

**DATA COLLECTION SURVEY ON IMPROVING
ROAD-BASED PUBLIC TRANSPORT SYSTEM
IN METRO MANILA,
REPUBLIC OF THE PHILIPPINES**

FINAL REPORT

APRIL 2022

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

**ALMEC CORPORATION
ORIENTAL CONSULTANTS GLOBAL CO., LTD.**

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TABLE OF CONTENTS

SUMMARY

1. INTRODUCTION	1-1
1.1 Background	1-1
1.2 Study Overview	1-2
1.3 Study Team	1-3
1.4 Study Implementation	1-3
2. CURRENT SITUATION AND ISSUES ON ROAD-BASED PUBLIC TRANSPORT SYSTEM IN METRO MANILA	2-1
2.1 Socio-economic Characteristics	2-1
2.2 Existing Road-based Public Transport Systems.....	2-4
2.3 Characteristics of the Demand Forecasting Database in Metro Manila.....	2-14
2.4 Summary of the Issues on Road-based Public Transport System in Metro Manila ..	2-19
3. CURRENT SITUATION AND ISSUES OF PUBLIC ROAD TRANSPORT RELATED AGENCIES	3-1
3.1 Basic Information of PUV related Agencies.....	3-1
3.2 Current Situation of PUV related Agencies and Their Issues	3-6
4. CURRENT SITUATION AND ISSUES OF BUS OPERATORS.....	4-1
4.1 Current Status of Bus Operators Operating in Metro Manila.....	4-1
4.2 Analysis of Questionnaires and Interviews with Bus Operators	4-2
4.3 Organizing Issues faced by Bus Operators	4-12
5. CURRENT SITUATION AND ISSUES ON INTERMODAL TRANSFER FACILITIES	5-1
5.1 Current Situation of Intermodal Transfer Facilities	5-1
5.2 Relevant Laws and Regulations.....	5-7
5.3 COVID-19 Reponses at Intermodal Transfer Facilities.....	5-13
5.4 Issued on Intermodal Transfer Facility Development	5-16
6. IDENTIFICATION OF NEEDS FOR ICT IMPLEMENTATION IN PUBLIC TRANSPORTATION AND ITS APPLICABILITY.....	6-1
6.1 Level of IT literacy and Acceptance of IT Services among Bus Users.....	6-1
6.2 Status of ICT Adoption by Bus Operators and Their Needs	6-4
6.3 ICT Applicability in Public Transportation	6-7
7. PROPOSAL ON POSSIBLE SOLUTION FOR ROAD-BASED PUBLIC TRANSPORT	7-1
7.1 Concept Plan to Solve the Issues	7-1
7.2 Proposed Short-term Actions	7-6
7.3 Conclusions.....	7-10

Appendix 1: Results of Questionnaire Survey for Bus Operators

Appendix 2: Results of Questionnaire Survey for Bus Users

Appendix 3: Proceedings of Workshop

LIST OF TABLES

Table 1.3.1	Study Team Composition	1-3
Table 1.4.1	Meeting List.....	1-3
Table 1.4.2	Survey Conducted by JICA Study Team	1-3
Table 2.1.1	No. of Families, Annual Family Income and Expenditure in Metro Manila, 2018	2-1
Table 2.1.2	Registered Motor Vehicles by Type, by Region in 2020 (1,000 vehicles).....	2-2
Table 2.2.1	No. of PUJ Units Owned by an Operator (2016)	2-7
Table 2.2.2	Transport Sector Project of DOTr in Metro Manila.....	2-13
Table 2.3.1	Outlines of MUCEP 2 Study.....	2-15
Table 2.3.2	No. of Transit Lines Recorded in the MUCEP 2 Database	2-17
Table 3.1.1	List of Transport related Offices in LGUs	3-5
Table 3.2.1	Tasks of PUV related Agencies at Central Level	3-6
Table 3.2.2	Self-Assessment of RTI for Planning/Design of Public Transportation Facilities.....	3-6
Table 3.2.3	Possible Data Sources.....	3-7
Table 3.2.4	No. of Technical Staff in PPDO by Educational Background	3-7
Table 3.2.5	Self-Assessment of PPDO Planning/Design of Public Transportation Facilities	3-7
Table 3.2.6	Self-Assessment of PPDO for Public Transportation Regulation	3-8
Table 3.2.7	Self-Assessment of PPDO for Public Transportation Monitoring and Evaluation.....	3-8
Table 3.2.8	No. of Technical Staff in LTFRB by Educational Background	3-9
Table 3.2.9	Self-Assessment of LTFRB Planning/Design of Public Transportation Facilities	3-9
Table 3.2.10	Self-Assessment of LTFRB for Public Transportation Regulation	3-9
Table 3.2.11	Self-Assessment of LTFRB for Public Transportation Management.....	3-10
Table 3.2.12	Self-Assessment of LTFRB for Public Transportation Monitoring and Evaluation	3-10
Table 3.2.13	Self-Assessment of LTO for Public Transportation Regulation.....	3-11
Table 3.2.14	No. of Staffs at LTO by Status of Appointment	3-11
Table 3.2.15	Self-Assessment of DPWH for Planning/Design of Public Transportation Facilities	3-12
Table 3.2.16	Staff Number of the Department/Group by Contract Type.....	3-13
Table 3.2.17	Self-Assessment of MMDA for Planning/Design of Public Transportation Facilities	3-13
Table 3.2.18	Self-Assessment of MMDA for Public Transportation Regulation.....	3-14
Table 3.2.19	Self-Assessment of MMDA for Public Transportation Monitoring and Evaluation	3-14
Table 3.2.20	Budget of DOTr (2018–2022).....	3-15
Table 3.2.21	Key Appropriations by Program under Office of the Secretary, DOTr (2018–2022)	3-15
Table 3.2.22	Budget under Land Public Transportation Program (2018–2022).....	3-16
Table 4.2.1	Overview of Bus Operators Operated in Metro Manila	4-1
Table 4.2.1	Company Profile of Operators Responded (FY 2020).....	4-2
Table 4.2.2	Income and Expenditure of the Operators Surveyed.....	4-3
Table 4.2.3	Outline of “FILIPINO DRIVER’S MANUAL”	4-6
Table 4.2.4	Implementation Status of Post-employment Training	4-6
Table 4.2.5	No. of Operators Providing Guidance from Driver or Conductor	4-8
Table 4.2.6	Items of Equipment of Bus Vehicle (No. of Operator).....	4-9
Table 4.2.7	No. of Operators with Gender-related Employment Practices.....	4-10
Table 4.3.1	Organizing Issues Faced by Bus Operators (Summary)	4-12
Table 4.3.2	Outline of Central PUV Monitoring System.....	4-13

Table 4.3.3	Outline of Public Transport Information Management Center	4-19
Table 5.1.1	Profile of PITX and VGC	5-1
Table 5.1.2	Surveyed Stations for Walkability Assessment	5-2
Table 5.1.3	Summary List of Road Infrastructure Facilities	5-5
Table 5.2.1	Profile of PITX and VGC	5-7
Table 5.3.1	Guidelines on Transportation by Community Quarantine Measures	5-13
Table 5.3.2	Examples of Measures by Public Transport Operators	5-15
Table 6.1.1	Comparison of Internet Usage Time by Country.....	6-1
Table 6.1.2	Breakdown of Internet Use in the Philippines	6-1
Table 7.1.3	Roadmap for Increasing Accessibility to Road-based Public Transport.....	7-2
Table 7.1.1	Roadmap for Assuring the Safety and Security of Road-based Public Transport Passengers	7-4
Table 7.1.4	Roadmap for Adding Better Amenities to Road-based Public Transport Services ..	7-5
Table 7.1.5	Roadmap for Strengthening the Capacity of Road-based Public Transport related Agencies.....	7-5
Table 7.2.1	List of Technologies and Systems that can be Introduced (DRAFT).....	7-8
Table 7.3.1	Proposed Programs	7-10

LIST OF FIGURES

Figure 1.2.1	Transport Network in Metro Manila.....	1-2
Figure 2.1.1	Average Annual Family Income by Region at Current Prices: 2018 and 2015.....	2-1
Figure 2.1.2	Change of the Registered Motor Vehicles in NCR and the Philippines by Type, 2010, 2015, and 2020	2-2
Figure 2.1.3	Change of the Private Vehicle Ownership Ratio in the Philippines and NCR.....	2-3
Figure 2.1.4	Change of Annual Average Daily Traffic of MMDA Traffic Count Stations	2-3
Figure 2.2.1	Public Transport Network in Metro Manila	2-4
Figure 2.2.2	Fare Structure of the Road Based Public Transport Services	2-4
Figure 2.2.3	Bus Fleet of Premium P2P in Metro Manila	2-5
Figure 2.2.4	EDSA Bus Carousel	2-6
Figure 2.2.5	Traditional Jeepney	2-7
Figure 2.2.6	Electric Jeepney (E-Jeepney)	2-7
Figure 2.2.7	UV Express Fleet.....	2-8
Figure 2.2.8	Tricycle in Metro Manila (Quezon City)	2-9
Figure 2.2.9	E-Trikes Distributed by the DOE to LGUs	2-9
Figure 2.2.10	No. of Vehicles involved in Traffic Accidents in Metro Manila by Vehicle Type (2010–2019).....	2-10
Figure 2.2.11	No. of Buses and Jeepneys involved in Traffic Accidents in Metro Manila by Accident Type (2010-2019).....	2-10
Figure 2.2.12	People’s Evaluation on Road-based Public Transport in Metro Manila	2-11
Figure 2.2.13	Reasons of Using Private Cars in Metro Manila (Dry-run Result).....	2-12
Figure 2.3.1	Four-Step Model.....	2-14
Figure 2.3.2	Traffic Volume on the Existing Road Network—Based on Traffic Model, as of 2017	2-14
Figure 2.3.3	Transit Network Data.....	2-15
Figure 2.3.4	Transit Network Developed in MUCEP2 Study	2-18
Figure 3.1.1	Organization Chart of PPDO of DOTr	3-1
Figure 3.1.2	Organization Chart of RTI of DOTr.....	3-2

Figure 3.1.3	Organization Chart of LTFRB	3-2
Figure 3.1.4	Organization Chart of LTO.....	3-2
Figure 3.1.5	Organization Chart of DPWH	3-3
Figure 3.1.6	Organization Chart of MMDA	3-4
Figure 4.2.1	Online Interview with Operator.....	4-2
Figure 4.2.2	Flow at the Time of a Road Crash (Traffic Accident) (Image)	4-5
Figure 4.2.3	Information Dissemination by Bus Operator	4-7
Figure 4.3.1	Pictures on Safety Recorder (Image).....	4-13
Figure 4.3.2	Central Monitoring Center	4-14
Figure 4.3.3	Bus Education and Training Program in Japan.....	4-16
Figure 4.3.4	Map of where Near Miss Occurred (Image)	4-17
Figure 4.3.5	General Bus Stops in Metro Manila with Little Information Guidance.....	4-18
Figure 4.3.6	Information Dissemination Tools Proposed by PUV Modernization Program	4-19
Figure 5.1.1	Situation of Intermodal Transfer Facilities in Metro Manila	5-2
Figure 5.1.2	Overall Walkability Rating from Candidate Stations.....	5-3
Figure 5.1.3	Walkability Scores of Candidate Stations.....	5-4
Figure 5.1.4	Planned Intermodal Transfer Facilities with Urban Development	5-6
Figure 5.3.1	Road Based Public Transport in 2020 GCQ	5-14
Figure 5.3.2	Infection Control Measures in PITX (as of January 25th 2022)	5-14
Figure 6.2.1	Image of Sakay.ph.....	6-4
Figure 6.2.2	Image of the Beep Card Application.....	6-5
Figure 6.2.3	SWATRide Image	6-6
Figure 6.3.1	Information Service for Users Using Bus Information Platform.....	6-8
Figure 6.3.2	Future Plan of Electronic Payment System.....	6-9
Figure 7.1.1	Contribution of Road-based Public Transport for Traffic Congestion Mitigation	7-1

ABBREVIATION LIST

AADT	Annual Average Daily Traffic
AGM	Assistant General Manager
Asec	Assistant Secretary
AUV	Asian Utility Vehicle
BED	Budget Execution Documents
BP	Batas Pambansa
BRT	Bus Rapid Transit
CAB	Civil Aeronautics Board
CAD	Computer-aided design
CALABARZON	Cavite, Laguna, Batangas, Rizal, and Quezon
CAR	Cordillera Administrative Region
CAVITEX	Manila Cavite Expressway
CBD	Central Business District
CCTV	Closed-circuit Television
CLUP	Comprehensive Land Use Plan
CNG	Compressed Natural Gas
COVID-19	Coronavirus Disease 2019
DILG	Department of the Interior and Local Government
DOE	Department of Energy
DOTr	Department of Transportation
DPF	Diesel Particulate Filter
DPWH	Department of Public Works and Highways
ECQ	Enhanced Community Quarantine
EDSA	Epifanio de los Santos Avenue
EV	Electric Vehicle
FY	Fiscal Year
GA	Government Agency
GCQ	General Community Quarantine
GCR	Greater Capital Region
GDP	Gross Domestic Product
GFI	Government Financial Institution
GIS	Geographic Information System
GPS	Global Positioning System
GRDP	Gross Regional Domestic Product
GTFS	General Transit Feed Specification
HLURB	Housing and Land Use Regulatory Board
HOV	High Occupancy Vehicles
IAct	Inter Agency Council for Traffic
IATF-EID	Inter-Agency Task Force for the Management of Emerging Infectious Diseases
IC	Integrated Circuit
ICT	Information and Communication Technology
IRR	Implementing Rules and Regulations
IT	Information Technology
ITX	Integrated Terminal Exchange
JICA	Japan International Cooperation Agency
LCUTS	Low Carbon Urban Transport Systems
LGC	Local Government Code
LGU	Local Government Unit

LPTRP	Local Public Transport Plan
LRT	Light Rail Transit
LTFRB	Land Transportation Franchising. & Regulatory Board
LTO	Land Transport Organization
MaaS	Mobility-as-a-Service
MARINA	Maritime Industry Authority
MC	Motorcycle
MECQ	Modified Enhanced Community Quarantine
MFO	Major Final Outputs
MGCQ	Modified General Community Quarantine
MIMAROPA	Mindoro Oriental & Occidental, Marinduque, Romblon, and Palawan
MMDA	Metro Manila Development Authority
MMSP	Metro Manila Subway Project
MOU	Memorandum of Understanding
MRT	Manila Metro Rail Transit
MS	Microsoft
MUCEP	Metro Manila Urban Transportation Integration Study Update and Capacity Enhancement Project
MUCEP2	The Route Rationalization Study for the MUCEP Area
MMUTIS	Metro Manila Urban Transportation Integration Study
MV	Motor Vehicle
NCDA	National Council of Disability Affairs
NCR	National Capital Region
NEP	National Expenditure Program
NFC	Near Field Communication
NGO	Non-government Organization
NLEX	North Luzon Expressway
NOx	Nitrogen Oxides
NSCR	North–South Commuter Railway
NTSP	National. Transportation Strategy for the Philippines
OAGMP	Office of the Assistant General Manager for Planning
OD	Origin and Destination
OTC	Office of Transportation Cooperatives
OTS	Office for Transportation Security
P2P	Point to Point
PCG	Philippine Coast Guard
PCU	Passenger Car Unit
PHP	Philippines Pesos
PITX	Parañaque Integrated Terminal Exchange
PNP	Philippine National Police
PNR	Philippine National Railways
PPDO	Planning and Project Development Office
PR	Public Relation
PSA	Philippine Statistics Authority
PTPS	Public Transport Priority System
PUB	Public Utility Bus
PUJ	Public Utility Jeepney
PUV	Public Utility Vehicle
PUVMP	Public Utility Vehicle Modernization Program
PWD	Person With Disability
QR	Quick Response

RRP	Regional Route Plan
RROW	Road Right-of-Way
RTI	Road Transport and Infrastructure
SaaS	Software as a Service
SCABET	Sub-Committee on Accessibilities, Built Environment and Transportation
SCR	Selective Catalytic Reduction
SOCCSKSARGEN	South Cotabato, Cotabato, Sultan Kudarat, Sarangani and General Santos City
STRADA	System for Traffic Demand Analysis
SUV	Sports Utility Vehicle
TC	Tricycle
TCITX	Taguig Integrated Terminal Exchange
TNC	Transport Network Companies
TNVS	Transport Network Vehicle Service
TOR	Terms of Reference
TRB	Toll Regulatory Board
TSC	Transportation Service Cooperative
UNDP	United Nations Development Programme
Usec	Undersecretary
UTS	Utilities, Transportation and Services
UV	Utility Vehicle
V/C	Volume per Capacity
VGC	Valenzuela Gateway Complex

SUMMARY

1. INTRODUCTION

1) Background

1. While urban migration has been concentrating on Metro Manila, the unquestioned insufficient infrastructure has become an urgent issue, which possibly generates economic loss due to traffic congestion. The government aims to encourage the modal shift from private transport, including private cars, to public transport by developing the public transport network focusing on the railway. In order to encourage the modal shift to public transport, improving public road transport services together with railway network development, which is about 70% of what the population in Metro Manila use, is essential. According to the Philippine Development Plan (2017–2022), the modal shift can be encouraged by ensuring (i) accessibility, (ii) availability, (iii) affordability, (iv) adequacy, and (v) convenience and reliability.

2. Although the Department of Transportation (DOTr) and Land Transportation Franchising and Regulatory Board (LTFRB) conducted various programs to mitigate traffic congestion and improve the quality of service of public road transport, many issues remain. It is important to clarify the priority issues that must be solved and formulate strategic approaches.

3. In order to study the measures for the solution of issues, more specific issues need to be determined by collecting comprehensive information on service improvement of existing public road transport operators and safety assurance of public road transport users as well as measures to improve the connectivity between railway and public road transport services.

2) Study Overview

4. The objectives of the Study are to identify the needs and propose improvement measures through conducting the following tasks and discussing with counterpart agencies in the Philippines.

- (i) Collect information on existing public road transport services.
- (ii) Identify the issues on policy formulation and implementation capacity of public road transport-related agencies and capacity of bus operators.
- (iii) Identify the issues on intermodal transfer facilities (station plaza, bus stops, etc.) and pedestrian infrastructures to enhance the connectivity among public transport services, and propose improvement measures.

5. The Study coverage is the entire Metro Manila.

3) Study Implementation

6. The Study was implemented from October 2021 to April 2022. The following coordination activities and surveys were conducted during the Study:

- (i) coordination with the counterpart agencies from the Philippines,
- (ii) workshop to share the results of the Study with stakeholders,
- (iii) bus operator survey and interview to collect the information on bus companies,
- (iv) bus user survey to collect the bus usage and passenger assessment on bus services,
- (v) intermodal transfer facility survey to evaluate the current situation around the LRT or MRT stations, and
- (vi) self-capacity assessment by road-based public transport related agencies.

2. CURRENT SITUATION AND ISSUES ON ROAD-BASED PUBLIC TRANSPORT SYSTEM IN METRO MANILA

1) Socio-economic Characteristics

7. **Population and GRDP.** Metro Manila is composed of one municipality and 16 cities with an area of 620 km² and a population of around 13 million (2020). Its population continues to grow, and suburbanization in adjoining areas has progressed. The urbanized metropolitan area includes adjoining municipalities and has about a population of 22 million, which is forecasted to reach 30 million in 2030. The GRDP in Metro Manila accounts for about 36% of the Philippines' GDP.

8. **Number of Vehicles.** Regarding the number of registered motor vehicles in 2020, Metro Manila had the highest registration for all vehicle types in the entire country. The growth of four-wheeled vehicles has stagnated since 2010, while the number of motorcycles has significantly increased.

9. **Traffic Situation.** Based on the data on annual average daily traffic (AADT) in Metro Manila in 2018, 2019, and 2020 by the Metropolitan Manila Development Authority (MMDA), a decline in traffic volume was observed at some traffic count stations in 2020 compared to previous years, partly due to the emergence of the COVID-19 pandemic. On the other hand, the number of motorcycles has increased that can be attributed to the adoption of several quarantines and travel restrictions in Metro Manila.

2) Existing Road-based Public Transport Systems

10. **Type of Services.** Various road-based public transport services, such as bus, jeepney, tricycle, pedicab, UV Express, and P2P, operate in Metro Manila. Aside from those are taxis, transport network vehicle services, and motorcycle ride-hailing services.

11. **Traffic Accidents.** Based on the Metro Manila Accident Reporting and Analysis System (MMARAS) by MMDA, the share of buses and jeepneys involved in traffic accidents in Metro Manila among the total number of vehicles are 5% and 4%, respectively. The number of jeepneys involved in traffic accidents has been relatively stable at 10,000–11,000, while the number of buses involved increased from 7,633 in 2010 to 10,841 in 2019. Traffic accidents involving buses and jeepneys from 2010 to 2019 have frequently caused property damage.

12. **People's Evaluation.** According to the LRT/MRT Users Survey by a central business district study in 2014,¹ the satisfaction level with road-based public transport services is not high. About 50–60% are not satisfied with the different aspects of the public transport services, particularly the satisfaction level of drivers (i.e., the driver's attitude and driving manner/skills) are lower. On the other hand, a questionnaire survey dry run for Mobility Management conducted in 2019² revealed that convenience and safety or security influence private car users when choosing their travel mode. In other words, these factors need to be improved to encourage shifting to public transport modes.

13. **Transport Sector Project Proposed by DOTr.** On the aspect of funding, the DOTr secured a PHP15.97 billion budget in 2022 for various road transport sector projects nationwide, which also covers the projects in Metro Manila such as the Service Contracting Program, PUV Modernization Program, EDSA Busway Project, Greenways Projects, Metro

¹ The LRT/MRT Users Survey was conducted by the Preparatory Survey on Metro Manila Central Business Districts Transit System Project in the Republic of the Philippines in 2014.

² The Detailed Design Study of the Metro Manila Subway Project in the Republic of the Philippines (JICA).

Manila BRT Line project – Quezon Avenue and Active Transportation Infrastructure and Related Programs.

3) Demand Forecasting Database in Metro Manila

14. The latest person trip survey was conducted for “The Project for Capacity Development on Transportation Planning and Database Management in the Republic of the Philippines (MUCEP)” in 2014 and has been the basis of the traffic demand forecasting database. The demand forecast methodology is an orthodox four-step model. The transit service information is created in a specific format for the modeling software.

15. Currently, the “Route Rationalization Study for the Metro Manila Urban Transportation Integration Study Update and Capacity Enhancement Project (MUCEP Area,” or MUCEP2, is ongoing to conduct a strategic assessment of the road transit network. The main tasks of MUCEP2 are (i) formulation of the Local Public Transport Route Plan (LPTRP) Manual, (ii) updating of MUCEP database and model, (iii) conducting validation survey, (iv) drafting the public transport rationalization plans for the MUCEP Area, (v) mapping, (vi) establishment of a monitoring and updating framework, and (vii) consultation meeting.

4) Summary of the Issues on Road-based Public Transport System in Metro Manila

16. It can be summarized that the safety, security, convenience, and comfortability of road-based public transport systems need to be improved to avoid the modal shift to private travel modes and encourage the modal shift from private travel modes to the public ones.

17. Dangerous and selfish driving behavior results in traffic accidents and traffic congestion. Traffic safety education is also needed for the passengers.

18. Convenience of public transport services can be assessed through service frequency, punctuality, congestion at stops and on-board, distance to the loading/unloading points, fare system, and transfer environment. Punctuality is difficult to achieve under the current traffic situation, but information dissemination of the travel and arrival times is possible. A detailed analysis of the demand-supply gap and dispatch considering the demand would improve the operation situation. The waiting environment is one of the new aspects for the Philippines to be addressed, which can improve the convenient and comfortability of passengers.

19. The service integration among the road-based public transports and between railway and the road-based public transport is also one of the keys to improve the usability of public transport, which can include integrating the fare payment system, providing intermodal transfer facilities, and others.

20. Aside from the road-based public transport service, planning public road transport also has several issues, such as lack of a database to formulate the road-based public transport plans, lack of a database on public road transport operators and its proper updating system, a lack of updated person-trip survey data, lack of methodology to consider the post-COVID-19 situation, lack of route reorganization system corresponding with the change in travel demand, and absence of office units and/or human resources to formulate the route plan in LGUs.

3. CURRENT SITUATION AND ISSUES OF PUBLIC ROAD TRANSPORT RELATED AGENCIES

21. PUV-related agencies include DOTr, LTFRB, Land Transport Office (LTO), Office of Transportation Cooperative (OTC), Department of Public Works and Highways (DPWH), MMDA, and Local Government Units (LGUs).

22. **DOTr.** Its mandate is to function as the primary policy, planning, programming, coordinating, implementing, and administrative entity of the executive branch of the government on transportation services. Under DOTr, Planning and Project Development Office (PPDO) and Road Transport and Infrastructure Office (RTI) are closely related to public road transport services. The attached agencies related to public road transport services are LTFRB, LTO, and OTC.

23. **DPWH.** Its mandate is to undertake (i) the planning of public infrastructures and (ii) the design, construction, and maintenance of national roads and bridges and major flood control systems. The offices related to the PUV facilities are mainly the Planning Service and Bureau of Design.

24. **MMDA.** Their metro-wide services include (i) development planning; (ii) transport and traffic management; (iii) solid waste disposal and management; (iv) flood control and sewerage management; (v) urban renewal, zoning and land use planning, and shelter services; (vi) health and sanitation, urban protection, and pollution control; and (vii) public safety. Its offices related to PUV facilities are mainly the Office of the Assistant General Manager for Planning and Traffic and Transport Management Office.

25. **LGUs.** In relation to PUV services, LGUs shall provide adequate, effective, and efficient transportation facilities for the access and mobility of people. However, there is no specialized office for transport planning in LGUs except in Pasig City. Among the offices in each LGU, the City Planning Office and Traffic Management Office traditionally handle the approval of terminal locations of PUVs and plan the intra-city PUV routes.

26. The provision of public transportation services in Metro Manila has been entrusted to the private sector; therefore, no government agencies are involved in the operation and management of public transportation. The role of national government agencies is shown below.

Table 1 Tasks of PUV-related Agencies at Central Level

	Task/Role	RTI	PPDO	LTFRB	LTO	OTC	DPWH	MMDA
1	Planning/Design of Public Transportation Facilities/access roads and walkways	Yes	Yes	Yes	No	No	Yes	Yes
2	Operation*	No*	No	No	No	No	No	No
3	Management*	No*	No	Yes	No	No	No	No
4	Regulation *	No*	Yes	Yes	Yes	No	No	Yes
5	Monitoring and Evaluation*	No*	Yes	Yes	No	Yes	No	Yes

*Through related agencies

Source: Self-capacity Assessment Questionnaire

27. Based on the responses of all the agencies surveyed, the number of technical staff performing various tasks related to planning/design, regulation, and monitoring/evaluation of road public transportation facilities and services is inadequate, and training programs in key aspects of public transportation are necessary. For RTI, PPDO, and LTFRB, there is also a need to invest in computer software intended for road public transport planning.

4. CURRENT SITUATION AND ISSUES OF BUS OPERATORS

1) Current Status of Bus Operators Operating in Metro Manila

28. In order to collect the information of bus operators, a questionnaire survey and interview survey were conducted. Among the 76 operators listed by LTFRB, ten operators responded to the questionnaire survey and one operator was interviewed.

29. **Income and Expenditure.** Four out of the ten operators responded on their income and expenditure status. All reported a decrease in revenue and operating income when compared with the pre-COVID period due to fewer passengers and limited bus routes during the pandemic.

30. **Operation Planning.** While bus routes are set by the DOTr and LTFRB, operation timetables and schedules are determined by the operators based on the scale of demand from users. Operation plans are monitored by the number of passengers surveyed based on the fares received and the tickets sold. The current issue in development operation planning is the shortage of bus drivers. Although there are license holders able to drive large vehicles, they are inexperienced in driving a bus and, therefore, prone to accidents.

31. **Operation Management.** Operators conduct an alcohol detection test before operations, health condition checks at the start of work, and vehicle inspections at the beginning of the workday as daily operation management. To monitor the operation actual operation, 80% of the operators analyze and reflect the data from GPS in their operation plans, and 70% utilize the data in daily operation management. For the operation management system, three operators have some kind of computer-based management system. In case of traffic accident, each operator has established a system to contact the police and the office as the first response during road crashes or traffic accidents. As a part of operation management, all operators provide pre-employment training for both drivers and conductors using the Filipino Driver's Manual by LTO.

32. **Fare Revenue Management.** Eight operators have conductors to collect fares on-board the bus, while seven have implemented fare payments using IC cards or QR codes. When the conductor collects fares, a ticket is issued, and the data from the system and the amount paid are confirmed. By the end of the day, the collected fares are paid to the office at the depot, and the management deposits them in a bank account the next day. When payment using a beep card, transactions will be reported to the card management company every business day. All operators offer discount fares (20% discount on regular fares) for the elderly, disabled, and students, while there are no transfer discounts between modes.

33. **Information for Passengers.** Four bus operators use Facebook to disseminate information and only one posts on their website. None has developed a smartphone application. Two operators also provide information at bus stops, but only the minimum, such as destination, route map, etc. Only one operator disseminates information inside their buses.

34. **Services for Bus Users.** Passengers are guided during driving and stopping. Operators also receive numerous requests and complaints, including more convenient public transportation in general, the attitude of drivers and conductors towards passengers, and the driving manner of drivers.

35. **Bus Vehicles and Maintenance.** In general, operators replace their vehicles at intervals of 10 to 15 years. As equipment for bus vehicles, many operators have not introduced the necessary information displays for buses like in Japan. For the

accommodation of vulnerable transport users, all operators installed priority seats for the elderly and physically disabled. Each operator also formulates a vehicle maintenance plan and conducts maintenance at the beginning and end of the day and every month. The maintenance record is kept in paper form.

36. **Environmental Measures.** In order to purify diesel engine emissions as an environmental measure, all surveyed vehicles have been equipped with diesel particulate filters (DPFs). Relatively new diesel vehicles are also equipped with urea selective catalytic reduction (SCR) systems. In addition, while three operators have introduced hybrid vehicles powered by diesel engines and motors and two have introduced compressed natural gas (CNG) buses, no electric vehicle (EV) buses have been introduced.

37. **Working Conditions for Driver and Conductor.** In compliance with the Philippine Labor Code, each operator has a basic 9-hour workday with 8 hours of work and 1 hour of rest. Some operators have implemented a two-shift system (4:00 am – 2:00 pm and 2:00 pm – 11:00 pm). Regarding overtime, it depends on the operators, but they typically have long working hours, averaging a minimum of 24 hours and a maximum of 120 hours per month. Regarding the base salary, most operators specifically stated PHP537–600 per working day, with one operator at PHP18,000–20,000 per month.

2) Organizing Issues faced by Bus Operators

38. Based on the analysis of the interviews with the bus operators described in Chapter 4.2 and the interviews with the DOTr/LTFRB, the issues faced by the bus operators were identified, and the possibilities for future efforts to enhance and improve bus services in Metro Manila are summarized in Table 2.

Table 2 Organizing Issues Faced by Bus Operators (Summary)

Issues	Plan for Action (Draft)
A Operation planning and management using onboard GPS and surveillance cameras are not well-managed.	1 Strengthening of monitoring
B The introduction of systems necessary for operation management has not progressed. In addition, there is a lack of ability to create data-based aggregates and statistics.	2 Implementation of a program to improve the capacity of relevant organizations and bus operators to develop route and operation plans
C Lack of training programs for safe driving	3 Consideration of introducing operation management system by Japanese system vendor
D Few sales measures to increase the number of users	4 Enhancement of employee education and training
E Information that contributes to user convenience is not being disseminated.	5 Introduction of sales measures such as transfer discounts
F Long working hours need to be corrected.	6 Strengthening of information dissemination
	7 Cooperation and support for the full-scale introduction of the Service Contracting Program

Source: JICA Study Team

5. CURRENT SITUATION AND ISSUES ON INTERMODAL TRANSFER FACILITIES

1) Current Situation of Intermodal Transfer Facilities

39. Intermodal transfer facilities are generally developed to provide an easier and smoother transfer environment between two transportation modes. The intermodal transfer facilities for public transport services are composed of provincial bus terminals (so-called Intermodal Terminal Exchange Facilities), P2P stations, bus stops, loading/unloading bay, UV Express terminals, and tricycles terminals.

40. Provincial bus terminals are relatively well developed with clean and separate comfort rooms, sufficient parking lots, communication facilities, CCTV, information counters, signages, and others. The facilities at P2P stations are usually ticket booths, vending machines, and bus shelters. The condition of bus stops varies. Some are lay-by types, but others are just roadside. Some have bus shelters. Aside from the designated bus stops, some loading and unloading bays are also developed near railway stations. Those bays are provided about 100–1,000 m away from the station and usually do not have any facility.

41. Sidewalks or walkways are also important intermodal transfer facilities. Based on the walkability survey conducted by the Study Team, the walkability in CBD is much better than in other areas. Among the nine evaluation criteria (1. Walking path modal conflict, 2. Availability of walking paths, 3. Availability of crossings, 4. Grade crossing safety, 5. Motorist behavior, 6. Amenities, 7. Disability infrastructure, 8. Obstructions, 9. Security from crime), the disability infrastructure and amenities must be prioritized and improved to facilitate the utilization of walkable routes from stations.

42. Intermodal transfer facility projects along new railway alignments are under construction or planned. Some are integrated with urban development like PITX. In addition, several greenways projects, which are footbridges or walkways linking loading and unloading bays along with park and ride facilities, are also planned.

2) Relevant Laws and Regulations

43. The manuals, guidelines, department orders, and memorandum circulars issued by the DOTr, DPWH, and LTFRB pertaining to the development of intermodal facilities and the depot of bus companies include the following:

- (i) Implementing Rules and Regulations of the National Building Code of the Philippines (PD1096)
- (ii) Department Order 58: Revised Guidelines in the Design and Location of Turnouts (Loading and Unloading Bays) along National Roads
- (iii) DPWH Road Safety Design Manual Part I
- (iv) Implementing Rules and Regulations BP344-Accessibility Law (Amendment)
- (v) Design Guidelines, Criteria & Standards Vol. 4 Highway Design 2015
- (vi) Memorandum Circular No. 2017-030. Guidelines for Off-Street Terminal Operations under Department Order No. 2017-011, Otherwise Known as the Omnibus Franchising Guidelines
- (vii) Local Public Transport Route Manual Volume 1

3) COVID-19 Responses at Intermodal Transfer Facilities

44. In the early stage of the COVID-19 pandemic, several preventive measures were

implemented. Since 17 January 2022, a “no vax no ride” scheme has been started in Metro Manila. Commuters not fully vaccinated are prohibited from riding public transport. In PITX, several infection control measures are observed, while remarkable measures could not be observed at the local public intermodal transfer facilities except by wearing masks.

4) Examples of Measures against COVID-19 in Public Transportation of Other Countries

45. “Building Safe, Resilient, and Reliable Mobility against the Impact of COVID-19.” JICA summarizes examples of preventive measures against COVID-19 by governments in 34 countries and regions and by public transport operators in 41 countries and regions.

Table 3 Examples of Measures by Public Transport Operators

Category	Measures	Category	Measures
Employees	Establishment and compliance with guidelines	Vehicle maintenance	Cleaning and sanitation of high contact surfaces
	Checking the physical condition of employees		Restrictions of seat usage to keep distance
	Wearing masks/face shields		Ventilation by window or air conditioner
	Promotion of contactless fare payment		Marking to promote social distance in vehicle, etc.
	Restrict use near the driver’s seat, etc.		Operation management based on congestion level
Passengers	Temperature measurement before boarding	Operation planning	Stop operation
	Wearing masks		Limit maximum number of passengers
	Hand sanitizer		Fare raise, etc.
	Promotion of social distance inside vehicles	Public transport facilities	Cleaning and sanitation of high contact surfaces
	Calling attention to prevent infection		Installation of hand sanitizer
	Sharing crowding information		Ventilation in facilities
	Infection tracking app, etc.		Marking to promote social distance in facilities, etc.

Source: Building safe, resilient, and reliable mobility against the impact of COVID-19, JICA 2020, summarized by the JICA Survey Team

5) Issued on Intermodal Transfer Facility Development

46. In general, safety and security for all are the priority for developing intermodal transfer facilities. The Philippines have Accessibility Law, Sub-Committee on Accessibilities, Built Environment and Transportation (SCABET) under the National Council of Disability Affairs (NCDA), and Task Force for Accessibility under DOTr. However, the facilities were not developed to provide safe access for all. Other issues are as follows.

- (i) **Lack of Clear Development Directions.** Although the importance of the intermodal transfer facilities is recognized and some projects are implemented, the development directions of bus stops, loading and unloading bays, and sidewalks are not clear.
- (ii) **Lack of Right-of-Way.** Land acquisition will be required to develop loading and unloading bays or wide sidewalks. However, the Government of the Philippines is reluctant to acquire lands for such facilities.
- (iii) **Insufficiency of Standards.** Specification and location conditions are provided by relevant regulations and manuals, but these have not considered traffic volumes (e.g., the number of passengers, the number of PUVs using the facility, etc.).
- (iv) **No Proper Public Intervention to Private Development.** When some private establishments provide transport terminals, review or approval by transport authorities is not required. In addition, developers are not required to act to mitigate traffic impacts by their development.
- (v) **No Enforcement of Laws and Regulations.** Although some regulations and guidelines are provided, the specifications of the intermodal transfer facilities are not always followed. Additionally, the use of those facilities is also not enforced strictly.

6. IDENTIFICATION OF NEEDS FOR ICT IMPLEMENTATION IN PUBLIC TRANSPORTATION AND ITS APPLICABILITY

1) Level of IT literacy and Acceptance of IT Services among Bus Users

47. According to statistical data from 2021, the internet penetration of the Philippines is about 67%. (In developed countries, the penetration rate is usually over 90%.) The number of mobile devices with an Internet connection has reached 152.4 million, or 138.2% of the population. People of 16 to 64 years old spend an average of 10 hours and 56 minutes per day on the Internet, which is more than double of Japan.

