination certificates became mandatory,

and for public schools, face-to-face classes were in rotation.

Furthermore, by the end of January 2022, the restriction on business hours of motorcycle taxis (boda-bodas) was also lifted, and the government has decided to steer the policy from with-COVID-19 to post-COVID-19 by moving the economy. Since February 2022, after lifting these restrictions, the flow of people to parks increased sharply in Uganda, and it can be said that people's behaviors, as well as needs, are changing (see Figure 11.1.2).



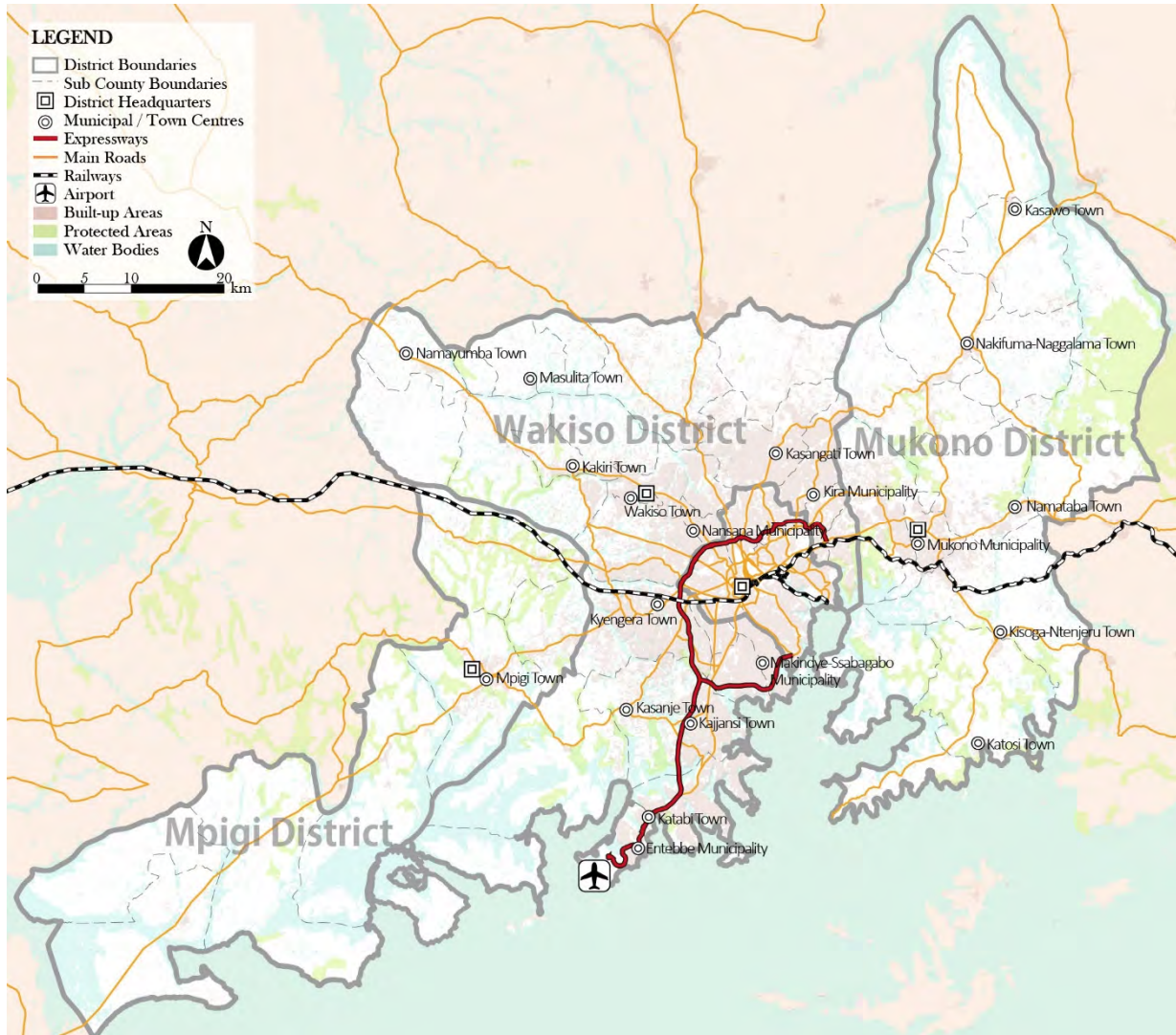
Source (COVID-19 Positive Cases): Ministry of Health Uganda

Source (Mobility): Google COVID-19 Community Mobility Report

Figure 11.1.2 Daily COVID-19 Infection Cases and Changes in Movement in Uganda (March 2020–March 2022)

11.1.2 New Urban Problems Revealed by the COVID-19 Pandemic

The Greater Kampala Metropolitan Area (GKMA) is defined by the Kampala Capital City Act amended in 2019, consisting of Kampala Capital City and its surrounding three districts (Wakiso, Mukono, and Mpigi) for the purpose of coordinating physical plans.



Source: JICA Study Team

Figure 11.1.3 Map of the Greater Kampala Metropolitan Area

The GKMA has an urban development master plan, the Kampala Physical Development Framework / Kampala Physical Development Plan 2012 (KPDF/KPDP 2012) prepared with the support of the World Bank, and the Multi-Modal Urban Transport Master Plan for Greater Kampala Metropolitan Area (MMUTMP) formulated in 2018 covering both Kampala Capital City and parts of Wakiso District and Mukono District called the Kampala Special Planning Area (KSPA). The COVID-19 pandemic highlighted the significance of some of the urban problems identified in these master plans.

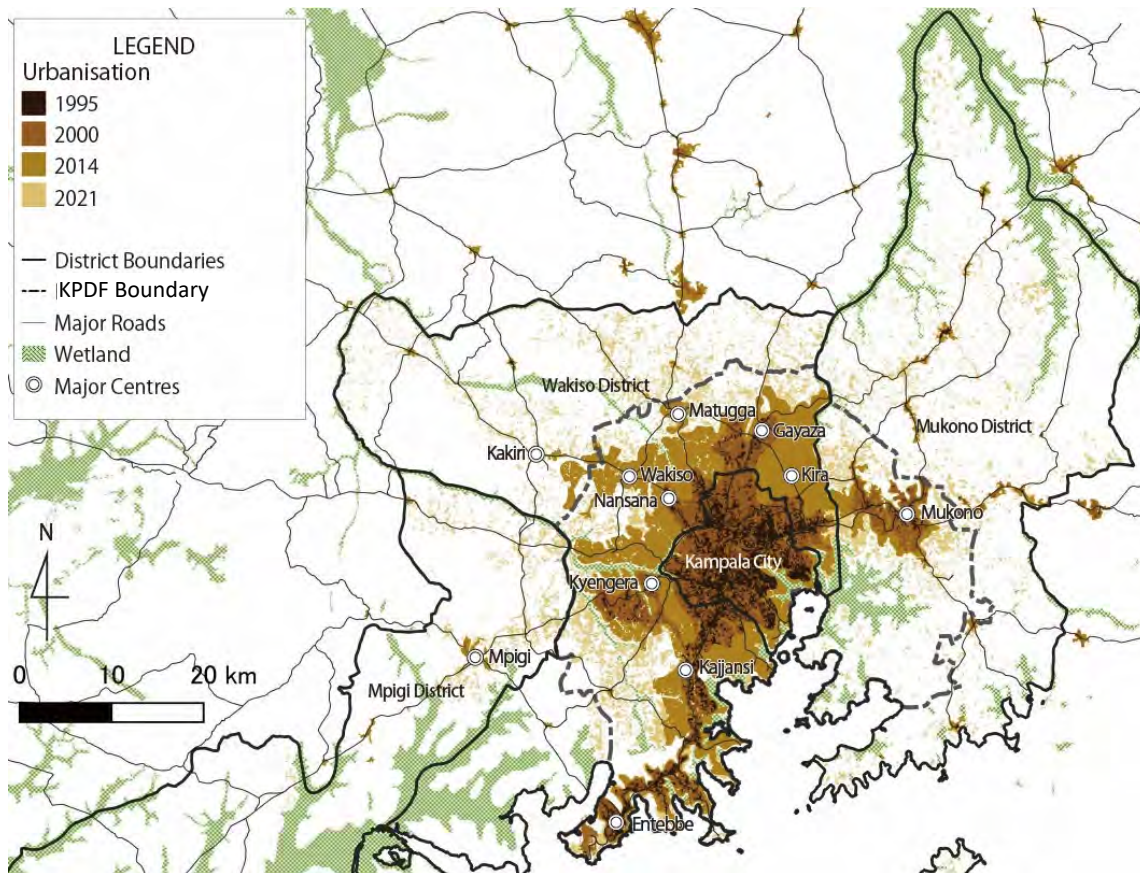
Major problems the GKMA is facing in adapting to the new normal life with/post-COVID-19 in urban areas are as follows:

- High population density resulting from overconcentration in the city center
- Underdeveloped public transport systems

- Limited basic infrastructure
- Poor administrative services and social infrastructure (e.g., schools, health facilities, and markets)
- Lack of open space

11.1.3 Urban Spatial Structure

The urban area is spreading, covering an area with a radius of around 20km centered in the city center of Kampala as of 2021. This means that the urbanization has not just covered most of the target area of the Kampala Physical Development Framework (KPDF) 2012 but partly spread beyond it.



Source: OCG, YEC, PACET, and Pasco (2022) Progress Report 1 on the Project for Integrated Urban Development Master Plan for Kampala Special Planning Area (Prepared based on ALOS data)

Figure 11.1.4 Urbanization in the Greater Kampala Metropolitan Area

While urbanization is spreading beyond Kampala City's boundary, the urban functions of the GKMA are still concentrated in Kampala Capital City because other urban centers are underdeveloped. This extreme centralization has caused traffic congestion, slum formation, land shortages, and land price hikes in Kampala.

According to the Population and Housing Census 2014, the population of the GKMA was 4,351,850, with approximately 1.50 million residents in Kampala Capital City and approximately 2.85 million residents outside the capital city. Furthermore, comparing the population growth rates of Kampala City, Wakiso District, Mukono District, and Mpigi District, the Wakiso District stands out with an average annual growth rate of 6.79% for the years between 2002 and 2014.

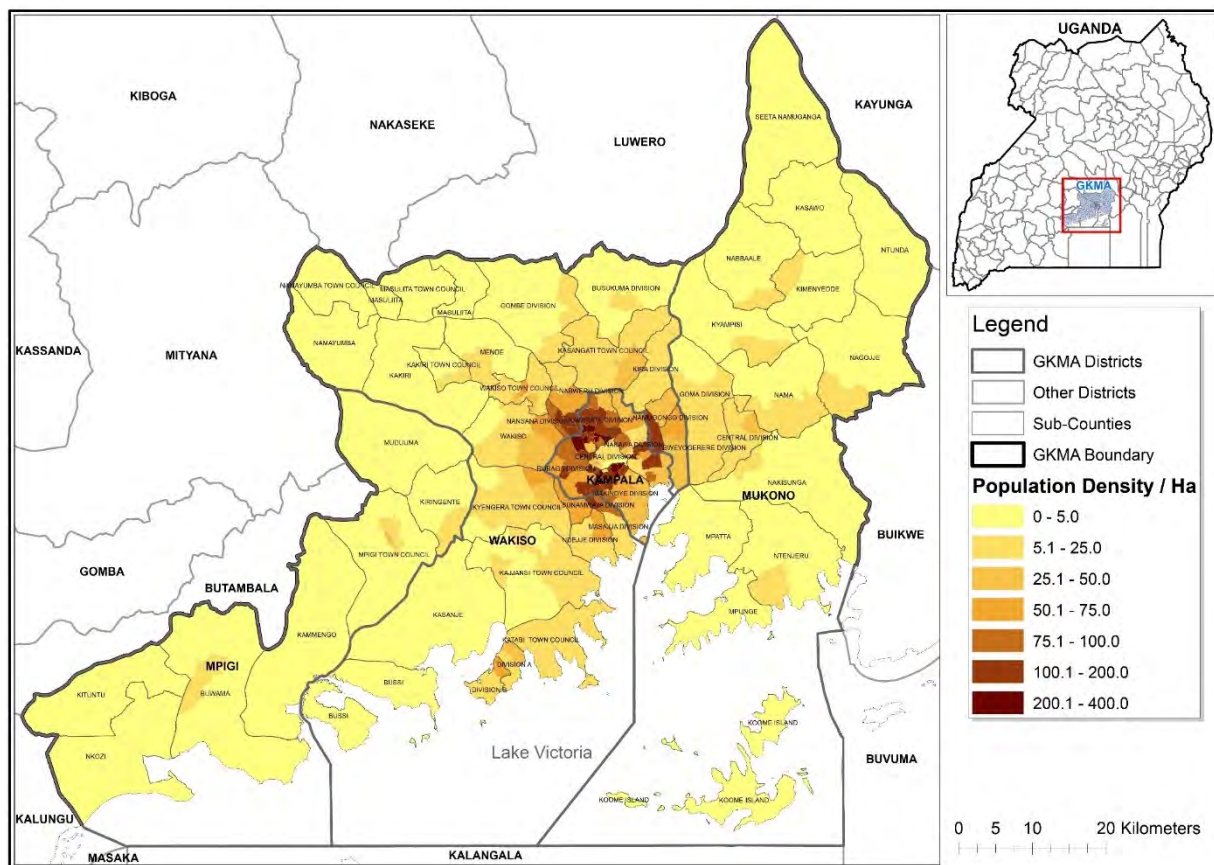
In the meantime, suburban residents outside Kampala City made up three-fifths of the population in KSPA, according to the 2014 population census, and are growing rapidly at an annual average rate of over 8%.

Table 11.1.1 Urban Population Numbers in the Greater Kampala Metropolitan Area

	Surface Area	Population		Growth Rate 2002-14	Population Density 2014
		2002	2014		
Kampala City	189 km ²	1,189,142	1,507,080	1.99%	7,974 people/km ²
Wakiso District	1,917 km ²	907,988	1,997,418	6.79%	1,042 people/km ²
Mukono District	1,850 km ²	423,052	596,804	2.91%	323 people/km ²
Mpigi District	1,206 km ²	187,771	250,548	2.43%	208 people/km ²
Total of 3 Districts in GKMA	4,973 km ²	1,518,811	2,844,770	5.37%	572 people/km ²
GKMA	5,162 km ²	2,707,953	4,351,850	4.03%	843 people/km ²
Outside of Kampala City in KSPA	1,261 km ²	755,327	1,929,351	8.13%	1,530 people/km ²
KSPA	1,450 km ²	1,944,469	3,436,431	4.86%	2,370 people/km ²

Source: UBOS (2016) Population and Housing Census 2014 (Population in KPSA is estimated by the JICA Study Team)

Moreover, a closer look at the suburbs outside Kampala City shows that suburbs closer to Kampala City have a higher population density and a faster population growth rate. In these areas, there are also growing concerns about the lack of basic infrastructure in these rapidly urbanizing areas (see Figure 11.1.5).

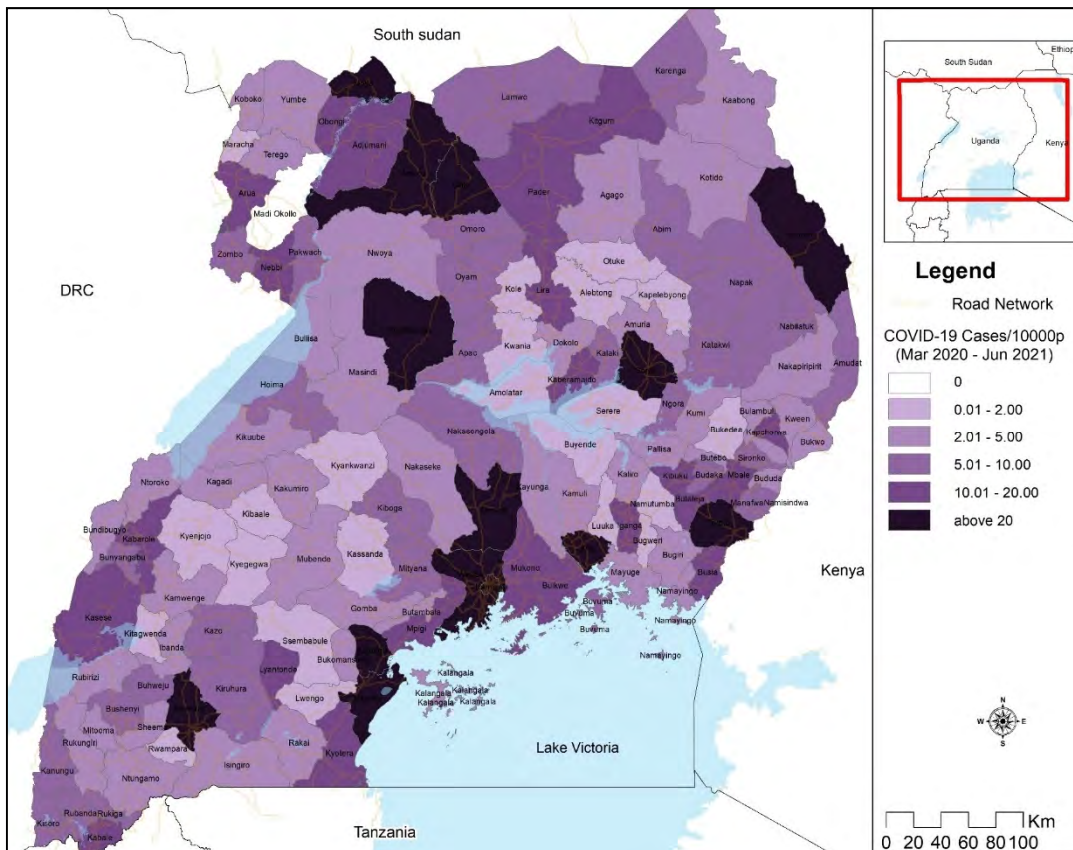


Source: Uganda Bureau of Statistics (2014) Population Census

Figure 11.1.5 Population Density by Parish in the Greater Kampala Metropolitan Area (2014)

It is not only basic infrastructure that is lacking in the GKMA. During the strict lockdown between April and June 2020, it was reported that many people started to jog and walk on the Northern Bypass for exercise and recreation. In rapidly urbanizing cities, there is usually a lack of open space or parks, too.

As mentioned above, the concentration of urban functions in Kampala City has made the city a destination for many commuters from surrounding municipalities and increased congestion in markets and taxi terminals in the city. The ratio of COVID-19 cases to the nighttime population is much higher in Kampala City than in other municipalities, which is attributed to its large daytime population, high flow of people, and crowded areas.



Source: Ugandan Ministry of Health

Figure 11.1.6 Infection Numbers Per 10,000 People in Uganda (March 2020 to June 2021)

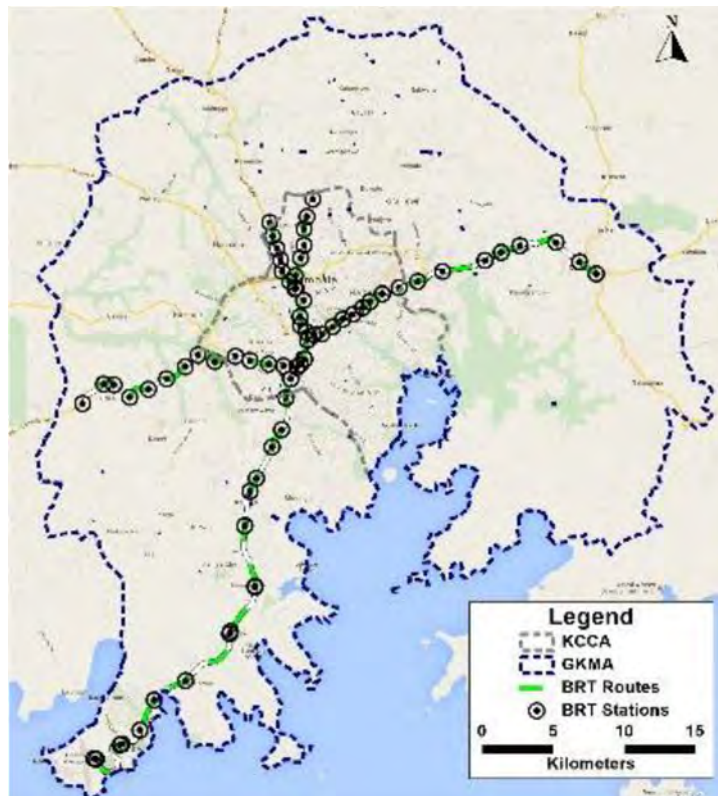
Given the continued population flow to the GKMA, it is expected that an increasing number of people, including business owners, will leave Kampala City to avoid overcrowding. This may lead to an increased need to decentralize urban functions from Kampala City to other urban centers. In that case, it will be necessary to prepare physical development plans and basic infrastructure projects to build sub-centers with surrounding settlements for different population segments outside Kampala City.

11.1.4 Transport Sector

In Uganda, where privately operated minibusses (taxis) and boda-bodas are widely used for public transport, it is necessary to introduce a bus rapid transit (BRT) system and other medium- to large-sized bus services, as mentioned in the existing plans. This has become even more urgent due to the increasing commuter inflow to Kampala City driven by

population growth in the GKMA, and the Ministry of Works and Transport (MoWT) is also working hard to accelerate BRT pilot projects.

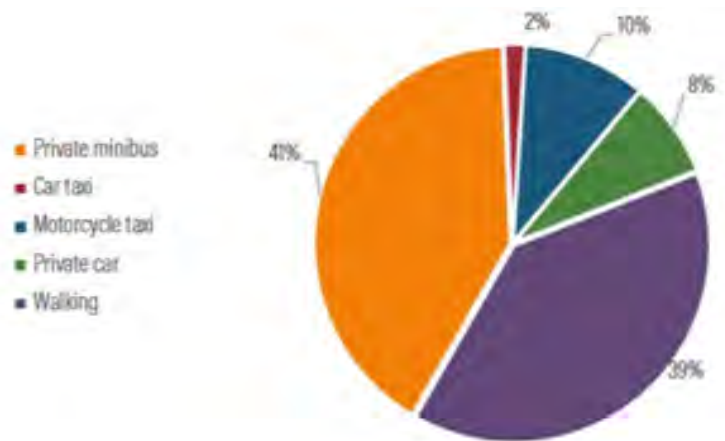
Moreover, there are only two taxi terminals (taxi parks) located close to each other in the center of Kampala City, though taxis are a major means of public transport in the GKMA. Therefore, these taxi terminals and their surrounding areas are always extremely crowded.



Source: KCCA (2018) MMUTMP

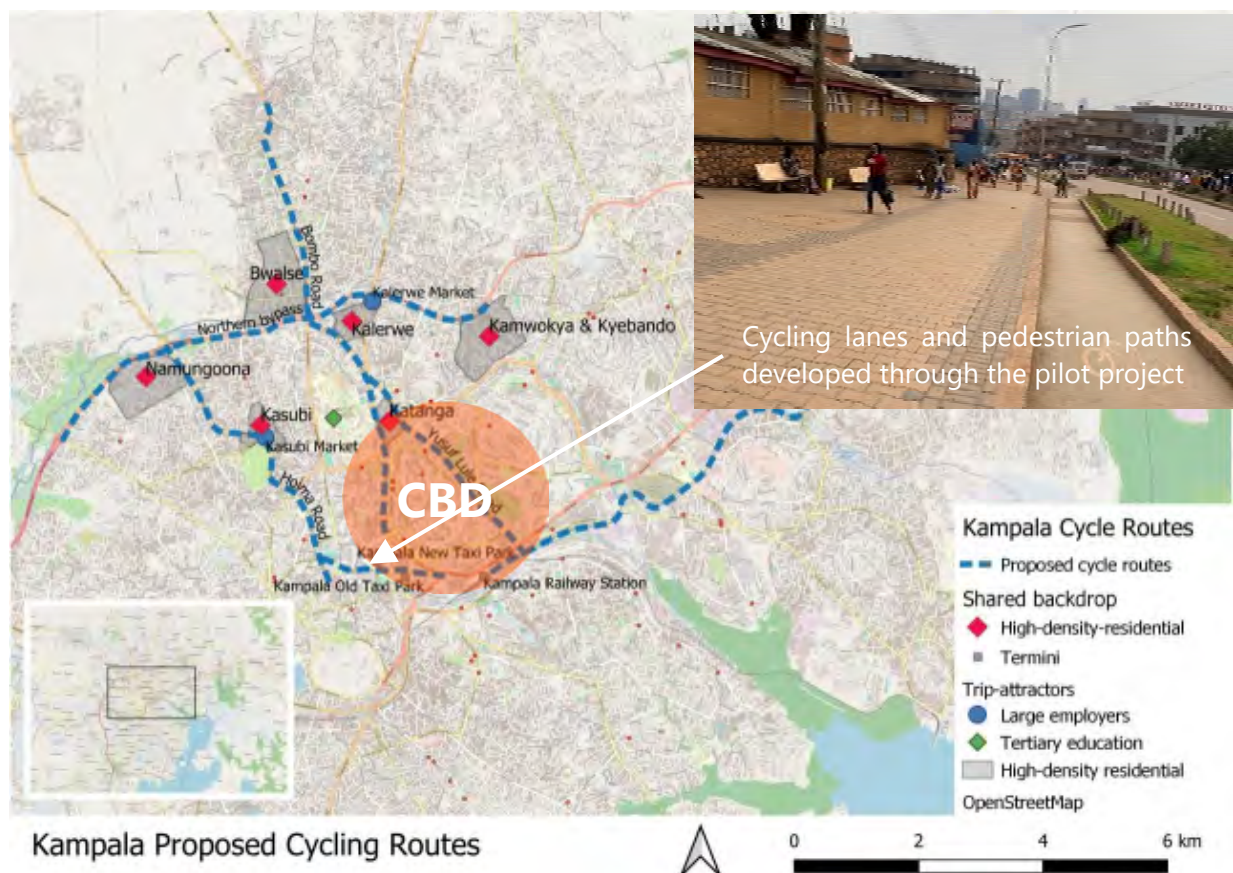
Figure 11.1.7 Prospective BRT Routes in the Greater Kampala Metropolitan Area

Meanwhile, walking has been the most popular means of person-trip in the GKMA, and the importance of NTMT has been pointed out in the existing plans. As a result, the implementation of dedicated cycling lanes called NMT Corridors has already started before the pandemic. A total of approximately 2 km of NMT Corridors have been constructed in Kampala City through a pilot project. However, because they are not convenient or well networked, it is often filled with street vendors. In order to solve this problem, Kampala Capital City Authority (KCCA) has been monitoring the NMT Corridors regularly while making them open to street vendors and using them as open spaces on Sundays.



Source: World Resources Institute

Figure 11.1.8 Means of Transport in the Greater Kampala Metropolitan Area



Source: JICA Study Team based on the MMUTMP

Figure 11.1.9 Proposed and Constructed Cycling Lanes in Kampala City

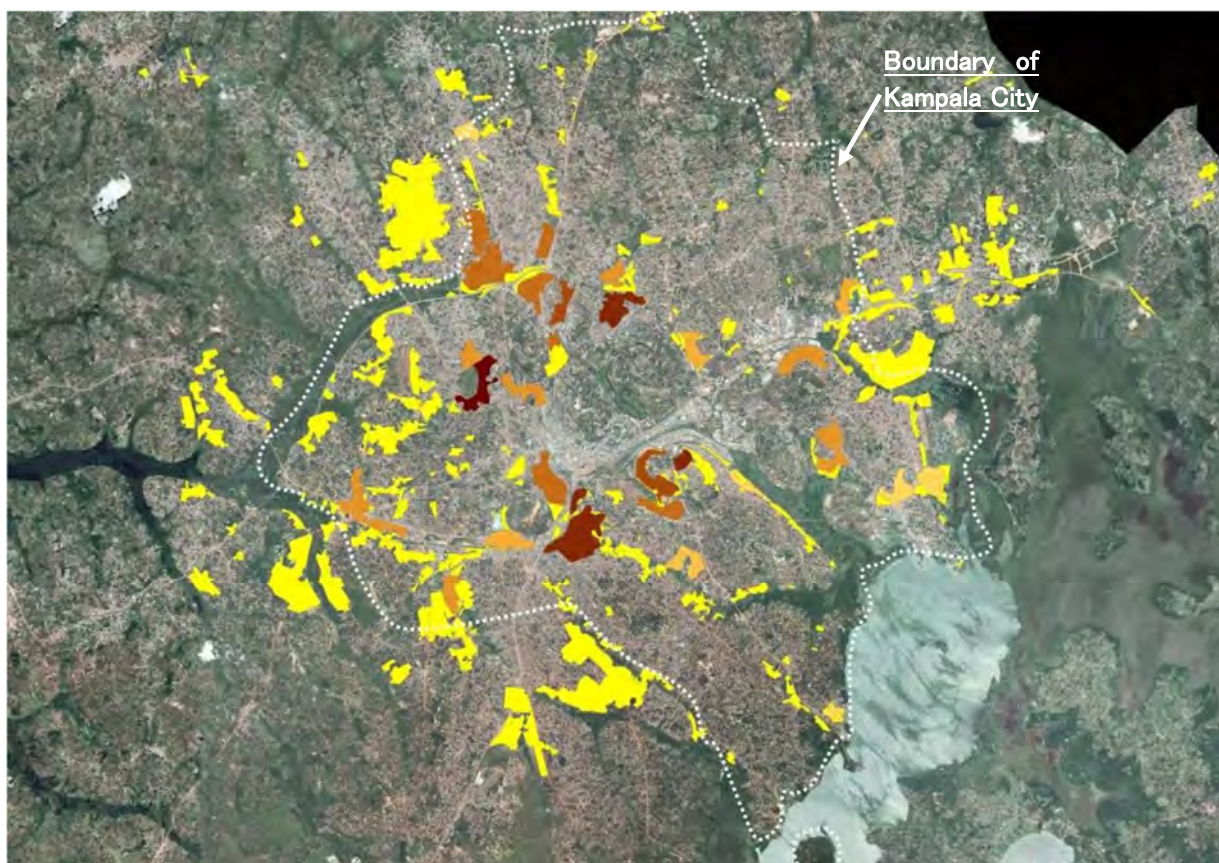
In Uganda, during the early period when the surge in COVID-19 cases was observed, bans on the operation of minibusses (taxis) and boda-boda prevented people without private cars or motorcycles from going to work, and some companies hired minibusses for employees to commute to work. It is also reported that an increasing number of people shifted from minibusses (taxis) to bicycles for commuting and traveling.

Moreover, boda-boda is widely used by residents as an alternative to the limited public transport services due to its ubiquitous and convenient means of transport, which were temporarily suspended from carrying passengers from March 2020. Boda-boda passenger transport services were resumed in July 2020, but until January 2022, it was restricted from

operating after 6 pm, so many people walked home from work after 6 pm. Nevertheless, most streets in the GKMA are not well developed or properly lit for pedestrians, and therefore it has become urgent to ensure the safety of pedestrians. KCCA is now planning to develop pedestrian paths along railroads.

11.1.5 Urban Sanitation

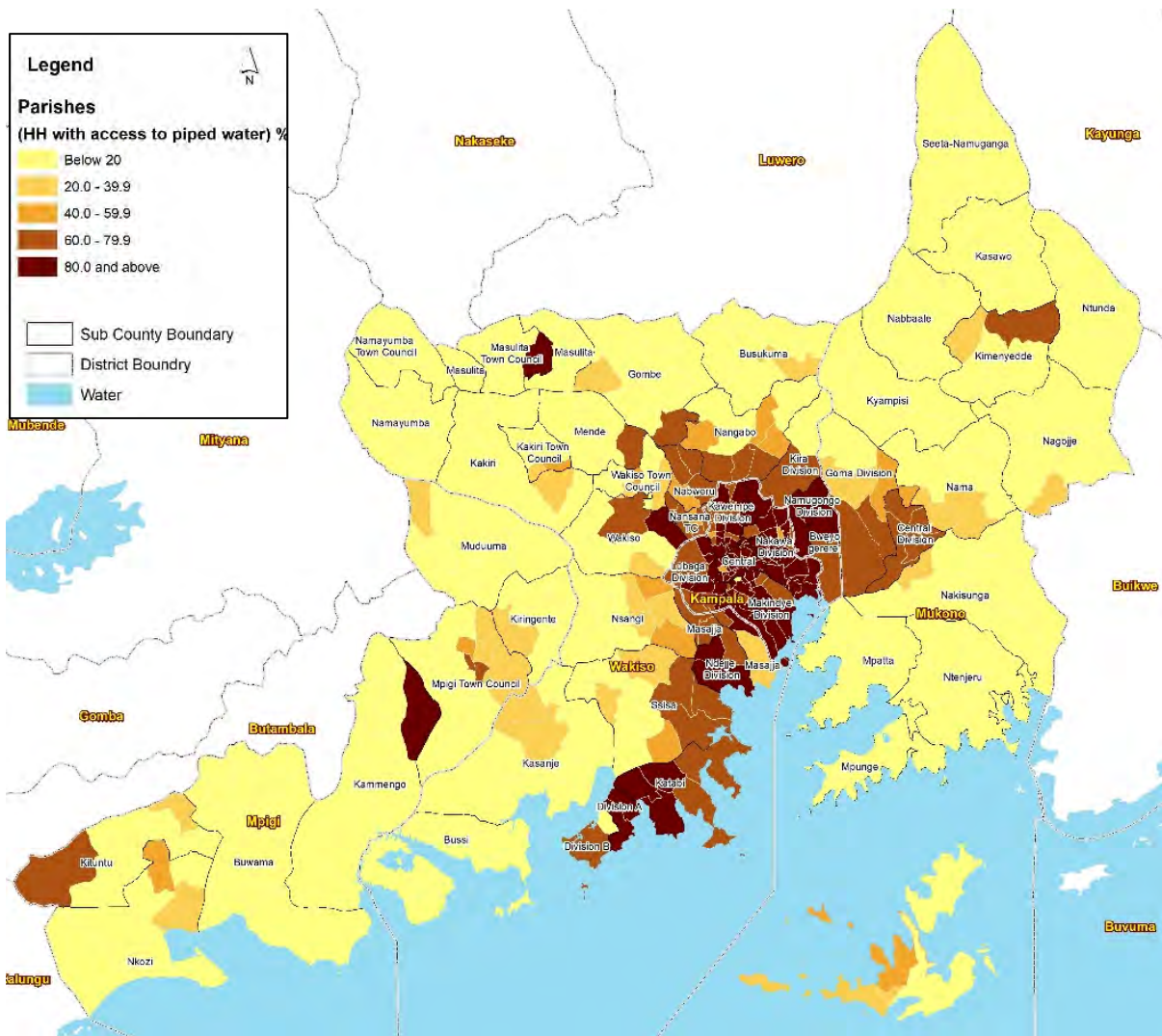
It is reported that more than 50% of the population of Kampala City resides in informal settlements, or slums, which cover around 16% of the city's total surface area, and many people suffer from limited access to piped water and sanitary facilities. Furthermore, these slums are sprawling to increasingly populated areas outside the city.



Source: KCCA (2012) KPDF/KPDP

Figure 11.1.10 Informal Settlements Identified as of 2011

In Kampala Capital City, only 38% of households have water taps within their premises, but about 80% of households rely on piped water. Most dwellers in the city fetch water from public water taps, and in fact, 48% of households spend more than 30 minutes every day collecting water. There is a critical shortage of public water taps, and many people have limited access to handwashing water. This is because many communities in the urbanized area still have limited or no access to water.



Source: Uganda Bureau of Statistics (2016) Population and Housing Census

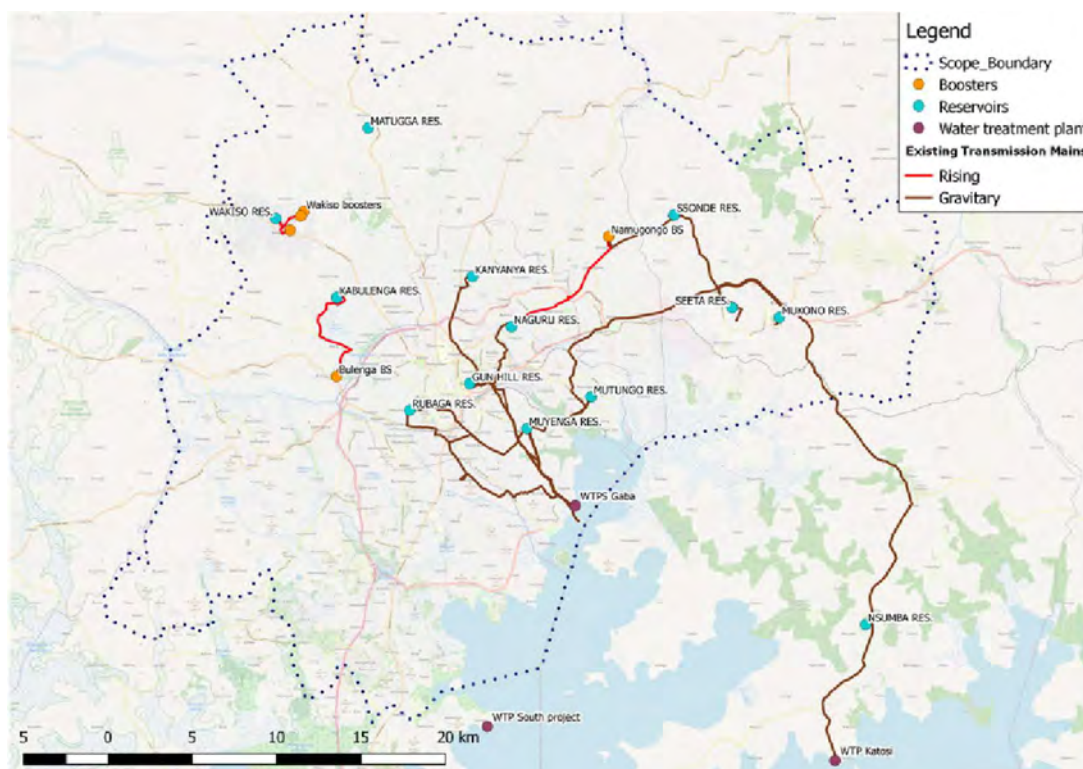
Figure 11.1.11 Proportions of Households with Access to Piped Water by Parish in the Greater Kampala Metropolitan Area (2014)



Source: JICA Study Team

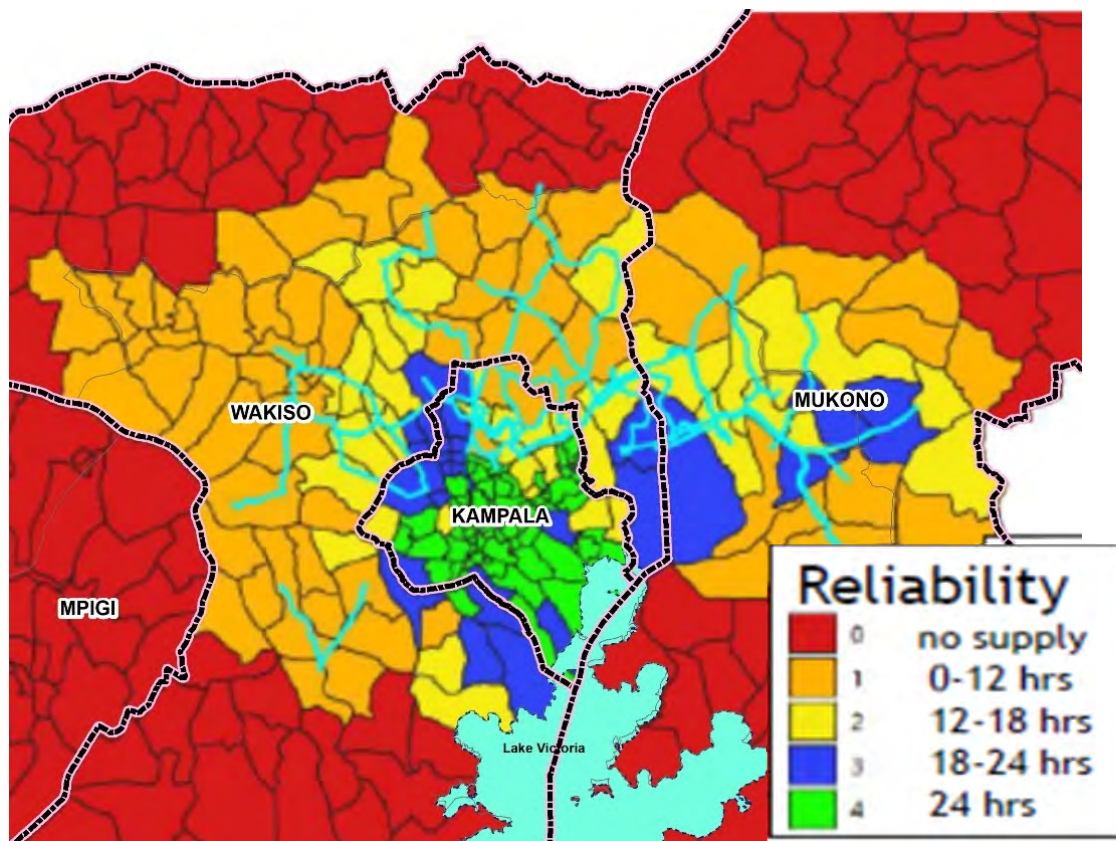
Figure 11.1.12 Local People Collecting Spring Water in a Community without Water Supply in Kampala City

Outside Kampala City, there are more communities without access to piped water. The northwestern part of Wakiso District, in particular, is far from the existing water treatment plant and, with the fastest population growth in the GKMA, it is way behind in water supply development. In addition, most communities supplied with piped water from the National Water and Sewerage Corporation (NWSC) of Uganda outside of Kampala City can access the service only for 0–12 hours a day. The water supply master plan updated by the NWSC using the results of the 2014 population census indicates that it is unlikely to meet the water demand in the surrounding areas of Kampala City by 2040, especially in its northwestern areas with underdeveloped water supply facilities.



Source: OCG, YEC, PACET, and Pasco (2022) Progress Report 1 for the Project for Integrated Urban Development Master Plan for Kampala Special Planning Area

Figure 11.1.13 Present Situation of Water Supply (Main Transmission Pipelines) in the Greater Kampala Metropolitan Area



Note: The areas in red are areas outside the jurisdiction area of NWSC Kampala Metropolitan Area

Source: August 2021, Draft Optioneering Report (Preparation of Detailed Design, Tendering and Works Supervision for the Rehabilitation, Restructuring and the Extension of Kampala Water Supply Network)

Figure 11.1.14 Water Supply Reliability in Greater Kampala Metropolitan Area in 2020

A study by Makerere University School of Public Health revealed that in the slum areas of Kampala City, the COVID-19 pandemic has disrupted economic activities and made it difficult to purchase water for washing hands. In fact, another survey reported that the number of people washing hands has decreased by 92.6% from pre-pandemic levels in Uganda. On the other hand, the COVID-19 pandemic has raised public health awareness and increased the demand for hand washing and sanitary facilities.

In response to the COVID-19 pandemic, the NWSC is planning and implementing a program to deliver 10,000-liter tanks (so-called COVID tanks), install simple public water taps, and use water trucks to supply water to communities with no access to piped water. As of November 2021, 80 out of the 220 planned water supply stations have been implemented, and the NWSC is raising funds for the remainder of 140 stations.

In addition, in Uganda, with limited isolation facilities, infectious patients are generally self-quarantined at home, even if they live in overcrowded housing conditions as typically seen in slums; therefore, it is considered critical to building quarantine facilities, especially in densely populated areas, to prevent transmission not only for COVID-19 but for other various diseases.

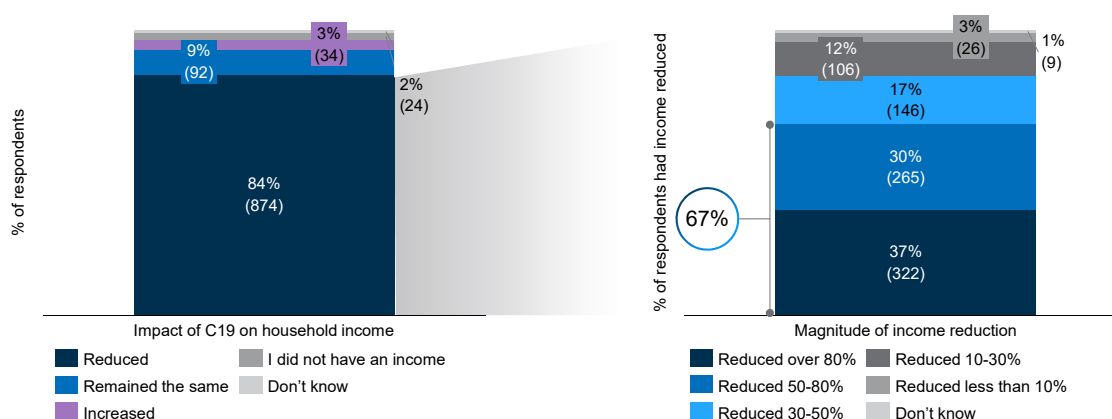
Besides the isolation facilities, there is also a lack of sanitation facilities such as hygienic public toilets and hand washing facilities in public facilities such as schools, markets, and bus terminals.

11.1.6 Urban Socioeconomic

In Uganda, stringent containment measures were put in place based on the pandemic severity, while they have a significant impact on informal sector workers, including taxi and boda-boda drivers and store, restaurant, and bar staff, which accounts for about 80% of the working population in Kampala City. According to a survey commissioned to Boston Consulting Group by JICA in 2020, roughly 84% of questionnaire respondents saw their income decrease, and two-thirds of households experienced an income reduction of over 50% (see Figure 11.1.15).

C19 Impact on income: 84% have experienced declines in income due to C19; 12% have maintained or increased income

Magnitude of income reduction: Of the 84% who experienced income reduction, 67% experienced reductions over 50%



Source: JICA (2020) Data Collection Survey for Building Pandemic Resilience in Urban Areas in Kenya and Uganda-Uganda Final Report

Figure 11.1.15 COVID-19 Impact on Household Income in Kampala (2020)

In Uganda, there are numerous private primary and secondary schools to cover the shortage of public schools, and many children go to private schools unless they are from a very low-income family. However, due to income declines as described above, some children are transferred from private schools to public schools. Moreover, an increasing number of children dropped out of primary and middle schools because they could no longer afford meals (lunches), etc., necessary at public schools, which is already a small amount.

Uganda's stringent containment measures for COVID-19 prevention also affected education. Schools were completely closed for long periods, from April to September 2020 and from June to December 2021, because their limited facilities would not be able to enable social distancing or provide a sufficiently hygienic environment. During these closed periods, international schools were allowed to deliver classes, private schools provided online classes, and most public school students were studying from home without educational materials. In the meantime, the national government created and uploaded educational materials on the website of the Ministry of Education and Sports (MES) for students studying from home and broadcasted educational programs on television for children from grades 4 to 12, although the 2014 population census showed that only 21.8% of households in the country had access to television. Consequently, children from lower-income households have been left behind in education.

When schools reopened in October 2020, public schools started to have each grade attend school on a rotating schedule and then modified the schedule in March 2021 to allow each

two grades to simultaneously attend school. These rotating attendance schedules allowed students in the same grade or grades to attend school for two months while the remaining students were studying from home. When schools were closed again in June 2021, only the third to sixth grades of primary education had attended school, and the first and second grades of public schools had had no access to education for one and a half years.

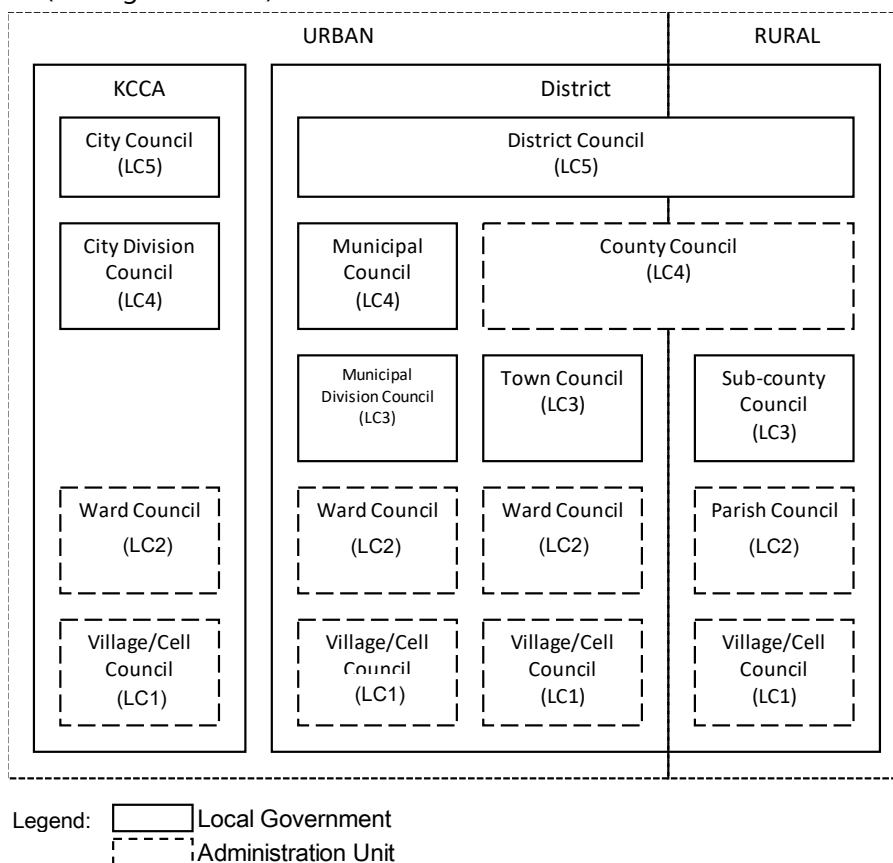
As of 2020, the Government of Uganda planned to develop school facilities to return schools to normal operations by 2024. However, when another wave of COVID-19 infections hit Uganda around May 2021, schools were closed again.

In January 2022, schools reopened for all grades, but most schools are having each grade attend school on a rotating schedule.

11.1.7 Urban Administration

The GKMA consists of Kampala Capital City and three surrounding districts, namely Wakiso District, Mukono District, and Mpigi District.

The local governments in Uganda have a hierarchical structure from LC1 at the village/cell level to LC5 at the district/city level. The local governments LC5 (districts and cities), LC4 (city divisions and municipalities) as well as LC3 (sub-counties in rural areas and municipality divisions in urban areas) have legal personalities. In rural areas, LC5 is called the higher local government, and LC3 is called the lower local government, and the higher local government has the authority to supervise the lower local governments within the jurisdiction. LC3 has been delegated certain discretionary powers from LC5 and is providing various administrative services (see Figure11.1.16).



Source: JICA Study Team, based on the Local Government Act

Figure 11.1.16 Composition of Local Government in Uganda

In the GKMA, as the urbanization expanded rapidly beyond the boundary of Kampala Capital City into its neighboring local governments, the need for an integrated plan as one urban area emerged. However, since the previous master plan KPDP/KPDP 2012 was formulated by KCCA, the plan was not recognized as their physical plan in the surrounding local government, and the implementation of the plan only has been taking place in Kampala Capital City.

Under such circumstances, in 2020, the Ministry of Kampala Capital City and Metropolitan Affairs (MKCC&MA) was created based on the Kampala Capital City (Amendment) Act 2019 to coordinate physical plans in the GKMA.

The local governments within the GKMA vary in population size and capacity.

Wakiso District is a local government with the largest population in Uganda, and its current population is assumed to be approximately 3 million, with approximately two-thirds of the population living in urban areas. On the other hand, the population of the Mpigi District is approximately 0.3 million, and most of the areas are still rural.

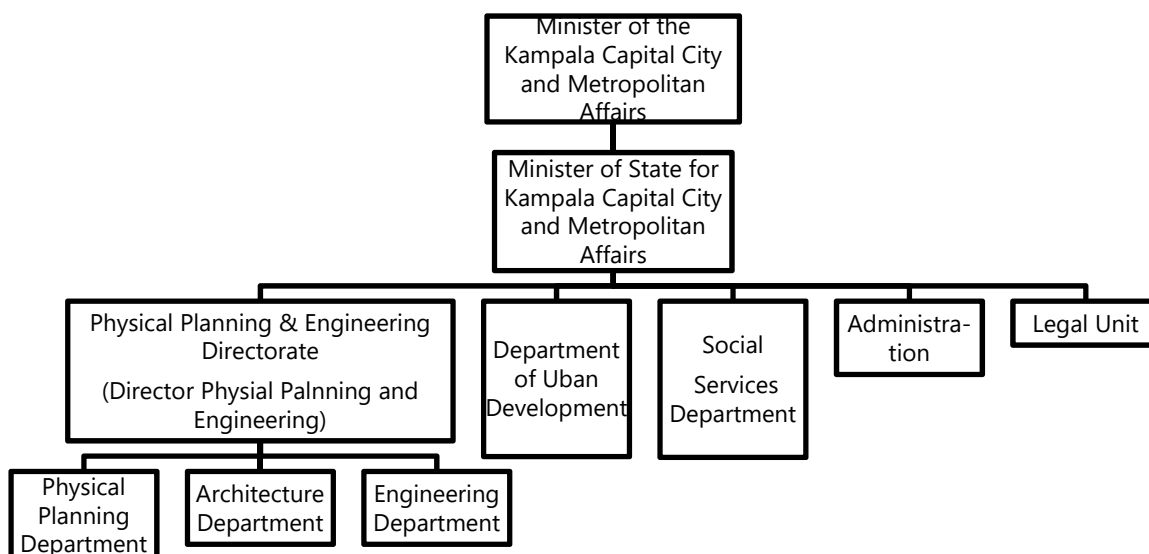
Currently, the creation of special purpose cities has been ongoing in Uganda since 2020, establishing cities by upgrading several municipal councils. On 1 July 2020, 10 cities were created in Jinja, Mbarara, Gulu, Mbale, Fort Portal, Arua, Masaka, Lira, Soroti, and Hoima. In addition, five more cities, including Entebbe and Wakiso, will be created by 2025. Wakiso District will be reformed into two new city administrations

1) **Ministry of Kampala Capital City & Metropolitan Affairs**

The Ministry of Kampala Capital City & Metropolitan Affairs (MKCC&MA) is a new ministry structured under the Office of the President, which started its operation as the Department of Kampala Capital City and Metropolitan Affairs in July 2018 with mainly administrative staff.

The budget for the first financial year was to consider UGX 0.70bn for non-wage recurrent activities and UGX 1.65bn for development activities critical for developing a harmonized, physical plan for the Greater Kampala Metropolitan Area, evaluation of policy framework governing the development and service delivery in KCCA and monitoring KCCA programs.

However, the MKCC&MA has been, in the past few years, increasing the number of its staff and the budget for recruiting necessary technical staff for the establishment of the Physical Planning & Engineering Directorate with 12 technical staff, the Department of Urban Development with four technical staff, and Social Services Department with four technical staff has been approved. It is now waiting for the recruitment of these technical staff.



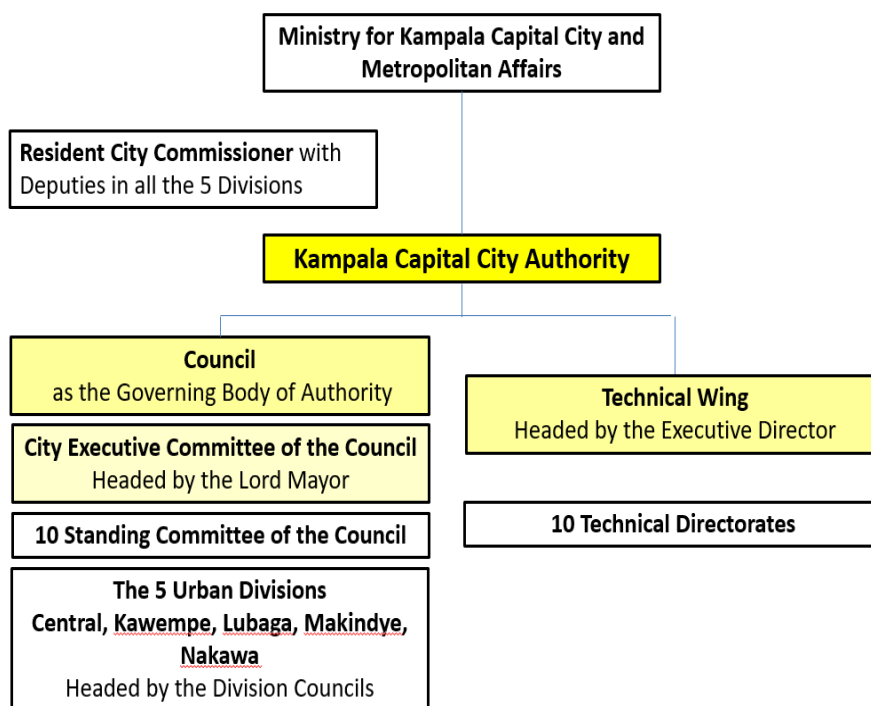
Source: JICA Study Team based on information from Ministry of Public Services

Figure 11.1.17 Structure of Ministry of Kampala Capital City and Metropolitan Affairs

2) Kampala Capital City Authority

Kampala Capital City Authority (KCCA), the entity responsible for the operations of Kampala Capital City, has a special status provided by the Kampala Capital City Act and is part of the central government in terms of budget and organizational structure. This unique status has helped KCCA to secure the necessary budget for its infrastructure projects compared to other local governments.