48. Considering the Internet access and usage trends in the Philippines, the present IT literacy and acceptance of IT services are at the same or higher level than in developed countries. Future growth can be expected. However, based on the current situation of bus usage and evaluation of services, it is difficult to say that services taking advantage of the high IT literacy are being provided. It is necessary to improve and strengthen not only the hardware, such as bus vehicles and bus stops but also software, such as bus information and digital technology, to improve services.

2) Status of ICT Adoption by Bus Operators and Their Needs

49. **Services and Systems for Bus Users.** A route and transfer search application that specializes in public transportation and electronic payment system were already introduced in the Philippines. Bus operators have begun installing GPS in their vehicles to keep track of their operations. However, the GPS-based bus location system does not provide passengers with real-time operation information or bus location information. The information provided through websites, SNS, or mobile apps is not so common yet.

50. **Operation Systems.** Considering there is no timetable of bus services except for the first and last departure times, it is assumed that neither the scheduling nor the fare setting process is systemized. Similarly, it can also be assumed that schedule management, such as allocation of drivers and vehicles to operation plans, has not been systematized even though there is GPS on board. Although safety management systems, vehicle management systems and drivers' training are conducted, ICT is not introduced yet.

3) ICT Applicability in Public Transportation

51. The proposal is not intended for individual bus operators but rather focuses on themes that should be addressed in Metro Manila as a whole. For this purpose, a three system (i.e., bus information platform, electronic payment system functions and services, and Software as a Service [SaaS]) would be introduced.

- (i) **Development of Bus Information Platform** can consolidate information and data on buses operating in Metro Manila, promote information dissemination by the government and even operators, and create an environment where data can be used openly.
- (ii) **Enhancement of Electronic Payment System Functions and Services** can bring the benefits of improved convenience for users, optimized operation times and routes through analysis of boarding and alighting data, and streamlined settlement operations for operators.
- (i) **SaaS** would improve efficiency and productivity of operation management and office work.

7. PROPOSAL ON POSSIBLE SOLUTION FOR ROAD-BASED PUBLIC TRANSPORT

52. According to the Follow-up Study on the Transport Infrastructure Development Roadmap for Greater Capital Region (GCR) (JICA, 2019), Metro Manila has a high modal share of public transportation at 71%. However, it can be expected that more people will shift to private vehicles due to the poor quality of current public transport services and the availability of affordable vehicles, including motorcycles. Therefore, the goal of improving the road-based public transport system is to keep the current modal share in the short term and provide better feeder services to the railways in the medium to long term. In order to do so, four aspects of the road-based public transport system (i.e., safety, security, convenience, and comfortability) need to be improved.

53. In this Study, the following objectives are tentatively proposed with **providing a better traveling environment with public transport** as the goal:

- (i) to increase the accessibility to road-based public transport,
- (ii) to assure the safety and security of road-based public transport passengers,
- (iii) to add better amenities to road-based public transport services, and,
- (iv) to strengthen the capacity of road-based public transport-related agencies.

54. Several government agencies related to road-based public transport services and different kinds of road-based public transport services are provided by a relatively huge number of operators. Unlike many other countries, the private sector in the Philippines provides road-based public transport services intervention in road-based public transport services has a certain limitation. However, DOTr should lead the entire measures as a leading agency for managing the road-based public transport services.

55. Several projects/programs including the donor projects are under implementation, especially for the institutional system of LGUs and ICT applications. However, the capacity enhancement activities of the national government, PUV infrastructure/facilities development, improvement measures for the PUV operators are still lacking. Therefore, three programs are proposed in this study, as shown below.

Table 4 Proposed Programs

No.	Program	Counterpart		Related Impact ^{1/}			
		Main	Minor	Safety	Security	Convenience	Comfortability
1	Capacity Enhancement Program on Public Transport Planning and Management	DOTr/ LTFRB	DPWH, MMDA, LGUs	B	C	A	B
2	Capacity Enhancement Program on Improving Traffic Safety of Road-based Public Transport	DOTr/ LTO/LTFRB	DPWH, PNP, MMDA, LGUs	A	B	C	B
3	Verification Survey for Technology Adaptation for Road-based Public Transport Optimization	DOTr/ LTFRB/ PUV Operator	LGUs	-	-	-	-

^{1/}A: High, B: Fair, C: Low. The related impact of item 3 is not stated since this is a verification survey project.

Source: JICA Study Team

MAIN TEXT



1. INTRODUCTION

1.1 Background

1.1 While urban migration has been concentrating on Metro Manila, the unquestioned insufficient infrastructure has become an urgent issue, possibly generating economic loss due to the traffic congestion. The current administration of President Duterte is strongly committed to mitigating traffic congestion, particularly through big-ticket railway projects, such as Metro Manila Subway Project, North–South Commuter Railway (NSCR) (Malolos–Tutuban section), NSCR Extension Project, and other projects. These have been implemented under the Build! Build! Build! Program of the government. The Government of the Philippines aims to encourage the modal shift from private transport, including private cars, to public transport by developing the public transport network, focusing on the railway.

1.2 In order to encourage the modal shift to public transport, improving public road transport services together with railway network development, which is about 70% of what the population in Metro Manila use, is essential. According to the Philippine Development Plan (2017–2022), the modal shift can be encouraged by ensuring (i) accessibility, (ii) availability, (iii) affordability, (iv) adequacy, and (v) convenience and reliability.

1.3 Traveling by public transport generally takes longer than by private vehicles in Metro Manila. However, improving convenience by shortening the travel time of public transport service is uncertain. Additionally, there are various issues related to the quality of service in public road transport, for instance, when enforcing bus operators to drive along permitted lanes and load and unload at designated stops, realizing on-time performance, improving efficient transfers between travel modes by providing intermodal transfer facilities like bus stops, and introducing low-emission vehicles, among others.

1.4 Although the Department of Transportation (DOTr) and Land Transportation Franchising and Regulatory Board (LTFRB) conducted various programs to mitigate traffic congestion and improve the quality of service of public road transport, such as rationalization of the public road transport network, jeepney fleet renewal, and others, many issues remain. It is important to clarify the priority issues that must be solved and formulate strategic approaches.

1.5 In addition to enhancing the convenience of public road transport service by improving its quality, developing intermodal transfer facilities, such as station plazas and bus stops, is also an urgent issue. Intermodal transfer facilities will enable smooth transfers between public road transport and railways, considering the development of a railway network connecting the urban center and suburban areas. Furthermore, it is necessary to optimize each transport mode in the entire transport network of Metro Manila by rationalizing the public road transport network considering the railway operation plans and changes in travel demands, reviewing the capacity of public transport vehicles, etc.

1.6 In order to study the measures for solving the issues, more specific concerns need to be determined by collecting comprehensive information on service improvement of existing public road transport operators and safety assurance of public road transport users as well as measures to improve the connectivity between railway and public road transport services.

1.2 Study Overview

1) Objectives

1.7 The objectives of the Study are to identify the needs and propose improvement measures through conducting the following tasks and discussing with counterpart agencies in the Philippines, considering the situation of the existing public transport network in Metro Manila.

- (i) Collect information on existing public road transport services.
- (ii) Identify the issues on policy formulation and implementation capacity of public road transport-related agencies and capacity of bus operators and propose the improvement measures.
- (iii) Identify the issues on intermodal transfer facilities (station plaza, bus stops, etc.) and pedestrian infrastructures (sidewalk, underground walkway, footbridge, etc.) to enhance the connectivity among public transport services, including railways, and propose improvement measures.

2) Coverage

1.8 The Study coverage is the entire Metro Manila (Figure 1.2.1).



Source: JICA Study Team

Figure 1.2.1 Transport Network in Metro Manila

1.3 Study Team

1.9 The Study Team is composed of six international experts and five national experts as follows.

Table 1.3.1 Study Team Composition

	No.	Position	Name
International Experts	1	Team Leader/Public Transport Policy	Tetsuji Masujima
	2	Deputy Team Leader/Public Transport Policy	Chika Watanabe
	3	Business Management Planner of Public Transport	Eijiro Otsuka
	4	Transport Planner	Kaoru Yamada
	5	Transport Analyst	Takayoshi Futose
	6	Bus IT Expert	Tsutomu Kikkawa
Nation Experts	1	National Team Leader/ Transport Planner	Ricardo Sigua
	2	Public Transport Business Assistant	Glenn Simon D. Latonero
	3	Intermodal Transport Facility Assistant	Jerome N. Ballarta
	4	Transport Demand Assistant	Sahid A. Kamid
	5	Project Coordinator/Research	Hanna C. Pablo

Source: JICA Study Team

1.4 Study Implementation

1.10 The Study duration is from October 2021 to April 2022. The following coordination activities and surveys were conducted.

1) Coordination with the Counterpart Agencies from the Philippines

1.11 Aside from the daily communication through e-mails and Viber, the following meetings were held.

Table 1.4.1 Meeting List

Date	Attendees	Topics
2021/10/29	DOTr, LTFRB, OTC, JICA	<ul style="list-style-type: none"> Kick-off meeting (explaining the study outline, requesting the information sharing, etc.)
2021/11/24	IBS Study Team (ARUP), JICA, WB	<ul style="list-style-type: none"> Outline of studies Information sharing
2021/12/20	DOTr, LTFRB, TTPI (consultants of MUCEP2)	<ul style="list-style-type: none"> Request for additional information Q&A
2022/1/28	DOTr, LTFRB, JICA	<ul style="list-style-type: none"> Follow-up information/data requests Q&A
2022/4/12	DOTr, LTFRB, JICA	<ul style="list-style-type: none"> Share the study results and discussion through a workshop

Source: JICA Study Team

2) Workshop

1.12 In order to share the study results with stakeholders, a workshop was held on 21 April 2022. Details are shown in **Appendix 3**.

3) Surveys Conducted

1.13 The following surveys were conducted in this Study to collect the primary data related to bus services and relevant infrastructures as well as evaluate the capacity of relevant agencies.

Table 1.4.2 Survey Conducted by JICA Study Team

No.	Survey Name	Methodology	Objectives	Schedule
1	Bus Operator Survey	Methodology: Send questionnaires via e-mail and followed up via e-mail/call.	Aimed to collect the following information to understand the situation of bus companies and their services: <ul style="list-style-type: none"> Bus company profile 	December 2021–February 2022

No.	Survey Name	Methodology	Objectives	Schedule
		Target: All 76 bus operators in the list of LTFRB No. of responses: 10 operators	<ul style="list-style-type: none"> • Profit and loss statement • Operation management • Safety driving management • Passenger information • Fare system • Bus service • Bus vehicle management 	
2	Bus Operator Interview	Methodology: Web-meeting Interviewee: One bus operator	Aimed to ask the follow-up questions after Bus Operator Survey.	February 2022
3	Bus User Survey	Methodology: Randomly distribute the questionnaire (created with Google Forms) via Facebook. No. of responses: 73 bus users	Aimed to collect the following information to understand the situation of bus users and their assessment of bus services: <ul style="list-style-type: none"> • Respondent profile • Bus usage situation • Bus services evaluation 	December 2021
4	Intermodal Transfer Facility Survey	Methodology: Conduct site survey using uniform evaluation forms. Target sites: Ten selected LRT/MRT stations	Aimed to determine the situation of intermodal transfer facilities around the LRT or MRT stations.	November–December 2021
5	Capacity Assessment Survey	Methodology: Distribute the questionnaire for self-capacity assessment to relevant agencies. Target: DOTr-PPDO, DOTr-RTI, LTFRB, LTO, OTC, DPWH, MMDA	Aimed to determine the capacity of agencies relevant to the road-based public transport system.	November 2021–March 2022

Source: JICA Study Team

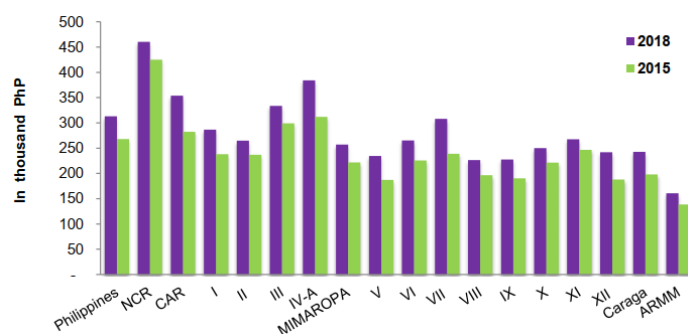
2. CURRENT SITUATION AND ISSUES ON ROAD-BASED PUBLIC TRANSPORT SYSTEM IN METRO MANILA

2.1 Socio-economic Characteristics

1) Socio-economic Status

2.1 Metro Manila comprises one municipality and 16 cities, and is governed by the Metropolitan Manila Development Authority (MMDA) in coordinating metropolitan-wide projects. Metro Manila has an area of 620 km² and a population of around 13 million (2020). Its population continues to grow, and suburbanization in adjoining areas has progressed. The urbanized metropolitan area includes adjoining municipalities and has about a population of 22 million, which is forecasted to reach 30 million in 2030.

2.2 The GRDP in Metro Manila accounts for about 36% of the Philippines' GDP, making it the nation's economic engine. According to the 2018 Household Expenditure Survey conducted by the Philippine Statistics Authority (PSA), the average household income in Metro Manila is PHP460,000, about 1.5 times the national average (PHP313,000). Metro Manila also has a large proportion of high-income groups (Table 2.1.1).



Source: Philippine Statistics Authority, 2018 Family Income and Expenditure Survey

Figure 2.1.1 Average Annual Family Income by Region at Current Prices: 2018 and 2015

Table 2.1.1 No. of Families, Annual Family Income and Expenditure in Metro Manila, 2018

Income Level (PHP/month)	Whole Philippines						Metro Manila (NCR)					
	Households		Income		Expenditure		Households		Income		Expenditure	
	No (1,000)	(%)	Total (PHP bil.)	Ave (PHP 1,000)	Total (PHP bil.)	Ave (PHP 1,000)	No (1,000)	(%)	Total (PHP bil.)	Ave (PHP 1,000)	Total (PHP bil.)	Ave (PHP 1,000)
Under 40000	135	0.5	4	33	4	32	0.61	0.02	0.02	30	0.02	34
40,000–59,999	436	1.8	23	52	22	51	3.96	0.12	0.21	53	0.23	59
60,000–99,999	1,151	4.7	17	83	163	78	30	1	3	85	3	93
100,000–249,999	11,354	46	1,922	169	1,678	148	467	14	17	195	160	188
250,000–499,999	7,078	29	2,467	349	1,956	276	1,454	44	522	359	447	307
500,000 and over	3,660	15	3,167	865	2,082	569	981	30	838	854	614	626
Total	24,742	100	7,754	313	5,906	239	3,318	100	1,528	460	1,223	369

Source: JICA Study Team

2) Motorization Trend

2.3 Table 2.1.2 shows the number of registered motor vehicles by type and by region in 2020. The data were acquired from the Land Transportation Office (LTO). The National Capital Region (NCR) registered the highest figures for all vehicle types, such as cars, utility vehicles (UV), sport utility vehicles (SUV), trucks, and buses, as well as motorcycles and

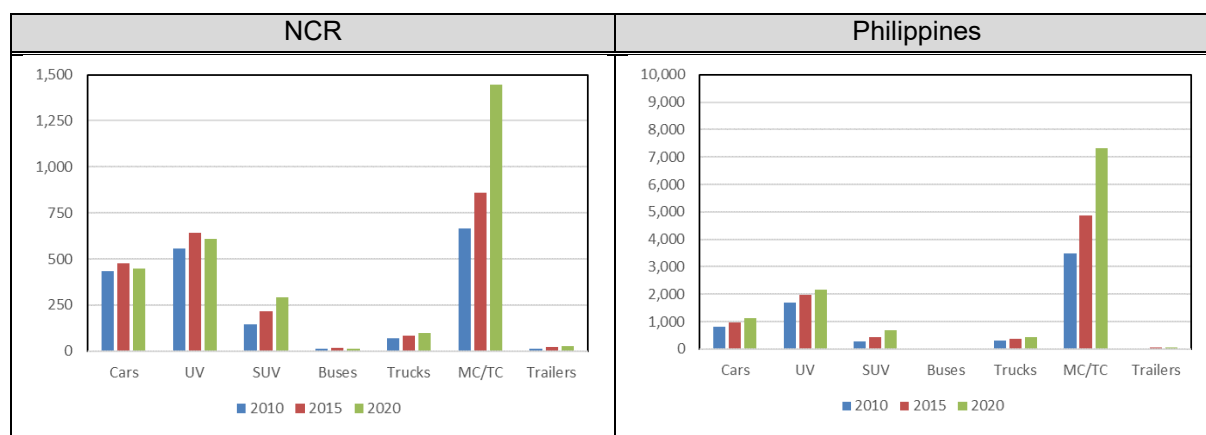
tricycles, with and without sidecars.

Table 2.1.2 Registered Motor Vehicles by Type, by Region in 2020 (1,000 vehicles)

	Car	UV	SUV	Buses	Trucks	MC/TC	Trailers	Total
NCR (Metro Manila)	447	606	290	13.5	99.2	1,444	26.2	2,926
Region I (Ilocos Region)	50	100	28	0.6	15.1	461	1.1	655
Region II (Cagayan Valley)	22	74	22	0.7	20.8	355	4.3	499
Region III (Central Luzon)	145	253	79	2.0	50.3	763	7.1	1,299
Region IV-A (CALABARZON)	201	292	87	1.5	24.6	1,011	2.7	1,620
MIMAROPA Region	8	24	6	0.1	5.4	158	0.1	202
Region V (Bicol Region)	26	55	13	1.1	12.7	347	0.7	455
Region VI (Western Visayas)	44	116	31	1.4	35.3	434	1.3	664
Region VII (Central Visayas)	66	159	39	1.1	30.6	621	4.7	921
Region VIII (Eastern Visayas)	12	42	8	0.3	12.1	211	0.8	286
Region IX (Zamboanga Peninsula)	13	62	9	0.7	19.6	284	1.3	390
Region X (Northern Mindanao)	26	94	19	0.7	30.8	281	2.5	454
Region XI (Davao Region)	31	91	23	0.8	21.4	443	2.7	614
Region XII (SOCCSKSARGEN)	23	106	15	0.5	37.1	284	3.2	468
Cordillera Administrative Region (CAR)	12	66	15	0.2	7.0	80	0.2	180
Region XIII (CARAGA)	10	37	7	0.3	12.0	150	0.6	217
Total	1,134	2,178	692	25.3	434.2	7,328	59.6	11,851

Source: LTO

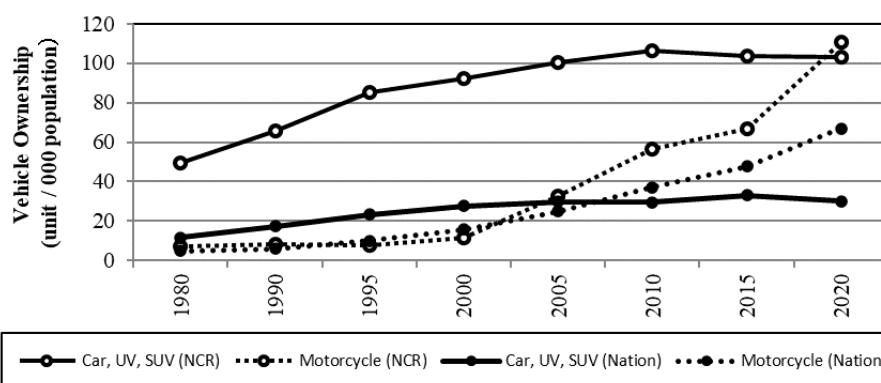
2.4 Figure 2.1.2 shows the change in the registered motor vehicles in NCR and the Philippines since 2010. The growth of four-wheeled vehicles has stagnated, and the number of motorcycles has significantly increased. The growth patterns are similar to the national trends.



Source: Land Transport Office (LTO)

Figure 2.1.2 Change of the Registered Motor Vehicles in NCR and the Philippines by Type, 2010, 2015, and 2020

2.5 Figure 2.1.3 shows the changes in the number of private vehicles per population in NCR and the Philippines since 1980. The ownership ratio of four-wheeled vehicles has not significantly changed since 1995, and the ownership ratio of motorcycles is higher than four-wheeled vehicles today.



Source: Land Transport Office (LTO) and Philippine Statistics Authority (PSA)

Figure 2.1.3 Change of the Private Vehicle Ownership Ratio in the Philippines and NCR

3) Sectional Traffic Volume

2.6 Data on annual average daily traffic (AADT) in Metro Manila are collected by the Metropolitan Manila Development Authority (MMDA). The vehicle types in the AADT data of MMDA comprise car, public utility jeepney (PUJ), utility vehicle (UV), taxi, public transport (bus), truck, trailer, motorcycle, and tricycle. The data were recorded from the following circumferential and radial roads.

2.7 Figure 2.1.4 shows the changes in AADT to the data collected from MMDA Traffic Count Stations. The traffic volume at some stations declined in 2020 compared to previous years, partly due to the emergence of the COVID-19 pandemic sometime in March 2020. Another significant observation in 2020 is the increase in the number of motorcycles that can be attributed to the adoption of several quarantines and travel restrictions in Metro Manila, wherein public transport capacities were reduced, and physical distancing inside public transport vehicles was enforced. Operations of some transport modes were even halted for several months. The number of PUJs also decreased in 2020.

Circular Arterial Roads		2018	2019	2020
C01	RECTO	58	53	61
C02-1	MENDOZA	80	77	57
C02-2	PRES. QUIRINO AVE.	97	100	46
C03	ARANETA AVE.	64	71	62
C04	EDSA	348	348	261
C05	C.P. GARCIA/ KATIPUNAN AVE. / TANDANG SORA	200	187	155
Radial Arterial Roads		2018	2019	2020
R01	ROXAS BLVD.	179	172	148
R02	TAFTAVE.	90	88	99
R03	SSH	92	115	119
R04	SHAWBLVD.	82	81	73
R05	ORTIGAS AVE.	143	136	134
R06-1	MAGSAYSAY BLVD.	94	99	79
R06-2	AURORABLVD.	89	94	90
R07-1	QUEZON AVE.	183	199	197
R07-2	COMMONWEALTH AVE.	224	266	227
R08	A. BONIFACIO	70	76	74
R09	RIZAL AVE.	74	75	67
R10-1	DEL PAN	79	70	94
R10-2	MARCOS HIGHWAY	156	179	172
R10-3	MCARTHUR HIGHWAY	76	77	81

(Units: 000 converted PCU per day)

Source: Worked by the JICA Study Team, from MMDA data

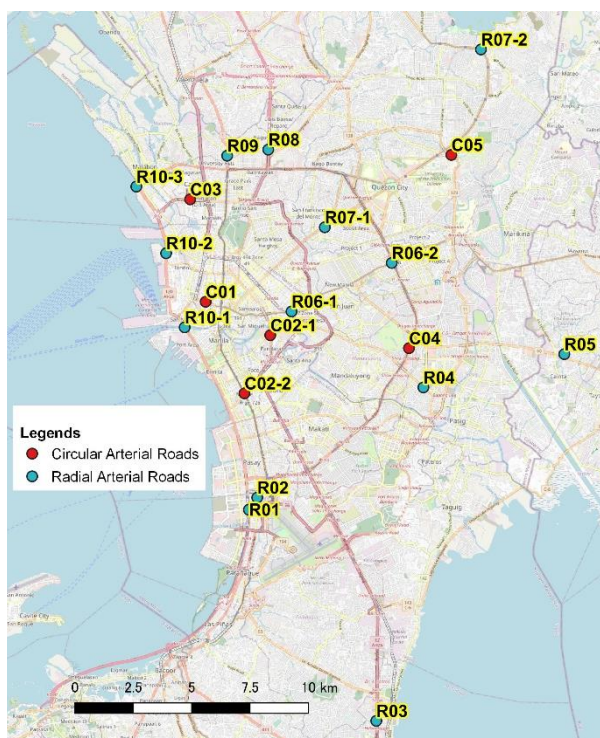
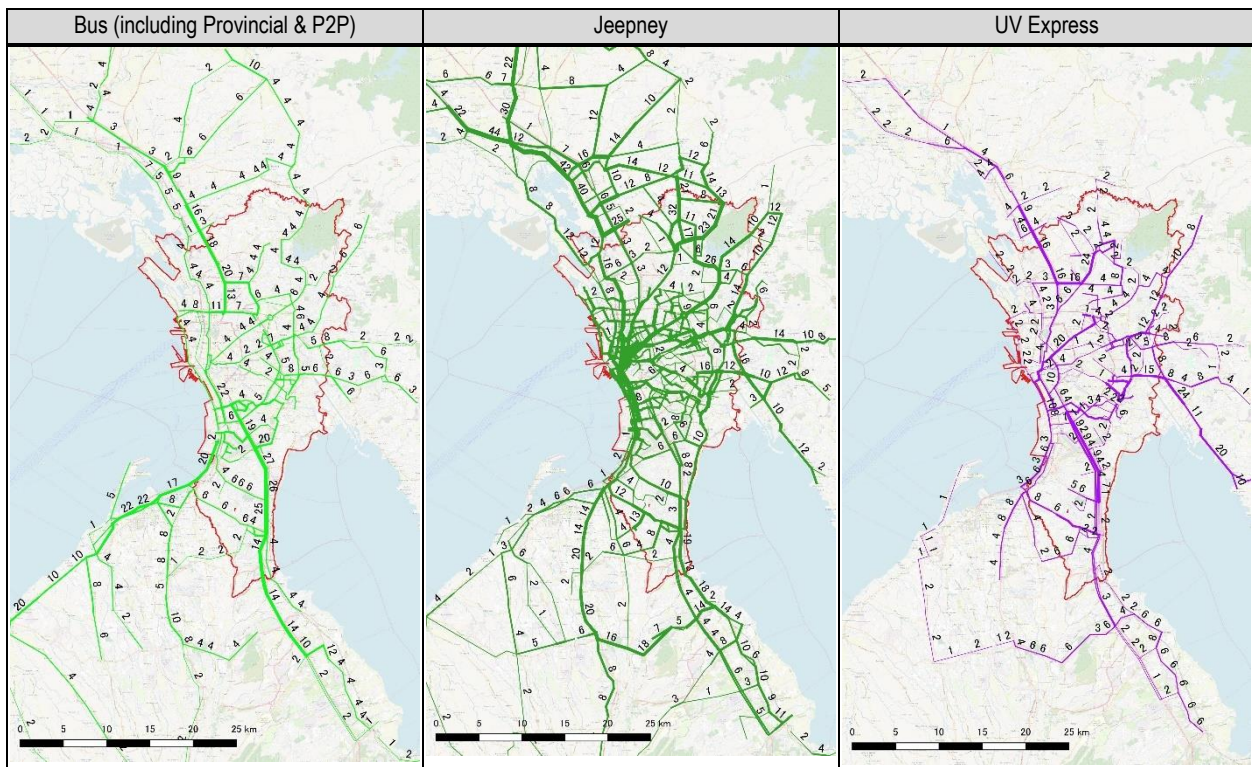


Figure 2.1.4 Change of Annual Average Daily Traffic of MMDA Traffic Count Stations

2.2 Existing Road-based Public Transport Systems

1) Overview

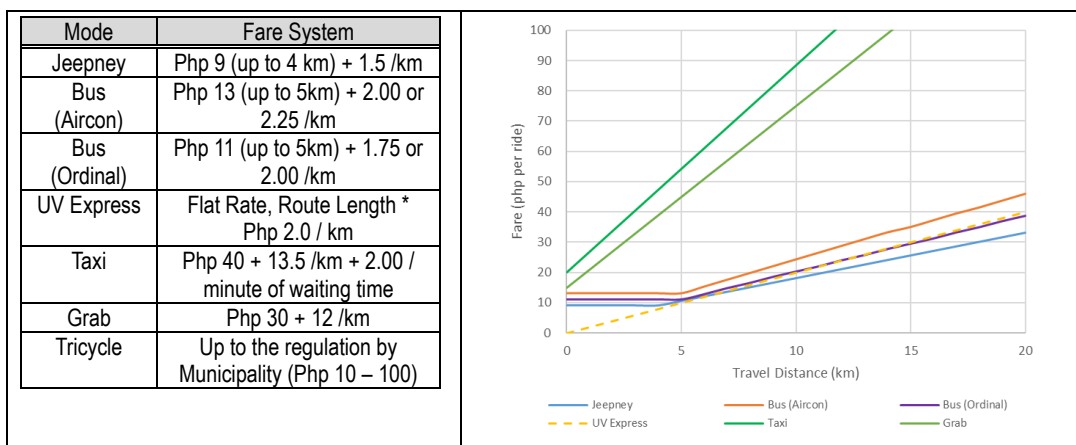
2.8 Various road-based public transport, such as bus, jeepney (a minibus first made from U.S. military jeep), tricycle (motorcycle taxi with sidecar), pedicab (bicycle taxi), UV Express (passenger service by utility vehicles), and P2P (premium direct bus service) operated by private bus companies connect business districts of each city in the region (as well as to other regions in Luzon). The fare structure of the public transport services is summarized in Figure 2.2.2.



1) Number and line width means the number of routes operated in the road section

Source: Route Rationalization Study for the Metro Manila Urban Transportation Integration Study (MMUTIS¹) Update and Capacity Enhancement Project (MUCEP²) Area

Figure 2.2.1 Public Transport Network in Metro Manila



Source: Worked by JICA Study Team based on LTFRB

Figure 2.2.2 Fare Structure of the Road Based Public Transport Services

¹ Metro Manila Urban Transportation Integration Study (JICA, 1999)

² Metro Manila Urban Transportation Integration Study Update and Capacity Enhancement Project (JICA, 2015)

2) Bus

2.9 Buses in Metro Manila operate in different branding, which include buses plying routes in the region and express bus units under a premium point-to-point service setting.

(a) Existing Bus Services

2.10 There are buses without air-conditioning (called ordinary bus) and with air-conditioning, with different fares as shown in Figure 2.2.2. Besides the driver, a bus has a fare collector who also calls for passengers along the road. Buses are generally seated and can take passengers directly to their destinations in the suburbs (no transfers, no extra fares, etc.), but these get stuck in traffic jams and calling passengers slow down trips, making operations not run smoothly.

2.11 Although operations were suspended for three months after the outbreak of the COVID-19, routes were reorganized and resumed based on the stepwise and coordinated approach of the government agencies to the resumption of public transportation services in Metro Manila. Services were also gradually expanded as traffic demand increased. As a result of the route reorganizations, the 82 bus routes in 2014 were consolidated to 31 when service resumed in June 2020.

(b) Premium P2P

2.12 Premium P2P, meaning “Point to Point,” provides better service than the existing bus transport and is a direct express mode from origin to destination. The number of stops is fewer, and the travel time is also relatively shorter. The fare is higher, but P2P buses come with Wi-Fi service and have better seating comfort. Moreover, standees are not allowed. The service was introduced in 2015 and, as of today, has around 50 routes in Metro Manila. As the COVID-19 pandemic spread, the advantages of the service have been appreciated more than ever.



Source: JICA Study Team

Figure 2.2.3 Bus Fleet of Premium P2P in Metro Manila

(c) EDSA Bus Carousel

2.13 In June 2020, the government implemented a bus rapid transit (BRT) line, part of the bus routes in Metro Manila, and named it “EDSA Carousel.” It was deployed to augment MRT Line 3. The line has an exclusive right-of-way on a dedicated bus lane called EDSA Busway, which is separated by concrete barriers and steel bollards along the EDSA corridor. Mega Manila Consortium Corporation and ES Transport and Partners Consortium operate this line under the supervision of the DOTr and MMDA. The fare structure is the same as the existing bus routes (with aircon).



Source: PNA photo by Jess M. Escaros Jr.

Figure 2.2.4 EDSA Bus Carousel

(d) Provincial Bus Scheme in Metro Manila

2.14 Provincial buses used to operate to/from their bus terminals within Metro Manila before; however, to ease the traffic congestion along EDSA, the Metro Manila Council (MMC) approved Regulation Number 19-002 in March 2019 that aims to close down all 47 provincial bus terminals along EDSA. The regulation also prevents LGUs from issuing business permits to bus operators who intend to set up a terminal along the main thoroughfare.

2.15 The dry run of provincial bus ban started on 7 August 2019. During this dry run, provincial buses were banned from traversing along the stretch of EDSA from 4 am to 10 pm. Within these hours, they can only load and unload passengers at designated integrated terminals: the Parañaque Integrated Terminal Exchange (PITX), Araneta Center Bus Terminal, North Luzon Express Terminal (NLET), and the Santa Rosa Integrated Bus Terminal (SRIT). While the PITX and Araneta Center are within Metro Manila, the NLET is in Bocaue, Bulacan and the SRIT is in Santa Rosa, Laguna.

2.16 On 24 March 2022, MMDA started a two-week dry run for the return of provincial buses on EDSA. Provincial buses were allowed to ply EDSA from 10 pm to 5 am.

2.17 The effects of the provincial bus scheme are not evaluated in this study nor found in the relevant documents. According to some websites and social media, there was much negative feedback from the operators and passengers. Since they cannot enter Metro Manila directly and the intermodal transfer facilities or connected services are not developed properly, commuters need to shoulder the additional travel time and costs in commute. In addition, there are also voices that the provincial buses are not the main cause of traffic congestion along EDSA.

3) Jeepneys

(a) Existing Industrial Structure

2.18 Jeepneys is the most frequently used mode of transport in Metro Manila that operates on a fixed route basis. In 2016 (LTFRB), the officially registered units in Metro Manila were about 55,000. It is recognized that the jeepney sector is highly fragmented and individualized in terms of ownership and operation. It is responsible for the existence of single operators that compete on the streets. The absence of consolidation led to a vehicle/franchise ratio of only 2.25. The majority of jeepney operators (78%) own just a single unit.



Source: researchgate.net (Biona et al.)

Figure 2.2.5 Traditional Jeepney

Table 2.2.1 No. of PUJ Units Owned by an Operator (2016)

No. of Owned Units	Operators		Owned Buses	
	No.	(%)	No.	(%)
1	19,098	78.3	19,098	34.7
2	3,696	15.2	7,392	13.4
3	669	2.7	2,007	3.6
4	410	1.7	1,640	3.0
5-9	368	1.5	app. 25,000	45.5
10+	146	0.6		
Total	24,387	100	app. 55,000	100

Source: Kaenzig, 2016 (Integrated Transport Planning Ltd) / "Transforming Public Transport in the Philippines"

(b) Modernization Program

2.19 In the Public Utility Vehicle (PUV) Modernization Program, vehicles are required to meet minimum standards that aim to ensure a safe, convenient, and environmentally sustainable mode of transportation for the commuters. In 2018, the DOTr announced that at least 300 modern electricity-powered jeepneys (e-jeepney) were rolled out. Currently, many cities in Metro Manila have several e-jeepney units that ply their thoroughfares. The routes in the city cores and on arterial roads have been gradually deployed with modernized vehicles.



Source: primer.com.ph

Figure 2.2.6 Electric Jeepney (E-Jeepney)

2.20 In the Memorandum Circular (2020-058) issued on 10 October 2020, the LTFRB announced the reopening of some 44 traditional PUJ routes to give way to 4,820 jeepney drivers to operate again in Metro Manila during the quarantine period. The "calibrated" reopening of routes had 27,016 jeepneys plying 302 routes in Metro Manila. The said number of PUJs accounts for almost half of the 55,000 traditional PUJs that had to stop operations since the quarantine started in March.

4) FX, AUV/UV Express

2.21 FX (Tamaraw FX), also referred to Asian utility vehicle (AUV), is one high

occupancy vehicle (HOV) that serves inter- and intra-cities and municipalities in Metro Manila and its neighboring areas. Official records list this mode as UV / AUV Express, also inclusive of other types such as bigger utility van units that can usually accommodate 10 to 18 passengers. Typically, they are comprised of Nissan Urvan and Isuzu Crosswind units (Figure 2.2.7).



Source: Various Sources

Figure 2.2.7 UV Express Fleet

2.22 The UV / AUV Express service routes and operation characteristics are like Premium P2P, providing direct express services between the terminals in the city centers, suburbs, and adjoining provinces. By official rule, they are designated to operate on a terminal-to-terminal basis and are not allowed to pick up and drop off passengers along the way. However, actual observation reveals they pick up and drop off passengers almost anywhere along their routes.

5) Tricycle

2.23 Tricycle is a motorized vehicle in the Philippines composed of a motorcycle with an attached passenger cab. Typically, it can accommodate a maximum of five passengers, excluding the driver. Their build and design, even passenger capacity, varies depending on the city in the country. They either operate a designated route or act like as for-hire taxis, serving door-to-door services via barangay or residential roads, which are too narrow for other road-based transit modes.

2.24 There are 1.7 million registered tricycle units in the country, with possibly more operating without franchises, as stated by the National Confederation of Tricycles and Transport Operators and Drivers Associations of the Philippines. There are about 300,000 registered tricycle units in Metro Manila alone.³

2.25 Similar to e-jeepneys, some electric-powered tricycles or e-trikes continually roll out in Southeast Asian countries like the Philippines. In June 2019, the Department of Energy (DOE) distributed 3,000 e-trikes to LGUs in Metro Manila and nearby cities, such as Biñan and Los Baños in Laguna, as well as in Carmona City, Isabela, and Tuguegarao City. One of the many designs of e-trikes rolled out in Metro Manila is shown in Figure 2.2.9.

³ Nicole Anne Espiritu: Tatlong Gulong ng Buhay: The Tricycle Drivers and their Lived Experiences During the Pandemic, Vol-7 Issue-1 2021 IJARIII-ISSN(O)-2395-4396



Source: Flickr.com

Figure 2.2.8 Tricycle in Metro Manila (Quezon City)



Source: newsbytes.ph

Figure 2.2.9 E-Trikes Distributed by the DOE to LGUs

6) Taxi and Ride Hailing Service⁴

2.26 Taxicabs were already in use in the 1970s and 1980s, with the Isuzu Gemini being the most prominent model. Since the automotive industry the boom in the mid-1980s, after the ousting of a former Philippine president, more taxicab models have been seen on the road. In the late 1990s, taxi fleets began using Asian utility vehicles (AUV) and vans since these offered large seating capacity and versatility other than their affordable maintenance.