The five divisions in KCCA have authority associated with the LC4 status, but the functions of these divisions are integrated into the governance of the KCCA headquarters. Each directorate of KCCA dispatches one or two staff to division offices, respectively.



Source: Ministerial Policy Statement for Kampala Capital City Authority for FY2020/21

Figure 11.1.18 Structure of Kampala Capital City Authority, as of December 2017

Table 11.1.2 and Table 11.1.3 describe the recent record of approved budgets along with the proposed budget for FY 2020/21. The budget for KCCA had jumped from FY 2018/19 to 2019/20, followed by a slight shrink in FY 2020/21. The increase was due to the significant growth of expenditures for development initiatives. On the other hand, the shrinking of the FY 2020/21 budget could be due to the wage for the non-permanent staff. In FY 2021/22, there has been a shortage of staff at KCCA.

Table 11.1.2 Overview of Recent KCCA Budgets (UGX)

Grant/Fund	Type	Budget	Budget	Budget	Budget
		FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
		Billion UGX	Billion UGX	Billion UGX	Billion UGX
Recurrent	GOU-Wage	64.59	72.70	65.99	65.99
	GOU Nonwage	21.52	12.23	64.12	24.12
Total Wage + Nonwage		86.11	84.93	130.11	90.10
Development	GOU Development	77.65	77.72	77.77	77.77
	Ext. Financing-KIIDP 2	172.79	157.52	224.23	139.70
	Ext. Financing-ADB				95.30
	Uganda Road Fund URF	20	30.56	22.39	30.56
Total Dev. (GOU Dev., Ext. Financing + URF)		270.44	265.8	324.38	343.32
Total Recurrent + Development		356.55	350.73	454.49	433.43
Domestic Arrears				0.17	
AIA [Nontax Revenue (NTR)]		122.8	126.9	87.07	87.07
Total (MTEFS allocated)				541.73	520.49
Projected Grant Funds				6.41	12.09
Grand Total		479.35	477.62	548.14	532.58

Source: Ministerial Policy Statement for Kampala Capital City Authority for FY2020/21

Table 11.1.3 Comparison of Budget Allocations in KCCA by Function for FY 2019/20 and FY 2020/21

Sector /Vote Function	FY 2019/20				Est. FY 2020/21			
	GOU	NTR	Projected Donor Funds	Total	GOU	NTR	Projected Donor Funds	Total
Production	6.76	0.43		7.19	6.76	0.43		7.19
Education	42.41	2.56		44.97	42.41	2.56	0.21	45.18
Health	12.01	1.77		13.78	12.01	1.77	3.31	17.10
Water & Environment	0.01	15.92	5.13	21.06	0.01	15.92		15.93
Social Development	1.55	0.39		1.94	1.55	0.39	0.35	2.29
Revenue Collection	0.43	0.89		1.32	0.43	0.89	1.50	2.83
Human Resources & Admin.	35.25	42.00	0.08	76.97	35.25	40.71		75.96
Legal Support	0.55	5.11		5.66	0.55	4.77		5.31
Political Governance		13.43		13.43	0.00	15.06		15.06
Treasury Services	0.16	1.02		1.18	0.16	0.66		0.83
Internal Audit	0.04	0.18		0.22	0.04	0.18		0.22
Corporate Services	43.79	1.83		45.62	3.79	1.83	6.72	12.34
Urban Planning		1.59	1.2	2.79	0.00	1.59		1.59
Works &	64.9	0.30		65.20	64.90	0.30		65.20

Sector /Vote Function	FY 2019/20				Est. FY 2020/21			
	GOU	NTR	Projected Donor Funds	Total	GOU	NTR	Projected Donor Funds	Total
Transport GoU								
Works & Transport URF	22.39			22.39	30.56			30.56
Works & Trans. (KIIDP 2)	224.23			224.23	139.70			139.70
Works & Trans.ADB	0.00			0.00	95.30			95.30
Domestic Arrears	0.14			0.14				0.00
Grand Total	454.63	87.07	6.41	548.14	433.43	87.07	12.09	532.58

Source: KCCA, 2020, Ministerial Policy Statement for Kampala Capital City Authority for FY2020/21

3) District Level Local Administration (LC5)

In the district, the Chief Administrative Officer (CAO) is the top administrative officer and is responsible for operations and accounting. CAO is appointed by the District Service Commission (DSC). There are 12 sections under the CAO, as shown in Figure 11.1.19.

Each district has a District Council that has authority over planning, legislative, and executive powers. The District Council is composed of District Chairperson and Councilors. The District Chairperson is elected by the elections in the entire district, while Councilors are by each sub-county.

As shown in Table 11.1.4, the revenue for FY 2020/21 in the districts of the GKMA largely vary. The largest revenue is for Wakiso District with UGX94 billion, nearly three times larger than Mpigi District's UGX34 billion. The total budget of Mukono District is approximately UGX63 billion, or two-thirds of that for Wakiso District, but two times larger than the revenue for Mpigi District. However, compared with the budget of KCCA, even the budget of Wakiso District is only one-fifth of the budget of KCCA for the FY 2020/21. However, for Wakiso District and Mukono District, the municipalities in their districts are autonomous governments with budgets.

Table 11.1.4 Revenue Plans by Source for FY 2020/21 by District in Greater Kampala Metropolitan Area

	Mpigi District		Mukono District		Wakiso District	
	Revenue (‘000 UGX)	Share (%)	Revenue (‘000 UGX)	Share (%)	Revenue (‘000 UGX)	Share (%)
Locally Raised Revenues	957,990	2.80	3,250,400	5.14	15,623,633	16.62
Discretionary Government Transfers	3,515,312	10.28	5,550,320	8.77	11,532,065	12.26
Conditional Government Transfers	26,562,202	77.68	44,644,074	70.53	57,868,318	61.54
Other Government Transfers	2,458,540	7.19	6,299,656	9.95	7,466,779	7.94
External Financing	700,686	2.05	3,552,631	5.61	1,537,535	1.64
Grand Total	34,194,730	100.00	63,297,080	100.00	94,028,331	100.00

Source: Government of Uganda, Approved Budget Estimates of Revenue and Expenditure for 2021–2022

Table 11.1.5 shows planned budget allocations by program for FY 2020/21 of the three districts in the GKMA. A large portion of the budget is for human capital development including wages for local government staff.

The budget allocated for development plan implementation is 2.68% in Mpigi and Mukono Districts, while it is slightly larger in Wakiso District with 3.60% of the total budget. The budget which the district local government can use for development is 1–4% of the budget KCCA has for development and is very small.

Table 11.1.5 Summary of Program Allocations for FY 2020/21 by District in Greater Kampala Metropolitan Area

	Mpigi District		Mukono District		Wakiso District	
	Budget ('000 UGX)	Share (%)	Budget ('000 UGX)	Share (%)	Budget ('000 UGX)	Share (%)
Agro-Industrialization	2,970,968	8.69	5,933,292	9.37	7,105,357	7.56
Tourism Development	3,489	0.01	3,000	0.00	7,912	0.01
Natural Resources, Environment, Climate Change, Land and Water Management	1,194,560	3.49	1,370,182	2.16	2,162,349	2.30
Private Sector Development	46,491	0.14	372,251	0.59	144,479	0.15
Integrated Transport Infrastructure and Services	1,482,324	4.33	2,290,000	3.62	9,287,390	9.88
Sustainable Urbanization and Housing	N/A	0.00	N/A	0.00	16,687	0.02
Human Capital Development	20,304,289	59.38	38,555,640	60.91	42,331,951	45.02
Community Mobilization and Mindset Change	572,212	1.67	832,381	1.32	468,094	0.50
Governance and Security	598,580	1.75	1,026,801	1.62	1,776,400	1.89
Public Sector Transformation	6,104,328	17.85	11,214,156	17.72	27,344,529	29.08
Development Plan Implementation	917,490	2.68	1,699,378	2.68	3,383,183	3.60
Grand Total	34,194,730	100.00	63,297,080	100.00	94,028,331	100.00

Source: Government of Uganda, Approved Budget Estimates of Revenue and Expenditure for 2021–2022

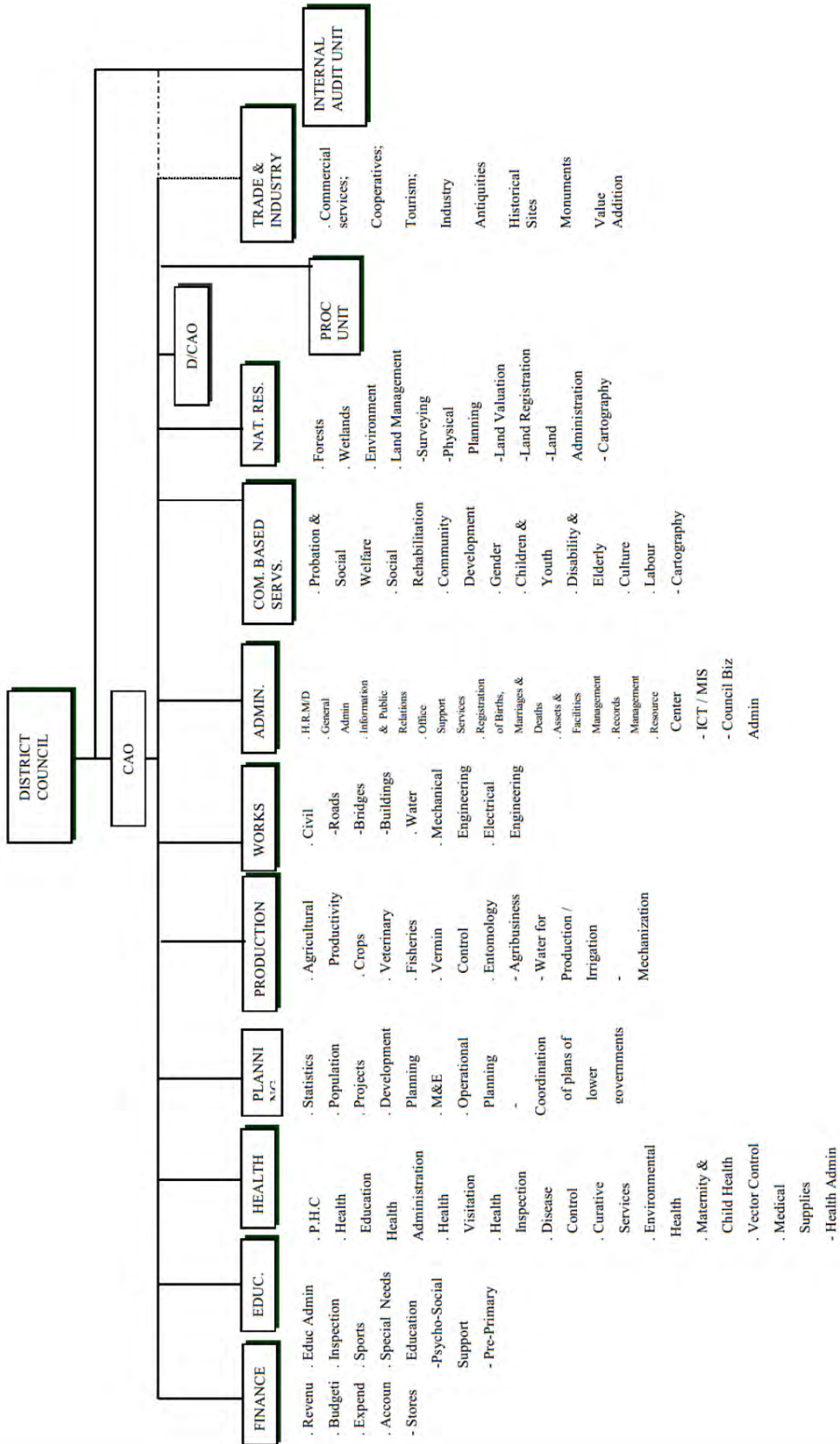


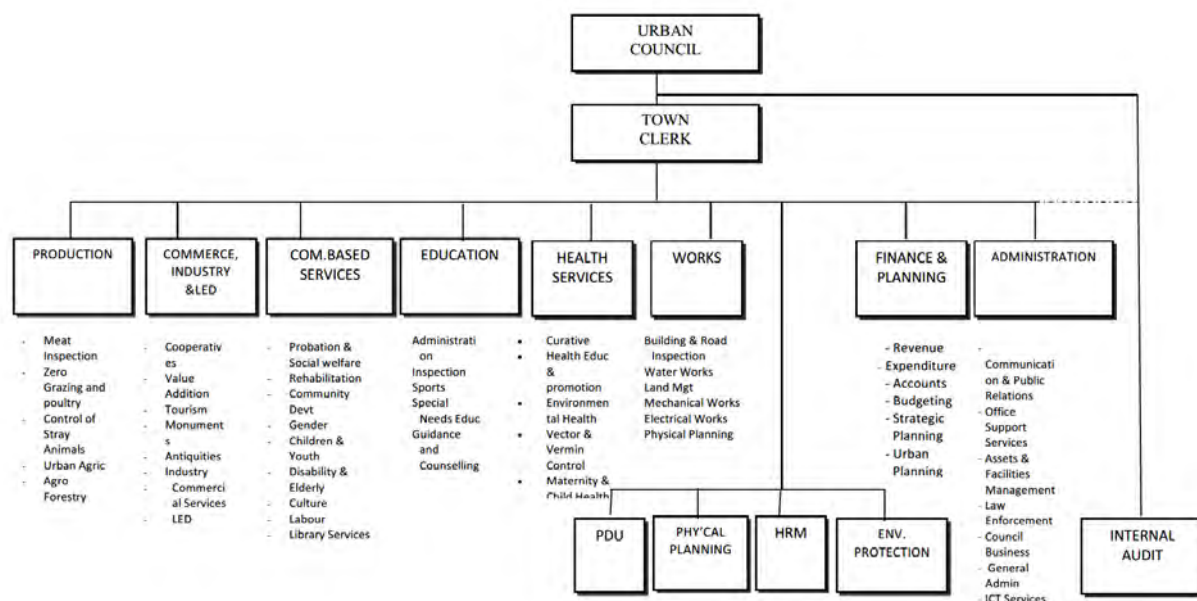
Figure 11.1.19 General Structure for Districts in Uganad as of May 2016

Source: Ministry of Public Service

4) Municipal Level Local Administration (LC4)

Municipalities have the status of urban local governments and autonomy over their financial and planning matters with the district councils.

In the municipality, the town clerk is the top administrative officer and has the responsibility for operation and accounting. The Ministry of Local Government appoints the town clerk. There are 12 sections under the town clerk, as shown in Figure 11.1.20.



Source: Ministry of Public Services

Figure 11.1.20 General Structure of Municipalities in Uganda, as of May 2016

In the GKMA, there are five municipalities, four in Wakiso District (Entebbe Municipality, Kira Municipality, Makindye-Ssabagabo Municipality, and Nansana Municipality) and one in Mukono District (Mukono Municipality). The condition of local revenue seems better in these five municipalities compared with the districts with more share of revenue locally raised. Especially in Kira Municipality, the local revenue covers 39.4% of the total budget.

Table 11.1.6 Municipalities' Revenue Plans by Source for FY 2020/21 in Greater Kampala Metropolitan Area

	Mukono		Entebbe		Makindye – Ssabagabo		Nansana		Kira	
	Revenue ('000 UGX)	Share (%)	Revenue ('000 UGX)	Share (%)	Revenue ('000 UGX)	Share (%)	Revenue ('000 UGX)	Share (%)	Revenue ('000 UGX)	Share (%)
Locally Raised Revenues	4,651,046	23.1	12,658,554	33.5	9,340,000	35.8	6,175,036	22.6	11,495,000	39.4
Discretionary Government Transfers	1,856,711	9.2	16,288,651	43.2	2,460,269	9.4	3,780,418	13.8	2,522,634	8.6
Conditional Government Transfers	11,869,826	59.1	6,981,769	18.5	12,828,619	49.2	14,604,946	53.4	12,284,869	42.1
Other Government	1,717,658	8.5	1,676,596	4.4	1,394,241	5.3	2,711,523	9.9	2,677,173	9.2
External Financing	0	0.00	129,000	0.3	65,748	0.3	100,000	0.4	220,000	0.8
Grand Total	20,095,242	100.0	37,734,569	100.0	26,088,876	100.0	27,371,923	100.0	29,199,676	100.0

Source: Government of Uganda, Approved Budget Estimates of Revenue and Expenditure for 2021–2022

The share of budget for development plan implementation is also larger in the municipalities compared to the districts. Budgets for development plan implementation in the five

municipalities are UGX1.1 billion for Mukono Municipality, UGX1.9 billion for Kira Municipality, UGX2.4 billion for Nansana Municipality, UGX2.7 billion for Entebbe Municipality, and UGX3.0 billion for Makindye-Ssabagabo Municipality.

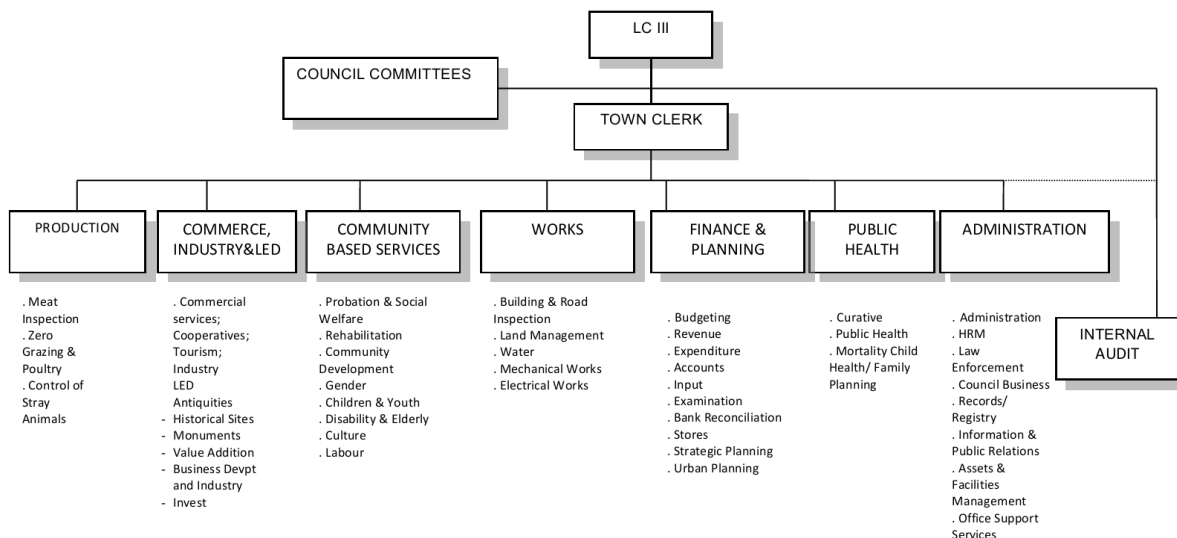
Table 11.1.7 Summary of Municipalities' Programme Allocations for FY 2020/21 in Greater Kampala Metropolitan Area

	Mukono		Entebbe		Makindye– Ssabagabo		Nansana		Kira	
	Budget ('000 UGX)	Share (%)	Budget ('000 UGX)	Share (%)	Budget ('000 UGX)	Share (%)	Budget ('000 UGX)	Share (%)	Budget ('000 UGX)	Share (%)
Agro-Industrialization	366,039	1.8	280,968	0.7	715,515	2.7	985,324	3.6	401,031	1.4
Tourism Development	2,600	0.0	13,000	0.0	5,000	0.0	2,083	0.0	2,817	0.0
Natural Resources, Environment, Climate Change, Land and Water Management	459,795	2.3	200,966	0.5	927,684	3.6	462,717	1.7	509,341	1.7
Private Sector Development	49,299	0.2	148,217	0.4	102,764	0.4	260,042	1.0	120,996	0.4
Integrated Transport Infrastructure and Services	1,713,187	8.5	18,749,480	49.7	8,587,326	32.9	2,560,450	9.4	8,929,470	30.6
Sustainable Urbanization and Housing	115,000	0.6	3,560,000	9.4	1,025,086	3.9	4,019,819	14.7	1,298,696	4.4
Human Capital Development	12,224,309	60.8	6,229,569	16.5	6,091,662	23.3	11,440,684	41.8	10,216,627	35.0
Community Mobilization and Mindset Change	390,633	1.9	256,139	0.7	494,625	1.9	692,915	2.5	333,027	1.1
Governance and Security	678,407	3.4	1,250,275	3.3	910,274	3.5	1,332,791	4.9	1,381,085	4.7
Public Sector Transformation	2,919,132	14.5	4,361,565	11.6	4,261,076	16.3	3,231,557	11.8	4,084,282	14.0
Development Plan Implementation	1,176,841	5.9	2,684,390	7.1	2,967,866	11.4	2,383,542	8.7	1,922,303	6.6
Grand Total	20,095,242	100.0	37,734,569	100.0	26,088,876	100.0	27,371,923	100.0	29,199,676	100.0

Source: Government of Uganda, Approved Budget Estimates of Revenue and Expenditure for 2021–2022

5) Town Level Local Administration and Sub-county Level Local Administration (LC3)

In the town, the town clerk is the top administrative officer and has responsibility of operation and accounting. There are seven sections under the town clerk, as shown in Figure 11.1.21.

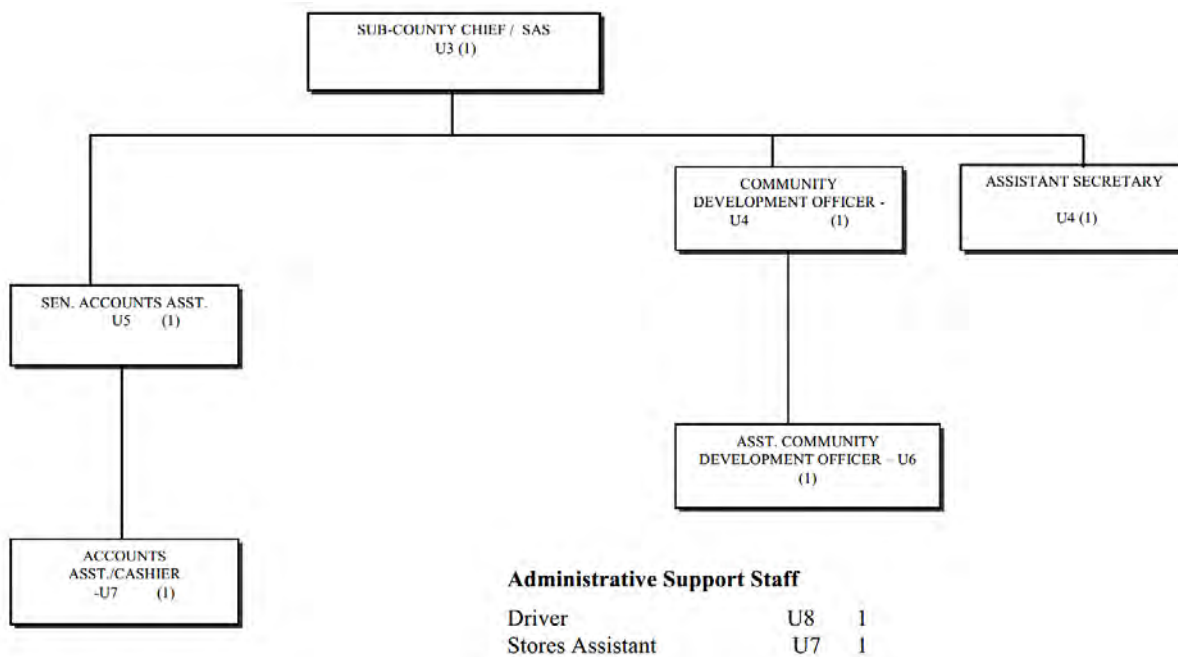


Source: Ministry of Public Services

Figure 11.21 General Structure of Towns in Uganda, as of May 2016

While the urbanized areas in the counties are designated as towns, the rural areas at the LC3 level are sub-counties. The Sub-county Council has a legal personality. Sub-counties have the authority to formulate and execute plans and can create ordinances to the extent that it does not violate national law or district policy. Sub-county priorities can also be claimed when the district creates a plan.

The Sub-county Council consists of a Chairperson and representatives of parish and ward under its umbrella.



Source: Ministry of Public Services

Figure 11.22 General Structure of Sub-counties in Uganda, as of May 2016

6) Ministry of Local Government (MoLG)

The MoLG is responsible for guidance and overall vision of governance in local governments and oversees the government structures and operations at local levels, so they are harmonized and supported to bring about socio-economic transformation of the country. It is composed of two directorates. Its mandate comprised of the following:

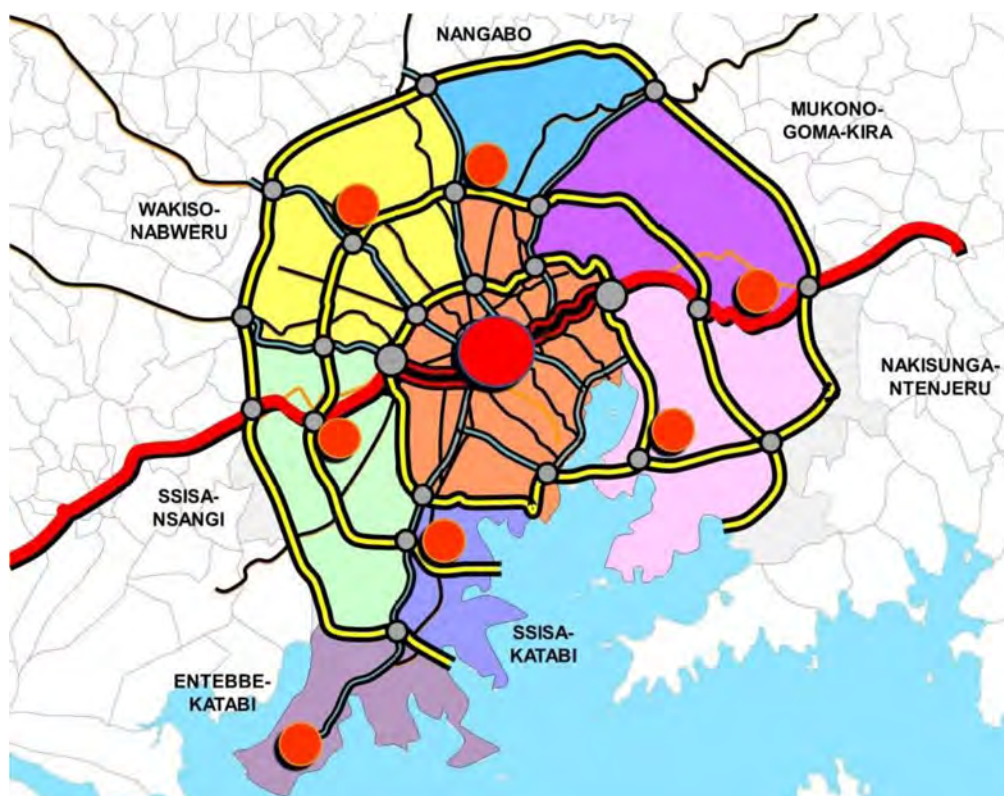
- Inspect, monitor, and, where necessary, offer technical advice/assistance, support supervision, and training to all local governments.
- Coordinate and advise local governments for purposes of harmonization and advocacy.
- Act as liaison/linkage ministry with respect to other central government ministries and departments, agencies, private sector, and regional and international organizations.
- Research, analyze, develop, and formulate national policies on all taxes, fees, levies, and rates for local governments.

11.2 Consideration on Urban Development Programs for the With- and Post- COVID-19 Era

11.2.1 Review of Existing Master Plans

1) KPDF/KPDP 2012

The existing master plan, KPDF/KPDP 2012, suggests a transition from the mono-centric urban structure of Kampala City to a multi-nucleus urban structure and envisions the development of seven metropolitan zone centers outside Kampala Capital City: Kasangati, Wakiso, Kyengera, Kajjansi, Entebbe, Mukono, and Ntenjeru. All these centers, except for Entebbe, are located 15–20km from the center of Kampala City. These areas are the more urbanized in the KSPA, with settlements spreading, but have not been developed enough to serve as metropolitan sub-centers to provide metropolitan-level services or attract business and commercial facilities.



Source: KCCA (2012) KPDF/KPDP

Figure 11.2.1 Future Urban Structure Proposed in KPDF/KPDP 2012

Although the existing urban development master plan for KSPA a proposed multi-nucleus urban structure, it was formulated using the population census result of 2002 and did not consider the urbanization occurring rapidly outside Kampala Capital City, assuming that the population was continuing to increase at a high rate within Kampala Capital City and projected the population in 2011 in Kampala Capital City to be 1.8 million while the actual population in 2014 was approximately 1.5 million. On the other hand, it was projected that the population outside Kampala Capital City in KSPA was 1.35 million in 2011, while according to the population census 2014, the actual population was approximately 1.9 million in 2014.

Therefore, the projection of the population outside Kampala Capital City has accelerated the lack of infrastructure in the suburban areas in the GKMA outside Kampala Capital City. At present, this master plan is being revised with the support of JICA.

The KPDP/KPDP formulated in 2012 includes 195 projects centered on Kampala Capital City. The 195 projects included in the existing master plan are divided into three categories (Categories I to III) depending on their priority level. The 87 highest priority projects are classified into Category I, the 62 second highest priority projects into Category II, and the 47 lower priority projects into Category III.

Some projects which can tackle issues highlighted by COVID-19 are not included in Category I, and health projects are classified into Category II.

Table 11.2.1 KPDP/KPDP 2012 Category I Projects (Excluding Projects Confirmed Implemented)

Code	Title	Target Area
DR2	Nakivubo Tributaries & Wetland Reticulation	KCCA
DR3	Nalukolong Channel Upper Reaches	KCCA
DR4	Kinawataka Upper Reach Drainage Channels	KCCA
EC2	Urban Land Tenure Reform Study	GKMA
EC3	Public Lands Management, Allocation and Development Master Plan	KCCA
EC4	KESC Establishment & Capacity Building	KCCA
EC5	Operate KESC	KCCA
EC9	Markets Pilot Project	KCCA
EC11	Industrial and Business Zone Development	GKMA
EC12	"One-stop" Investment Centre Establishment and Capacity Building	KCCA
EC13	"One-stop" Investment Centre Operations	KCCA
ED1	Education and Community Development Master Plan (KCCA)	KCCA
ED8	Primary School Facilities Construction	KCCA
ED9	Primary School Facilities Construction	KMTC
ED10	Primary School Facilities Equipment	KCCA
ED11	Primary School Facilities Equipment	KMTC
ED12	Secondary & High School Facilities Construction	KCCA
ED13	Secondary & High School Facilities Construction	KMTC
ED14	Secondary & High School Facilities Equipment	KCCA
ED15	Secondary & High School Facilities Equipment	KMTC
ED20	Tertiary Education Facilities Construction	KCCA
ED21	Tertiary Education Facilities Equipment	KMTC
EN1	Waterfront and Wetlands Preservation, Landscaping and Development Master Plan (KCCA) with Waterfront and Central Park SDPs	KCCA
EN2	Wetland Delineation	KCCA
EN3	Wetlands Incursion and Flooding	KCCA
EN4	Integrated Waste Management System Study	GKMA
EN5	New Landfills and Treatment Plants Stage 1	GKMA
EN14	Boulevard Development - Stage 1	KCCA
EN20	Parks and Gardens - Stage 1	KCCA
EN23	Parks and Gardens - Stage 1	KMTC
IN1	NPIC Establishment	GKMA
IN2	Operate NPIC	GKMA
IN3	KPIC Establishment	KCCA
IN4	Operate KPIC	KCCA
IN5	KDF Establishment & Capacity Building	KCCA
IN6	Operate KDF	KCCA
IN7	KLB Establishment & Capacity Building	KCCA
IN8	Operate KLB	KCCA
IN9	KCCA Revenue Development Study	KCCA

Code	Title	Target Area
IN10	KCCA Revenue System	KCCA
IN11	KCCA Capacity Building & Training Plan	KCCA
IN12	KCCA Training	KCCA
IN14	KPDP Implementation Support	KCCA
IN15	KMSC Establishment & Capacity Building	KCCA
IN16	Operate KMSC	KCCA
IN17	KCCA TU Establishment & Capacity Building	KCCA
IN18	Operate KCCA TU	KCCA
IN19	KCAA CM&E Unit Establishment & Capacity Building	KCCA
IN20	Operate KCAA CM&E Unit	KCCA
PL2	KPDP, KMFP and CIF M&E	GKMA
PL3	KCCA & GKMA Mapping (Control and Monitoring)	GKMA
PL4	KPDP, KMFP and CIF update	GKMA
PL6	PPDP Precinct 20 - Nsambya (New CBD) + 3 SPDs	KCCA
PL7	PPDP Precinct 3 - Mengo-Namirembe (Cultural Heritage Precinct) + 2 World Heritage Site SPDs	KCCA
PL8	PPDP Precinct 21 - Industrial Area (Business Precinct) + 3 SPDs	KCCA
PL10	Model Residential Precinct PPDPs (with 3 model SPDs each)	KCCA
PL13	PDP Metropolitan Zone F Ssisa-Nsangi New Town + 3 PPDPs	KMTC
PL14	PDP Metropolitan Zone D Nakisonga-Ntenjeru New Town + 3 PPDPs	KMTC
PL33	Urban Freeway SDP	KCCA
PL34	Nsambya Police SDP	KCCA
PL38	New Residential Development Pilot Plans SDPs	KCCA
PL39	Residential Upgrade and Densification Pilot Plans SDPs	KCCA
TR1	Transportation, Movement and Access Master Plan (GKMA and KCCA)	GKMA
TR2	TM: Central Taxi Parks Relocation	KCCA
TR3	TM: Signalized intersections and TCC	KCCA
TR4	TM: Managed Parking in City Centre	KCCA
TR5	TM: Road Marking and Signs	KCCA
TR8	NMT: NMT Master Plan	KCCA
TR9	NMT 200 km of pedestrian pavement	KCCA
TR13	Integrate Urban & Transport Planning (TIA procedures)	KCCA
TR14	Adopt Cost Benefit Analysis procedures	KCCA
TR15	Integrated Public Transport Master Plan	KCCA
TR17	Feasibility Study, SDP and Detailed Design for the BRT Phase II	KCCA
TR21	Construct BRT pilot corridor (Phase I)	KCCA
WS7	KCCA Sewage extension (75 target 2022)	KCCA
WS8	KMTC Sewage extension (50 target 2022)	KMTC

Source: KCCA (2012) KPDF/KPDP

Table 11.2.2 shows seven projects classified into Category II but given higher priority due to the COVID-19 pandemic. Among these projects, WS6 (Water Supply Improvements in Katosi) has been implemented.

Table 11.2.2 KPDF/KPDP 2012 Category II Projects with Higher Priority Due to COVID-19

Code	Title	Target Area
HE1	Health Master Plan	KCCA
HE2	Hospital and Primary Medical Facilities Construction	GKMA
HE3	Hospital and Primary Medical Facilities Equipment	GKMA
PL40	Slums Upgrade Pilot Plans SDPs	KCCA
PL42	Markets and Precinct/Neighborhood Centre Pilot Plans SDPs	KCCA
TR11	NMT 50 km of Cycling Network	KCCA

WS6	Water Supply Improvements Stage II – Katosi	KCCA
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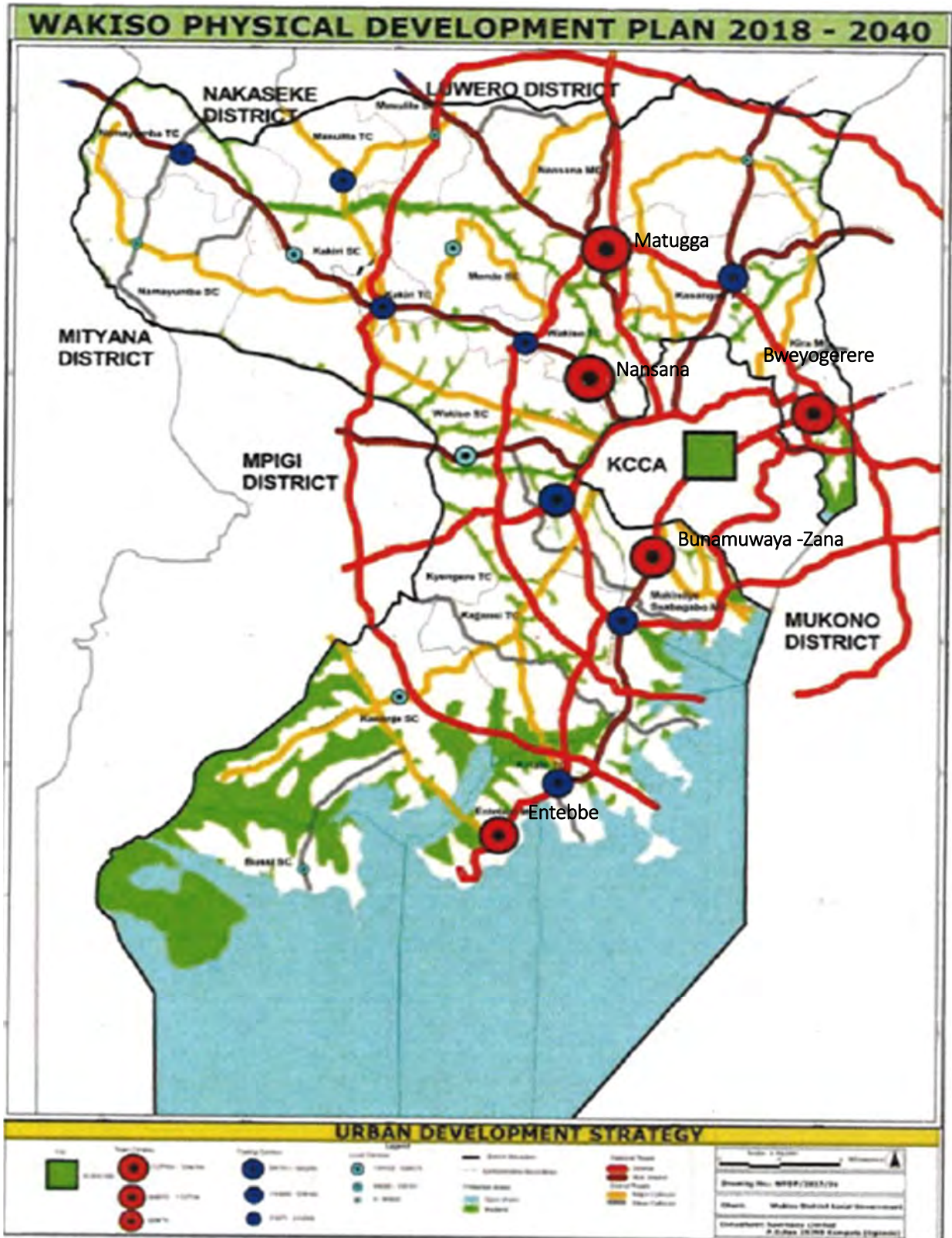
Source: KCCA (2012) KPDF/KPDP

2) **Wakiso District Physical Development Plan**

The Wakiso District Physical Development Plan was formulated and approved in 2018, proposing eight key action areas, as follows:

- Industrial Park Master Plan for Matugga Kakerenge
- Waterfront Master Plan for tourism development
- PDPs for all urban councils and neighborhood detailed plans, especially in the inner residential zone
- Solid Waste Management Plan
- Slum Upgrading in Kasokoso Namasuba, Masajja, Kisimu, Jinja Karoli
- Restoration and preservation of ecological zones
- Drainage Master Plan
- Upgrading the proposed district roads

The Wakiso District Physical Development Plan designates five town-level centers (Nansana, Matugga, Entebbe, Zzana, and Kyaliwajjala) and four primary service centers (Kira, Kyengera, Kajjansi, and Katabi). The town-level center of Entebbe and the primary service centers of Kyengera and Kajjansi are also prioritized in the KPDF/KPDP 2012.



Source: Wakiso District Local Government (2018) Wakiso District Physical Development Plan

Figure 11.2.2 Future Urban Structure Proposed in the Wakiso District Physical Development Plan

The Wakiso District Physical Development Plan only includes a list of proposed strategic interventions as shown in Table 11.2.3 and does not provide specific details on prospective projects.

Table 11.2.3 Strategic Interventions Proposed in the Wakiso District Physical Development Plan

Sector	Current Challenge	Strategic Intervention and Recommendation
Physical	<ol style="list-style-type: none"> 1. Rapid unguided urban sprawl 2. No coherent physical structure 3. High levels of land use invasion–succession 4. High demand for land and services as a result of proximity to Kampala City 	<ol style="list-style-type: none"> 1. Define urban development and settlement limits through the creation of zoning belts. 2. Use urbanization as the engine of growth, development, and rural transformation. 3. Develop a hierarchy of satellite towns to act as centers of employment and to contain urban sprawl. 4. Development of local level physical development plans to guide and control haphazard physical development.
Ecological	<ol style="list-style-type: none"> 1. Public land (mainly marginal lands) has highly encroached 	<ol style="list-style-type: none"> 1. Demarcation and restoration of all the ecological zones in the district through forceful removal of encroachers and replanting. 2. Develop a comprehensive GKMA solid waste management plan.
Demography	<ol style="list-style-type: none"> 1. Population explosion over the last 10 years (Population density: 560 per km² in 2002 => 1,060 per km² in 2014) 2. High level of immigration into the district, which puts stress on service provision in the district 	<ol style="list-style-type: none"> 1. Improve accessibility to serviced land in urban areas in the countryside to control immigration. 2. Provide planned infrastructure with adequate employment centers and amenities in urban areas. 3. Wakiso District should plan for all neighborhoods to accommodate the population inflow.
Social Services	<ol style="list-style-type: none"> 1. Poorly maintained infrastructure and equipment both in schools and health facilities 2. The majority of services were privately owned 3. A good number of residents could not afford the provided services 	<ol style="list-style-type: none"> 1. Create an enabling environment for health care service providers to expand good quality services, especially to rural areas in the district. 2. Given the predictable population explosion, plan for phased construction of health facilities giving specific attention to the areas that lack services. 3. Government should reduce overcrowding in lower-level education and health facilities.
Housing & Land Tenure	<ol style="list-style-type: none"> 1. High demand for housing, especially for low-cost housing 2. Real estate developers were guiding settlement patterns in Wakiso and opening up virgin areas for residential development 3. Proportion in rented residential houses was high with high rental costs 4. Land fragmentation and lack of security of tenure 5. Over 90% of tenure was privately owned, which impacted negatively on the provision of public infrastructure 	<ol style="list-style-type: none"> 1. There should be deliberate interventions to tackle informal settlements, especially for the poor communities. 2. Streamline compulsory land acquisition procedures and adequate compensation to ease the provision of infrastructure. 3. Ensure an adequate supply of land for infrastructure development, public facilities, and public open spaces to meet the district requirements for 2040. 4. There was a need for land adjustments and regularisation to provide access to essential land for the upgrading and redevelopment of informal settlements. 5. Encourage systematic integrated planning for infrastructural development.
Local Economic Development	<ol style="list-style-type: none"> 1. Lack of planning low, low servicing, and disregard of planning standards 2. Inadequate skilled human capital 3. Small industrial and commercial segment hence unemployment 4. High poverty at the community and household 	<ol style="list-style-type: none"> 1. Provide employment centers, e.g., industrial parks, improving markets, and incubators of small-scale enterprises. 2. Facilitate private investment through training and access to credit. 3. Promote tourism as a major economic sector in the district. 4. Plan and development of three new industrial zones. 5. The need to strengthen the districts' financial capacity to improve their self-financing capacity and

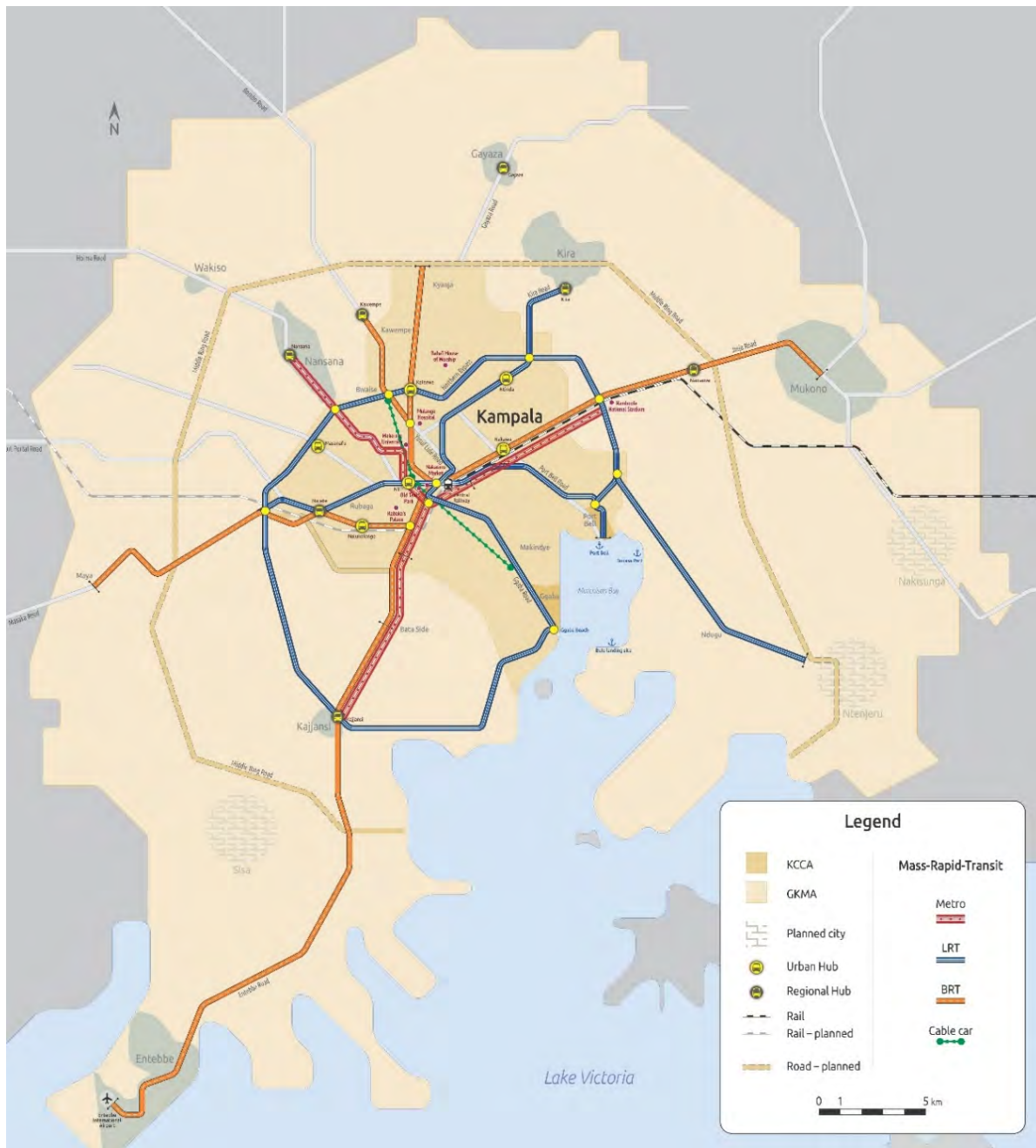
	level	their creditworthiness concerning investment in infrastructure systems.
Infrastructure (Transport)	<ol style="list-style-type: none"> 1. Inadequate and poor bus facilities 2. Lack of infrastructure provisions for NMT 3. Private taxi park operations 4. Lack of transit terminals in Wakiso 	<ol style="list-style-type: none"> 1. Promote an integrated transport network where bus routes interconnect with other modes of transfer. 2. Provide a waterfront route interconnecting inland ports, landing sites, and other transportation modes to reduce traffic congestion. 3. Need to develop inner and outer ring roads to increase circulation and flow of traffic.
Infrastructure (Water Supply)	<ol style="list-style-type: none"> 1. There is fair coverage and erratic supply of piped water in the district 	<ol style="list-style-type: none"> 1. NSWC should take over water supply, operation, and maintenance in Wakiso District.
Infrastructure (Sewerage)	<ol style="list-style-type: none"> 1. 90% of the people in the district were not connected to the sewerage system 2. Limited access to the sewer network was the cause of industrial discharge to the environment in an uncontrolled manner 	<ol style="list-style-type: none"> 1. Prepare Wakiso District Drainage Master Plan. 2. Creation of small treatment plants for major polluters such as commercial industries and institutions facilities not connected to the NSWC network.
Infrastructure (Solid Waste Management)	<ol style="list-style-type: none"> 1. Lack of a clear solid waste management plan resulting in indiscriminate dumping 	<ol style="list-style-type: none"> 1. Develop a comprehensive solid waste master plan for the GKMA. 2. Sensitize the public about proper solid waste management.

Source: Wakiso District Local Government (2018) Wakiso District Physical Development Plan

Wakiso District fell behind in responding to the needs of the increasing nighttime population. However, in addition to the nighttime population, the daytime population is expected to grow as those doing businesses in Kampala City are closing their business and returning to their hometowns or local areas due to the COVID-19 pandemic. Therefore, it has become urgent to respond to the needs of both the daytime and nighttime populations.

3) Multi-Modal Urban Transport Master Plan for Greater Kampala Metropolitan Area (MMUTMP)

The MMUTMP was formulated by KCCA in 2018 with the support from the World Bank. The MMUTMP covers KSPA, and it includes projects to develop mass public transport system in KSPA (See Figure 11.2.3).



Source: KCCA (2018) Final Report, Multi-Modal Urban Transport Master Plan

Figure 11.2.3 Public Transport Network Planned in the MMUTMP

It also proposes a project designed to introduce a public transport ticketing system that has been given higher priority due to the COVID-19 pandemic. Although the MMUTMP proposes a step-by-step approach to this end, as shown below, the COVID-19 pandemic has made it necessary to consider accelerating the project to introduce transport IC cards and the Smart Card Mobile Application as soon as possible.

- Short run: Ticket Booths at Major Stations
- Mid-run: Ticket Vending Kiosks
- Long run: Smart Card Charging
- Very long run: Smart Card Mobile Application

4) Greater Kampala Metropolitan Area Economic Development Strategy (GKMAEDS)

The GKMAEDS, developed in 2017 with support from the World Bank, proposes programs and projects for each of the five strategic objectives.

Table 11.2.4 Strategic Objectives and Major Programs and Projects in the GKMAEDS

Strategic Objectives	Major Programs	Flagship Projects
1. World Class Economic Infrastructure	Strategic Roads Program	<ul style="list-style-type: none"> • Upgrade existing roads • Strategic new roads investment
	Public Transportation Program	<ul style="list-style-type: none"> • Pilot BRT key corridors • Light rail network • Non-motorized transport pilot
	Affordable Housing and Land Management Program	<ul style="list-style-type: none"> • High-density affordable housing pilot • Land zoning and land banking
2. Conserve and protect environmental assets	Comprehensive Solid Waste Management Program	<ul style="list-style-type: none"> • Modern waste management facilities • Community sensitization campaigns
	Lakes, Wetlands, Waterways Conservation Program	<ul style="list-style-type: none"> • Lake Victoria and wetland environmental conservation
3. Business support to informal sector, the youth and economic clusters	Micro-enterprise workspace program	<ul style="list-style-type: none"> • Development of Artisan parks • Workspaces and markets for street vendors
	Business engagement and youth entrepreneurship development program	<ul style="list-style-type: none"> • Business engagement centers • Business incubation and job centers for youth
	Cluster Competitiveness Program	<ul style="list-style-type: none"> • Strengthening existing clusters and attracting further enterprise investment
4. A unique center for tourism	Tourism development Program	<ul style="list-style-type: none"> • Kampala tourism circuit • MICE Tourism • Cultural and Religious Tourism • Lake and Eco-tourism
5. Effective city and local government service delivery	Sub national Government Skills and Efficiency Program	<ul style="list-style-type: none"> • E-governance roll-out, including ICT infrastructure and training • Capacity-building for local government officials

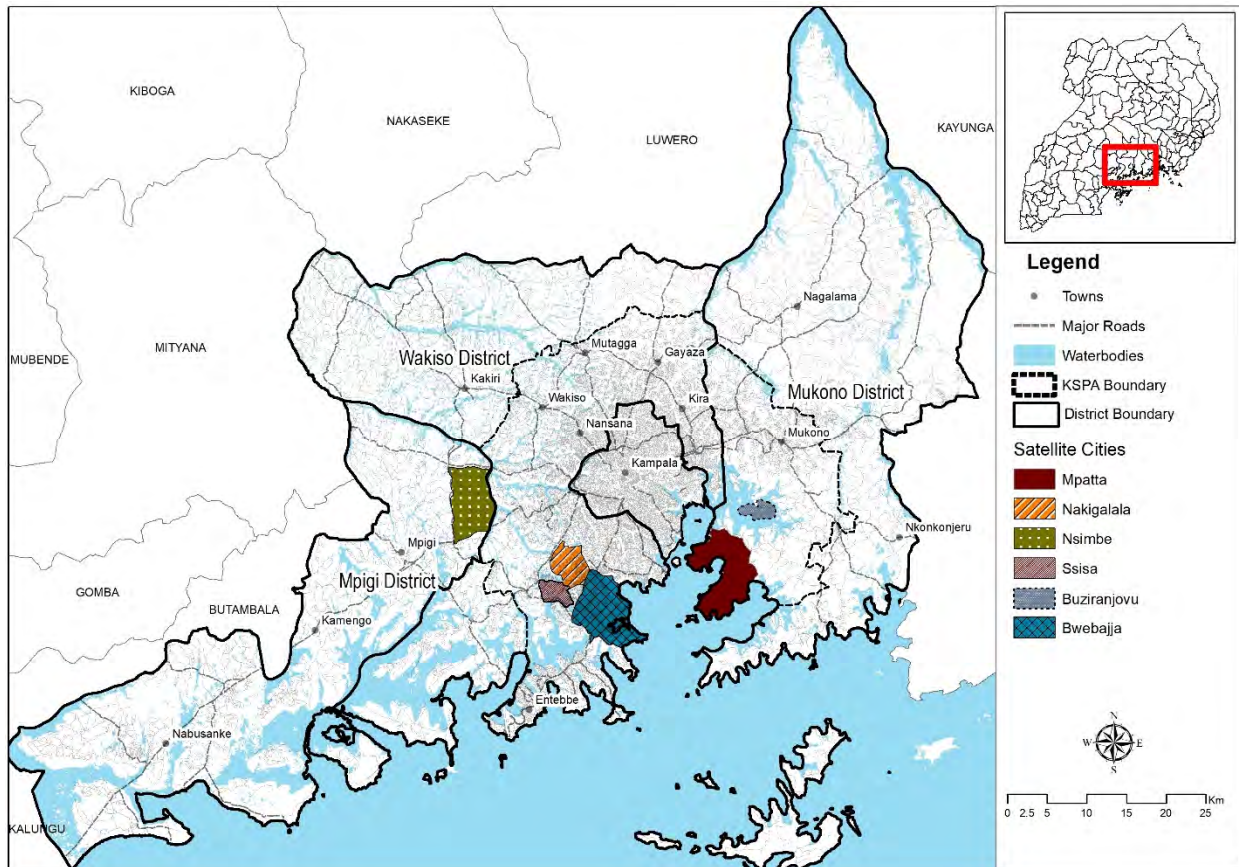
Source: National Planning Authority (2017) GKEDS Draft Final Report

At present, the World Bank and the Government of Uganda are discussing the actual implementation of the proposed projects to put the GKMAEDS into practice. Projects selected for the Urban Development Program-for-Results financing will be put into practice from July 2022 onwards. The GKMAEDS projects are expected to focus on districts and municipalities outside Kampala City which have lagged in infrastructure development.

5) Satellite City Program

The Ministry of Lands, Housing and Urban Development (MoLHUD) is working on a satellite city program to develop new towns in five suburban communities around Kampala City (Nsimbe, Nakigalala, Bwebajja, Mpata, and Buziranjovu Island). This program is expected to contribute to solving the housing shortage in the GKMA. It is also planned to provide workplaces and recreation facilities in these new towns. As for Nakigalala, a Malaysian company has been commissioned to develop a master plan, and investors will be invited to

take part in the development of this satellite city. Meanwhile, Bwebajja is to be developed to have an office complex for ministries, and the government has purchased 120 ha of land though no specific schedule has been set yet.



Source: OCG, YEC, PACET, and Pasco (2022) Progress Report 1 on the Project for Integrated Urban Development Master Plan for Kampala Special Planning Area (Prepared based on Statutory Instruments, 2020 No.54, the Physical Planning Instrument [Declaration of Special Planning Areas], 2020)

Figure 11.2.4 Locations of Satellite Cities to be Developed by the MLHUD

11.2.2 On-going JICA Projects

JICA is now implementing the following projects in the GKMA.

1) The Project for Integrated Urban Development Master Plan for Kampala Special Planning Area

The KPDF/KPDP formulated in 2012 is currently being upgraded. The project is scheduled from March 2021 to March 2024. This ongoing project will also develop guidelines for formulating the detailed local-level physical development plans through model planning and establish a collaboration and coordination mechanism for stakeholders involved in urban development.

2) Project for Capacity Enhancement of KCCA in Management of Traffic Flow in Kampala City

This project was implemented from 2015 to 2021 to deliver the following outputs to enhance the capacity of KCCA to manage traffic flow in Kampala City.

- (i) Strengthen the urban traffic management policy of KCCA
- (ii) Enhance capacity to design intersection improvements
- (iii) Enhance capacity to install and maintain traffic signals at intersections
- (iv) Enhance capacity to conduct awareness-raising campaigns on traffic rules
- (v) Enhance capacity to manage traffic flow, especially at intersections

Going forward, the Project for the Improvement of Traffic Control in Kampala City will develop a traffic control center as well as install and improve traffic signals at intersections.

3) Project on Patient Safety Establishment through 5S-CQI-TQM in Uganda

The Project on Patient Safety Establishment through 5S-CQI-TQM in Uganda is scheduled from 2021 to 2027. This project is being implemented following the Project on Improvement of Health Service through Health Infrastructure Management in Uganda, which was carried out from 2016 to 2021 to promote the 5S-CQI-TQM approach (workplace environment improvements and total quality management), provide user training (UT), and support capacity building for medical equipment maintenance at all regional referral hospitals (RRHs) across the country, and establish a supporting/supervising system in the Ministry of Health (MOH) in order to strengthen the health infrastructure management of RRHs across the country under the initiative of the MOH. The scope of the ongoing project includes an RRH in Entebbe.

4) Others

The Government of Japan is also implementing the following projects in the GKMA:

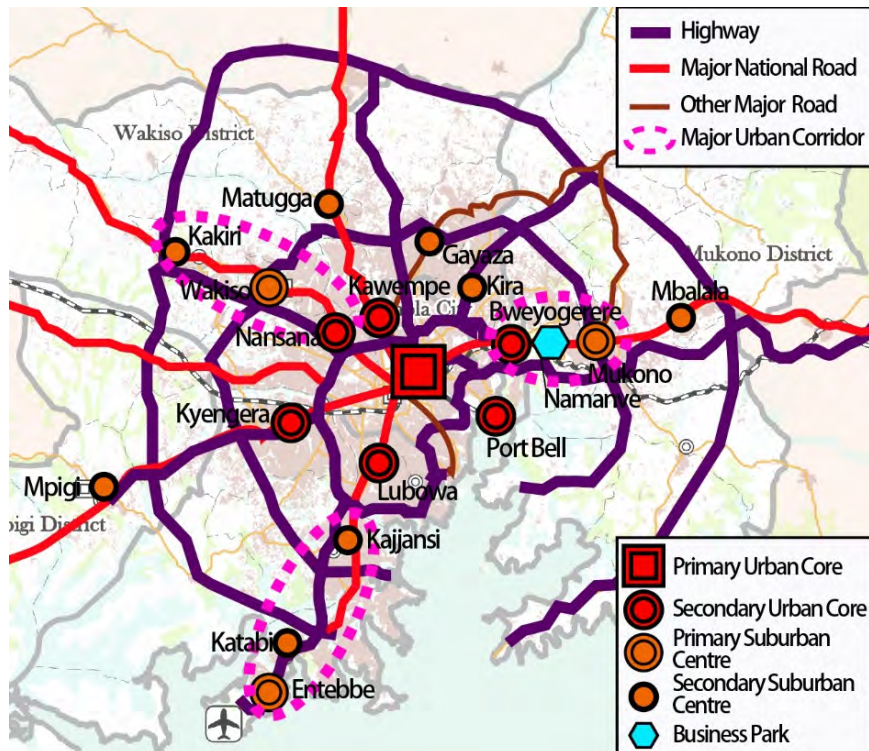
- Kampala Flyover Construction and Road Upgrading Project
- Kampala Metropolitan Transmission System Improvement Project

11.2.3 Urban Development Strategies based on New Neighborhood Policy and Five Agendas

As mentioned above, the existing development plans, such as the KPDF/KPDP 2012 and the Wakiso District Physical Development Plan, suggest a transition from the monocentric spatial structure to a multi-nucleus structure. However, so far, the urban area is sprawling without achieving the multi-nucleus spatial structure.

Meanwhile, COVID-19 control measures that had remained in place for almost two years, such as curfews and a ban on boda-boda services after 6 pm, as well as inter-district travel bans during surges in the pandemic, seem to have increased working population flow from Kampala Capital City to the suburbs of the GKMA.

JICA's ongoing Project for the Integrated Urban Development Master Plan for the Kampala Special Planning Area is deliberating how to restructure the urban structure for the GKMA based on the assumption that its population will reach approximately 10 million by 2040. The key to actualizing the multi-nucleus structure in GKMA is to develop sub-centers around Kampala Capital City and sub-urban centers in the suburbs of the GKMA.



Source: OCG, YEC, PACET, and Pasco (2022) Progress Report 1 on the Project for Integrated Urban Development Master Plan for Kampala Special Planning Area

**Figure 11.2.5 Proposed Future Distribution of Urban Centers
in the Greater Kampala Metropolitan Area**

However, it is not easy for the GKMA to move away from the current mono-centralized structure. While the infrastructure of Kampala Capital City has not developed enough to meet the needs of its daytime population, the current strenuous efforts of development partners focused on infrastructure development in Kampala Capital City will need to be redirected from Kampala to other urban centers because of the continued investments in infrastructure development for the daytime population in Kampala Capital City will only lead to a vicious circle where the growing daytime population will accelerate further concentration in Kampala. In order to cut this vicious circle, efforts should be focused on the development of suburban centers.

The development of suburban centers is expected to create new living areas around these centers, which shall be acknowledged as "new neighborhoods." New neighborhoods should be provided with business centers, commercial functions, higher educational and advanced health facilities as well as public transport hubs and open spaces. Furthermore, adequate water supply, electricity supply is essential for such suburban centres to develop since despite the fact population will continue to concentrate in areas with inadequate basic infrastructure due to inexpensive land price, private investment will not come to such areas.

It is also important to develop basic infrastructure around the new suburban centers to create well-designed residential areas before informal settlements are formed.

11.2.4 Overview of the Proposed Urban Development Program

In light of the challenges the GKMA faces, prospective projects included in the existing master plans, and recent initiatives by the local governments, this study proposes two cooperation projects, as shown in Table 11.2.5.

Table 11.2.5 Proposed Projects for the Urban Environment Improvement Program against COVID-19 and Other Infectious Diseases in the Greater Kampala Metropolitan Area

	Project Name	Project Site	Project Period
GKMA-1	Project for Capacity Development for Urban Environment Improvement in S Greater Kampala Metropolitan Area	Kampala City, Wakiso, Mukono, and Mpigi Districts	Short-term
GKMA-2	Project for Development of Sub-centres and Suburban Centres in Greater Kampala Metropolitan Area	Wakiso, Mukono and Mpigi Districts	Mid- to long-term
GKMA-3	Project for Improvement of Water Supply Reliability in Suburban Areas of Greater Kampala Metropolitan Area	Wakiso District	Long-term

Source: JICA Study Team

11.3 Cooperation Project Formulation

11.3.1 Detailed Analysis

1) Scope of the Analysis

As discussed in the previous sections, it is considered essential to implement strategies for realizing multi-nucleus spatial structure since a transition from a mono-centric spatial structure that is likely to accelerate population concentration in the urban center to a decentralized spatial structure, as well as the utilization of ICT to strengthen collaboration and coordination mechanisms among concerned organizations, can help control the spread of infectious diseases like COVID-19.

The key to establishing a decentralized urban spatial structure is to develop sub-centers in suburbs to integrate/distribute urban functions. It is also necessary to develop residential areas not only for the middle and upper classes but also for the low-income segment around the sub-centers. In many cases, informal settlements emerge spontaneously along radial roads in urban areas before sub-centers are developed in a systematic way. When left as they are, they can turn into densely populated and poorly maintained slums.

Therefore, it is critical to identify potential locations for future sub-centers in the vicinity where informal settlements are emerging and investigate and formulate projects to develop sidewalks, drainage channels, water supply facilities, public latrines, and open spaces at an early stage of development.

Because no map that can indicate the areas outside Kampala Capital City with emerging needs, it is suggested that potential project sites could be located based on a digital map created using aerial photos and satellite images to quantitatively show the size and density of buildings.

Since KCCA had just prepared the latest building footprint data of Kampala Capital City, the study team created a simplified digital topographic map of the surrounding areas of Kampala, covering 933.13km², as shown in Figure 11.3.1

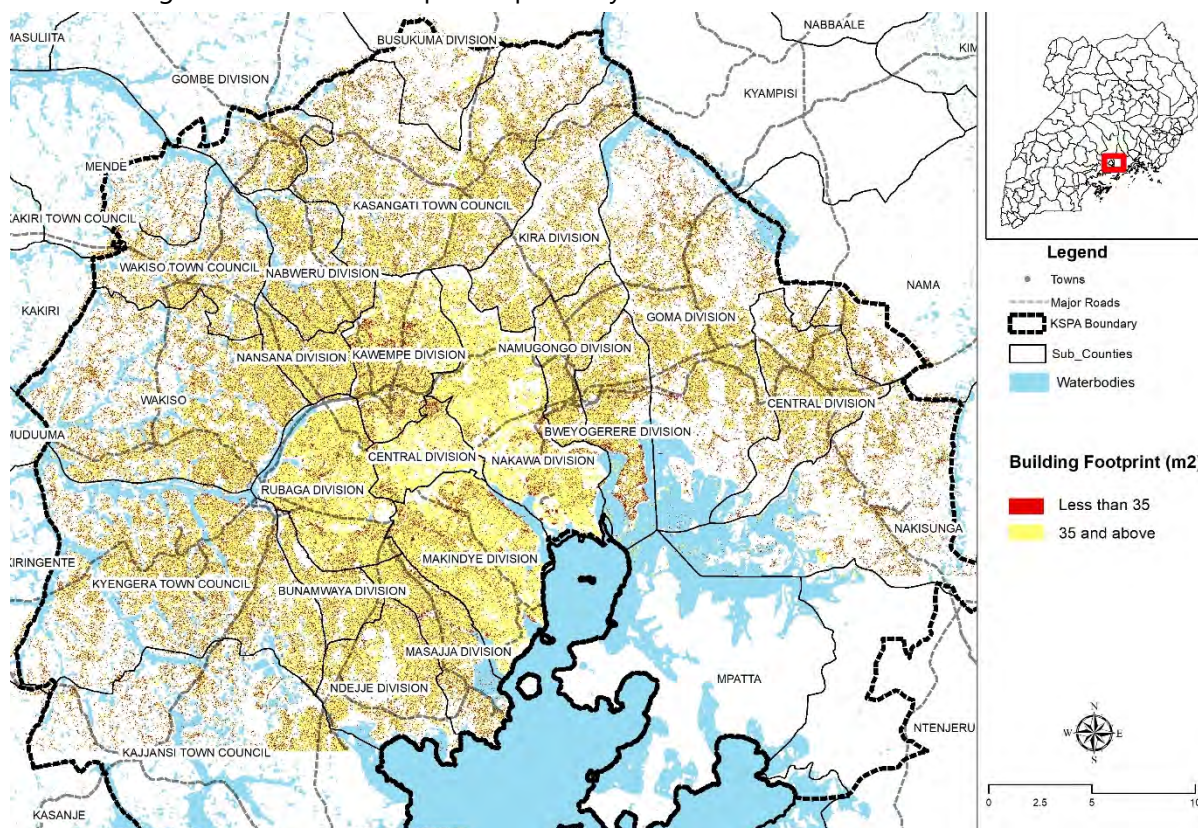


Source: JICA Study Team

Figure 11.3.1 Coverage Area of Digital Map Prepared for Greater Kampala Metropolitan Area in CUREIP

2) Analysis

The building footprint data created based on orthophotos taken in 2019 revealed that there are more small buildings outside Kampala City than inside, as shown in Figure 11.3.2, where the area with red dots represents a building with less than 35m² building footprints are more recognizable outside Kampala Capital City.



Source: JICA Study Team (Prepared based on map data collected by the subcontractor and information provided by KCCA)

Figure 11.3.2 Building Footprint Size in and around Kampala Capital City (2019)

The parish with the most buildings with a building footprint size of less than 35.0m² is Nankonge Parish in Kajjansi Town, followed by Banda Parish in Mende Sub-County, Namayiba Parish in Nakisunga Sub-County, Bukerere Parish in Mukono Municipality, Nsaggu Parish in Kajjansi Town, Magigye Parish in Nansana Municipality, Namusera Parish in Mende Sub-County, Lukwanga Parish in Wakiso Sub-County, Katadde Parish in Kasangati Town, Namuyenje Parish in Nakisunga Sub-County and Nanziga Parish in Kyengera Town. Including the 10 parishes listed, there are 18 parishes in the area in which the digital map was prepared that have more than half of the buildings' footprint size of less than 35.0m².

Table 11.3.1 Share of Number of Building by Building Footprint Size by Parish

District	County	Sub-County	Parish	Share of No. of Building-by-Building Footprint Size		
				35.0 m ² and less	35.1-50.0 m ²	50.1 m ² and above
Wakiso	Busiro	Kajjansi Town	Nankonge	60.4%	9.9%	29.7%
Wakiso	Busiro	Mende	Banda	58.3%	9.9%	31.7%
Mukono	Mukono	Nakisunga	Namayiba	57.3%	10.6%	32.2%
Mukono	Mukono Municipality	Goma Division	Bukerere	56.8%	10.2%	33.1%
Wakiso	Busiro	Kajjansi Town	Nsaggu	56.1%	11.1%	32.8%

Preparatory Study for Urban Environment Improvement against COVID-19 (CUREIP)

Final Report

District	County	Sub-County	Parish	Share of No. of Building-by-Building Footprint Size		
				35.0 m ² and less	35.1-50.0 m ²	50.1 m ² and above
Wakiso	Nansana Municipality	Busukuma Division	Magigye	56.0%	9.8%	34.1%
Wakiso	Busiro	Mende	Namusera	56.0%	9.7%	34.3%
Wakiso	Busiro	Wakiso	Lukwanga	56.0%	10.7%	33.3%
Wakiso	Kyandondo	Kasangati Town	Katadde	55.9%	9.5%	34.6%
Mukono	Mukono	Nakisunga	Namuyenje	55.8%	9.9%	34.3%
Wakiso	Busiro	Kyengera Town	Nanziga	55.3%	12.1%	32.6%
Wakiso	Busiro	Kajjansi Town	Nkungulutale	53.4%	10.3%	36.3%
Mukono	Mukono	Nakisunga	Kyetume	52.4%	9.6%	38.0%
Mukono	Mukono	Nama	Namubiru	52.2%	9.9%	37.9%
Wakiso	Busiro	Kyengera Town	Katereke	51.3%	9.1%	39.6%
Wakiso	Kira Municipality	Kira Division	Kimwanyi	50.5%	8.8%	40.7%
Mukono	Mukono Municipality	Goma Division	Nyenje	50.4%	7.9%	41.7%
Wakiso	Kyandondo	Kasangati Town	Kabubbu	50.3%	9.1%	40.7%
Wakiso	Busiro	Wakiso Town	Kasengeje	49.9%	9.5%	40.7%
Wakiso	Busiro	Wakiso	Bukasa	49.8%	10.7%	39.5%
Wakiso	Busiro	Kyengera Town	Mauy	49.7%	9.2%	41.1%
Wakiso	Busiro	Wakiso Town	Namusera	49.4%	9.3%	41.3%
Wakiso	Kyandondo	Kasangati Town	Nangabo	49.1%	7.8%	43.1%
Wakiso	Busiro	Wakiso Town	Kavumba	49.0%	8.0%	43.0%
Mukono	Mukono Municipality	Goma Division	Misindye	48.8%	7.8%	43.3%
Wakiso	Kira Municipality	Bweyogerere Division	Kiriny	48.7%	9.3%	42.0%
Wakiso	Kyandondo	Kasangati Town	Wattuba	48.3%	9.2%	42.4%
Mukono	Mukono Municipality	Central Division	Ntaawo	48.1%	9.1%	42.7%
Mukono	Mukono Municipality	Central Division	Nsuube Kauga	47.7%	8.2%	44.1%
Mukono	Mukono Municipality	Goma Division	Nantabulirirwa	47.7%	8.2%	44.1%
Wakiso	Busiro	Wakiso Town	Naluvule	46.9%	8.9%	44.3%
Mukono	Mukono Municipality	Central Division	Namumira Anthony	46.8%	9.8%	43.4%
Wakiso	Nansana Municipality	Gombe Division	Matugga	46.5%	10.1%	43.4%
Wakiso	Busiro	Kyengera Town	Buddo	46.4%	9.5%	44.1%
Wakiso	Busiro	Kyengera Town	Kitemu-Kisozi	46.1%	10.1%	43.8%
Mukono	Mukono Municipality	Central Division	Ggulu	45.9%	8.8%	45.3%
Wakiso	Busiro	Kyengera Town	Nabbingo	45.6%	8.7%	45.7%
Wakiso	Busiro	Wakiso	Buloba	45.3%	8.8%	45.9%
Wakiso	Kira Municipality	Bweyogerere Division	Bweyogerere	45.0%	8.2%	46.9%
Wakiso	Kyandondo	Kasangati Town	Masooli	44.9%	8.2%	46.9%
Wakiso	Nansana Municipality	Nabweru Division	Kawanda	44.6%	10.6%	44.8%
Wakiso	Kira Municipality	Kira Division	Kira	44.6%	6.2%	49.2%
Mukono	Mukono Municipality	Goma Division	Seeta	44.6%	7.1%	48.3%
Wakiso	Busiro	Wakiso Town	Mpunga	44.5%	9.3%	46.3%
Wakiso	Kyandondo	Kasangati Town	Bulamu	44.4%	9.9%	45.7%
Wakiso	Kyandondo	Kasangati Town	Gayaza	44.3%	9.3%	46.4%
Wakiso	Busiro	Wakiso Town	Gombe	44.2%	9.9%	45.9%
Wakiso	Kyandondo	Kasangati Town	Kiteezi	44.1%	9.7%	46.2%
Wakiso	Kyandondo	Kasangati Town	Wampeewo	43.8%	7.8%	48.4%
Wakiso	Busiro	Kyengera Town	Nsangi	43.6%	10.2%	46.2%

Preparatory Study for Urban Environment Improvement against COVID-19 (CUREIP)

Final Report

District	County	Sub-County	Parish	Share of No. of Building-by-Building Footprint Size		
				35.0 m ² and less	35.1-50.0 m ²	50.1 m ² and above
Wakiso	Busiro	Kyengera Town	Kikajjo	43.5%	9.2%	47.4%
Wakiso	Busiro	Kyengera Town	Kasenge	43.5%	11.1%	45.5%
Wakiso	Busiro	Wakiso Town	Kisimbiri	43.4%	11.3%	45.3%
Wakiso	Nansana Municipality	Nabweru Division	Nakyesanja	43.2%	8.9%	47.9%
Wakiso	Makindye-Ssabagabo Municipality	Ndejje Division	Mutungo	42.9%	9.7%	47.4%
Wakiso	Busiro	Kyengera Town	Kyengera	42.9%	9.9%	47.2%
Wakiso	Kira Municipality	Namugongo Division	Kyaliwajjala	42.4%	6.3%	51.3%
Wakiso	Busiro	Wakiso	Ssubwe	41.2%	10.8%	48.1%
Wakiso	Nansana Municipality	Nabweru Division	Maganjo	41.1%	9.4%	49.5%
Wakiso	Makindye-Ssabagabo Municipality	Ndejje Division	Seguku	40.9%	8.3%	50.8%
Wakiso	Kira Municipality	Namugongo Division	Kireka	40.8%	9.2%	50.0%
Wakiso	Makindye-Ssabagabo Municipality	Masajja Division	Busabala	40.7%	11.9%	47.4%
Wakiso	Busiro	Wakiso	Bulenga A	40.4%	11.3%	48.3%
Wakiso	Busiro	Wakiso	Nakabugo	39.8%	9.2%	50.9%
Wakiso	Nansana Municipality	Nabweru Division	Wamala	39.8%	12.7%	47.5%
Wakiso	Makindye-Ssabagabo Municipality	Bunamwaya Division	Mutundwe	39.3%	10.1%	50.7%
Wakiso	Nansana Municipality	Nansana Division	Nabweru South	39.2%	11.7%	49.1%
Wakiso	Makindye-Ssabagabo Municipality	Bunamwaya Division	Bunamwaya	39.1%	7.8%	53.1%
Wakiso	Nansana Municipality	Nansana Division	Ochieng	39.1%	9.1%	51.8%
Wakiso	Busiro	Wakiso	Kyebando	38.3%	12.0%	49.7%
Wakiso	Nansana Municipality	Nansana Division	Nansana West	38.0%	9.4%	52.6%
Wakiso	Makindye-Ssabagabo Municipality	Ndejje Division	Ndejje	37.5%	10.3%	52.2%
Wakiso	Nansana Municipality	Nansana Division	Nansana East	37.1%	9.7%	53.2%
Wakiso	Nansana Municipality	Nabweru Division	Wakiso	36.9%	9.6%	53.5%
Wakiso	Nansana Municipality	Nansana Division	Nabweru North	36.4%	12.5%	51.1%
Wakiso	Makindye-Ssabagabo Municipality	Masajja Division	Masajja	36.4%	11.1%	52.5%
Wakiso	Nansana Municipality	Nansana Division	Kazo	35.5%	11.1%	53.5%
Wakiso	Makindye-Ssabagabo Municipality	Masajja Division	Namasuba	34.6%	8.9%	56.5%

Source: JICA Study Team

Other parameters that the building footprint data can be used for is the number of buildings per hectare by the parish. Areas with a high number of buildings per hectare are Kazo Parish in Nansana Municipality, Nabweru North Parish in Nansana Municipality, and Nabweru South Parish in Nansana Municipality, and Nansana West Parish in Nansana Municipality. These parishes have more than 40 buildings per hectare.

Furthermore, in Uganda, wetlands are often occupied by informal settlers. Many locations have names related to wetlands, and water bodies are likely to have some informal settlers.

11.3.2 Project Profiles

Below are three project profiles proposed in the Urban Environment Improvement Program against COVID-19 and Other Infectious Diseases (CUREIP) for the GKMA.

- Project for Capacity Development for Urban Environment Improvement in Suburban Areas of Greater Kampala Metropolitan Area
- Project for Development of Sub-centres and Suburban Centres in Greater Kampala Metropolitan Area
- Project for Improvement of Water Supply Reliability in Suburban Areas of Greater Kampala Metropolitan Area

Table 11.3.2 Project Profile 1: Project for Capacity Development for Urban Environment Improvement in Suburban Areas of Greater Kampala Metropolitan Area

(1) Project No.	(2) Country/City	(3) Sector		
GKMA-01	Uganda/ Greater Kampala	Urban Development		
(4) Project Name				
Project for Capacity Development for Urban Environment Improvement in Suburban Areas of Greater Kampala Metropolitan Area				
(5) Counterpart Agency		(6) Relevant Agency		
Ministry of Kampala Capital City and Metropolitan Affairs		Ministry of Lands, Housing and Urban Development, Ministry of Local Government, Kampala Capital City Authority, Wakiso District Local Government, Mukono District Local Government and Mpigi District Local Government		
(7) Project Scheme/ Budgeting sources		(8) Project Period		
Technical Assistance for Capacity Development/ JICA		2025–2027	Emergency	Short-term
			○	Mid- long
(9) Background (including relevance to CUREIP Output)				
<p>The Greater Kampala Metropolitan Area (GKMA) has been increasing its population rapidly in the past decades. While the population of Kampala City increased with a population growth rate of around 4% per annum between 1991 and 2002, it dropped to approximately 2% per annum between 2002 and 2014. On the other hand, the population in the surrounding districts, especially Wakiso District, has rapidly increased population since 2002 with an average population growth rate of 6.8%, which is extremely high, doubling its population in just 12 years. Furthermore, in some of the municipalities or towns adjoining Kampala City, the growth rate exceeds 8% between 2002 and 2014.</p> <p>Due to such a rapid population increase, the basic infrastructure is lacking in many new urbanizing areas, and many buildings encroach on the wetland. Although the future urban structure proposed in the physical development framework formulated in 2012 shows a multi-nucleus metropolitan structure, these proposed centers are currently only functioning as the service center for their municipality or town and, in most cases, are not sufficient to function as a suburban center providing services to the metropolitan.</p> <p>Furthermore, in Kampala Capital City and its neighboring municipalities, the population densities are high, with limited areas designated as parks or gardens. In addition, wetlands, farmlands, and forests which used to function as open spaces are decreasing due to urbanization.</p> <p>The new Post COVID-19 Urban Agenda proposed in the Project for Urban Environment Improvement against COVID-19 (CUREIP) suggests the necessity of strengthening the multi-nucleus metropolitan structure with suburban centers providing not only the infrastructure to support the metropolitan but also services such as tertiary referral hospital, good secondary school and tertiary education facility, and also facilities including commercial center, transportation hub, business center, etc.</p> <p>In a rapidly urbanizing city, it is important to secure sufficient lands necessary for the future infrastructure and development of the metropolitan. In order to secure such land, detailed plans should be prepared for the future sub-centers and suburban centers.</p>				

Furthermore, it is proposed in CUREIP that it is important to develop socially and economically self-sustaining neighborhoods with the following objectives:

- To enrich each neighborhood with functions such as “living,” “working,” “studying,” “enjoying,” and “accessing services.”
- To improve amenity and walkability in each neighborhood as well as basic infrastructure.
- District-based planning and community-based urban management.

In some areas in Kampala Capital City and its neighboring highly dense areas, it is also important to consider the playground of public schools to serve as public spaces in areas without sufficient parks or open spaces.

Furthermore, the guideline for the formulation of detailed plans is currently being prepared by JICA's project, The Project for Integrated Urban Development Plan for Kampala Special Planning Area.

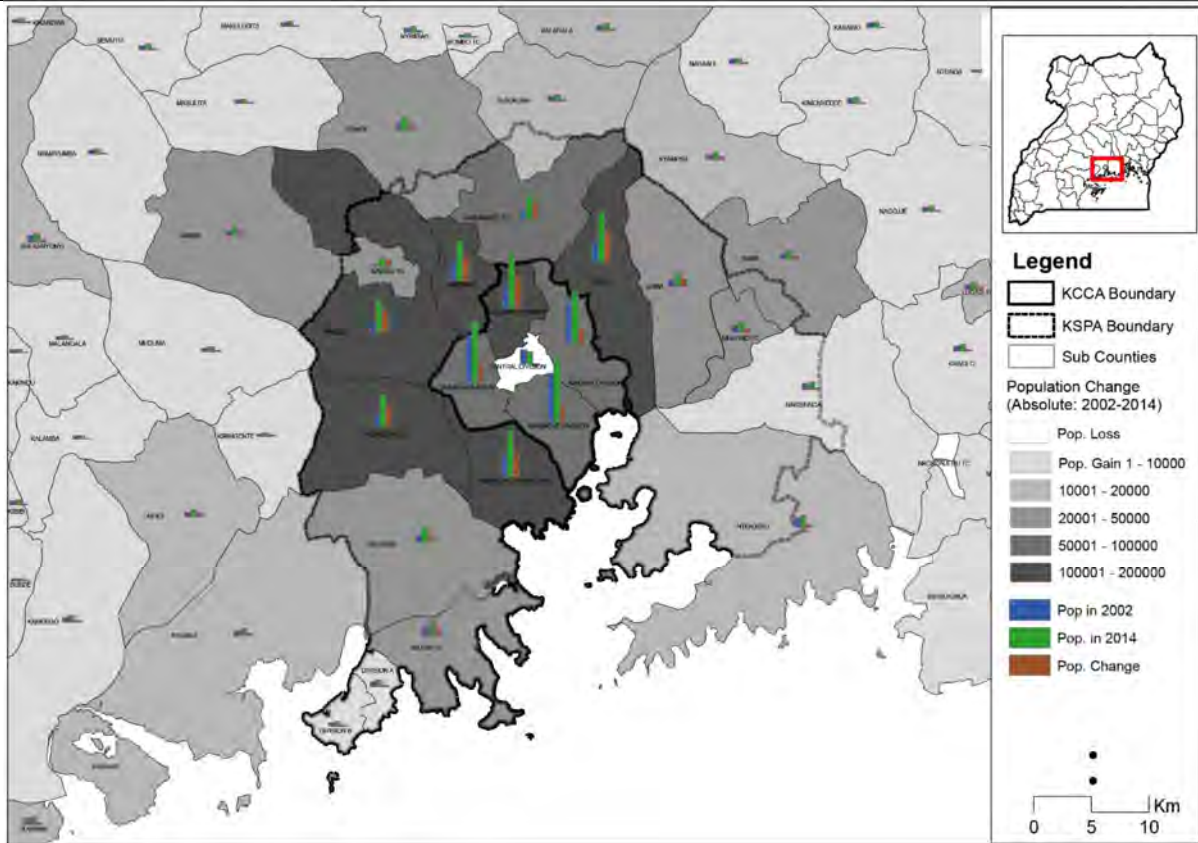
(10) Project Outline

Objectives	<ul style="list-style-type: none"> • To ensure the transformation from the present mono-centric spatial structure to a multi-nucleus spatial structure of Greater Kampala Metropolitan Area by preparing detailed local-level physical development plans (detailed land use plans) for sub-centers and suburban centers. • To improve the living environment of communities in the rapidly urbanizing areas • To develop the capacity of officers in suburban local governments necessary to formulate and implement detailed local-level physical development plans
Project Location	<p>Plan formulation: Local governments with sub-centers and suburban centers in the GKMA</p> <p>Pilot Project 1: Residential communities near sub-centres and suburban centres lacking basic infrastructure</p> <p>Pilot Project 2: in Kampala Capital City and surrounding high density residential areas in the GKMA</p>
Type of Project	<p>() Construction</p> <p>(○) Technical Assistance</p> <p>() Basic Survey</p> <p>() Operation and Maintenance</p>
Scope of Project	<p>Activity 1: Capacity Development for the Formulation of Local-Level Detailed Physical Development Plans</p> <ul style="list-style-type: none"> • Analysis of the existing conditions (including stakeholder analysis and review of existing plans, if any) • Provision of training for formulating detailed local-level physical development plans for sub-centers and suburban centers dedicated to the upper-level master plan. • Monitoring the implementation of detailed local-level physical development plans <p>Activity 2: Implementation of Pilot Project in Residential Settlements Around Sub-centres and Suburban Centres with Insufficient Basic Infrastructure</p> <ul style="list-style-type: none"> • Implementation of district roads, local roads, drainage, open space, public toilets and other basic infrastructure at pilot project sites. • Operation and management of basic infrastructure implemented <p>Activity 3:</p> <ul style="list-style-type: none"> • Implementation of WASH facilities, such as handwashing facilities, toilets, roof water harvesting facilities, water supply from NWSC, and facilities and equipment for school playgrounds, such as park furniture, outdoor physical exercise equipment and shade-providing structures. • Operation and management of utilization of public schools as open space and community facilities
Project Cost (estimated)	TBD
Implementation Period	3–5 years

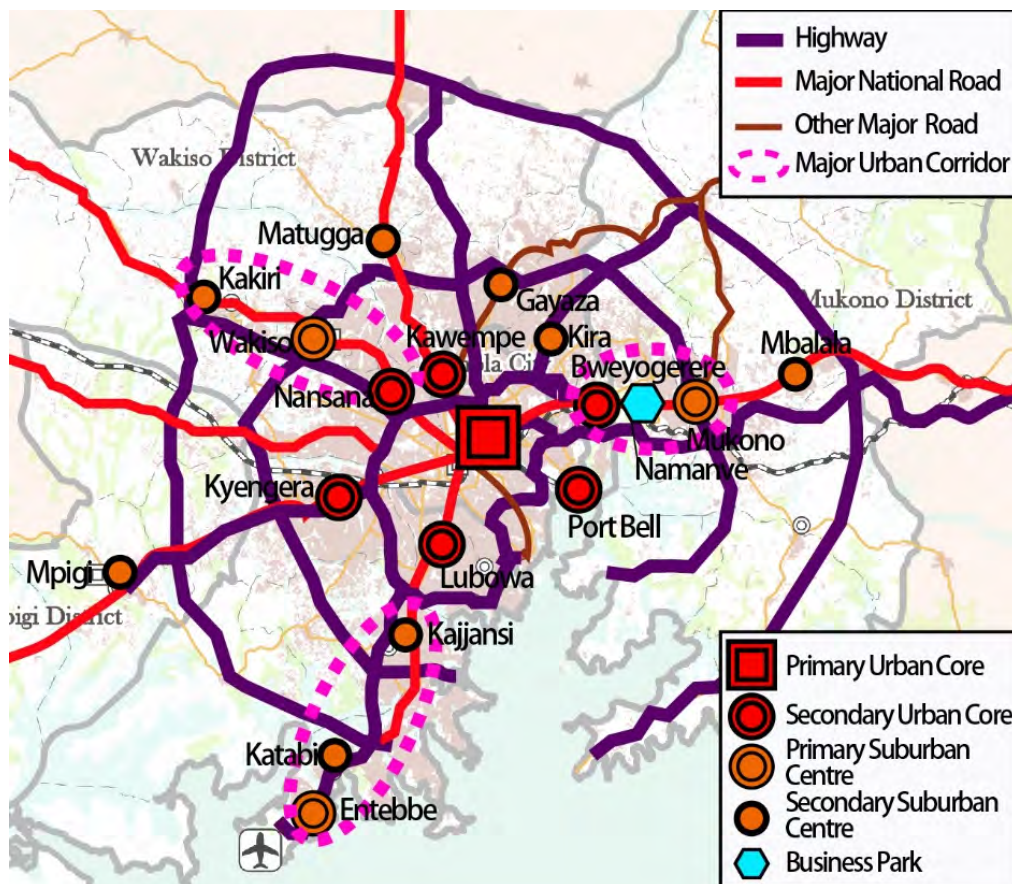
(11) Outcome and Impact

<p>Expected outcome</p>	<ul style="list-style-type: none"> • Detailed local-level physical development plans are formulated in the sub-centers and suburban centers of the GKMA to secure land necessary for infrastructure, service facilities, and business and commercial centers. • KCCA and its surrounding suburban local governments in the GKMA can implement detailed local-level physical development plans in line with the metropolitan-level land use plans. • Officers of surrounding local governments of the GKMA can educate and inform the general public about land use regulation and building control. • Providing basic infrastructure in the rapidly increasing residential areas will prevent such settlements from becoming informal settlements. • The population with access to basic infrastructure living in a better urban environment will increase in the GKMA
<p>Beneficiaries</p>	<ul style="list-style-type: none"> • Residents in suburban areas of the GKMA • Investors who are interested in doing business in the GKMA
<p>Environmental and Social Impact</p>	<p>The detailed physical development plans will be prepared following the upper-level master plan, which will conduct a strategic environmental assessment study. However, the detailed plan formulated may suggest relocation of certain facilities and usage of wetland for future infrastructure. Therefore, although the actual plan is currently unknown, the environmental and social impact needs to be carefully assessed during the plan formulation phase</p>
<p>(12) Necessary Input from Counterpart</p>	
<ul style="list-style-type: none"> • Approval of the master plan for the GKMA is currently under update. • Officers from the local governments for the implementation of the project. • Approval of the detailed physical development plan to be formulated. • Creation of new cities (Wakiso and Entebbe) needs enforcement with sufficient technical officers for implementing this proposed project. 	
<p>(13) Relevant Projects</p>	
<ul style="list-style-type: none"> • The Project for Integrated Urban Development Plan for Kampala Special Planning Area (JICA) • WASH projects conducted in some public schools in Kampala Capital City by GIZ and other organizations. • COVID Tank Project (NWSC) 	

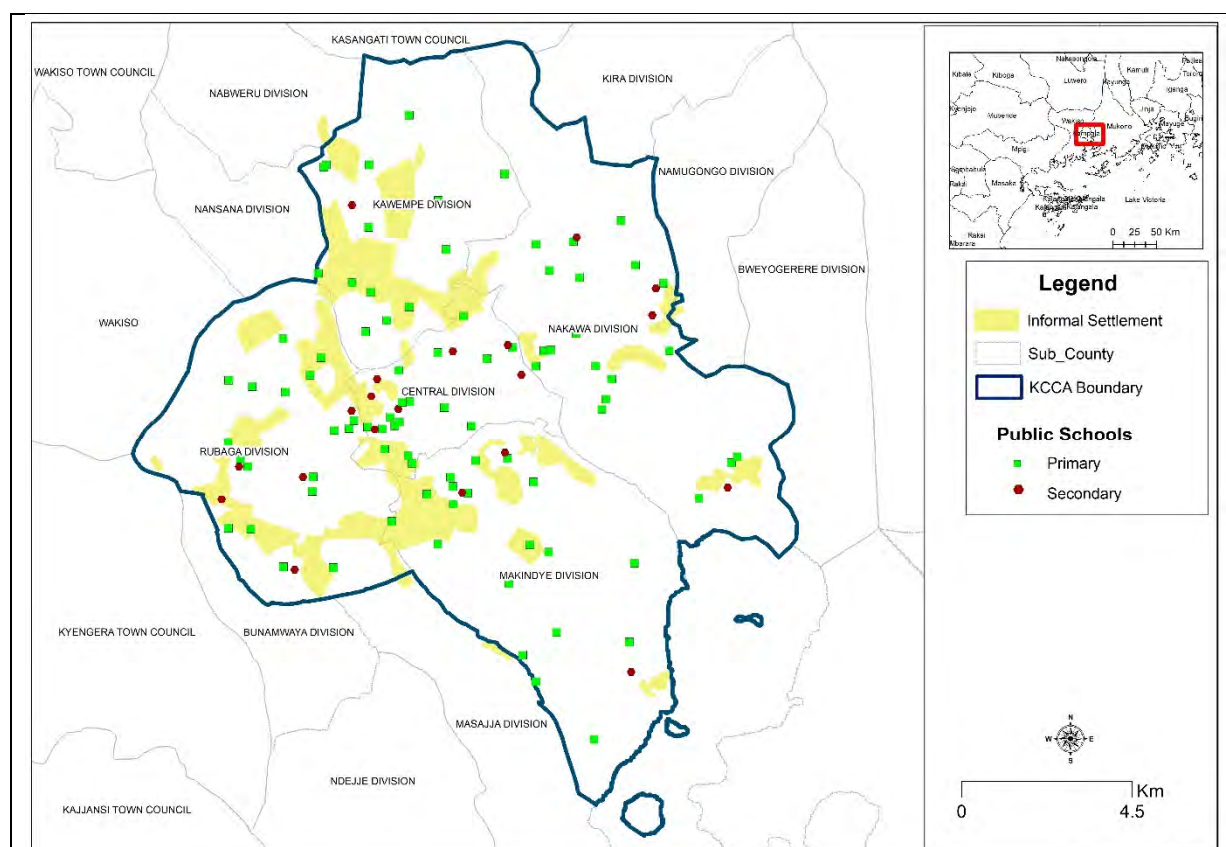
(14) Remarks (map, etc.)



Population Changes in Greater Kampala (2002-2014)



Source: JICA Study Team for the Project for Integrated Urban Development Plan for Kampala Special Planning Area
Proposed Future Urban Structure for Greater Kampala Metropolitan Area (Preliminary Draft)



Source: JICA Study Team based on the data from KCCA

Location of Public Schools in Kampala City

Table 11.3.3 Project Profile 2: Project for Development of Sub-centres and Suburban Centres in Greater Kampala Metropolitan Area

(1) Project No.	(2) Country/City	(3) Sector		
GKMA-02	Uganda/ Greater Kampala	Urban Development		
(4) Project Name				
Project for Development of Sub-centres and Suburban Centres in Greater Kampala Metropolitan Area				
(5) Counterpart Agency		(6) Relevant Agency		
Ministry of Works and Transport Ministry of Lands, Housing and Urban Development		Ministry of Kampala Capital City and Metropolitan Affairs, Ministry of Local Government, Ministry of Water and Environment, Uganda National Roads Authority, National Water and Sewerage Corporation, Wakiso District, Mukono District and Mpigi District		
(7) Project Scheme/ Budgeting sources		(8) Project Period		
Grant / JICA		2028–2033		
		Emergency	Short-term	Mid- long
				○
(9) Background (including relevance to CUREIP Output)				
<p>The Greater Kampala Metropolitan Area (GKMA) has been increasing its population rapidly in the past decades. While the population of Kampala City increased with population growth rate of around 4% per annum between 1991 and 2002, between 2002 and 2014 it dropped to approximately 2% per annum. On the other hand, the population in the surrounding districts, especially Wakiso District has increased its population rapidly since 2002 with the average population growth rate of 6.8%, which is extremely high, doubling its population just in 12 years. Furthermore, in some of the municipalities or towns adjoining Kampala City, the growth rate exceed 8% between the period of 2002 and 2014.</p> <p>The new Post COVID-19 Urban Agenda proposed in the Project for Urban Environment Improvement against COVID-19 (CUREIP) suggests the necessity of strengthening the multi-nucleus metropolitan structure with</p>				

suburban centres providing not only infrastructure to support the metropolitan but also services such as tertiary referral hospital(s), good secondary school(s) and tertiary education facility, and also facilities including commercial centre, transportation hub, business centre, etc.

For the suburban center to function as support for the metropolitan, it is necessary to provide sufficient urban infrastructure. Especially in the Wakiso District, since many plans formulated before the Population and Housing Census 2014 was revealed showing the rapid population increase outside Kampala Capital City, the importance of infrastructure development for Wakiso District was not realized. As a result, many of these plans are now being revised to provide the necessary infrastructure for the GKMA population outside Kampala Capital City.

(10) Project Outline

Objectives	<ul style="list-style-type: none"> To provide sufficient infrastructure in the suburban centres and/or urban corridor to accelerate multi-nucleus urban structure
Project Location	Wakiso District, Mukono District and Mpigi District
Type of Project	<input type="radio"/> Construction <input type="checkbox"/> Technical Assistance <input type="checkbox"/> Basic Survey <input type="checkbox"/> Operation and Maintenance
Scope of Project	Phase 1: <ul style="list-style-type: none"> Conducting feasibility study (details to be considered based on the selected location.) Phase 2: <ul style="list-style-type: none"> Detailed planning of priority project Phase 3: <ul style="list-style-type: none"> Construction of infrastructure for the development of sub-centres, suburban centers or urban corridors
Project Cost (estimated)	TBD
Implementation Period	5 years

(11) Outcome and Impact

Expected outcome	Sufficient infrastructure is implemented to make a selected suburban center out of the designated suburban centers into a center to support the multi-nucleus urban structure of the metropolitan. One Sub-center, Suburban Center, and/or Urban Corridor to be proposed in the physical development plan formulated in the Project for Integrated Urban Development Plan for Kampala Special Planning Area is implemented with public transport.
Beneficiaries	Residents of the Greater Kampala Metropolitan Area and investors
Environmental and Social Impact	The infrastructure to be implemented will not be large scale infrastructure, but impact assessment is necessary prior to implementation.

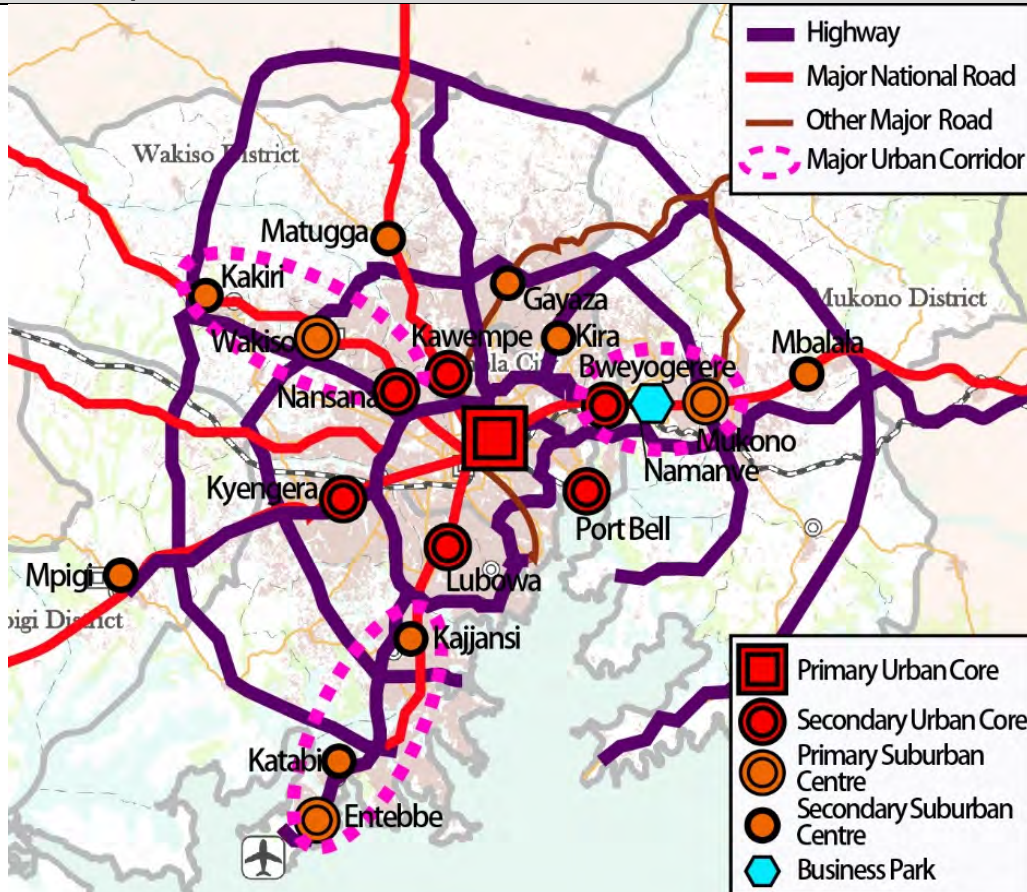
(12) Necessary Input from Counterpart

Land acquisition necessary for infrastructure implementation.

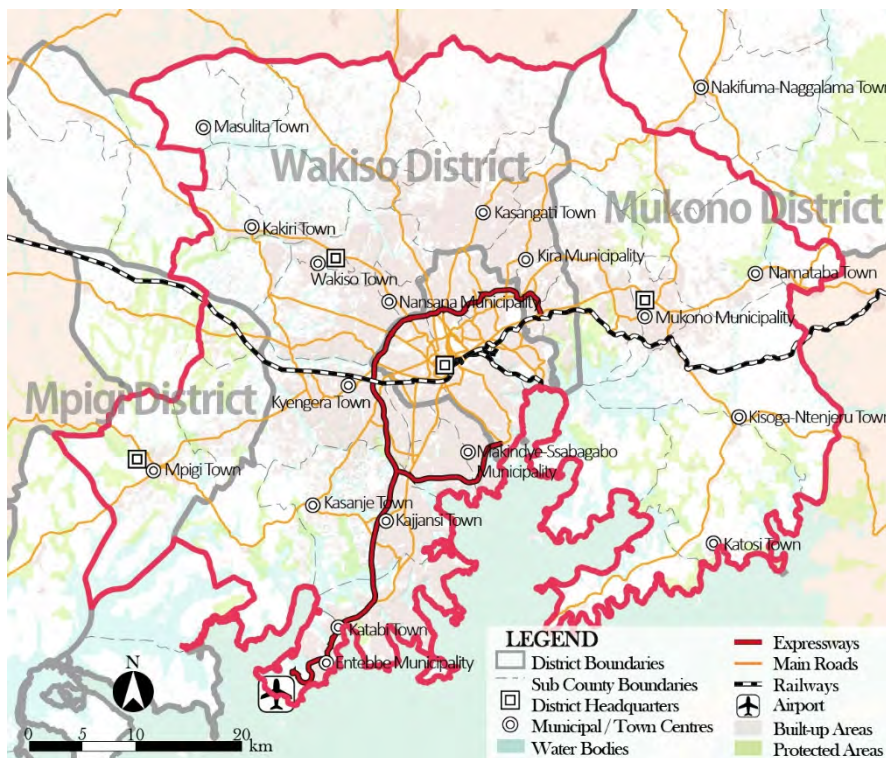
(13) Relevant Projects

- The Project for Integrated Urban Development Plan for Kampala Special Planning Area (JICA)
- Project for Capacity Development for Urban Environment Improvement in Suburban Areas of Greater Kampala Metropolitan Area (Proposed project by CUREIP)

(14) Remarks (map, etc.)