2.27 In 2015, Transport Network Companies (TNC) such as Grab were introduced in the Philippines. With the worsening traffic management system in the country, TNC uses the power of mobile applications to serve commuting needs and demands. According to a statement from LTFRB, there are 18,813 TNVS (Transport Network Vehicle Service) and 16,701 taxis in Metro Manila as of June 2020.⁵

2.28 By 2019, LTFRB has been implementing the pilot project of motorcycle ride-hailing services. Three operators, Angkas, Move-it, and JoyRide, provide this service with around 45,000 registered motorcycles in Metro Manila as of February 2021.⁶

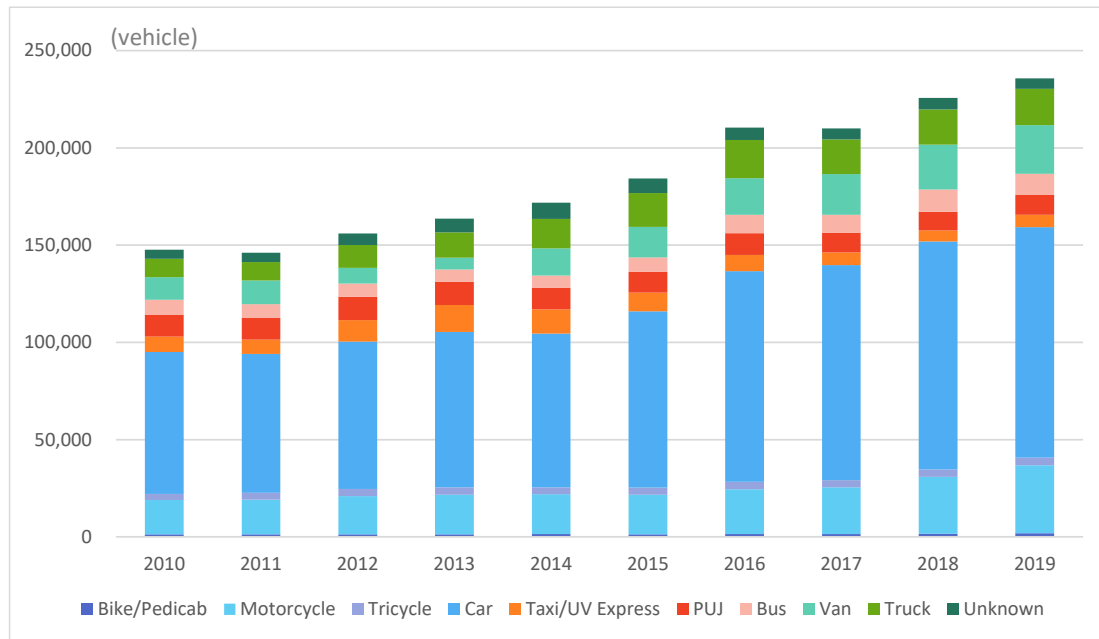
7) Traffic Accidents by Road-based Public Transport in Metro Manila

2.29 Based on the Metro Manila Accident Reporting and Analysis System (MMARAS) by MMDA, the share of buses and jeepneys involved in traffic accidents in Metro Manila among the total number of vehicles are 5% and 4%, respectively. The number of jeepneys involved in traffic accidents has been relatively stable at 10,000–11,000, while the number of buses involved increased from 7,633 in 2010 to 10,841 in 2019 (Figure 2.2.10).

⁴ Pinoy Taxi Directory (http://pinoytaxi.blogspot.com/p/taxi-in-metro-manila_13.html)

⁵ The Philippine Star: (<https://www.philstar.com/nation/2020/06/12/2020331/ltfrb-35514-taxis-tnvs-resume-operations>) LTFRB: 35,514 taxis, TNVS resume operations

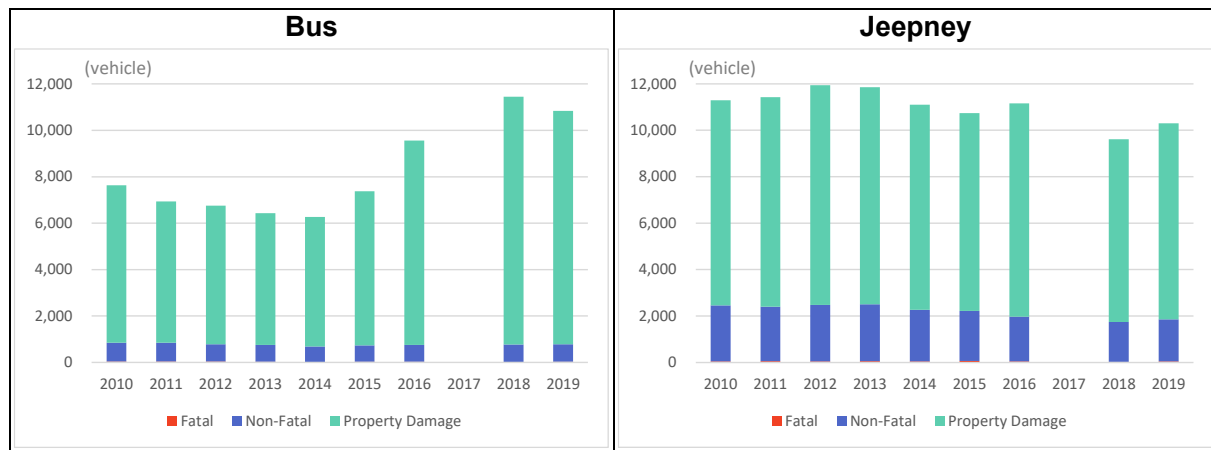
⁶ LTFRB



Source: MMDA

Figure 2.2.10 No. of Vehicles Involved in Traffic Accidents in Metro Manila by Vehicle Type (2010–2019)

2.30 Traffic accidents involving buses and jeepneys from 2010 to 2019 have frequently caused property damage. While heavy traffic congestion in Metro Manila may cause fewer fatal and non-fatal accidents, there are still 50–100 killed and about 3,000 injured from traffic accidents involving buses and jeepneys.



Note: Data from 2017 was not available.

Source: MMDA

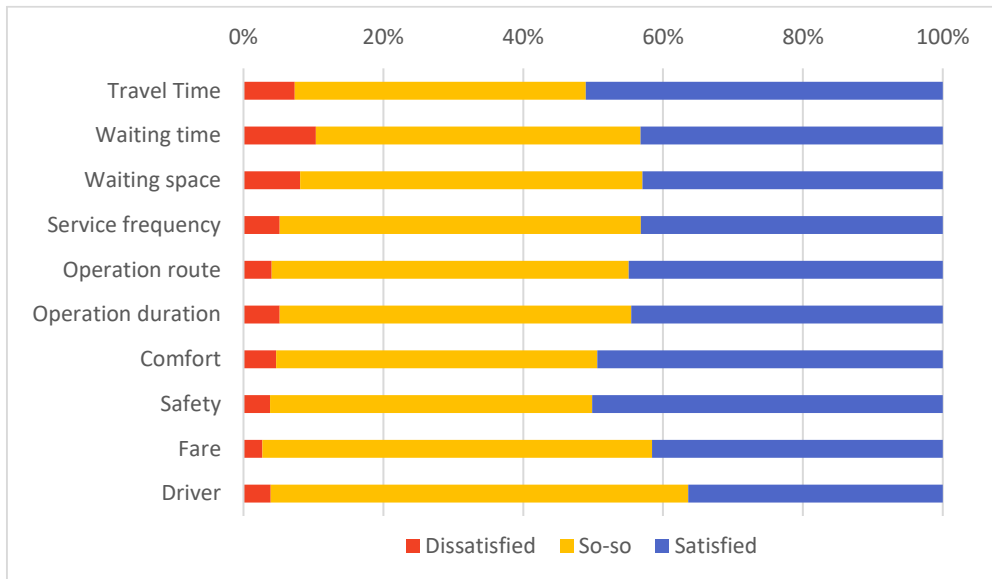
Figure 2.2.11 No. of Buses and Jeepneys Involved in Traffic Accidents in Metro Manila by Accident Type (2010-2019)

8) People's Evaluation on Road-based Public Transport in Metro Manila

2.31 According to the LRT/MRT Users Survey by a central business district study in 2014,⁷ the satisfaction level with road-based public transport services is not high. About 50–60% are not satisfied with the different aspects of the public transport services,

⁷ The LRT/MRT Users Survey conducted by the Preparatory Survey on Metro Manila Central Business Districts Transit System Project in the Republic of the Philippines in 2014 aimed at railways users in Metro Manila. The total sample number is about 5,000 people.

particularly the satisfaction level of drivers (i.e., the driver's attitude and driving manner/skills) are lower. However, it is noted that the survey target is public transport users.



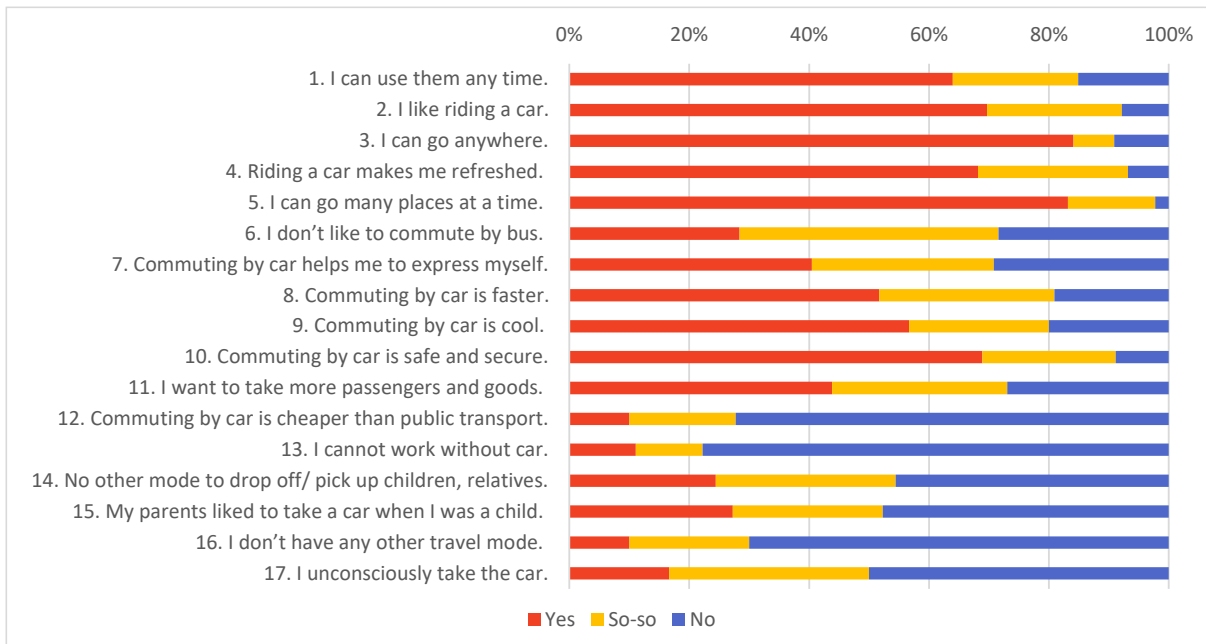
Source: LRT/MRT Users Survey by Preparatory Survey on Metro Manila Central Business Districts Transit System Project in the Republic of the Philippines (JICA, 2014)

Figure 2.2.12 People's Evaluation on Road-based Public Transport in Metro Manila

2.32 In the Detailed Design Study of the Metro Manila Subway Project in the Republic of the Philippines (JICA), a questionnaire survey dry run for Mobility Management was conducted in 2019, targeting about 100 people. The survey also asked for the reason for using private cars, including Grab cars, taxis, and carpooling. The results identified the following reasons.

- (i) They can go anywhere (84.1%).
- (ii) They can go to many places at a time (83.1%).
- (iii) They like riding a car (69.7%).
- (iv) Commuting by car is safe and secure (68.9%).
- (v) Riding a car makes me refreshed (68.2%).

2.33 Therefore, convenience and safety or security influence private car users when choosing their travel mode. In other words, these factors need to be improved to encourage them to shift to public transport modes.



Source: Dry-run survey of Mobility Management questionnaire by the Detailed Design Study of the Metro Manila Subway Project in the Republic of the Philippines (JICA, 2019)

Figure 2.2.13 Reasons of Using Private Cars in Metro Manila (Dry-run Result)

9) Future Outlook on Public Transport Development

(a) Overview

2.34 As the country moves towards reforms and improvements in its transportation system through DOTr and other support line agencies, Metro Manila could expect a promising future. It may come in the form of more reliable and efficient infrastructures for motorists and commuters. However, the setup could be different, especially with the COVID-19 pandemic, wherein the transition to a "new normal" may pose new challenges to all sectors of society in many aspects. It will surely involve ensuring reliable public transportation service, providing a safe and equitable transportation system, and a sustainable transport economy. Furthermore, public transportation and general mobility in 2022 and the succeeding years will also deal with the efficient utilization of active transportation modes to address the potential gaps between different transportation modes while simultaneously seizing opportunities to take on the challenges brought by motor vehicle emissions.

2.35 The reduced capacity of PUVs, such as buses, jeepneys, utility vans (FX, for hire vans, etc.), and even paratransit modes (tricycles), due to the social distancing policy, is also a factor to be discussed. On the other hand, the service level of public transport service is still required, and the related initiative of the government, the Public Utility Vehicle Modernization Program (PUVMP), has been implemented. Even then, there is a big possibility that restrictions for inter- and intra-city movements will ease, and public transport capacity may be increased, which could mean catering to more passenger demand and volume. In any case, it will be a scenario to take on issues on mobility, economy, and health.

(b) Transport Sector Project Proposed by DOTr

2.36 On the aspect of funding, the DOTr secured a PHP15.97 billion budget in 2022 for various road transport sector projects nationwide. Along with this, DOTr also has a budget of PHP7.0 billion to continue the service contracting program in 2022 for an invocation to continue providing aid to affected PUV drivers during the pandemic. The

proposed projects are listed in Table 2.2.2.

2.37 There is also the Service Contracting Program (L01) for transport sector workers, especially bus drivers and operators, by the LTFRB. Aside from ensuring the continuous provision of public transport service to the public, the program was intended to provide a temporary livelihood for displaced workers in the transport industry and provide support amid the implementation of the reduced passenger capacity of the PUVs.

2.38 The EDSA Busway Project (L04) will soon offer better service by constructing three pedestrian bridges with concourses through a partnership with the private sector. In addition, the agency is currently working on PUVMP (L03), meant to address the reformation of the country's public land transportation industry. It will bring about regulatory reform and set new guidelines for franchise issuance for road-based public transport services.

2.39 Furthermore, active transportation like cycling and walking are also part of the planning scale (L02). While these modes became the safest alternative for those without personal vehicles to satisfy their travel needs, the sudden creation of pop-up bicycle lanes along several roads in Metro Manila faced many issues. Among these are related to poor design, placement, and maintenance. Additionally, other road users have system shock, where some vehicle drivers do not seem to give proper courtesy to vulnerable road users. Some even use the designated bicycle lanes as parking spaces and even as loading and unloading areas for PUVs. These situations must be reflected on, particularly for the coming year, as to how the government will address the issues that have recently emerged.

Table 2.2.2 Transport Sector Project of DOTr in Metro Manila

Category	Project Name		Total Project Cost (PHP mil.)	Budget (PHP mil.) ^{4/}		
				2020	2021	2022
Locally Founded Project	L01	Service Contracting Program	-	-	3,000	7,000
	L02	Active Transportation Infrastructure and Related Programs	-	-	-	2,000
	L03	PUV Modernization Program	-	-	592	1,801
	L04	EDSA Busway Project	-	-	-	473
	L05	Makati-BGC Greenways	126 ^{1/}	-	-	-
	L06	Taguig City Integrated Terminal Exchange	4,000 ^{2/}	-	-	-
Foreign-Assisted Projects	F01	EDSA Greenways Project	8,794 ^{3/}	-	1,000	-
	F02	Metro Manila BRT Line project – Quezon Avenue	5,464 ^{2/}	-	-	-

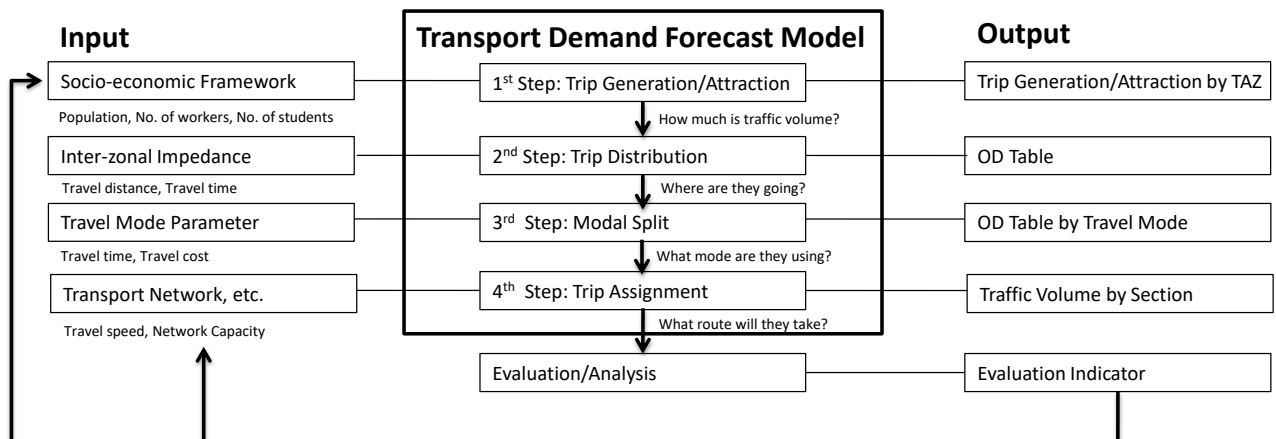
Source: 1/ DOTr proposed budget for 2022, 2/DOTr website, 3/ NEDA, 4/ GAA

2.3 Characteristics of the Demand Forecasting Database in Metro Manila

1) Review on the Traffic Demand Forecasting Database in JICA Study

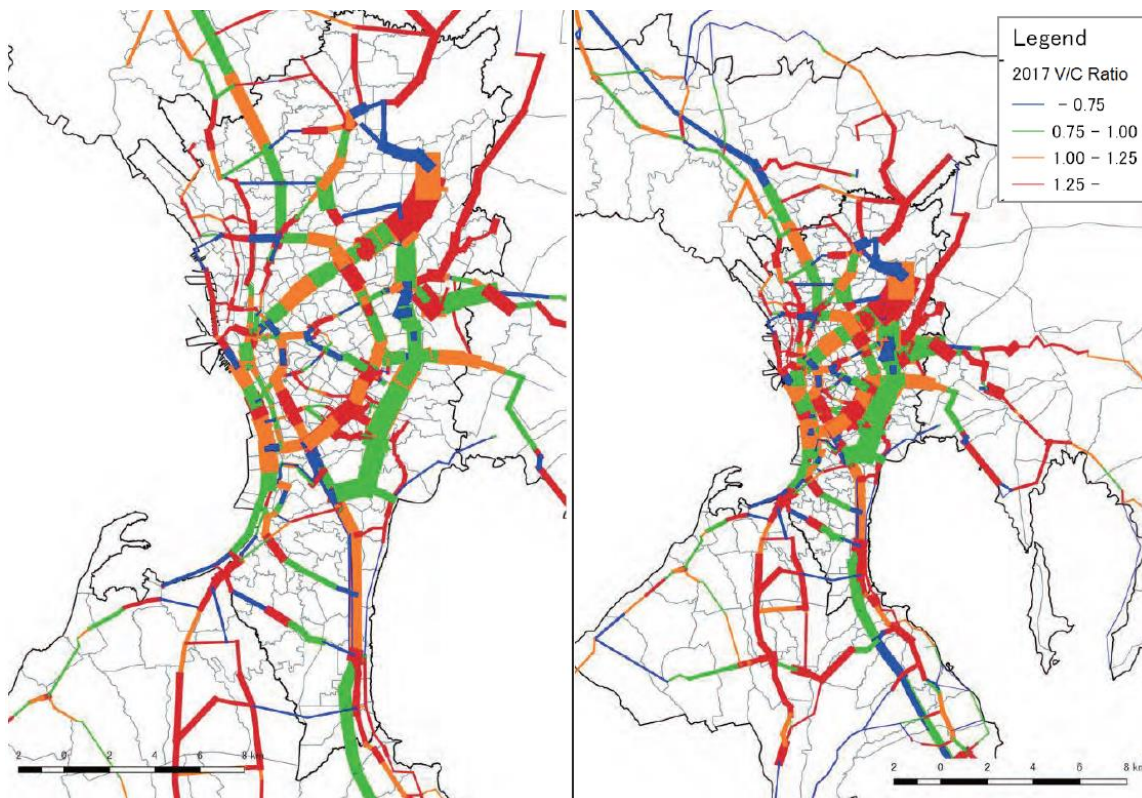
2.40 A Person Trip Survey has already been conducted several times in Metro Manila. The latest was for “The Project for Capacity Development on Transportation Planning and Database Management in the Republic of the Philippines (MUCEP)” in 2014 and has been the basis of the traffic demand forecasting database.

2.41 The demand forecast methodology is an orthodox four-step model (Figure 2.3.1). When forecasting the current transport demand using the MUCEP database, the trip assignment can be computed with the updated OD table using the travel mode and current transport network (Figure 2.3.2).



Source: Follow-up Survey on Roadmap for Transport Infrastructure Development for Greater Capital Region (2017)

Figure 2.3.1 Four-Step Model



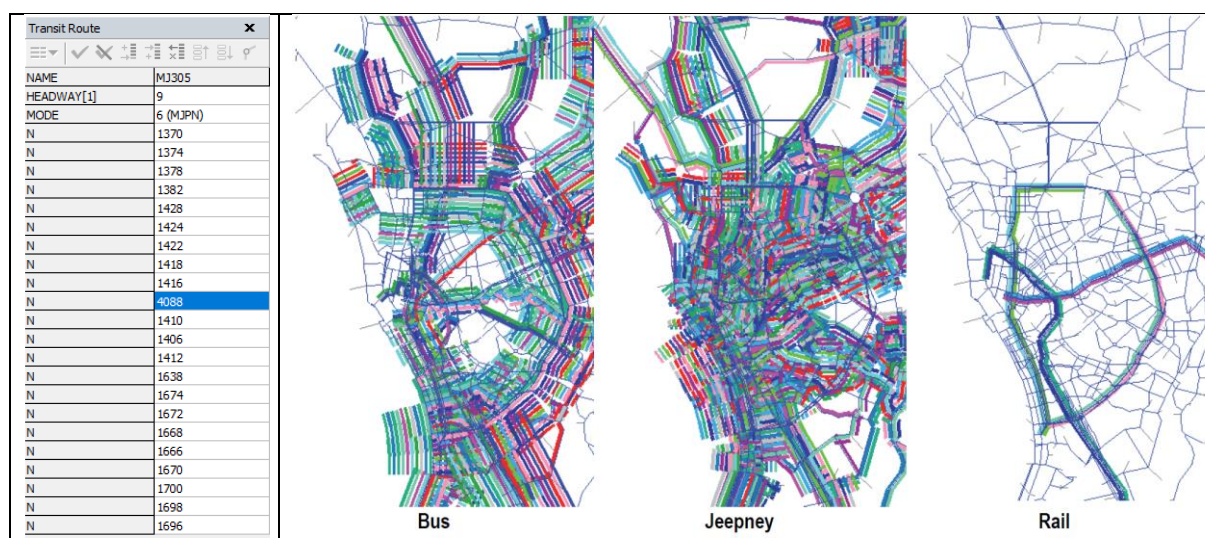
Source: Follow-up Survey on Roadmap for Transport Infrastructure Development for Greater Capital Region (2017)

Figure 2.3.2 Traffic Volume on the Existing Road Network—Based on Traffic Model, as of 2017

2.42 The transport database that was established in MUCEP. It has been updated during various transport studies, including the feasibility study of the transportation project and the transport infrastructure development trends based on the following.

- (i) The latest socio-economic framework, based on the census or the latest statistical information;
- (ii) results of supplemental traffic surveys (i.e., screen line survey, cordon line survey);
- (iii) infrastructure development; and
- (iv) transit service information.

2.43 The transit service information is created in a specific format for the modeling software. The data includes the city bus, jeepney, and the rail route in Mega Manila with the route alignment, frequency, vehicle size, and fare structure.



Source: The Project for Capacity Development on Transportation Planning and Database Management in the Republic of the Philippines (MUCEP)

Figure 2.3.3 Transit Network Data

2) Review of the MUCEP2 Study

(a) Outline

2.44 Currently, the “Route Rationalization Study for the Metro Manila Urban Transportation Integration Study (MMUTIS) Update and Capacity Enhancement Project (MUCEP) Area,” or “MUCEP2” Study, is ongoing to conduct a strategic assessment of the road transit network. The outlines of the MUCEP2 Study are as follows:

Table 2.3.1 Outlines of MUCEP 2 Study

Objectives		
<ul style="list-style-type: none"> ● To understand the transportation demand and supply in the MUCEP study Area ● To identify the rationalized routes through transport modeling ● To validate the rationalized routes through transport surveys 		
Tasks		
1	Formulation of Local Public Transport Route Plan (LPTRP) Manual	Manuals “designed for corrido-focused transportation route planning” shall be formulated. It shall focus on the highly urbanized cities and municipalities that require a more complex transportation model and analysis.
2	Updating of MUCEP Database and Model	Update the existing MUCEP database and model based on the related public transport studies in the MUCEP Area
3	Conducting Validation Survey	Conduct manual transport and traffic surveys and inventory studies to enhance the demand forecasting model

4	Drafting of the public transport rationalization plans for the MUCEP Area	Using the data and database, including the validation surveys, the Public Transport rationalization plan shall be drafted by the target term (immediate priority, medium-term, and long-term)
5	Mapping	GIS-based route database system mapping out of the existing and proposed public transport systems in the study area shall be prepared
6	Establishment of a Monitoring and Updating Framework	A monitoring and updating framework for the implementation of the rationalization plans shall be proposed.
7	Consultation Meeting	Public consultation meetings with the transport groups, commuter groups, and other key individuals must be arranged and facilitated.

Source: Route Rationalization Study for the Metro Manila Urban Transportation Integration Study Update and Capacity Enhancement Project (MUCEP) Area (Amend TOR)

2.45 Basically, public transport surveys in MUCEP2 were conducted to determine the current operational characteristics of the subject area’s road-based public transportation, such as route ends, alignment, terminals, and the actual number of units in operation. The data collection was conducted from March to August 2020, when the situation was considered abnormal due to the COVID-19 pandemic. As such, not all routes had operations back then, but only routes allowed by LTRFB were operated and then surveyed. In addition, the data collection on other public transport characteristics, such as number of units, travel time, number of round trips, frequency (the number of units dispatched per unit time) as well as boarding and alighting surveys, were carried out to get passenger load per route per mode type. Eventually, this was compared with the records of the LTRFB. In general, the surveys are the following.

- (i) License Plate Survey: recording license plate numbers of vehicles present at the subject location or zone. The survey can be of two kinds: an on-road survey and a parking lot survey. Both may be manually done or use video cameras. Some of the information that can be gathered with this survey includes, but is not limited to, time, license plate number, slot (for parking area), duration of stay, and license plate matching or duplication.
- (ii) Travel Time Survey: measuring a vehicle's time with respect to its distance traveled. Travel time data can be obtained through several methods. One way is to measure the travel times of vehicles along with test vehicles, and another is by license plate matching. The third way may be through the use of probe vehicle.
- (iii) Boarding and Alighting Survey: generally dedicated to public transportation modes in determining passenger profiles (hourly volume, daily volume), load profile throughout the route under study, peak passenger volume, and passenger load per route per mode type.

2.46 As of January 2022, the survey results have not been received from DOTr and LTRFB. Only one chapter of the Interim Report and draft database were provided by LTRFB.

(b) Outline of the Transportation Demand Forecasting Work in MUCEP2 Study

2.47 For the Immediate Priority Route Plan, the transport forecasting database developed in the Follow-up Survey on Roadmap for Transport Infrastructure Development for Greater Capital Region (Roadmap 2) (JICA, 2017) is utilized. The major task in updating the Roadmap 2 model is replacing the public transport routes with the latest, as authorized under GCQ by LTRFB and as per the original franchise allocation.

2.48 Table 2.3.2 shows a summary of the transit lines by transportation mode. There are transit lines formed as one-way round trips and two-way trips. A total of 951 routes operated in Metro Manila and adjoining provinces were recorded in the MUCEP2 database.

Table 2.3.2 No. of Transit Lines Recorded in the MUCEP 2 Database

Code	Mode	Operating Speed (kph)	No. of Transit Lines		
			One-Way	Two-Way	Total
1	Regular/non-airconditioned City Bus	30	31	10	41
2	Airconditioned City Bus	30 / 40 ¹⁾	29	11	40
3	P2P Bus	35	30	8	38
4	Provincial Bus	30	11	7	18
5	PUJ-Traditional	20	180	407	587
6	PUJ-PUVMP (Modern)	20	13	41	54
7	UV Express	25	72	93	165
8	PNR Commuter Service	30-35	2	0	2
9	LRT Line 1		2	0	2
10	LRT Line 2		2	0	2
11	MRT 3		2	0	2
Total			374	577	951

1) for EDSA Carousel

Source: Route Rationalization Study for the Metro Manila Urban Transportation Integration Study (MMUTIS) Update and Capacity Enhancement Project (MUCEP) Area

2.49 For the transit lines recorded in the MUCEP2 Study, there are several operation parameters, including operation speed, frequency, and fare structure. The operation speed is uniformly assumed, as shown in Table 2.3.2. Service frequency in units per hour was estimated from the number of operating units, roundtrip distance, and roundtrip time. For the computation of the service frequency by route, the following equations were used given the number of authorized units and route length from the route specifications of LTRFB.

- (i) Equation 1: Operating units = Number of authorized units × 10 %
- (ii) Equation 2: Roundtrip Time = (Route length × 2 directions) / Operating speed
- (iii) Equation 3: Service frequency (units/hour) = Operating units / Roundtrip time

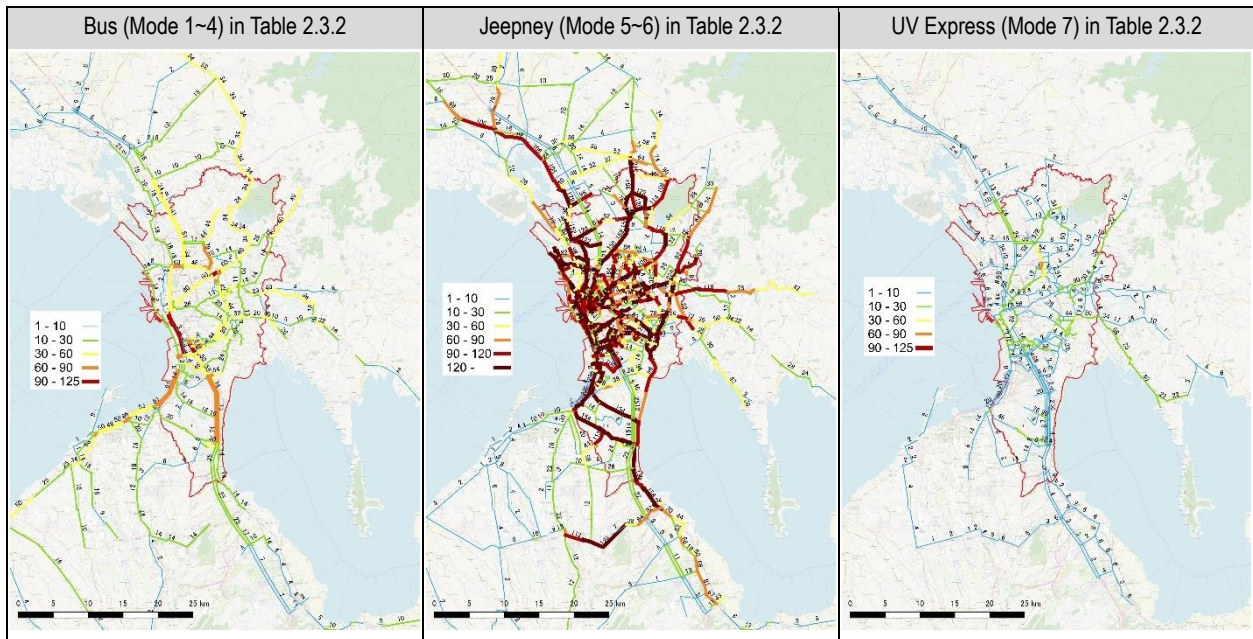
2.50 Figure 2.3.4 visualizes the number of operating routes and estimated trips in peak hours per 2 directions. According to the estimation by MUCEP2, many road sections show a very high frequency of jeepney traffic. One-hundred and twenty (120) vehicles per hour in two directions means one vehicle per minute per direction. Boarding and alighting on the roadside of such busy sections may cause serious traffic congestions, and physical mitigation measures are necessary.

2.51 The comprehensive public transport database shall be the essential infrastructure for technical assistance in public transport sectors. The sectional frequency and transport density could be measured as criteria for decision-making for some priority measures. The road section with the extremely high frequency of buses and jeepneys may cause serious traffic congestion at or around the stops. As the boarding and alighting by jeepney are not systematically conducted and severe bottleneck could be created, especially around the huge trip generator. The competition between operators also could be assumed. Possible countermeasures are as follows:

- (i) creation of dedicated boarding and alighting spaces, with boarding and alighting regulations;
- (ii) reduction of the number of trips; and
- (iii) improving the capacity (substitute into the high-capacity vehicle, introducing priority lane, Public Transport Priority System [PTPS], BRT).

2.52 The transit database could be the basis of the consideration for the decision-making. On the other hand, the database must be verified or calibrated through actual traffic

count data.



Source: Route Rationalization Study for the Metro Manila Urban Transportation Integration Study (MMUTIS) Update and Capacity Enhancement Project (MUCEP) Area

Figure 2.3.4 Transit Network Developed in MUCEP2 Study

2.4 Summary of the Issues on Road-based Public Transport System in Metro Manila

2.53 **Safety.** Compared with private vehicles, public road transport involvement is much lower. However, about 10,000 buses and jeepneys each are involved in traffic accidents in Metro Manila every year. Generally, there are fewer fatal accidents in Metro Manila due to the slow speed of traffic, but tragic public road transport accidents occur in adjoining provinces. Traffic accidents occur because of dangerous driving, boundary system of drivers, lacking awareness of the importance of traffic safety, the current regulation on jeepneys allowing them to load and unload almost anywhere, among others. Evidently, additional traffic safety measures are necessary to guarantee the safety of public transport users.

2.54 In addition to the abovementioned situation of drivers' behavior and mind, passengers also cause traffic congestions along the main road, near intersections, etc. The level of traffic safety education of passengers is also not immense so they get in and off buses and jeepneys anywhere convenient for them. Those behaviors can put themselves and other road users in dangerous situations.

2.55 **Security.** Crimes, like pickpocketing and robbery, in traditional jeepneys are reported. Since CCTVs are already required for buses and modernized jeepneys, the modernization of jeepneys could improve the situation.

2.56 **Convenience.** Assessment of the convenience of public transport services can be through service frequency, punctuality, congestion at stops and on-board, the distance to the loading/unloading points, fare system, and transfer environment.

- (i) **Punctuality.** Since public road transport services, except P2P, in Metro Manila, are not scheduled, service frequencies depend on the traffic conditions, and arrival time is not informed at bus or jeepney stops or via a mobile app. Predicting the travel time is difficult since we do not know when we can board. It might be unrealistic to have a schedule for public road transport services considering the current situation of road traffic congestion; however, informing passengers of the expected arrival and travel times is possible.
- (ii) **Frequency.** During peak time, long queues can be observed at the EDSA Carousel bus stops, similar to the situation of MRT-3. Ever since the COVID-19 pandemic, the occupancy level of public road transport vehicles has become lower than pre-pandemic, but fully occupied vehicles can still be seen. Even the provincial buses pick up more passengers after leaving the terminals. The demand-supply gap depends on the route. Detail analysis of the gap and dispatch considering the demand would improve the situation.
- (iii) **Waiting environment.** Since passengers can board and alight almost anywhere, it is difficult to evaluate the distance between loading and unloading points. But even with bus/jeepney stops, the provided facilities are minimal. Signages, information boards/maps, shelters, benches, and other facilities can be considered to improve the convenience and comfortability of passengers.
- (iv) **Fare payments.** Cashless options like IC cards and mobile wallets were introduced due to the pandemic. However, there are at least two IC cards called Beep and BEEP Rides. Beep has been used for urban railways and selected bus routes, while the latter was introduced for modern jeepneys. Since the systems were not integrated,

passengers of both services must carry two cards, causing inconvenience. In addition, the identical card names are confusing. The mutual use of IC cards must be considered.

2.57 **Comfortability.** Ending the current loading/unloading system (i.e., pick up and drop off anywhere) and assigning loading/unloading with facilities can improve the waiting environment. Facilities can be decided depending on the number of users, frequency of services, and others. The on-board environment can be improved by shifting from traditional jeepneys to modernized jeepneys, enhancing driving manner, mandating air-conditioners, etc.

2.58 **Planning Public Road Transport.** Although the review of the final outputs on MUCEP2 is necessary, the issues related to planning public road transport in Metro Manila are as follows:

- (i) lack of database to formulate the road-based public transport plans (supposed to be prepared by MUCEP2);
- (ii) lack of database on public road transport operators and its proper updating system;
- (iii) lack of updated person-trip survey data, though DOTr is trying to combine the person trip survey into population census;
- (iv) lack of methodology to consider the post-COVID-19 situation;
- (v) lack of route reorganization system corresponding with the new railway line operation and change in travel demand; and
- (vi) absence of office units and/or human resources to formulate the route plan in LGUs, though DOTr is implementing the pilot project to establish the transport office in LGUs.