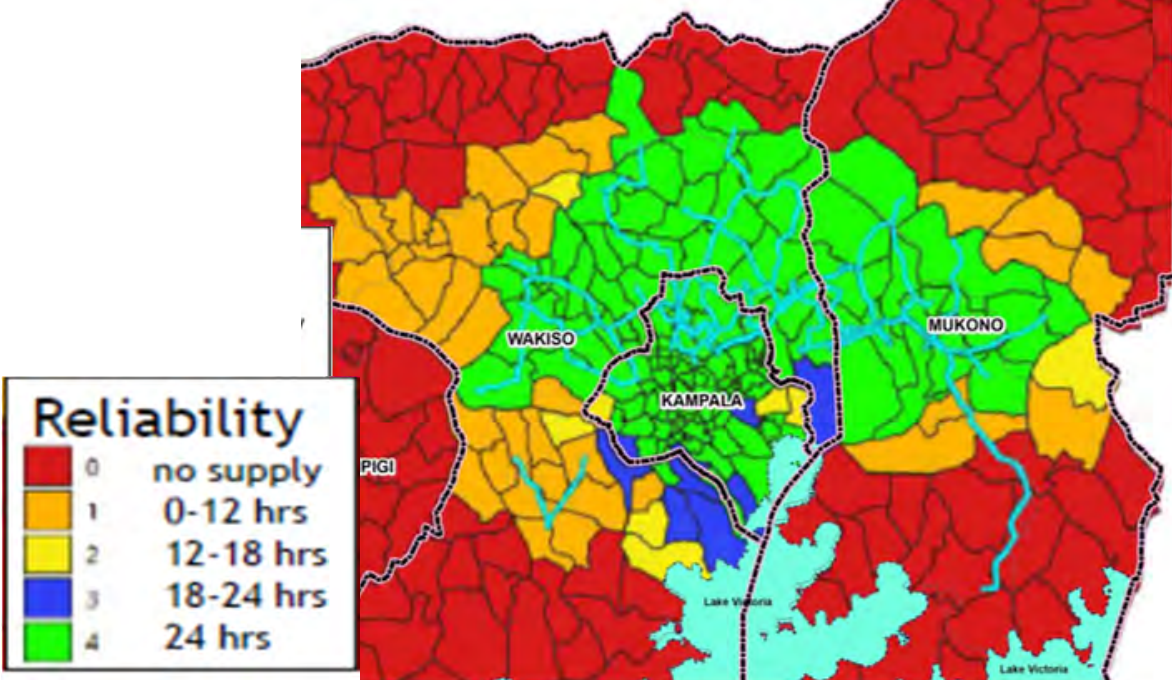
Source: JICA Study Team for the Project for Integrated Urban Development Plan for Kampala Special Planning Area
Proposed Future Urban Structure for Greater Kampala Metropolitan Area (Preliminary Draft)

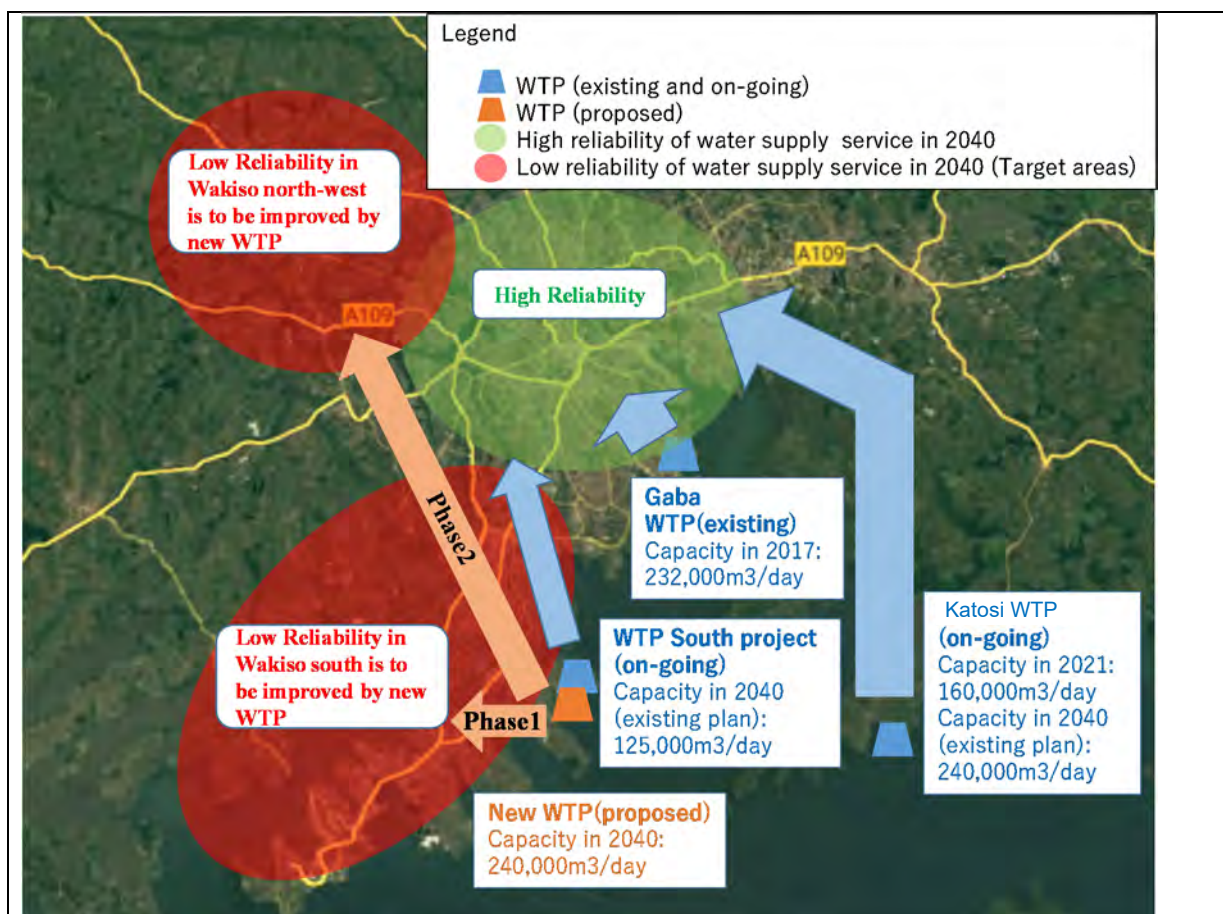


Source: JICA Study Team for the Project for Integrated Urban Development Plan for Kampala Special Planning Area
Proposed Urban Planning Area for Greater Kampala Metropolitan Area

Table 11.3.4 Project Profile 3: Project for Improvement of Water Supply Reliability in Suburban Areas of Greater Kampala Metropolitan Area

(1) Project No.	(2) Country/City	(3) Sector		
GKMA-03	Uganda/ Greater Kampala	Water Supply		
(4) Project Name				
Project for Improvement of Water Supply Reliability in Suburban Areas of Greater Kampala Metropolitan Area				
(5) Counterpart Agency		(6) Relevant Agency		
National Water and Sewerage Corporation		Wakiso District		
(7) Project Scheme/ Budgeting sources		(8) Project Period		
Loan		2030–2033	Emergency	Short-term
				Mid- long
				○
(9) Background (including relevance to CUREIP Output)				
<p>The Greater Kampala Metropolitan Area (GKMA) has been increasing its population rapidly in the past decades. While the population of Kampala City increased with a population growth rate of around 4% per annum between 1991 and 2002, it dropped to approximately 2% per annum between 2002 and 2014. On the other hand, the population in the surrounding districts, especially Wakiso District, has rapidly increased since 2002 with an average population growth rate of 6.8%, which is extremely high, doubling in just 12 years. Furthermore, in some municipalities or towns adjoining Kampala City, the growth rate exceeds 8% between 2002 and 2014.</p> <p>The new Post COVID-19 Urban Agenda proposed in the Project for Urban Environment Improvement against COVID-19 (CUREIP) suggests the necessity of strengthening the multi-nucleus metropolitan structure.</p> <p>For the suburban center to function as support for the metropolitan, it is necessary to provide sufficient urban infrastructure. Especially in Wakiso District, since many plans formulated before the Population and Housing Census 2014 was revealed did not consider the rapid population increase in Wakiso District, the infrastructure implementation is greatly delayed. As a result, many of these plans are now being revised, including the water supply master plan, to provide the infrastructure necessary for the population in the GKMA outside Kampala Capital City. However, since it took more than five years after the 2014 census was conducted to start the revision process, even with all the projects proposed to be implemented by 2040 in the GKMA, this will not provide sufficient water in some parts of the GKMA.</p> <p>Under such circumstances, a new strategy is necessary to provide water to the area far from the water treatment plant newly constructed in Katosi.</p>				
(10) Project Outline				
Objectives	<ul style="list-style-type: none"> To provide sufficient infrastructure in the suburban centres to accelerate multi-nucleus urban structure 			
Project Location	Wakiso District, Mukono District and Mpigi District			
Type of Project	<input type="radio"/> Construction <input type="checkbox"/> Technical Assistance <input type="checkbox"/> Basic Survey <input type="checkbox"/> Operation and Maintenance			
Scope of Project	<ul style="list-style-type: none"> Construction of water treatment plant for Wakiso North-West and Wakiso South 			
Project Cost (estimated)	USD 410 million			
Implementation Period	4 years			
(11) Outcome and Impact				
Expected outcome	Water treatment plants with the capacity of 240,000 m ³ /day are implemented to provide sufficient water to the future suburban centers of Wakiso District, which are assumed to have a low reliable water supply in 2040 under the present water supply master plan.			
Beneficiaries	Residents of the GKMA and investors			

<p>Environmental and Social Impact</p>	<p>Environmental Impact Assessment needs be conducted prior to the implementation of the water treatment plant.</p>										
<p>(12) Necessary Input from Counterpart</p>											
<p>Land acquisition necessary for infrastructure implementation.</p>											
<p>(13) Relevant Projects</p>											
<p>The Project for Integrated Urban Development Plan for Kampala Special Planning Area (JICA) Kampala Water-Lake Victoria Water and Sanitation Project (KW-LVWATSAN) (KfW Entwicklungsbank, Agence Française de Développement (AFD), European Union Africa Infrastructure Trust Fund (EU-ITF), European Investment Bank (EIB))</p>											
<p>(14) Remarks (map, etc.)</p>											
 <p>Reliability</p> <table border="1"> <tr> <td>0</td> <td>no supply</td> </tr> <tr> <td>1</td> <td>0-12 hrs</td> </tr> <tr> <td>2</td> <td>12-18 hrs</td> </tr> <tr> <td>3</td> <td>18-24 hrs</td> </tr> <tr> <td>4</td> <td>24 hrs</td> </tr> </table>		0	no supply	1	0-12 hrs	2	12-18 hrs	3	18-24 hrs	4	24 hrs
0	no supply										
1	0-12 hrs										
2	12-18 hrs										
3	18-24 hrs										
4	24 hrs										
<p>Note: The areas in red are areas outside the jurisdiction area of NWSC Kampala Metropolitan Area</p>											
<p>Source: August 2021, Draft Optioneering Report (Preparation of Detailed Design, Tendering and Works Supervision for the Rehabilitation, Restructuring and the Extension of Kampala Water Supply Network)</p>											
<p>Water Supply Reliability in Greater Kampala Metropolitan Area after Project Implementation Proposed by Kampala Water-Lake Victoria Water and Sanitation Project in 2040</p>											



Source: JICA Study Team

Map of Proposed Water Supply System for Greater Kampala Metropolitan Area

Required Water Supply Volume in 2040 for Improvement in Wakiso District

Target areas	Target town and municipality	A. Water Demand in 2040 (m³/day)	B. Ratio of Water Suspension in 2040	C. Shortage of WS Volume in 2040 (m³/day) < C=AxB >	D. Required WS Volume in 2040 (m³/day) < D=C/0.8 >
Wakiso North-West	Nansana Municipality	47,308	50% (12 hrs./day)	23,654	29,568
	Wakiso Town	77,912		38,956	48,695
	Kakiri Town	19,206		9,603	12,004
	Sub Total	144,427	-	72,213	90,267
Wakiso South	Makindye-Ssabagabo Municipality	93,039	75% (18 hrs./day)	69,780	87,224
	Kajjasi Town	2,466		1,850	2,312
	Katabi Town	34,172		25,629	32,037
	Entebbe Town	22,913	17,185	21,481	
Sub Total	152,591	-	114,443	143,054	
Total	297,018	-	186,657	233,321	

Source: JICA Study Team

Breakdown of Estimated Cost for Water Treatment Plants

Target areas	Items	Quantity		Unit price (UGX)	Total (UGX billion)
	WTP for Wakiso north-west (all facilities are included)	95,000	m³	1,840,690	174.9

Wakiso north-west (Phasel)	Transmission Main DI ND>1000mm from WTP to Reservoirs	35,000	lm	3,423,921	119.8
	Distribution Main DI >ND 400mm to ND<1000mm	152,413	lm	2,000,150	304.8
	Distribution sub-main uPVC/DI <ND 400mm	48,821	lm	454,233	22.2
	Reservoirs 6,000m ³ x 3units 5,000m ³ x 3units	33,000	m ³	954,270	31.5
	SCADA Sub station and water level gauge	6	Piece	80,922,096	0.5
	Administration and Overhead cost	40	%	-	239.9
	Sub Total				839.7
Wakiso south (Phasel)	WTP for Wakiso south (all facilities are included)	145,000	m ³	1,840,690	266.9
	Transmission Main DI ND>1000mm from WTP to Reservoirs	15,000	lm	3,423,921	51.4
	Distribution Main DI >ND 400mm to ND<1000mm	65,320	lm	1,646,434	107.5
	Distribution sub-main uPVC/DI < ND 400mm	20,923	lm	454,233	9.5
	Reservoirs 10,000m ³ x 3units 6,000m ³ x 2units 4,000m ³ x 2units 1,000m ³ x 1unit	51,000	m ³	954,270	48.7
	SCADA Sub station and water level gauge	8	Piece	80,922,096	0.60
	Administration and Overhead cost	40	%	-	193.8
	Sub Total				678.4
Total				1,518.1	

Source: JICA Study Team

11.3.3 Recommendations

The ongoing JICA project, The Project for Integrated Urban Development Plan for Kampala Special Planning Area, will determine the development of the GKMA in the next decade and is also directly related to the projects proposed in CUREIP and prepare the guideline for the local-level detailed physical development plan. Therefore, CUREIP recommends the following to be considered in the physical development plan formulation in the ongoing project:

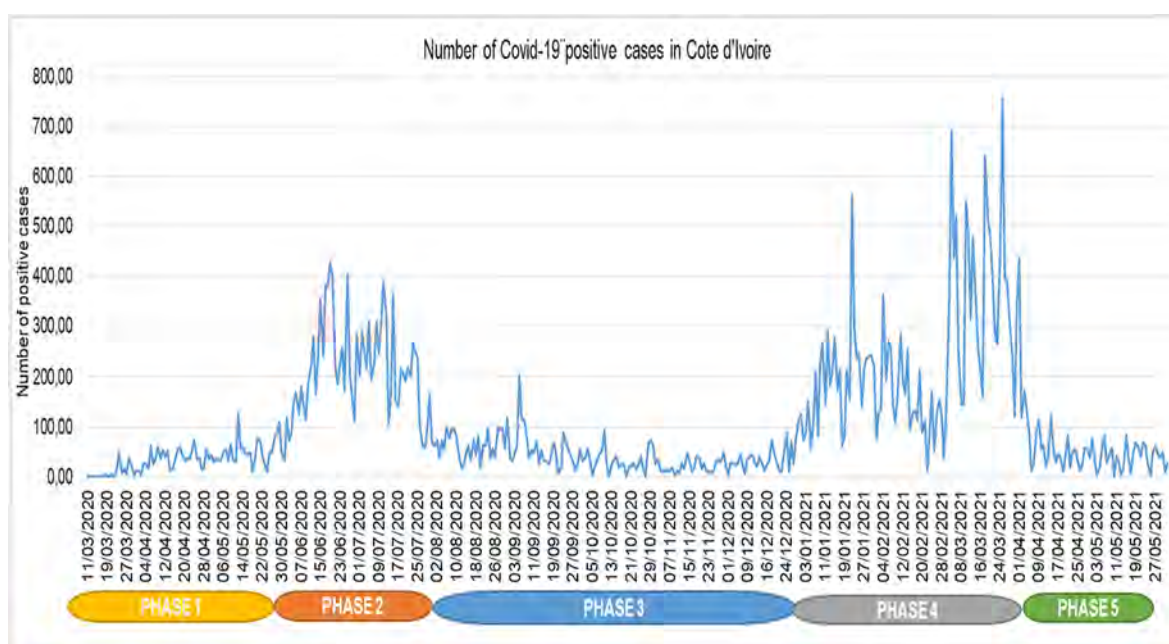
- To consider the multi-nucleus spatial structure with the New Neighborhood concept proposed in CUREIP to be promoted in the physical development plan for the future urban area of the Greater Kampala Capital City.
- To prepare guidelines for formulating the local-level detailed physical development plan so the detailed plans in the future can be prepared with the necessary consideration of the new neighborhood concept proposed in CUREIP.
- To identify the priority areas and priority infrastructure necessary to develop the multi-nucleus spatial structure in the GKMA.

12. Formation of Cooperation Project in Abidjan

12.1 Changes in urban issues in COVID-19

12.1.1 Situation of infection

In Côte d'Ivoire, since the first case of infection was found on 11 March 2020, the cumulative number of cases is 47,293 nationwide and 44,746 in Abidjan as of 27 May 2021, with Abidjan accounting for 95% of the national total. The infectious phase was during phase 2 (3 June to 27 July 2020) and phase 4 (30 December 2020 to 1 April 2021), as shown in Figure 12.1.1. The cited reasons for the spread of infections are the government relaxation of infection control measures and citizens' inadequate infection control measures. It is also believed that these infections were mainly caused by imported cases, people who vacationed in Europe during Christmas and Easter, and inadequate masking, social distancing, and handwashing.

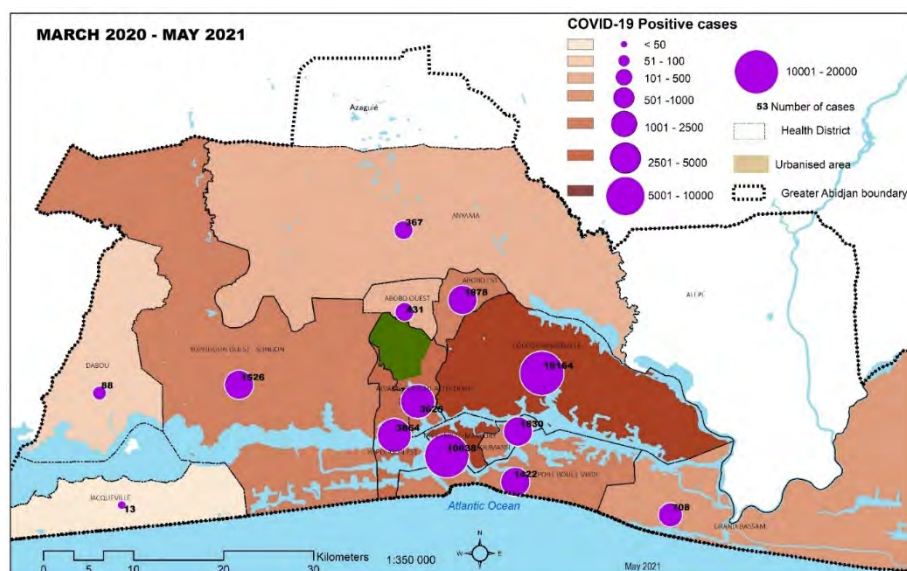


Source: Ministry of Health and Public Hygiene (<https://coronavirustracking.ci>)

Figure 12.1.1 Trends in the number of infected cases in Côte d'Ivoire (March 2020–May 2021)

12.1.2 Infection situation in the city of Abidjan

The number of cases by Health District, the district division of the Ministry of Health and Public Hygiene, is shown in Figure 12.1.2 and Table 12.1.1. As shown in Table 12.1.1, the two districts of Cocody-Bingerville (42.8%) and Marcory-Treichville (23.4%) account for 66% of the total number of positive cases and the number of positive cases per 10,000 people in Abidjan. Four districts of these two districts and two others of Yopougon-Songon (12.2%) and Plateau - Adjamé - Attécoubé (8.2%) account for 86.6% of Abidjan's total population.



Source: JICA Study Team based on data from the Ministry of Health and Public Hygiene

Figure 12.1.2 Number of Infected People by Health District in Abidjan

Table 12.1.1 Number of Infected People by Health District in Abidjan

Health District	Number of positives cases per 10,000 persons	Number of Positive cases of COVID-19
Anyama	24.6	367
Marcory - Treichville	293.2	10,335
Abobo	22.4	2,309
Plateau - Adjamé - Attécoubé	56.5	3,625
Koumassi	42.3	1,830
Cocody-Bingerville	350.7	18,878
Yopougon Songon	47.8	5,390
Port-Boët	33.9	1,422

Source: Ministry of Health and Public Hygiene

12.1.3 Impacts of COVID-19 on the lives of citizens, etc.

The impacts of COVID-19 are shown in the table below.

Table 12.1.2 Impacts of COVID-19

Area	Impacts
Economy	<ul style="list-style-type: none"> • Temporary or permanent closure of the enterprise • Greater impact on micro, small, and medium enterprises than on large enterprises. In the informal sector, 70% of value-added, and in Cote d'Ivoire, 90% of employment. • Household income, particularly the households with low income and those working in the service sector, were most vulnerable. Infection control measures mainly reduced household income, such as movement restrictions, prohibition of gatherings, and night curfew. • Employment was also affected, resulting in high unemployment rates. The sectors with high unemployment due to the pandemic are industry (power/electricity; 58%), construction (40%), transportation (75%), restaurants/hotels (63%), and services (40%).

Area	Impacts
	<ul style="list-style-type: none"> Agricultural imports and exports were affected due to transportation restrictions, and the tertiary industry is the most affected.
Society, community	<ul style="list-style-type: none"> Educational disparity (by region and income) between rural and urban areas and income disparity in urban areas. Isolation of non-registered citizens and migrant workers Slander of positive persons and their relatives Psychological burden: fear, anxiety, suicide, psychosis
Transportation	<ul style="list-style-type: none"> In public transportation (SOTRA buses, <i>gbaka</i>, <i>woro-woro</i>), the number of riders was limited, passengers decreased, and revenue decreased. No specific transition from public to private transportation appears to have taken place.
Environment	<ul style="list-style-type: none"> Improvement in air pollution was not observed. No change in general waste, but there was an increase in medical waste.

Source: JICA Study Team based on various information

12.1.4 Changes brought about by COVID-19

Lifestyle changes and responses were observed due to the spread of COVID-19.

Table 12.1.3 Lifestyle Changes due to COVID-19

(Data) Item	Contents
Schools (protocol for reopening schools by the Ministry of Education)	<ul style="list-style-type: none"> Thorough hygiene practices like hand washing or hand sanitation with soap, alcohol, and disposable wipes at school entrances, classrooms, etc. Placement of trash bins and daily disposal Supply of liquid soap and toilet paper in toilets
Public place	<ul style="list-style-type: none"> Installation of hand washing equipment and alcohol gel (at entrances to supermarkets, religious institutions, banks, restaurants, markets, theaters, SOTRA buses, etc.) Frequent disinfection of SOTRA buses, supermarkets, etc.
Health care facilities	<ul style="list-style-type: none"> Installation of hand washing equipment and alcohol gel Disinfection of hospital rooms Strengthening hospital sanitation Establishment of infection prevention and control (IPC) task force. The Ministry of Health and Public Hygiene and NGOs regularly strengthens the capacity of IPC.
Hygiene awareness	<ul style="list-style-type: none"> Use of thermometers (in schools and health care facilities) Various educational activities (hand washing, mask use, social distancing, etc.)
Community/Household	<ul style="list-style-type: none"> Encourage hand washing, using masks, and social distancing Provision of sanitation kits to communities from the government and NGOs to implement sanitation measures in areas of vulnerable people Increase hygiene awareness
Telework	<ul style="list-style-type: none"> Encouragement of telework (especially for government agencies) Change of working hours: Government (during lockdown (8:00-14:00)) Ministry of Digital Economy and Postal reports increased use of Teams,

(Data) Item	Contents
	integration with e-Government
ICT and Online Services	<ul style="list-style-type: none"> • Free courses conducted by the Ministry of National Education, Technical Education and Vocational Training via SMS, TV, and radio • Ministry of Education: Launch of My School at Home Program • Ministry of Health and Public Hygiene: Launch of a training platform in Health Districts with the support of WHO • Use of drones to provide information in rural and urban areas

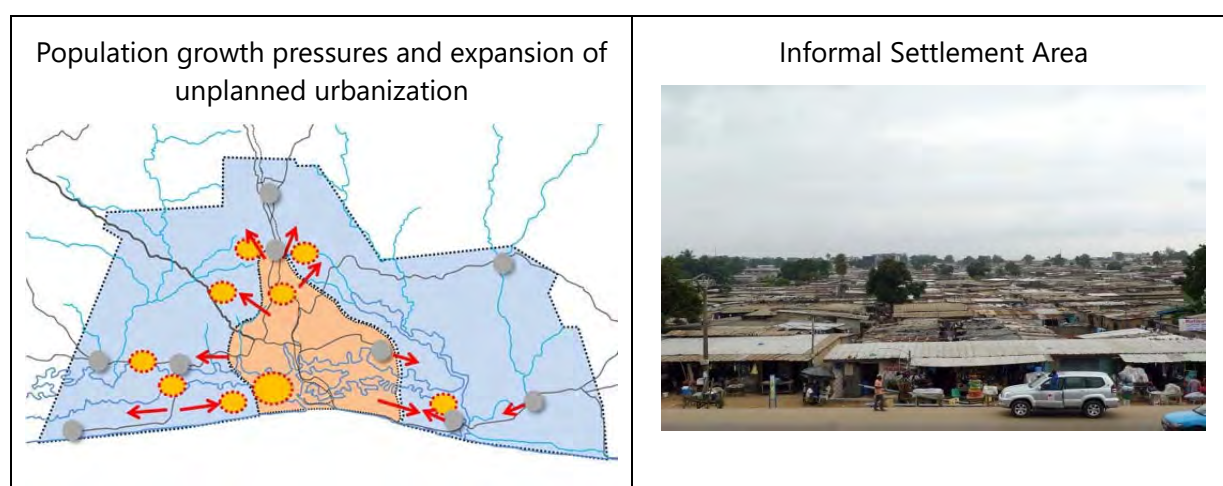
Source: Compiled by JICA Study team from various sources.

12.1.5 Existing urban issues in Abidjan

1) Urban Planning Issues

According to the "Project for the Development of the Urban Development Plan in Greater Abidjan" (SDUGA: Schéma Directeur d'Urbanisme du Grand Abidjan, JICA, March 2015), Abidjan's existing urban challenges can be summarized as follows.

The population of the Greater Abidjan Area is projected to increase from the current 5.0 million (2014) to 7.6 million by 2030, at an average annual growth rate of 2.72% between 2014 and 2030. The population is projected to continue to grow by a high 4.7% to 12.4% in the urbanized areas of Plateau, Yopougon, and Port-Boët and their surrounding areas. In addition, 1.5 million people, or one-third of the population of Abidjan, live in informal settlements.



Source: Project for the Development of the Urban Master Plan in Greater Abidjan (SDUGA) Final Report, JICA, March 2015.

Figure 12.1.3 Urbanization Pressure and Informal Settlement Areas in Abidjan

As the consequences of urban sprawl, urban problems listed below have been taking place.

- Shortfall and inequitable distribution of community facilities
- Inadequate housing supply leading to individual property densification and illegal settlements
- Under capacity utilities provision
- Major employment area in south of city causing traffic congestion and long-distance

commutes

- Increased urbanization of cheaper agricultural land at urban edge

These problems which remain unsolved at present will lead to the degradation of environmental quality such as:

- Loss of natural forest and biodiversity assets
- Low quality living, plan, and work environment
- Increased noise and air pollution
- Proliferation of bad neighbor development
- Threats to health and safety
- Reduced food and potable water security

2) Issues in Transportation Sector

In the transportation sector, the following issues are identified.

Table 12.1.4 Key Issues in Transportation Sector

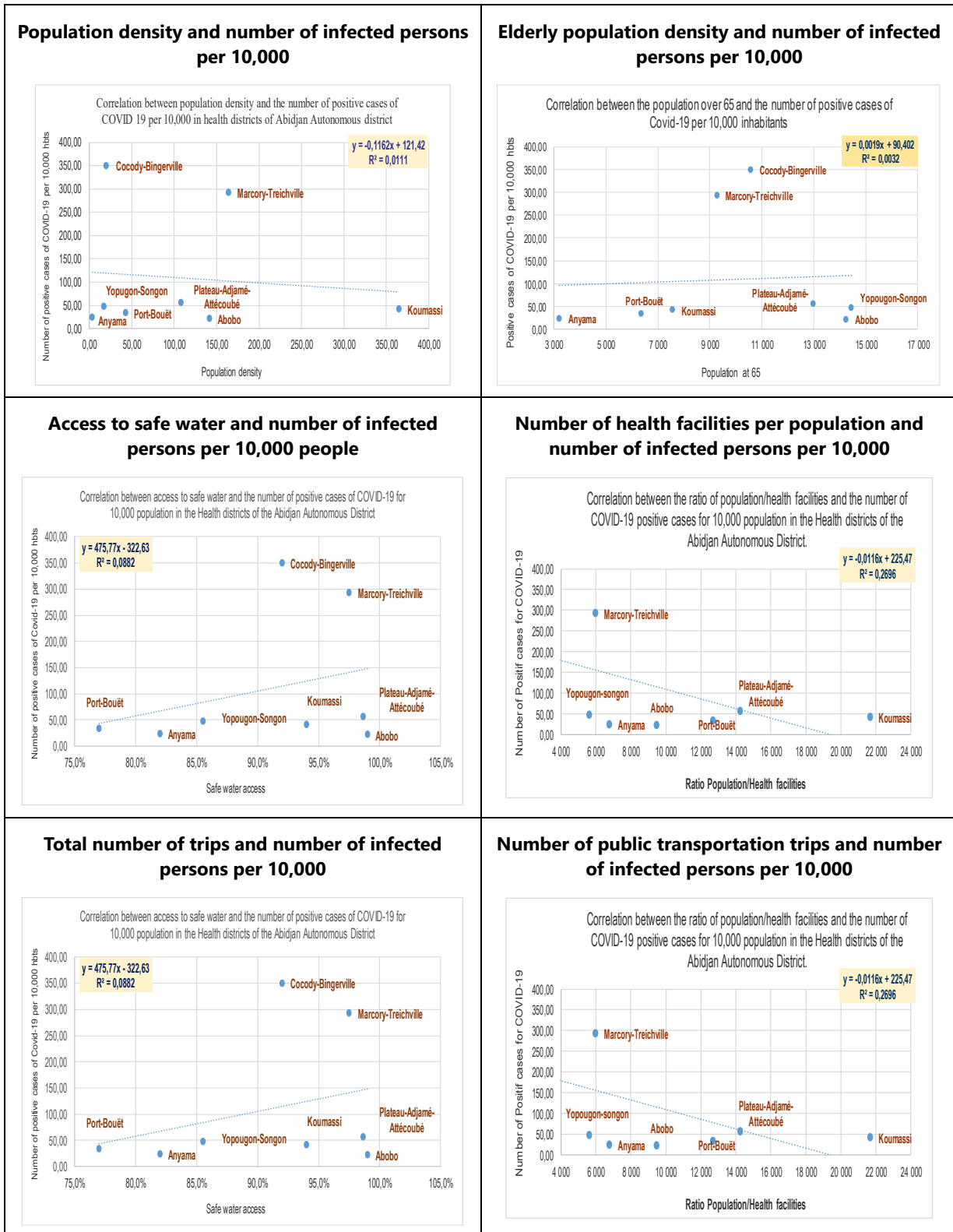
Item	Issue
Road	<ul style="list-style-type: none"> • Road network features: poor road surface conditions, missing links, insufficient road capacity • Peak hour traffic congestion occurs throughout the road network • Road network developed without special consideration for public transport • To integrate public transport, especially mass transit, with road transport, sufficient space for both road users and public transport facilities should be ensured on the targeted roads. • The width of the right-of-way of roads is determined by the type of selected public transportation. • In Abidjan, the main arterial roads connect the main industrial areas, so the main arterial roads have a mix of general traffic and slower-speed heavy vehicles.
Public transportation	<ul style="list-style-type: none"> • Key Issues in Public Transportation: Public transportation is primarily serviced by the informal sector, consisting of gbaka, metered taxi, woro-woro, and commune taxi, which accounts for about 85% of total public transportation trips and are gaining shares while the formal sector is losing passengers. • A close examination of the transportation needs of the citizens of Greater Abidjan, land use, and development directions indicates that high-demand public transportation corridors require the development of new Rail-based mass transit systems. • Abidjan is in a situation where water transportation is not being used.
Traffic Management	<ul style="list-style-type: none"> • Traffic conditions in Abidjan have already exceeded acceptable limits, with demand exceeding traffic capacity at many intersections and severe congestion in broad areas.

	<ul style="list-style-type: none">• Some of the traffic management measures to improve overall efficiency, such as upgrading signal control, establishing traffic information systems and traffic management systems on highways, enforcing overloaded vehicles, and enforcing traffic regulations, could also be measures to make public transportation more attractive. In addition, parking management, prioritization of public transport, and even road safety are also important measures to consider.
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Source: "Project for the Development of the Urban Master Plan in Greater Abidjan (SDUGA)" Final Report, JICA, March 2015.

12.1.6 Correlation analysis of infected persons per 10,000 people

Correlation of the cumulative number of infections per 10,000 persons by Health District in Abidjan as reported by the Department of Health and Public Hygiene, was analyzed with the following indicators: (1) population density, (2) population density of persons at 65 years and older, (3) access rate to safe water, (4) population per health facility ratio, (5) total number of trips, and (6) number of public transportation trips. As shown in the figures below, there was little correlation between any of the indicators. Infection did not correlate well with the spatial structure and density of the city, which suggests that the main cause of infection was inadequate measures to reduce contact opportunities and ensure hygiene, such as avoiding three Cs (closed spaces, crowded places, and close-contact setting) and encouraging masks and hand washing.



Source: JICA Study Team

Figure 12.1.4 Correlation between the number of infected cases per 10,000 in Abidjan by various indicators

12.2 Sorting-out of urban development programs for With-Corona and Post-Corona

12.2.1 Outline of existing master plan

JICA implemented the "Project for the Development of the Urban Master Plan in Greater Abidjan, or Shéma Directeur d'Urbanisme de Grand Abidjan (SDUGA)" from 2013 to 2015 to support the development of an urban master plan and urban transportation master plan for the Greater Abidjan region (including 13 communes in the Autonomous District of Abidjan, 6 surrounding communes, and surrounding sub-prefecture (*sous prefecture*)) with the target year of 2030. It received government approval in 2016. The outline of the SDUGA is as follows.

Future Population

The population growth rate for the Greater Abidjan planning area is at 2.72% and is projected to reach 7.63 million in 2030, an increase of 2.7 million people from 2014 and 1.8 million from 2020.

Table 12.2.1 Greater Abidjan Population Projection

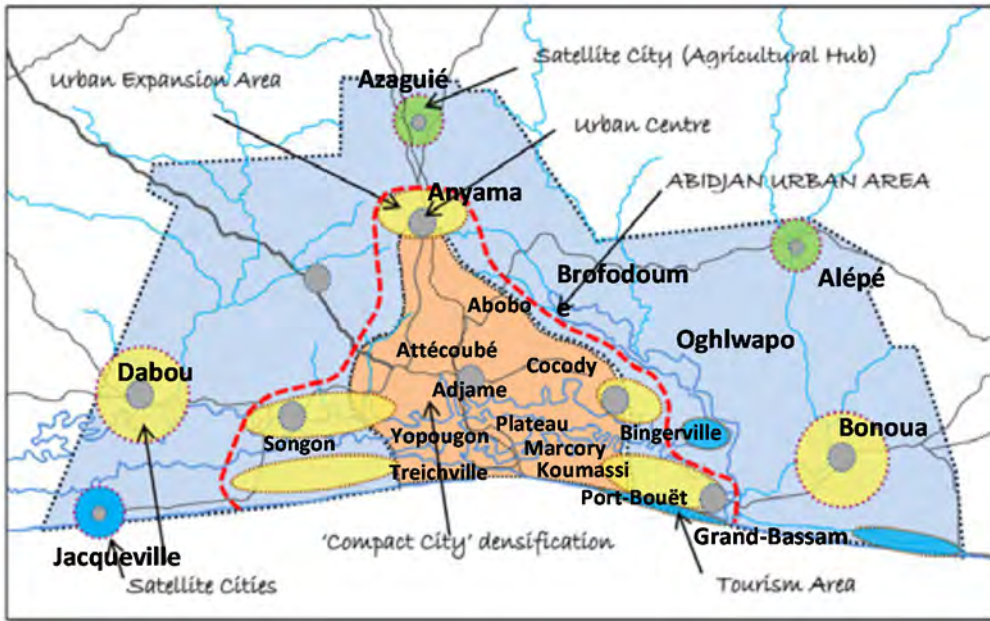
	Area Covered by the Plan	
	Population (thousands)	Rate of Increase
1998	3,309	-
2014	4,968	2.72%
2020	5,836	2.72%
2025	6,675	2.72%
2030	7,634	2.72%

Source: SDUGA Final Report

Direction of Urban Spatial Development

In order to achieve the sustainable development of Greater Abidjan, smart growth agenda is set up as described below:

- 1) Establish Compact City** initiatives to combat expensive and destructive urban sprawl, by providing a range of employment opportunities near residential areas.
- 2) Promote transit-oriented development (TOD)** by giving precedence to public and green transport over private vehicle use.
- 3) Promote public health and quality of life by:**
 - i. creating a sense of identity and ownership for residents through community, supported with a place building,
 - ii. distributing public facilities equitably, and
 - iii. providing a choice of housing for all income groups.
- 4) Preserve and enhance natural and cultural resources**

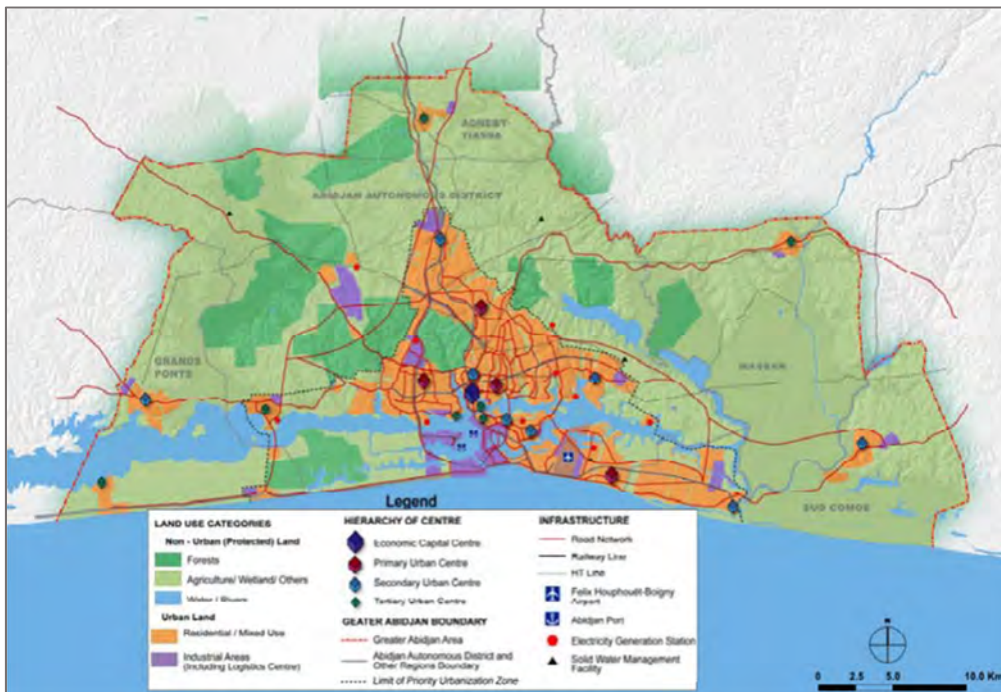


Source: SDUGA Final Report

Figure 12.2.1 Direction of urban spatial development

Spatial Strategy

The main components of the strategy are “Protected Land, Developed Land, Compact Urban Centers, Urban and Rural Development, Hierarchy of Urban Centers and Employment Clusters,” as presented in Figure 12.2.2.



Source: SDUGA Final Report

Figure 12.2.2 Greater Abidjan Urban Development Spatial Strategy 2030

12.2.2 Outline of urban development programs

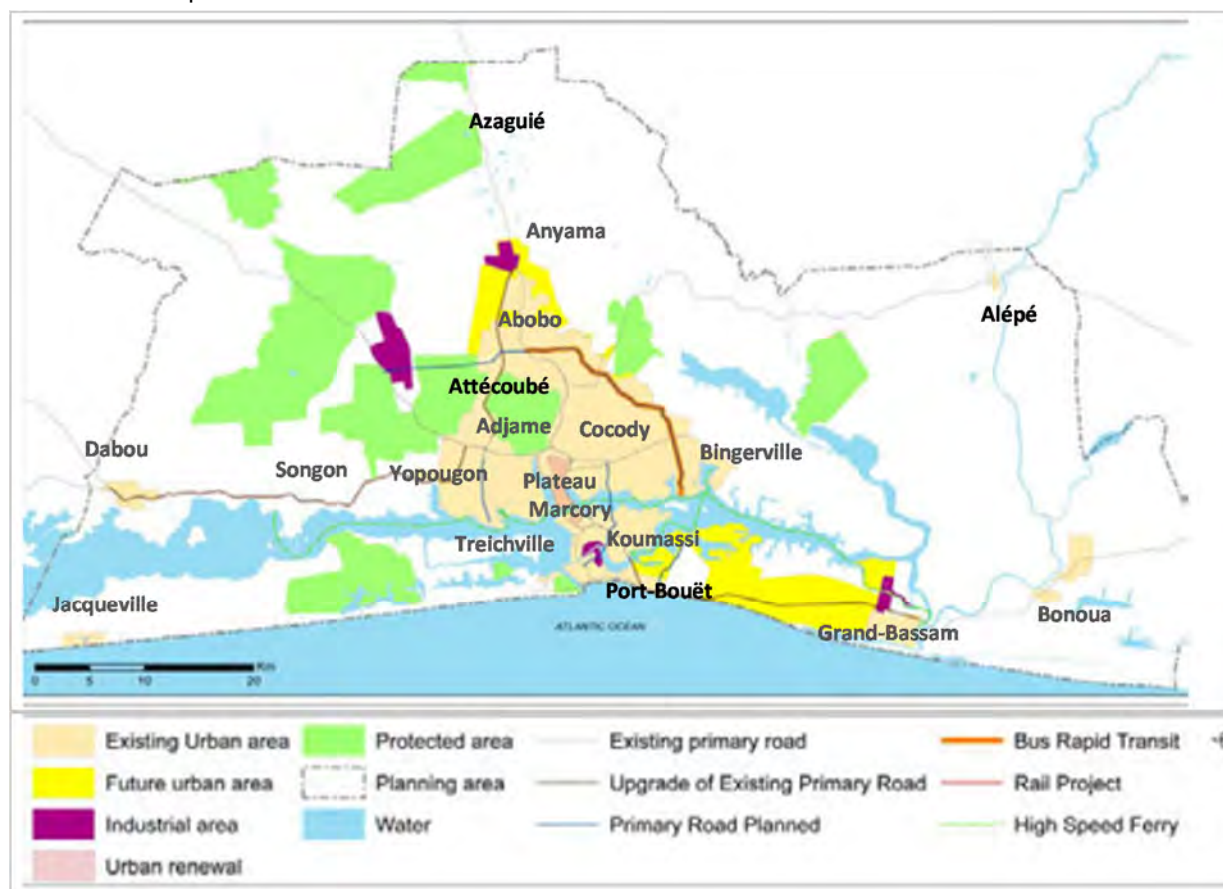
For the above-mentioned developments, SDUGA has proposed the following urban development programs, as well as the number of projects and priority projects in the transportation sector and community facilities to be developed in each urban unit.

1) Urban Development Program

The development implementation program will include the following:

Implementation Program 2015–2020. During this period, the implementation will focus on the urban growth and renewal areas from north to south of the city.

- Axis of Anyama to Grand Bassam
- Urban renewal of Plateau, Adjame, and Treichville
- Industrial zones in Attinguie, Anyama, Grand-Bassam, and Vridi Port
- provision of public transit: urban rail from north to south, BRT to Abobo and Cocody, and high-speed ferry from west to east along Ébrié Lagoon.
- construction of the northern and eastern sections of the Y4 ring road and the road and bridge links to Bouley Island and Plateau through Yopougon.
- Various road widening projects in Marcory, including a bridge to service the new port expansion in Vridi

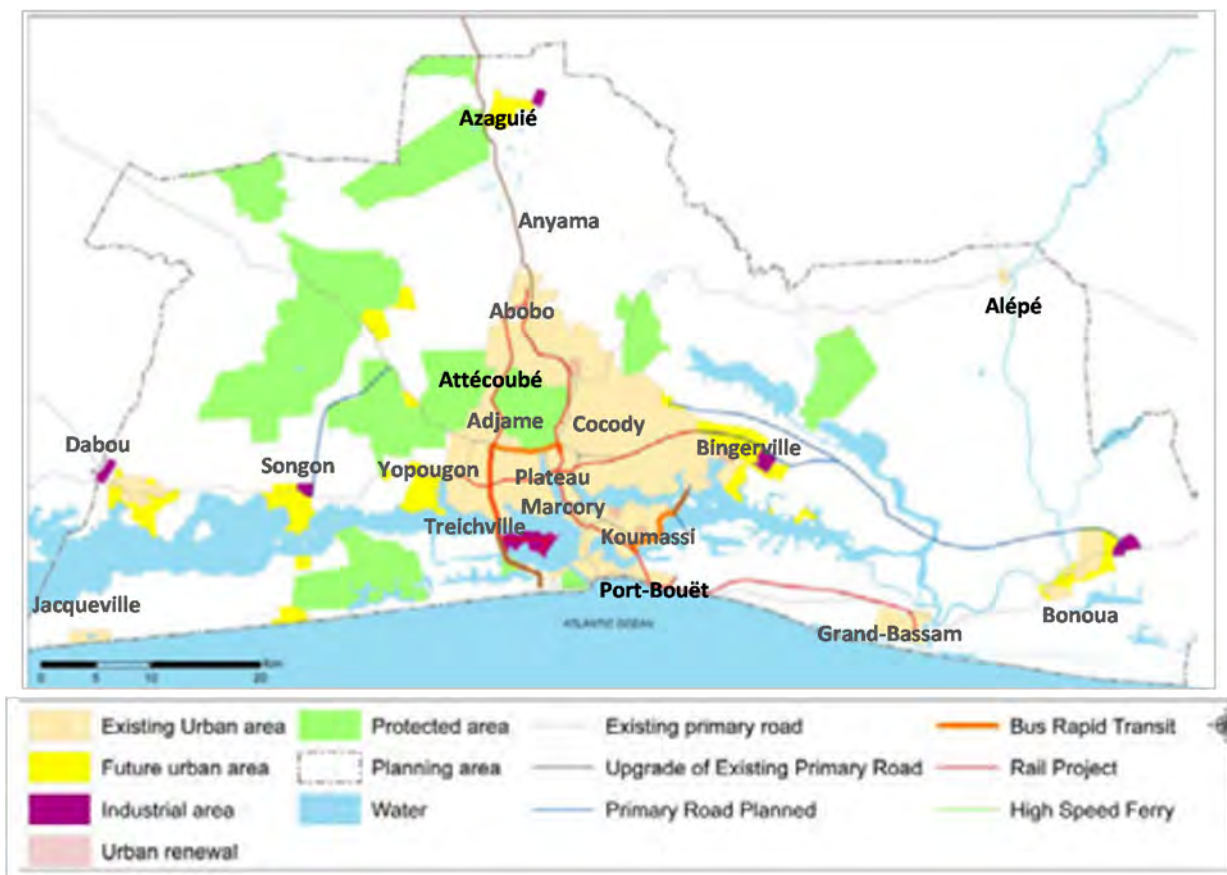


Source: SDUGA Final Report

Figure 12.2.3 Urban Development Program 2015–2020

Implementation Program 2020–2025. The focus of growth is west to east and building upon the new infrastructure in the previous five years.

- Developing the Songon corridor, a new town at Attinguie, and urbanizing the Bingerville peninsula.
- Urban renewal to Abobo, Marcory, Koumassi and Bingerville.
- Industrial zones in Dabou, Bingerville, Bonoua, and Abidjan Port expansion.
- Provision of public transit: urban rail extended to Grand-Bassam and BRT to link Cocody with Koumassi.
- Provision of the western freight rail route to Abidjan Port Expansion.
- Extending the Y4 ring road by bridge at Isle Desiree to Petit Bassam and Port Bouet. New Bingerville bypass to Bonoua. New roads to existing urban areas.
- Road widening of Dabou Road and Abobo bypass.



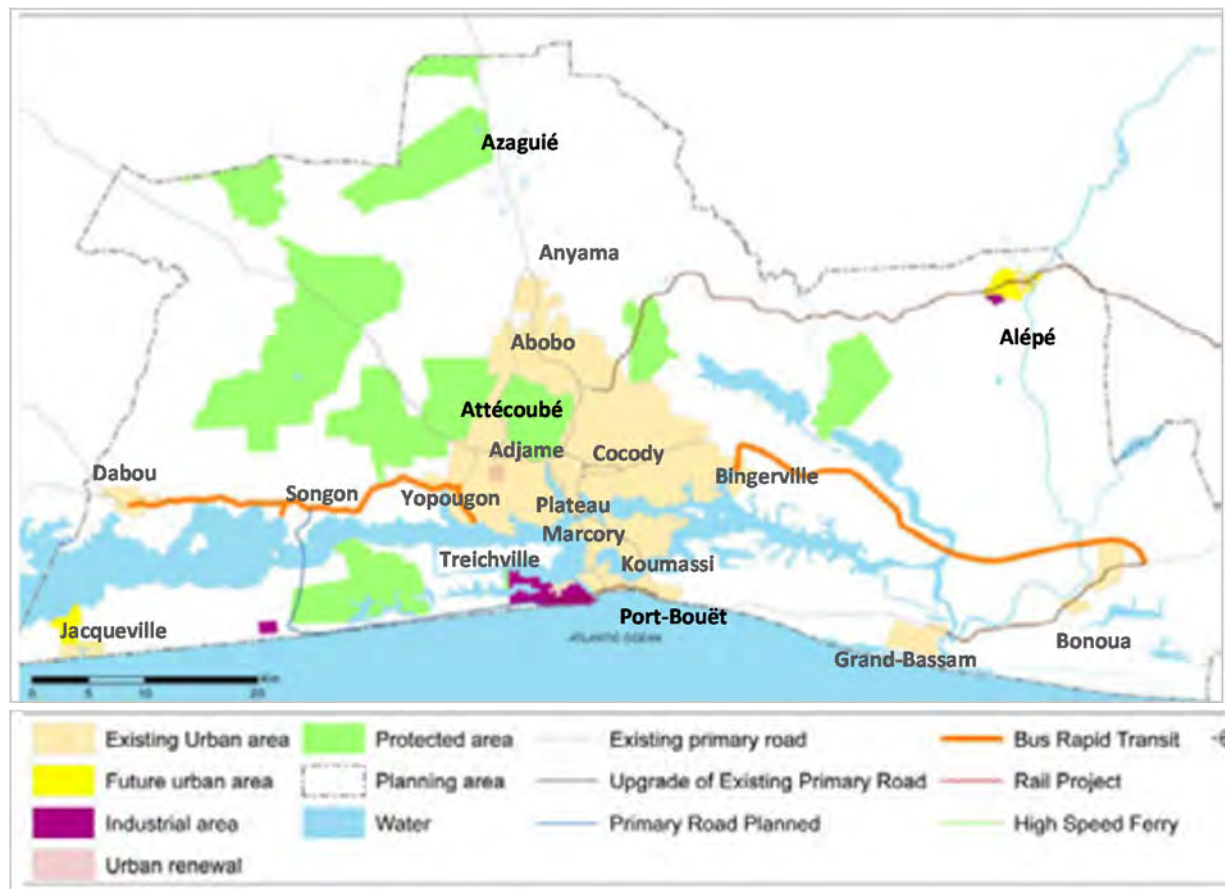
Source: SDUGA Final Report

Figure 12.2.4 Urban Development Program 2020–2025

Implementation Program 2025–2030. The final phase of growth over the plan period is concentrated at the satellite towns of Alepe, Azaguie, and Jacquville.

- Urban Renewal to Yopougon center
- Industrial zones in Ako-Brake, Alepe, Azaguie, and Abreby / Ambroise
- Provision of public transit: Urban rail W-E line Yopougon to Bingerville and BRT's Dabou–Yopougon, Bingerville–Bonoua

- Completion of the Y4 ring road west from Abobo to Vridi, new northern road Port Bout to Grand-Bassam, and new roads to existing urban areas
- Road widening of Alepe Road and western Banco Forest bypass



Source: SDUGA Final Report

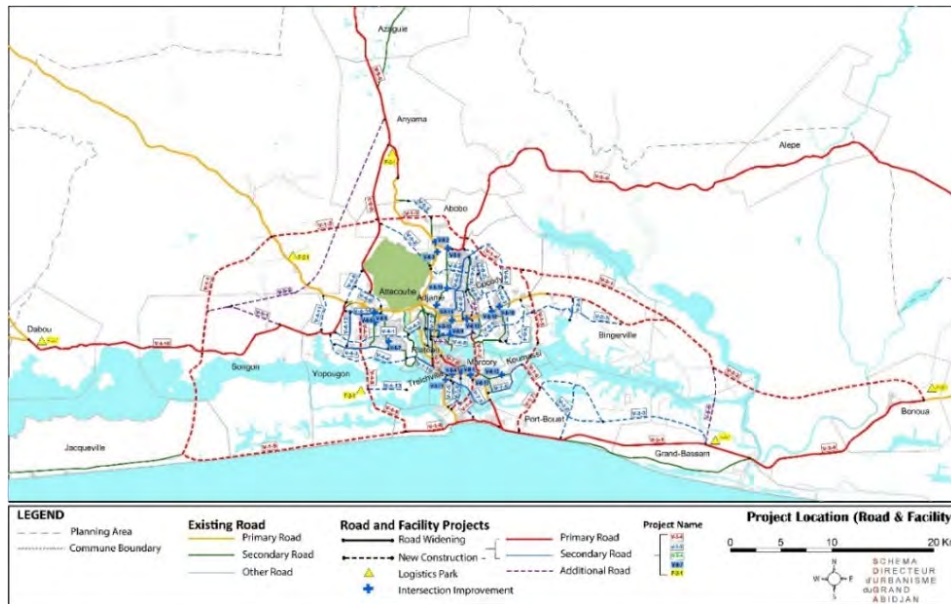
Figure 12.2.5 Urban Development Program 2025–2030

2) Urban Transport Development Program

In the SDUGA, the “Urban Transport Master Plan for Greater Abidjan” was formulated with a target year of 2035, and 118 transportation projects were proposed. The proposed road and public transportation projects are listed in エラー! 参照元が見つかりません。 and エラー! 参照元が見つかりません。 . エラー! 参照元が見つかりません。 shows the progress and other information of the projects.

Road improvement projects

As for road improvement projects, some of the projects proposed by SDUGA are being implemented by JICA, the World Bank, the African Development Bank (BAD), the West African Development Bank (BOAD), the French Development Agency (AFD), the French National Debt Agency, and the U.S. Millennium Challenge, among others. In addition, Projet d'Intégration Port-Ville d'Abidjan (PACOGA) has as its main components urban planning (strengthening governance, detailed urban planning [Plan d'urbanisme de detail or PUD], urban transportation, adressage), infrastructure construction and improvement projects (AKWABA crossing, roads around the Port of Abidjan, sections 2 and 3 of Y4), and logistics platforms.



Source: Final Report of the Detailed Planning Study for Project for the Operationalization of Urban Master Plan in Greater Abidjan (SDUGA-2), Côte d'Ivoire.

Figure 12.2.6 SDUGA Project Location Map (Roads and Road Facilities)

Public transportation and railroads

The proposed public transportation and rail projects are as follows:

North–South Urban Railway between Ayame Centre and Grand Bassam

- Stage 1: Anyama Center to the airport, 37 km in length with 20 stations. Construction to start in 2020, funded by French government.
- Stage 2: Airport to Grand Bassam (Feasibility Study)

The SDUGA's proposal for the East–West urban railway between Yopougon and Bingerville is being promoted as a BRT with support from the World Bank and the Swedish government.



Source: Final Report of the Detailed Planning Study for Project for the Operationalization of Urban Master Plan in Greater Abidjan (SDUGA-2), Côte d'Ivoire.

Figure 12.2.7 SDUGA Project Location Map (Public Transportation and Rail)

Table 12.2.2 SDUGA Project List and Current Status (1/2)

Projects	Status	Donor	Remarks	
V Road Development Plan				
V-1 Development of Y4 Ring Road				
V-1-1	Development of Y4 Ring Road - Songon / Autoroute du Nord Section	B	World Bank	Changed from 2x2 to 2x1 lanes. To be implemented in 2023 (PTUA - PACOGA)
V-1-2	Development of Y4 Ring Road - Autoroute du Nord / Pk18	B	World Bank	To be implemented in 2023 (PTUA - PACOGA)
V-1-3	Development of Y4 Ring Road - Pk18 to Abobo Baoulé Section	B	BAD, JICA	Partially funded. To be implemented in 2023 (PTUA - PACOGA)
V-1-4	Development of Y4 Ring Road - Abobo Baoulé / François Mitterand Section	B	BAD	Partially funded. To be implemented in 2023 (PTUA - PACOGA)
V-1-5	Development of Y4 Ring Road - François Mitterand / Riviera 6 Section	A	BAD	Completed
V-1-6	Development of Y4 Ring Road - Desirée Island Bridges Section	C	AFD	Partial sections only
V-1-7	Development of Y4 Ring Road - Aerocté Section	B	World Bank	Study implemented
V-1-8	Development of Y4 Ring Road - Canal du Vridi Section	B	World Bank	Study implemented. Partial sections only
V-1-9	Development of Y4 Ring Road - Jacquville Section	C		
V2 Development of Bingerville Area Road Network (BiARN)				
V-2-1	Development of BiARN - Bingerville Northern Bypass	B	BAD, JICA	Study implemented. Partially funded
V-2-2	Development of BiARN - Extension of the Boulevard François Mitterand	B	BAD, JICA	Study implemented. Partially funded
V-2-3	Development of BiARN - Widening of the Route de Bingerville	C		
V-2-4	Development of BiARN - Bingerville BHLS Road	C		
V3 Development of Bassam Area Road Network (BaARN)				
V-3-1	Development of BaARN - Abidjan-Bassam Expressway (under construction)	A	China	Completed
V-3-2	Development of BaARN - Aerocté Area	C		
V-3-3	Development of BaARN - Bassam Northern Bypass	C		
V-3-4	Development of BaARN - Widening of the Route de Bonoua	B	China	Partial sections only
V4 Development of Yopougon Area Road Network (YoARN)				
V-4-1	Development of YoARN - Voie V23 - Parkway Section	B	BAD	First section is funded along with V-4-2. Funding is sought for the second section.
V-4-2	Development of YoARN - Voie V23 - 5th Bridge Section	A	BAD	Abidjan fourth bridge. Funded (PTUA)
V-4-3	Development of YoARN - Voie V2	C		
V-4-4	Development of YoARN - Voie V6	C		
V-4-5	Development of YoARN - Voie V9	C		
V-4-6	Development of YoARN - Yopougon Industrial Zone Arterial Road	C		
V-4-7	Development of YoARN - Voie V28 - Northern Section	C		
V-4-8	Development of YoARN - Voie V28 - 4th Bridge	C		
V-4-9	Development of YoARN - Voie V28 - Southern Section	C		
V-4-10	Development of YoARN - Autoroute de l'Ouest	B	BAD	Study implemented. Partially funded
V-4-11	Development of YoARN - Yopougon Western Bypass	C		
V-4-12	Development of YoARN - Widening of the Voie V1	C		
V-4-13	Development of YoARN - Central Road of Boulay Island	C		
V-4-14	Development of YoARN - Widening of Siporex-Sable Link	C		
V5 Development of Abobo Area Road Network (AbARN)				
V-5-1	Development of AbARN - Extension of O1			
V-5-2	Development of AbARN - Western Abobo Bypass	B	BAD	Alignment changed to avoid the Banco National Park
V-5-3	Development of AbARN - Extension of Voie N'Dotre	B	BAD	Study implemented. Funded
V-5-4	Development of AbARN - Widening of the Route d'Alépe	C		
V-5-5	Development of AbARN - Widening of the Autoroute d'Abobo	C	BAD	Partial sections only. Study implemented. Funded
V-5-6	Development of AbARN - East-West Abobo-Cocody Link	C		
V6 Development of Cocody Area Road Network (CoARN)				
V-6-1	Development of CoARN - Extension of Boulevard Latrille	B	BAD	Study implemented. Construction being prepared
V-6-2	Development of CoARN - Voie Y3	C		
V-6-3	Development of CoARN - Old Y4 Alignment	B		Completed
V-6-4	Development of CoARN - Extension of the Boulevard de France	B	AFD	Completed with 2x1 lanes
V-6-5	Development of CoARN - Boulevard de France Redressé	B	World Bank	Completed for the most part (Blvd. de France redressé). Remaining is a project by AGEROUTE (PMUA)
V-6-6	Development of CoARN - Widening of the Boulevard Latrille	B	KOICA	Boulevard de Martyrs
V-6-7	Development of CoARN - Widening of the Rue des Jardins	C		
V-6-8	Development of CoARN - Widening of the Boulevard de la Comiche	C		
V-6-9	Development of CoARN - Widening of the Boulevard Allotan	C		Led by the CI government
V-6-10	Development of CoARN - Widening of the Boulevard de la 7e Tranche	C		
V7 Development of Central Area Road Network (CeARN)				
V-7-1	Development of CeARN - Voie Triomphale	C		
V-7-2	Development of CeARN - 3rd Bridge (under construction)	A		Implemented through PPP
V-7-3	Development of CeARN - Widening of the Boulevard de Marseille	B	BOAD	Changed from the initial plan and implemented
V-7-4	Development of CeARN - Vridi Bridge	C	World Bank	Implemented as Port Access Road Phase 1
V-7-5	Development of CeARN - Vridi Northern Bypass	B	MCC	Only design implemented
V-7-6	Development of CeARN - Grand-Campement Arterial Road	C		
V-7-7	Development of CeARN - Upgrade of Felix Houphouët Boigny Bridge	B	AFD	Rehabilitation of Houpet-Boigny Bridge
V-7-8	Development of CeARN - Upgrade of General de Gaulle Bridge	B	Trésor	
V-7-9	Development of CeARN - Vridi-Bietry Bridge	C		
V-7-10	Development of CeARN - Yopougon-Treichville Tunnel	C		
V8 Intersection Improvement				
V-8-1	Intersection Improvement - Solibra (Treichville)	B	JICA	Partially implemented
V-8-2	Intersection Improvement - Mairie d'Abobo (Abobo)	B		Study implemented
V-8-3	Intersection Improvement - Banco (Abobo)	C		
V-8-4	Intersection Improvement - Palais des Sports (Treichville)	C		Implemented as improvement of the at-grade intersection
V-8-5	Intersection Improvement - Siporex (Yopougon)	B	China	
V-8-6	Intersection Improvement - Kenya (Yopougon)	C		
V-8-7	Intersection Improvement - Sapeur Pompiers (Yopougon)	B		Implemented as part of the Fourth Bridge
V-8-8	Intersection Improvement - Samake (Abobo)	C		
V-8-9	Intersection Improvement - St Jean (Cocody)	C		
V-8-10	Intersection Improvement - Palmeraie (Cocody)	B	JICA	
V-8-11	Intersection Improvement - CHU Treichville (Treichville)	C		Implemented as part of improvement of Blvd. de Marseille
V-8-12	Intersection Improvement - Inchallah (Koumassi)	C		
V-8-13	Intersection Improvement - Zoo (Adjamé-Cocody)	C		
V-8-14	Intersection Improvement - Williamsville (Adjamé)	B	BAD	
V-8-15	Intersection Improvement - Carrefour de la Vie (Cocody)	C		
V-8-16	Intersection Improvement - Carrefour de L'Ecole Nationale de Police (Cocody)	B	JICA	
V-8-17	Intersection Improvement - Carrefour de Marcori (Marcori)	C		
V-8-18	Intersection Improvement - Carrefour Orca (Cocody)	C		
V9 Development of Additional Roads				
V-9-1	Development of an Alternative Road to the Route de Dabou	C		
V-9-2	Development of an Alternative Connection between Autoroute du Nord - Carrefour Thomasset	C		
V-9-3	Development of an Elevated Road over Cocody Bay	C		
V-9-4	Development of a Northern Extension of the 3rd Bridge	C		
V-9-5	Development of a Connection Road between Boulevard Mitterand and Grand Bassam	C		

Note: BAD: African Development Bank; BOAD: West African Development Bank; AFD: French Development Agency; Trésor: French National Debt Office; MCC: Millennium Challenge Corporation (USA). Regarding progress, A: Implemented, B: Partially implemented or financed, C: Not implemented.

Source: Final Report of the Detailed Planning Study for Project for the Operationalization of Urban Master Plan in Greater Abidjan (SDUGA-2), Côte d'Ivoire.

Table 12.2.2 SDUGA Project List and Current Status (2/2)

Projects	Status	Donor	Remarks
G Traffic Control and Management Plan			
G-1 Development of Traffic Control System			
G-1-1 Development of Area Traffic Control System	B		To be implemented as part of PTUA
G-1-2 Development of Public Transport Priority System	C		
G-1-3 Development of Urban Traffic Information System	B		Ongoing discussion with TransitLab
G-2 Development of Public Transportation System			
G-2-1 Development of Dedicated Bus Lanes	B	World Bank	Studied as part of BRT plans in PMUA
G-2-2 Implementation of Transportation IC-Card System	C		
G-2-3 Development of Bus Operation Monitoring and Control System	C		
G-2-4 Development of Public Transportation Operation Information Provision System	C		
G-3 Parking System Development			
G-3-1 Development of Parking Facilities/Parking Information System	C		
G-4 Development of Expressway System			
G-4-1 Development of Highway Traffic Control System	B		Ongoing discussion with QuiPux
G-4-2 Development of Electronic Toll Collection System	C		
G-5 Traffic Enforcement Assistance			
G-5-1 Development of Overloaded Truck Control System	C		
G-5-2 Development of Road Pricing System	B		Toll system on the Third Bridge
G-5-3 Supporting System for Control of Illegal Parking	C		
G-6 Traffic Safety Assistance			
G-6-1 Pedestrian Facility Development for Better Environment	C		
G-7 Road Management			
G-7-1 Development of Road Surface Condition Survey System	B	MCC	Initial stage of implementation
G-7-2 Management System of Information on Road Maintenance Works	A	MCC	Initial stage of implementation
G-7-3 Development of Asset Management System	C		
T Public Transport Development Plan			
T-1 Commuter Rail Development			
T-1-1 North-South Rail Project-Stage 1 Anyama to Airport	B	Trésor	Study completed. Construction being prepared
T-1-2 North-South Rail Project-Stage 2 Airport to Grand-Bassam	C	Trésor	
T-1-3 East – West Rail Project (Yopougon to Bingerville)	B	World Bank	Changed to BRT
T-2 Bus Transportation Development			
T-2-1 Development of BRT Service: Adjame – Braké Industrial Zone	C		
T-2-2 Development of BRT Service: Abobo – Koumassi Phase 1	C		
T-2-3 Development of BRT Service: Abobo – Koumassi Phase 2	C		
T-2-4 Development of BHLS Service: Bingerville – Bonoua	C		
T-2-5 Development of BHLS Service: Yopougon – Dabou	C		
T-2-6 Purchase of Additional Buses for SOTRA	B	Scania, Swedfund	SOTRA will procure 2000 buses by the end of 2020.
T-2-7 Pilot project of communal transport	C		
T-3 Intermodal Transportation Terminal Development			
T-3-1 Development/Improvement of Intermodal centers at Adjame, and Central/Southern	C		
T-4 Water-based Transportation Development			
T-4-1 East – West High Speed Ferry Service (Songon - Grand Bassam)	B	World Bank, PPP	New stations constructed in PACOGA. Other stations constructed by private operators (CITRANS, STL)
T-4-2 Water Bus - Attacoubé to Treichville	C		
F Freight Transport Development Plan			
F-1 Railway Transport Services			
F-1-1 Developing Direct Container Freight Loading & Unloading System	C		
F-1-2 New Freight Railway Connecting to Western Part of Abidjan Port	C		
F-2 Truck Transport Services			
F-2-1 Metropolitan Logistic Center Development	B	Red Cross	Discussions with private operators for construction to be completed soon
O Organizational and Institutional Arrangements			
O-1 Establishment of Agency/Commission			
O-1-1 Establishment of Road Projects Implementation Commission	B		By AGEROUTE/AMUGA
O-1-2 Establishment of IT S Cote d'Ivoire	B		By DGTTC/ART I/AMUGA
O-1-3 Establishment of Clearing House Organization	B		Within AMUGA
O-1-4 Development of Transport Planning Centre of Excellence	C		
O-2 Public Transport Services			
O-2-1 Reorganization of SOTRA Bus Services	B	AFD	

Note: BAD: African Development Bank; BOAD: West African Development Bank; AFD: French Development Agency; Trésor: French National Debt Office; MCC: Millennium Challenge Corporation (USA). Regarding progress, A: Implemented, B: Partially implemented or financed, C: Not implemented.

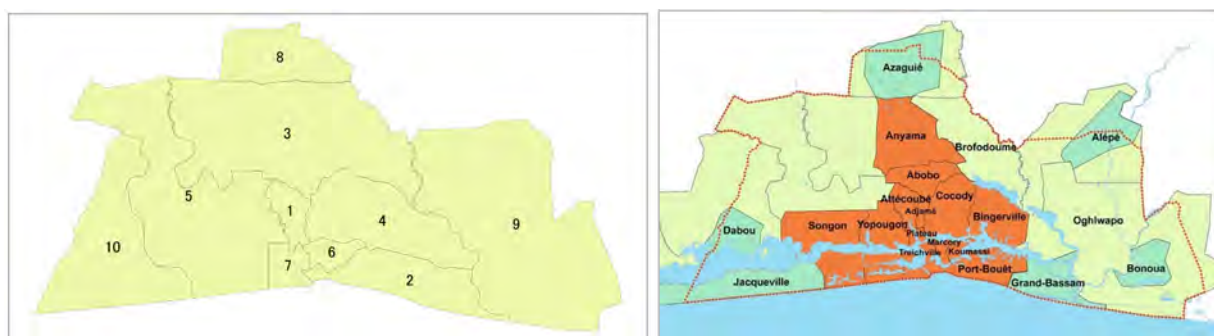
Source: Final Report of the Detailed Planning Study for Projact for the Operationalization of Urban Master Plan in Greater Abidjan (SDUGA-2), Côte d'Ivoire.

Pedestrian path and Bicycle Lane Improvement Projects

In addition to the SDUGA proposal, a project for the development of pedestrian paths and bicycle lanes (with a total length of 150 km) in the Autonomous District of Abidjan to promote inclusive and sustainable urban mobility in Abidjan has been partially incorporated into the PACOGA (a project supported by the African Development Bank), with 50 km of the project being under development. The remaining 100 km section is seeking financial sources through the Global Fund for Cities Development (FMDV). The 50 km section is in Zone 1 (Cocody, Adjame, Plateau commune) and Zone 2 (Marcory, Koumassi commune).

3) **Community Facilities by Urban Unit**

SDUGA divides Abidjan into 10 urban units, as shown below, and the number of community facilities required in accordance with the planning standards is proposed for each.



	Unit no.	Area
Abidjan Autonomous District	Unit 1 - Central Urban Area	Attecoube, Adjame, Plateau
	Unit 2 - South East Coast Urban Area	Port Bouet, Grand-Bassam
	Unit 3 - Northern Urban Area	Abobo, Anyama
	Unit 4 - Eastern Urban Area	Cocody, Bingerville
	Unit 5 - Western Urban Area	Songon, Yopougon
	Unit 6 - Petit Bassam Urban Area	Marcory, Koumassi, Treichville
	Unit 7 - Special Function Area	Abidjan Port (part of Port Bouet, Treichville, Yopougon)
Satellite Cities	Unit 8 - Northern Greater Abidjan	Azaguie
	Unit 9 - Eastern Greater Abidjan	Alepe, Bonoua
	Unit 10 - Western Greater Abidjan	Dabou, Jacquenville

Source: SDUGA

Figure 12.2.8 Urban Units in the Abidjan Region (Urban Unit)

Table 12.2.3 Number of community facilities developed by urban unit

Facility	Type	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10
Security	Gendarmerie, police station	52	79	133	70	146	64		3	32	41
Town Hall	Mayor, technical services	22	42	56	36	58	26		2	16	22
Infrastructures	Communication, Potable water, Electricity	1,652	2,496	4,317	2,193	4,699	2,020		98	1,022	1,271
Health	CSU, FSU, CSUS, CSDR	152	415	722	197	398	181		9	91	114
Education	Infant school, Primary, Secondary Canteen	1,314	1,559	3,377	1,746	3,662	1,607		77	814	1,010
Economic activities	Market, bus station	311	459	781	334	844	371		16	188	233
Sociocultural	Multipurpose center, social center, training, youth club and female centers	517	139	302	122	329	112		6	57	71
Sport	Sport entertainment, sport center, sport complex, stadium	219	328	563	291	616	268		12	136	170
Public gardens and green spaces	Relaxation and recreation spaces	5% of the urbanized area									

Note: Unit 7 is a special function area for port development, so the number of facilities to be developed for community facilities is not shown.

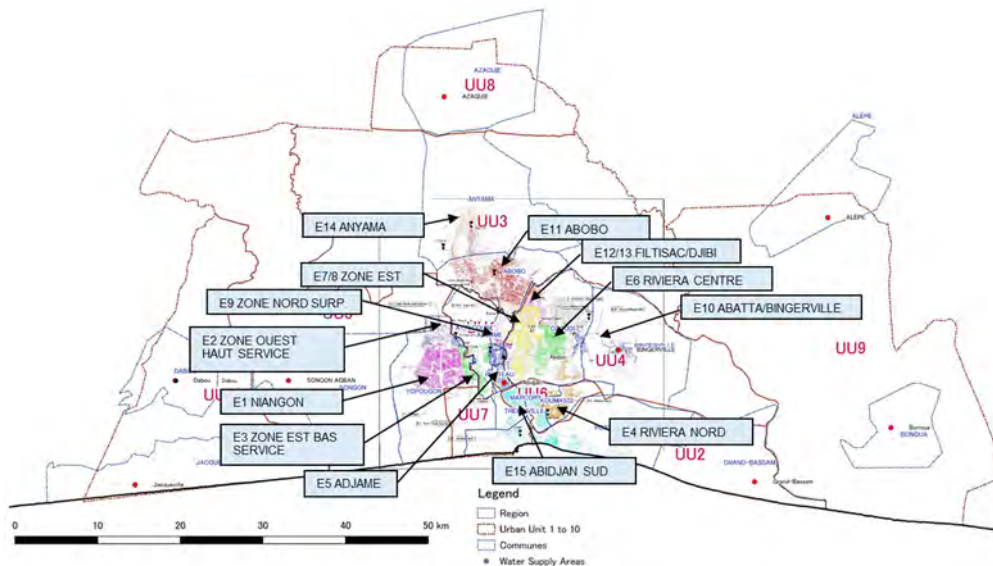
CSU: Urban Health Center (Centre de Santé Urbain), FSU: Urban Health Formation (Formation Sanitaire Urbaine), CSUS: Specialized Urban Health Center (Centre de Santé Urbain Spécialisé), CSDR: Health reference Centre (Centre de Santé de Référence)

Source: SDUGA

4) Water supply Development

Projects related to water supply are proceeding under the Abidjan Drinking Water Supply Investment Program (2015–2025). According to the project list by the Ministry of Hydraulics

(MH) in 2019, the Project for the Operationalization of Urban Master Plan in Greater Abidjan, the Yopougon/Abobo/Abidjan South/Cocody-Riviera Structural Pipe Network Reinforcement Project, and the Abidjan Municipal Drinking Water Distribution Expansion and Reinforcement Project (Gonzaqueille, Abobo, Cocody, Bingerville) have been already completed. The Reinforcement of Bingerville Drinking Water Production Facilities and Abidjan city water supply reinforcement (Mé River water source) projects are also underway, and projects for water source development, Abidjan City Water Supply, etc., are scheduled for implementation.



Source: Final Report of the Detailed Planning Study for Project for the Operationalization of Urban Master Plan in Greater Abidjan (SDUGA-2), Côte d'Ivoire.

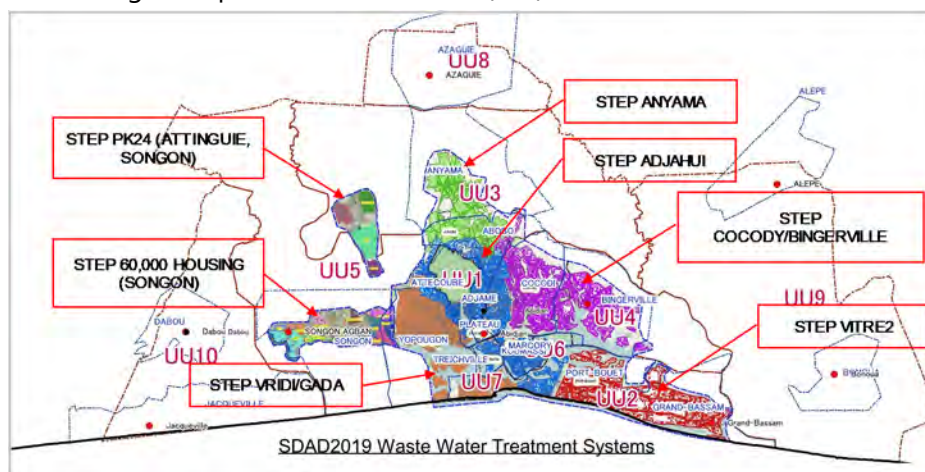
Figure 12.2.9 Water Supply Areas in the 2014 SAFEGE Abidjan Municipal Water Supply Master Plan

5) Sewage Development Program

The Master Plan of Sanitation and Drainage in Abidjan District (Schéma Directeur d'Assainissement et de Drainage du District d'Abidjan, 2019 [SDAD 2019]) has been prepared with the support of the Islamic Development Bank (IDB). SDAD 2019 covers the urbanized area of the Autonomous District of Abidjan, i.e., the 12 communes excluding Songon and Grand Bassam commune. The following projects are under implementation with support from various donors.

- Study on Wastewater Treatment in Yopougon – 1st tranche of SDAD (privately funded)
- Sanitation and Urban Resilience Project (PARU) (World Bank)
- Gourou Watershed Project (PBVG) Emergency Phase (Phase 1: West African Development Bank, Phase 2: African Development Bank)
- Millennium Challenge Corporation (MCC)
- Project for Reinforcement of Water Supply and Sanitation in Urban Area (PREMUA) (World Bank)
- Programme for Sustainable Improvement of Situation of Sanitation and Drainage (PADSAD) (IDB)

- Project for Improvement of Human Sludge Management (PAGEMV) in Abidjan District and 11 region capitals in Cote d'Ivoire (IDB)



Source: Source: Final Report of the Detailed Planning Study for the Project for the Operationalization of Urban Master Plan in Greater Abidjan, Côte d'Ivoire

Figure 12.2.10 Seven treatment systems of the Abidjan Sewage and Drainage Master Plan (SDAD 2019)

6) Waste Management

The Abidjan Autonomous District Waste MP (2030) is being developed by the PADSAD of the ISD, and the plan covers the 2030 target of the Abidjan Autonomous District.

According to the National Waste Management Agency (ANAGED), the following projects have been completed, are being implemented, or are planned.

Table 12.2.4 Waste Management Projects

Classification	Project
Completed projects	<ul style="list-style-type: none"> • Technical Centre for Recycling and Landfill (CVET) in Kossihouen • Construction of Four Waste Transfer Centres (Anguédédou 1 and 2 in Youpougon, from Namoué to Bingerville and from Port-Bouët)
Ongoing Projects	<ul style="list-style-type: none"> • Construction of a waste transfer center in Adjamé • Construction of the second lot of the CVET in Kossihouen • Renovation of the former Akuédo Landfill into an urban environment park
Projects under planning	<ul style="list-style-type: none"> • Construction of waste transfer centers under the World Bank PARU project (Grand Bassam, Dabu and Siken), construction of a recycling center (site to be decided), construction of a second recycle and landfill technology center (Atiekoi)

Source: Final Report of the Detailed Planning Study for the Project for the Operationalization of Urban Master Plan in Greater Abidjan, Côte d'Ivoire.

12.2.3 Review of existing JICA projects

JICA is implementing the following projects in Abidjan.

1) Project for the Development of the Urban Master Plan in Greater Abidjan (SDUGA)

The SDUGA developed the Urban Development Plan for the Greater Abidjan (including the Urban Master Plan and Urban Transport Master Plan), with a target year of 2030, for the area as shown in the figure below, and selected priority projects in the urban transport sector.

The study area of the project is the Greater Abidjan consisting of administrative units, the

Abidjan Autonomous District (13 communes) and 6 surrounding communes, a total of 19 communes and un-urbanized sous-prefectures, as shown in Figure 12.2.11. The total area is 431,063 ha.

Within the study area, the "Planning Area" is defined as the area delineated with geographical features as rivers, mountains, and roads considered the most likely limit of area for the urban master planning and shown by the red dotted line in Figure 12.2.11 エラー! 参照元が見つかりません。 (total area: 349,202 ha).



Source: SDUGA Final Report

Figure 12.2.11 Areas covered by SDUGA survey and planning

2) **Project for the Operationalization of Urban Master Plan in Greater Abidjan (SDUGA-2)**

The project is being implemented to strengthen the capacity for efficient implementation of SDUGAs by supporting the establishment and operation of monitoring committees, improving the effectiveness of urban development management at the district level, and updating urban transportation plans, thereby contributing to the promotion of sustainable urban development. The outcomes are as follows: (i) establishment of a structure for the SDUGA Implementation Facilitation and Monitoring Committee to ensure coordination and consistency with major urban infrastructure sector plans; (ii) enhancement of the effects of urban development management at the district level for SDUGA implementation has been enhanced; and (iii) urban transportation plan has been reviewed to improve convenience and accessibility of public transportation.

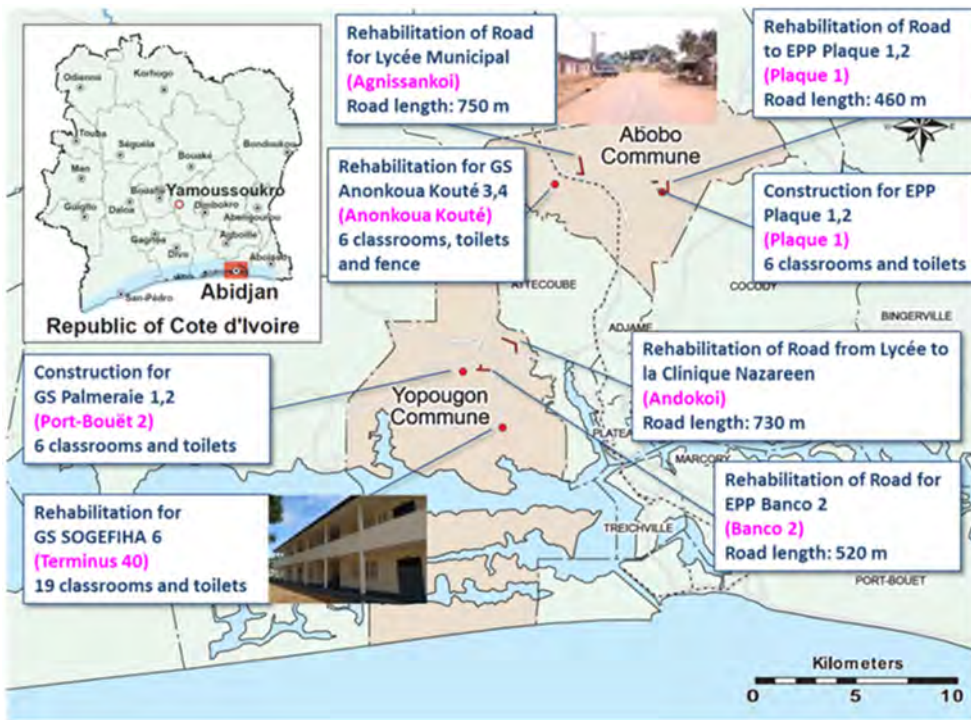
3) **Project on the reinforcement of communities for promoting social cohesion in Greater Abidjan (COSAY)**

COSAY Phase 1 was implemented in Abidjan's Abobo and Yopougon Communes with the objective of "strengthening relations among residents in conflict-affected communes through the implementation of social infrastructure development projects." The results of the project are as follows: (i) pilot projects are selected based on the results of the check of social infrastructure development project plans and implementation systems in each commune; (ii) pilot projects are implemented according to the plans and the projects were properly supervised; (iii) and methods are developed for city government officials to implement social infrastructure development projects with an awareness of social integration.

In COSAY Phase 2, the objective is "methodology for public service delivery with

considerations for social cohesion is consolidated in the target communes." The results are as follows: (i) three-year plans and other projects¹ in Abobo and Yopougon Communes are developed using a social cohesion-aware, science-based planning methodology; (ii) the Joint Management Committee (Comité Conjoint de Gestion [CCGs]) and their successor bodies in Abobo and Yopougon Communes are developed and monitored based on the COSAY methodology to strengthen social cohesion among residents and between residents and commune offices.

Both phases are implementing pilot projects to promote social integration, including the following road improvements and the construction of an elementary school.

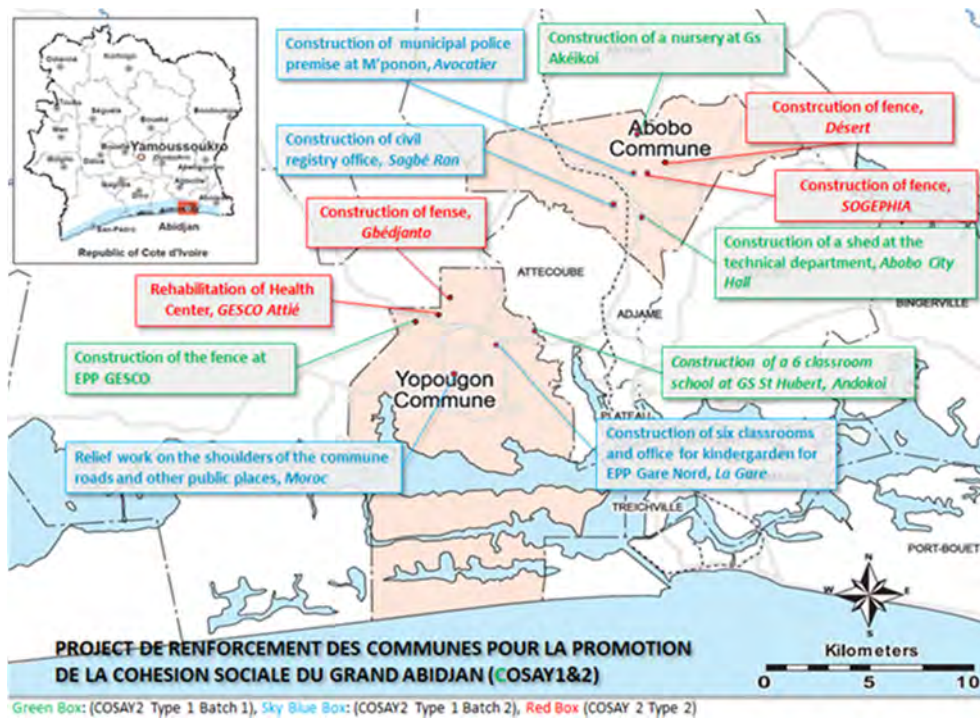


Note: GS (kindergarten), EPP (elementary)

Source: COSAY

Figure 12.2.12 COSAY Phase 1 Pilot Project

¹ Other projects include central government- and donor-funded projects.



Source: COSAY2

Figure 12.2.13 COSAY Phase 2 pilot project

In addition to the above, the following infrastructure projects are being implemented:

Japan-Cote d'Ivoire Friendship Interchange Improvement Project (Phase 1 & Phase 2) (Grant aid, 2015–)

The intersection of the Valéry-Giscard-d'Estaing (VGE) Boulevard and De Gaulle Boulevard, the main artery of Abidjan, is the most serious bottleneck of the road network, and the construction of a multi-level flyover at the intersection (commonly known as the Solibra intersection).

Project for construction of Three intersections in Abidjan (Loan Project, 2019–):

The project aims to increase traffic capacity and facilitate traffic flow by upgrading three intersections (the intersection in front of the Police Academy, the Riviera intersection, and the Palmeraie intersection) located on Mitterrand Avenue, which crosses the Greater Abidjan area.

The Project of Cereal Terminal Construction at the Port of Abidjan (Japanese Yen Loan Project (STEP: (Special Term for Economic Partnership), 2017-)

The Port of Abidjan is not only the logistics hub of Cote d'Ivoire but also one of the largest ports in West Africa in terms of handling container volume. The expansion of the existing port infrastructure, especially the cereal berths, has not kept up with the increase in cargo volume accompanying high economic growth but is one of the government's top priorities. The project will contribute to economic revitalization and food security by building a new grain berth to meet the growing demand in the country and surrounding landlocked countries in the Sahel region.

12.2.4 Direction of urban development based on New Neighborhood and Five Urban Agendas

The urban issues of Abidjan City and the challenges in post-COVID-19 in terms of urban spatial structure, transportation and mobility, urban environmental sanitation, and urban socio-economy, based on existing urban issues, the impacts of COVID-19, and changes in characteristics, are summarized in the table below. It can be said that the challenges of the urban area have not changed with the spread of COVID-19, but rather the existing urban issues have further highlighted the underdevelopment of sanitation facilities and the negative economic impact on the informal sector and informal settlements of the vulnerable urban population.

Table 12.2.5 Characteristics of Abidjan and Challenges to Post-COVID-19

	Existing Urban Issues and Characteristics of Abidjan	Challenges in Post-COVID-19
Urban Spatial Structure	<ul style="list-style-type: none"> • Concentration in the center of Abidjan • Road-oriented urban structure • Circular road bypassing the city center not yet developed • Distribution of informal settlements and outward urbanization pressure 	<ul style="list-style-type: none"> • Decentralization of urban functions (in conjunction with mass transit systems, bus route reorganization, and other public transportation improvements) • Ring road development • Development of a multipolar urban structure as a receptacle for the increasing population • Ensure open space • Development of community facilities
Transportation & Mobility	<ul style="list-style-type: none"> • Centralized road network, poor road surface, missing links, insufficient capacity • Function as a major road or freight traffic corridor • Traffic jams • Public transportation is the main mode: Woro-woro (40%), gbaka (30%), SOTRA (15%), and metered taxi (5%). Private transportation is mainly cars (10%). • Most trips are on foot, with about 70% of all trips within the commune. 	<ul style="list-style-type: none"> • Ring road and missing link development • Development of mass transit systems (MRT, BRT) • Utilization of public transportation data to control infection and raise awareness • Development of non-motorized transport (NMT) environment and promotion of universal design
Urban Environment and Sanitation	<ul style="list-style-type: none"> • Extensive informal settlements and the lack of basic infrastructure • Increase in medical wastes 	<ul style="list-style-type: none"> • Improvement of informal settlements living conditions • Continue to raise hygiene awareness
Urban socio-economy	<ul style="list-style-type: none"> • Vulnerable informal economy 	<ul style="list-style-type: none"> • Safety nets for the urban economy, especially for the informal sector • Formation of neighborhood communities, cooperation of NGOs, etc.

Source: JICA Study Team

12.2.5 Cooperation Project (draft)

The city requires the following to prevent and respond to infections in Post COVID-19: (i) urban structures that prevent and control infections, such as spatial structures that allow for low mobility and maintaining social distance, and (ii) urban structures that make life better in the event of an infection disaster. It is required to form a city that is resilient to future outbreaks of infectious diseases while functioning as a receptacle for a significantly increasing population in the future.

To this end, the following district (neighborhood) level and wider regional level development programs can be considered. As seen above, infrastructure-related projects such as roads, public transportation, water supply, sewage, waste, etc., involve a variety of donors, including the World Bank, the BAD, and the French government.

A program of urban environmental improvement at the neighborhood level is envisioned to address the issues specifically highlighted by COVID-19 infection.

1) **Neighborhood Urban Environment and Public Administrative Services Improvement Program (Short- and Mid-term)**

The project aims to establish a 15 to 20 minute "neighborhood that is resilient to COVID-19 in Abobo Commune (with a population of 1.03 million people and an area of 90 km² in 2014) and Yopougon Commune (with a population of 1.07 million and an area of 153 km² in 2014) where the low-income population is concentrated and the socioeconomic impact of COVID-19 is considered significant. It also aims to improve public administrative services and the urban environment within the zone.

[Annex commune hall development project]

The commune has concentrated in its main hall to provide public administrative services, but a second annex hall should be developed to provide such administrative services to avoid people densely gathering in the city hall. Annex office buildings will be constructed and personnel will be trained to work at the annex buildings to provide public administrative services.

[Park Improvement Project]

People are mentally exhausted by the COVID-19 pandemic and need space to destress and exercise. AfDB is incorporating pedestrian paths and bicycle lane improvements into the PACOGA. It is proposed to promote the development of parks in conjunction with the previously mentioned annex commune halls. (The two above-mentioned municipalities will seek to identify such projects).

[Non-motorized transport (NMT) Development Project]

In Abidjan, NMT, such as walking and bicycling, is common. In order to improve the urban environment of living areas, bicycle paths will be developed in connection with the development of pedestrian paths and bicycle lanes that AfDB has incorporated into the PACOGA (the two communes above will also seek to identify such projects).

[Improvement of Public Administration Services with by Introducing ICT (digitization) Project]

The project focuses on upgrading public administration services by digitizing the network among the commune's main and annex offices. Alternatively, some public administrative services can be provided to citizens through information technology (IT), such as submitting applications or requests through SNS.

[Primary School Hygienic Facility Improvement and Hygiene Education Project]

Although there have been no reports of cluster outbreaks in schools in Abidjan, the COVID-19 pandemic has had a major impact on education, including school closures. Therefore, schools equipped with hygienic facilities are required to maintain school education for children while preventing infection. This component can also be positioned as a development of the expansion plan for school facilities through the Community Empowerment Project (CEP) related to infectious disease control, which has been promoted by the JICA Cote d'Ivoire office.

In this program, projects except for ICT and those school-related are planned in the PUD (detailed plan) of the Urban Unit of SDUGA in Abidjan and need coordination and collaboration with the PUD of each unit. Therefore, coordination with JICA's SDUGA-2, which supports the implementation of the entire SDUGA, is also required.

2) Multipolarization of Urban Spatial Structure Program: Medium- to Long-term Program

While the above-mentioned program was envisioned to improve public services at the neighborhood level in the short- to medium-term, the following programs that would significantly change the urban spatial structure are conceivable in the medium to long term.

[Transportation Infrastructure Development Program]

- **Public transportation and railway development.** In order to change the urban spatial structure, MRT and BRT development are required in the long term. As mentioned above, the World Bank and other organizations have already initiated these projects. Therefore, JICA's involvement should be considered.
- **(Ring) Road Improvement.** JICA is currently implementing a road improvement project by a flyover at the Solibra intersection and three intersections on Mitterrand Street. Other missing links that have not yet been started and that will determine the urban structure can largely be envisioned as cooperative projects.
- **Public transportation nodal development.** The main modes of public transportation in Abidjan are the informal woro-woro and gbaka and the formal SOTRA buses. At these nodal terminals, enough space should be secured to reduce contact opportunities and make them resilient to infectious diseases.

[Program of the Development of Basic Infrastructure in Satellite Centers]

The development of basic infrastructure in satellite centers in Abidjan, which are planned to accommodate the increasing population while keeping existing urban areas compact and controlled and promote decentralization, will contribute to curbing infectious diseases by reducing contact opportunities. Basically, the development of community facilities in each urban unit as proposed in the SDUGA, together with the development of the transportation infrastructure described above, will greatly contribute to the development of satellite centers. Community facilities include government buildings, utility facilities, schools, parks, markets,

etc.

These programs will contribute to building a resilient city of Abidjan through the implementation of infrastructure projects proposed in SDUGA. Therefore, the establishment of these pathways in SDUGA-2, JICA's assistance for the realization of SDUGA's proposed projects, in coordination with relevant organizations, will support the achievement of the "Resilient City of Abidjan."

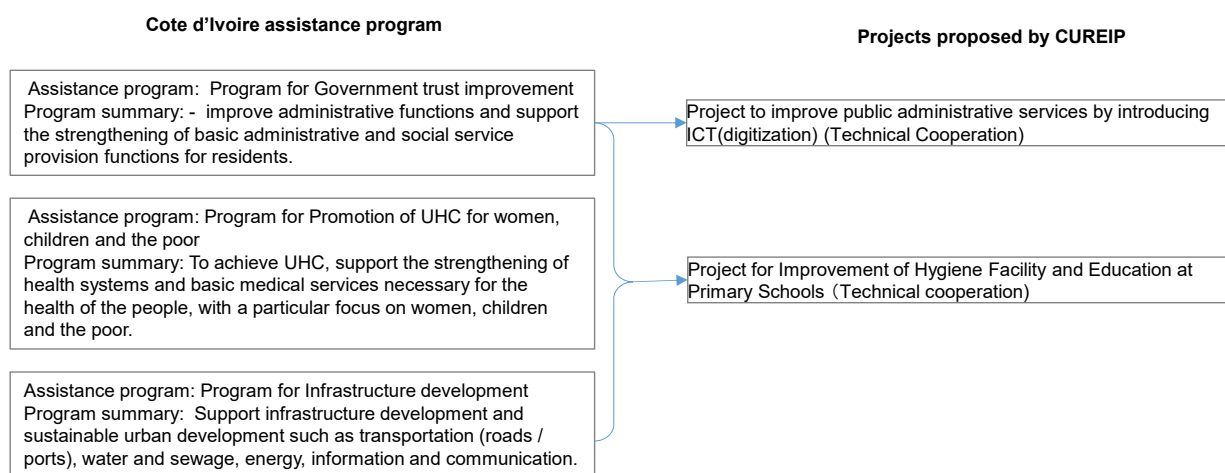
12.3 Formation of cooperation projects

Transportation infrastructure that affects the regional urban spatial structure, which is included in the "Multipolarization of Urban Spatial Structure Program" of the medium- to long-term program described in the previous section, has generally been initiated by several donors and other organizations. In addition, SDUGA-2 will provide technical assistance to formulating detailed plans of the Urban Units. By applying this study's urban development concept to construct a city resilient against infectious diseases in urban development at satellite centers and community facilities in the district as well as the wide-area urban structure, it is thought that a resilient city against infectious diseases will be formulated

The ideas for the "Annex commune hall development project", "Park Improvement Project", "NMT Improvement Project" in the "Neighborhood Urban Environment and Public Administrative Service Improvement Program (Short- and Medium-term Program)" are also proposed to be incorporated into the detailed planning support for the Urban Units of SDUGA 2, as part of the development of Community Facilities.

Under these circumstances, this study proposes (1) a "Public Administrative Service Improvement by Introducing ICT (Digitalization) Project" to avoid congestion in the civic life and (2) a "School Hygienic Facility Improvement and Hygiene Education Project" in primary schools where overcrowding and poor sanitation due to lack of facilities were observed in the infectious disease disaster.

The relationship of these two projects to the relevant programs of Development Cooperation Policy for Côte d'Ivoire is as follows.



Source: JICA Study Team

Figure 12.3.1 Proposed Project and Related Programs of the Côte d'Ivoire Country Development Cooperation Policy

12.3.1 Public Administrative Service Improvement by Introducing ICT (Digitalization) Project

ICT for public services is positioned as one of the five short-term key points on how a city should be, as described in Chapter 4, and is also positioned as one of the Urban Agenda for realizing a New Neighborhood, as described in the medium- to long-term initiatives. ICT in this public administrative service is positioned as an important measure to avoid congestion. Using ICT is also in line with the digitalization and administrative modernization trends

promoted by the Government of Cote d'Ivoire. It will also contribute to building a city that is resilient to infectious diseases.

The table below contains a summary of the project for public administrative services improvement by introducing ICT (digitization).

Table 12.3.1 Proposed projects to improve public services by introducing ICT (digitization)

<p><u>Background:</u></p> <p>In Yopougon Commune and Abobo Commune, despite having a population of over 1 million, public administrative services are concentrated in the main commune hall building and annex buildings have not been developed adequately. As a result, the commune hall is crowded with citizens needing public administrative assistance. Crowded conditions have returned to normal yet this still poses the risk of infection. In the future, it will be necessary to avoid congestion in the provision of public administrative services to live a social life with COVID-19 or post-pandemic. Digitalization of public administrative service provision and development of annex buildings are highly needed by citizens and civic groups as a measure against COVID-19 infection.</p>
<p><u>Objective:</u></p> <p>Capacity and operational efficiency in providing public administrative services in Abobo and Yopougon municipalities will be improved, and citizens will be able to receive public administrative services without congestion at the commune hall.</p>
<p><u>Components:</u></p> <ol style="list-style-type: none"> 1. Review of the status of modernization and digitalization of administrative services in Côte d'Ivoire. 2. Promotion of digitalization related to the provision of public administrative services in Abobo and Yopougon Communes. 3. Pilot Project for Online Public Administrative Services in Abobo and Yopougon Communes. 4. Strengthening of capacity of organizations and staff related to online public administrative services in Abobo and Yopougon Communes. 5. Public relations and awareness raising activities to promote using the online public administrative services in Abobo and Yopougon Communes to citizens. 6. Recommendations to disseminate and promote digitalization of public administrative services to other municipalities.
<p><u>Main related institutions:</u></p> <p>Major counterpart agencies: Abobo Commune and Yopougon Commune</p> <p>Related agencies: Ministry of the Interior and Security, Ministry of Civil Services and Administrative Modernization, Ministry of Digital Economy and Telecommunications, ONECI¹, Abidjan Autonomous District</p> <p>Other relevant organizations: UVICOCI², RIMCI³, private ICT developer, and</p>

telecommunications companies (Orange, Moov, MTN, etc.)

- Note : ¹⁾ ONECI: Office National de l'Etat Civil et de l'Identification, National Office of Civil Status and ID;
²⁾ UVICOCI: Union des Villes et Communes de Côte d'Ivoire, (Union of Cote d'Ivoire Cities and Communes);
³⁾ RIMCI: Réseau des Informaticiens des Mairies de Côte d'Ivoire, (Network of Information Officers of Commune Halls of Côte d'Ivoire)

Source: JICA Study Team

1) **Current ICT Policy and Other Issues in Cote d'Ivoire**

The following is a summary of Cote d'Ivoire's ICT policy, modernization of public services, etc.

(1) **Status of digitization in Côte d'Ivoire**

According to JICA's "Data Collection Survey on Digitalization of Public Services in African Countries " (March 2022), Cote d'Ivoire currently intends to spread ICT in the lives of its citizens, but faces challenges such as stagnation of e-Government services and slow integration of digital national ID with other IDs. On the other hand, ICT and digitization projects by international organizations, donors, and the private sector are underway, including the World Bank's national ID project adopting common specifications for the ECOWAS region. In addition, Côte d'Ivoire does not have a digital strategy at this time, but is developing New Digitalization Strategy 2030 (provisionally named) and plans to develop an all-inclusive strategy for all services by the end of 2021, with support from EU. The priority areas in the New Digitalization Strategy 2030 are infrastructure, education, and services. Services here means promoting the use of online services. The government is promoting online services.

(2) **National Development Plan 2021–2025**

The National Development Plan 2021–2025 of Côte d'Ivoire outlines the status and strategies presently for promoting IT in local governments as follows:

(a) **Status of administrative modernization**

The State Ministry of Public Service and Modernization of Administration was created to modernize the public administration to make it more citizen-centered, more efficient, and more effective. The government is modernizing all ministries and agencies through the Program for the National Support of Organizational Innovation and National Modernization (le Programme National d'Appui aux Reformes Institutionnelles et à la Modernisation de l'Etat [PRIME]). In addition, the E-Administrative Procedure (le projet E-Demarche Administrative: E-DA) simplified the administrative procedures and made them go paperless. As a result, 66 out of 300 administrative procedures for citizens in sectors such as health, legal, water, forestry, education, tourism, and agriculture have switched to paperless. Furthermore, in 2017, the Public Service Oversight (L'Observatoire du Service Public [OSEP]) was launched to bring citizens closer to the administration, and in 2019, a portal for citizens called "Milie" (www.milie.ci) was launched to listen to the public opinions of citizens. Despite the implementation of these various policies, user satisfaction with the provision and quality of public services remains at a low level. These are reflected in the numerous complaints about public services in OSEP.

(b) Issues and challenges in the administrative modernizationAdministrative Modernization Issues

The National Development Plan 2021–2025 identified the issues for the Administrative Modernization Board to address.

- (i) Multiplicity and complexity of administrative procedures
- (ii) Difficulties in accessing public services (geographical/economic/informational)
- (iii) Low use of available innovations in the provision of public services
- (iv) Inadequate and/or poor application of quality standards in the provision of public services
- (v) Subdivision of administrative databases
- (vi) Slow pace of simplification and paperless administrative procedures
- (vii) Continued use of physical procedures unsuitable for paperless procedures in many government agencies that have completed paperless procedures
- (viii) Small number of transactional e-services in operation throughout the administration
- (ix) Weak government commitment to e-services development
- (x) Resistance to the introduction of electronic signatures

Major Issues in Administrative Modernization

During the COVID-19 pandemic, public administration was greatly affected; therefore, accelerating the development of digital tools is necessary to ensure efficient and continuous provision of public services even under a crisis. Accordingly, the following issues need to be addressed in order to solve the above-mentioned problems, according to the report.

- (i) Improve the public's access to quality public services.
- (ii) Accelerate the digital transformation of public administration.
- (iii) Accelerate the process of simplifying and paperless administrative procedures.
- (iv) Prioritize the use of paperless procedures in many government agencies that have completed the paperless process.
- (v) Accelerate the implementation of quality management systems in user and customer oriented public services.
- (vi) Operate digital signatures
- (vii) Capacity building of government officials.
- (viii) To strengthen the innovation of public services and the provision of local services.
- (ix) Improve the management and coordination of the administrative modernization process.

(3) Relevant organizations related to the promotion of ICT in local government

According to JICA's "Data Collection Survey on Digitalization of Public Services

in African Countries" (March 2022), cooperation with the following organizations is required to promote the shift to online services for citizens.

(a) Ministry of Public Service and Modernization of Administration (ministère de la

fonction publique et de la modernisation de l'administration)²

The Ministry of Digital Economy and the Ministry of Civil Service and Administrative Modernization share common responsibilities. The Minister of Digital Economy is responsible for the implementation of national policies. The sphere of activity of the Minister of Digital Economy is broad and affects all areas of digital economy activities. The Ministry of Civil Service and Administrative Modernization, on the other hand, focuses exclusively on public services and is responsible for the specification of public services and the digitization of public administration. The Ministry of Civil Service and Administrative Modernization receives authority from the Ministry of Digital Economy for the specification of public services and the digitization of public administration, while the Ministry of Digital Economy provides technical assistance upon request.

(b) Ministry of Digital Economy and telecommunications (Ministère de l'Économie Numérique, des Télécommunications)³

The Ministry of Digital Economy is responsible for developing and monitoring policies related to digitization and the digital economy. It develops strategies and action plans for the digital ecosystem. The Ministry develops policies to reduce barriers to digitization for the people of Côte d'Ivoire. This promotes access to the Internet in all segments of society. It also promotes human resources development and regional policies in the field of ICT, research in ICT from a global perspective, training, and legislation for all of these.

(c) Ministry of the Interior, Directorate General for Decentralization and Local Development (DGDDL)

The Directorate General for Decentralization and Local Development (DGDDL) of the Ministry of Interior (MEMIS) is responsible for decentralization, and its main roles are as follows:

- Organize and enforce state supervision over local governments.
- Coordinate technical and financial assistance to local governments.
- Strengthen the capacity of local governments.
- Inspect and supervise local governments through general inspections of local administrative services.
- Monitor and evaluate the decentralization.
- Provide support and oversight for planning and community development conducted by local governments.
- Support inter-municipal cooperation.

The DGDDL has a sub-directorate of administrative policy, civil status, and population, which is responsible for civil registration.

(d) The National Office of Civil Status and Identification (l'Office National de l'Etat Civil et de l'Identification [ONECI])

The national ID and resident registration were under the jurisdiction of the National Office of

² JICA Data Collection Survey on Digitalization of Public Services in African Countries" (March 2022) Final Report

³ same as above

Identification (L' Office national de l'identification [ONI]) under the Ministry of the Interior, but became under the jurisdiction of ONECI when it was established in May 2019. ONECI is responsible for the identification of citizens residing in Côte d'Ivoire and the identification of officials and citizens. The ONECI aims to accelerate the operationalization process of the National Registration of Physical Persons (Registre National des Personnes Physiques [RNPP]), addressing the modernization of the monitoring of the civil status and identification of citizens, foreigners, and immigrants.

ONECI is also responsible for implementing civil rights policy in cooperation with civil registration agencies and judicial authorities, and its tasks include modernizing civil status and designing the central government civil registration file. It currently implements the National Biometric Register (RNPP) to modernize the civil registration system.

As seen in Yopougon and Abobo, among the services provided by city halls, those related to the civil registration are the administrative services that most citizens demand. A major component of this service is the national civil ID. In terms of the ICT of administrative services, e-government trends can be summarized as follows.

(4) Basic Information for Citizen Registration

(a) National ID and Birth Registration Status

As seen in Abobo and Yopogon, there was congestion in civil registration-related operations. The basic information related to civil registration is the national ID and birth registration. According to JICA's "Data Collection Survey on Digitalization of Public Services in African Countries" (March 2022), the status of national ID and birth registration is organized as follows.

National ID: Based on the vision formulated by "Vision Côte d'Ivoire 2040", the ministry is working on the digitalization of administrative procedures related to the application and acquisition of birth certificates, passports, driver's licenses, etc., by promoting the spread of ICT in people's lives and ID digitization (Ministry of Digital Economy). In addition, the "Ten Years National Strategic Plan (2017–2027)" has established an improvement initiative and external support improvement plan, as well as a ten-year national strategic plan to improve the civil registration and vital statistics system and the current state of resident registration.

National ID registration: Issuance of the ID card takes one to three months after registration at the registration center, and although a mobile registration campaign is underway, the registration rate is only about 45% of the population. There are also plans to introduce IC cards with biometric data, but the two types of ID certifiers, the national ID and nationality certificates, are not compatible with each other. As for national IDs, the World Bank has been working on a common specification out-maintenance ID and online service for the Economic Community of West African States (ECOWAS) since 2018.

Birth registration: The registration is within three months of birth, but the nationwide registration rate is low at 55%.

Linkage with other sectors: The National Health Insurance Fund has a biometric identification system for approximately 4 million people, but it is not linked to the national ID database.

(b) Issues related to national ID and resident registration

The Data Collection Survey on Digitalization of Public Services in African Countries also identified the following issues in the national ID and resident registration at the national and local levels.

Table 12.3.2 Issues related to national ID and resident registration

Level	Issue
National level	<ul style="list-style-type: none"> • <u>Inter-governmental data utilization between ministries and agencies.</u> Although the national ID card itself is being digitized, the databases of each ministry and agency are maintained separately, and the promotion of utilization through data linkage is seen as an issue. • <u>Lack of initiatives for stateless residents, including immigrants from neighboring countries and ethnic minorities.</u> An estimated 700,000 stateless or nationality-unknown residents live in the country and face numerous problems with schooling, opening bank accounts, traveling, registering their children, etc. • <u>Digitization of birth registration.</u> Birth registration, which is a prerequisite for obtaining a national ID, has not been digitized and remains paper-based. Since birth registration is the basis for obtaining a national ID, improving the birth registration rate is also seen as an urgent issue.
Local level	<ul style="list-style-type: none"> • Communication infrastructure issues (last mile connectivity) • Educational activities, such as Internet access support, to promote digitization (bridging the digital divide) • To address these issues, various organizations are working on projects such as the Optical Fiber Network Installation Project by the National Telecommunications Agency (ANSUT) and the e-agriculture project by the Ministry of Agriculture. In order to realize national IDs and inter-organizational data linkage, the development of ICT infrastructure and the bridging of the digital divide are considered to be the leading issues.

Source: Data Collection Survey on Digitalization of Public Services in African Countries (JICA, March 2022)

When considering online services by local governments, it is necessary to coordinate with the relevant agencies for consistency with the various data related to civil registrations and for the scope of handling.

(5) Network of Information Officers of City Halls of Cote d'Ivoire, Réseau des Informaticiens des Mairies de Côte d'Ivoire (RIMCI)

RIMCI is an organization that provides technical cooperation in promoting online services and digitization in communes. It is a group of professionals that aims to contribute in reducing the digital divide by bringing together the skills of IT professionals in the communes of Côte d'Ivoire, exchanging their experiences, digitizing the services offered to the population, and strengthening the capacities of local actors. RIMCI is a union organization according to the Ivory Coast law No. 60-315 (September 21, 1960).

(a) Mission of RIMCI

RIMCI has the following missions related to local government service delivery and improvement.

- Sharing of IT skills among commune municipalities
- Implementation of IT solutions for modernization of municipalities and state regional services
- Development of a master plan for the computerization of the Civil Status center of the

commune of Côte d'Ivoire

- Provision of a common application for civil rights record management to the civil rights departments of city halls
- Promotion of interconnection of Civil Status centers intending to build a national Civil Status database
- Building a digital database of Civil Status records
- Become an important point of contact for the supervising ministry in matters related to computerization in the municipality
- Assistance for the Government of Côte d'Ivoire in its modernization policy for the Côte d'Ivoire communes
- Establishment of interactions and cooperation with all organizations and institutions that seek to revitalize municipal services
- Seek financial assistance or scholarships for members
- Continuing education seminars for elected officials and municipal officials
- Raise awareness of elected officials and municipal administrators about the challenges of using ICT and the Internet
- Facilitation of access to information on municipal management using ICT
- Support for establishing a municipal multimedia center that provides low-cost access and quality training
- Strengthening of ICT and Internet access and training in schools

(b) E-commune

RIMCI started developing the E-Commune online service platform in 2016 with the aim of promoting it in the communes. The E-Commune is in the pre-design phase and has been tried in the Yopougon commune since January 2021. Its features are as follows:

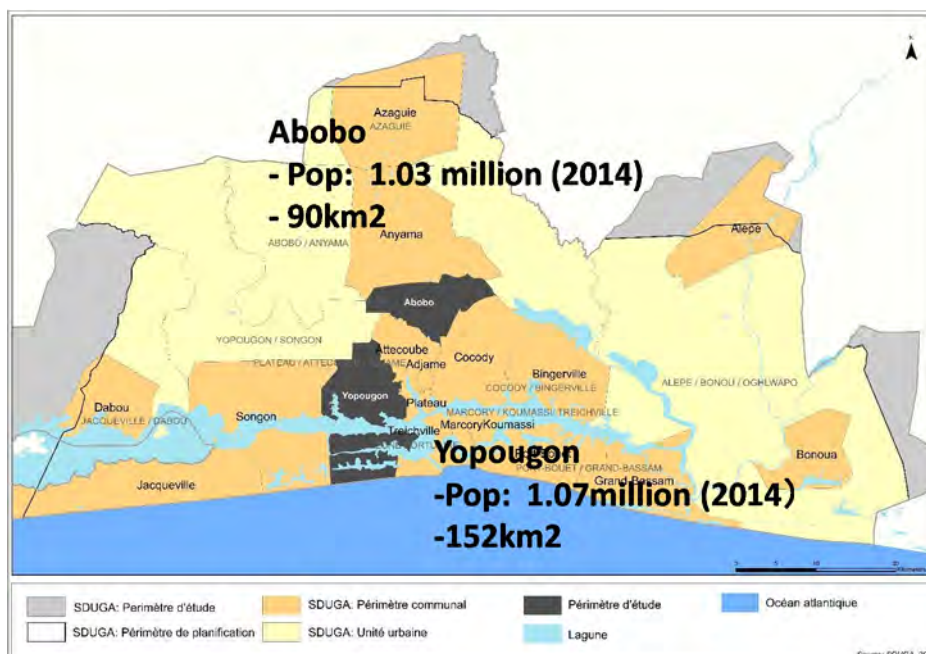
- Manage the process of document applications and requests (birth, marriage, and death certificates) at the Yopougon commune office.
- Designed to be upgradeable to handle the process of document application and requests from any commune office in a general way.
- Consists of the following applications:
 - Mobile Apps: Mobile phone application (available on Android and iOS) for submitting requests and document applications from smartphones.
 - Touch screens: Touch screen kiosk applications are available for requesting applications for documents in supermarkets (e.g., shopping centers).
 - Back office: Internal management of document requests (printing) and management of mobile application contents.
 - Document check: Using the VScan application (available on Android and iOS) for checking and publishing document requests.

The trial has been a great experience of deployment to be shared with communes outside of Yopougon.

2) Detailed Analysis of Administrative Services in Abobo and Yopougon

(1) Survey of current service delivery and needs of government offices in Abobo and Yopougon

In preparation for the digitization of government offices in Abobo and Yopougon, a survey of the current situation was conducted for the items shown in エラー! 参照元が見つかりません.