3. CURRENT SITUATION AND ISSUES OF PUBLIC ROAD TRANSPORT RELATED AGENCIES

3.1 Basic Information of PUV related Agencies

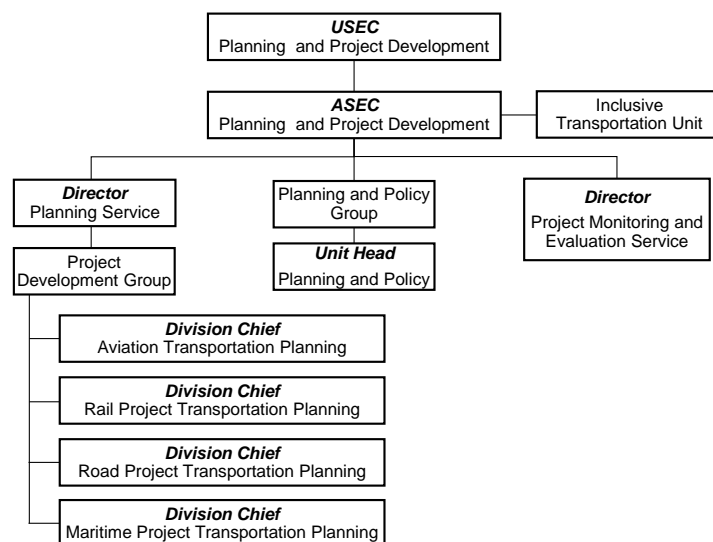
1) DOTr

3.1 DOTr, formerly known as Ministry of Transportation and Communications in 1979–1987 and Department of Transportation and Communications in 1987–2016, was created in July 1979 under Executive Order No. 546. Its mandate is to function as the primary policy, planning, programming, coordinating, implementing, and administrative entity of the executive branch of the government on the promotion, development, and regulation of a dependable and coordinated network of transportation systems, as well as in the fast, safe, efficient, and reliable transportation services.

3.2 Aside from administrative offices, and others, there are five sectoral offices in DOTr, namely (i) Planning and Project Development Office (PPDO), (ii) Railway Office, (iii) Road Transport and Infrastructure Office (RTI), (iv) Aviation and Airports Office, and (v) Maritime Office. PPDO and RTI are closely related to public road transport services. The attached agencies related to public road transport services are the Land Transportation Franchising and Regulatory Board (LTFRB), the Land Transport Office (LTO), and the Office of Transportation Cooperative (OTC).

(a) Planning and Project Development Office (PPDO)

3.3 PPDO is responsible for planning and project development, project monitoring and evaluation service supervision, intra/inter-agency support/participation, and administrative and support functions in DOTr. The organizational structure of PPDO is shown below.



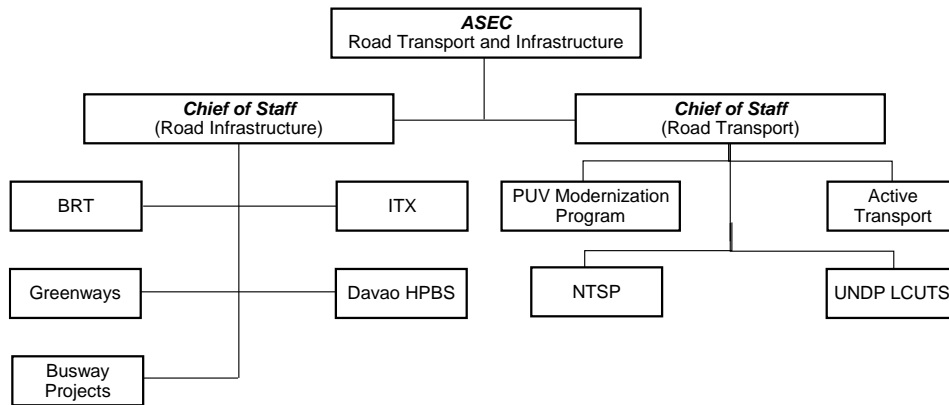
Source: PPDO, DOTr

Figure 3.1.1 Organization Chart of PPDO of DOTr

(b) Road Transport and Infrastructure Office (RTI)

3.4 RTI identifies and rationalizes major public transport (bus, jeepneys, AUVs such as vans, and shuttle services) routes and determines the routes to enable efficient management of the public transport service. It is also responsible for the development and planning of programs, projects, and policies on environmentally sustainable road

transportation, especially geared towards mass public transportation. The organizational structure of RTI is shown below.

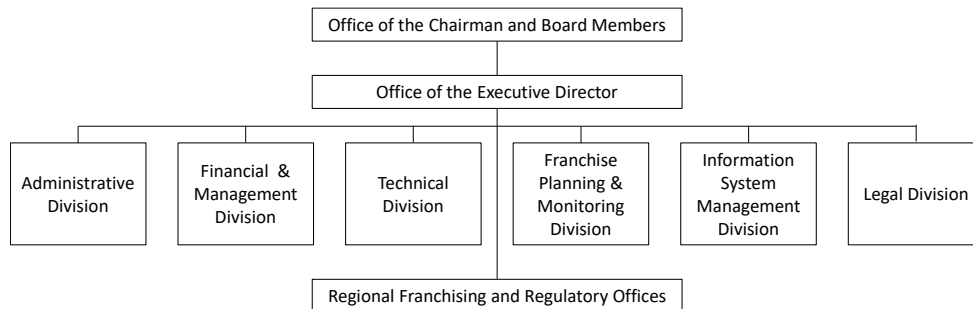


Source: RTI, DOTr

Figure 3.1.2 Organization Chart of RTI of DOTr

(c) Land Transportation Franchising and Regulatory Board (LTFRB)

3.5 The mandate of LTFRB is to promulgate, administer, enforce, and monitor compliance with policies, laws, and regulations of public land transportation services. The organizational structure of LTFRB is shown below.

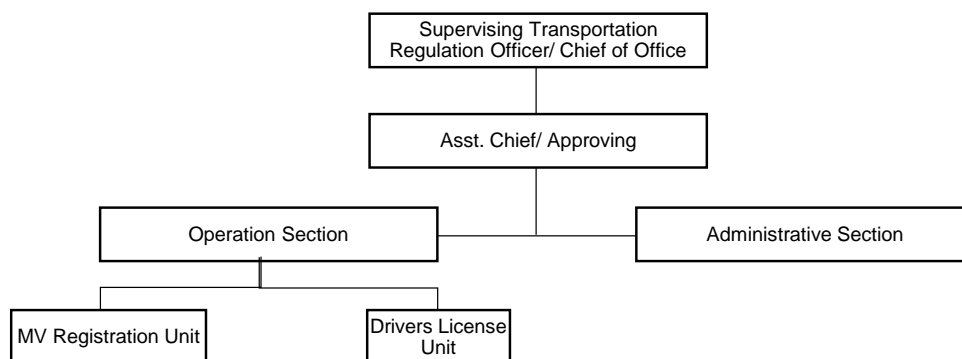


Source: LTFRB

Figure 3.1.3 Organization Chart of LTFRB

(d) Land Transport Office (LTO)

3.6 The function of LTO is for the registration of motor vehicles, issuance of driver's/conductor's licenses and permits, enforcement of transportation laws, rules, and regulations, and adjudication of apprehension cases. The organizational structure of LTO is shown below.



Source: LTFRB

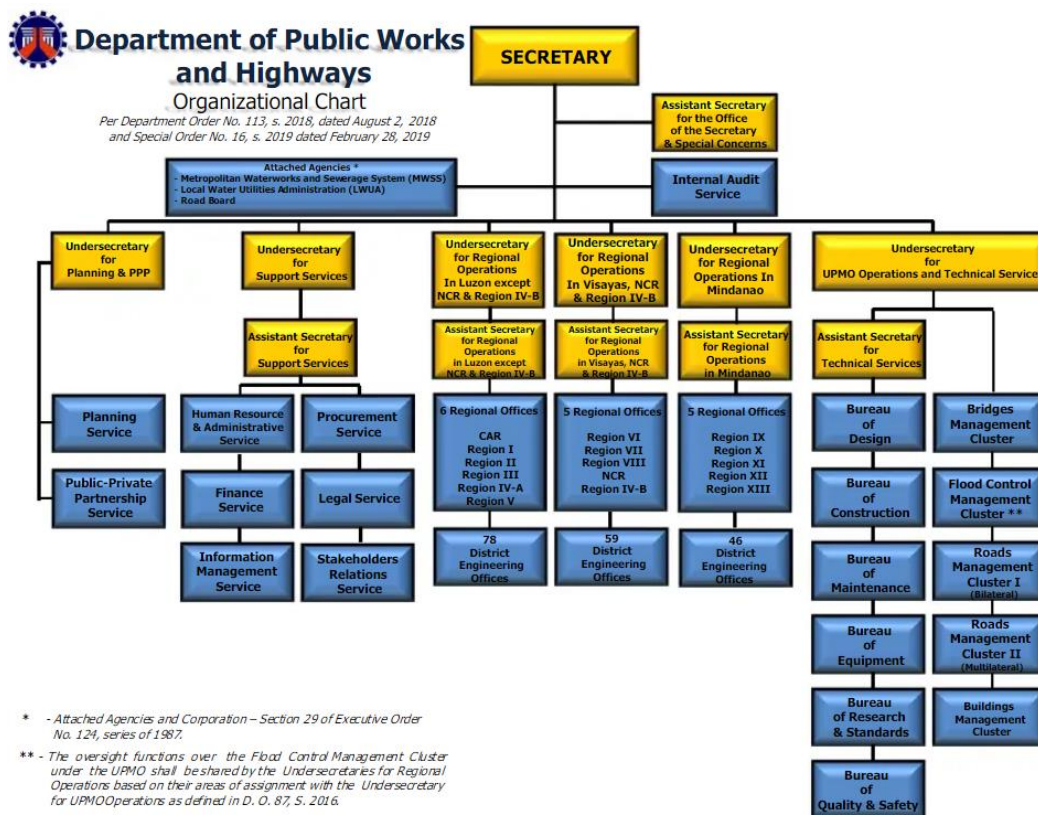
Figure 3.1.4 Organization Chart of LTO

(e) Office of Transportation Cooperative (OTC)

3.7 OTC is mandated to promulgate and implement rules and regulations that will govern the promotion, organization, registration (accreditation), regulation, supervision and development of transportation cooperatives, subject to the approval of the Department of Transportation and Communications.

2) Department of Public Works and Highways (DPWH)

3.8 DPWH, formerly known as the Bureau of Public Works and Highways, was established in 1868. Under Executive Order No. 124, s. 1987, its mandate is to undertake (i) the planning of infrastructures, such as national roads and bridges, flood control, water resources projects, and other public works, and (ii) the design, construction, and maintenance of national roads and bridges, and major flood control systems. The organizational structure of DPWH is shown below. The offices related to the PUV facilities are mainly the Planning Service and Bureau of Design.



Source: DPWH

Figure 3.1.5 Organization Chart of DPWH

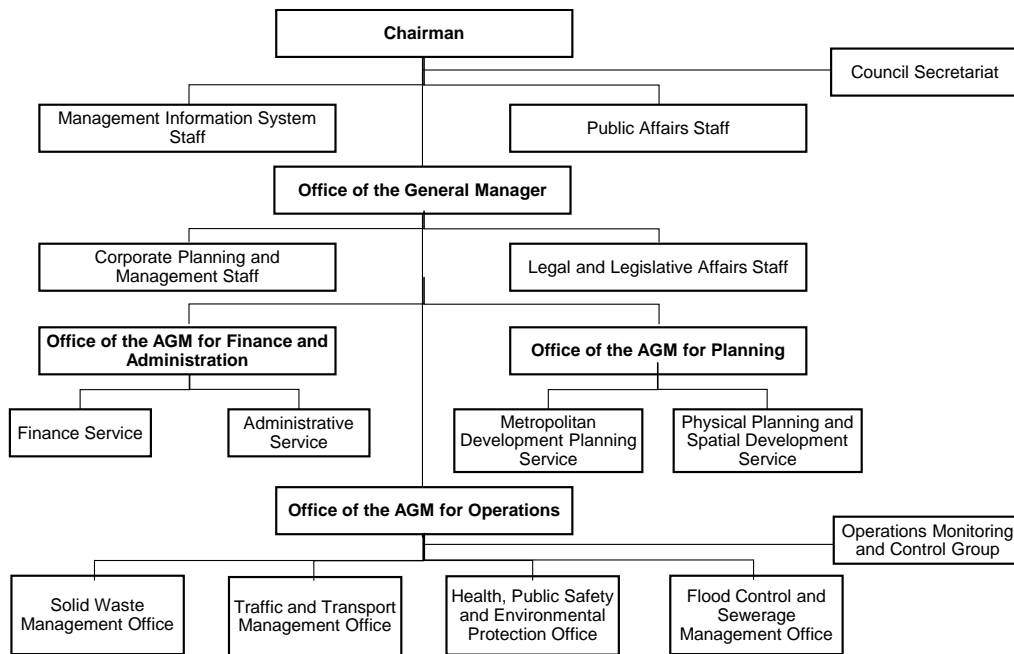
3) Metro Manila Development Authority (MMDA)

3.9 As stated in Republic Act 7924, metro-wide services under the jurisdiction of MMDA are only those with metro-wide impacts and transcend local political boundaries or entail huge expenditures such that it would not be liable for said services to be provided by the individual LGUs comprising Metropolitan Manila. Their services include (i) development planning; (ii) transport and traffic management; (iii) solid waste disposal and management; (iv) flood control and sewerage management; (v) urban renewal, zoning and land use planning, and shelter services; (vi) health and sanitation, urban protection, and pollution control; and (vii) public safety.

3.10 The organizational structure of MMDA is shown below. Its offices related to PUV

facilities are mainly the Office of the Assistant General Manager for Planning and Traffic and Transport Management Office.

3.11 For the transport sector, the service of MMDA includes the formulation, coordination, and monitoring of policies, standards, programs, and projects to rationalize the existing transport operations, infrastructure requirements, the use of thoroughfares, and promotion of safe and convenient movement of persons and goods; provision for the mass transport system and the institution of a system to regulate road users; and administration and implementation of all traffic enforcement operations, traffic engineering services, and traffic education programs, including the institution of a single ticketing system in Metro Manila.



Source: MMDA

Figure 3.1.6 Organization Chart of MMDA

4) Local Government Units (LGUs)

3.12 According to the Local Government Code (LGC) of 1991, LGUs shall endeavor to be self-reliant and continue exercising powers and discharging the duties and functions vested upon them. They shall also fulfill the functions and responsibilities of national agencies and offices devolved to them according to the LGC. Likewise, LGUs shall perform other powers and functions and responsibilities as are necessary, appropriate, or incidental to efficient and effective provisions of basic services and facilities. In relation to the PUV service, LGC provides that LGUs, particularly in cities, shall provide adequate, effective, and efficient transportation facilities that would provide access and mobility for its people to pursue socio-economic activities, as reflected in its Comprehensive Land Use Plan (CLUP).

3.13 In addition, the Department of Interior and Local Government and DOTr Joint Memorandum Circular No. 001 Series of 2007 provides that each Metro Manila LGU shall formulate the local public transport plan (LPTRP) for the intra-city routes of public road transport. LPTRP is also supposed to be revised every three years from its formulation. However, at this moment, most LGUs may not have the capacity to create the LPTRP by themselves.

3.14 There is no specialized office for transport planning in LGUs except in Pasig City.

Among the offices in each LGU, the City Planning Office and Traffic Management Office traditionally handles the approval of terminal locations of PUVs and plans the intra-city PUV routes. Table 3.1.1 shows the name of offices in each LGU.

Table 3.1.1 List of Transport related Offices in LGUs

No.	LGU	Transport related Office	No.	LGU	Transport related Office
1	Caloocan	City Planning and Development Office City Engineer's Office Department of Public Safety and Traffic Management	10	Paranaque	City Planning and Development Office City Engineer's Office Traffic and Parking Management Office
2	Las Pinas	City Planning and Development Office City Engineer's Office Traffic Bureau	11	Pasay	City Planning and Development Office City Engineer's Office Traffic and Parking Management Office
3	Makati	City Planning and Development Office City Engineer's Office Public Safety Department	12	Pasig	City Planning and Development Office City Engineer's Office City Transportation Development & Management Office
4	Malabon	City Planning and Development Office City Engineer's Office Public Safety and Traffic Management	13	Pateros	City Planning and Development Office City Engineer's Office Traffic Enforcement Unit
5	Mandaluyong	City Planning and Development Office City Engineer's Office City Traffic and Parking Management Department	14	Quezon City	City Planning and Development Office City Engineer's Office Department of Public Order and Safety
6	Manila	City Planning and Development Office City Engineer's Office Traffic and Parking Bureau	15	San Juan	City Planning and Development Office City Engineer's Office Traffic and Parking Management Office
7	Marikina	City Planning and Development Office City Engineer's Office Office of Public Safety and Security	16	Taguig	City Planning and Development Office City Engineer's Office Traffic and Parking Management Office
8	Muntinlupa	City Planning and Development Office City Engineer's Office Traffic Management Bureau	17	Valenzuela	City Planning and Development Office City Engineer's Office Traffic and Parking Management Office
9	Navotas	City Planning and Development Office City Engineer's Office City Traffic and Parking Management Office			

Source: JICA Study Team

3.2 Current Situation of PUV related Agencies and Their Issues

1) Tasks of PUV related Agencies at Central Level

3.15 The provision of public transportation services in Metro Manila has been entrusted to the private sector; therefore, no government agencies are involved in the operation and management of public transportation. The DOTr, through its RTI Unit and the Road Transport Planning Division of the PPDO, is mandated to plan and design, regulate, and monitor/evaluate all public transportation activities in the country. The LTO, an attached agency of DOTr, focuses on regulations on motor vehicles, including inspection and registration, issuance of licenses and permits, enforcement of land transportation rules and regulations, and adjudication of traffic cases. The OTC, an agency under the DOTr's Office of the Secretary, focuses on the operation of transport cooperatives and helps DOTr develop policies and regulations for public transportation services improvement. DPWH is currently responsible for the planning, design, construction, and maintenance of national highways. MMDA is tasked to plan, design public transport facilities as well as regulate, monitor, and evaluate the public transport services in Metro Manila.

Table 3.2.1 Tasks of PUV related Agencies at Central Level

	Task/Role	RTI	PPDO	LTFRB	LTO	OTC	DPWH	MMDA
1	Planning/Design of Public Transportation Facilities/access roads and walkways	Yes	Yes	Yes	No	No	Yes	Yes
2	Operation*	No*	No	No	No	No	No	No
3	Management*	No*	No	Yes	No	No	No	No
4	Regulation *	No*	Yes	Yes	Yes	No	No	Yes
5	Monitoring and Evaluation*	No*	Yes	Yes	No	Yes	No	Yes

*Through related agencies

Source: Self-capacity Assessment Questionnaire.

2) Current Situation of PUV related Agencies

(a) RTI

3.16 **Human Resources.** Based on the self-assessment, the current number of technical staff is inadequate. Although the staff has sufficient know-how on the topics, it is indicated that training, possibly on more advanced topics, is still necessary (Table 3.2.2).

Table 3.2.2 Self-Assessment of RTI for Planning/Design of Public Transportation Facilities

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Mass transportation systems planning	3	10	3	Yes	No	Yes	Yes
Travel demand forecasting	3	10	3	Yes	No	Yes	Yes
Public transport route planning	3	10	3	Yes	No	Yes	Yes
Design of public transportation facilities	3	3	1	No	No	Yes	Yes
Design of roads and walkways including footbridges	6	3	10	No	No	Yes	Yes
Sustainable transportation; integration with active transportation; green	6	6	Admin. staff of the whole office	Yes	No	Yes	Yes

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
vehicles; alternative fuels							

Source: Self-capacity Assessment Questionnaire.

3.17 **Data Availability.** Based on the responses of the RTI, relevant data is not available in-house, but they know where to obtain the following data (Table 3.2.3).

Table 3.2.3 Possible Data Sources

Available Source	Data	
Philippine Statistics Authority	Existing and future socio-economic data	
LPTRP, RRP, and previous studies	Passenger demand data	
LTFRB	Public transport route data Location of intermodal transfer facilities Operation frequency of PUV per route Bus operation data	Jeepney operation data Passenger satisfaction data Traffic accident data with PUV involvement
DPWH	Road network data	
LTO, MMDA, IAct, etc.	Traffic apprehension data by PUVs	

Source: Self-capacity Assessment Questionnaire.

3.18 **Software Availability.** Software for planning, such as AutoCAD, ArcGIS, Q-GIS, STRADA, etc., are being used by technical staff. None of the software, however, was provided nor procured by the office.

(b) PPDO

3.19 **Human Resources.** As shown in Table 3.2.4, all technical staff of PPDO is regular employees and mostly civil engineers.

Table 3.2.4 No. of Technical Staff in PPDO by Educational Background

Educational Background	Type of Employment	
	Regular	Others
Urban Planning	1	0
Transport Planning	0	0
Civil Engineering	23	0
Architecture	1	0
Economics	5	0
Total	30	0

Source: Self-capacity Assessment Questionnaire

(i) **Planning/Design of Public Transportation Facilities/Access Roads and Walkways.** Based on the self-assessment of PPDO, the current number of technical staff is not adequate as well their know-how on the topics. It was suggested that training on the said topics is necessary (Table 3.2.5).

Table 3.2.5 Self-Assessment of PPDO Planning/Design of Public Transportation Facilities

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Urban transportation planning	9	6	1	Yes	No	No	Yes

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Land use and transportation integration	9	0	1	No	No	No	Yes
Mass transportation systems planning	9	2	1	Yes	No	No	Yes
Travel demand forecasting	9	7	1	Yes	No	No	Yes
Public transport route planning	9	5	1	Yes	No	No	Yes
Design of public transportation facilities	9	0	1	No	No	No	Yes
Design of roads and walkways including footbridges	9	0	1	No	No	No	Yes
Sustainable transportation; integration with active transportation; green vehicles; alternative fuels	9	7	1	Yes	No	No	Yes
Others: Evaluation/development of public transport project proposals	9	9	1	Yes	No	No	Yes

Source: Self-capacity Assessment Questionnaire

- (ii) **Public transportation regulation.** Regarding regulations, PPDO is largely involved in developing rules and policies, which is part of its regular duty. Currently, it has no staff with technical training or formal education on the subject matter (Table 3.2.6).

Table 3.2.6 Self-Assessment of PPDO for Public Transportation Regulation

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Development of policies and regulations	9	0	1	Yes	No	No	Yes

Source: Self-capacity Assessment Questionnaire

- (iii) **Public Transportation Monitoring and Evaluation.** Under public transportation monitoring and evaluation, PPDO indicated the need for training on developing indicators for minimum urban public transportation service standards (i.e., security, safety, convenience, affordability, equality, orderliness, etc.) (Table 3.2.7).

Table 3.2.7 Self-Assessment of PPDO for Public Transportation Monitoring and Evaluation

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Development of indicators for minimum urban public transportation service standards	9	0	1	Yes	No	No	Yes

Source: Self-capacity Assessment Questionnaire

3.20 **Software Availability.** For transportation modeling, like travel demand forecasting, RTPD has CUBE and VISUM as planning tools.

(c) LTFRB

3.21 **Human Resources.** As shown in Table 3.2.8, about half of the technical staff of LTFRB are regular employees and mostly civil engineers.

Table 3.2.8 No. of Technical Staff in LTFRB by Educational Background

Educational Background	Type of Employment	
	Regular	Regular
Urban Planning	1	3
Transport Planning	4	0
Civil Engineering	18	16
Architecture	0	4
Economics	8	1
Total	31	24

Source: Self-capacity Assessment Questionnaire

(i) **Planning/Design of Public Transportation Facilities/Access Roads and Walkways.** Based on the self-assessment of LTFRB, the current number of technical staff is not adequate as well their know-how on the topics. It was suggested that training on the said topics is necessary (Table 3.2.9).

Table 3.2.9 Self-Assessment of LTFRB Planning/Design of Public Transportation Facilities

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Urban transportation planning	3	1	4	Yes	No	No	Yes
Travel demand forecasting	3	1	4	Yes	No	No	Yes
Public transport route planning	4	1	4	Yes	No	No	Yes

Source: Self-capacity Assessment Questionnaire

(ii) **Public transportation regulation.** This is a part of the regular duty of LTFRB, but none is assigned for some tasks. LTFRB needs more personnel and know-how (Table 3.2.10).

Table 3.2.10 Self-Assessment of LTFRB for Public Transportation Regulation

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Development of policies and regulations	5	2	7	Yes	No	No	Yes
Public transportation fare setting	-	-	-	Yes	No	No	Yes
Bus services standards	-	-	-	Yes	No	No	Yes
Standards and specifications on the bus operators	-	-	-	Yes	No	No	Yes

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Jeepney services standards	-	-	-	Yes	No	No	Yes
Standards and specifications on the Jeepney operators	-	-	-	Yes	No	No	Yes
Enforcement of traffic rules and regulations pertaining to PT violations	Approx. 90 personnel nationwide	Approx. 90 personnel nationwide	-	Yes	No	No	Yes

Source: Self-capacity Assessment Questionnaire

(iii) Public Transportation Management. This is one of the main tasks of LTFRB, but the staff and know-how are insufficient. (Table 3.2.11)

Table 3.2.11 Self-Assessment of LTFRB for Public Transportation Management

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Real-time bus supply and service requests coordination and management	10	-	-	Yes	No	No	Yes
Bus dispatch; operation of a control center; ITS	5	-	-	No	No	No	Yes
Cost and Operation Management	-	-	-	No	No	No	Yes
Fare and Revenue Management	2	-	-	No	No	No	Yes
Mobility as a Service (MaaS); ITS	2	-	-	Yes	No	No	Yes

Source: Self-capacity Assessment Questionnaire

(iv) Public Transportation Monitoring and Evaluation. This is also part of the main tasks of LTFRB, but the staff and know-how are insufficient. They also need training opportunities on the said topics. (Table 3.2.12).

Table 3.2.12 Self-Assessment of LTFRB for Public Transportation Monitoring and Evaluation

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Development of indicators for minimum urban public transportation service standards	4	2	4	Yes	No	No	Yes
Reporting and enforcement of monitoring activities	5	3	2	Yes	No	No	Yes
Monitoring of operating	4	3	4	Yes	No	No	Yes

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
standards							
Performance evaluation	5	2	4	Yes	No	No	Yes

Source: Self-capacity Assessment Questionnaire

3.22 **Data Availability.** The available data at LTFRB includes transport demand data (certain routes), public transport routes, the locations of intermodal transfer facilities (some), public transport operation frequency (certain routes), bus operation data (certain routes), and traffic apprehension by PUVs (related to franchising).

3.23 **Software Availability.** The software used by LTFRB is Q-GIS and CPUVMS (operation monitoring software).

(d) LTO

3.24 **Human Resources.** From the self-assessment, the current number of technical staff is not adequate. The know-how of the staff on the topics may already be sufficient, but training, possibly on more advanced topics, was still indicated as necessary (Table 3.2.13).

Table 3.2.13 Self-Assessment of LTO for Public Transportation Regulation

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Development of policies and regulations	9	0	1	-	-	-	-
Enforcement of traffic rules and regulations pertaining to PT violations	See Table 3.2.9	-	-	Yes	No	Yes	Yes

Source: Self-capacity Assessment Questionnaire

3.25 Table 3.2.14 shows the number and status of appointments of staff working at LTO. More than one-third of LTO staff (37.8%) are in Metro Manila.

Table 3.2.14 No. of Staffs at LTO by Status of Appointment

Area	Status of appointment				%
	Regular	Job Order	Casual	Total	
NCR - West	384	384	0	768	37.8
NCR - East	176	233	9	409	
Total Nationwide	1,903	1,201	9	3,113	100.0

Source: Self-capacity Assessment Questionnaire

(e) OTC

3.26 **Human Resources.** As part of its supervision and development functions, the OTC continuously monitors and evaluates the public transport operations of its accredited transport cooperative. It also provides technical guidance through a menu of services designed to facilitate their transformation to become responsive transport service providers and highly competitive business organizations through a genuine and quality cooperative operation.

- (i) **Public Transportation Regulation.** The OTC may not be directly involved in public transport regulation but has assisted in developing policies and regulations with partner GAs, GFIs, NGOs, and private institutions, such as but not limited to DOTr, LTFRB, and LTO, among others. The personnel consists of the technical staff from the Office of the Chairperson/Executive Director (2), Operations Division (9), and Planning and Evaluation Division (6).
- (ii) **Public Transportation Management.** The OTC has also assisted in formulating public transport management with partner GAs, GFIs, NGOs, and private institutions, such as but not limited to DOTr, LTFRB, and LTO, among others. The personnel consist of the technical staff from the Office of the Chairperson/Executive Director (2), Operations Division (4), and Planning and Evaluation Division (2).
- (iii) **Public Transportation Monitoring and Evaluation.** For public transportation monitoring and evaluation, OTC concentrates on transport cooperatives operation, particularly identifying the areas of operational concerns or improvements, thereby applying **corrective** measures and serving as a basis for formulating new or enhanced policies and plans for TSCs guidance. The personnel consist of the technical staff from the Office of the Chairperson/Executive Director (2), Operations Division (4), and Planning and Evaluation Division (2).

3.27 **Availability of Data.** The Transport Cooperatives' Annual Reports contain basic and operational data/information, such as the number of members, the number of units (according to type and mode of service), a list of consolidated franchises, attended training, and financial data, among others.

3.28 The Transport Cooperative Statistical Data consists of basic information, such as addresses, emails, names of officers, registration, and accreditation numbers, including the number of units (mode/type of service), number of members, and area of operations.

3.29 **Availability of Software.** MS Excel is used mostly for the computing work of the technical staff.

(f) DPWH

3.30 Human Resource. Based on the self-assessment of the Planning Service of DPWH, their current number of technical staff is insufficient, know-how on the topics is not enough, and suggested that training on the said topics is necessary. It is also mentioned that the Bureau of Design (BoD) needs some training related to the prevailing guidelines and standards (Table 3.2.15).

Table 3.2.15 Self-Assessment of DPWH for Planning/Design of Public Transportation Facilities

Task/Field of Specialization	No. of Staff					Self-assessment			
	Technical Staff		With Formal Training		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Permanent	Job-Order	Permanent	Job-Order					
Land use and transportation integration	44	4	17	0	6	Yes	No	No	Yes
Travel demand forecasting	52	10	20	1	15	Yes	No	No	Yes
Design of public transportation facilities	70	5	66	3	15	Yes	No	No	Yes
Design of roads and walkways including footbridges	22	3	18	1	7	Yes	No	No	Yes
Sustainable transportation; integration with active	74	6	45	0	18	Yes	No	No	Yes

Task/Field of Specialization	No. of Staff				Self-assessment				
	Technical Staff		With Formal Training		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Permanent	Job-Order	Permanent	Job-Order					
transportation; green vehicles; alternative fuels									

Note: DPWH-BoD's task with the design of roadways and walkways (particularly roads and bridges) is to review the design plans submitted as an output of design consultants. Although that is not a primary activity, the know-how of the prevailing guidelines and standards is considered crucial in this regard.

Source: Self-capacity Assessment Questionnaire

3.31 Data Availability. The available data at DPWH Planning Service includes existing and future socio-economic data, passenger demand, traffic data, public transport route, road network, location of intermodal transfer facilities, the operation frequency of PUV per route, traffic accidents by PUVs, and road and bridge inventory and conditions.

3.32 Software Availability. DPWH Planning Service uses AutoCAD, ArcGIS, Q-GIS, traffic simulation and analysis software (STRADA, VISTRO, VISSIM, and Visum), design analysis software (Infrastructure Design Suite, STAAD, Midas, and others), spreadsheet software, and Highway Development and Maintenance (HDM-4).

(g) MMDA

3.33 Human Resources. Under the Office of the Assistant General Manager for Planning (OAGMP) of MMDA, it has 23 technical staff with varying backgrounds (Table 3.2.16).

Table 3.2.16 Staff Number of the Department/Group by Contract Type

Educational Background	Type of Employment		
	Regular	Casual	Total
Urban Planning	8	0	8
Transport Planning	1	0	1
Civil Engineering	3	1	4
Architecture	4	0	4
Economics	6	0	6
TOTAL	22	1	23

Source: MMDA

3.34 Planning/Design of Public Transportation Facilities/Access Roads and Walkways. Based on the self-assessment of MMDA, the current number of technical staff is insufficient, even their know-how on the topics is not enough, and suggested that training on the said topics is necessary. In addition, since urban transportation planning is not part of the regular duties of MMDA, it expressed the necessity for training (Table 3.2.17).

Table 3.2.17 Self-Assessment of MMDA for Planning/Design of Public Transportation Facilities

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Urban transportation planning	0	0	0	No	No	No	Yes
Land use and transportation integration	5	5	5	Yes	No	No	Yes
Travel demand forecasting	0	0	0	No	No	No	Yes
Design of public	0	0	0	No	No	No	Yes

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
transportation facilities							
Design of roads and walkways including footbridges	4	4	2	Yes * Footbridges only	No	No	Yes
Others: Support and Enhancement to other agencies in relation to traffic management	19	19	97	Yes	No	No	Yes

Source: Self-capacity Assessment Questionnaire

- (v) **Public transportation regulation.** MMDA is largely involved in the enforcement aspect of the regulations. Although their know-how is adequate, they need more staff and further training (Table 3.2.18).

Table 3.2.18 Self-Assessment of MMDA for Public Transportation Regulation

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Enforcement of traffic rules and regulations pertaining to PT violations	2549* Enforcers incl.	48	165	Yes	No	Yes	Yes

Source: Self-capacity Assessment Questionnaire

- (vi) **Public Transportation Monitoring and Evaluation.** MMDA cited needing more staff and training on the reporting and enforcement of monitoring activities, bus volume monitoring, and sanitary health protocols (Table 3.2.19).

Table 3.2.19 Self-Assessment of MMDA for Public Transportation Monitoring and Evaluation

Task/Field of Specialization	No. of Staff			Self-assessment			
	Technical Staff		Admin./ Support staff	Regular duty	No. of staff is adequate	Staff's know-how is adequate	Training is necessary
	Without formal training/ education	With formal training/ education					
Reporting and enforcement of monitoring activities;	2	2	7	Yes	No	No	Yes
Others: Bus Volume Monitoring and Sanitary Health Protocols	2	2	7	Yes	No	No	Yes

Source: Self-capacity Assessment Questionnaire

3.35 **Data Availability.** The available data at OAGMP includes bus dispatching data, traffic accidents by PUVs, and traffic apprehension by PUVs.

3.36 **Software Availability.** The software used by OAGMP is AutoCAD, ArcGIS, Q-GIS, VISTRO, VISSIM, and Sketchup. In addition, the office uses software for booking management and monitoring.

3) Financial Situation

3.37 **DOTr.** The department has a total appropriation of P75.4 billion in 2022 based on General Appropriations Act FY 2022-Volume I-B. Its total budget includes the budgets of the Office of the Secretary, Civil Aeronautics Board (CAB), Maritime Industry Authority (MARINA), Office of Transportation Cooperatives (OTC), Office for Transportation Security (OTS), Philippine Coast Guard (PCG), and Toll Regulatory Board (TRB). Table 3.2.20 shows the summary of budget allocation for the different offices under DOTr in the period 2018–2022.

Table 3.2.20 Budget of DOTr (2018–2022)

Office	Budget of DOTr (PHP mil.)				
	2018	2019	2020	2021	2022
Office of the Secretary	51,474	54,240	83,065	72,878	54,442
Civil Aeronautics Board	128	152	141	204	216
Maritime Industry Authority	1,041	930	771	766	909
Office of Transportation Cooperatives	86	38	38	36	33
Office of Transportation Security	357	349	120	318	313
Philippine Coast Guard	13,225	11,925	15,221	13,209	19,301
Toll Regulatory Board	29	35	39	35	34
Total Appropriations	66,340	67,669	99,395	87,446	75,248

Source: DBM (GAA)

3.38 The Office of the Secretary (DOTr) has a general appropriation of about P54.4 billion for the year 2022. It has various programs for the operation of different transportation modes. Under the road transportation services improvement, the Motor Vehicle Regulatory Program has a PHP3.5 billion budget, while the Land Public Transportation Program has about PHP16.0 billion, as shown in Table 3.2.21. However, despite the decreasing budget for DOTr since 2020, the Land Public Transportation Program budget has increased.

Table 3.2.21 Key Appropriations by Program under Office of the Secretary, DOTr (2018–2022)

Key Appropriations by Program		Budget of Office of the Secretary, DOTr (PHP mil.)				
		2018	2019	2020	2021	2022
General Administration and Support		3,028	2,827	2,088	2,094	2,260
Support to Operations		114	15,137	10,849	7,004	3,073
Operations	Rail Transport Program	24,059	26,156	61,436	49,274	23,120
	Aviation Infrastructure Program	9,785	3,869	2,446	4,946	3,875
	Maritime Infrastructure Program	5,464	1,787	573	562	2,606
	Motor Vehicle Regulatory Program	1,690	2,176	4,652	2,259	3,538
	Land Public Transportation Program	7,334	2,289	1,021	6,738	15,970
	Sub-total	48,333	36,277	70,127	63,780	49,109
Total Appropriations		51,474	54,240	83,065	72,878	54,442

Source: DBM (GAA)

3.39 Table 3.2.22 shows some of the locally funded and foreign-assisted projects under the Land Public Transportation Program, such as the construction, rehabilitation, and improvement of land public transportation infrastructure, the DOTr-LTO IT Infrastructure Project, the PUV Modernization Project, and the Service Contracting of Public Utility Vehicle Program. Some foreign-funded projects, which would require capital outlays, are also listed. The 2022 budgets for the PUV Modernization Project and Service Contracting of the PUV Program were more than double of 2021 budgets.

Table 3.2.22 Budget under Land Public Transportation Program (2018–2022)

Projects		Budget of Land Public Transportation Program (PHP mil.)				
		2018	2019	2020	2021	2022
Issuance of Certificate of Public convenience, granting of permits and establishments of routes		316	380	355	408	465
Locally funded Projects:	Construction, rehabilitation and improvement of other transportation infrastructure	1,012	15	1	1	1
	DOTr-LTO IT Infrastructure Project	1,298	925	550	1,200	-
	PUV Modernization Project	888	447	-	592	1,801
	Service Contracting of Public Utility Vehicle program	-	-	-	3,000	7,000
	Traffic Management Mentorship Assistance Program	-	-	115	-	-
	Integrated Transport System Project	100	100	-	-	200
	Active Transport Bike Share System and Safe Pathways Program in Metropolitan Areas	-	-	-	-	2,000
	EDSA Busway Project	-	-	-	-	473
	Fuel Subsidy to Transport Sector Affected by Rising Fuel Price	-	-	-	-	2,500
	Rehabilitation of El Nido Transport Terminal	-	-	-	-	150
	Davao High Priority Bus System	-	-	-	-	1,000
	Construction of Ilocos Norte Transport Hub and Parking Building (Central Terminal), Laoag City	-	-	-	-	380
	Sub-Total	3,299	1,487	666	4,793	15,505
Foreign-assisted projects:	EDSA BRT	300	-	-	-	-
	Metro Manila BRT Line 1	275	-	-	-	-
	EDSA Greenways Project	-	-	-	1,000	-
	Cebu BRT Project	3,081	422	-	511	-
	Davao High Priority Bus System	64	0	-	26	-
	Sub-Total	3,719	422	-	1,537	-
Total	7,334	2,289	1,021	6,738	15,970	

Source: DBM

3.40 **LTFRB.** The LTFRB remits all its revenues (income or payments made by motorists such as licenses, license plates, vehicle registration, late fees, etc.) collected to the National Treasury. It needs to request its budget allocation from the national government to address all its programs and activities. Based on its Budget Execution Documents (BED) Form, its budget allocation was about PHP502.5 million in 2021.

3.41 **LTO.** The budgets of LTO cover general management and supervision budget, operation budget (motor vehicle registration system, law enforcement and adjudication and issuance of drivers and permits), and project funds. In 2022, the project funds cover Seat Belt Use Promotions and Child Restraint Systems Installation, Use and Maintenance Promotions with PHPP67.9 million and LTO IT Infrastructure Project with PHP1.2 billion.

3.42 Based on its Major Final Outputs (MFO) Matrix, the agency had about PHP3.4 billion budget allocation (under NEP: National Expenditure Program) in 2021.

3.43 **OTC.** The OTC, an agency under the Office of the Secretary of DOTr, has an appropriation of about PHP33.1 million in 2022, which has been almost stable since 2019.

4) Need for Capacity building

3.44 Based on the responses of all the agencies surveyed, the number of technical staff performing various tasks related to planning/design, regulation, and monitoring/evaluation of road public transportation facilities and services is inadequate, and training programs in key aspects of public transportation are necessary. For RTI, PPDO, and LTFRB,

there is also a need to invest in computer software intended for road public transport planning, i.e., travel demand forecasting software, GIS, computer-aided design (CAD), etc.

4 CURRENT SITUATION AND ISSUES OF BUS OPERATORS

4.1 Current Status of Bus Operators Operating in Metro Manila

4.1 Although a wide range of information on the status of bus operators currently operating in Metro Manila was requested, including information from DOTr/LTFRB and other relevant agencies, MMDA using local consultants, and system vendors developing traffic search applications in Metro Manila, we were not able to obtain any summary documents or information. The results of the survey are shown in Table 4.2.1 below.

Table 4.2.1 Overview of Bus Operators Operated in Metro Manila

Items	Unit	At present (during COVID-19)	Before COVID-19
Number of bus operators	operator	208	222
Number of routes	route	35	161
Number of trips	trip	-	-
Number of bus vehicles	vehicle	4,581	5,678
Number of drivers	person	-	-
Number of conductors	person	-	-
Number of bus stops	stop	-	-
Number of passengers using (average of 1 day)	person	-	-
Average speed	km/h	11	19
Average length of route	Km	22.64	36.7
Revenue (average of 1 day)	PHP	-	-

Source: JICA Study Team

4.2 Normally, LTFRB, which is the licensing authority for bus services, should have developed such documents and information, but it is unclear whether they have not, or whether they were not submitted at the time of this study.

4.2 Analysis of Questionnaires and Interviews with Bus Operators

1) Contents

4.3 As described in **Chapter 1.4**, 76 operators were listed, some of which did not provide correct contact information. The JICA Study Team had contacted 44 operators but only had direct contact with the person in charge with 18 operators. Among them, eight operators were unable to respond due to their busy work schedules because of the COVID-19 pandemic, or some requested an extension to respond. In the end, responses were collected from ten operators.

4.4 In the work plan, about 20 to 30 bus operators were planned to be surveyed, but since the survey included medium- to relatively large-sized bus operators and similar trends were observed in the content of the responses and the problems and issues recognized by the operators, it is believed that the survey is sufficient for analyzing the responses and making recommendations for improvement. Operators are implementing similar efforts in operation management, which will be described later. Although the status of system implementation varies, the answers to what is needed are similar for each operator. As for bus services, issues were determined not only from the responses from the operators but also through the local consultant to understand the actual situation. In terms of operation plans, vehicles, and driver training, there were no major differences in the responses of the operators as the systems have been designed by the relevant agencies, such as DOTr, LTFRB, and LTO. Therefore, the report identifies the issues that Japanese bus operators are addressing, yet Metro Manila bus operators are not acknowledging and recommending improvements.

4.5 Regarding the responses from each operator, although the response rate was high for questionnaires and simple questions on Google Forms, only four to five operators responded to the questions that required time to answer or other formats like Excel. Therefore, increasing the response rate when using the online survey is necessary.



Source: JICA Study Team

Figure 4.2.1 Online Interview with Operator

2) Overview of the Operators surveyed

4.6 Among the ten operators that cooperated in the survey, five responded with their company profile.

Table 4.2.1 Company Profile of Operators Responded (FY 2020)

	BUENASHER Transport Corp.	PAMANA transport Services, Inc.	ST. MARTIN of Tours Trailways, Inc.	NUESTRA SEÑORA DEL CARMEN TRANSPORT SERVICES, Inc.	UBE Express, Inc.
Established	Jun. 2013	Apr. 2000	Mar. 2007	Aug. 1999	Feb. 2015
Capital (PHP 000)	5,000	3,000	5,000	10,000	6,250.9

	BUENASHER Transport Corp.	PAMANA transport Services, Inc.	ST. MARTIN of Tours Trailways, Inc.	NUESTRA SEÑORA DEL CARMEN TRANSPORT SERVICES, Inc.	UBE Express, Inc.
Other Business other than Bus Operation	School (Senior High School)	-	-	-	Logistics
Employees	41	109	54	141	339
Number of Vehicles	19	22	18	59	56 (incl. P2P:32)
Number of Bus Routes	5	4	3	1	8 (incl. P2P:7)

Source: JICA Study Team

3) Income and Expenditure of the Operators surveyed

4.7 Four out of the ten operators responded on their income and expenditure status. All reported a decrease in revenue and operating income when compared with the pre-COVID period due to fewer passengers and limited bus routes during the pandemic.

Table 4.2.2 Income and Expenditure of the Operators Surveyed

Unit: Thousand PHP

Name of Operator	BUENASHER Transport Corp.			PAMANA Transport Services, Inc.		
	2019	2020	Comparison	2019	2020	Comparison
Operation Revenue	9,992	5,257	▲ 4,735	25,061,001	7,883,051	▲ 17,177,950
Operation Profit	▲ 4,126	▲ 4,065	61	1,459,392	▲ 464,023	▲ 1,923,415
Name of Operator	ST. MARTIN			NUESTRA SEÑORA DEL CARMEN TRANSPORT SERVICES, INC.		
	2019	2020	Comparison	2019	2020	Comparison
Operation Revenue	6,348,222	2,606,675	▲ 3,741,547	35,184,261	14,927,986	▲ 20,256,275
Operation Profit	1,841,150	922,586	▲ 2,759,714	159,664	▲ 9,993,445	▲ 10,153,109

Source: JICA Study Team

4) Operation Planning

(a) Method of Setting Bus Route / Apply for Permission

4.8 Before the pandemic, the bus route plan for Metro Manila was being developed by the DOTr and LTFRB. But when a bus operator establishes a new route, the operator decides after considering the needs of citizens, feasibility, and profitability. The operator obtains a letter of recommendation from the LTFRB and then applies to DOTr and LTFRB for a permit to operate. The application must be at least 30 days before the start of operation and includes the number of vehicles, hours of operation, and frequency of operation. The application may be rejected if it is judged that the application will have an impact due to competition with other routes. The current situation is that there is a well-developed means of transportation in Metro Manila other than buses, such as jeepneys and tricycles, and the routes cover all major roads in the city, so there is little need to establish new routes. However, the bus routes and permit applications for new routes after the pandemic are still under discussion in DOTr and LTFRB.

(b) Method of Setting Timetable and Schedule

4.9 The setting of operation timetables and schedules is determined by the scale of demand from users. If a new route competes with an existing bus operator, the service level of the existing bus operator is taken into consideration before setting the new route.

(c) Method of Monitoring Operation Planning

4.10 The operator surveys the number of passengers, regularly (almost daily to

weekly) monitoring based on the fares they receive and the tickets they sell, and the information is only shared internally. However, during the COVID-19, passengers pay their fares using QR codes, and the bus operators use these codes to keep track of the number of passengers.

4.11 In particular, they collect data on the number of passengers during peak and off-peak hours (especially in the early morning), and as a result of the monitoring, they implement measures such as reducing the number of vehicles in operation on routes or time zone that are not profitable.

(d) Issues in Developing Operation Planning

4.12 Besides the impacts of COVID-19, the shortage of bus drivers has been an issue for bus operators. Although there are license holders able to drive large vehicles, they are inexperienced in bus driving, making them prone to accidents. Therefore, it is difficult to employ drivers with actual bus driving experience.

5) Operation Management

(a) Daily Operation Management

- (i) **Alcohol Detection Test.** Many of the operators conduct an alcohol detection test before operations.
- (ii) **Health Condition Check before Operation.** Each operator also conducts health condition checks at the start of work.
- (iii) **Vehicle Inspection before/after Operation.** All the operators conduct vehicle inspections at the beginning of the workday based on the inspection items specified by each operator. In addition, four operators reported that they do inspections after the operation at the depots.
- (iv) **Placement of Spare Vehicles/Drivers.** All operators have spare vehicles and drivers in their depot (office).

(b) Response in case of Abnormalities

- (i) **Unexpected Absence by Driver.** As a rule, the spare drivers and conductors handle the situation, but there are times other members are called and assigned a driver who is available to work.
- (ii) **Vehicle Break Down.** Each operator has a slightly different way of handling this, but they can be broadly classified into two categories.
 - Dispatch mechanics from each operator will go to the breakdown site and rescue the vehicle.
 - Towing a broken-down vehicle.
- (iii) **Complaints.** When a complaint is received, the basic policy is to investigate and resolve the issue. Some operators have established service support hotlines to accept complaints as well as provide information.

(c) Monitoring

- (i) **GPS.** Although all buses are equipped with GPS, 80% of the operators responded that they analyze and reflect the data in their operation plans, and 70% utilize the data in daily operation management, such as arranging for a replacement vehicle in case of delays. More effective use of GPS is required.

(ii) **Operation Management System.** Three operators have implemented the following systems:

- 1) vehicle management system;
- 2) maintenance management system (360 Maintenance Checklist Operation Software for Maintenance); and
- 3) operation management system (Booking and Driver Vehicle Operation Software for Operation).

When asked about systems they would like to introduce in the future, some operators mentioned GPS-based Operation Management Systems, Vehicle Dispatch Systems (Automated Maintenance Systems), and Dispatching and Fleet Management Systems.

(iii) **Surveillance Camera.** All operators are equipped with surveillance cameras, and most can check live video feeds. However, even though video data is useful for analyzing traffic accidents and investigating the causes of accidents, such as the attitude of drivers and the occurrence of complaints from passengers, only 70% of the operators use them.

(d) Safety Management System

(i) **Compliance with Laws and Regulations.** Each operator has been thoroughly instructed to observe the speed limit and properly use direction indicators when turning at intersections, changing lanes, and arriving at or departing from bus stops.

In addition, from the viewpoint of ensuring the safety of passengers, boarding and alighting at places other than bus stops should be prevented. However, one company responded that this is allowed because drivers routinely compete for bus passengers.

(ii) **Road Crash (Traffic Accident).** Each operator has established a system to contact the police and the office as the first response during road crashes or traffic accidents.



Source: JICA Study Team

Figure 4.2.2 Flow at the Time of a Road Crash (Traffic Accident) (Image)

Analyzing the causes of road crashes (traffic accidents) and sharing this information is considered useful by bus operators in Japan for preventing subsequent accidents. Among the surveyed bus operators, four operators prepared the accident statistics and results of the analysis. On the other hand, nine operators verified the details of accidents and shared the information during internal meetings.

Although the information is provided to relevant agencies in the event of an accident, little sharing information with other operators is done. Improvements in information sharing are desired from the perspective of deterring road crashes (traffic accidents).

(e) Education and Training for Employees

- (i) **Pre-employment Training.** All operators provide pre-employment training for both drivers and conductors. The minimum training period is 3 days, and the maximum is 15 days. In terms of training content, many operators use the Filipino Driver’s Manual by LTO, and practical training includes understanding the location of bus stops, operation routes, and danger spots on each bus route.

The main contents of the manual are shown in Table 4.2.3.

Table 4.2.3 Outline of “FILIPINO DRIVER’S MANUAL”

Chapter	Title	Items
1	Licensing Information	<ul style="list-style-type: none"> Permits and Licenses Driver’s License Classification and Vehicle Category etc.
2	Getting Ready to Drive	<ul style="list-style-type: none"> Course Content of Driving School Road Traffic Signs / Pavement markers
3	Driving Fundamentals	<ul style="list-style-type: none"> Checking motor Vehicle and Documents Driving on the Road, etc.
4	Road Courtesy and Safety	<ul style="list-style-type: none"> Attitude and Behavior Dealing with Emergency Situations Road Hazards
5	Rights, Duties and Responsibilities of Drivers	<ul style="list-style-type: none"> Rights of Driver Responsibilities of a Driver, etc.
6	Reviewer	



Source: FILIPINO DRIVER’S MANUAL by LTO

- (ii) **Post-employment Training.** Many operators conduct post-employment training, as shown in Table 4.2.4.

Table 4.2.4 Implementation Status of Post-employment Training

	Training Items	No. of Operators
1	Monthly Training or Education (Driver)	8
	Monthly Training or Education (Conductor)	7
2	Training or Education for Driver given a Complaint	10
3	Training or Education for Driver involved in Road Crash (Traffic Accident)	10
4	Training or Education for Driver for Deviating Bus Route	9
5	Training or Education for Driver for not Complying with Operating time intentionally	9
6	Safety Driving Training or Education carried out by Police or Bus Operator	10
7	Annual Aptitude Test for Driver	7
8	Training or Education for Conductor for treating passengers	10

Source: JICA Study Team

6) Fare Revenue Management

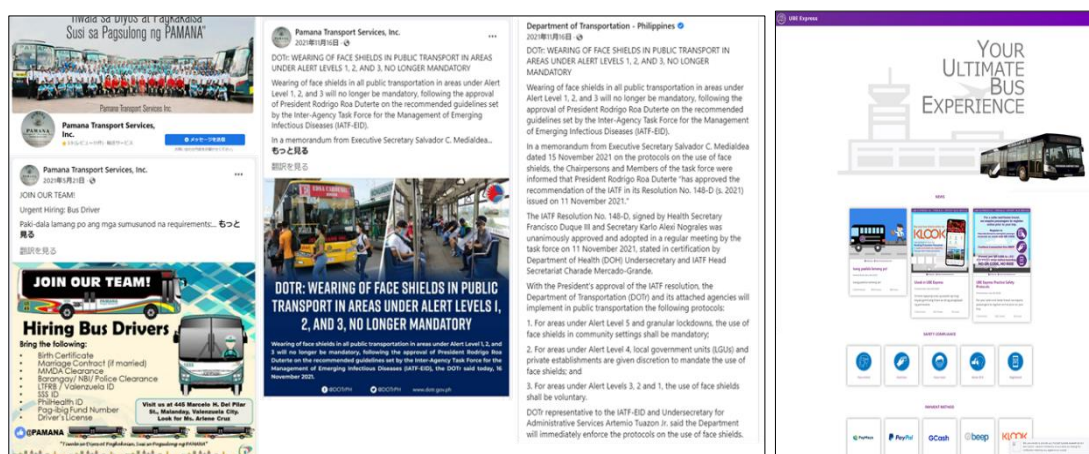
- (i) **Method of fare payment.** Conductors collect fares, and eight operators have them on board the bus. Seven operators have implemented fare payment using IC cards (such as Beep cards) or QR codes, and the remaining operators are considering the introduction of the systems. On the other hand, introducing the commuter monthly pass system, commonly used in Japan, has not yet been realized. As for E-ticketing (application and online payment) using other IC cards or cell phones, almost all the operators would like to introduce it but have yet to do so.
- (ii) **Management of fares collected from passengers.** When a passenger boards the bus, the conductor collects the fare. All the collected fares are paid to the office at the depot by the end of the day. The next day, the management deposits them in a bank

account.

- (iii) **Consistency between the number of passengers paid in cash and the amount settled in the depot.** When the conductor collects the fare, a ticket is issued. The data from the system and the amount paid are confirmed so that the system is consistent.
- (iv) **Settlement of the IC card (beep card) when returning to the depot.** When a payment is made using a beep card, it will be reported to the card management company every business day. Since the settlement is done through the bank, the settlement amount will be transferred the next day.
- (v) **Fare discount.** All operators offer discount fares (20% discount on regular fares) for the elderly, disabled, and students.

7) Information for Passengers

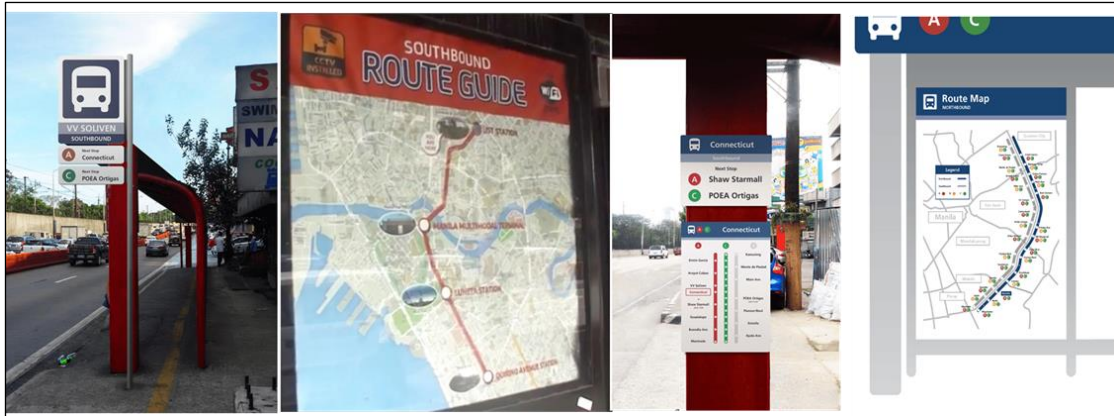
- (i) **Usage of website and SNS.** In the Philippines, information dissemination through Facebook has become the norm. Four bus operators use it to disseminate information, such as operation schedules, operation information, and important announcements from agencies like DOTr or LTFRB. Only one operator provides information on its website. None has developed a smartphone application.



Source: Pamana Transport Services, UBE Express

**Figure 4.2.3 Information Dissemination by Bus Operator
(Left: Facebook Right: Website)**

- (ii) **Call center.** Only two operators have call centers where users can directly contact for services. Seven operators considered developing such a center in the future.
- (iii) **Information at bus stops.** Only two operators responded that they provide information at bus stops, but only minimum, such as destination, route map, etc. It does not include operational intervals, fares, and contact information of bus operators. The remaining bus operators do not seem to place much importance on the information provided at bus stops.



Source: JICA Study Team, Sakay (<https://blog.sakay.ph/bus-stops-redesign-metro-manila/>)

Figures 4.2.1 Information at Bus Stops (Destination, Route Map)

- (iv) **Information provided inside the bus.** Only one operator disseminates information inside their buses.

8) Services for Bus Users

- (i) **Guidance given from driver or conductor.** Responses regarding the guidance given by the driver or conductor were received, as shown in Table 4.2.5. Although most of the items are provided, one operator responded that they are not interested in guiding right and left turns at intersections, but this should be provided from the perspective of preventing route deviations and onboard accidents involving passengers.

Table 4.2.5 No. of Operators Providing Guidance from Driver or Conductor

	Provided	To be Considered	No Interest
Paying attention (Calls) by driver or conductor when passengers boarding and alighting	6	4	-
Departing after passengers are seated	8	2	-
Guidance when turning left or right	7	2	1
Announcing the name of bus stop / Guidance when passing through the bus stop	8	2	-
Guidance to move more inside of the bus when crowded	8	2	-
Stop at the bus stop, and call to the passengers, in case of passing through because of full loading	8	2	-

Source: JICA Study Team

- (ii) **Request and complaints from bus users.** Users have made a wide range of requests, including more convenient public transportation in general, easier-to-understand service information and operation schedules, more vehicles and more frequent service, and improved fare payment methods.

As for the complaints, most of them are related to the attitude of drivers and conductors towards passengers and the driving manner of drivers, while other complaints are about delays and discourteous passengers.

In addition, there are many complaints about lost property.

- (iii) **Transfer discounts.** Although there are various modes of transportation in Metro Manila, there are no transfer discounts between modes. In order to promote the shift from private cars to public transportation, it is necessary to remove the financial burden on users.

9) Bus Vehicles and Maintenance

(a) Bus Vehicles

- (i) **Purchase and replacement of bus vehicle.** Most operators purchase vehicles while some lease. As for the frequency of replacements, 3 operators replace in 10 years and five operators in 15 years. The remaining 2 operators replace their vehicles between 10 and 15 years, considering vehicle usage. In general, operators replace their vehicles at intervals of 10 to 15 years.

A subsidy program for the purchase of new bus vehicles has been established under PUVMP, and four operators have taken advantage of this.

- (ii) **Equipment of bus vehicle.** Many operators have not introduced the necessary information displays for buses like in Japan, which could be inconvenient from the perspective of users waiting for buses or not used to riding buses.

Table 4.2.6 Items of Equipment of Bus Vehicle (No. of Operator)

Equipment	Equipped	Not Equipped	Equipment	Equipped	Not Equipped
Air conditioner	10	-	Display of destination (Rear)	4	6
Wi-Fi	8	2	Bus stop information broadcasting	6	4
USB port	7	3	Display of fare	8	2
Display of destination (Front)	7	3	Display of bus stop	4	6
Display of destination (Side)	4	6	Buzzer for getting off	5	5

Source: JICA Study Team

Users are willing to have TVs installed in buses and pay more for charging facilities, such as USB ports for mobile phones.

For the accommodation of vulnerable transport users, all operators installed priority seats for the elderly and physically disabled. Furthermore, 70% of the surveyed operators have wheelchair-accessible buses. But not all their buses are equipped with this, except for one operator. Wheelchair-accessible vehicles have ramps for getting on and off, belts for securing the wheelchair, and a dedicated space for wheelchairs.

- (iii) **Maintenance of bus vehicles.** Each operator formulates a vehicle maintenance plan and conducts maintenance at the beginning and end of the day and every month. The inspection items include engine oil, tires, and vehicle condition. All operators keep a maintenance record book for each bus, but since the record is kept in paper form, some operators would like to systemize it.

Most operators conduct maintenance in their depots, but one reported that they outsource maintenance.

(b) Environmental Measures

- (i) **Environmental measures for enrolled vehicles.** In order to purify diesel engine emissions as an environmental measure, it has become mainstream to equip vehicles with diesel particulate filters (DPFs), which are filters used to repair particulate matter in the exhaust. All of the vehicles surveyed have been equipped.

In addition, relatively new diesel vehicles are equipped with urea selective catalytic reduction (SCR) systems, a technology that purifies NOx in diesel engine exhaust. Six operators have also introduced vehicles equipped with urea SCR.

- (ii) **Low-emission bus vehicle.** While three operators have introduced hybrid vehicles

powered by diesel engines and motors and two have introduced compressed natural gas (CNG) buses, no electric vehicle (EV) buses have been introduced. Although many of them would like to introduce such vehicles, the bus depots have few charging stations and places to fill in batteries. The facility infrastructure, as well as vehicles, also need to be developed in parallel.

10) Working Conditions for Driver and Conductor

- (i) **Working hours.** According to the Philippine Labor Code, each operator has a basic 9-hour workday with 8 hours of work and 1 hour of rest. Some operators have implemented a two-shift system: morning shift from 4:00 am to 2:00 pm and afternoon shift from 2:00 pm to 11:00 pm. Some operators also impose working throughout the day, with working hours from 5:30 a.m. to 8:00 p.m. In addition, two operators impose a 16-hour workday with a 14-hour driving time and 2-hour rest.

Regarding overtime, it depends on the operators, but they typically have long working hours, averaging a minimum of 24 hours and a maximum of 120 hours per month. There is no legal limit on overtime work.

While the number of working days in a month widely varies, some operators report a minimum of 15 days and a maximum of 26 days. Two of the ten surveyed operators reported 24 working days per month, and three reported 26 days, indicating four to seven days off per month are granted.

Based on the above, considering the working hours with overtime per day and the days off per month, the overall working hours are long and should be given attention to as part of health management.

- (ii) **Salary.** About the base salary, most of the operators specifically stated PHP537–600 per working day, with one operator at PHP18,000–20,000 per month.

As for the additional pay, it varies on the operator, but some provide PHP300 per day for meal allowance, some provide hazard allowance, while others impose quotas that must be achieved at a rate commensurate with the wages provided.

Responses regarding the average annual salary widely vary. For drivers, the lowest annual salary is PHP144,000, and the highest is PHP600,000, which is assumed to be affected by the difference in overtime work. The discrepancy with conductors is also large, ranging from PHP100,000 to PHP420,000, depending on the operator.

11) Others

- (i) **Addressing gender issues.** The survey was conducted on the employment status of female drivers, the elderly, and the physically disabled. In the future, it will be necessary to create an organization and work environment in which female drivers can play an active role, as well as a guide on driving techniques.

Table 4.2.7 No. of Operators with Gender-related Employment Practices

	No. of Operators Currently Employing	No. of Operators Giving Consideration to Work Patterns
Female driver	5	4
Elderly	9	6
Physically disabled	6	5

Source: JICA Study Team

- (ii) **Requests to the government and other related organizations.** Six operators have

made requests, listed below.

- Change bus route due to road congestion
- Improve connections between buses and MRT
- Provide incentives to operators that provide good service

(iii) **Outlook for the future.** Although each operator has a different vision for the future, all are still focused on improving the convenience of users.

- Improve user services by introducing new bus vehicles
- Introducing exclusive bus lanes to improve the convenience
- Widening online payment options

4.3 Organizing Issues faced by Bus Operators

1) Outline

4.13 Based on the analysis of the interviews with the bus operators described in **Chapter 4.2** and the interviews with the DOTr/LTFRB, the issues faced by the bus operators were identified, and the possibilities for future efforts to enhance and improve bus services in Metro Manila are summarized in Table 4.3.1.

Table 4.3.1 Organizing Issues Faced by Bus Operators (Summary)

Issues	Plan for Action (Draft)
A Operation planning and management using onboard GPS and surveillance cameras are not well-managed.	1 Strengthening of monitoring
B The introduction of systems necessary for operation management has not progressed. In addition, there is a lack of ability to create data-based aggregates and statistics.	2 Implementation of a program to improve the capacity of relevant organizations and bus operators to develop route and operation plans
C Lack of training programs for safe driving	3 Consideration of introducing an operation management system by the Japanese system vendor
D Few sales measures to increase the number of users	4 Enhancement of employee education and training
E Information that contributes to user convenience is not being disseminated.	5 Introduction of sales measures such as transfer discounts
F Long working hours need to be corrected.	6 Strengthening of information dissemination
	7 Cooperation and support for the full-scale introduction of the Service Contracting Program

Source: JICA Study Team

2) Strengthening of Monitoring

(a) Current Status and Issues

4.14 As for the data obtained from GPS, bus operators utilize this by checking the speed of vehicles, if the buses operate on their routes properly, and reflecting the data in maintenance calculated from fuel consumption, mileage, and so on. However, there is no information dissemination for users. In addition, data such as the operation status (delay status) by time zone is not utilized for revising operation plans.

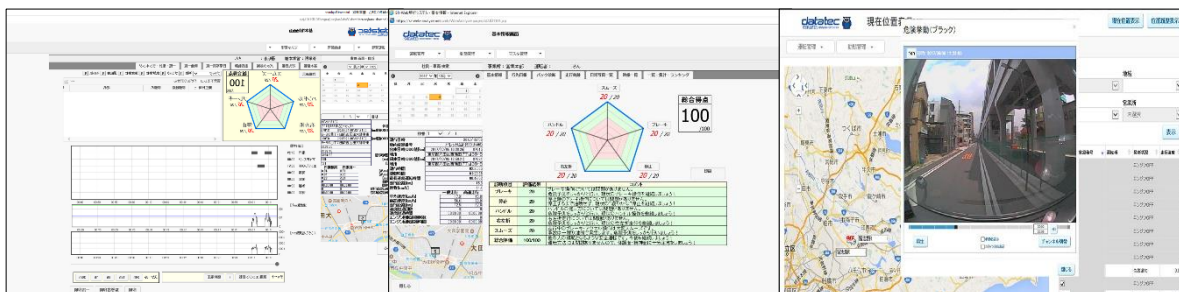
4.15 Surveillance cameras are only used for searching lost property or when necessary, and there are few opportunities to check the contents during normal operations. Installing cameras will not only allow the operator to understand the working attitudes of drivers and conductors but also protect employees by enabling objective investigation in case of complaints. Furthermore, by recording the outside of the vehicle, it becomes easier to pursue the cause of the accident when it occurs.

(b) Action Plan and Efforts for Improvement (Draft)

4.16 Although operators provide safe driving training to the drivers, in reality, the drivers seemingly have low safety awareness as they try to carry as many passengers as possible, waiting at bus stops on the way or boarding at intersections other than bus stops. Therefore, operators must monitor whether they are operating correctly and safely.

4.17 Many bus operators in Japan use GPS and drive recorders (safety recorders) to manage and record daily operation records, and use them to educate drivers when necessary, thereby playing a role in preventing accidents. Specifically, the system not only records vehicle speed and engine speed but also quantifies smooth driving operations,

such as braking and right/left turns, enabling both drivers and management to evaluate them at a glance. In addition, the system records the details of sudden braking and steering, as well as image data, making it possible to investigate the cause. In this way, both drivers and managers of bus operators can improve their awareness of safe driving, thereby gaining the trust of public transportation users.



Source: datatech Inc.

Figure 4.3.1 Pictures on Safety Recorder (Image)

4.18 By setting up an auditing department at each bus operator or related organization, recruiting staff for citizen monitoring, and conducting undercover investigations, it will be possible to understand the working and customer service attitudes of drivers and conductors and improve their behavior.

4.19 In addition, the PUV Modernization Program being implemented by the LTFRB/DOTr is considering establishing a system to monitor PUVs, including buses. By conducting parallel micro-monitoring and macro-monitoring, providing safe and secure public transportation in Metro Manila and developing a safe driving education program for public transportation workers will be possible.

Table 4.3.2 Outline of Central PUV Monitoring System

Description	Implementing Agency	Fund/Cost (PHP)	Status
<p>The project will serve as the primary tool of the Board in monitoring the PUVs geared towards the following expected outputs:</p> <ul style="list-style-type: none"> - establish an information system for the GNSS Provider Accreditation (revival of the Bus Management Information System, - data collection of GPS spatial data, - establish a comprehensive network infrastructure, - data exchange/common platform and linkage between public, land transportation governing agencies, - automated and customizable reporting tool, - knowledge transfer, - data back-up and recovery (cloud storage), and - development of public-facing applications (web and mobile). 	LTFRB, DOTr	9,324,840	<p>Project started in September 2020 and is 90% completed.</p> <p>Ongoing initial implementation and technical inspection of GPS devices.</p>

Source: DOTr



Figure 4.3.2 Central Monitoring Center

3) Implementation of a Program to Improve the Capacity of Relevant Organizations and Bus Operators to Develop Route and Operation Plans

(a) Current Status and Issues

4.20 Route planning in Metro Manila is developed by the DOTr and LTFRB, while route planning tasks in other regions and provinces are delegated to LGUs per the 2017 Joint Memorandum Circular between the DOTr and the Department of Interior and Local Government (DILG). LGUs are expected to rationalize existing routes based on passenger demand, road hierarchy, and road capacity and develop their own Local Public Transport Route Plans (LPTRPs) to identify new or developed routes. However, each relevant organization has been said to have limited human resources, and developing human resources to continuously formulate and review route plans has become an issue.

4.21 Furthermore, although bus operators have the information necessary for route conditions and operations, such as the actual driving environment, they are not directly involved in formulating and reviewing the route plan. Therefore, it is expected that an operational plan in line with actual conditions has not been established.

(b) Action Plan and Efforts for Improvement (Draft)

4.22 Formulating route and operation plans should not only reflect objective data, such as demand forecast, but it should also reflect the opinions of the actual operators. In order to improve the capacity of both government agencies and bus operators to formulate route and operation plans, it is possible to develop a project that enables technology transfer by Japanese academic experts, such as university professors, local governments, and bus operators. Fully utilizing data obtained from GPS and surveillance cameras can make it possible to create an operational plan that matches the actual situation.

4) Consideration of Introducing Operation Management System by Japanese System Vendor

(a) Current Status and Issues

4.23 Currently, some bus operators have the following systems in place.

(i) **Fleet Management System.** The system records the number of trips, fuel consumption, trip records (number of round trips made, time of entry and exit), etc., similar to a Japanese drive recorder.

(ii) **360 Maintenance Checklist System for Bus maintenance.** The driver utilizes a

tablet to check the condition of the bus, including tires, dashboard, fuel, and dents and scratches on the bus.

(iii) Fare Payment Terminal

- Since the UBE Express is an airport shuttle bus service, it has introduced various systems, such as Beep card, Klook, PayMaya, GCash, and Paypal for online payments, including advance payment functions.
- At CHER, TRIPKO uses contactless or cashless payments by introducing a cashless terminal. Therefore, the use of Beep is currently not available, but they have been considered.

4.24 It is estimated that some operators can cope with daily operations using the introduced systems but cannot compile data and create statistics. They are unable to reflect the results in safe driving education and vehicle maintenance plans.

4.25 As for the cashless system, although various payment methods are accepted, it is not standardized among the bus operators in Metro Manila. From the point of view of a user, it is difficult to know which card can be used on which bus. Thus, it will cause further inconvenience and may lead to a shift away from bus use.

(b) Action Plan and Efforts for Improvement (Draft)

4.26 The systems necessary for operation management, as discussed in **2) Strengthening of Monitoring**, are being introduced by Japanese bus operators from a business management and efficiency improvement perspective. However, among the surveyed operators, only a few have introduced systems necessary for operation management. It is expected that the systems will be introduced by utilizing the know-how of Japanese vendors and bus operators based on the opinions of related organizations and operators.

4.27 For bus operators, the system will make it easier to understand the actual situation, even for the LTFRB, DOTr, and other related organizations, if they can create data-based totals and statistics by changing the current paper-based recording and tabulation work to the use of the system. By disseminating such information from the relevant organizations to each operator, the causes of serious accidents, the results of analysis, and dangerous locations can be shared, which will contribute to deterring drivers from causing traffic accidents.

5) Enhancement of Employee Education and Training

(a) Current Status and Issues

4.28 In accordance with a Memorandum of Understanding (MOU) issued in 2017, the LTFRB has made it mandatory for all operators involved in public transportation and their drivers to attend the "Drivers Academy." Course results are registered by the LTFRB and stored in a database. The program aims to improve the behavior and driving skills of PUV drivers and promote the health, welfare, safety and convenience of passengers, pedestrians, and the rest of the public.

4.29 The program consists of:

- (i) LTFRB Policy,
- (ii) Traffic Safety,
- (iii) Traffic Accident and Anger Management,

- (iv) Road Traffic Signs and Pavement Markings, and
- (v) Attitude and Behavior.

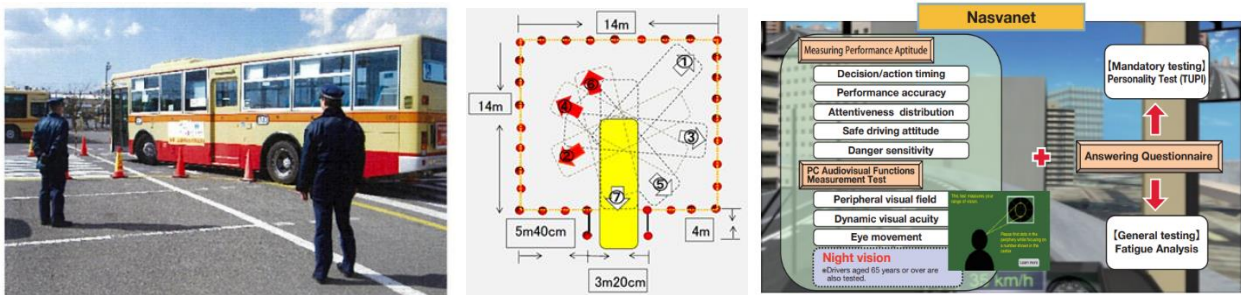
4.30 Currently, due to the COVID-19 pandemic, it is not being implemented.