Source: JICA Study Team

Figure 12.3.2 Abobo and Yopougon Communes

Table 12.3.3 Current Survey on Public Services in Abobo and Yopougon

(Data) Item	Contents
Objective of the Survey	To understand the current status and issues of public administrative service provision and the use of ICT in commune offices (Abobo and Yopougon) with few office facilities and large population, which are expected to be particularly congested in the Abidjan Autonomous District, and to obtain basic data for considering the necessity of annex commune halls and the introduction of digitization to improve efficiency of public administrative service operations in neighboring areas.
Survey Contents	<ul style="list-style-type: none"> • Organization and public administrative service operations and issues • ICT usage • Request for improvement of efficient provision of public administrative services by citizens and citizens' groups
Subject of survey	<p><u>Communes:</u> Interviews with commune councilors and heads of departments in the commune after sending questionnaires to them.</p> <p><u>Citizen's groups:</u> Questionnaires sent to citizen's groups and interviews were conducted in Abobo Commune (12 organizations) and Yopougon Commune (4 organizations)</p> <p><u>Citizens who came to Commune Hall:</u> Directly interviewed citizens at the Abobo Commune (57 people) and Yopougon Commune (60 people)</p>

Source: JICA Study Team

(a) Administrative documents issued in Abobo and Yopougon Communes

The following administrative documents are issued at the commune office.

- Birth certificate
- Marriage certificate
- Certificate (life insurance, non-marital, non-divorced)
- Permits for demonstrations and assemblies
- Death certificate and birth declaration
- Legalization of administrative documents
- Payment of taxes
- Identification card

(b) Existing methods of requesting and issuing information

Both communes provide services through physical methods, by applying in person at the counter to receive documents.

Table 12.3.4 Methods of Requesting and Issuing Administrative Documents in Abobo and Yopougon

Abobo	Yopougon
<ul style="list-style-type: none"> • Application for administrative documents is only personally or by physical means. • Online services are not yet functional. • A website with all online procedures exists but is not yet operational. Incidentally, so far, no information about this website has been communicated to residents yet. 	<ul style="list-style-type: none"> • Application for administrative documents is only personally or by physical means. • The online document application service is in the pilot phase and will be available in a few months. • Website for online application for trial: http://www.yopougon.ci/ • ICT-related personnel are available, but their capacity needs to be strengthened

Source: Interview survey (JICA Study team)

(c) Processing time for administrative documents

In Abobo, it takes 8 hours for document authentication and 24 to 72 hours for civil identification by civil law. However, in practice, it takes several days depending on technical reasons and the availability of the signer.



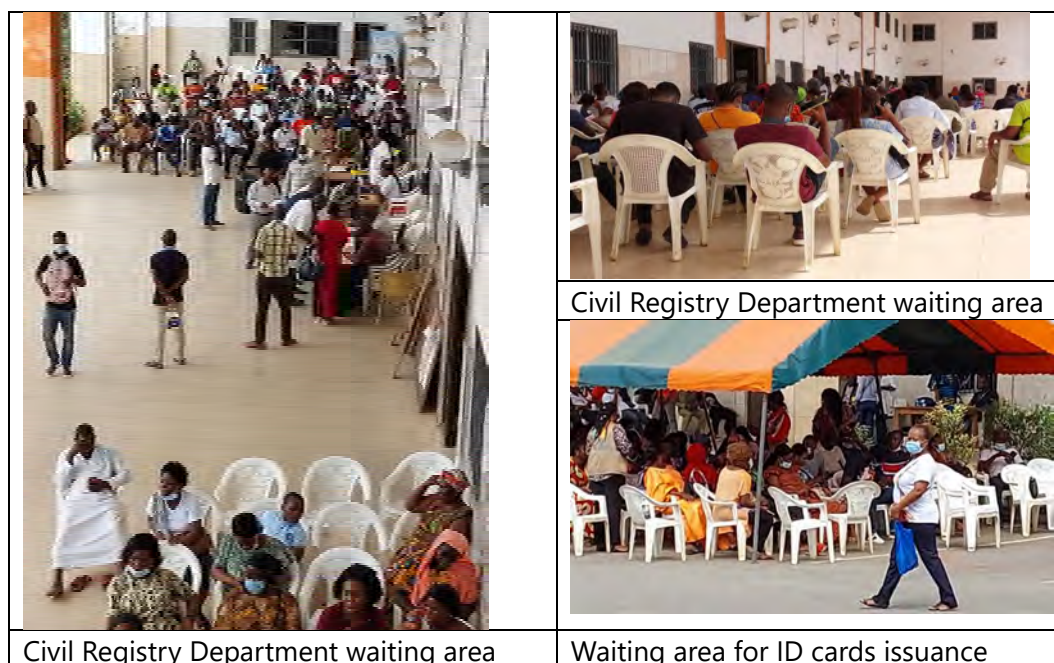
Figure 12.3.3 Congestion in Abobo commune government offices

On the other hand, the survey in Yopougon indicates that applicants may wait several hours, even days, before receiving documents.

Table 12.3.5 Administrative Document Processing Time in Yopougon Commune

Document	When applying over the counter, time required	Online Application
Birth Certificate	1 hour	Operation not yet confirmed / Testing phase in progress
Marriage Registration	1 hour	
Death Certificate	1 hour	
Legalization of Documents	1 hour	
Certificate of Survival (LIFE)	45 minutes to 1 hour	
Authorization	1 hour	
Other Documents	1 hour	

Source: Yopougon Commune



Source: JICA Study Team

Figure 12.3.4 Congestion at Yopougon Commune Town Hall

(d) Citizens' responses to the commune's services

According to the survey, citizens' responses to the commune's services are shown in the table below.

Table 12.3.6 Citizens' Responses to the Services at the communes

Item	Abobo	Yopougon
Most Requested Services	<ul style="list-style-type: none"> • Issuance of birth certificates • Legalization of documents • Marriage Celebrations • Declaration of Birth 	<ul style="list-style-type: none"> • Issuance of birth certificates • Legalization of documents • Marriage Celebrations • Declaration of Birth

Item	Abobo	Yopougon
Difficulties faced by citizens	About 80% of respondents had difficulty accessing services. <ul style="list-style-type: none"> • Promises not kept. • Incomplete documentation • Late arrival of documents • corruption • Unpleasant treatment of citizens 	About 57% of respondents reported no particular difficulties, but the civic associations pointed out the following problems related to public service provision: <ul style="list-style-type: none"> • Issuance of documents takes too long. • Lost documents • Abuse of power and corruption by city officials
Citizens' opinions about the service	Application for renewal of birth certificate copy, legalization of document copy, marriage, declaration of birth, etc., are considered risk for spreading COVID-19 infection.	Application for renewal of birth certificate copy, legalization of document copy, marriage, declaration of birth, etc., are considered risk for spreading COVID-19 infection.

Source: Interview survey (JICA Study Team)

(e) Recommendations of citizens and civic groups for improvement of services

The interview survey shows there is a great need for the development of annex offices and the digitalization of services, as shown in the table below.

Table 12.3.7 Citizens' and civic groups' recommendations for improving government services

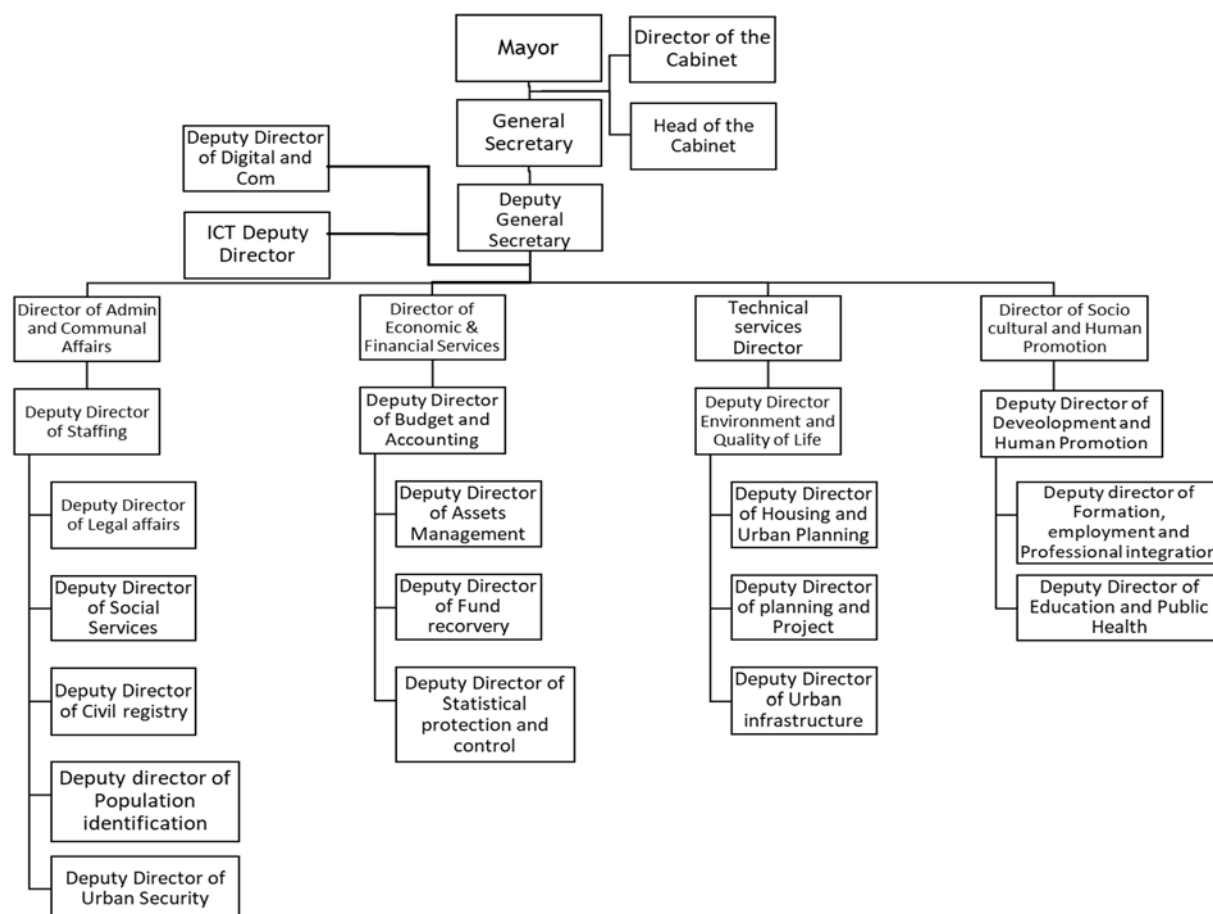
	Abobo	Yopougon
Citizen	<ul style="list-style-type: none"> • Build a commune hall annex office in the neighborhood to avoid long distance travel. • Create online services to avoid travel and congestion • Communicate and inform about online services 	<ul style="list-style-type: none"> • Inform people and make users aware of online services • Online platform operations • Establish a new local annex office • Eliminate favoritism within the town hall
Citizen's Group	<ul style="list-style-type: none"> • Establish online services and announce such services • Involve beneficiaries (residents) in city hall projects • Create local services (construction of annex commune hall) 	<ul style="list-style-type: none"> • Create annex commune halls in several districts of the commune • Promote services through social media • Involve all social strata and promote different services • Build online services and raise awareness of residents about these services

Source: Interview survey (JICA Study team)

(2) **Organizational Chart of the Commune Office**

(a) Abobo

The organization chart of the Abobo commune and the number of its staff are shown in Figure 12.3.5 and Table 12.3.8.



Source: Abobo Commune

Figure 12.3.5 Abobo Commune Organization Chart

Table 12.3.8 Number of people in each department of Abobo commune

Department	Number of staff
General Secretariat	9
Cabinet of the Mayor	12
Human Resources and Legal Affairs Directorate	76
Economic and Financial Directorate	101
Technical Services Directorate	26
Infrastructure Projects Directorate	5

Source: Abobo Commune

Among these departments, the Department of General Affairs (DAGA) is responsible for personnel management and administrative tasks and oversees the activities of the Civil Registration Department, the Identification Cards and Population Management Department, the Police Department, and other departments.

In the IT area, three staff members, of which two have a background in IT, oversee the digital services under the supervision of the ICT Deputy Director. The commune hall system is designed by an outside provider, but it is currently not functioning. There is also no Internet connection at the city hall.

(b) Yopougon

Figure 12.3.6 shows the organizational chart of Yopougon Commune, and Table 12.3.9 and Table 12.3.10 shows the number of staff in each of its departments.

Table 12.3.9 Number of staff in each department of Yopougon commune

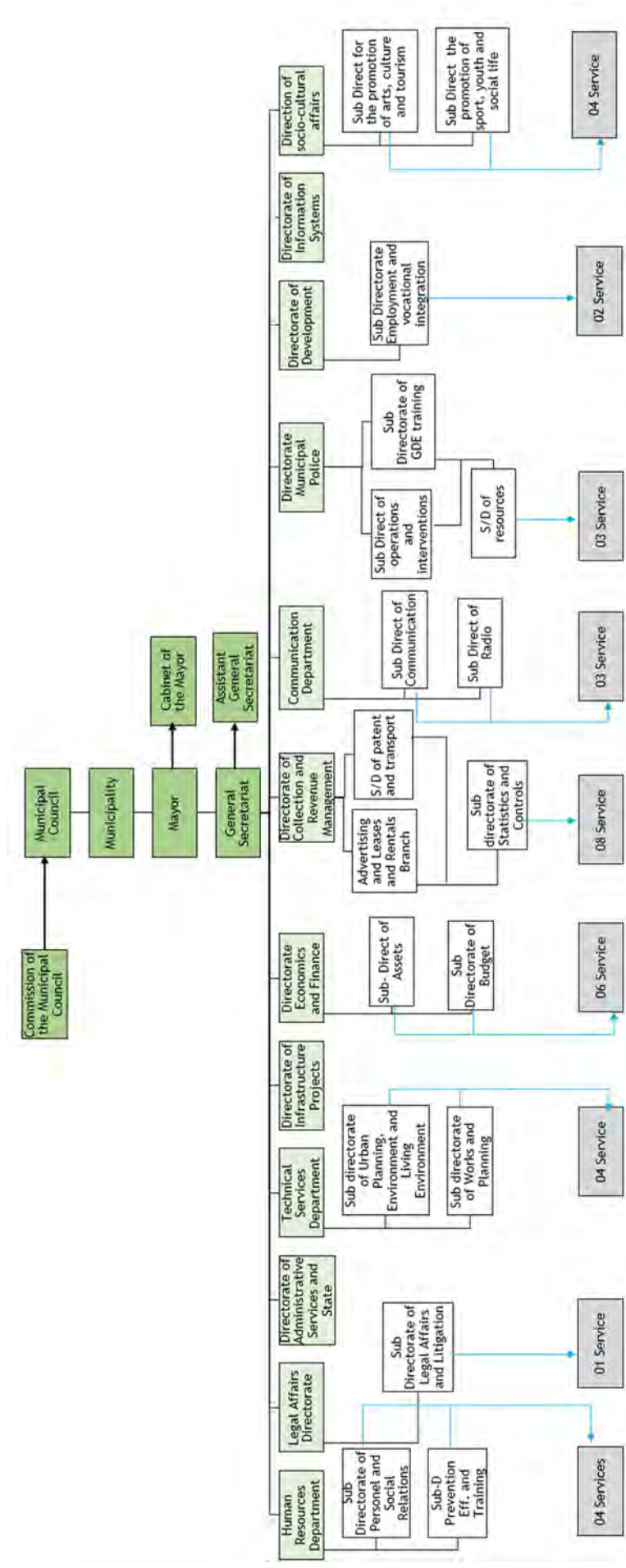
N°	Department	Number of staff
1	General Secretariat	7
2	Cabinet of the Mayor	33
3	Human Resources Directorate	23
4	Administrative Services Directorate; Civil Registry	121
5	Economic and Financial Directorate	18
6	Directorate of Revenue and Taxation	100
7	Communication Directorate	26
8	Legal Affairs Directorate	8
9	Information Systems Directorate	19
10	Human Development Directorate	27
11	Directorate of Socio-cultural Affairs	39
12	Municipal Police Department	302
13	Technical Services Directorate	63
14	Infrastructure Projects Directorate	5
15	Tax Office	8
16	General Directorate of Taxes	19

Source: Yopougon Commune

Table 12.3.10 Staffing of the main office and branch offices of Yopougon Commune

N°	Department	Service	Number of staff
1	Administrative Services Directorate; Civil Registry	Main Townhall of Selmer	65
2		Branch Townhall of Toit Rouge	23
3		Branch Townhall of Texaco	20
4	Technical service Directorate (Branch of SIDECI)	Secretariat and mail services	6
5		Sub-Directorate for Urban Planning, Construction and Housing	12
6		Sub-directorate Environment and Living Conditions	22
7		Sub-directorate for works and planning	19

Source: Yopougon Commune

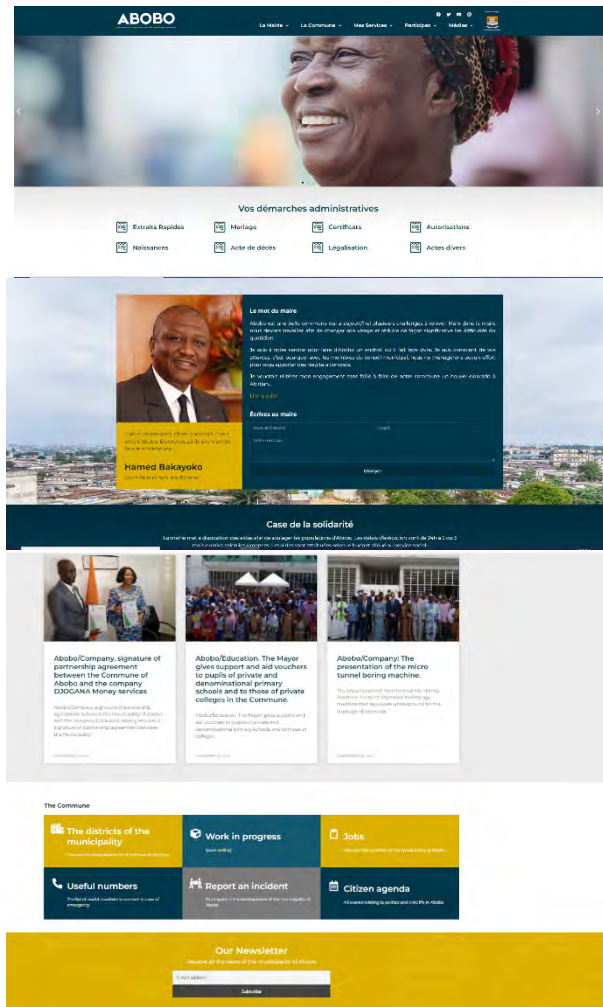


Source: Yopougon Commune
Figure 12.3.6 Yopougon Commune Organization Chart

(3) Status of Abobo and Yopougon's web and on-line systems

(a) Abobo

Abobo does not handle online administrative services but operates a website at <https://mairie-abobo.ci/> to disseminate information.



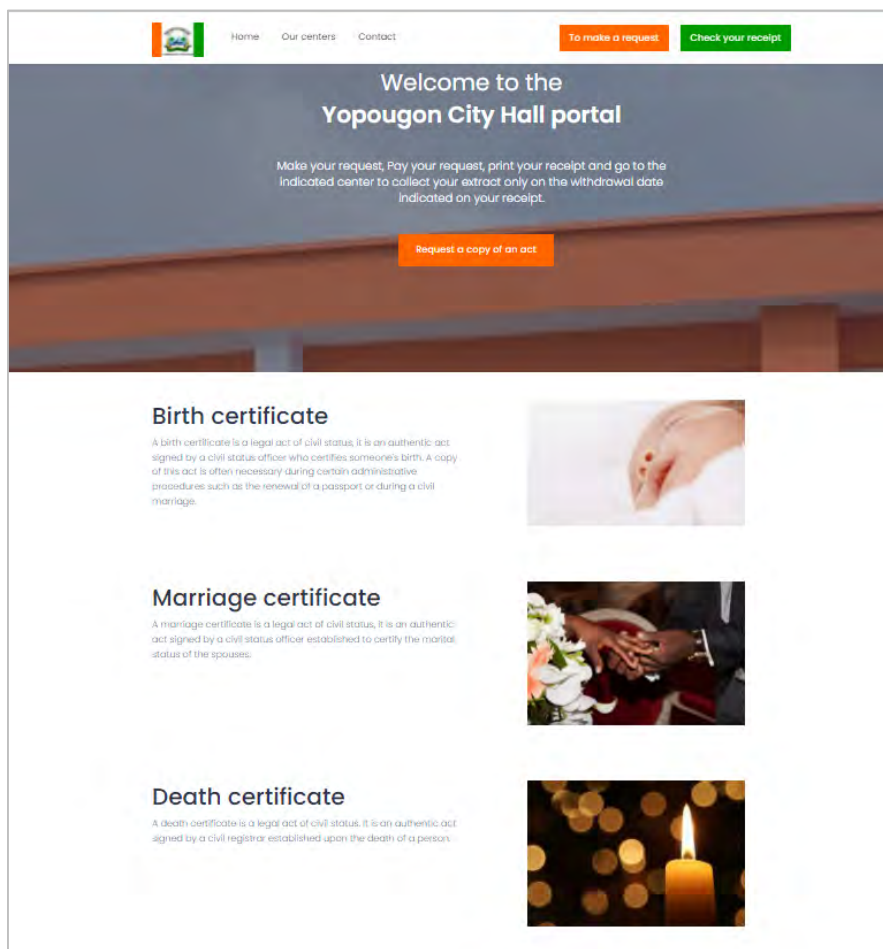
Source: <https://mairie-abobo.ci/>

Figure 12.3.7 Abobo commune home page

(b) Status of administrative services through Yopougon's online system

On the website of Yopougon Commune (www.yopougon.ci), an online service for birth, marriage, and death civil registration is under the testing phase. Documents can be picked up at the commune office 24 hours after applying online with the necessary information and payment by e-money. The online service is part of the e-communes being developed in collaboration with the RIMCI. The Commune of Yopougon is a front-runner commune in its efforts to promote IT and online services.

In addition, two annex offices, Annex of TOIT-ROUGE and Annex of NIANGON-TEXACO, which handle civil registry operations, are linked to the server in the main commune hall via a network.



Source: www.yopougon.ci

Figure 12.3.8 Yopougon Commune's trial online application

Online system development

Yopougon Commune is developing an online system by outsourcing to the RIMCI. The plan is to have an online process for the following documents:

- Civil registry and population documents
- Birth
- Marriage
- Death
- Legalization
- Certification
- Life certificate and care⁴
- Issuing of proxies⁵
- Booking of wedding dates

⁴The certificate of care proves that a person is responsible for the child or children whose names appears on the documents the person has submitted.

⁵ Proxy is a written authorization that gives power of attorney to a person who act on another's behalf in private affairs, business, or some other legal matter.

- Appointment booking
- Follow-up of letters
- Platform of discussion between elected representatives and populations

(4) Assessing the status of construction plans for the annex commune halls in Abobo and Yopougon

(a) Abobo

In Abobo, currently, the construction of five city hall branches (annexes) are planned. Out of them, one has been at the completion phase, one in the process of contractor procurement, and three have not yet started. These annex halls will handle civil registration.

Table 12.3.11 Status of the planned construction of a city hall branch office in Abobo.

Location	Anticipated services	Situation
Abobo Baloulé	Citizens Registration Bureau	(Work) Not yet started
N'Dotré	Citizens Registration Bureau	Contractor Procurement
Akeikoi	Citizens Registration Bureau	(Work) Not yet started
Sagbé.	Citizens Registration Bureau	Stage of construction completion
Anonkoi Kouté	Citizens Registration Bureau	(Work) Not yet started

Source: Technical department, city councilors, Abobo Commune



Note: Community Facility Plan for Development Unit 3 of SDUGA
 Town Hall (Mayor and technical services)
 2014 Population = 1,195,462 (Abobo at 1,030,658 and Anyama 148,962)
 2030 Population = 1,394,061 (an increase of 17% at 198,599)
 Town halls proposed: 56 (140.08 ha; 2.5 ha/location)
 Source: Abobo Commune

Figure 12.3.9 Location map of city hall and annex commune halls in Abobo

(b) Yopougou

In addition to the main commune hall, Yopougou has three annex halls. Another annex hall is planned to be built.

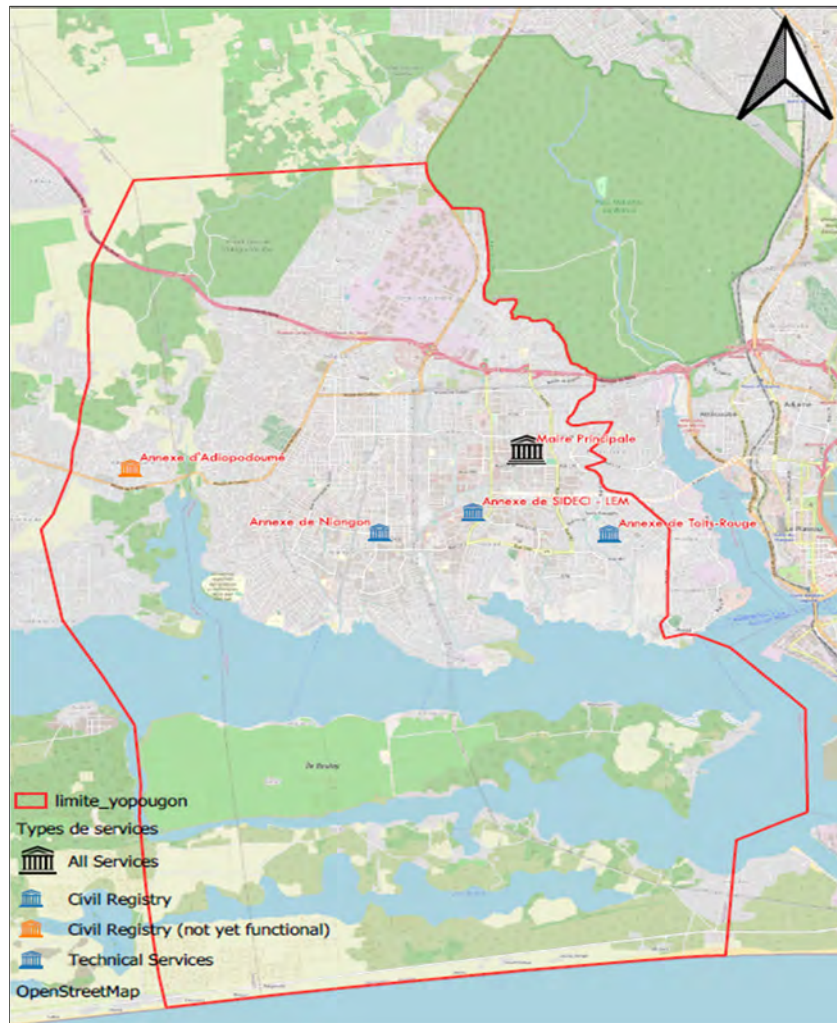
Table 12.3.12 Status of the planned construction of a city hall branch (annex) in Yopougou

Location	Anticipated services	Situation
Main Town Hal (Main Town Hall)	All Services	Operation (of machine)
Annex of TOIT-ROUGE	Citizen Registration	Operation (of machine)
Annex of NIANGON-TEXACO	Citizen Registration	Operation (of machine)
Annex of Sideci	Technical Service	Operation (of machine)
Annex of Adiapodoume	Citizen Registration	Non-functional

Source: Yopugon Commune

The following civil registration documents are handled by these offices

- civil registry and population documents,
- birth,
- marriage,
- death,
- legalization,
- certification, and
- life certificate and care.



Reference: Community Facility Plan for Development Unit 5 of SDUGA

Town Hall (Mayor, Technical service)

2014 Population = 1,127,581 (Songon at 56,038 and Yopougon at 1,071,543)

2030 Population = 2,300,777 (104% increase of 1,173,196)

Town halls proposed: 58 (24.95 ha; 0.43 ha/location)

Branch office maintenance standard: According to Yopougon officials, the standard maintenance standard for a branch office is one per 5 km radius with a population of 10,000

Source: Yopougon Commune

Figure 12.3.10 Map of the development and location of the city hall and annex commune halls in Yopougon

It would be beneficial that these branches handling civil registry be linked to the main office building, so online services can be provided smoothly.

3) **Draft activity plan for the project "Improvement of Public Services through Digitalization"**

Based on the above, the following seven components are proposed activities under the project of improving public services through digitization.

- (1) Review of the status of modernization and digitalization of administrative services in Côte d'Ivoire.
- (2) Promotion of digitalization related to providing public administrative services in Abobo and Yopougon Communes.

- (3) Pilot project for online public administrative services in Abobo and Yopougon Communes.
- (4) Strengthening of capacity of organizations and staff related to online public administrative services in Abobo and Yopougon Communes.
- (5) Public relations and awareness-raising activities for citizens to use the online public administrative services in Abobo and Yopougon Communes.
- (6) Recommendations to disseminate and promote the digitalization of public administrative services to other municipalities.

These draft activity plans for the components are shown in Table 12.3.13..

Table 12.3.13 Schedule of activities for the project to improve public administrative services through digitization (Proposal)

	Activities	1st year	2nd year	Third year
1	Review of the status of modernization and digitization of administrative services in Côte d'Ivoire	■■■■■		
1-1	Review of Côte d'Ivoire's plans and visions for improving administrative services, and related legal systems and related organizations	■■■■■		
1-2	Review of public administrative service items of communes in the Côte d'Ivoire	■■■■■		
2	Promotion of digitization related to the provision of public administration services in Abobo and Yopougon Communes	■■■■■		
2-1	Identification of current status and issues of administrative document-related work for citizens in Abobo and Yopougon Communes	■■■■■		
2-2	Formulation of public administrative improvement plans and improvement procedure manuals in Abobo and Yopougon Communes	■■■■■		
2-3	Consideration of the scope of online services for improvement of public administrative services for citizens in Abobo and Yopougon Communes and formulation of plan of online services	■■■■■		
3	Pilot project for online public administrative services in Abobo and Yopougon Communes	■■■■■	■■■■■	■■■■■
3-1	Consideration of necessary materials, equipment and software for planning online public administrative services including annex offices in Abobo and Yopougon Communes	■■■■■		
3-2	Determination of scope of pilot projects in Abobo and Yopougon Communes		■■■■■	
3-3	Formulation of equipment and software introduction plans for pilot projects, and installation of equipment and software		■■■■■	
3-4	Implementation of pilot projects for the online system			■■■■■
3-5	Public relations and promotion activities for citizens to use the online systems in pilot projects			■■■■■
3-6	Completion of issues and lessons learned in planning and implementing the pilot projects			■■■■■
4	Strengthening of capacity of organizations and staff related to online public administrative services in Abobo and Yopougon Communes	■■■■■		
4-1	Capacity assessment of organizations and staff of online public administrative services in Abobo and Yopougon Communes	■■■■■		
4-2	Formulation of training programs for capacity building	■■■■■		
4-3	Preparation of training guidelines and manuals	■■■■■		
4-4	Implementation of training		■■■■■	
4-5	Implementation of pilot projects in Abobo and Yopougon Communes			■■■■■
5	Public relations and awareness raising activities to promote citizens to use the online public administrative services in Abobo and Yopougon Communes	■■■■■	■■■■■	■■■■■
5-1	Identification of the current status and issues of IT literacy of citizens regarding the online services	■■■■■		
5-2	Formulation of plans of public relations and awareness raising activities for promotion of the online service usage	■■■■■		
5-3	Implementation of public relations and awareness raising activities		■■■■■	■■■■■
6	Recommendations to disseminate and promote digitalization of the public administrative services to other communes			■■■■■
6-1	Compilation of issues and lessons learned about digitalization of public administrative services in Abobo and Yopougon Communes			■■■■■
6-2	Proposal of dissemination measures to other commune and roles and responsibility of related promoting organizations			■■■■■

Source: JICA Study Team

12.3.2 The Project for Improvement of Water Supply, Sanitation and Hygiene (WASH) in Primary Schools

1) Overview of the Project for Improvement of WASH in Primary Schools

Based on the information collected in the field and discussions with relevant agencies, the Project for Improvement of WASH in Primary Schools is summarized in Table 12.3.14.

Table 12.3.14 Proposed Elementary School Water Sanitation Improvement Project

<p>(1) Background</p> <p>The closure of schools during an infectious disease outbreak poses a major risk to the education and well-being of children, while the suspension of educational services has a profound impact on civic and economic activities. In Greater Abidjan, piecemeal project-based activities have so far been implemented as government/development partner-led activities and contracted to NGOs, with very limited involvement of local governments (communes), who are responsible for identifying local educational needs and developing and implementing plans to improve school WASH based on actual conditions. In order to develop and manage basic WASH infrastructures, such as water supply, latrines, and hand washing facilities in public primary schools, and to systematically implement hygiene education in these improved environments, there is an urgent need to improve school WASH and strengthen emergency response capacity in the event of an outbreak of infection by improving the capacity of communes for school WASH and by clearly sharing roles with school WASH actors such as central and decentralized administrations, donors, NGOs, and communities.</p>
<p>(2) Purpose</p> <p>Capacity for the development, dissemination, and management of WASH facilities and hygiene education in public elementary schools in Abobo and Yopougon Communes will be improved, and appropriate facility development and management, hygiene education and hygiene monitoring, and emergency response systems will be initiated in collaboration with the central and decentralized administration, NGOs, and communities.</p>
<p>(3) Components</p> <ol style="list-style-type: none"> 1. An inventory survey of WASH facilities and hygiene behavior in public primary schools in Abobo and Yopougon Communes will be conducted, and a ledger will be established. 2. The roles and responsibilities among actors for improving WASH in public primary schools in Abobo and Yopougon Communes will be clarified, and a school WASH improvement plan and a business continuity plan (BCP) in case of an outbreak will be developed. 3. Personnel in charge of information technology for the survey (monitoring) and planning who shall support school WASH facilities and hygiene actions in public primary schools in Abobo and Yopougon Communes will be appointed, and IT human resources will be trained. 4. Methodologies and a plan for WASH facility maintenance and WASH improvement activities

for Public School Management Committee (COGES⁶) will be developed.

5. Through the implementation of the pilot projects (facility development + equipment procurement + maintenance + hygiene education), the methodology and implementation structure of the school WASH projects will be developed, and the capacity of communes, COGES, and related actors will be enhanced.

(4) Major related organizations

Major Institutions: Abobo Commune, Yopougon Commune

Related organizations: Ministry of Interior and Security (MIS), Ministry of National Education and Literacy (MENA), MH, Ministry of Sanitation and Salubrity (MINASS), Ministry of Health, Public Hygiene and Universal Health Coverage, Abidjan Autonomous District, NGOs, community organizations for maintenance of each facility (COGES, etc.).

Source: JICA Study Team

The reasons for the selection of the Project for Improvement of WASH in primary schools are as follows:

- An improved WASH is critical to improving urban resilience against the spread of infectious diseases.
- In Abidjan, master plans for the development of facilities in the major sectors of WASH—water supply, sewage treatment, and waste management—have been developed or are being developed. These master plans will be integrated into urban planning under JICA's ongoing project, the Project for the Operationalization of Urban Master Plan in Greater Abidjan (hereinafter referred to as "SDUGA2").
- This study will consider a cooperation proposal that focuses on improving WASH in primary schools rather than improving WASH in the city. The following issues are identified regarding WASH in primary schools:
 - The closure of schools during the spread of infectious diseases causes problems such as loss of educational opportunities for students and impacts on economic activities. It is necessary to improve WASH facilities in schools and instill hygiene behavior in school personnel as well as students when using these facilities to mitigate problems.⁷
 - Public primary schools with many students will be selected for cooperation. In addition, the Abobo Commune and Yopougon Commune, where the community mobilization training for infrastructure development and maintenance was conducted under the JICA COSAY project, will be the target.

⁶ COGES is a committee of students, parents, and teachers for the management and operation of school facilities, whose legal basis is provided in Presidential Decree No. 2012-488, dated June 7, 2012, and its revised Decree No. 2020-997, dated December 30, 2020. The DAPS COGES (Department of Education's Office of COGES Awareness, Promotion, and Surveillance) is responsible for COGES supervision, training, etc.

⁷ The JMP School WASH Progress Report (2020) warns of the unprecedented risks to children's education and well-being posed by COVID-19 and points out the importance of regular hand washing, thorough daily disinfection and surface cleaning, provision of basic water, sanitation, and waste management facilities, and appropriate environmental cleanup and decontamination.

- In Abidjan, most primary schools are equipped with water sanitation facilities (drinking water, latrines, and hand washing facilities), but many are inoperable.⁸ While the acquisition of appropriate hygiene behaviors requires proper placement and continuous maintenance of facilities, the current maintenance system presents challenges.
- The MENA is responsible for supervising and directing the educational activities, school facilities, and the educational environment in primary schools throughout the country. However, the competence for the development of school facilities was transferred to local governments (communes and regional councils) by the 2003 law on the transfer of authority to local governments.⁹ Consequently, communes in Abidjan are now the main actors in the construction and renovation of primary schools.
- Furthermore, the chairperson of the COGES General Assembly, the mayors of the communes responsible for the maintenance of school facilities, and with the revision of the 2020 COGES Decree, the responsibility for funding COGES' activities was also placed on the communes.
- To date, however, activities to improve primary school WASH have been very limited by communes, although project-based implementation by MENA, supported mainly by donors such as UNICEF and USAID, and individual activities by NGOs have been conducted.
- In addressing these issues, this study proposes a project to improve WASH in primary schools, which aims to establish a system of technical assistance to communes from government agencies related to primary school WASH (MENA, MH, MINASS, Ministry of Health, Public Hygiene and Universal Health Coverage, etc.) and strengthen the communes' capacity to implement activities for WASH improvement.
- The General Directorate of Decentralization and Local Development (DGDDL) of the MIS, which oversees all local governments (communes and regional councils) nationwide and is responsible for supervising, guiding, and allocating budgets for municipal activities, will be the agency responsible for the project. As the responsible agency for the project, DGDDL is expected to coordinate with the MENA and other technical ministries, allocate budgets and institutional support to the communes, and promote the accumulation and dissemination of project results to other communes in Abidjan.

The following is a summary of the current state of WASH in primary schools in Abidjan, as well as the results of the project activities to improve WASH in primary schools.

2) Efforts to improve WASH throughout Abidjan

As noted in 4.2 Orientation of Urban Development Required in the With-Corona and Post-

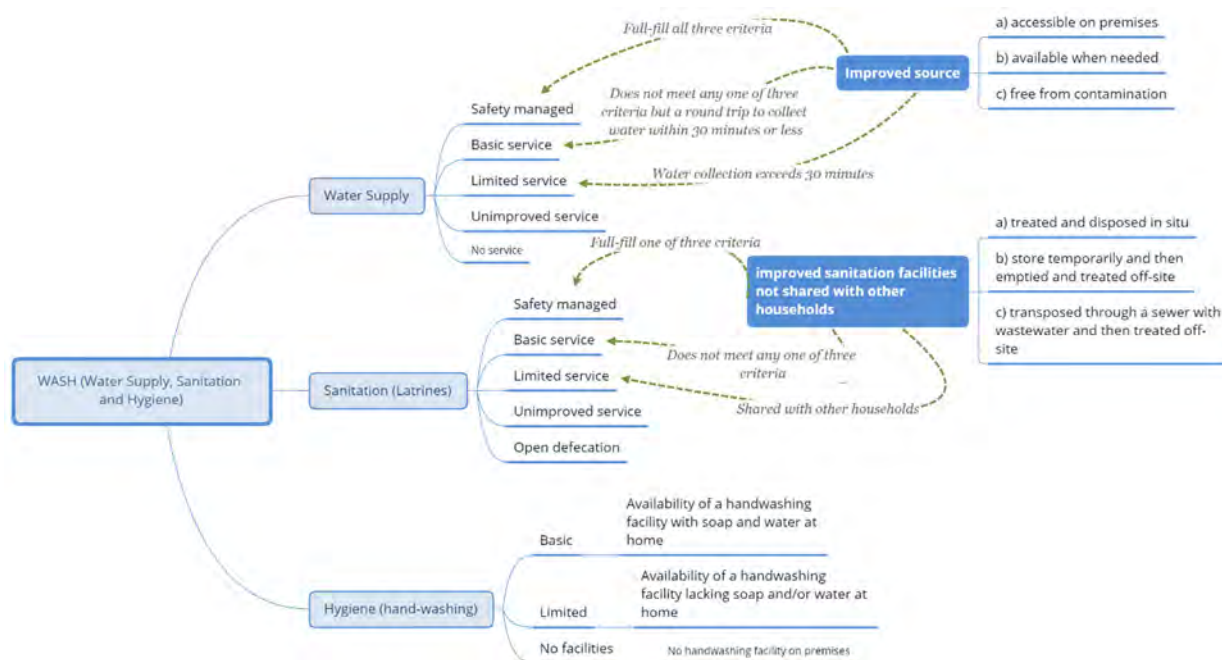
⁸ According to the 2019 Ministry of Education School Statistics, in 1,090 public elementary school in Abidjan, 18% of water supply facilities, 21% of school toilets, and 53% of school hand washing facilities are all inoperable.

⁹ Law No. 2003-208 of 7 July 2003 on the Transfer of Competence from the State to Local Governments.

Corona, continued improvement of WASH is critical for the resumption of urban activities and improvement of urban resilience to the spread of infectious diseases, in the short-, medium-, and long-term.

Improving water sanitation has been a key urban issue even before the COVID-19 outbreak. Therefore, the Government of Côte d'Ivoire is taking steps to achieve SDG targets 6.1¹⁰ and 6.2.¹¹

The WHO/UNICEF Joint Monitoring Programme (JMP) has established the service ladder, as shown in Table 12.3.11, to monitor the coverage of water supply, sanitation (toilets), and hand washing facilities at each service level in countries around the world.



Source: JMP Water Sanitation Household Progress 2000-2020, prepared by the study team.

Figure 12.3.11 JMP's Service Ladder for the WASH Sector

In its National Development Plan 2021–2025 (NDP 2021–2025), the Government of Côte d'Ivoire has set the following to achieve SDG targets 6.1 and 6.2:

- decrease open defecation in urban areas from 8.1% in 2016 to 4%,
- decrease the percentage of open defecation in urban areas from 8.1% in 2016 to 4%,
- increase the percentage of access to improved sanitation facilities (individual toilets, soapy hand washing facilities) from 78% in 2019 to 83% by 2025, and
- increase the percentage of access to potable water in urban areas from 84% in 2020 to 96% by 2025.

In Côte d'Ivoire, the WASH sector spans four sectors, each under the jurisdiction of a ministry

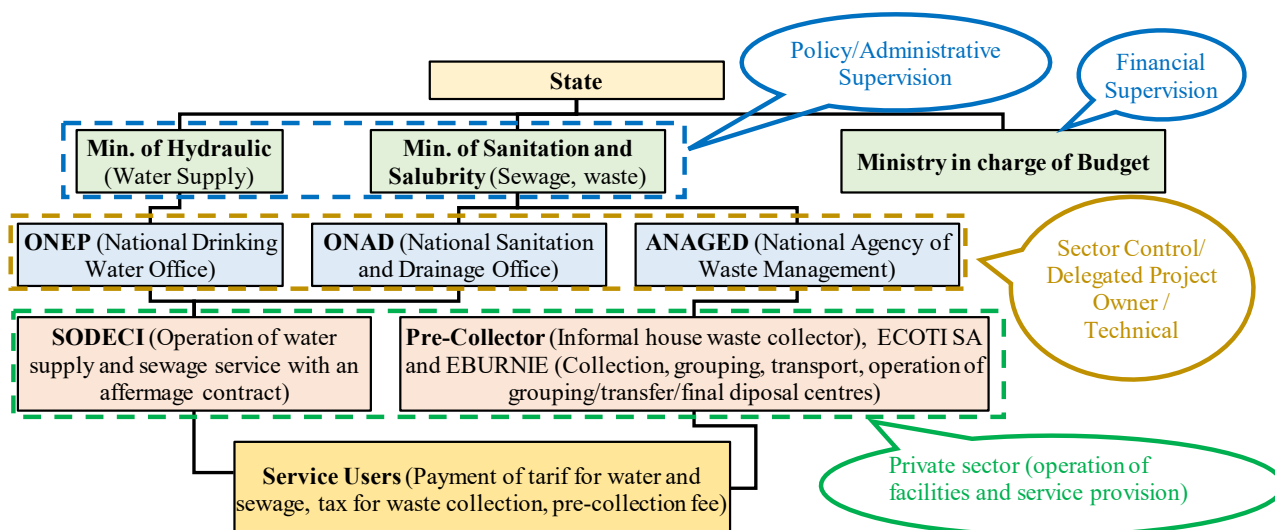
¹⁰ SDG Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all people (Indicator 6.1.1: Percentage of population using safely managed drinking water services)

¹¹ SDG Target 6.2: By 2030, achieve adequate and equitable access to sanitation and hygiene facilities for all people and eliminate open defecation. Pay particular attention to the needs of women and girls and vulnerable populations (Indicator 6.2.1: a) Percentage of population using safely managed sanitation services; b) Percentage of population using hand washing facilities with soap and water)

responsible for it:¹²

- Water supply: MH
- Sanitation (sewage treatment): MINASS
- Solid waste management: same as above
- Public health (sanitation action): Ministry of Health, Public Hygiene and Universal Health Coverage

In Abidjan, WASH services (water supply, wastewater treatment, and waste management) are operated under the jurisdiction of the MH and MINASS, based on contractual relationships between the implementing agencies—public companies and independent administrative agencies under the ministry, service providers, and consumers. The Ministry of Health and Public Hygiene is responsible for the implementation and supervision of the government's health and public health policies and understanding the public health environment and implementing and guiding improvement measures.¹³



Source: Study Report on the Formulation of a Detailed Plan for the Project for the Operationalization of Urban Master Plan in Greater Abidjan, Côte d'Ivoire.

Figure 12.3.12 Relevant institutions for WASH services

¹² As a result of the reorganization of the ministries in April 2022, the Ministry of Hydraulics and Sanitation was merged and renamed the Ministry of Hydraulics, Sanitation and Salubrity. However, this section describes the situation before this integration.

¹³ In the NDP 2021–2025, hygiene education for the population to prevent infectious diseases, etc., is positioned as an activity of Health Sector Effect 2: “The population, especially vulnerable groups, use quality health facilities and learn hygiene behaviors to prevent from diseases.”

As shown in Table 12.3.15, the master plans for the infrastructures development for each sector of WASH have been developed or are being developed in Abidjan.

Table 12.3.15 Master Plan for Water Supply, Sanitation, and Waste Management in Abidjan

	Water Supply	Sanitation	Waste Management
Document Name/Creator	Emergency Program for Enhancement of Water Supply in Abidjan Town (Desserte en Eau Potable de la Ville d'Abidjan) (Prepared by SAFEGE and ordered by ONEP)	Abidjan Sanitation and Drainage Master Plan (SDAD: Schéma Directeur d'Assainissement et de Drainage du District d'Abidjan) (prepared by MERLIN and ordered by the Ministry of Construction, Housing, Sanitation and Urbanization)	Master Plan under development as of 2020 under the PADSAD (Program for the Improvement of Sanitation and Drainage Conditions) with the support of the IDB. - Ordered by National Sanitation and Drainage Office - Prepared by SETEC and TERRABO
fiscal year	Created 2014	Revised 2019	Scheduled to be created in 2021
Plan Year	2030	2030 and 2060	2030
Target Area	Abidjan Autonomous District 13 Commune	13 communes in the Abidjan Autonomous District + Grand Bassam Commune	Abidjan Autonomous District 13 Commune
Target Population	7.77 million	8.06 million	Unknown
Service Quantity	Maximum daily demand 1.28 million m ³ /day	Planned daily sewage volume: approx. 1.00 million m ³ /day	Unknown
Target coverage rate	94%.	60%	Unknown

Source: Study Report on the Formulation of a Detailed Plan for the Project for the Operationalization of Urban Master Plan in Greater Abidjan, Côte d'Ivoire.

JICA is currently implementing the Project for the Operationalization of Urban Master Plan in Greater Abidjan, which plans to integrate the WASH sector into the master plan for facility development, as shown in the table above. The Study Team believes that a more effective WASH facility development will be promoted through this process. Therefore, the improvement of WASH in Abidjan as a whole is not the subject of project formation in this study.

3) WASH in Public Primary Schools in Abidjan: Current Status and Challenges

(1) Importance of school WASH as a COVID-19 measure

The School Water Sanitation Progress Report (2020) of JMP points out the negative impacts of the spread of COVID-19 in schools and the importance of improving school WASH.

- The pandemic highlights the need to accelerate the school WASH improvement.
- Closure of schools worldwide in response to the COVID-19 pandemic poses unprecedented risks to children's education and well-being. Prolonged closures will negatively impact learning outcomes and disrupt school services essential for the nutrition, health, well-being, and protection of vulnerable children.
- The WHO/UNICEF Guidelines for the Prevention and Control of COVID-19 Transmission in Schools describe a series of measures that should be implemented to ensure that schools can safely reopen and resume activities. It also emphasizes the important role of WASH in reducing communicable diseases and recommends that all schools practice regular hand washing, ensure daily disinfection and surface cleaning, provide basic water, sanitation, and waste management facilities, and follow appropriate environmental cleanup and decontamination procedures.
- However, at the start of the pandemic, half of all schools lacked basic water and sanitation facilities, and three-quarters lacked basic handwashing facilities in 60 countries¹⁴ considered at risk for COVID-19-related health and humanitarian crises. Therefore, accelerating progress in countries with the lowest coverage of toilet services in schools is critical for increasing school safety during and after the COVID-19 epidemic.

(2) Current state of sanitation facilities in elementary schools nationwide

Most public primary schools lack basic facility infrastructures, such as electricity, water supply facilities, toilets, and canteens, and the situation is deteriorating. According to the Ministry of National Education/Vocational Training (MENA) and Ministry of Higher Education and Scientific Research (MESRS) Education/Training Sector Planning Report (2016–2025), the sanitation conditions in public elementary schools in 2016 were as follows:

- Water supply facilities - 39% (61% urban, 27% rural)
- Cafeterias - 35% (32% urban, 37% rural)
- Toilet in operation - 22%
- Usable and operating hand washing facilities - 37%

With the support of UNICEF, the National Standards for School Water and Sanitation Facilities and Guidelines for School Water and Sanitation Facility Maintenance Mechanisms have also been developed.

- Conduct a survey on the current state of the school WASH and prepare report (2020)
- Develop national standards for the construction of school WASH facilities (to be developed in 2020, approval process underway)
- Develop guidelines for maintenance mechanisms for school WASH facilities (to be developed in 2020, approval process underway)

The guidelines aim to improve school WASH at the national level by strengthening the

¹⁴ According to the COVID-19 Risk Index (available at <https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Covid-19>), "high" or "very high" risk countries where health and humanitarian impacts exceed national response capacity and require humanitarian assistance or "very high" risk countries where health and humanitarian impacts exceed the country's ability to respond and require humanitarian assistance. Côte d'Ivoire is rated as a "high" risk, with a risk ranking of 38th. Source: School Water and Sanitation Progress Report (COVID-19 Close-up), JMP, 2020.

institutional framework, clarifying the division of roles among school water sanitation actors (e.g., Ministry of Education) and its decentralized administrative units (e.g., the Regional Directorate of National Education and Literacy [DRENA], the Inspectorate of Education and Physical Education [IEPP], as well as the COGES, NGOs, etc.), and by strengthening the institutional framework for school water sanitation improvement. The goal is to achieve effective school WASH improvement through a collective impact.

(3) WASH Facilities in Public Primary Schools in Abidjan: Development Status and Challenges on Maintenance

(a) WASH facilities in public primary school in Abidjan

The MENA conducts an annual statistical survey of schools nationwide and publishes the results in a report and on the web. It covers a wide range of items, including information on teachers, number of students, educational content, school environment, and ancillary facilities, including school buildings and WASH facilities. The collected statistical data are compiled and stored in a database (SIGE: Education Management and Information System) by the Directorate of Statistics and Strategic Planning (DSPA) of the Ministry of Education.

The SIGE contains information on each school's water supply, toilet, and hand-washing facilities, including the number of facilities and their operating status.

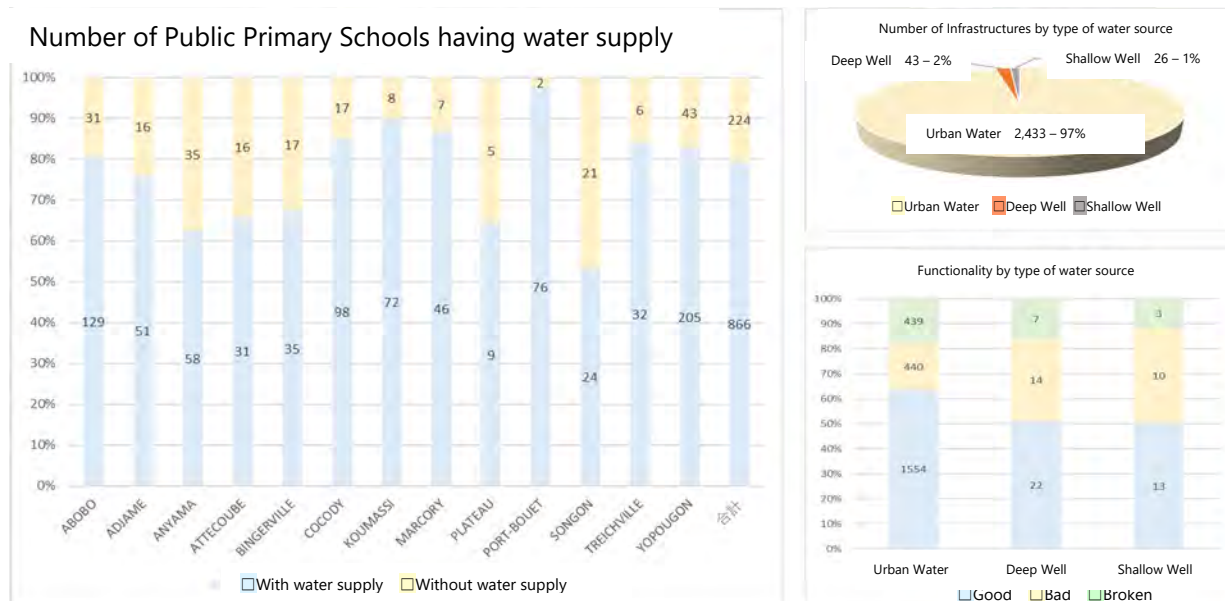
The following is a summary of the availability of water supply, toilet, and hand washing facilities in public primary schools in Abidjan, compiled from SIGE data for the school year 2019.

i) Water supply facilities

Water supply is not yet available in 224 out of 1,090 public elementary schools in Abidjan, or 21% of all schools in the entire Abidjan Autonomous Region. By type of water source, 97% is supplied by urban water. The operation status of facilities shows that 18% of urban water supplies, 16% of deep wells, and 12% of shallow wells are out of service.