4.31 UBE Express utilizes the “Academy of Developmental Logistics,” a training institute run by the Lina Group to which the express service belongs, to train its bus drivers to be professional by using state-of-the-art simulators.

(b) Action Plan and Efforts for Improvement (Draft)

4.32 Apart from the training provided by the LTFRB, many bus operators provide pre-employment and post-employment training. But for professional drivers responsible for the lives of their many passengers, it is essential to raise safety awareness by providing regular education and training. In Metro Manila, classroom training is provided for licensed drivers, but it is necessary to consider and develop other training programs, such as on-the-job training and periodic aptitude tests, which are provided by bus operators in Japan. Through such education and training, not only will operators be able to hire people with no experience in bus driving, but they will also acquire the skills to become "professional" drivers, thereby solving the shortage of drivers.

4.33 In terms of on-the-job training, the following can be considered: (i) education to deepen awareness of blind spots and inner-wheel differences, which are unique to large vehicles; (ii) practical “Takotsubo training,” running on bottlenecks and turn-around training, to recognize vehicle sensations; (iii) experience with sudden braking; and (iv) simulated experience with elderly people. In addition, it would be possible to consider periodic aptitude assessments that can be used to prevent traffic accidents by identifying driving habits, such as strengths and weaknesses, through various measurements and providing advice tailored to each habit.



Source: FY2020 Safety Reports (Kanagawa Chou Kotsu inc.), Shinki Bus Inc., NASVA

Figure 4.3.3 Bus Education and Training Program in Japan (Left: On-the-Job Training, center: “Takotsubo training,” right: Aptitude Assessment Items)

4.34 In addition to one-way training, group work allowing each participant to think on their own or in small group discussions is expected to have the effect of sharing information among members and make it easier to gain insights from different perspectives yet same standpoint. In this context, it would also be beneficial to share the locations and details of hazards that did not lead to accidents but were felt to be dangerous during operation and analyze and map “near-miss” that would be useful in preventing future accidents.



Source: Nishi Nippon Railways Inc., Transportation Bureau of Osaka city

Figure 4.3.4 Map of where Near Miss Occurred (Image)

6) Introduction of Sales Measures such as Transfer Discounts

(a) Current Status and Issues

4.35 In Metro Manila, there are various means of transportation, such as LRT, buses, jeepneys, and tricycles, each with an established fare system. As a result, users must make payments every time they make a connection, creating an economic barrier.

4.36 Although there is a discount system for the elderly and students, other people must pay regular fares when using public transportation for commuting or shopping. This is thought to have led to reluctantly using public transportation and choosing easily available means of transportation.

4.37 Beep card usable on the LRT is incompatible with BEEP Rides usable on city buses, so bus operators have introduced multiple payment methods. Passengers must own and carry multiple IC cards to ride different modes of transportation or buses of different operators, which is not very convenient.

(b) Action Plan and Efforts for Improvement (Draft)

4.38 The DOTr or LTRFB should lead in developing a comprehensive fare system that covers the entire Metro Manila, instead of a fare system based on individual operators and routes, to improve the convenience for citizens. In addition, the introduction of transit discounts is expected to promote shifting to public transportation. In Japan, from the perspective of reducing the burden on operators, transit discounts have been offered by the single operator or within the group company. However, as part of the measures of promoting public transportation use in Metro Manila, where multiple modes are provided by various operators, the transit discounts may need to be introduced among the different operators. In this case, the government must consider establishing a subsidy system for operators. Operators can also introduce coupon tickets and unlimited one-day passes, which are common in Japan, and offer points based on the amount spent on IC cards.

4.39 In order to achieve this, introducing a compatible payment system that enables payment even if the card companies issue different cards, such as Suica and PASMO in Japan, should be considered. It is also necessary to consider introducing a MaaS application and explore the possibility of fare payment and multi-mode route and time search.

4.40 In addition to the fare aspect, implementing mobility management can be considered in parallel, where the bus is not just a “means” to reach a destination but has an incentive. For example, a discount if riding the bus to shop at a certain commercial facility.

7) Strengthening of Information Dissemination

(a) Current Status and Issues

4.41 As for external information dissemination, most commuters mainly use Facebook to check for information. Operators have been disseminating only little information through websites or smartphone applications. In Japan, information dissemination by each bus operator has been established, providing much information like time searches, among others. However, buses in Metro Manila can only provide departure times at the first stop and none for intermediate stops. Due to the road congestion and other reasons, timetables at bus stops may not be useful.

4.42 Since each operator does not disseminate fixed information related to its routes (e.g., schedules, fares, routes, etc.), it is difficult for citizens to obtain route information other than those they use daily. For operators to share information, private companies must develop applications (similar to transfer guides in Japan), or LTFRB must aggregate and disseminate data.

4.43 Regarding disseminating information inside the train, using announcements and displays at bus stops can put passengers at ease, but many operators have not yet introduced this system.

4.44 Additionally, considering the driving environment with traffic congestion, it is thought predicting the arrival time at the destination when traveling by bus is difficult. As a result, many citizens may hesitate to use the bus.



Source: JICA Study Team

Figure 4.3.5 General Bus Stops in Metro Manila with Little Information Guidance

(b) Action Plan and Efforts for Improvement (Draft)

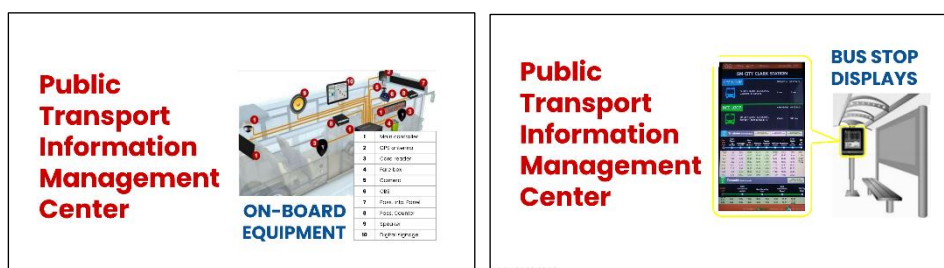
4.45 As earlier mentioned, buses operating in Metro Manila are all equipped with GPS. By utilizing the GPS data obtained daily, it will be possible to calculate the average time required at different times of the day. Then if it becomes possible to combine the data with Google Maps and Waze, it will be possible to provide more accurate estimated arrival times.

4.46 The PUV Modernization Program studies the provision of information inside buses and at bus stops, and it is expected that Japanese system vendors will consider introducing systems for information dissemination.

Table 4.3.3 Outline of Public Transport Information Management Center

Description	Implementing Agency	Fund/Cost (PHP)	Status
Proper regulation of road-based public transport and more responsive planning of transport services require ACCURATE and TIMELY information on vehicle location and movements. LTFRB needs to use advanced information and communication technology (ICT) in the regulation and monitoring of PUVs.	LTFRB, DOTr	319 mil.	Finalization of Terms of Reference

Source: DOTr



Source: DOTr

Figure 4.3.6 Information Dissemination Tools Proposed by PUV Modernization Program

4.47 In addition, to disseminate information across various aspects and operators in Metro Manila that will promote bus use, bus operators could collaborate to develop a website referring to the websites produced by bus operators in Japan.

8) Cooperation and Support for the Full-scale Introduction of the Service Contracting Program

(a) Current Status and Issues

4.48 Since most bus operators have a commission system in which they earn allowances based on their income from passengers on top of their basic salary, it has been observed that passengers board buses outside the proper stop changing the operation schedule. Therefore, to improve the efficiency and quality of public transportation and gain the trust of users, the LTFRB launched the Service Contracting Program to provide subsidies to PUV operators and drivers based on the number of trips they make, regardless of whether they have passengers.

4.49 The LTFRB plans to move forward with the program to eliminate the commission system, but the program has not progressed because drivers complained their pay may not be correct or not what they expect.

4.50 On the other hand, in both the current survey and the LTFRB survey, many operators have a favorable view of introducing the new system and believe that changing from a commission system to a fixed salary system will enable them to provide more stable bus services.

4.51 For this program, the LTFRB has set aside a budget of PHP7 billion for FY2022.

(b) Action Plan and Efforts for Improvement (Draft)

4.52 Establishing such a system will promote the employment of more bus drivers by recognizing that they can expect stable employment and salary as a profession, resulting in possibly breaking away from the current work style that depends on long hours. This will

lead to providing safe and reliable bus services from a health management perspective.

4.53 It is because the program requires “regulation,” “financing,” “planning” on the part of the regulator, and “operation and management” on the part of the operator, among the other necessary aspects of public transportation. Since JICA already has experience implementing administrative management systems related to public transportation and restructuring on the part of operators in the JICA-supported bus technical cooperation project, it can make use of such know-how to propose and cooperate in promoting the program.

5. CURRENT SITUATION AND ISSUES ON INTERMODAL TRANSFER FACILITIES

5.1 Current Situation of Intermodal Transfer Facilities

1) Existing Intermodal Transfer Facilities

5.1 Intermodal transfer facilities are generally developed to provide an easier and smoother transfer environment between two transportation modes. In Metro Manila, there are no specific facilities for private vehicles, such as taxi bays at a station, P&R facilities, and others. Therefore, this chapter focuses on the intermodal transfer facilities for public transport services, composed of provincial bus terminals (so-called Intermodal Terminal Exchange Facilities), P2P stations, bus stops, loading/unloading bay, UV Express terminals, and tricycles terminals. Since there are many loading and unloading bays, UV Express terminals, and tricycles terminals, only those facilities around railway stations were chosen for the study.

(a) Provincial Bus Terminals

5.2 There are two Intermodal Terminal Exchange Facilities, namely the Parañaque Integrated Terminal Exchange (PITX) and Valenzuela Gateway Complex (VGC) Integrated Terminal. These terminals were developed for provincial buses as they are restricted entry in the center of Metro Manila. Passengers of provincial buses must transfer to city buses or other transport modes. The available facilities of the two terminals are shown in Table 5.1.1.

5.3 PITX was opened in 2018 as the southwestern terminal in Metro Manila, with three-story terminals and four office towers. It is accessible from Macapagal Boulevard (with eight lanes) and Manila Cavite Expressway (CAVITEX). The first and second floors serve as spaces for public transport services, while the third floor is the parking space for private vehicles and UV Express.

5.4 The VGC Integrated Terminal, the northern terminal, opened in 2018. It is accessible from the two-lane E-Service Road of North Luzon Expressway (NLEX). Unlike PITX, its transport facilities are only at ground level, but it has a two-story building as a waiting space and for some commercial business.

5.5 Both PITX and VGC follow the minimum requirements set by the LTFRB through its Memorandum Circular No. 2017-030. The requirements include providing clean and separate comfort rooms for males, females, and PWDs, sufficient parking lots, drop-off and pick-up areas of private vehicles, communication facilities (telephones, fax, internet), CCTV, information and passenger assistance counters, signages, and others.

Table 5.1.1 Profile of PITX and VGC

Name	Area (ha)	No. of Gates for Bus	No. of Berth						Furniture		
			P2P	Provincial Bus	City Bus	Jeepney	Trikes	Total	Shade	Bench	Comfort Room
PITX	4.5	10	1	42	14	10	0	59	Yes	Yes	Yes
VGC	5.0	45	-	43	2	-	57	102	Yes	Yes	Yes

Source: JICA Study Team

(b) P2P Stations

5.6 There are 40 P2P stops in Metro Manila, of which 11 stations are near railway stations. The facilities at P2P stations are usually ticket booths, vending machines, and bus

shelters. Some of the stations serve long-distance P2P routes heading outside Metro Manila. In that case, the facilities include a waiting lounge and comfort rooms.

(c) Bus Stops

5.7 Bus stops are provided near some LRT-1 and MRT-3 stations and all stations of LRT-2. Although the EDSA Carousel operates along MRT-3, it is only connected to 9 of the 12 stations due to the limited space to provide bus stops. These stops are about 50–150 m away from the stations. The EDSA Carousel bus stops are equipped with bus shelters and traffic barriers. However, most of these facilities are located on the left side of the bus lane when most buses have their doors on the right side. Thus, passengers need to go around to get on the bus in the hot weather or rains. Also, the bus bay of EDSA Carousel can accommodate only one bus at a time.

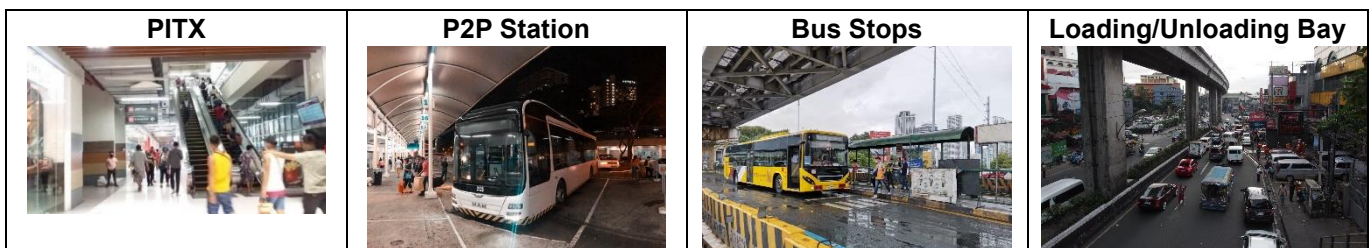
5.8 The stops near LRT-2 stations are not designated only for buses but also for jeepneys and other modes. The situation of bus stops also varies depending on the stations. Some are lay-by types, but others are just roadside. Some have bus shelters.

(d) Loading and Unloading Bays

5.9 Aside from the designated bus stops mentioned previously, some loading and unloading bays are also developed near railway stations for buses, jeepneys, and other travel modes. Depending on the stations, those bays are provided about 100–1,000 m away from the station. Although most of the stations have loading and unloading bays somewhere, many vehicles would stop or wait in front of stations for passengers, causing traffic congestion around the stations.

(e) Tricycle Terminals

5.10 As the last mile travel mode, some stations have tricycle terminals nearby, usually at the corner of the main road and minor road.



Source: JICA Study Team

Figure 5.1.1 Situation of Intermodal Transfer Facilities in Metro Manila

2) Walkability

5.11 In order to evaluate the walkability around the stations, the walkability survey was conducted for two stations per station category, as shown in Table 5.1.2. The stations were categorized into five groups depending on the surrounding situations (CBD (Central Business District), institutional, residential, terminal station, transfer station). The surveyed stations were also listed.

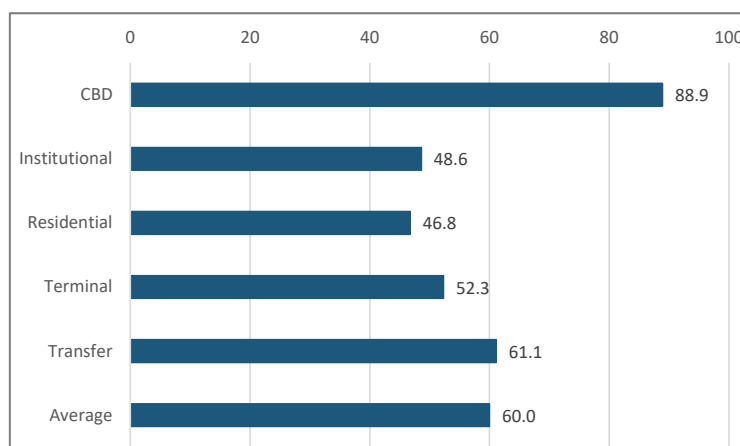
Table 5.1.2 Surveyed Stations for Walkability Assessment

Category	Feature	Station
Terminal Station	A terminal station where passengers need to transfer to other transport mode	<ul style="list-style-type: none"> • LRT-1 Baclaran Station • LRT-2 Santolan Station
Transfer Station	A transfer station between railway stations	<ul style="list-style-type: none"> • LRT-1 EDSA Station/MRT3 Taft Ave. Station

Category	Feature	Station
		<ul style="list-style-type: none"> LRT-2/MRT-3 Araneta Center - Cubao Station
Station in CBD	A station located in CBD where the area is developed.	<ul style="list-style-type: none"> MRT-3 Ayala Station MRT-3 Ortigas Station
Station near Institutional Establishment	A station located near many government establishments, universities, and hospitals	<ul style="list-style-type: none"> LRT-1 Central Terminal Station LRT-1 United Nations Station
Station near Residential Area	Station located in residential areas	<ul style="list-style-type: none"> LRT-2 Anonas Station LRT-2 J. Ruiz Station

Source: JICA Study Team

5.12 Based on the walkability survey¹, the walkability in CBD is much better than in other areas (i.e., institutional, residential, transfer station, and terminal station areas). The overall mean walkability score from various station categories was fixed at 60. Candidate stations categorized under the CBD and transfer stations posted walkability scores above average at 88.9 and 61.1, respectively. Figure 5.1.2 illustrates the overall walkability rating of the different station categories.

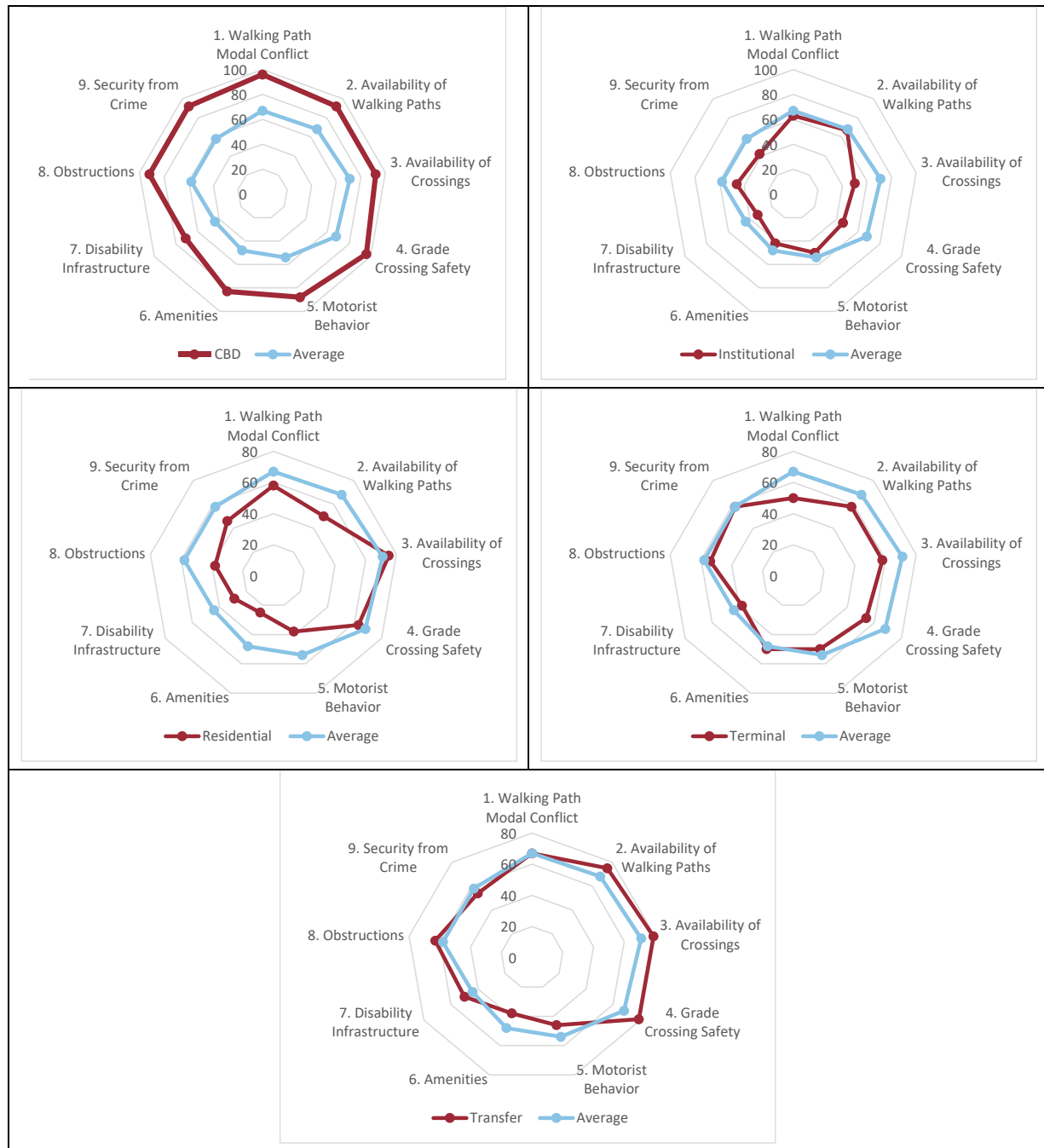


Source: JICA Study Team

Figure 5.1.2 Overall Walkability Rating from Candidate Stations

5.13 Figure 5.1.3 reflects that the surveyed stations emanating from the CBD exhibited walkability scores above the average on all aspects pertaining to the set of walkability criteria. Residential stations compiled the least score at 47. The figure also indicates that disability infrastructure and amenities parameters should be given appropriate attention and must be prioritized and improved to facilitate the utilization of walkable routes from stations.

¹ The survey was conducted on three main destinations among ten LRT and MRT stations.



Source: JICA Study Team

Figure 5.1.3 Walkability Scores of Candidate Stations

5.14 Table 5.1.3 enumerates the number of intersections (signalized or unsignalized) and footbridges. It also provides the distance of the destination point from the station and the intersection, in addition to the sidewalk width. It was observed that there are more loading and unloading bays than terminals along the walkable route. The presence of lighting and road signages were prevalent along the route. Unfortunately, only the terminal station type has furnishings, such as shelter or benches.

5.15 The average sidewalk width is about 1.2 m, except in institutional areas. It is also the minimum requirement of the Accessibility Law.²

² Occupation width of one adult is about 0.75 m.




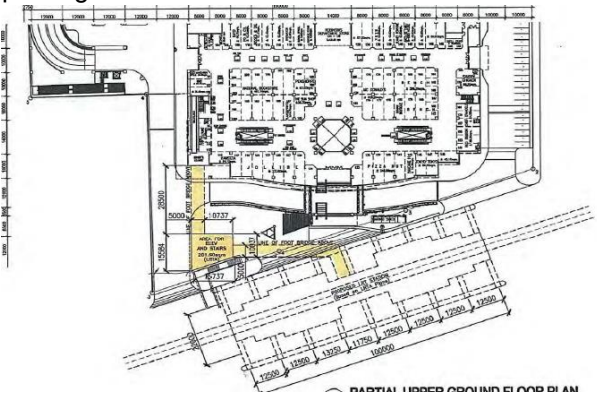
Table 5.1.3 Summary List of Road Infrastructure Facilities

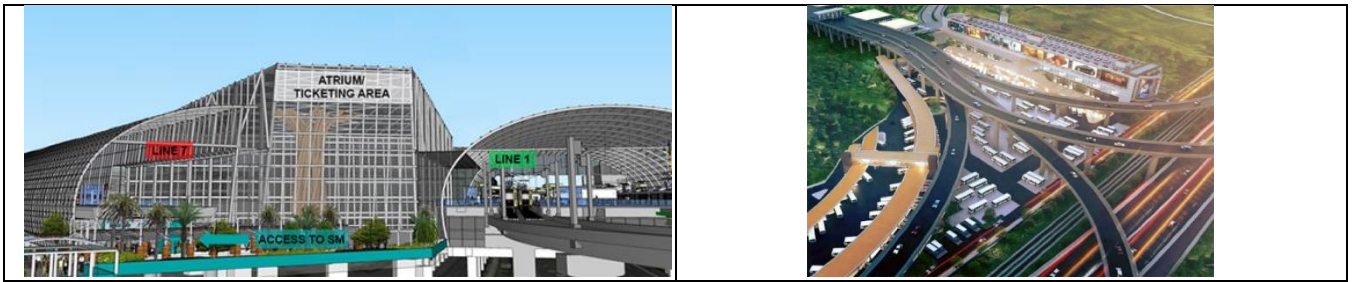
Station Type	No. of Intersection			No. of Footbridges at Intersection	No. of PUV Facilities		Availability of Road Facilities			Ave. Width of sidewalk (m)	Tot. Distance surveyed (km)
	With Traffic Signal	Without Traffic Signal	Total		Terminal Area	Loading/Unloading Bay	Road marker/signage	Lighting	Shelter / bench		
CBD	8	3	11	3	-	4	Yes	Yes	-	1.2	3.8
Institutional	5	5	10	-	1	2	Yes	Yes	-	2.0	2.3
Residential	6	9	15	3	-	1	Yes	Yes	-	1.2	2.8
Terminal	-	7	7	4	1	1	Yes	Yes	Yes	1.2	3.8
Transfer	9	5	14	2	1	2	Yes	Yes	-	1.2	3.7

Source: JICA Study Team

3) Intermodal Transfer Facilities with Urban Development

5.16 Several intermodal transfer facilities are planned along new railway alignments, such as the LRT-1 extension, LRT-2 extension, MRT-4, MRT-7, MMSP, NSCR, and Makati Intra-City Subway. Some are integrated with urban development like PITX, as shown in Figure 5.1.4.

<p>LRT1 Niog Station Intermodal Transport Hub Between Emilio Aguinaldo Highway and Molino Blvd. (Phase 1: 1.18 ha, Phase 2: 2.6 ha)</p> 	<p>NSCR Transport Hub and Walkway at Alabang Station Adjacent to Alabang Market and Filinvest (Transport hub1: 1.5 ha, Transport hub2: 1.2 ha)</p> 
<p>One Ayala Bus station A three-floor, 20,000 m² transportation hub with direct connection to MRT Ayala Station at One Ayala, a mixed-use complex of Ayala.</p> 	<p>Transit Mall Facilities at LRT2 Emerald Station Footbridges linking to loading/unloading bays and parking facilities</p> 
<p>Grand Central Station Common station for LRT1–MRT3–MRT7 in the vicinity of the EDSA–North Avenue intersection, and common platform of LRT1–MRT3 links with MRT7 via a walkable atrium.</p>	<p>Taguig Integrated Terminal Exchange (TITX) TITX will function as the southeast provincial bus terminal, next to Arca South developed by Ayala.</p>



Source: JICA Study Team compiled from the several sources.

Figure 5.1.4 Planned Intermodal Transfer Facilities with Urban Development

5.17 Aside from the above projects, several greenways projects, which are footbridges or walkways linking the loading and unloading bays along the park and ride facilities, are also planned. The EDSA Greenways Project is a 5-kilometer elevated, open-air, and canopy walkways along LRT-1 Balintawak station, MRT-3 and LRT-2 Cubao stations, MR-T3 Guadalupe, and LRT-1 and MRT-3 Taft station. On the other hand, the Makati BGC Greenways Project is an elevated walkway with at-grade bike lanes that connect the northbound MRT-3 Buendia Station to BGC near Zamora Oval through Quingua Street. Both projects utilized elevators in the elevated walkways to address the needs of the elderly, pregnant women, PWDs, and people traveling with small children.

5.2 Relevant Laws and Regulations

5.18 The manuals, guidelines, department orders, and memorandum circulars issued by the DOTr, DPWH, and LTRFB pertaining to the development of intermodal facilities and the depot of bus companies are listed below. It enumerates the minimum requirements, the standard set by authorities, and PUV terminal location indicators, among other provisions. The summary also provides the appropriate dimensions of turnouts (loading and unloading bays), sidewalks, and the formula for the necessary area of the intermodal facility and terminal. Most of the sources utilized cover from 2010 up to 2017.

Table 5.2.1 Profile of PITX and VGC

No.	Title	Type	Issuance Year
1.	Implementing Rules and Regulations of the National Building Code of the Philippines (PD1096)	IRR	2005
<p><u>Minimum Required Off-Street (Off-RROW) cum On-Site Parking Slot, Parking Area, and Loading/Unloading Space Requirements by Allowed Use or Occupancy</u></p> <p>Transit Stations and the like (UTS): Provide on each side of the RROW: 1 off-RROW passenger loading space for 4 jeepney/shuttle slots or 3 bus slots. For elevated mass transit stations, on-RROW terminals on both sides of the RROW may be considered.</p> <p><u>Size of Parking Slot</u></p> <ul style="list-style-type: none"> • Car: 2.50 m by 5.00 m for perpendicular or diagonal parking and 2.15 m by 6.00 m for parallel parking. • Bus: a minimum of 3.60 meters by 12.00 m. • Jeepney or shuttle: a minimum of 3.00 m by 9.00 m. <p><u>Allowed Off-RROW/Off-Street cum Off-Site Parking Provision</u></p> <ul style="list-style-type: none"> • Direct access of parking/loading/utility slots and terminals to the RROW shall be generally disallowed. • Traffic generating buildings may be located at major intersections or within 100.00 m of such intersections, provided that the distance between the street curb of the ingress/egress of such a commercial lot/property (nearest the intersection) and the straight curb of the intersection shall not be less than 50.00 m. <div data-bbox="454 1232 1244 1803" style="text-align: center;"> <p>REQUIRED DISTANCE OF INGRESS / EGRESS OF VEHICLES FOR A COMMERCIAL LOT NEAR MAJOR INTERSECTIONS</p> <p>NOTE: MINOR RROW HAS TO BE AT LEAST 10.00 M² WIDE. MAJOR RROW HAS TO BE WIDER THAN 10.00 M.</p> </div> <p><u>Minimum Width of Sidewalk</u></p> <ul style="list-style-type: none"> • For an RROW width of 9.00 m or more: 1.20 m on each side of the RROW or a total of 2.40 m on both sides of the RROW. • Sidewalks shall be of uniform width throughout the entire length of a street. • Width of the sidewalk shall be as follows: 			

Road Right-Of-Way (RROW) Width	Range of Required Sidewalk Widths (Total at both sides of RROW)
30.00 meters & above	From 1/6 up to 1/4 of RROW Width
25.00 - 29.00 meters	From 1/6 up to 1/3 of RROW Width
20.00 - 24.00 meters	From 1/6 up to 1/3 of RROW Width
10.00 - 19.00 meters	From 1/4 up to 1/3 of RROW Width
Below 10.00 meters	From 1/4 up to 1/3 of RROW Width

- Width of the sidewalk shall include both the paved and unpaved (planted) portions.

Road Right-Of-Way (RROW) Width	Total Minimum Widths of Planting Strip within RROW* (width per sides of RROW) (meters)
30.00 meters & above	1.20 (0.60)
25.00 - 29.00 meters	0.60 (0.30)
20.00 - 24.00 meters	0.60 (0.30)
10.00 - 19.00 meters	0.40 (0.20)
Below 10.00 meters	Optional

Note:

* Minimum width of planting strip (for grass and shrubs) is 200 millimeters for each side of the RROW. The minimum width of planting strip (for trees) is 300 millimeters for each side of the RROW.

- Sidewalk pavement shall have a non-slip surface and shall slope down from the building line towards the curb line at not more than 1/50 and shall level off with the curb.

Grade of Sidewalks

- Sidewalks shall be level and of uniform grade throughout the entire length of the street, as much as possible.
- Whenever the street slope does not exceed 1/12, the sidewalk grade shall follow the level or slope of the street.
- Whenever the slope of the street is 1/10, the sidewalk shall be maintained level for every 20.00 to 40.00 m of the run. Sidewalks of different levels shall be joined through a ramp having any convenient slope not exceeding 1/6.
- When the grade of two connecting sidewalks is between 1/10 and 1/8, they shall be joined through a ramp having any convenient slope not exceeding 1/10.

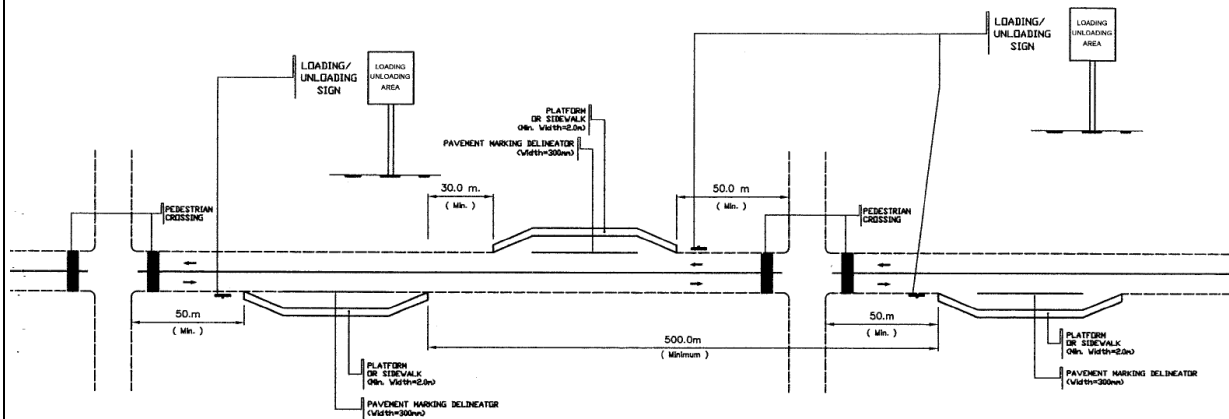
2.	Department Order 58: Revised Guidelines in the Design and Location of Turnouts (Loading and Unloading Bays) along National Roads	Department Order	2010
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Dimensions of Turnouts

- Length including transition taper: 60 m, but not longer than 185 m.
- Minimum width: 3.6 m

Location of Turnouts

- Should not be placed adjacent to horizontal and vertical curves.
- At least 50 m away from road intersection.
- Minimum distance between two consecutive turnouts should not be less than 500 m for urban areas and 1 km for other areas in a single direction.
- Should not be placed opposite each other. The recommended distance is not less than 30 m apart.



Pavement

- Same pavement type as the existing pavement of the carriageway.
- Pavement thickness: 100 mm for asphalt, 230 mm for concrete

Sidewalk near Turnouts

- Minimum width for a pedestrian sidewalk is 2 m.

Drainage

- Drainage facilities, such as curb and gutter, inlets, and storm sewer, shall be provided within the turnout.

Signages and Markings

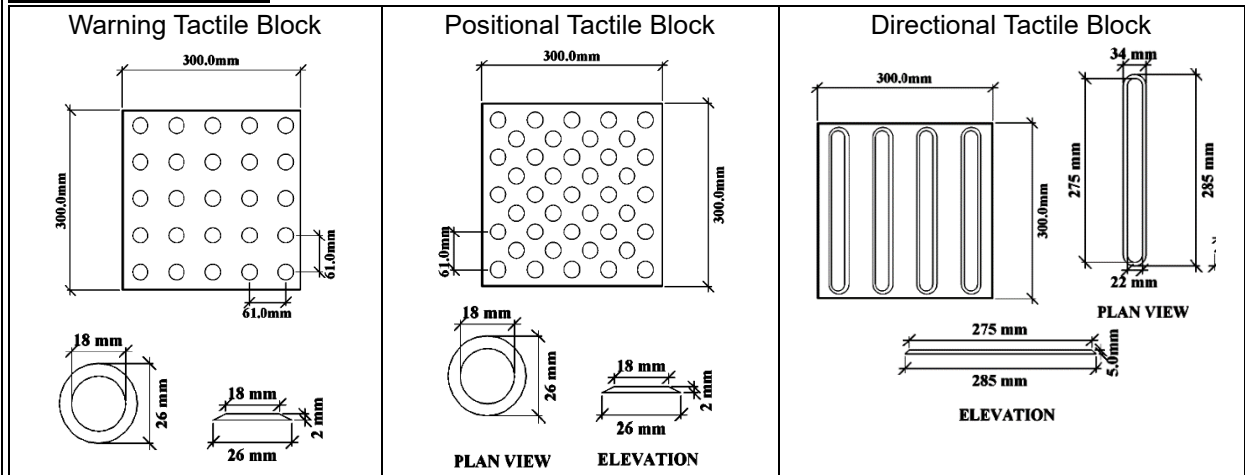
- Adequate signages and pavement marking shall be installed.

3.	DPWH Road Safety Design Manual Part I	Manual	2012
<p><u>General Guidelines in Planning for Public Transportation Facilities</u></p> <ul style="list-style-type: none"> • Lay-bys should be positioned on a straight, level part of the road with provision for good sight distance. • Access to lay-bys should be convenient and safe for vehicles and pedestrians in the case of bus stops. • A warning sign could be built. • Adequate queuing and waiting areas should be available. • Bus stops should be located beyond the pedestrian crossing having roofing, seating, and lighting amenities. • On highly trafficked roads, public transport vehicles should stop off the main carriageway. • In urban areas, it can be advantageous to locate the indented bus or jeepney stops on the downstream side of major signalized intersections. 			
4.	Implementing Rules and Regulations BP344-Accessibility Law (Amendment)	IRR	2013 (Draft)
<p><u>Dropped curbs</u></p> <ul style="list-style-type: none"> • Dropped curbs at the crossing have a width corresponding to the width of the crossing; otherwise, the minimum width is 0.90 m. • Dropped curbs shall be ramped towards adjoining curbs with a gradient not more than 1:12. • Dropped curbs shall be sloped towards the road with a maximum cross gradient of 1:20 to prevent water from collecting at the walkway. • The lowest point of a dropped curb should not exceed 25 mm from the road or gutter. <p><u>Curb cut-outs</u></p> <ul style="list-style-type: none"> • Curb cut-outs should only be allowed when they will not obstruct or lessen in any way the width of a walkway. • The min. width of a curb cut-out should be 0.90 m. • Curb cut-out should have a gradient not more than 1:12. <p><u>Walkways and Passageways</u></p> <ul style="list-style-type: none"> • Walkways should be kept as level as possible and provided with slip-resistant material. • Whenever possible, walkways should have a gradient of no more than 1:20 or 5%. • Walkways should have a minimum cross gradient of 1:100. • Walkways should have a minimum width of 1:20 m. • If possible, gratings should never be located along walkways. When occurring along walkways, grating 			

openings should have a max dimension of 13 mm x 13 mm and shall not project 6.5mm above the level of the walkway.