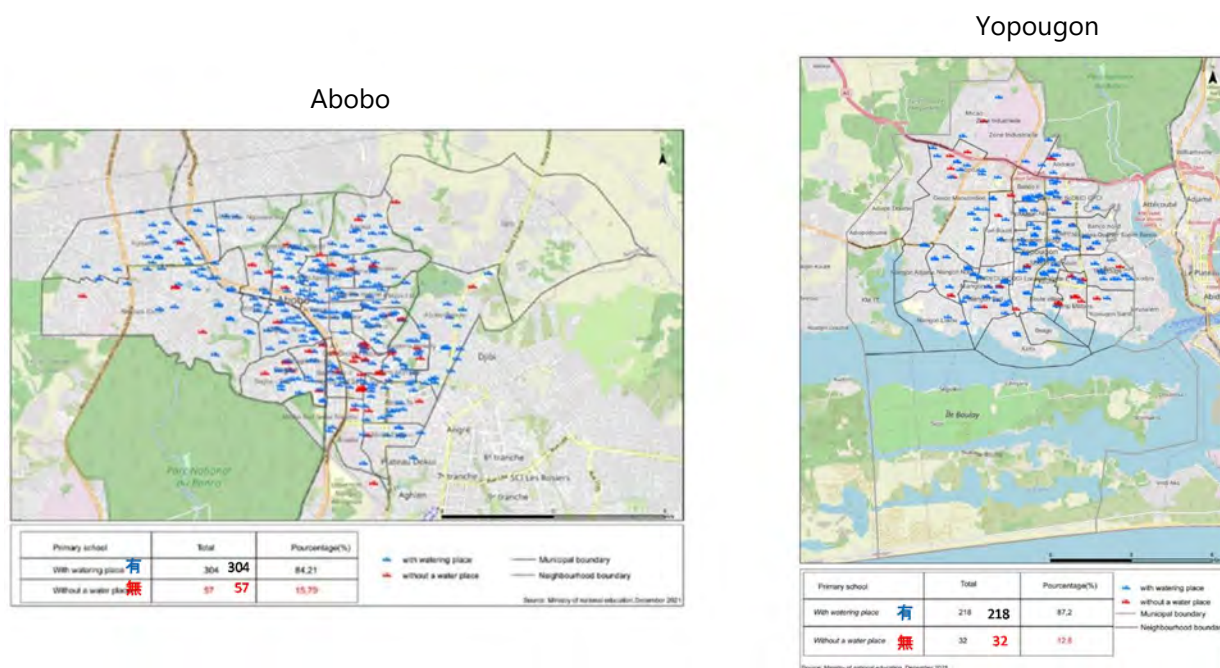


Figure 12.3.13 Cover of Pocket Book of School Statistics (Ministry of Education, 2021)



Source: SIGE (School Statistics Database) 2019

Figure 12.3.14 WASH Facilities in Public Primary Schools in Abidjan - Water Supply Facilities

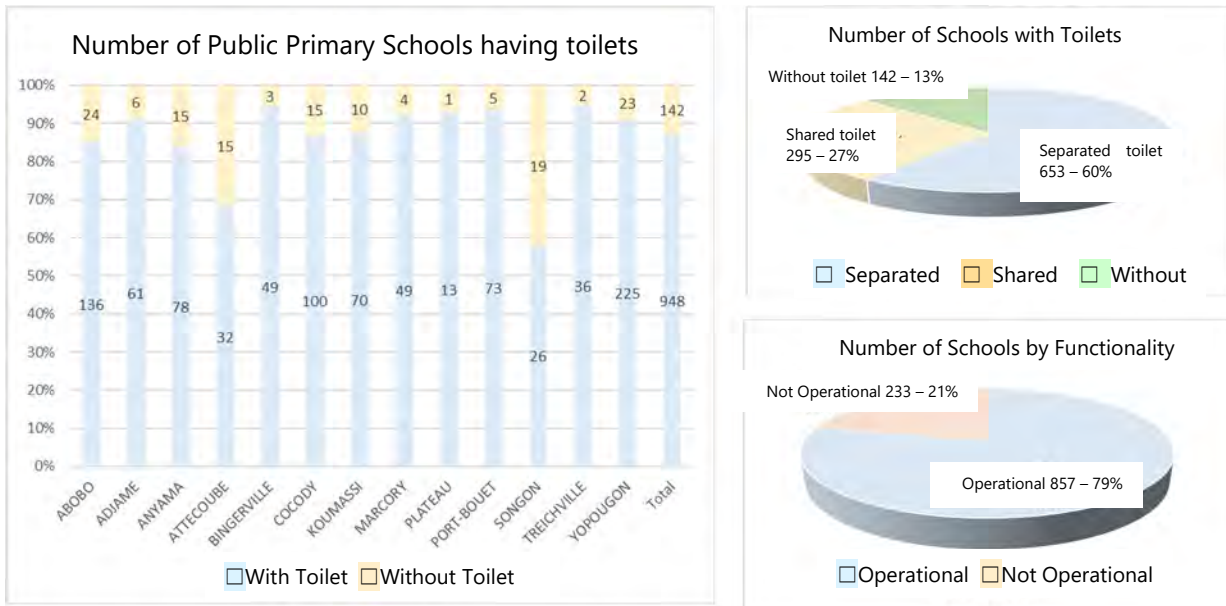


Source: MENA School Location Database

Figure 12.3.15 Availability of water supply facilities in public and private primary school in Abidjan

ii) Toilet

Out of 1,090 public primary schools in Abidjan, 142 are not yet equipped with toilet facilities, or 13% of all schools in the entire Abidjan Autonomous District. In addition, toilets are not operational in 21% of the schools.

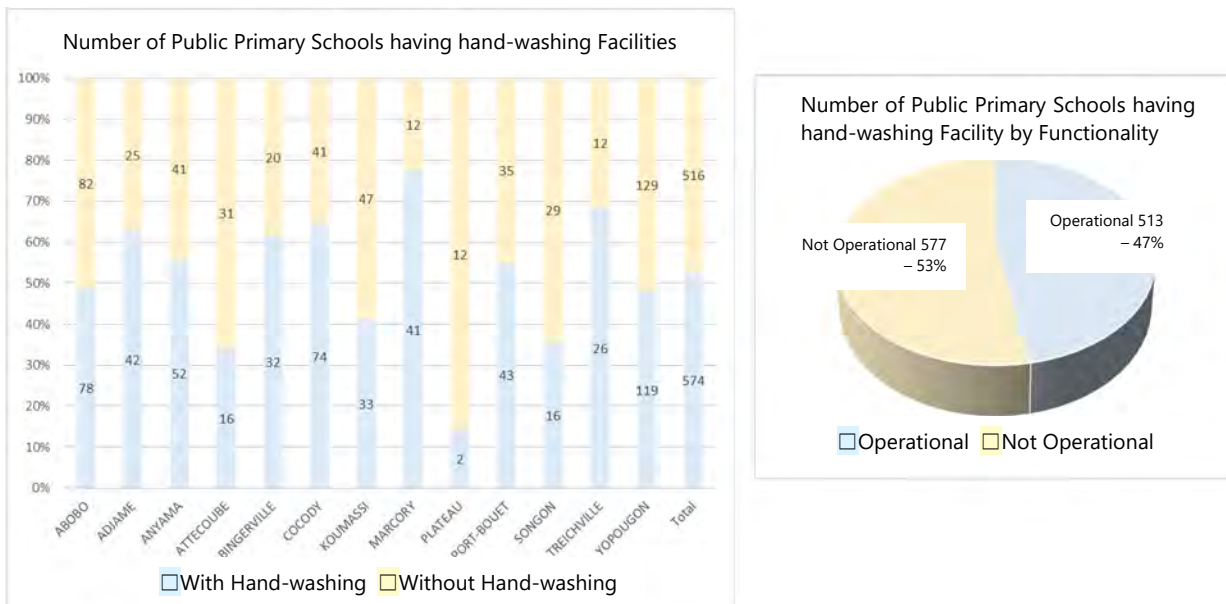


Source: SIGE (School Statistics Database) 2019

Figure 12.3.16 Water and Sanitation Facilities in Public Elementary Schools in Abidjan - Toilet Facilities

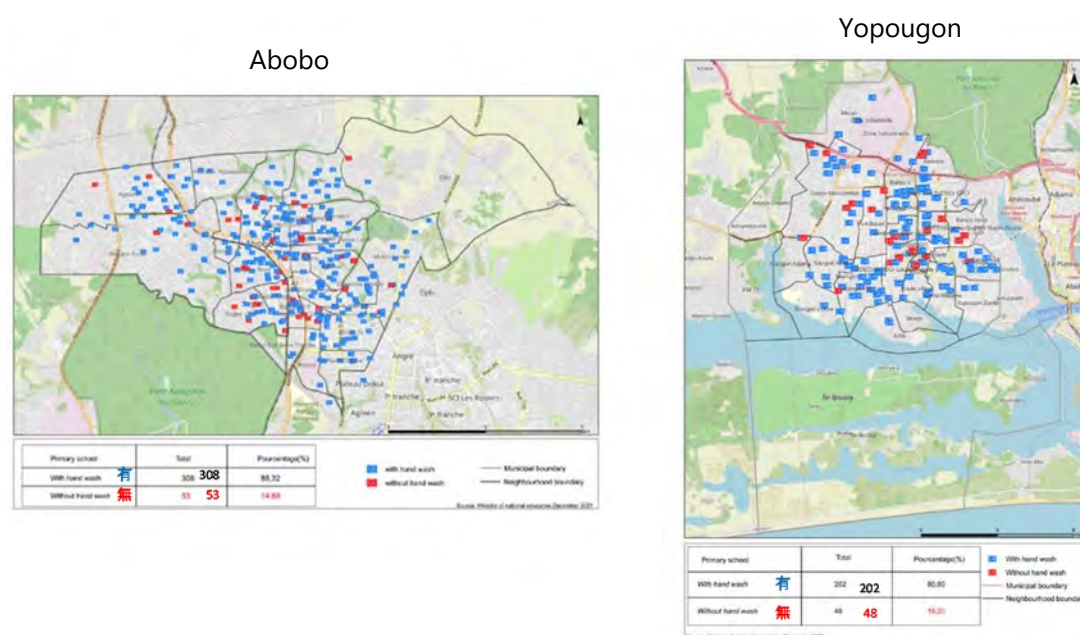
iii) Hand washing facilities

The status of hand-washing facilities in Abidjan's public primary schools is underutilized in 47% of the 516 schools out of 1,090 schools in the entire Abidjan Autonomous District. In terms of availability, a total of 53% are non-operational.



Source: SIGE (School Statistics Database) 2019

Figure 12.3.17 Water and Sanitation Facilities in Public Primary Schools in Abidjan - Hand Washing Facilities



Source: MENA School Location Database

Figure 12.3.18 Availability of Handwashing Facilities in Public and Private Elementary Schools in Abidjan

(b) Analysis of causes of non-operationality of WASH facilities

As noted previously in section (a), many of the WASH facilities in Abidjan's public primary schools are not operational. UNICEF conducted a survey of the status of water sanitation in 254 public elementary schools across the country in 2019 to analyze the operational status of facilities.¹⁵ Results revealed that many WASH facilities were abandoned within a short period after their construction, deemed to be due to a dysfunctional system of facility maintenance and management. This situation is widely recognized by actors involved in school WASH facilities and was echoed by the MENA, Ministry of Health, Public Hygiene and Universal Health Coverage, communes, and other actors interviewed during the field survey for this study.

In addition, the "Strengthening Urban Water Supply and Sanitation Project - Additional Financing (PREMU-FA)", implemented by the MH with support from the World Bank, plans to conduct a survey and analysis of the current status of water and sanitation facilities in schools and health facilities in the targeted areas (Abidjan (Bangelville), Aboville, Tiarezendousine Gianouan, Beumi, Korogo, Ferkessedougou , Daboussongon, Nyakaramandugu and Isiah), and to propose sustainable management practices for WASH facilities with developing a national manual.¹⁶

The aforementioned UNICEF 2020 Status Survey Report cites the following as causes of failure in maintaining water sanitation facilities.

¹⁵ Government Partner Support for the Definition of School WASH Standards and Revision of Technical Documents for the Construction of WASH Facilities - Status Report, 2020, UNICEF

¹⁶ Urban Water Supply and Sanitation Enhancement Project - Additional Financing (PREMU-FA) Study on Sustainable Management Approach for Sanitation Facilities in Schools and Health Facilities Bid Specification, 2021, MH/World Bank

- shortage of financial and human resources,
- Lack of information or failure to share information,
- lack or failure of comprehensive facility management,
- lack of procedures,
- insufficient dissemination of tools for school facilities management,
- insufficient capacity of the construction company,
- lack of institutional coordination, and
- lack of structural coordination.

Risks from facility maintenance not only exist during the post-completion maintenance phase of a facility but can occur throughout all phases of the school facility life cycle, from identification of facility needs to construction and maintenance, leading to maintenance failures. The report subdivides the life cycle of a school facility as follows.

- Carte Scolaire¹⁷ (School Facility Request Study) Design and Planning
- Survey
- Selection of construction contractor
- Construction supervision
- Completion and delivery of facilities
- Preservation of technical documents
- Facility Management
- Training of relevant parties

From the above analysis, it is clear that for sustainable maintenance of school WASH facilities, close information sharing and role-sharing among a wide range of actors involved (government agencies, students, teachers, community organizations, private service providers, etc.), as well as appropriate technical management throughout the facility's life cycle and the development of national standards for facilities that should be shared by all parties involved, are important.

UNICEF has developed the National Standards for WASH Facilities and Guidelines for Sustainable Maintenance Mechanisms for Pre-School/Primary School WASH Facilities based on the results of the 2020 Status Survey. These documents are currently in the approval process by the government. After approval, it is expected that the documents will be used as a common platform for all actors involved in school WASH to promote efficient school WASH improvement activities.

(4) Facilities subject to elementary school water sanitation

The MENA developed the "School Facility Construction Standards - Part I: Primary Schools" in 2008. It provides minimum standards for primary schools regarding the quantity and specifications of facilities, including WASH facilities. Based on these standards and the

¹⁷ Carte Scolaire (School Map): An annual survey conducted by the Ministry of Education in schools on the facilities, personnel, and equipment needs. Survey results are compiled by the Ministry of Education and shared with the local governments. Public schools must be registered with the Cultus Scolaire to receive teacher dispatches from the central government.

analysis of the 2020 Status Survey, UNICEF developed the National Standard for WASH Facilities in Schools in 2020 that also specifies the standards for each user category: (i) toilets, (ii) water supply facilities, (iii) hand washing facilities, (iv) menstrual hygiene management facilities, and (v) accommodations for the disabled and visually impaired, with female and male students, administrative staff and teachers, and outpatients as the users. In addition, the schools covered are preschools and elementary schools with 3, 6, 12, 18, and 24 classrooms. Table 12.3.16 provides an overview of these standards.

Table 12.3.16 UNICEF National Standards for School Water and Sanitation Facilities (2020, excerpts)

General Standards	
Number of classrooms	1 room / 50 students
Number of facilities (for elementary schools)	1 or multiple toilets/classrooms 1 water supply facility 1 fenced athletic field 1 canteen
Staff	Principals, vice principals, teachers
Technical Standards for WASH Facilities	
General Provisions	<ul style="list-style-type: none"> - Proper use of facilities - Proper use of sanitation facilities by different users - Compliance with environmental protection - Respect for the user's culture
Water Supply	<ul style="list-style-type: none"> - Two types of water sources: <ul style="list-style-type: none"> o Deep well with human-powered pump o Connection to existing water distribution network
Toilets	<ul style="list-style-type: none"> - Septic tanks are mandatory for toilets connected to the water supply. - If there is no connection to the water supply, pit latrines or automatic ventilation types should be used. - Roof rainwater should percolate into the ground through gutters.
Toilet Facilities	<ul style="list-style-type: none"> - Installation of sink, soap dispenser, and toilet paper holder
Handicapped Accessibility	<ul style="list-style-type: none"> - Take necessary measures such as auditory and visual postings, installation of ramps and handrails, etc.
Menstrual Hygiene Management	<ul style="list-style-type: none"> - Flushing faucets, water, and sanitary napkins - Menstrual hygiene faucets and wastewater drains in all private women's restrooms
Example of Calculating the Quantity of Water and Sanitation Facilities per School (for a 6-room school)	
Water supply facilities	<ul style="list-style-type: none"> - 1 water supply facility/classroom × 6 classrooms = 6 locations
Toilets	<ul style="list-style-type: none"> - Toilet Building-1 - Number of users 50 students/classroom × 6 classrooms/building × 1 building = 300 students - Teachers: 4 rooms (2 for disabled) - Boys: 3 (1 for disabled) - Girls: 3 (1 for disabled)

Source: National Standards for WASH, 2020, UNICEF

As shown in the table above, the target facilities for elementary school WASH should include water supply facilities, toilets, and hand washing facilities, and in addition, facilities to serve the disabled and facilities for menstrual hygiene management should be considered. Moreover, the availability of outside services such as connection to urban water supply for water supply facilities, sludge withdrawal services from septic tanks for flushing toilets, and garbage collection services for solid waste management will greatly affect the proper maintenance of school sanitation facilities.

Therefore, it is important to assess the condition of school WASH facilities, include these considerations in the design of new construction or rehabilitation projects, and establish a system that enables appropriate technical management throughout the life cycle of school WASH facilities, from planning to maintenance, in order to improve WASH conditions.

(5) Related actors of elementary water sanitation

Based on the results of the 2020 Status Survey conducted by UNICEF relevant actors that need to be coordinated in the area of school WASH have been identified, including the Ministry of Health, Public Hygiene and Universal Health Coverage, MH, Ministry of Sanitation and Salubrity, MENA, etc., as well as teachers and students as users of facilities and COGES as the main actors in facility maintenance and management.

Among these relevant actors, the MENA has the DRENA and the Office of the School Inspector under its umbrella to manage and guide the educational environment of each school.¹⁸ In addition, the MENA has the Directorate of Schools, High Schools and Colleges (DELC), which is in charge of developing and disseminating education-related standards; the Directorate of Animation, Promotion and Monitoring of COGES (DAPS COGES), which is in charge of COGES supervision and training, and the Directorate of School Life (DVS), which is in charge of monitoring and guiding the living environment and sanitary conditions of schools. Various departments are implementing activities related to school WASH in their respective fields.

On the other hand, for communes, which are the authority for the maintenance of school facilities and responsible for the COGES General Assembly, activities related to school water sanitation have so far been very limited. With the amendment of the COGES Decree in 2020, the government and local governments will contribute to the costs of COGES activities. Therefore, the proactive involvement of communes, in both technical and financial respects, is crucial for the proper maintenance of WASH facilities by COGES. In addition, the General Directorate of Decentralization and Local Development (DGDDL) of the Ministry of the Interior and Security, which has jurisdiction over local governments nationwide, are required to support primary school WASH by communes and disseminate it to other communes in Abidjan through coordination with the MENA and other actors related to primary school WASH, institutional support to communes, human resource development, accumulation of know-how, and other activities.

¹⁸ The Office of the Inspector General is staffed by educational counselors, school life counselors, and COGES counselors, who are involved in the local educational scene in their respective fields.

(6) WASH Education Activities

WASH education in primary schools in Côte d'Ivoire has not been implemented systematically but on a one-off basis through donor-supported Ministry of National Education and Literacy projects and NGOs. UNICEF and USAID have provided support as donors.

To cite a project example, the UN-HABITAT's "Values-Based WASH Education Project," through 37 trained facilitators, conducted a variety of activities such as WASH classes, tours of water treatment plants, preparation of teacher's guides, and development of codes of conduct for water supply and toilets, to improve students' sanitation awareness and behavior. The project aimed to improve students' hygiene awareness and behavior.

UNICEF, through the Directorate of School Life of the MENA, conducted a pilot project of the Three-Star Approach in 110 schools in 7 provinces across the country. The Three-Star Approach is UNICEF's global initiative to improve sanitation awareness and behavior through the development of WASH facilities, the establishment of sanitation clubs, and sanitation education. Schools that implemented the activities were given a one to three stars rating for their level of water sanitation as an incentive for continued efforts to improve water sanitation. Both the sustainable operation of WASH facilities and the improvement of WASH awareness and behavior are needed in a complementary manner to improve primary school water sanitation. Common procedures and methods need to be established to promote systematic facility improvement and WASH education in the context of collaboration among primary school WASH actors.

(7) Challenges and Responses to the Project for Improvement of WASH in Primary Schools

The table below shows the issues from the project for improvement of WASH in primary schools. The responses will be examined closely through the activities of the proposed project to determine the necessary items and promote capacity building and system development to achieve the project goals.

Table 12.3.17 Challenges and Responses in the Project for Improvement of WASH in Primary Schools

Field	Issue	Support
Clarification of roles and responsibilities among actors	<ul style="list-style-type: none"> Unclear existing guidelines on the roles and responsibilities of local governments (communes) in Abidjan. 	<ul style="list-style-type: none"> Clarify the division of roles and responsibilities among central and decentralized administrations and communes through project implementation
	<ul style="list-style-type: none"> The MENA is responsible for the supervision of school WASH facilities and sanitation environment in schools throughout the country, but the communes, which should be aware of local conditions and lead in improving WASH, are very limited in their activities. 	<ul style="list-style-type: none"> Strengthen the central government-commune collaboration system, including information sharing of data from the Ministry of National Education and Literacy's SIGE (School Statistics DB), technical assistance, etc. Capacity building is needed for officials of communes, whose involvement in school WASH has been limited to date.
Facility	<ul style="list-style-type: none"> The current state of water 	<ul style="list-style-type: none"> Capacity building for WASH facility

Field	Issue	Support
Development and Maintenance	supply facilities, toilets, hand washing facilities, etc., is generally known through statistical surveys by the MENA, but the information sharing with communes and the ability of communes to utilize the data is insufficient.	inventory survey and planning by the communes themselves is needed
	<ul style="list-style-type: none"> • There are many schools with inadequate facilities, and even those with facilities have high non-operational rates. 	<ul style="list-style-type: none"> • Thoroughly understand the current state and causes of schools with inadequate or underutilized facilities and formulate and implement appropriate maintenance plans. • Establish a technical support system from central and deconcentrated government structures for inventory survey and planning. • Establish the necessary community-based operation and maintenance system. • Establish a collaborative system between central/deconcentrated administrative organizations and communes to revitalize COGES. • Develop and renovate high-quality facilities consistent with national standards. The project will develop a ledger and budget and implement a facility development plan.
WASH education	<ul style="list-style-type: none"> • WASH education is mainly a central government initiative, project-based, and outsourced to NGOs. Communal involvement is very limited. 	<ul style="list-style-type: none"> • The communes themselves should survey the WASH situation (including facilities, sanitation awareness, and behavior) in each school, and a capacity-building and technical support system from central and deconcentrated administrations should be established to develop a WASH improvement plan.
Capacity Development of Monitoring and Planning for Improvement of WASH by communes	<ul style="list-style-type: none"> • The commune staff does not have experience in WASH monitoring and planning and needs capacity building to initiate these activities. 	<ul style="list-style-type: none"> • Provision of SIGE (School DB) information from the central government and how it is used by the communes • Methods of School WASH Inventory Surveys by Commune • Establishment and capacity building of a dedicated IT department for school WASH surveys and planning by the commune • Capacity building for the development of school WASH improvement plans

Source: JICA Study team

4) Draft Action Plan for the Primary School Water Sanitation Improvement Project

Based on the above, the Study Team proposes five components for the activities of the Project for Improvement of WASH in primary schools.

1. An inventory survey of WASH facilities and hygiene behavior in public primary schools in Abobo and Yopougon will be conducted, and a ledger will be maintained.
2. The division of roles and responsibilities among actors for improving WASH in public primary schools in Abobo and Yopougon will be clarified, and a WASH improvement plan and a business continuity plan (BCP) for outbreak will be developed.
3. Personnel in charge of survey (monitoring) and planning information technology support for WASH facilities and hygiene actions in public primary schools in Abobo and Yopougon will be appointed, and IT personnel will be trained.
4. A methodology and plan for facility maintenance and WASH improvement activities will be developed by COGES.
5. Through the implementation of the pilot projects (facility development + equipment procurement + maintenance + hygiene training), the methodology and structure of the WASH improvement project will be developed, and the capacity of the communes, COGES, and related actors will be improved.

Draft activity schedule for these components is shown in Table 12.3.18.

Table 12.3.18 Schedule of activities for the project for improvement of WASH in primary schools (draft)

Component / Activity	1st Year			2nd Year						3rd Year																														
	Month																																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36				
0 Project Management																																								
0.1 JCC								▲																																
0.2 TWG													▲																											
1 An inventory survey of WASH facilities and hygiene behavior in public primary schools in Abobo and Yopougon will be conducted and a ledger will be maintained.																																								
1.1 Collection and organization of existing materials and data																																								
1.2 Pre-survey of current situation																																								
1.3 Planning of inventory survey																																								
1.4 Preparation of manual and training contents of inventory survey																																								
1.5 Training on inventory survey																																								
1.6 Implementation of inventory survey of WASH facilities in primary schools																																								
1.7 Data organization and analysis																																								
1.8 Preparation of short list for priority projects																																								
2 The division of roles and responsibilities among actors for improving WASH in public primary schools in Abobo and Yopougon will be clarified, and a WASH improvement plan and a business continuity plan (BCP) for outbreak will be developed.																																								
2.1 Support for establishment of technical working group (TWG) for formulation of improvement plan of WASH in primary schools																																								
2.2 Workshop for clarification of roles and responsibilities and examination of work procedures																																								
2.3 Determination of orientations of improvement plan of WASH in primary schools																																								
2.4 Formulation of improvement plan of WASH in primary schools																																								
2.5 Formulation of action plan of improvement of WASH in primary schools																																								
3 A personnel in charge of survey (monitoring) and planning information technology support for WASH facilities and hygiene actions in public primary schools in Abobo and Yopougon will be appointed and IT personnel will be trained.																																								
3.1 Preparation of manual of data collection and analysis for WASH in primary schools																																								
3.2 Training on data collection																																								
3.3 Training on data analysis																																								
3.4 Training on GIS mapping																																								
4 A methodology and plan for facility maintenance and WASH improvement activities will be developed by COGES.																																								
4.1 Preparation of manual for improvement of WASH for COGES																																								
4.2 Training on WASH improvement for COGES																																								
4.3 Training on WASH improvement for schools																																								
4.4 Monitoring of WASH in primary schools																																								
5 Through the implementation of the pilot projects (facility development + equipment procurement + maintenance + hygiene training), the methodology and structure of the WASH improvement project will be developed and the capacity of the communes, COGES and related actors will be improved.																																								
5.1 Implementation of technical assessment and selection of pilot projects																																								
5.2 Preparation of implementation plan of pilot projects																																								
5.3 Tender procedures																																								
5.4 Implementation of pilot projects (construction / rehabilitation of primary school WASH facilities)																																								

12.4 Rapid Environmental Impact Assessment

12.4.1 Côte d'Ivoire Country Environment Institution

In Côte d'Ivoire, the Ministry of the Environment and Sustainable Development (MINEDD) was established in 1983 based on the Ivorian Constitution. The MINEDD indicates three major policies:

- development and implementation of government policy in the field of sustainable development,
- participation in international climate negotiations, and
- promotion of sustainable management of scarce resources.

MINEDD is responsible its directorates as well as their tasks and responsibilities, listed in Table 12.4.1.

Table 12.4.1 Relevant departments and areas of responsibility within MNEDD

Directorates	Tasks and Responsibilities
Directorate of Ecology and Nature Protection	<ul style="list-style-type: none"> - Conservation and sustainable development of national parks and protected areas - Monitoring of ratification of international conventions on ecosystem conservation, etc. - Coordination of water management, standards, and related source water conservation and monitoring practices - Monitoring and evaluation of development projects - Monitoring of forests, national parks, and valuable flora and fauna - Awareness-raising on conservation activities, etc.
Directorate of Environmental Quality and Risk Preservation	<ul style="list-style-type: none"> - Development and implementation of environmental protection policy - Environmental monitoring - Sector planning, awareness-raising of the introduction of risk mitigation related to natural disasters and biotechnology into planning by local governments - Natural disaster monitoring - Recommendation of an action plan for healthy life - Support for the introduction of environmental considerations into regional development and policy formulation
Directorate of Industrial Waste and Chemical Substances	<ul style="list-style-type: none"> - Formulate and monitor industrial/chemical waste management - Comply with the Basel Convention and other ratified waste-related treaties - Support for technologies for industrial waste management to the private sector and others - Support for compliance with international standards for industrial/chemical waste management - Assistance to private and other entities in disposing of industrial/chemical waste - Continual monitoring of transboundary movement of industrial/chemical waste - Awareness and education on industrial/chemical waste management
Directorate for the Fight against Climate Change	<ul style="list-style-type: none"> - Development of policy and sectoral policies to address climate change - Strengthening the legal system - Compliance with the post-Paris Convention and other relevant provisions - Monitoring of greenhouse gas reductions - Establishment of a national network for climate change action - Strengthening of countermeasure capacity and technology transfer - Promote the incorporation of climate change measures into the sector and regional plans

Directorates	Tasks and Responsibilities
	- Awareness-raising and educational activities
Directorate of Sustainable Development Policies and Strategies	- Incorporate sustainable development into sector and regional planning - Development of monitoring indicators for planning and implementation - Cooperation and coordination with related organizations - Implementation of capacity building to relevant institutions
Directorate of Promotion and Education for Sustainable Development	- Conduct public awareness-and education for sustainable development - Information disclosure - Promotion of sustainable development to educational institutions
Directorate of Green Economy and Corporate Social Responsibility	- Promote adoption of green economy, encourage and support investment in clean technology - Collaboration with PND (National Health Development Plan) - Study for introduction of environmental tax - Promotion of the introduction of carbon finance, environmental accounting, and recycling economy - Promotion of the introduction of renewable and low-carbon energy, - Promotion of corporate social responsibility for sustainable development at the public, private, and civic levels

Source: MINEDD

In addition, the three organizations listed below are related to MINEDD and responsible for their respective environmental administrations.

(1) National Environmental Agency (L' Agence Nationale De Environnement [ANDE])

In ANDE, ministries such as the Ministry of Economy and Finance, the Ministry of Agriculture, and the Ministry of Economy and Infrastructure, as well as commercial and agricultural associations, formulate a committee for environmental management, particularly environmental licensing for project implementation.

(2) Ivoirian Antipollution Center (CIAPOL)

CIAPOL is also one of the subordinate organizations under the MINEDD, which formulates a council committee composed of ministries and ministers. Its responsibility mainly involves the environmental pollution caused by industrial activities, waste management, and the planning and implementation of pollution control measures.

(3) Ivorian Office of Parks and Reserves (Ivorian Office of Parks and Reserves [OIPR])

OIPR manages national parks and nature conservation areas and is responsible developing and implementing policies and licensing systems for ecosystem conservation and sustainable management of protected areas and fringe areas.

12.4.2 Environmental and Social Licensing System in Côte d'Ivoire

1) Environmental impact assessment

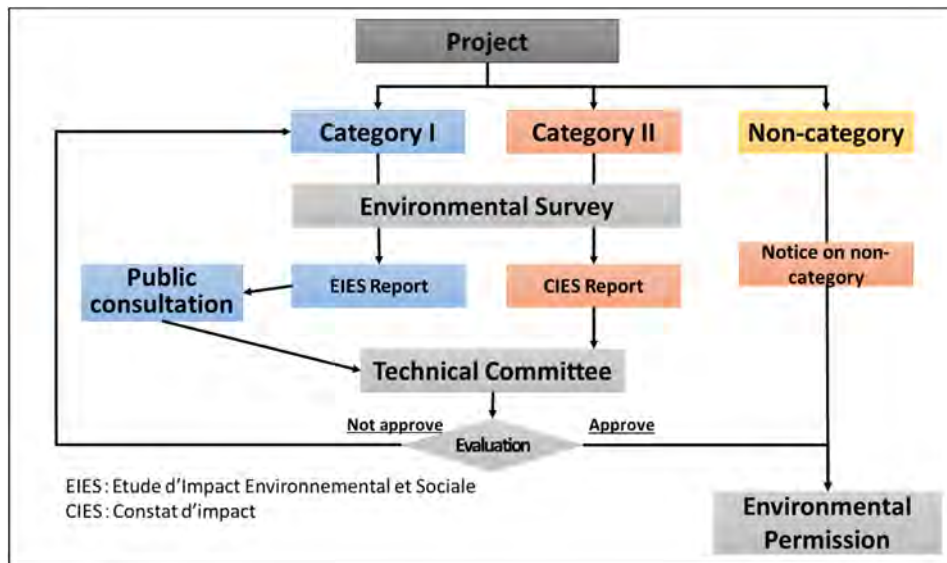
The Environmental Impact Evaluation System (EIES [Etude d'impact Environmental et Social]) is centralized in the ANDE. Table 12.4.2 shows categories according to the scale of each major sector.

Table 12.4.2 Categorization related to EIES

Sector	Category I	Category II
Agriculture	<ul style="list-style-type: none"> - Agricultural land readjustment - Large scale cultivation over 999 ha 	<ul style="list-style-type: none"> - Cultivation - Poultry, livestock barn - Aquafarming - Marine development
Forest development	<ul style="list-style-type: none"> - Large scale development over 999 ha 	<ul style="list-style-type: none"> - Reforestation or cultivation within the scale between 100–999 ha
Mining	<ul style="list-style-type: none"> - Mining of petroleum, natural gas - Mining of metals, rocks 	<ul style="list-style-type: none"> - Excavation for waste storage or water supply facility - Other mining
Energy	<ul style="list-style-type: none"> - Petroleum refinery, gas-to-liquid fuel - Thermal power plant - Hydro power plant 	<ul style="list-style-type: none"> - Energy generation other than Category I - Transmission, hot water supply line, natural gas supply line (on land) - Underground storage of fuel gases - Supplemental facility for hydro power plant
Waste management	<ul style="list-style-type: none"> - Storage and/or treatment of waste - Treatment facility for medical waste, wastewater treatment 	-
Food production	<ul style="list-style-type: none"> - Animal/vegetable oil production - Dairy production - Brewage production - Confectionery production - Slaughterhouse - Seafood processing - Sugar production 	-
Chemical industry	<ul style="list-style-type: none"> - Chemical industry - Pesticide production - Dyeing industry - Rubber industry 	-
Steel industry	<ul style="list-style-type: none"> - Iron, non-ferrous industry - Storage for steel materials 	<ul style="list-style-type: none"> - Plating industry - Storage facility for metal production - Car assembling - Ship building - Production and maintenance of aircraft - Railway facilities - Blast excavation - Facility for lime/metal industry
Textile / leather / paper industry	<ul style="list-style-type: none"> - Pulp and cotton industry - Cellulose industry - Tanning industry - Textile industry 	<ul style="list-style-type: none"> - Wool industry - Coloring of textile - Rubber industry
Infrastructure	<ul style="list-style-type: none"> - Road and railway, and aircraft runway over 2,100m length - Port development - Industrial development - Urban development - Waterway affecting water (ex. artificial canal) - Dam, weir - Petroleum/gas pipeline - Water supply network 	<ul style="list-style-type: none"> - Road, railway, and runway except Category I - Tram
Others	<ul style="list-style-type: none"> - Cement industry - Accommodation having over 150 beds - Production of explosive material 	<ul style="list-style-type: none"> - Urban development master plan - Land use planning - Land maintenance plan

Source: Decree No. 96-894, 1996

The environmental impact assessment procedure is outlined in Figure 12.4.1



Source: Decree No. 96-894, 1996

Figure 12.4.1 Environmental Impact Assessment Procedure

Category I projects are required to prepare an EIES report and collect comments at a public hearing prior to the review.

For Category II projects, a CIES or Environmental Declaration Report describing the anticipated environmental impacts is prepared, and the review determines the permit, but it is not always necessary to provide specific mitigation measures, and the study is often simplified.

2) Procedures related to resettlement

For resettlement, the EIES is required to develop a mitigation and monitoring plan as one of the social impact items. A Relocation and Resettlement Plan (PAR) is to be prepared, but there are no specific regulations, and it is operationally implemented based on the World Bank guidelines.

12.4.3 Rapid Environmental and Social Impact Assessment for Cooperative Projects

1) Simplified Environmental and Social Impact Assessment

A simplified environmental and social impact assessment was conducted for the proposed cooperative project. The evaluation items were divided into three fields (see Table 12.4.3), and the evaluation was mainly a qualitative assessment.

Table 12.4.3 Environmental and Social Impact Indicators

Environmental and Social Fields	Indicators
Pollution, Contamination	Air pollution, water pollution, waste, soil contamination, noise and vibration, land subsidence, odors, climate change
Natural Environment	Protected areas, ecosystems, hydrology, geography, topography
Social Environment	Land acquisition and resettlement, vulnerable and poor groups, indigenous peoples, local economy, water use, existing social infrastructure and services, social organization, unfair distribution of damage and benefits, cultural heritage, conflicts among communities, land use and local resource use, landscape, gender, child rights, HIV/AIDS and other infectious diseases, work environment and safety, accidents

Source: JICA Study Team

Since the two proposed cooperative projects aimed at strengthening the technical capacity of the implementing agencies in Abobo and Yopougon Communes, basically, no environmental impacts from constructing the structures are expected.

On the other hand, "Pilot projects can involve a certain plan of construction of facilities," and "Ivorian side will develop and implement certain developments/projects which can cause environmental impacts after the cooperative projects." Therefore, the rapid assessment focuses on the possible impacts caused by such situations.

**Table 12.4.4 Simplified Environmental and Social Impact Assessment
(Public Services Improvement through Digitization Project)**

Environmental and Social Classification	Impact Assessment
Pollution, Environmental Pollution	<ul style="list-style-type: none"> - Activities that cause pollution or environmental contamination are not expected. - The following impacts are anticipated by the construction of branch offices and other facilities that provide digital services. <ul style="list-style-type: none"> • Air pollution, noise and vibration, and soil pollution due to construction work, etc. • Construction waste generation • Water pollution from construction workers' toilets, canteen, leaching of fuel oil, etc.
Natural Environment	<ul style="list-style-type: none"> - Activities that cause pollution or environmental contamination are not expected. - Impacts on the natural environment could be minimized by selecting a construction site at a valuable ecosystem area.
Social Environment	<ul style="list-style-type: none"> - Activities that affect social conditions are not expected. - The following impacts are anticipated for the construction of branch offices and other facilities that provide digital services. <ul style="list-style-type: none"> • Land acquisition and resettlement by the occupancy of the construction site • Loss of employment due to resettlement • Imbalance of accessibility to the digital services - The following social impacts are expected for the operation of digital services <ul style="list-style-type: none"> • Costs associated with devices and the internet for accessibility of the digital services (especially for the vulnerable and poor) • Lack of know-how required to use digital services (especially for the elderly and disabled) • Information Security

Source: JICA Study Team

Table 12.4.5 Simplified Environmental and Social Impact Assessment (Sanitation Facility Development and Sanitation Education Project for Elementary Schools)

Environmental and Social Classification	Impact Assessment
Pollution, Environmental Pollution	<ul style="list-style-type: none"> - Activities that induce pollution or environmental contamination are not expected. - The following impacts are anticipated in the installation of equipment in the school and connections to existing water mains or waterways. <ul style="list-style-type: none"> • Air pollution, noise and vibration, and soil pollution due to construction work, etc. • Construction waste generation • Water pollution from construction workers' toilets, eating and drinking, and leaching of fuel oil, etc. - During operation, the increased opportunity to wash hands with soap increases water contamination of active surfactants, which contributes to water pollution.
Natural Environment (physical)	<ul style="list-style-type: none"> - Activities that induce pollution or environmental contamination are not expected. - Impacts on aquatic life from contaminated water by the active surfactants during operations.
Social Environment	<ul style="list-style-type: none"> - Activities that affect social conditions are not expected. - The following impacts are anticipated for connections to existing drainage: <ul style="list-style-type: none"> • temporary relocation of vendors due to open excavation, and • imbalance of accessibility to the sanitation facilities.

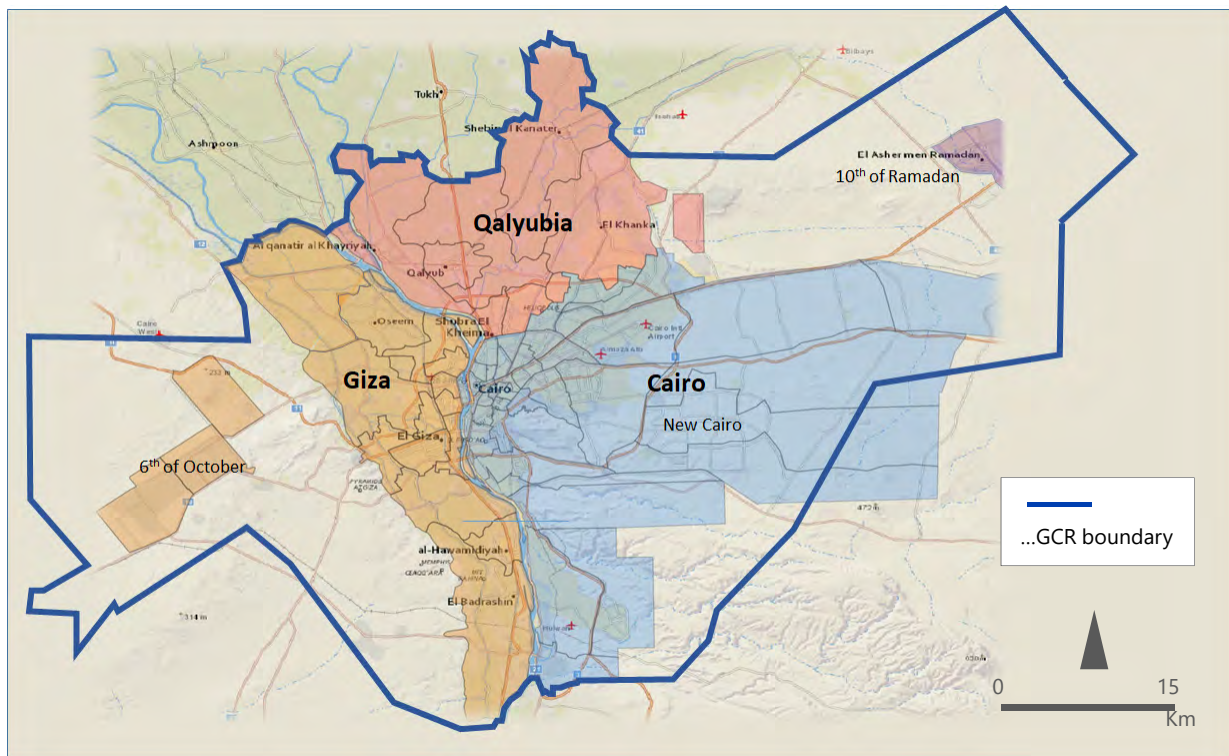
Source: JICA Study Team

13. Formulation of Cooperation Project in Cairo

13.1 Change of Urban Issues by COVID-19

13.1.1 Overview of the Greater Cairo Region

The Greater Cairo Region (GCR) is one of the largest metropolitan areas in the world with an area of about 2,770 km², covering Cairo Governorate, Giza Governorate, Qalyubia Governorate, and Sharqia Governorate.¹

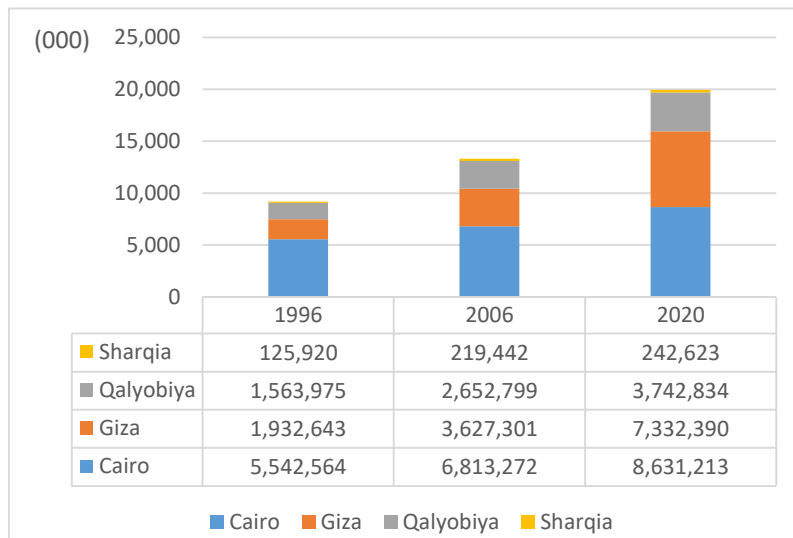


Source: JICA Study Team

Figure 13.1.1 Boundary of GCR

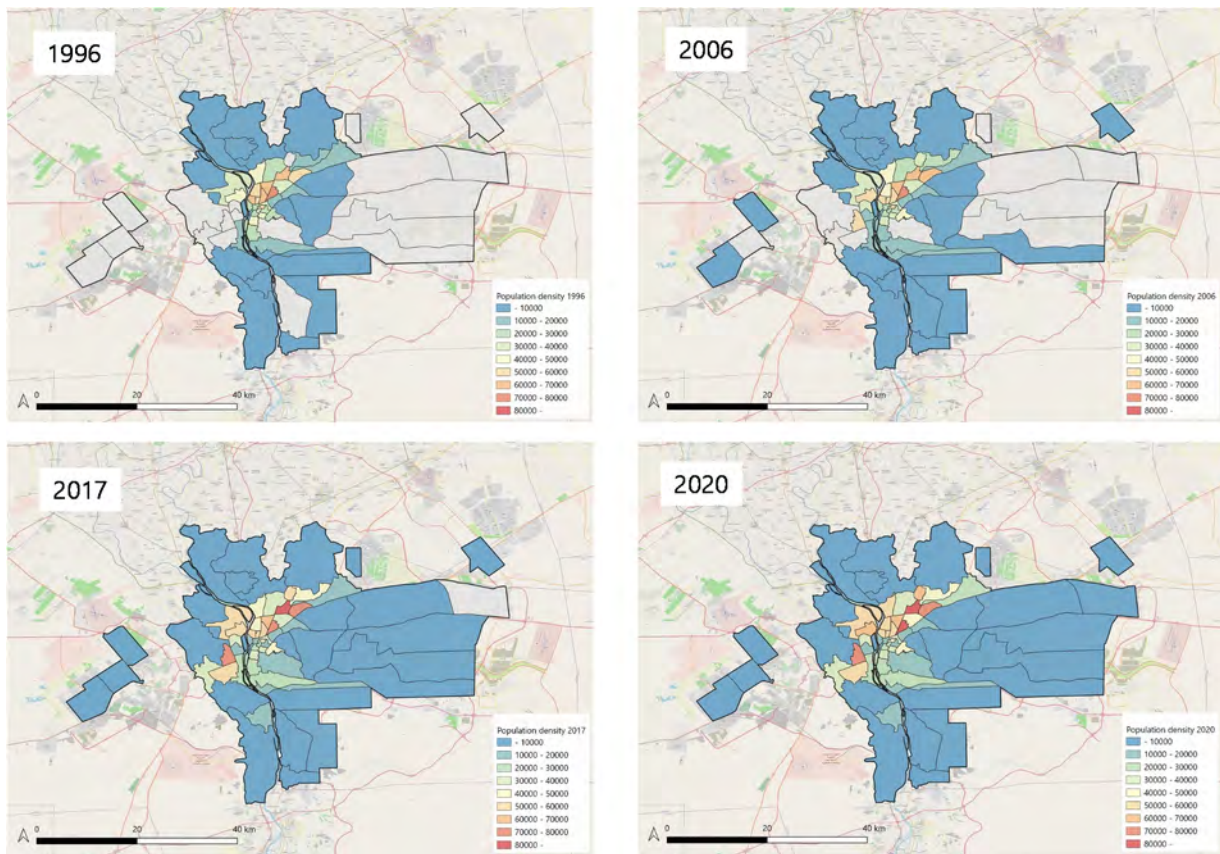
The population of the GCR continued to increase at an average annual rate of 2.9% for 14 years from 2006 to 2020 and exceeded 20 million in 2020. Given such rapid increase of urban population, the population density in the center of the old town has further increased. Some central areas has reached more than 80,000 pax/km², such as Al Matariyya, Hadaiq Al-Qubba in 2020 (Figure 13.1.3). Severity of this turns out obvious when comparing with the highest population density in Tokyo is about 23,000 people/km² in Toshima District (as of August 2021).

¹ Greater Cairo Metropolitan Area (GCMA) or GCR is sometimes defined not to include the 10th of Ramadan New Town in Sharqia Governorate and a part of Qalyubia Governorate. However, CUREIP uses GCR used in the Strategic Urban Development Master Plan Study conducted by JICA in 2008.



Note: Figure excludes population of certain areas of Qalyubia Governorate, which was not publicly available.
 Source: JICA Study Team prepared from CAPMAS, Census

Figure 13.1.2 Trends in the Population of GCR



Source: JICA Study Team prepared from the data of CAPMAS

Figure 13.1.3 Change of the Population Density in GCR (1996–2020)

It is expected that GCR will continue to experience a population increase in the foreseeable future. The GCR has suffered from a broad range of urban problems even before COVID-19, such as a disorderly expansion of densely populated residential areas, including slums, erosion of farmlands, traffic congestion, a shortage of housing for low- and middle-income earners, degradation of historic areas, air pollutions, and others.

In order to respond to such urban issues, the Egyptian government has developed new towns called the New Urban Communities (NUCs) in the suburban desert to accommodate an ever-growing urban population. Therefore, the rate of population growth in NUCs in the suburbs is significantly high. The record high growth rate for the last 4 or 5 years is largely ascribed to the president's initiative.



Source: JICA Study Team prepared from CAPMAS, Census 202

Figure 13.1.4 Population Growth Rate (2006–2020)



Note: Green circles indicate projects that have already been implemented, yellow indicates projects that are underway, and numbers indicate the number of house units under construction.

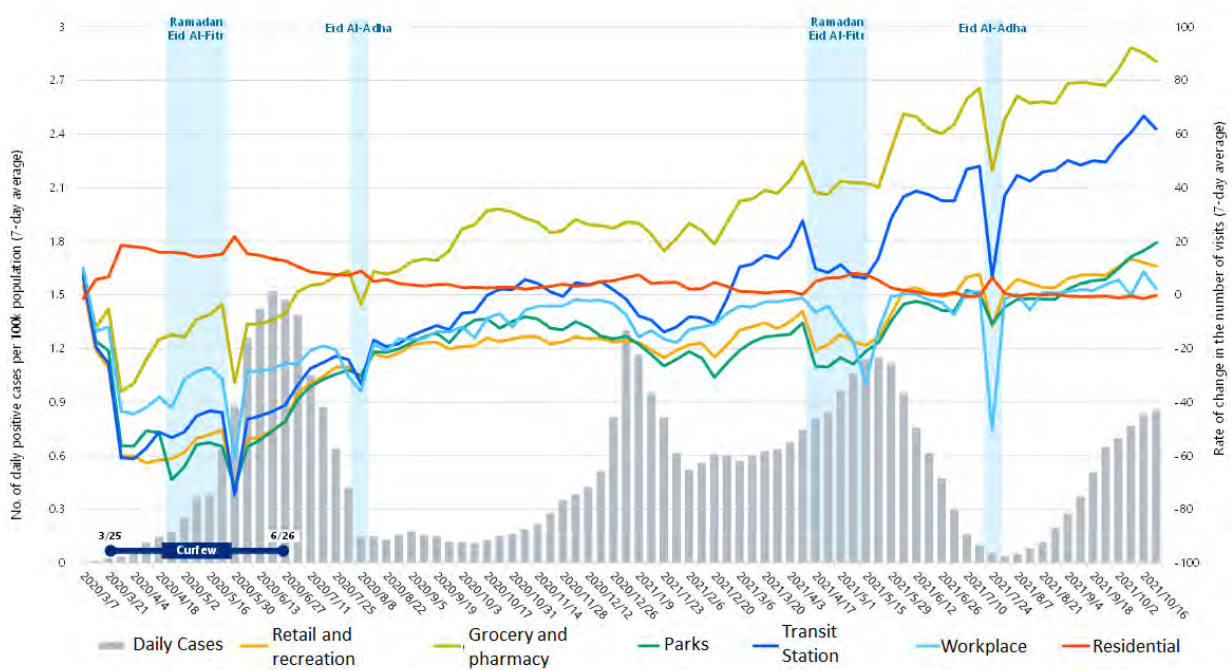
Source: JICA Study Team

Figure 13.1.5 Development of New Urban Communities on the President's Initiative

13.1.2 COVID-19 Infection and the Change of Urban Activities

Egypt saw the peak of the first wave from mid- to late-June in 2020 following the beginning of the pandemic in early March. The active cases counted more than 1,500 per day during that period. Following the decline of infection cases, December in the same year saw the peak of the second wave followed by the third in May 2021.

The Google Community Mobility Report shows that people’s visits to each urban facility declined by 30% to 70% compared to pre-COVID-19 in parallel with the curfew imposed from March 25 to June 26, 2020. However, it turned to robustly increase, overcoming the pre-COVID-19 level, and kept growing as of October 2021.



Source: COVID-19 Data Repository, the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (<https://github.com/CSSEGISandData/COVID-19>)

Figure 13.1.6 Trend of People’s Mobility and Positive Cases per 100k Population

13.1.3 Change in Urban Issues by COVID-19

The whole picture of the impacts of COVID-19 on GCR is summarized by four urban sectors: urban structure, urban transport, health environment, and socio-economy (Figure 13.1.7). It is obvious that the urban issues have become more severe compared to the pre-pandemic era. Particular issues against urban resiliency are identified as (i) high-dense existing residential areas with high infection risks, (ii) deteriorated urban hygiene environment, including the increase of waste disposals, and (iii) lack of coordination mechanism between the administrations and the communities.

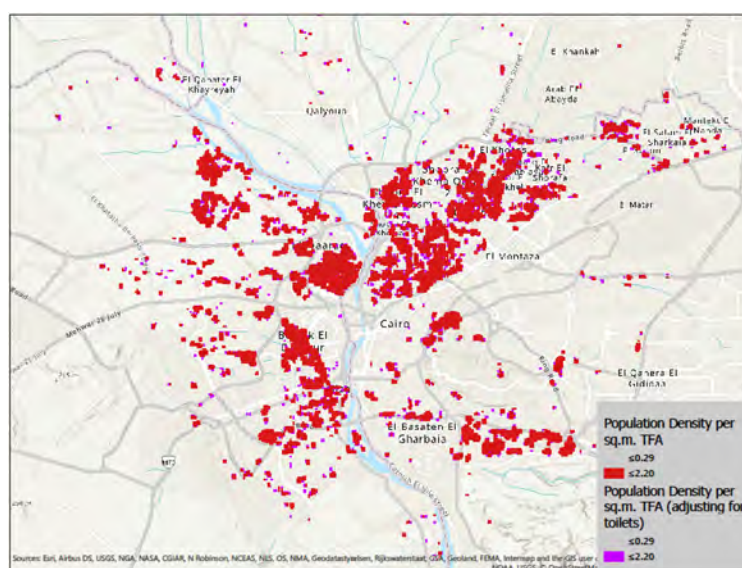
	Urban Issues before COVID-19	Urban Issues Caused by COVID-19	Urban Issues for Post-COVID-19
Urban Structure	<ul style="list-style-type: none"> Overcrowded built-up areas Short in spaces for businesses Improper management of the natural and cultural resources 	<ul style="list-style-type: none"> High risk of infections and constrains in avoiding crowding due to lack of open spaces Shortages in recreational areas 	<ul style="list-style-type: none"> Decentralization of urban functions Green and open spaces for utility purposes Securing business areas for SMEs
Hygiene awareness and customs	<ul style="list-style-type: none"> Chronicle traffic congestion Low service level of public transport Transport poors 	<ul style="list-style-type: none"> Deteriorated income of transport operators (mini bus and ride share bus) A rise of delivery transport 	<ul style="list-style-type: none"> Mobility in NUCs for commuters Walkability and NMT environment Upgrading public transport Environment for delivery and e-hailing
Urban hygiene	<ul style="list-style-type: none"> Overcrowded residential areas with more than 3,000/ha and informal dwellings Improper treatment of wastes 	<ul style="list-style-type: none"> Infectious risks in the overcrowded dwellings Increase in wastes Infection risks from corps 	<ul style="list-style-type: none"> Hygienic living environment (ex. Slum upgrading, community hygiene, etc.) Resilient waste treatment system Mainstreaming hygiene education
Urban Social Economy	<ul style="list-style-type: none"> Short in financial access to the informal sectors High vacancy rate in NUCs, i.e. short in houses for low income population 	<ul style="list-style-type: none"> Unemployment and economic loss Digital divides in online education No disclosure of infectious information Short in coordination with community responses to the pandemic 	<ul style="list-style-type: none"> Improving resiliency of livelihoods of informal sector using finance and ICT Disclosure institutes using ICT Coordination mechanism with the CBOs and NGOs

Source: JICA Study Team

Figure 13.1.7 Changes in Urban Issues

1) Urban Spatial Structure: Increased Infectious Risk in Congested Residential Areas

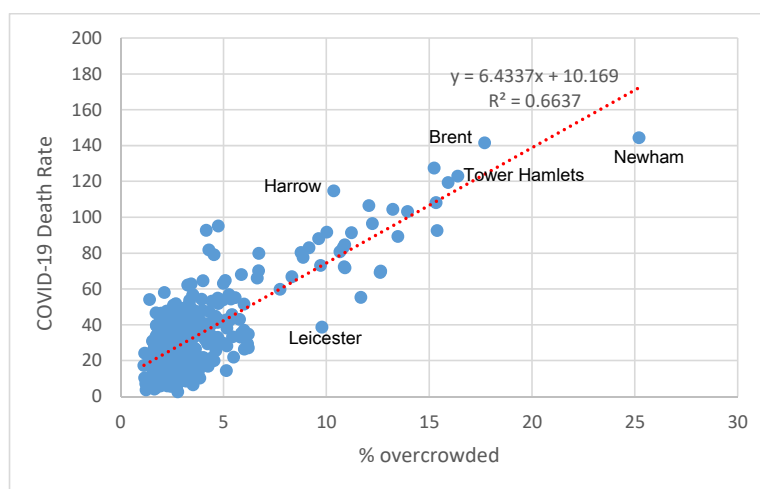
The problem of the overcrowded urban areas of Cairo became even more serious due to the spread of COVID-19 followed by government measures such as curfews. The World Bank’s survey in April 2020 identified possible hotspots vulnerable to COVID-19 infections, where the floor area per person is scarce to the point where it is difficult to secure a physical distance of 2 m. The aggregated area of those hotspots reached 100 km², and the estimated population residing in those areas accounted for 36% of that of GCR.