- In lengthy or busy sidewalks/walkways, spaces should be provided at some point along the route so that a wheelchair may pass another or turn around. These spaces should have a minimum clear dimension of 1.50 m and should be spaced at a maximum distance of 12.00 m between rest stops.
- To guide the blind, walkways should as much as possible follow straightforward routes with right angle turns.
- Walkway headroom should not be less than 2.0 m.

Tactile Floor Surface



Signage

- Directional and information (audio, visual, and tactile) signages shall be at points that can be conveniently seen, heard, and felt by all persons with disabilities.
- Signages should be kept simple and easy to understand.
- The International Symbol of Access should be used to designate routes and facilities that are accessible in combination with pictographs.
- Should a sign protrude into a sidewalk/walkway or route, a minimum vertical clearance of 2.00 m should be provided.
- Signs (graphics, text, and Braille) on walls and doors should be installed at a maximum height of 1.50 m from the finish floor to the center of the sign.
- Positional, directional, and warning tactile blocks must be provided to warn people with visual impairments that they are approaching stairways other than fire exit stairs, escalators, passenger conveyors or moving walks, ramps other than fire-exit ramps, curb ramps, swimming pool ramps, and if there are no suitable protective barriers.

5.	Design Guidelines, Criteria & Standards Vol. 4 Highway Design 2015	Guidelines	2015
<p>Sidewalk</p> <ul style="list-style-type: none"> • Sidewalk widths in lower speed residential areas: 1.2 to 2.4 m • Good minimum width for a sidewalk: 1.8 m • Sidewalks less than 1.5 m wide: require the addition of a passing section every 60 m • Sidewalks adjacent to the curb: 0.6 m wider than the minimum required width • Cross slop: should not exceed 2% <p>Lay-by</p> <p>Referring Department Order 58: Revised Guidelines in the Design and Location of Turnouts (Loading and Unloading Bays) along National Roads</p>			
6.	Memorandum Circular No. 2017-030. Guidelines for Off-Street Terminal Operations under Department Order No. 2017-011, Otherwise Known as the Omnibus Franchising Guidelines	Memorandum Circular	2017
<p>Definition</p> <p>The off-street terminal shall be at both ends of the route, as proposed in the Local Public Transport Route Plan of the LGU, and shall include the loading and unloading bays and vehicle layover areas.</p> <p>The Integrated Terminal Exchange is an intermodal transport terminal that can simultaneously</p>			

accommodate at least four modes of transportation (e.g., buses, PUJs, UV Express, and taxis). A **terminal or bus terminal** must cater to less than four modes of transportation. Other PUV terminals must cater PUJs, UV Express, or other modes.

Minimum Requirements

The minimum requirements of each terminal are shown below.

No.	Requirements	ITX	Bus	Others
1	Separate and sufficient parking space for all modes ^{1/}	x	x	x
2	Separate arrival and departure bays	x	x	-
3	Separate entrance and exit	-	-	x
4	Wide entrances and exits	x	x	-
5	Drop off and pick up areas for private vehicles	x	-	-
6	Concrete flooring for entire terminal	x	x	x
7	Sufficient roofing	x	x	x
8	Installed communication facilities	x	x	-
9	Adequate CCTV	x	x	x
10	Availability of Information and Passenger Assistance Counters	x	x	x
11	On-line ticketing and dispatching	x	x	-
12	Detailed schedule of regular trips	x	x	x
13	Appropriate and adequate signages	x	x	x
14	Sufficient number of security personnel	x	x	x
15	Walkthrough metal detectors	x	-	-
16	Comfortable seats	x	x	x
17	Separate clean and well-maintained rest rooms for PWD's, Male and female	x	x	x
18	Priority lane for PWD's, elderly and pregnant women	x	x	x
19	Ramps for PWD's	x	x	x
20	Other facilities such as driver retiring rooms, canteen and administrative office	x	-	-

^{1/} minimum terminal size of Bus Terminal and Other PUV Terminals is at least 130% of the total space requirements of 50% of the franchised units that will use the terminal.

Location of Terminal

Guided by the HLURB Locational Guidelines and Standards for Land Transportation Terminals and Garages.

1. Municipality w/ Zoning Ordinance: Periphery of the commercial zone; jeepney/UV terminals can be in a commercial zone but not near a major intersection.
2. Municipality w/o Zoning Ordinance: Outside commercial centers; jeepney/UV terminals can be in a CBD but not near a major intersection
3. One hundred (100) meters away from institutional establishments, particularly schools and hospitals.
4. Terminals must be accessible to commuters.
5. Transfer routes are available within a service radius; terminals near highways and expressways are discouraged due to safety and to ensure smooth traffic flow.

Terminal Operations / Inspection

LTFRB is responsible for the inspection and supervision of terminal operators' compliance (at least twice a year).

Administrators and operators submit quarterly reports to appropriate regional offices.

Health Standards

Off-street terminal shall comply with Section 54 Chapter IX of the Presidential Decree No. 856 or the Code of Sanitation of the Philippines.

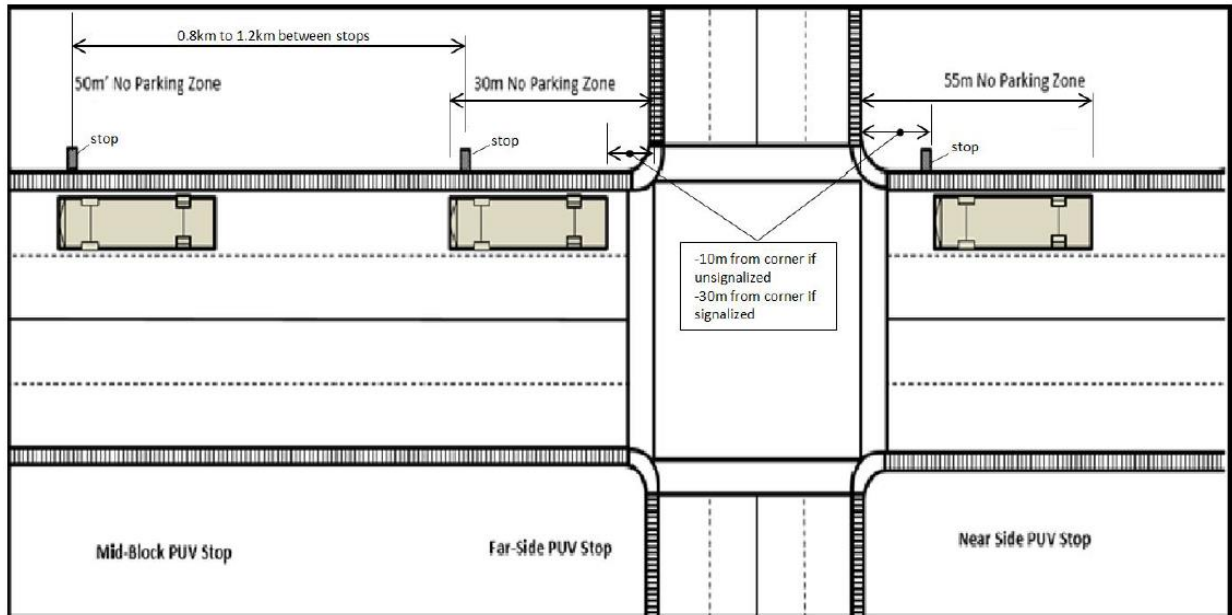
7.	Local Public Transport Route Manual Volume 1	Manual	2017
<p>Definitions Stops along the service route where passengers can alight and board. Terminals may refer to an origin or destination terminal. Garages to hold vehicles after service operation, as a waiting space prior to being called for service operations, maintenance, and regular vehicle checkup.</p> <p>Authority to Designate Terminal Locations and Issue Clearance to Operate</p>			

All public transportation terminals shall comply with the land use and zoning plan of the LGU. As such, the concerned LGU, in coordination with the DOTr and the LTFRB, shall have the authority to designate terminal locations and issue prior clearance to operate the said terminals, consistent with DILG-DOTr JMC No. 01, Series of 2008.

Location of Stops

PUV stops can be at the nearside, farside, or mid-block, as shown below. Stop signs should show the name and number of the stop, the route(s) using the stop, the estimated schedule of vehicle arrival or, at the very least, the frequency of vehicle arrival, and the hotline number of the LTFRB.

Additional amenities can be provided at a stop, such as a covered roof and benches. Lighting can also be provided, particularly during nighttime.



Minimums Location Requirement for Terminal

The minimum locational standards, as provided in HLURB’s “Locational Guidelines and Standards for Land Transportation Terminals and Garages,” pursuant to Board Resolution No. R-408 Series of 1988 and Memorandum Circular No. 12 Series of 1988 must be complied with.

Source: JICA Study Team

5.3 COVID-19 Responses at Intermodal Transfer Facilities

1) Outlines of Restriction by Community Quarantine Measures

5.19 In the Philippines, there were two main levels of community quarantine measures against the COVID-19 pandemic: enhanced community quarantine (ECQ) and general community quarantine (GCQ). Variations of ECQ and GCQ have been introduced over time, such as the modified enhanced community quarantine (MECQ) and the modified general community quarantine (MGCQ).

5.20 The movement of people was limited, as set by the country’s Inter-Agency Task Force for the Management of Emerging Infectious Diseases (IATF-EID) in the “Omnibus Guidelines on the Implementation of Community Quarantine in the Philippines of the IATF-EID.” Table 5.3.1 shows the summary of guidelines on transport sectors by Community Quarantine Measures in Metro Manila.

Table 5.3.1 Guidelines on Transportation by Community Quarantine Measures

(Implemented Periods in Metro Manila)		ECQ (17 Mar–15 May 2020) (29 Mar–11 Apr 2021) (6 Aug–20 Aug 2021)	MECQ (16 May–31 May 2020) (4 Aug–18 Aug 2020) (12 Apr–14 May 2021) (6 Aug–31 Aug 2021)	GCQ (1 June–3 Aug 2020) (19 Aug–28 Mar 2021) (1 Sep 2021–)	MGCQ (???)
General		100% stay at home	100% stay at home	21 to 59 years old are allowed to go out	No restriction
Work/ Business		Only essential works	Some business can be added to open with 50% capacity	All business can be opened with specified capacity	100% open
School		Close	Close	Online school	Limited face-to-face school
Regulation on Public Transport	Train (+ bus augmentation)	No Service	No Service	Phase I (June 1–21) at limited capacity: LRT1: 12%, LRT2: 10%, MRT3: 13%, PNR: 20%–30% Since October: 30 %	All modes allowed
	PUB - City	No Service	No Service	Since Phase II (June 22–30) at 50% capacity	
	PUB - Provincial	No Service	No Service	Resumed operations since September 30	
	Jeepney/Modern PUVs	No Service	No Service	Since Phase II at 50% capacity	
	UV Express	No Service	No service	Since Phase II, Limited capacity	
	Taxi	No Service	No Service	2 pax per row/ 1 pax in driver's row	
	TNVS	No Service	No Service	Multiple booking is prohibited.	
	Tricycle	No Service	No Service (exception subject to DILG/LGU guidelines)	Special permits to deliver feeder services Only 1 passenger in sidecar	
	Private Vehicles	Person in permitted sectors	2 persons per row	Allowed	
	Bicycle	Not allowed	1 person max	1 person max	
	Motorcycle	Not allowed	1 person max	1 person max Allows back riding for people from same households.	
	Motorcycle taxi	Not allowed	Couples/Live-in partners only	Since October 23, 2021 ¹⁾	
E-Scooter	Not allowed	1 person max	Allowed		

Source: DOTr and various news articles

5.21 Additionally, The COVID-19 alert level system was introduced with the pilot implementation of the system in Metro Manila which began on 16 September 2021.

According to the LGU's rule, any restrictions may be imposed.

2) Measures Implemented in Intermodal Transfer Facilities

(a) General

5.22 Road-based public transportation services were also stopped under ECQ and resumed operations gradually, since June 2020, based on a memorandum circular from LTFRB. The number of operating vehicles and routes have been increased according to local status. Several preventive measures were implemented in the early stage of the COVID-19 pandemic, as reported on local news sites. As of January 2022, however, such measures are hardly observed in the roadside and intermodal facilities while passengers and drivers wear masks.



Source: Various sources.

Figure 5.3.1 Road Based Public Transport in 2020 GCQ

5.23 Since 17 January 2022, a “no vax no ride” scheme has been started in Metro Manila. Commuters have to show certification, and those not fully vaccinated are prohibited from riding public transport.

5.24 DOTr pushed the implementation of cashless transactions for all vehicles passing the toll expressways. Department Order 2020-12 on 13 August 2020 was released, directing concerned agencies such as the Toll Regulatory Board (TRB), LTFRB, and Land Transportation Office (LTO) to have new procedures for the smooth implementation of cashless transactions on toll expressways. LTO will study and explore ways and means to allow full cashless and contactless systems along expressways. LTFRB will monitor the compliance of PUVs on the installation and use of electronic tags or other cashless systems in their units.

(b) Measures Implemented at Intermodal Transfer Facilities

5.25 In PITX, the first national multimodal transport hub, several infection control measures are observed, as shown in Figure 5.3.2. To provide passengers more convenient mobility while ensuring ride availability, PITX partnered with Angkas, one of the motorcycle ride-hailing firms. Passengers are required to use their own helmets during the pandemic.



Source: JICA Study Team

Figure 5.3.2 Infection Control Measures in PITX (as of January 25th 2022)

5.26 On the other hand, for the local public intermodal transfer facilities, remarkable measures like the verification of the vaccination certification could not be observed. The status of the public transport terminals constructed in commercial shopping malls is similar. Vaccination certification is required to enter the shopping malls but not when entering the public transport terminal and riding public transport.

3) Examples of Measures against COVID-19 in Public Transportation of Other Countries

5.27 JICA published case studies in several countries, including “Building Safe, Resilient, and Reliable Mobility against the Impact of COVID-19.” The case study summarizes examples of preventive measures against COVID-19 by governments in 34 countries and regions and by public transport operators in 41 countries and regions. The effectiveness of the preventive measures has not been verified.

5.28 Table 5.3.2 is the list of measures against COVID-19 by public transport operators in 41 countries and regions. Public transport tends to be considered a high-risk transport mode against COVID-19 infection because of the closed space and crowdedness during peak hours. The measures are summarized by category: employees, passengers, vehicle maintenance, operation management, and stations/bus stops. Explanations are added for some not well-known measures.

Table 5.3.2 Examples of Measures by Public Transport Operators

Category	Measures
Employees	Establishment and compliance with guidelines Checking the physical condition of employees Wearing masks/face shields Promotion of contactless fare payment Restrict use near the driver’s seat, etc.
Passengers	Temperature measurement before boarding Wearing masks Hand sanitizer Promotion of social distance inside vehicles Calling attention to prevent infection Sharing crowding information Infection tracking app, etc.
Vehicle maintenance	Cleaning and sanitation of high contact surfaces Restrictions of seat usage to keep distance Ventilation by window or air conditioner Marking to promote social distance in vehicle, etc.
Operation planning	Operation management based on congestion level Stop operation Limit maximum number of passengers Fare raise, etc.
Public transport facilities	Cleaning and sanitation of high contact surfaces Installation of hand sanitizer Ventilation in facilities Marking to promote social distance in facilities, etc.

Source: Building safe, resilient, and reliable mobility against the impact of COVID-19, JICA 2020, summarized by the JICA Survey Team

5.4 Issued on Intermodal Transfer Facility Development

5.29 In general, the safety and security of all are the priority for developing intermodal transfer facilities, including PUV facilities and sidewalks. The Philippines has the Accessibility Law, Sub-Committee on Accessibilities, Built Environment and Transportation (SCABET) under the National Council of Disability Affairs (NCDA), and Task Force for Accessibility under DOTr. However, the facilities are not developed or improved to provide safe access for all.

1) PUV Facilities

5.30 **Lack of Clear Development Directions.** Although provincial bus terminals are purposely located to prevent entry to the center of Metro Manila, the development directions of bus stops and loading and unloading bays are not clear. Therefore, PUV facilities have not been developed unless it is a big project like ITX, EDSA Carousel, etc. The lack of development directions leads to lacking facilities, resulting in PUVs loading and unloading passengers anywhere and causing traffic congestion.

5.31 **Lack of Right-of-Way.** Since lay-by was not considered along most roads and, with generally narrow roads, land acquisition will be required to develop loading and unloading bays. However, the Government of the Philippines is reluctant to acquire lands for such facilities. Another option is to develop curbside stops, but the sidewalk is generally too narrow to have the signage, roof, and other facilities.

5.32 **Insufficiency of Standards.** Specification and location conditions are provided by relevant regulations and manuals, but these have not considered traffic volumes (e.g., the number of passengers, the number of PUVs using the facility, the traffic volume along the roads, etc.).

5.33 **No Considerations on Integrating Railway and PUV Services.** Although the National Building Code requires loading and unloading spaces at a station, smooth transfers between two travel modes are not considered. (i.e., no minimum requirement between the railway station and lay-by, no consideration on the number of transfer passengers, etc.).

5.34 **No Proper Public Intervention to Private Development.** While some private establishments, such as shopping malls, provide bus and jeepney terminals, transport authorities do not require their review or approval. Therefore, some terminals cause traffic congestion on main roads. In addition, developers are required to prepare a Traffic Impact Assessment, but proper measures are not taken to mitigate traffic impacts.

5.35 **No Enforcement for PUVs to Use Facilities.** Even though some loading and unloading bays are provided, PUVs do not stop within turn-out. PUVs still load and unload passengers along main roads. It can be observed even if there are traffic policies.

2) Sidewalks

5.36 **Not Available for Walking.** Many roads provide the sidewalk but are not walkable or not comfortable to walk on because of poor pavement conditions, narrow width, utility poles, footbridges, street vendors, or extended use by adjacent properties, among others. The situation shows the low priority of sidewalk development in the Philippines, causing no proper operation and maintenance of sidewalks as well as no proper enforcement of sidewalk usage.

5.37 **Lack of Information.** Although DPWH and some LGUs have road inventories,

they do not include sidewalks or are not updated. Evaluating sidewalk conditions of the entire Metro Manila using secondary data is difficult. In addition, without the whole picture, prioritizing the projects for sidewalk development and improvement is hard.

5.38 **No Enforcement of Laws and Regulations.** Although the IRR of the Accessibility Law specifies the standards of sidewalks to ensure the accessibility of people, it is not followed. Same for the width of the sidewalk. A wider road is supposed to have a wider sidewalk, but these are usually only seen in the CBD. New railway stations will provide barrier-free facilities, but the paths to those stations are not barrier-free at all.

5.39 **Lack of Appropriate Standards.** Although the National Building Code and other regulations state the minimum requirements of sidewalk width, it does not consider the vehicle and pedestrian traffic volumes along the target road and during actual situations. The minimum width of the sidewalk under Accessibility Law is 1.2 m, but the recommended minimum should be more than 1.5 m.³ It also does not state the case when a sidewalk is not necessary to be provided.

³ Japan: 2.0 m except the case when a sidewalk is not necessary to be provided.
OECD/ECMT countries: 1.5–2.0 m
Malaysia: 2.0 m for moderate and high pedestrian traffic areas.

6 IDENTIFICATION OF NEEDS FOR ICT IMPLEMENTATION IN PUBLIC TRANSPORTATION AND ITS APPLICABILITY

6.1 Level of IT literacy and Acceptance of IT Services among Bus Users

1) Internet Penetration in the Philippines

6.1 According to statistical data from 2021, out of the 110.3 million population of the Philippines, 73.91 million use the Internet, with a penetration rate of about 67%. (In developed countries, the penetration rate is usually over 90%.)

2) Mobile Device Penetration in the Philippines

6.2 The number of mobile devices with an Internet connection has reached 152.4 million, or 138.2% of the population. Theoretically, this means that each person has about 1.4 mobile devices. Considering that the Internet penetration rate is 67%, if the denominator is converted to the number of Internet users instead of population, the number of mobile devices owned per person is more than two units. This is a higher percentage than in most developed countries. The most used digital device in the Philippines is the smartphone with 98.5% ownership, followed by personal computer at 77.3% and tablet at 33.2%. (Smartwatches and other wearable devices are unknown.)

3) Internet Usage Trends in the Philippines

6.3 The annual growth rate of the number of Internet users has been high at +6.1%, and according to a survey of 16 to 64 years old Internet users in the Philippines, they spend an average of 10 hours and 56 minutes per day on the Internet.

Table 6.1.1 Comparison of Internet Usage Time by Country

	Country	Average daily usage time
1	Philippines	10 hours, 56 minutes
2	America	7 hours, 11 minutes
3	England	6 hours, 26 minutes
4	France	5 hours, 37 minutes
5	China	5 hours, 22 minutes
6	Japan	4 hours, 25 minutes

Source : <https://www.atglobal.co.jp/strate/15828>

6.4 Based on the above, the amount of time Filipinos spend on the Internet is significant. In addition, the amount of time spent on TV is 3 hours and 30 minutes, further signifying that Filipinos are quite heavy Internet users.

Table 6.1.2 Breakdown of Internet Use in the Philippines

	Service	Average daily usage time
1	Social Media	4 hours, 15 minutes
2	Music Streaming Service	2 hours, 15 minutes
3	Game	1 hour, 31 minutes
4	News	1 hour, 12 minutes
5	Podcast	47 minutes

Source : <https://www.atglobal.co.jp/strate/15828>

6.5 The trends in the services used online suggest that a large number of young people among the Philippine population is reflected in the high level of Internet use.

4) Questionnaire Survey for Bus Users

6.6 Results of the questionnaire survey for bus users are shown in Appendix 1. Since the number of valid responses is very small at only 73 bus users, the needs of bus users and acceptability of IT services will be discussed as a reference only.

(a) Characteristics of Respondents

6.7 The percentage of female respondents is slightly higher, with 74% employed in some capacity and 82% having a monthly income between PHP10,000–99,000. Residency is dispersed, except for 41% in Quezon City, adjacent to the northeast of Manila. Only 27% own a car, and more than half don't, including motorcycles and bicycles.

(b) Purpose and Needs of Trip

6.8 The purpose of travel of 60% of the respondents is work-related, mainly for the low bus fare. Other reasons for using the bus are the bus stop is near the origin/destination and not owning a car or other means of transportation.

(c) Bus Usage

6.9 Among the respondents, 25% use the bus daily, 26% use it several times a week, and 90% use it several times a month or more, which means that the frequency of bus use is higher compared to Japan. However, only 29% of the respondents can reach their destination without changing buses, while 71% change buses (or jeepneys) about 2 to 4 times to reach their destination.

6.10 The rate of bus users that walk to the bus stop from their point of origin is 36%, while 27% ride the jeepney. Only a small number of respondents ride motorcycles or bicycles from their homes (the main departure point) to the bus stop. Since 59% of the respondents walk from the bus stop to their destination, it is important to locate bus stops within walking distance of potential destinations, especially in central Manila.

6.11 Majority of the respondents, at 86%, pay fares in cash. Cashless payment methods, such as Beep cards, are not widely used. The result of people getting information about buses mostly from Facebook is also a different trend from Japan.

(d) Evaluation of Bus Services

6.12 Half of the respondents rated the bus speed as fast and the other half as slow, suggesting that the impact of traffic congestion and other factors may vary depending on the route. As for service frequency, 59% of the respondents answered that it is frequent, but a number responded otherwise, so there is room for improvement.

6.13 Traffic congestion was cited as the reason for the decrease in bus use by 63% of respondents, and 21% cited the lack of dedicated/priority bus lanes to avoid traffic congestion. It shows that traffic congestion is a major obstacle to bus use. There is 86% that said dedicated/priority bus lanes are necessary.

6.14 A certain number of respondents gave low ratings to bus vehicles and bus stop facilities, suggesting there is room for improvement in each of these areas.

6.15 Regarding bus services in general, while a certain level of the evaluation was

given to routes, service hours, drivers, and conductors, many respondents were dissatisfied with the inconvenient transfers, required time for travel, and the quality of the information system, vehicles, and bus stops. The most essential are the time required, service frequency, and routes.

6.16 In addition, not knowing whether the bus stop is near the origin or destination is the most common reason for not using the bus, so providing information about the bus could greatly improve the situation. In addition, taxis, Grab taxis/cars, and jeepneys were the top alternatives when buses were not available.

5) Summary

6.17 Based on the Internet access and usage trends in the Philippines, IT literacy and acceptance of IT service presently are at the same or higher level than in developed countries, and future growth can be expected. However, based on the current situation of bus usage and evaluation of services, it is difficult to say that services that take advantage of the high IT literacy are being provided. It is necessary to improve and strengthen not only the hardware, such as bus vehicles and bus stops, but also software, such as bus information and digital technology, to improve services.

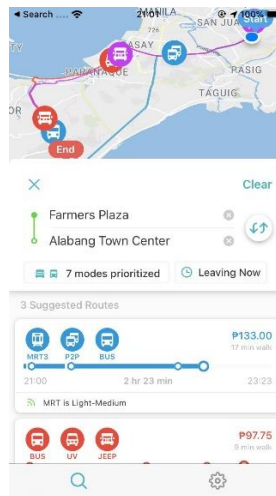
6.2 Status of ICT Adoption by Bus Operators and Their Needs

6.18 As mentioned in the chapter on Current Situation and Issues of Bus Operators, the current situation and needs will be organized again, including services provided by third parties other than bus operators.

1) Services and Systems for Bus Users

(a) Transfer Search Service

6.19 Services like Sakay.ph, a route and transfer search application that specializes in public transportation, have also begun to develop, similar to the NaviTime and Jorudan Transfer Guide in Japan.



Source: <https://sakay.ph/>

Figure 6.2.1 Image of Sakay.ph

(b) Bus Location System

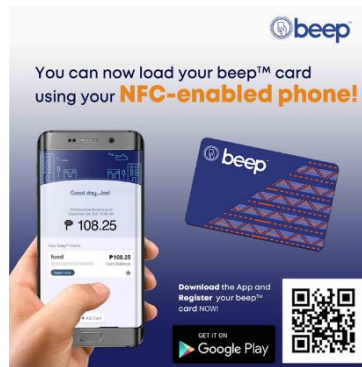
6.20 Bus operators have begun installing GPS in their vehicles to keep track of their operations. However, the GPS-based bus location system does not provide passengers with real-time operation information or bus location information.

(c) Provision of Information through the Company's Website

6.21 Among the bus operators that responded to the survey, only one provided information on their website and four on their Facebook Pages. It can be assumed most bus operators do not have websites of their own.

(d) Electronic Payment System

6.22 IC cards, such as the Beep for use with railway services and BEEPride for modern jeepneys, are also being introduced. In January 2022, a phone application for Beep was released that offers online card reloading and balance and history inquiries by use of near-field communication (NFC). Visa, Mastercard, JCB, debit cards, and QR code payments can be used for payment. In addition, functions and services as a Mobility as a Service (MaaS) application are beginning to be developed, such as for the purchase of QR tickets, which can be used in place of boarding passes, and the redemption of points based on the amount paid.



Source : <https://www.manilatimes.net/2022/02/04/public-square/beep-launches-1st-nfc-tech-based-card-loading/1831719>

Figure 6.2.2 Image of the Beep Card Application

2) Operation Systems

(a) Diagram Organization and Fare Table System

6.23 Basically, there is no timetable except for the first and last departure times, so the concept of scheduling itself does not exist. Although fares are mainly based on distance, there are no onboard fare indicators, and it is assumed that neither the scheduling nor the fare setting process is systemized.

(b) Operation Management System

6.24 GPS has been installed in the vehicles to monitor vehicle positions during operation. Although the system is being utilized to respond to delays, analyze operation performance data, and reflect the data in operation plans, it is assumed that schedule management, such as allocation of drivers and vehicles to operation plans, has not been systemized.

(c) Safety Management (Roll Call) System

6.25 Drivers undergo alcohol and health checks before and after each operation. But the extent of data management in the system must be determined, including identity theft prevention, so problems can be immediately addressed when they occur.

(d) Vehicle Management System

6.26 Vehicle maintenance records for daily and periodic inspections are mainly in paper form and not systemized, including procurement and inventory management of consumables and replacement parts.

(e) Drive Recorder and Digital Tachometer

6.27 With the progress of installing drive recorders in vehicles, the operation management side can check the images in real-time. They are also being used for analyzing accidents. However, it is assumed that efforts to improve driving techniques and safety by acquiring driving data using a digital tachometer and feeding back the analysis results to drivers have not progressed.

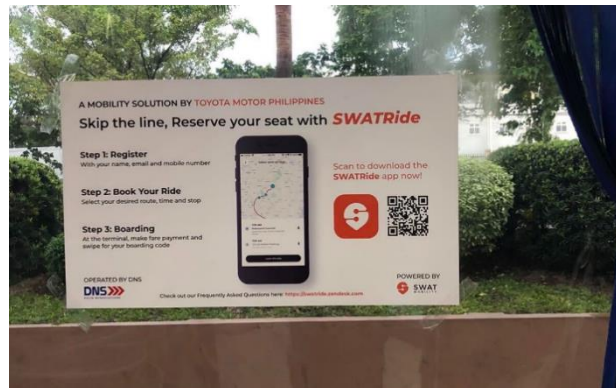
(f) Office System

6.28 The list of bus operators from the LTFRB, despite the restructuring of routes and consolidation of bus operators due to the impacts of the COVID-19 pandemic, covers 75 companies. Therefore, since many bus operators are small, it is assumed that accounting

systems, personnel and payroll systems, crew management systems, revenue management systems, and other systems necessary for management and business operations have not yet been implemented.

3) New Mobility Services

6.29 For three months starting July 2020, SWAT Mobility provided SWATRide, a free reservation app for P2P buses connecting Glorietta 3, Makati City and UP Town Center, Quezon City. The reservation system ensures no waiting time for passengers to board the bus, and by capping the number of passengers, it also serves as a measure to prevent the spread of COVID-19.



Source : <https://www.swatmobility.com/news/swat-mobility-provides-swatride-booking-app-for-p2p-commuters-in-manila>

Figure 6.2.3 SWATRide Image

6.3 ICT Applicability in Public Transportation

6.30 Issues will be summarized based on the contents of the survey so far, and the possibility of applying ICT to solve these issues will be discussed.

1) Problem Description

- (i) The Internet, social networking sites, and mobile devices that users depend on in their daily lives are not being used to improve public transportation services.
- (ii) Public information about buses is limited, as well as for users to find out about them. In particular, the available real-time information is little.
- (iii) Despite that many cannot reach their destinations without transfers, such as bus to bus and bus to jeepney, services are fragmented by transportation mode and operator.
- (iv) There is no concerted effort in the industry to improve safe operations and service.
- (v) There is no flexible response to route and operator restructuring or initiatives to transform operations and improve productivity using digital technology.

2) ICT Applicability

6.31 The proposal is not intended for individual bus operators but rather focuses on themes that should be addressed in Metro Manila as a whole.

(a) Development of Bus Information Platform

6.32 Contrary to the high growth rate of Internet users, the outstandingly long time spent using the Internet, and a large number of mobile devices in use, information about buses is not being obtained from the Internet or smartphone applications. Therefore, the priority should be measures that contribute to disseminating information and improving service and convenience through the Internet and smartphone applications.

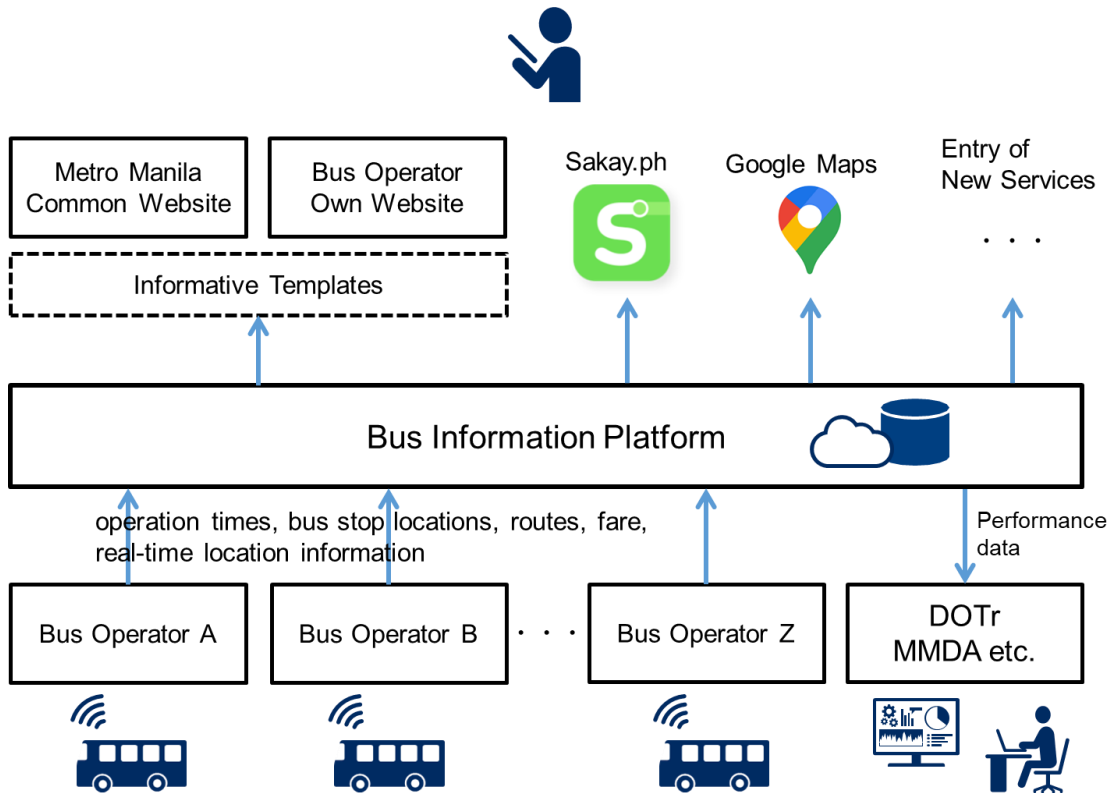
6.33 Although there are route or transfer search applications, such as Sakay.ph, to further enhance information dissemination in the future, the creation of an environment and mechanism for numerous smartphone applications and services and the improvement of services through competition is essential. To this end, it is necessary to consolidate information and data on buses operating in Metro Manila, promote information dissemination by the government and even operators, and create an environment where data can be used openly.

6.34 Bus information platforms envisaged at this stage are as follows (Figure 6.3.1).

- (i) Unify the data into a global standard public transportation data format, such as General Transit Feed Specification (GTFS), and integrated or consolidated static information, such as operation times, bus stop names and locations, and operation routes of each bus operator, as well as dynamic information, such as the real-time location of buses by GPS on a bus information platform.
- (ii) Establish and operate the consolidated information in a common website for Metro Manila and the bus operators' websites based on a unified template.
- (iii) Encourage new service providers to offer other than route/transfer search applications by providing the available information as open data to third parties.
- (iv) Create an environment wherein various information and performance data

accumulated in the bus information platform can be used by Metro Manila LGUs for analysis, route restructuring, etc.

- (v) Expand to other modes of transportation besides buses, such as railways and modern jeepneys, to further improve convenience during transit.



Source: JICA Study Team

Figure 6.3.1 Information Service for Users Using Bus Information Platform

(b) Enhancement of Electronic Payment System Functions and Services

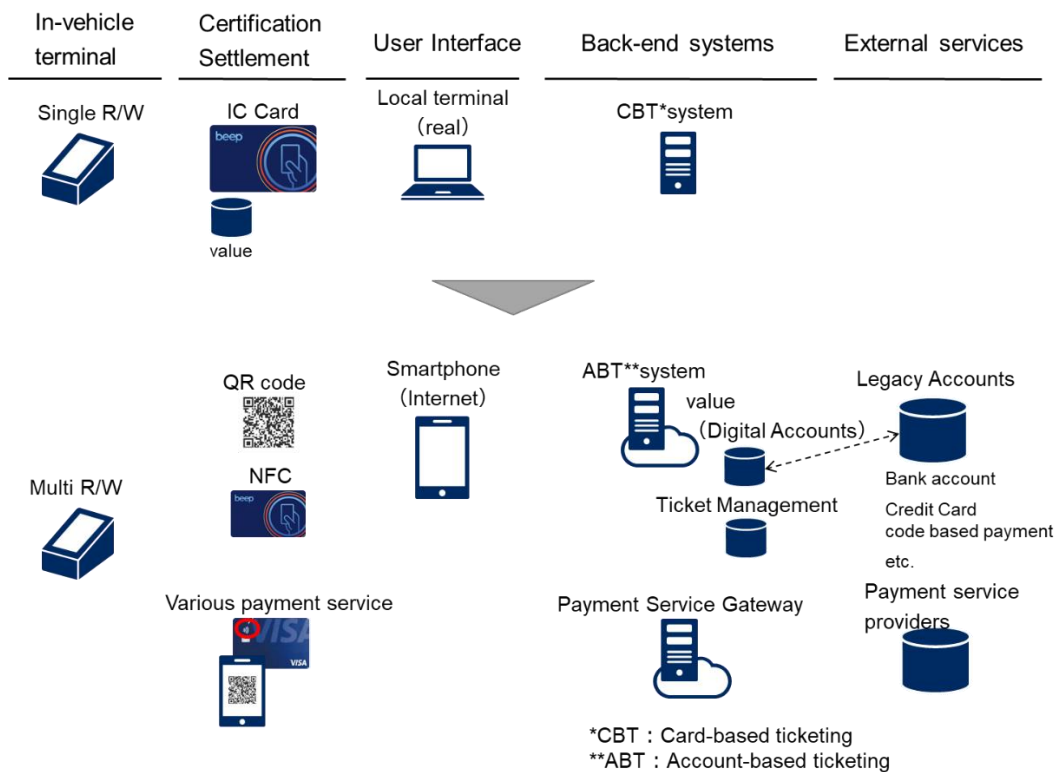
6.35 Although electronic payment systems using IC cards, such as Beep, are being introduced, the usage rate has not yet reached around 90% (like in the Japanese metropolitan area), based on the results of the survey. The benefits of electronic payment systems, such as improved convenience for users, optimized operation times and routes through analysis of boarding and alighting data, and streamlined settlement operations for operators, have not been fully achieved. Therefore, the approach and direction of future electronic payment systems in Metro Manila will be discussed.