Source: Cities, Crowding, and the Coronavirus: Predicting Contagion Risk Hotspots, World Bank, Apr. 2020

Figure 13.1.8 Hotspots Estimated by the World Bank

Since there is no detailed data on COVID-19 infection status by area in GCR, it is impossible to verify that a congested residential area poses a higher risk of COVID-19 infection. As discussed in Chapter 2, the result of analyzing CUREIP target cities shows no clear relationship between population density by district and the number of COVID-19 positive cases. However, one study shows a high coefficient of determination ($R^2 = 0.6637$) between residential density within each house and COVID-19 mortality in England and Wales, while the conditions of the residential area are quite different from Cairo.



Note: Fatality rate is calculated from death cases per 100 thousand from 1 March 2020 to 14 April 2020.

Source: JICA Study Team prepared from Office for National Statistics (ONS), UK

Figure 13.1.9 Correlation between Habitat Density and Fatality from COVID-19

The issue of the congested living conditions in Cairo cannot be separated from the slums issue that originated back in Nasser’s administration. The Informal Settlements Development Fund (ISDF) was established in 2008 under the Cabinet to redevelop informal settlement areas in Egypt. It categorized informal settlements into unsafe areas and unplanned areas. It had spent EGP3.2 billion for the first five years of President Sisi’s administration.

Table 13.1.1 ISDF’s Definition of Slum and Informal Settlement

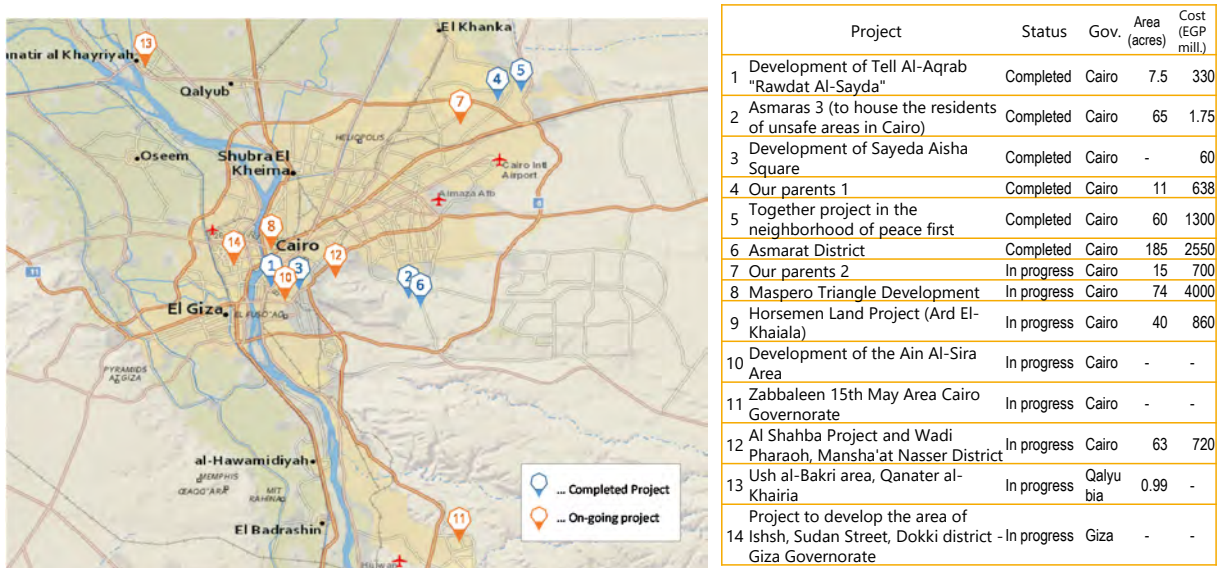
Category		Definition
Informal Settlement	Unsafe Areas	The areas with 50% or more of residential buildings that falls on the category that the unsafe standards are applied on (close to the meaning of “slums”).
	Unplanned Areas	The safe areas not established using the urban planning tools (i.e., using the detailed plans, the land readjustment schemes, or subject to the construction and planning conditions)

Source: Final Report of Data Collection Survey Mission on Slum and Informal Area Development in the Greater Cairo Region, JICA, January 2011

The ISDF was reorganized as Urban Development Fund (UDF) in 2021 and announced to allocate EGP400 for informal settlement improvement in the budget of FY2022.

The Egyptian government’s basic stance on improving slums is to entail the relocation of residents and build new residential buildings in the resettlement area. While such an

approach can clearly get rid of risks from the collapse of the building and provide safe residences, it has caused other issues such as division of the communities and further distance to workplaces.



Source: JICA Study Team prepared from Egypt's Projects Map (<https://egy-map.com/>)

Figure 13.1.10 Slum Improvement Projects of the Government of Egypt

2) Urban Hygiene Environment: Deteriorated by Increased Waste

In April 2020, Board of Education representative Fayez Barakat reported an estimate that medical waste across Egypt surged to 300 tons/day from 80 tons/day and requested Prime Minister Madbouly to properly dispose of medical waste.² In order to deal with the risk of COVID-19 infection from waste, the Egyptian government established a total of 12 intermediate treatment facilities in Governorates including Cairo, and at the same time distributed cleaning tools to each prefecture and cleaned the gutters in residential areas. In addition, the government dispatched a trainer specializing in medical waste to medical facilities and provided training to 68 medical facility staff on waste disposal methods.

On the other hand, in the GCR, there is a group of people living on household waste collection and recycling, traditionally called Zabaleen. Most of them live in certain areas within the GCR, and the most famous residential area of Zabaleen is the slum area called El-Zaraeb of Mansheyet Nasser. It is said that Zabaleen residing in this area treats about 5% of the total amount of household waste discharged in the GCR. The collected waste is manually separated and has a reputation for reusing almost all waste. On the downside, some processes in such a manually handling way may harm the health of workers raising a substantial issue in the aspect of hygiene.

Since the government of Egypt has problematized those Zabaleen in the El-Zaraeb area and has taken measures to replace them with outsourced private companies.³ Despite those

² The impact of COVID 19 on air pollution levels and other environmental indicators - A case study of Egypt (Mohamed K Mostafa, et al.) (<https://pubmed.ncbi.nlm.nih.gov/33069147/>)

³ In the 90s, trash collectors depended on wagons, but the General Authority for Cairo Cleaning and Beautification issued an order requiring replacing wagons with trucks for waste removal while introducing the new entrant companies, while the Zabaleen did not have the funds to purchase trucks. In 2003, the government of Egypt

adversary measures, the waste collection and recycling business of Zabaleen has always survived the crisis by exerting its capacity to wade through narrow streets and efficiently recycle wastes.

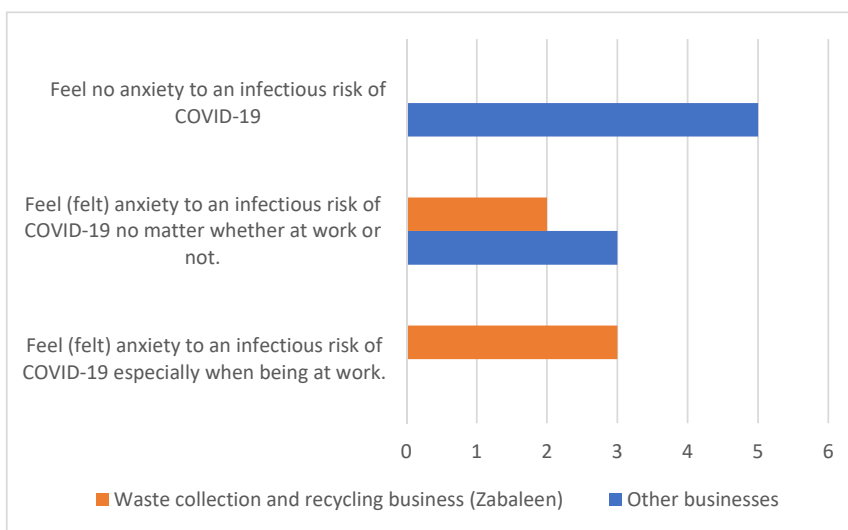


Source: Photo taken by JICA Study Team (Oct. 2021)

Figure 13.1.11 Waste Collection and Recycling in El-Zaraeb Area

Even under the curfew following the first wave of COVID-19, Zabaleen, who visits the back doors of each room of the apartment at night and early in the morning, continued the waste collection without rest and sustained the municipal waste management of the GCR.

Nevertheless, the Study Team revealed that most Zabaleen perceived a risk of being infected by COVID-19 at work from wastes containing masks and other clutters that may be contaminated (Figure 13.1.12). One Zabaleen respondent answered that almost all Zabaleen began wearing gloves right after the incident of mass infection when the death toll from COVID-19 rapidly increased in El-Zaraeb area, although, at first, he had not feared because they got used to be exposed to various infectious diseases.



Source: Results of the interview survey by JICA Study Team (Mar. 2022)

Figure 13.1.12 Infectious Risk Percieved in El-Zaraeb Area

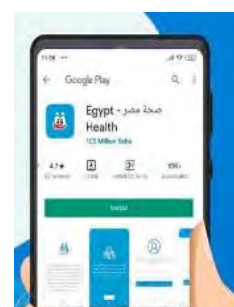
commissioned three European companies, which ended up cancellation because their trucks were too large for the narrow streets, and their recycling performance had never met the required recycle rate.

In this way, Zabaleen has played a crucial role in Cairo's waste management as an efficient waste treatment and recycling system rooted in the region, but there is little support from the government. Moreover, there were even measures to eliminate Zabaleen in the past. The outbreak of COVID-19 put Zabaleen at the risk of infection, placing the municipal waste disposal system at jeopardy.

To achieve a resilient city toward the post COVID-19 era, the government of Egypt is required to consider Zabaleen as the crucial body to sustain the Cairene municipal waste management, to develop their capacity in safety improvement, and to promote a coordination between them and the formal urban services.

3) Short of Administration's Coordination with Community Activities

Since the early days of the pandemic, the Egyptian government has consistently not disclosed more detailed information to the public except for the number of infection cases at the national level. The government provides information related to prevention measures through radio, TV and social media. The Government also developed the mobile apps for the purpose of providing information on medical institutions and raising awareness of infection prevention, but repeated errors have been reported. The app is not equipped with contagious route track functions. The Egyptian government has provided subsidies to informal sector workers and the unemployed, supplemented income, and reduced utility bills and taxes.



Egypt Health, the Infectious and Medical information app

Table 13.1.2 Economic Measures in Response to COVID-19 by the Government of Egypt

Category	Measure
Cash transfer	Distributed one-time cash benefit of EGP500 to around 130,000 seasonal workers newly registered to the Ministry of Manpower
Social security and pension	Distributed EGP27.6 billion in total to target 2.4 million households, which equals 10 million people, and increased pension benefits by 14%
Energy tax cut	Reduced a natural gas charge for businesses by 25% to promote production activities
	Electricity price reduction: 10 piastres reduction per 1 kWh of industrial electricity for the next 3 to 5 years.
Promotion of industry and tourism	Tax break for 3 months for a business entity
Taxation on agricultural land	Postponement of more than 2 years
Postponement of year-end adjustment deadline	Postponement of year-end adjustment deadline for sole proprietors and SMEs
Debt reduction and exemption	A grace period of 6 months for all bank loans, whether for business or private
	Exemption from partial interest payments and debt forgiveness equivalent to 50% of principal for debtors with EGP 1 million or less who are at risk of bankruptcy
	6-month extension of redemption to clients of mortgages, factoring, and

Category	Measure
	leasing companies by Financial Regulatory Authority (FRA)
	Preferential loan with 10% interest rate to medium-sized factories by a subsidy of 1 trillion EGP
	Subsidy for soft loans (interest rate 10%) to middle-class mortgage users (EGP 50 billion)
	Subsidy for soft loans (interest rate 10%) for tourism companies (EGP 50 billion)
	Subsidy investment for preferential housing loan (interest rate 10%) for middle class via regional banks (EGP 50 billion)
	Loan repayment deferment to agricultural workers (until September 2020)
	Soft loan to tourism companies (redemption period 2 years, interest rate 8%)

Source: JICA Study Team

On the other hand, during the curfew period (March 25–June 14, 2020), volunteer activities using NGO social media as a platform have become active to support citizens who have fallen into particularly difficult situations (Figure 13.1.13). In Egypt, about 52,000 local NGOs and 59 international NGOs provide various support during the pandemic.



Source: JICA Study Team

Figure 13.1.13 Major Volunteer Actions using Social Media

Notably, these activities included highly urgent activities such as emergency medical services for critical clients in self-containment and food assistance for the needy who have lost their jobs. The volunteer activities were mobilized by matching critically ill patients in self-isolation and volunteers on NGO's social media.

The government is required to better utilize the power of the community, such as the connection of volunteers on social media, which may supplement the lack of government services and build a collaborative system.

13.2 Urban Development Program during and after Pandemic

13.2.1 Review of the Existing Master Plan

The Strategic Urban Development Master Plan Study (SUDMP) targeting the year 2027, prepared by JICA in 2008 with the Egyptian Ministry of Housing, Utilities, and Urban Development (MoHUUD), is the latest urban master plan for the GCR.

The SUDMP converged various problems in GCR into four major issues comprising overcrowded existing city centers, lacking land for new business and commercial areas, improper management of natural and cultural resources, and inadequate living environment (Figure 13.2.1).



Source: JICA Study Team prepared from the Strategic Urban Development Master Plan Study for a sustainable Development of the Greater Cairo Region in the Arab Republic of Egypt, Aug. 2008

Figure 13.2.1 Urban Issues Identified in SUDMP

Based on these issues, the Master Plan has set Social Equity, Continuous Economic Growth, and Sustainable Development as the top goals for 2027, set out planning goals, and developed strategies to achieve them.

Table 13.2.1 Objectives and Development Strategies of SUDMP

	Statement	Description
Objective	<i>Making Cairo a better city for all the people to live in</i>	- Outcome of the continuous growth and sustainable development of the Study Area has to be enjoyed not by a limited number of people with good means of livelihood, but equally by all the people including those with limited means of livelihood with a fair share for all.
	<i>Making Cairo a more prosperous city with strong and diverse economic growth</i>	- In order to attract new businesses and high value industries mainly in NUCs, it is imperative for the Study Area to have a competitive advantage for attracting such businesses and industries, while taking into consideration the national and regional strategic plans.
	<i>Making Cairo with more well-balanced urban structure</i>	- Excessive population concentration in the main agglomeration needs to be remedied by converting to a multi-polar urban structure. Urban development will be integrated and incorporated with the urban transport network into a single format to encourage reshaping of the urban structure.
	<i>Making Cairo a more environmentally-friendly city</i>	- Green and open spaces are limited and dispersed in the main agglomeration, and agricultural lands extend in the outskirts along the bountiful River Nile that runs through the Study area. - The environmental potential needs to be managed fully for the attractive townscape and amiable urban environment for the people in the Study Area. Infringement of urban development on the agricultural areas needs to be controlled, as these agricultural areas are the precious green area of the Study Area.
	<i>Making Cairo a well planned city</i>	- To realize the sustainable development of the Study Area, the master plan needs to be duly implemented by the responsible authorities. Urban planning laws and their enforcement system need to be strengthened so as to form the city into the preferable shape. - The Study Area has plenty of historical, cultural and natural resources that make the city beautiful and attractive with unique townscape for tourists and citizens alike. More efforts should be made to maintain, preserve and utilize these resources to make the townscape more attractive.
Development Strategy	<i>Providing affordable housing adequately and upgrading neighborhood environment</i>	- A range of supply side issues needs to be addressed such as the supply of more affordable housing, improvement of informal areas and a better quality of living environment by upgrading of informal areas.
	<i>Providing intensified development for international business/industry</i>	- Urban development needs to create the business environment for promoting the international competitiveness by providing the new candidate sites for their activities in new urban communities, taking into consideration the infrastructure and traffic conditions. The efforts will be also made for the tourism sector by encouraging existing potentials of historical assets.
	<i>Creating development cores in combination with public transportation network</i>	- Future scale and phasing of development with the existing capacity is integrated to create multi-polarized urban form with public transportation by integrating main agglomeration and new urban communities.
	<i>Conserving scarce agricultural lands, increasing green spaces and protecting natural environment</i>	- Growth can only be accommodated without encroaching on agriculture land, protection area, and open spaces.
	<i>Strengthening human resource development and urban control for a well-planned city</i>	- Enhancement planning authority is needed to realize urban planning.

Source: JICA Study Team prepared from the Strategic Urban Development Master Plan Study for a sustainable Development of the Greater Cairo Region in the Arab Republic of Egypt, Aug. 2008

13.2.2 Review on the Past Projects conducted by JICA

Japan's development assistance policy for Egypt has set the basic goal of "cooperation for sustainable and comprehensive economic and social development and promotion of stability and development of regional and international communities," which entails the promotion of sustainable economic growth, social inclusion, and education human resources development as a priority area.

Table 13.2.2 Country Assistance Policy for Egypt

Overall Goal: Cooperation for sustainable and comprehensive economic and social development and promotion of stability and development of regional and international communities	
Priority Area 1: Promotion of sustainable economic growth	
Development Issue 1-1: Development of social and economic infrastructure	
Assistance program for electricity infrastructure development and energy saving promotion	
Assistance program for transport development	
Development Issue 1-2: Industry development	
Assistance program for tourism	
Assistance program for private sector development	
Priority Area 2: Promotion of social inclusion	
Development Issue 2-1: Improvement of basic social services	
Assistance program for basic social services	
Development Issue 2-2: Agriculture and rural area development	
Assistance program for irrigation agriculture and rural development	
Priority Area 3: Educational human resources development	
Development Issue 3-1: Education and human resource development	
Assistance program for Japanese style education and human resource development	
Assistance program for public sector reinforcement	
Development Issue 3-2: Human resource development for stabilization of the region	
Assistance program for human resource development in the Middle East	
Assistance program for human resource development in Africa	

Source: JICA Study Team translated from the web page of Country Assistance Policy for Egypt, Ministry of Foreign Affairs of Japan (<https://www.mofa.go.jp/mofaj/gaiko/oda/files/100153340.pdf>)

JICA's cooperation for the GCR typically has a track record in urban transportation represented by the development of Cairo Metro Line 4, tourism development represented by the construction of the Great Egyptian Museum, and the education sector.

JICA also provided technical cooperation for urban development and transport planning, including the abovementioned SUDMP 2008, Cairo Regional Area Transportation Study (CREATS) in 2002, and the Comprehensive Study on the Master Plan for Nationwide Transport System (MiNTS) in 2012. Based on the plans formulated by these surveys, the Egyptian government has steadily developed the transportation infrastructure and is now implementing the development of Cairo subway Line 4 financed by JICA's loan (Table 13.2.3, Figure 13.2.2).

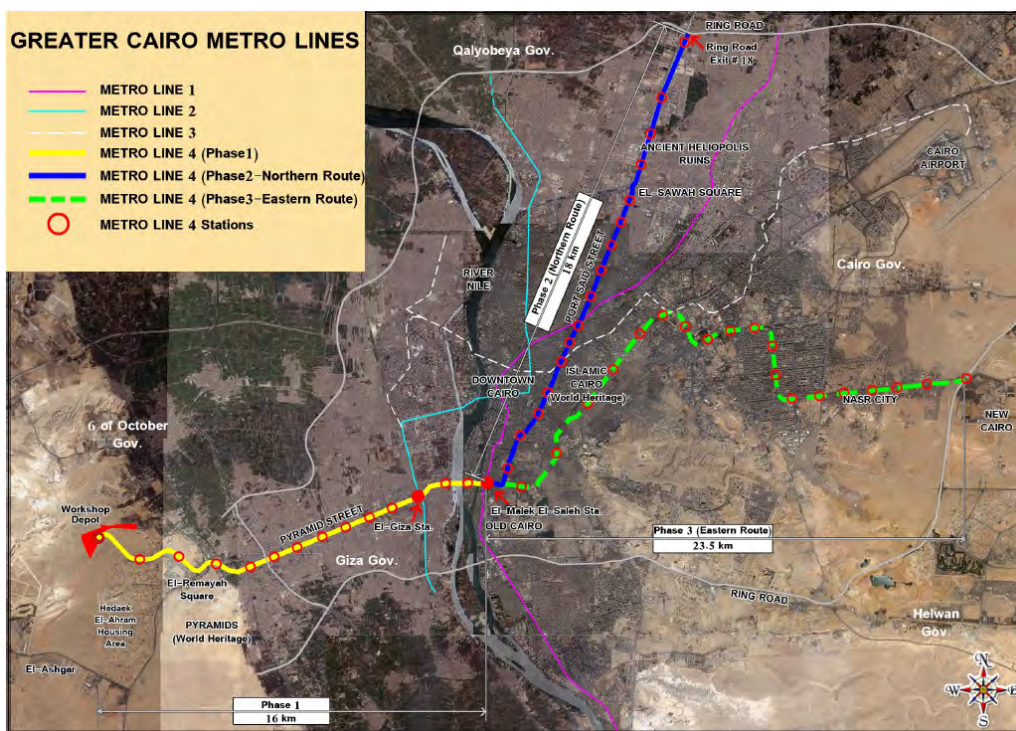
On the contrary, improvement of the urban living environment is not mentioned in the

Country Assistance Policy, and JICA has not implemented any assistance in this sector.

Table 13.2.3 The first Pahse of the Metro Line 4

Loan Agreement Date	March 19, 2012
Loan Amount	JPY32,717 million
Project Purpose	Contribute to the economic development of Egypt by responding to increasing traffic demand and alleviating serious traffic congestions through construction of a metro in the Southeast GCR.
Implementation Body	National Authority for Tunnel (NAT)
Length	Approx. 17 km, 16 stations

Source: JICA Study Team

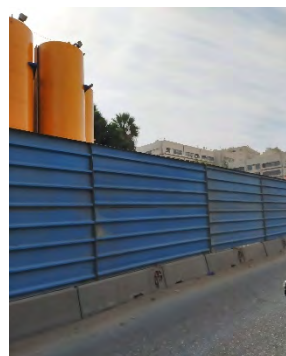


Note: The line colored in yellow indicates target alignment of Metro Line 4.
 Source: JICA Design Study for Greater Cairo Metro Line No.4 Phase I Project

Figure 13.2.2 Route Map of Cairo Metro Line 4



Metro station under construction adjacent to the Pyramids (February 2022)



Construction site along El Haram Street (February 2022)

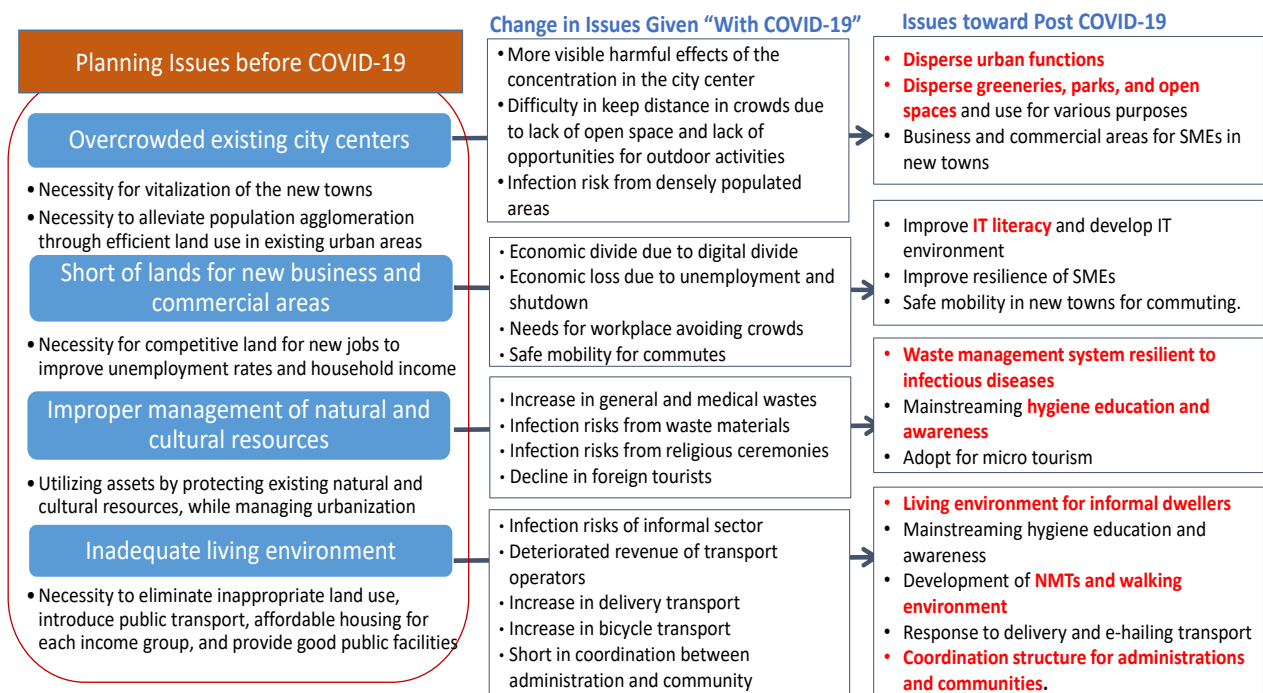
13.2.3 Direction of Urban Development Given the New Neighborhood and 5 Agenda

Figure 13.2.3 shows how the existing urban issues in the GCR have changed due to COVID-19.

Congestion has become a major challenge in avoiding infectious diseases in existing urban areas. Green spaces and parks have become more important in terms of the living environment during the lockdown period and voluntary isolation. The lack of commercial areas, which had been an obstacle for urban economies in GCR even before the pandemic, has widened economic disparity more seriously due to COVID-19 and the consequent lockdown measures. In particular, the availability of IT tools affects economic activities, which can further widen the economic gap.

The long-lasting issue of improper management of natural and cultural resources has further become a serious problem due to increased waste volume and a dive in tourism during the pandemic. GCR has faced new issues on how to preserve and effectively utilize natural and cultural assets while avoiding contagion.

Lastly, the inadequate living environment became ever more severe after the arrival of COVID-19, especially in the congested living areas, including slum areas.



Source: JICA Study Team

Figure 13.2.3 Changes in the Urban Issues toward Post-COVID-19

Table 13.2.4 summarizes the direction of urban development to meet these new urban issues along the five agendas based on the New Neighborhood concept.

Table 13.2.4 Direction of Urban Development based on New Neighborhood Concept

	Post COVID-19 Five Agenda	Focus Areas in GCR
1	Urban Structure	<ul style="list-style-type: none"> <input type="checkbox"/> Strengthen NUCs: improve living environment (amenity, community), securing job opportunities (commercial areas for SMEs), mobility (walkability, access to city center) <input type="checkbox"/> Improve existing urban areas: on-site slum improvement, green, open, and park spaces, solid waste management, utilization of relocation site
2	Mobility	<ul style="list-style-type: none"> <input type="checkbox"/> Sustain and improve public transport network <input type="checkbox"/> NMTs improvement: pedestrian path, bicycle path <input type="checkbox"/> Mobility within NUCs: pedestrian, public transport <input type="checkbox"/> Transport system compatible with delivery service and ride hailing transport
3	Urban Society/Community	<ul style="list-style-type: none"> <input type="checkbox"/> Strengthen roles of community on urban development: develop coordination system among NGOs, communities, and Governorates, <input type="checkbox"/> Involvement of community on urban development project
4	Inclusive/Universal Access	<ul style="list-style-type: none"> <input type="checkbox"/> Resilient livelihood for urban poor (business trainings for SMEs, ecosystem for startups, financial inclusion; insurance, etc., and IT trainings) <input type="checkbox"/> Municipal solid waste management system that is resilient to infectious diseases <input type="checkbox"/> Hygienic living environment (slum upgrading, development of mortgage finance market and regulation)
5	Urban Management	<ul style="list-style-type: none"> <input type="checkbox"/> Promote IT prevalent society: tracking system, e-government (permit, documents), Fin-techs <input type="checkbox"/> Planning handbook revision: community involvement, social facility development

Source: JICA Study Team

In order to improve living environment of existing high-dense urban areas, it is inevitable to realize “Deconcentrated and Connected City,” which requires (i) development of NUCs to accommodate increased population and to mitigate population density in the central area and (ii) living environment improvement of the existing urban areas.

Mobility improvement is one of the most important issues both in NUCs and existing residential areas. It requires a comprehensive approach such as public transport service improvement, non-motorized transport (NMT) and pedestrian environment, and provision of new mobility services such as shared cycling.

COVID-19 reaffirmed the role of the community to provide necessary support in an emergency. The role of the community needs to be strengthened so that each neighborhood area can be managed and maintained sustainably. In NUC, it is necessary to build local communities, while it is important to involve the existing community and people in O&M activities of the area.

From the perspective of Inclusive / Universal Access, resilience to infectious diseases can be strengthened by improving the livelihood resilient to external shocks and improving the sanitary environment, especially for areas in poor conditions. Promotion of the use of ICT is inevitable to strengthen urban management to realize the concept of a new neighborhood. It requires coordination with the private sector, particularly start-up business, which is active in Egypt.

13.2.4 Concept of Urban Development Programs

Based on the preceding matrix, JICA Study Team formulates a possible program that comprehensively captures the five agendas, incorporating the concept of the new

neighborhood in post-COVID-19, proposed in Chapter 4.

Post COVID-19, 5 Agenda					Indicative Scope	
1 Urban Structure	2 Mobility	3 Urban Society Community	4 Inclusive Universal Access	5 Urban Management		
✓	✓	✓	✓	✓	⇒	(1) Improvement of living environment in the existing urban areas Improvement of Existing Urban Area
	✓	✓	✓	✓	⇒	(2) Development of NMT in GCR <small>Covered by Update of Transport MP</small>
✓	✓	✓	✓		⇒	(3) Development of living environment toward Low Carbon City in NUCs Enhancement of New Town Development

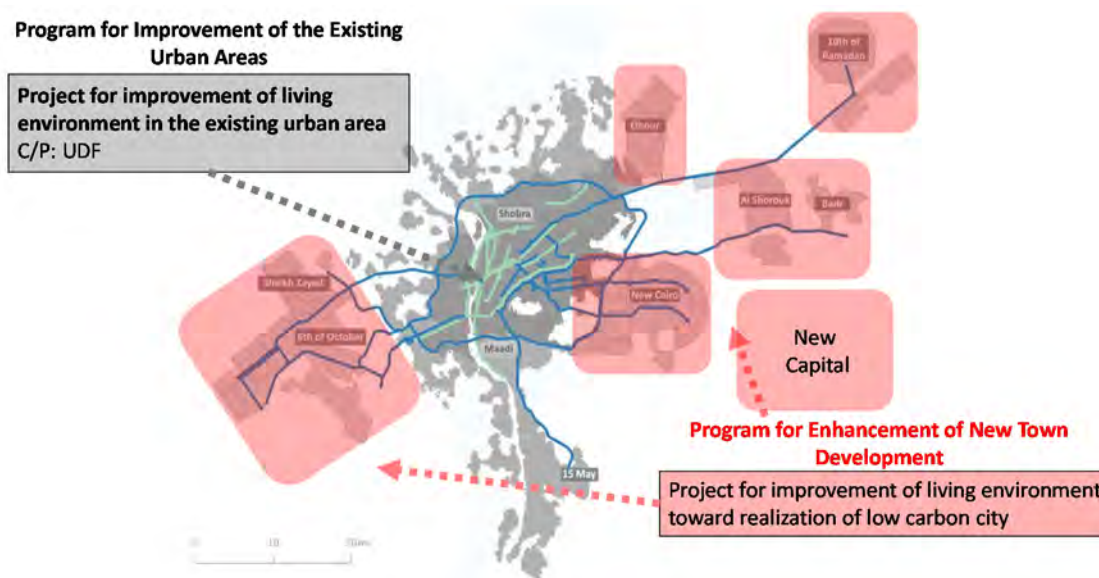
Source: JICA Study Team

Figure 13.2.4 Proposed Programs Built on Five Agenda

Since the second program, “NMT development,” is under the responsibility of GOPP, it is proposed to integrate it into the future JICA technical assistance on updating the transportation master plan study.

13.3 Proposed JICA Cooperation Projects

The CUIREP Study Team had a series of intensive discussions with relevant government agencies of Egypt over the preceding program concepts, which concluded in the two proposed projects: (i) project for mobility improvement in the existing urban areas and (ii) project for the development of low carbon city in New Urban Community (NUC).



Source: JICA Study Team

Figure 13.3.1 Indicative Cooperation Projects

13.3.1 Project for Mobility Improvement in the Existing Urban Area

1) Background of the Existing Urban Areas

The Egyptian government has implemented several projects to relocate the dwellers in slum areas in unsafe conditions. However, various issues rooted in the existing urban areas remain as they are. Urban problems in such a congested living environment include a deteriorating hygienic environment due to inappropriate solid waste management and a poor pedestrian environment with a narrow street, which had been observed even before the pandemic. On the other hand, narrow streets can be used as common open spaces and for local economic activities. Improvement measures to take advantage of such local conditions are required, such as the use of a small 3-wheeler which can run along narrow streets.

During the COVID-19 pandemic, those congested existing urban areas have faced difficulty maintaining accessibility to urban services, such as medical, educational, commercial, and public transport, as well as keeping social distance within an area. Typically, in slum areas such as Manshiyet Nasser, infection prevention measures cannot be taken due to a lack of basic infrastructures such as water supply, sanitation facilities, and medical facilities. There are areas isolated from the outside.



Densely populated residential areas of El-Zaraeb, Manshiyet Nasser (October 2021)



Geographically isolated area of Manshiyet Nasser (October 2021)

Source: JICA Study Team

Figure 13.3.2 Slum of Manshiyet Nasser



Commercial vehicle running through the narrow street in Shubra El-Kheima



Median strip covered up with a garbage pile hindering pedestrians in Shubra El-Kheima

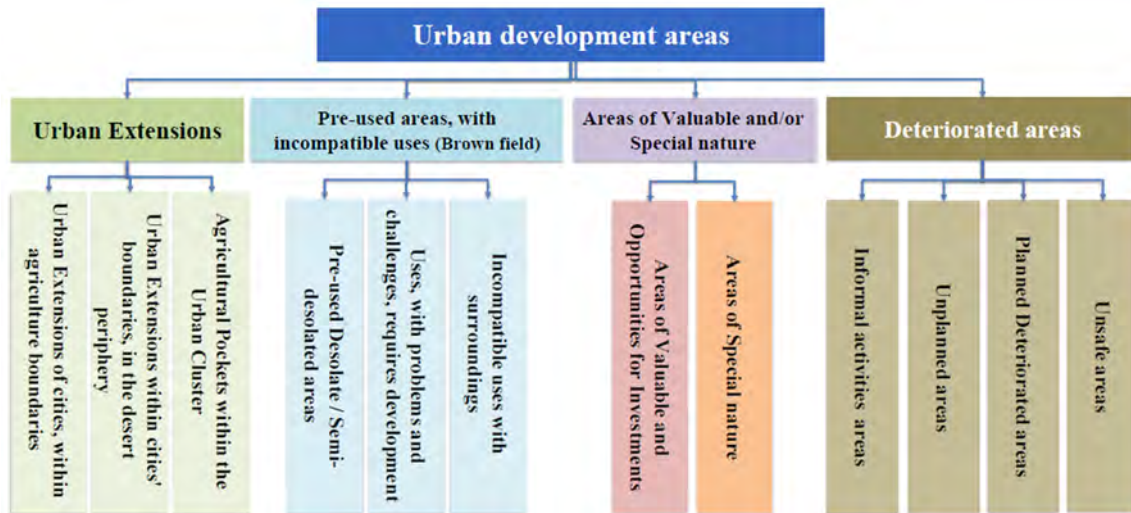
Source: JICA Study Team

Figure 13.3.3 Road conditions of Shubra El-Kheima

In such highly congested existing residential areas, it is quite difficult to conduct new construction projects, such as open space development or widening of existing roads. In order to improve residential mobility in such areas, a comprehensive approach is inevitable. It includes not only physical improvement such as pedestrian path improvement, but also traffic regulation such as speed limit, one-way operation, restriction of through traffic, various public transport services with small size vehicles, and urban design improvements such as green roads and urban furniture installment.

2) **Urban Development Fund (UDF)**

The government agency responsible for improving the living environment of these existing urban areas is the Urban Development Fund (UDF), which belongs to the Office of the Prime Minister. UDF was established in 2021. Its predecessor organization was the ISDF in charge of developing the informal settlement area. While ISDF's scope of work covers deteriorated areas, including the unsafe and unplanned, the UDF has expanded into historical area conservation and urban expansion area. Furthermore, UDF is now possible to invest can invest in private real estate development projects and own the land and building and use the business income for other projects UDF. On the other hand, UDF had a shortage of personnel and technical capacities to respond to such expanded scope of work.

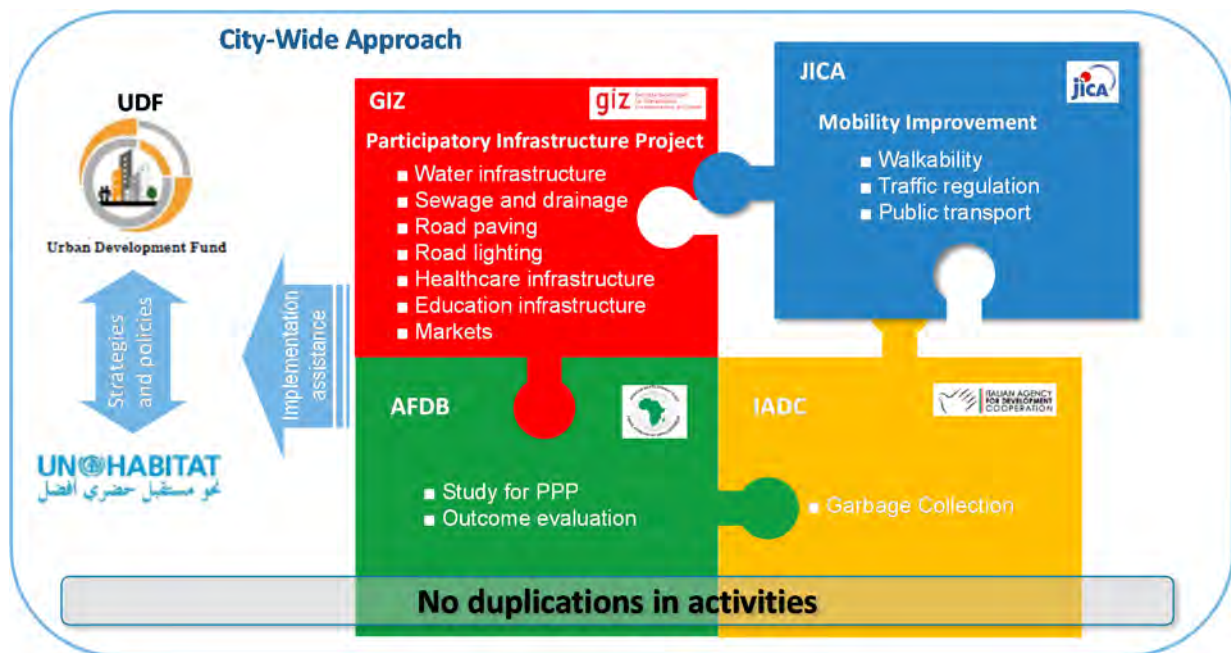


Source: UDF

Figure 13.3.4 Scope of Work of UDF

UDF has worked with various donor agencies. UN-Habitat assists it in policy development with a coordination mechanism named City-Wide Approach, under which the Participatory Infrastructure Project (PIP) by German Agency for International Cooperation (GIZ), the public-private-partnership (PPP) scheme developed by African Development Bank (AFDB), and the waste collection system development by Italian Agency for Development Cooperation (IADC) are implemented.

UDF has a policy to improve the connectivity of congested existing urban areas with surrounding areas. However, few projects have been conducted in the transport sector or mobility improvement. Therefore, mobility improvement can be a potential area for future JICA projects, where JICA could use its experience in the past transport projects in the GCR (Figure 13.3.5).



Source: JICA Study Team

Figure 13.3.5 Contribution from JICA

3) Overview of the Proposed Project

Background and Project Purpose: Given this background, a technical cooperation project of living environment improvement through mobility improvement in the densely populated residential areas. It includes pedestrian improvement, traffic regulation, and public transport service improvement in the transport sector and green corridor urban furniture development, and future urban redevelopment in the urban sector. It will establish an area management committee comprising relevant stakeholders, including citizens, and the local community, expected to ensure future O&M in the area. All these activities will be summarized in the guidelines, which can be disseminated to other areas by UDF in the future.



Source: JICA Study Team

Figure 13.3.6 Contribution from JICA

Project Purpose and Output: Project purpose, outputs, and activities (draft) are summarized below:

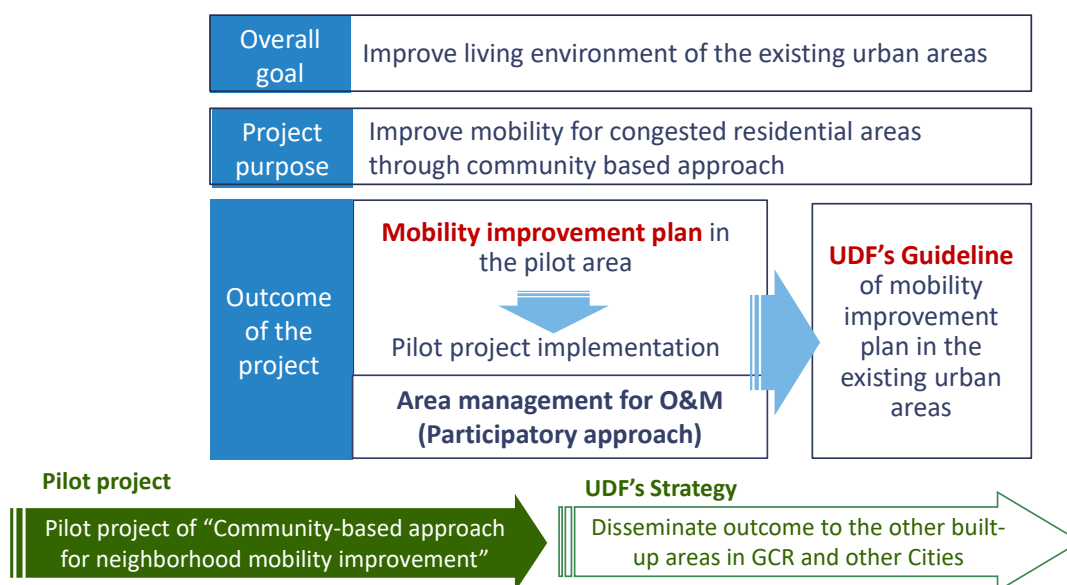
Project Purpose: to improve mobility in the existing urban areas

Output 1: Mobility improvement plan in the pilot area is formulated

Output 2: Pilot project is selected from the plan (Output1) and implemented.

Output 3: Area management committee is established to conduct Output 1 and Output 2. Future O&M structure is established.

Output 4: Mobility improvement guideline is formulated for further dissemination.



Source: JICA Study Team

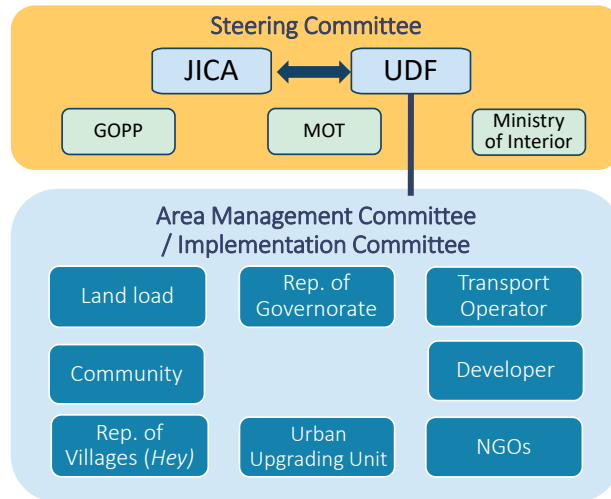
Figure 13.3.7 Overall Framework of the Mobility Improvement Project in the Existing Urban Area

Outcome	Activity
1. Area management committee is institutionalized	1-1 Select Committee members from local government, residents, CBOs, and others 1-2 Create draft TOR of the Committee 1-3 Implement workshops (ex. Problem analysis, roll share between public and private, selection of O&M measure)
2. Mobility improvement plan in the pilot areas is prepared	2-1 Mapping of infrastructure and public services through participatory approach 2-2 Merge collected data with the existing UDF's database 2-3 Implementation plan for pilot projects on walkability, traffic regulations, and small public transport created and authorized
3. Mobility is improved in pilot areas (pilot project implementation)	3-1 Select a pilot project to implement (improving pedestrian paths, execute traffic regulation, or pilot project of small public transport) 3-2 Implement pilot project
4. Capacity of UDF in improving mobility through community based approach is developed	4-1 Assist UDF staff in facilitating community, institutionalize committee, management of pilot projects, and coordination with local governments 4-2 Compile results of the Output 1 to 3 into guidelines applicable for the whole GCR 4-3 Training on walkability, traffic regulation, and small mobility in Japan (Study tour).

Source: JICA Study Team

Figure 13.3.8 Output and Activities of Mobility Improvement Project in the Existing Urban Area

Implementation Structure: In addition to the Steering Committee or Joint Coordinating Committee with UDF and major national agencies, it is important to establish an area management committee where local stakeholders are involved. The agenda to be discussed in the area management committee is to identify local mobility issues, formulate a mobility improvement plan, select a pilot project, and agree on the O&M structure in the area. Through those discussions, it is expected to continuously expand its role in the future, such as cleaning the site, maintenance of facilities, revision of the local traffic rule, etc.



Source: JICA Study Team

Figure 13.3.9 Project Implementation Structure (draft)

The candidate pilot project comprise walkability improvement, traffic regulations, and public transport improvement, of which examples are shown in Figure 13.3.10.



Source: Active Urban Plan and Design Guide, Kurihiro Hino, School of Engineering, the University of Tokyo (Picture right above and middle), Website of Musashino City (Picture right bottom) (http://www.city.musashino.lg.jp/kurashi_guide/norimono_chuurin_chuusha/mu_bus/1005137.html)

Figure 13.3.10 Candidate of Pilot Project Implementation

4) Target Pilot Area and Relevance of JICA’s Assistance

Through discussions with UDF, certain areas under the jurisdiction of UDF in Giza Governorate were identified as candidate project sites based on the criteria of high population density and poor accessibility to urban services.

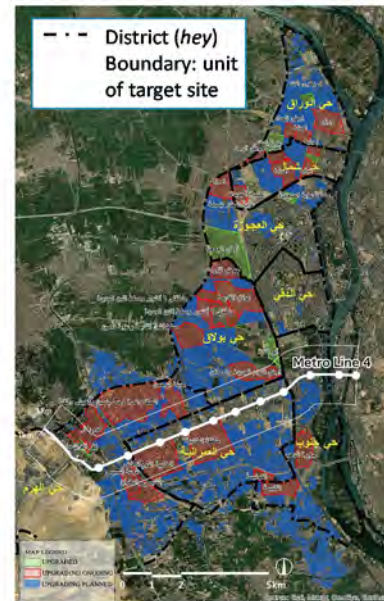
As stated previously, the Metro Line 4 project financed by JICA is now being implemented in Giza Governorate. If accessibility to the mass transit station can be covered in the mobility improvement plan, synergy effects are expected (Figure 13.3.11). Moreover, the prospective project to update the Urban Transport Master Plan in cooperation with the General Office for Physical Planning (GOPP) will formulate a metropolitan-wide plan, which can be coordinated with a district-level mobility improvement plan through a bottom-up approach.

□ Selection of Target Area

Congested residential areas where there is no good access to the urban amenities such as;



- Expected synergy effect with the on-going **Metro Line 4 construction**
- Possible cooperation with **GCR transport master plan preparation** (JICA's another possible cooperation with GOPP)



Source: JICA Study Team

Figure 13.3.11 Synergy Effects wit JICA's Other Projects

13.3.2 Improvement of the Living Environment toward the Realization of Low Carbon City

The Government of Egypt will host the 27th Conference of the Parties (COP27) to the United Nations Framework Convention on Climate Change (UNFCC). It is highly interested in addressing climate change and has expressed its commitment to promoting renewable energy and electric vehicles. For the urban sector, it is highly motivated to promote sustainable urban development such as low-carbon cities, the extension of metro lines, and green cities.

The New Urban Community Authority (NUCA), which is in charge of New Urban Community development, has also been advocating for NUC to become a Smart City and low-carbon city, based on the government policy mentioned above. It is actively promoting the introduction of renewable energy such as solar power. NUC, located in a desert, is required to develop green areas to mitigate rising temperatures and provide a comfortable living environment. In this connection, the limited capacity of the water treatment plants that distribute water within the NUC does not ensure sufficient water for maintaining green areas, and facilities for more efficient water recycling using wastewater are required.

CUREIP focuses on both self-sustaining satellite city development and redevelopment of existing urban areas as the two key elements for a resilient city in the GCR. To form a self-sustaining satellite city, a low-carbon city development project is proposed, which includes developing a public transportation system and introducing water circulating distribution facilities in the NUC.

Table 13.3.1 Project for Development of the Low Carbon City in New Urban Community (NUC)

Target Area	A NUC on planning phase
Candidate C/P	NUCA, GOPP
Scheme	Loan, preparatory survey, technical cooperation attached to loan
Purpose	Establish a low carbon city toward independent satellite city forming a resilient GCR through development of a water distribution system with a water circulation facilities and public transport systems in NUCs
Scope	<p>(First phase: Preparatory survey)</p> <ul style="list-style-type: none"> · Reviewing the development plan of NUC and progress of implementation · Collecting information on the living environment of certain area's status of infrastructure, green areas, water supply and sewage systems, mobility, and community · Identifying the scope of assistance <p>(Second phase: Implementation phase)</p> <ul style="list-style-type: none"> · Water environment improvement: Building a water reuse system with a combination of on-site wastewater treatment plants and concentrated wastewater treatment plants · Build greenery networks and a reused water distribution system · Develop public transport system and traffic nodes by a pilot project
Remarks	A possible project for upgrading the transport master plan will also address the issue concerning the last one mile as a part of the transport network development plans, although it is not limited to the NUCs. Continued considerations on the possibility of incorporating some elements of this proposal are required.

Source: JICA Study Team

13.3.3 Other Urban Issues and Directions of Prospective Responses

The two preceding proposed projects were selected as high-priority projects and projects that can utilize JICA's strengths after discussions with the Egyptian government agency and UN-Habitat. However, many issues need to be addressed, as shown in Table 13.3.2.

Table 13.3.2 Other Urban Issues and Indicative Measures

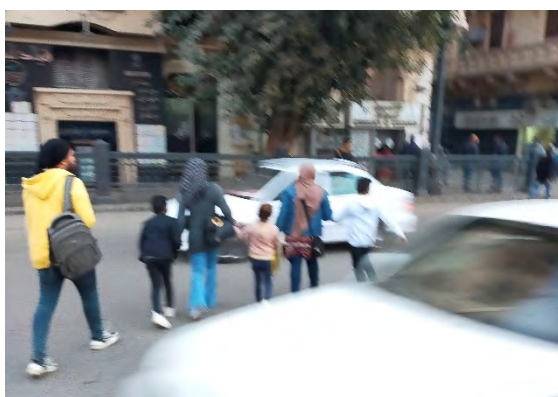
Issue	Background	Direction of measure	Remarks
Underdeveloped NMT environment in the existing urban areas	Pedestrians commonly cross boulevards, while cars and pedestrians are mixed even on narrow streets. Traffic accident rate is high.	<ul style="list-style-type: none"> · Development of NMT, ex., bicycle path, bicycle parking lot, sidewalk, pedestrian crossing, etc. in the area in front of the station · Temporary prohibition of car entry, public space use of road space, education, awareness to citizens, etc. 	Possibility to reflect the likely upgrading of the transport MP
Short of workplaces in the NUCs	Former slum residents have been relocated to NUCs as part of the government's slum relocation project, but there are shortages of workplaces, commercial facilities, and public transport.	<ul style="list-style-type: none"> · Survey on the NUC's existing plans, guidelines, facilities, communities, and mobility · Assistance in creating a development plan for a new relocation site (business land, public market, livelihood improvement support) 	Note those as issues from a long-term perspective

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1) Underdeveloped NMT Environment

In Cairo, with an estimated modal share of walking at 30%, it is common to see many pedestrians around downtown or Metro stations. However, in GCR, the pedestrian paths with adequate width or crossing equipment such as traffic lights and pedestrian crossing are almost non-existent. The safety of pedestrian and cyclists are not secured. NMT environment, including cyclists, is a cross-cutting issue in the urban transport sector, although the proposed project in the preceding section 13.3.1 has already addressed the issue of walkability.

During the pandemic, the importance of NMT as a means of transport while avoiding denseness in the living area was reaffirmed. In addition, the construction of the subway currently underway in Cairo may further increase the number of pedestrians accessing the station, and there is a pressing need to improve the walking environment at transportation hubs. Moreover, the GOPP is interested in the concept of a Healthy City, enabling the improvement of the health of citizens by regulation and guidance for land use, so the NMT environment development is relevant as well as a priority of the Government of Egypt. If discussions on NMT development can be addressed in a possible comprehensive transport MP in the next year, the MP will be able to address a more concise and all-encompassing transport system from axle transportation to NMT, thus making it possible to enjoy synergistic effects.



Mother and children attempt to cross the boulevard. Despite the high share of walking, GCR is short of pedestrian environment. (February 2022)

Source: JICA Study Team



Crossing facilities are short and many pedestrians make way through running cars in Al-Azhar Street penetrating the historic area (February 2022)

Figure 13.3.12 Pedestrian Environment in GCR

2) Short of Workplaces in NUCs

The government's report⁴ shows NUCs, which has become a host of the ever-increasing population of GCR, faces issues such as shortage in public transportation service, commercial land, employment opportunities, and markets and division of communities. In particular, residents who have been relocated from slums often found themselves without the opportunity to work in NUCs, so there are reported cases where they returned to their

⁴ ISDF, "mashrue tawthiq 'aemal sunduq tatwir almanatiq aleashwayiya (The Project to Document; the Works Executed by the Slums Development Fund)," October 2018

original residential areas. On the other hand, the NUC is laid out in an automobile-oriented fashion and is short on public transportation systems, so the means of transportation for people who cannot afford a car are quite limited. It is worth highlighting that securing job opportunities, as well as infrastructures and public services in NUCs, is critically important and should be considered in the long run.



A uniform look of Asmarat. According to some residents, incidents of thefts and pickpockets are often, and residents from different communities are distrustful. (October 2021)



One of the few shops in Asmarat. The district has almost no workplaces and people are unemployed or work in the surrounding area or in the city center, but transportation is limited. (October 2021)

Source: JICA Study Team

Figure 13.3.13 Residential Areas for Relocated Former Slum Dwellers