6.36 The following embodies the electronic payment system envisioned at this stage (Figure 6.3.2).

- (i) Shift from a traditional card-based electronic payment system (closed-loop system to be introduced by individual bus operators on their own) to an account-based electronic payment system utilizing mobile devices for shared use by bus operators.
- (ii) Other than supporting account authentication when boarding and exiting buses, In-vehicle terminals installed in buses will also be multi-system compatible with various payment services using contactless credit cards, such as Visa and Mastercard, based on the global standard “open-loop system.”
- (iii) Instead of conducting value charging at a manned counter, allow it and ticket purchase

online using an app on mobile devices.

- (iv) By making the system a joint-use type, it will be possible to support discounted fares based on transit connections and the number of times used and common digital tickets across multiple operators.
- (v) Promote coordination among operators by introducing fare pooling and reimbursement schemes and define diverse payment services as a competitive area to reduce the settlement fee rate.



Source : JICA Study Team

Figure 6.3.2 Future Plan of Electronic Payment System

(c) SaaS to Improve Efficiency and Productivity of Operation Management and Office Work

6.37 Instead of building systems and implementing software packages at individual businesses, system implementation and digitalization using Software as a Service (SaaS) are promoted. The master data on drivers, vehicles, suppliers, purchased goods, etc. that are necessary for management and business operations can be shared among services. It makes data linkage among accounting, revenue management, personnel and payroll, fleet management, operation management, and other systems easier. In addition, unifying the format of various types of master data will allow for smooth transfers and handovers in the future when routes are reorganized or when operators are consolidated in conjunction with the development of urban rail networks.

7. PROPOSAL ON POSSIBLE SOLUTION FOR ROAD-BASED PUBLIC TRANSPORT

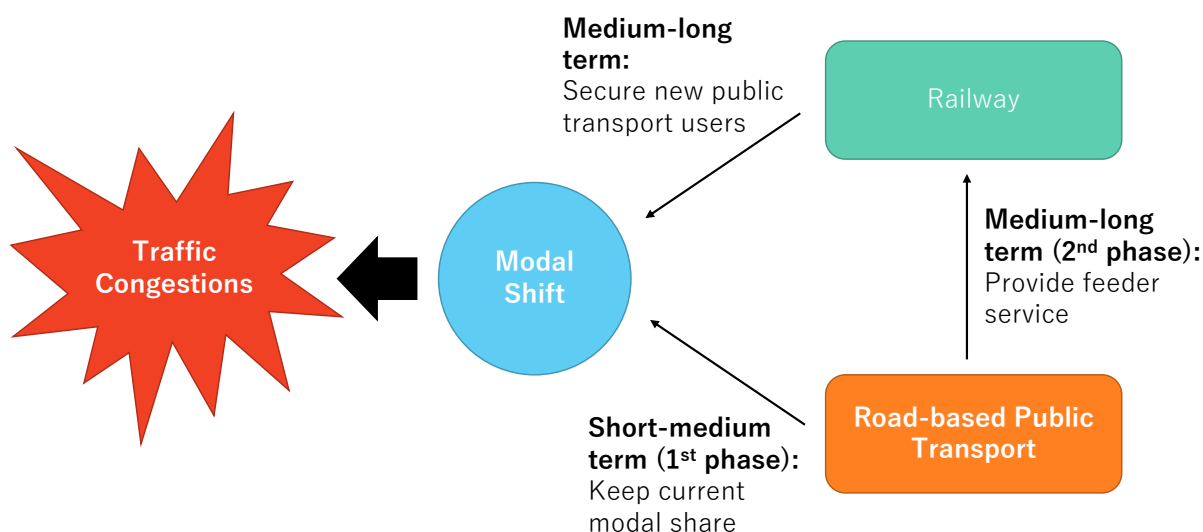
7.1 Concept Plan to Solve the Issues

1) Concept Plan to Improve Road-based Public Transport

7.1 As mentioned in **Chapter 1**, the mitigation of traffic congestion in Metro Manila is one of the top issues that need addressing. As each sub-sector of the transport sector has been addressing this issue, the road-based public transport sector also needs to act by improving road-based public transport services. There would be two phases for improving the road-based public transport services. The first phase aims to keep the current modal share of road-based public transport services as one of the main travel modes, while the second phase aims to provide better feeder services to the railways.

7.2 Although the modal share of public transport in Metro Manila is high at about 71%,¹ the number of registered motorcycles has been increasing, meaning more people are likely shifting from public transport to their motorcycles, which adds to the traffic congestion. One of the reasons for the shift is the availability of reasonable motorcycles. Once people enjoy traveling with their vehicles, encouraging them to shift back to public transport will be difficult. Therefore, while waiting for more railway lines to open, it is important to keep the current modal share of public transport modes by providing better services for the short to medium term.

7.3 When new railways open in the future, the integration between the railway and road-based public transport will be important to encourage more people to use public transport services. Railways will operate along the major roads and connect the central business districts (CBDs), while road-based public transport will operate between railway lines, between suburban areas and a railway station, within certain districts/communities, etc.



Source: JICA Study Team

Figure 7.1.1 Contribution of Road-based Public Transport for Traffic Congestion Mitigation

7.4 As discussed in the previous chapters, mainly the four aspects of safety, security, convenience, and comfortability of the road-based public transport system in Metro Manila need improvement to keep its current modal share. These aspects will be demanded from

¹ The Follow-up Study on the Transport Infrastructure Development Roadmap for Greater Capital Region (GCR) (JICA, 2019)

the feeder services of railways in the medium to long-term as well. The following objectives are tentatively set with **providing a better traveling environment with public transport** as the goal.

- (i) to increase the accessibility to road-based public transport,
- (ii) to assure the safety and security of road-based public transport passengers,
- (iii) to add better amenities to road-based public transport services, and
- (iv) to strengthen the capacity of road-based public transport-related agencies.

7.5 Both government agencies and PUV operators need to play their roles to fulfill the above objectives.

2) Roadmap for Improving Road-based Public Transport

7.6 The roadmaps, including improvement strategies, actions, implementing bodies, and implementing schedules, were summarized for each objective. Funding is not mentioned in each roadmap, but possible funding sources are not only from the government and official development assistance (ODA) but also through cooperation with the private sector. There is a significant number of public transport operators and system vendors in Japan and other countries. The direct and indirect involvement of those in the private sector would be significant in improving the road-based public transport services in Metro Manila.

(a) Increasing Accessibility to Road-based Public Transport

7.7 Public transport should be easily accessible and understood. Accessibility does not mean only physical road access to public transport services or services availability, but also the information, fare system, and integration with other modes. The following strategies are proposed.

- (i) Introduce universal design to realize inclusive public transport.
- (ii) Provide more information on road-based public transport.
- (iii) Provide more reliable, frequent, and fast services.
- (iv) Integrate with other travel modes, including railways.

7.8 A roadmap for increasing accessibility to road-based public transport is recommended, with an indicative timeline as shown below.

Table 7.1.1 Roadmap for Increasing Accessibility to Road-based Public Transport

Strategy	Action	Implementing Body	Schedule			Status
			- 2025	2025-30	2030 -	
Introduce universal design to realize inclusive public transport	1. Formulate an inclusive public transport plan.	DOTr				-
	2. Remove barriers from main access roads and sidewalks.	DOTr/DPWH/ MMDA/LGUs				-
	3. Design and provide barrier-free intermodal transfer facilities.	DOTr/MMDA/ LGUs/Operator				Partially planned ^{1/}
	4. Introduce more low-floor fleets.	DOTr/Operator				Under PUVMP
	5. Mandate to designate priority seating area.	DOTr/Operator				-
Provide more information on road-based public transport	1. Disseminate the PUV basic information (route, fare, operation schedule, estimated travel time, etc.) on the DOTr website	DOTr				-
	2. Establish PUV information platform	DOTr				-
	3. Improve the website/SNS of operators	Operator				-
	4. Introduce information provision system on PUVs	Operator				-

Strategy	Action	Implementing Body	Schedule			Status
			- 2025	2025-30	2030 -	
	5. Introduce an information provision system at the loading/unloading sites	DOTr/Operator				-
Provide more reliable, frequent and fast services	1. Establish the periodic PUV route rationalization system	DOTr				Under MUCEP2
	2. Introduce PUV operation and management system	DOTr/Operator				-
	3. Introduce public transport priority system (PTPS)	DOTr/MMDA				-
	4. Introduce SaaS	DOTr/Operator				-
Integrate with other travel modes including railways	1. Integrate the ticketing system among public transport including railway	DOTr				-
	2. Introduce the ticketing system collaborating with share cycling	DOTr/LGU/Operator				-
	3. Provide the transfer facilities among the travel modes	DOTr/MMDA/LGU/Operator				Partially planned ^{1/}
	4. Introduce MaaS	DOTr				-

^{1/} Station plazas for the station of the Metro Manila Subway Project were designed by the JICA.
Source: JICA Study Team

(b) Assuring the Safety and Security of Road-based Public Transport Passengers

7.9 One of the reasons people choose private travel mode is the safety and security within their vehicles.

7.10 Traffic safety is the top priority of public transport. There are three main factors of traffic accidents, namely human (e.g., poor driving behavior), vehicle and equipment (e.g., poor vehicle conditions), and environment (e.g., poor road conditions). Human factors involve PUV drivers and conductors, passengers, and others. PUV operators can train drivers and conductors, while government agencies can provide traffic safety education for all. Vehicle and equipment should be maintained and checked by PUV operators and tested periodically by government agencies (or government-accredited organizations). Environment improvement is the responsibility of the government, but operators can help by sharing information on road conditions, traffic accident data, etc. Considering these demarcations, the following strategies are proposed.

7.11 Not all crimes can be prevented by any effort of government agencies and PUV operators, and crime control by individuals is very important. However, some crimes can be discouraged by measures taken by PUV operators.

7.12 Considering the above situation, the following strategies are proposed.

- (i) Strengthen traffic safety education for PUV operators, drivers, conductors, and passengers.
- (ii) Improve PUV maintenance system.
- (iii) Improve the road and pedestrian infrastructures along PUV routes.
- (iv) Strengthen the surveillance system in the waiting area of PUVs and inside PUVs.
- (v) Improve the waiting area of PUVs and inside PUVs (e.g., lighting, etc.).
- (vi) Enhance awareness of PUV users on possible crimes in a PUV.

7.13 A roadmap for assuring the safety and security of road-based public transport is recommended with an indicative timeline, as shown below.

Table 7.1.2 Roadmap for Assuring the Safety and Security of Road-based Public Transport Passengers

Strategy	Action	Implementing Body	Schedule			Status
			-2025	2025-30	2030-	
Strengthen traffic safety education for PUV operators, drivers, conductors, and passengers	1. Upgrade the proper traffic accident database of road-based public transport	DOTr				DRIVER ^{1/} is ongoing.
	2. Improve the Driver's Academy of LTRFB to include practical classes and conduct upgraded programs	DOTr				-
	3. Establish and conduct the PUV driver aptitude test	DOTr/Operator				-
	4. Conduct the traffic safety education by the PUV operators periodically	Operator				-
	5. Improve the traffic safety monitoring system of each operator	Operator				-
	6. Conduct the information and education campaign for PUV users	DOTr				-
Improve PUV maintenance system	1. Continue PUV fleet renewal programs	DOTr/Operator				Under PUVMP
	2. Introduce computerized PUV maintenance system	Operator				On-going ^{2/}
Improve the road and pedestrian infrastructures along PUV routes	1. Prepare the road inventory along PUV routes	DOTr/MMDA/LGUs				Partially on-going
	2. Improve/Widen the roads/sidewalks along PUV routes	DOTr/DPWH/MMDA/LGUs				Partially on-going/planned ^{4/}
	3. Provide loading/unloading facilities	DOTr/DPWH/MMDA/LGUs				Partially on-going/planned ^{4/}
Strengthen the surveillance system in waiting areas of PUVs and inside PUVs	1. Establish the crime database related to road-based public transport.	DOTr/PNP				-
	2. Study the necessity of security cameras in waiting areas of PUVs.	DOTr				-
	3. Mandate the installation and monitoring of CCTV on PUVs.	DOTr/Operator				Under PUVMP
	4. Monitor the waiting area and onboard situation via CCTVs.	DOTr/Operator				-
Improve the waiting area of PUVs and inside PUVs	1. Increase the visibility of the waiting area of PUVs.	DOTr				-
	2. Improve the visibility inside PUVs.	Operator				-
Enhance awareness of PUV users on crimes related to the PUV system	1. Conduct an information and education campaign for PUV users.	Operator				-

1/ The Data for Road Incident Visualization Evaluation and Reporting (DRIVER), established by WB, is the basic database for all traffic accidents, not specific to public transport.

2/ LTO is preparing to launch a Motor Vehicle Inspection System (MVIS).

3/ Some roads were covered by the road inventory survey by the Project for Comprehensive Traffic Management Plan for Metro Manila (JICA, ongoing).

4/ Some are covered, but not in an integrated manner, by the ongoing/planned projects by the relevant agencies.

Source: JICA Study Team

(c) Adding Better Amenities to Road-based Public Transport Services

7.14 In order to encourage people to use PUVs more, the entire travel experience should be smooth and comfortable. Probably, some value can be added to the existing services too. The following strategies are proposed.

- (i) Provide a better waiting environment and facilities, including station plazas.
- (ii) Improve onboard environment and facilities.
- (iii) Conduct other promotion activities.

7.15 A roadmap for adding better amenity to road-based public transport services is recommended with an indicative timeline, as shown in the following table.

Table 7.1.3 Roadmap for Adding Better Amenities to Road-based Public Transport Services

Strategy	Action	Implementing Body	Schedule			Status
			-2025	2025-30	2030-	
Provide better waiting environment and facilities	1. Provide Wi-Fi at loading/unloading spots.	DOTr				-
	2. Introduce commercial facilities at loading/unloading spots such as vending machines, delivery boxes, etc.	DOT				-
	3. Introduce smart bus stops.	DOTr/Operator				-
Improve on-board environment and facilities	1. Provide Wi-Fi and an electric outlet on PUVs.	Operator				Some PUVs have.
	2. Mandate air conditioners provisions.	DOTr/Operator				-
Conduct other promotion activities	1. Study the possibility of providing shopping/tourist site discount tickets combined with PUV tickets.	DOTr/Operator				-
	2. Conduct the PR activities to emphasize the benefits of public transport services considering the local and global issues such as climate change, etc.	DOTr/Operator				-
	3. Introduce the one-day pass for tourists/visitors	DOTr/Operator				-

Source: JICA Study Team

(d) Strengthening the Capacity of Road-based Public Transport related Agencies

7.16 A strong commitment by government agencies and their resources are key to achieving all the objectives mentioned above. Therefore, the capacity enhancement of relevant agencies is inevitable. Proposed strategies are as follows.

- (i) Increase the planning and implementation capacity of relevant agencies;
- (ii) enhance the regulatory capacity on traffic enforcement; and
- (iii) establish the planning and management database.

7.17 A roadmap for strengthening the capacity of road-based public transport-related agencies is recommended with an indicative timeline, as shown below.

Table 7.1.4 Roadmap for Strengthening the Capacity of Road-based Public Transport related Agencies

Strategy	Action	Implementing Body	Schedule			Status
			- 2025	2025-30	2030 -	
Increase the planning and implementation capacity of relevant agencies	1. Conduct the capacity enhancement program for DOTr/LTFRB	DOTr/LTFRB				Partially under MUCEP2
	2. Establish the transport planning unit in LGUs	DOTr/LGUs				Pilot program under LCT. ^{1/}
	3. Establish a periodical review system on road-based public transport plans/programs/projects	DOTr/LTFRB				-
Enhance the regulatory capacity on traffic enforcement	1. Conduct the capacity strengthening program for traffic enforcers	DOTr/MMDA/LGUs				-
	2. Review the relevant regulations	DOTr				-
Establish the planning and management database	1. Establish the system to update traffic data including person trip data periodically	DOTr				Under discussion ^{2/}
	2. Establish the database of PUV operators	DOTr				-

^{1/} One of the project components of the Promotion of Low Carbon Urban Transport Systems in the Philippines (LCT) Project by UNDP is awareness and institutional capacity development of LGUs. Pasig City is a pilot city in Metro Manila.

^{2/} DOTr Road Transport and Infrastructure has ongoing coordination with the Philippines Statistical Agency.

Source: JICA Study Team

7.2 Proposed Short-term Actions

7.18 Among the abovementioned actions in the roadmaps, some have been tackled by the ongoing projects/programs by the DOTr and LTFRB. Therefore, the following programs are proposed to cover the remaining actions in the short term.

1) Capacity Enhancement Program on Public Transport Planning and Management

7.19 Capacity enhancement program for road-based public transport-related agencies would focus on three aspects, namely strengthening route planning and management capacity, intermodal transfer facility (including station plazas) development capacity, and database establishment. This program also aims to prepare the specific projects and programs to realize the proposed actions of the roadmaps abovementioned. The main counterparts would be DOTr and LTFRB, but the other agencies such as DPWH, MMDA, LGUs, and PUV operators need to be involved.

(a) Strengthening Route Planning and Management Capacity

7.20 This could depend on MUCEP2 status, but the following activities can be included.

- (i) Support to determine the vision of road-based public transportation in Metro Manila (goal, target, etc.). Although the PUV Modernization Program is ongoing, the goals and the indicative targets are uncertain. A clear vision, together with the targets, should be set and shared with society to strengthen the commitment of the government and establish a consensus with stakeholders.
- (ii) Prepare the manual for periodic review of PUV route planning. MUCEP2 is preparing the route rationalization plan and operation plans; however, this needs to be reviewed and revised regularly since travel behavior changes from time to time due to new railway line operation, new urban development, etc. Therefore, a system for regular review and evaluation of route plans can be standardized as a manual.
- (iii) Support the Full-scale Introduction of the Service Contracting Program. As one of the government initiatives for the PUV operators, Phase 1 and Phase 2 of the Service Contracting Program was implemented. For Phase 3, the experiences and know-how of supporting bus operators in other countries can be utilized.

(b) Strengthening Intermodal Transfer Facility (including station plazas) Development Capacity

7.21 This component needs close coordination with DPWH, MMDA, and the LGUs. The possible activities are as follows.

- (i) Conduct a site survey involving relevant agencies. Considering the local context, the site survey should be conducted with government officers to determine the expected standards of intermodal transfer facilities to be achieved.
- (ii) Formulate planning policy and development guidelines for intermodal transfer facilities. Some design parameters are in the DPWH design guidelines, while the planning concept is in the Local Public Transport Route Plan Manual. All information should be integrated into a single document for easier reference. The design or required facilities cannot be uniform, so the case study or planning concept by location, passenger demands, and others should also be included.
- (iii) Prepare an implementation scheme to develop intermodal transfer facilities in coordination with CLUP and other ongoing projects of JICA. Land acquisition would be one of the big challenges to providing intermodal transfer facilities. Therefore, it should be incorporated into the local plan. Moreover, a stepwise development scheme needs

to be considered.

- (iv) Implement pilot projects to develop intermodal transfer facilities/improve sidewalks. In order to evaluate the doability and usability of the formulated guidelines, pilot projects would be conducted in the project. Results can also be reflected in the guidelines.

(c) Planning and Management Database Establishment

7.22 In the course of this Study, it was revealed that much basic information related to PUV planning and management is not available or not properly arranged. Additionally, regular updating of data is necessary. The following activities can be considered.

- (i) Develop the road-based public transport database and proper update system. The database should include information about the operators (company profile, number of offenses, number of accidents, feedback from users, etc.), operation information (route, loading and unloading points, service information, etc.), and demand information (OD table, information of new development, etc.).
- (ii) Develop the PUV information platform, which will be open to the private sector and the public as a part of information dissemination. The part of the above database can be shared with other government agencies, PUV operators, and PUV users. Other government agencies can utilize it for their planning and projects, and operators can utilize it to improve their services. PUV users can use it to plan their journey.
- (iii) Support the integration of the person trip survey into the housing census. For the DOTr to conduct the person trip survey, which is the base data for demand forecast, without donor support, it seeks the possible integration of the person trip survey into the housing census conducted every five years by the Philippine Statistics Authority (PSA). The experiences in Japan and other cities can be utilized to determine the implementation method, including recommended questionnaire forms.

2) Capacity Enhancement Program on Improving Traffic Safety of Road-based Public Transport

7.23 The capacity enhancement program for traffic safety would focus on three aspects: (i) improving traffic safety education for PUV operators by the government, (ii) strengthening the capacity of traffic enforcement, and (iii) traffic safety campaign for public transport users. The main counterparts would be DOTr, LTFRB, and LTO, but participants from PNP, MMDA, LGUs, and PUV operators are needed.

(a) Improving Traffic Safety Education for PUV Operators

7.24 In order to improve the traffic safety situation of PUV operators, the following activities can be considered.

- (i) Review and improve the Driver's Academy. Currently, drivers need to take only one lecture, which is only a classroom course. Therefore, it could be taken yearly and include practical courses. Education items include the correct way to arrive at a bus stop, S Junction (curve), crank moving, and how to pass through traffic signals. In addition to these basic contents, the contents described in 4.33 may also be implemented.
- (ii) Prepare Driver's Manual for public transport. Some bus operators utilize the Filipino Driver's Manual prepared by LTFRB for their traffic safety education, but the manual focuses only on drivers. Therefore, a separate manual for public transport can be prepared, which includes the practices in Japan and other countries, a sample of driver aptitude tests, recommended practical lessons, etc.

- (iii) Conduct the traffic safety education for PUV operators. Driver's Academy is for drivers, but PUV operators managing drivers should also take similar lectures.

(b) Strengthening the Capacity of Traffic Enforcement

7.25 It was observed that actual enforcement varies on the traffic enforcers and some traffic signages are hard to see. The following activities can be considered in this component.

- (i) Improve the actual signages on the roads. Based on the regulations, the signages along the PUV routes should be updated and improve visibility.
- (ii) Prepare the capacity strengthening manual for traffic enforcers. Based on the capacity assessment of traffic enforcers and announced inspections, the manual would be prepared, including both classroom and practical lectures.
- (iii) Conduct the necessary lectures/workshops for traffic enforcers. The lectures or workshops can be a combination of classroom and on-site sessions.

(c) Traffic Safety Campaign for Public Transport Users

7.26 Some road-based public transport passengers are also unaware of the importance of traffic safety. Therefore, doing the following activities can increase awareness and change their behaviors.

- (i) Conduct public relations campaign for traffic safety in general. PR can be implemented through a website as well as at loading/unloading points and inside the PUVs.
- (ii) Conduct the traffic safety lesson for the pilot school children, including using public transport.

3) Verification Survey for Technology Adaptation for Road-based Public Transport Optimization

7.27 The systems necessary for operation management are being introduced by bus operators in Japan and other developed countries from the perspective of business management and efficiency improvement. However, among the surveyed bus operators, only a few have introduced the necessary systems. It is expected that the systems will be introduced by utilizing the know-how of Japanese and/or other countries' vendors and bus operators based on the opinions of related organizations and operators.

7.28 For the operators, as well as for the LTFRB, DOTr, and other related agencies, the system will be easy to use and make it easier to understand actual situations if they can create data-based totals and statistics by changing the current paper-based recording and tabulation work. By having each operator report the number of passengers, frequency of operations, and other operating conditions for each route periodically to the relevant agencies, it will be easier to understand the proper operation status of each operator and the actual status of travel by citizens. On the other hand, by disseminating information such as incidents of traffic accident from the relevant agencies to each operator, the causes of serious accidents, the results of analysis, and dangerous locations can be shared, which will contribute to deterring drivers from causing traffic accidents.

7.29 Possible technologies and systems to be introduced are as follows.

Table 7.2.1 List of Technologies and Systems that can be Introduced (DRAFT)

Technologies and Systems	Effect	Place to be introduced ^{1/}	
		LTFRB/DOTr	PUV Operator
(i) GPS, Drive Recorder, Safety Recorder and Digital	• Expected to be utilized for anti-crime measures and traffic safety, including accident prevention, by investigating the causes of accidents.	B	A

Technologies and Systems	Effect	Place to be introduced ^{1/}	
		LTFRB/DOTr	PUV Operator
Tachometer	<ul style="list-style-type: none"> Provide safe means of transportation by thoroughly instructing drivers, such as driving at safe speeds, sudden starting and braking, etc. 		
(ii) Operation and Fleet Management System	<ul style="list-style-type: none"> Managing operations using a bus location system as well as the work (attendance and leaving time, vacation leave, etc.) and attendance, including overtime, of crew members is expected to deter long working hours and reduce the workload of management personnel by automatically performing payroll and other calculations. 	C	A
(iii) Vehicle Maintenance Management System	<ul style="list-style-type: none"> Systemizing the vehicle maintenance book will make its management easier and enable proper inventory control of parts and other items needed for vehicles. 	C	A
(iv) Electronic Payment System	<ul style="list-style-type: none"> The widespread use of IC cards and other electronic payment systems will improve the profitability of operators through proper fare collections from passengers and enable discounts to be applied across various modes of transportation and encourage shifting the use of private cars to public transportation. 	C	A
(v) Bus Information Platform	<ul style="list-style-type: none"> By disseminating various information, such as timetables and current location of buses by each operator, and estimated time of arrival at the destination, it is expected that measures will be implemented to alleviate users' concerns and improve the reliability of buses. 	A	A
(vi) MaaS/SaaS	<ul style="list-style-type: none"> Consolidating information between operators and fare payment into a single app, etc., will increase travel options and reduce hassle in payments, which will promote a modal shift from private transport modes to public transport modes. Expected to expand the scope of use and services by adding points for each use and linking with commercial facilities along the route. 	A	A

^{1/} A: Recommended to introduce, B: Possible to introduce, C: No need to introduce

Source: JICA Study team

7.3 Conclusions

7.30 According to the Follow-up Study on the Transport Infrastructure Development Roadmap for Greater Capital Region (GCR) (JICA, 2019), Metro Manila has a high modal share of public transportation at 71%. However, it can be expected that more people will shift to the private vehicles due to the poor quality of current public transport services and the availability of affordable vehicles including motorcycles. Therefore, the goal of improving road-based public transport system is to keep the current modal share in the short term. For this to happen, four aspects of the road-based public transport system (i.e., safety, security, convenience and comfortability) needs to be improved.

7.31 There are several government agencies related to road-based public transport services, and the different kinds of road-based public transport services are provided by a relatively huge number of operators. Unlike many other countries, the private sector provides road-based public transport services, so government intervention in road-based public transport services has a certain limitation. However, DOTr should lead the entire measures as a leading agency for managing the road-based public transport services.

7.32 Several projects/programs, including the donor projects, are under implementation, especially for the institutional system of LGUs and ICT applications. However, the capacity enhancement activities of the national government, PUV infrastructure/facilities development, and improvement measures for the PUV operators are still lacking. Therefore, three programs are proposed in this study, as shown below.

Table 7.3.1 Proposed Programs

No.	Program	Counterpart		Related Impact ^{1/}			
		Main	Minor	Safety	Security	Convenience	Comfortability
1	Capacity Enhancement Program on Public Transport Planning and Management	DOTr/ LTFRB	DPWH, MMDA, LGUs	B	C	A	B
2	Capacity Enhancement Program on Improving Traffic Safety of Road-based Public Transport	DOTr/ LTO/LTFRB	DPWH, PNP, MMDA, LGUs	A	B	C	B
3	Verification Survey for Technology Adaptation for Road-based Public Transport Optimization	DOTr/ LTFRB/ PUV Operator	LGUs	-	-	-	-

1/ A: High, B: Fair, C: Low. The related impact of item 3 is not stated since this is a verification survey project.

Source: JICA Study Team

APPENDICES

Appendix 1: Results of Bus Operator Questionnaire Survey

1. List of Bus Operator in Metro Manila from LTFRB

1	ADMIRAL TRANSPORT CORP				
2	AIRFREIGHT 2100 INC (UBE EXPRESS)				
3	AJ SAMPAGUITA LINER COMPANY				
4	ALABANG METRO LINK BUS				
5	ARMI JOSH TRANSPORT				
6	ARR TRANSPORTATION INC				
7	BAGONG BUHAY TRANSPORT SERVICE COOP				
8	BANTAGE ONE TRANSIT INC				
9	BATMAN STAREXPRESS CORPORATION				
10	BENSAN TRANSPORT CORPORATION				
11	BOJVEN TRANSPORT SERVICES				
12	BUENASHER TRANSPORT CORPORATION				
13	CEMTRANS SERVICES INC				
14	CHER TRANSPORT DEVT SERVICES CORP				
15	CITY BUS INC				
16	COMMUTERS BUS CORPORATION				
17	DE GUIA ENTERPRISES INC				
18	DEL MONTE CITY TRANS CORP				
19	DIAMOND VEIGHT TRANS INC				
20	E & E ROYAL COUPLE BUS INC				
21	EARTH STAR EXPRESS INC				
22	EOS TRANSPORT CORPORATION				
23	ES TRANSPORT INC				
24	FAIRVIEW BUS INC				
25	FERMINA EXPRESS CORPORATION				
26	FRANCHESCA MAE GRAJIEL TRANSPORT INC				
27	FRANVILL TRANSIT INC				
28	HI-STAR INC				
29	HILLTOP TOURS INC				
30	HM TRANSPORT				
31	JAC LINER INC				
32	JACKPHERLYN TRANSPORT CORP				
33	JAYROSS L S TOURS BUS CO INC				
34	JELL TRANSPORT INC				
35	JOANNAJESH TRANSPORT CORP				
36	JOYSELLE EXPRESS INC				
37	JRMS GOLDEN SKY TRANSPORT INC				
38	KELLEN TRANSPORT INC				
39	LAGUNA STARBUS				
40	LIPPAD WENDELL M				
41	MA-FEL TRANSIT CORPORATION				
42	MAGICLINE EXPRESS CORP				
43	MANNROSE LINER INC				
44	MARIKINA AUTO LINE TRANSPORT CORP(MALTC)				
45	MARTHEL TRANSPORT INCORPORATED				
46	MAYAMY TRANSPORT CORP				
47	MERSAN SNOW WHITE TRANSPORT CORP				
48	N S TRANSPORT SERVICES INC				
49	NUESTRA SEÑORA DEL CARMEN TRANS SERVICE				
50	ORIGINAL TRANSPORT SERVICE COOP				
51	PAMANA TRANSPORT SERVICES INC				
52	PASCUAL LINER INC				
53	PHIL TOURISTERS INCORPORATED				
54	RBM GRAND RALLY TRANSPORT INC				
55	ROVAL TRANSPORT CORP				
56	RRCG TRANSPORT SYSTEM CO INC				
57	RS MASTER INC				
58	SAFEWAY BUS LINES INC				
59	SAINT ANTHONY OF PADUA TRANSPORT SYSTEM				
60	SAINT ROSE TRANSIT INC.				
61	SAW AGUSTIN TRANSPORT SERVICE CORP				
62	SANTRANS CORP				
63	SEVEN SKY EXPRESS LINER CORPORATION				
64	ST MARTIN OF TOURS TRAILWAYS INC				
65	STARITA TRANSPORT CORPORATION				
66	STARGREEN LINE INCORPORATED				
67	THELMAN TRANSIT INC				
68	VALENZUELA TRANSPORT SERVICE COOP				
69	VALISNO ROSALINDA MANABAT				
70	VIL 5000. INC				
71	VIOFEL TRANSPORT INC				
72	VOYAGER EXPRESS LINER INC				
73	YOHANCE EXPRESS INC				
74	BALIWAG TRANSIT INC				
75	GOLDEN BEE TRANSPORT				
76	TAS TRANS CORP				

Operator which answered to the questionnaire

2. Survey Questionnaire

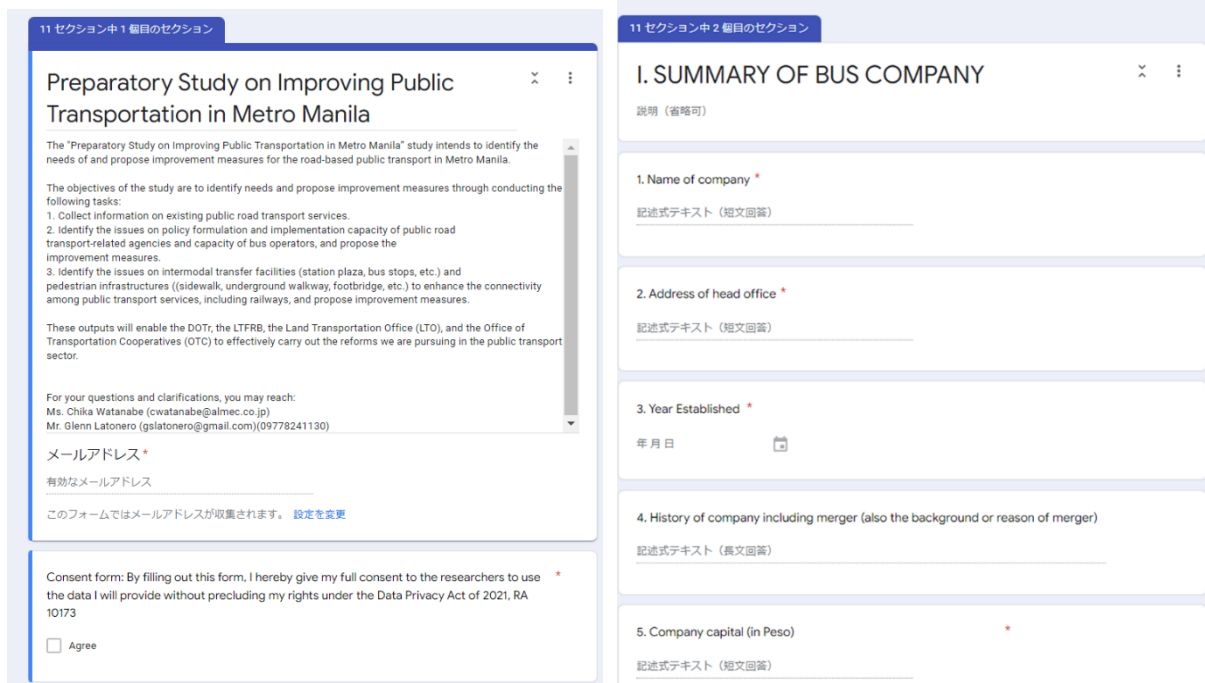
1	Summary
1-1	Name of company
1-2	Address of head office
1-3	Established (yy/mm/dd)
1-4	History of company including merger (also the background or reason of merger)
1-5	Capital (in Peso)
1-6	1-6-1 Other business
	1-6-2 If "YES", Description of business (except "bus operation")
	1-6-3 If "YES", Reason why you operates as bus company
1-7	Numbers of employees (staffs)
1-8	Numbers of bus vehicles
1-9	Numbers of bus routes / Numbers of operation in each bus route
2	Profit-and-loss statement
2-1	Profit-and-loss statement
3	Operation Planning
3-1	Operation diagram in each line, or timetable in each line (every stops, if not only departure time will be OK)
3-2	Method of setting time hourly between each bus stops in each line
3-3	Monthly and daily work schedule and statement (schedule) of bus vehicles
3-4	Method of setting numbers of operation and time (Considering market, competition against other bus operators, etc.)
3-5	How do you approach to LTFRB and LGU according to make new bus line or changing operation planning such as numbers or timetable)
3-6	How do you make decision of bus route?
3-7	Are there any alignment in advance between other bus operators when deciding to make new route or changing operation planning?
3-8	Is it necessary to apply for or report to DOTr, LTFRB, or OTC for the determined route, time, and number of operations?
3-9	If necessary, how many days in advance do I need to apply and report? And what kind of content is needed?
3-10	Issues / problems with operation planning
4	Operation Management
4-1	Work pattern
	4-1-1 Working (Duty) hours (Labour hours, operating (driving) hours, break time)
	4-1-2 Number of monthly working days (Numbers of monthly day-off, Numbers of paid-holiday in each year)
	4-1-3 Monthly overtime hours in average
4-2	Daily operation management
	4-2-1 Definition of Start of working hours and Time to go home (i.e.: Attendance 20 minutes before departure, 15 minutes after warehousing)
	4-2-2 Alcohol detection test
	4-2-3 Vehicle inspection before operation
	4-2-4 Health condition check before operation
	4-2-5 Placement of spare vehicles
	4-2-6 Placement of spare drivers
	4-2-7 What to do if absenteeism occurs on the day
	4-2-8 What to do if departing from designated bus route
	4-2-9 What to do if bus vehicle breaks down on the road
	4-2-10 What to do if bus occurs accident
	4-2-11 What to do if bus is in (terrible) delay
	4-2-12 What to do if you receive complaints from users, passengers, citizens of other car driver
	4-2-13 Analysis of GPS data
	4-2-14 Reflection of GPS data in operation planning
	4-2-15 Do you carry out operation management using GPS such as arrangement of substitute bus in case of delay?
4-3	Operational System
	4-3-1 Overview of the vehicle operation management system
	4-3-2 Other systems used for bus operation management
	4-3-3 What kind of system would you like to have?

4-4	Surveillance Camera
4-4-1	Installation of surveillance camera
4-4-2	Surveil on live
4-4-3	Usage of surveillance camera (such as analysing traffic accident, situation of complaints from passengers, driving attitude of bus driver, etc.)
4-4-4	Monthly running cost per car
4-5	Fare income management
4-5-1	Management of fare collected from passengers
4-5-2	Consistency between the number of passengers paid in cash and the amount setteled in depot
4-5-3	How to settle the IC card when returning back to the depot (at the end of the service)
4-6	Driver's training (education)
4-6-1	Training before joining the company
4-6-2	If "YES", period and content Training after joining the company
4-6-3	Monthly training (Lecture and Practical)
4-6-4	Training (Education) for driver occurred traffic accident
4-6-5	Training (Education) for driver given a complaint
4-6-6	Training (Education) for deviating bus route and not complying with operating time intenentionally
4-6-7	Safety driving training carried out by bus operator or police
4-6-8	Aptitude test in annual
4-7	Ticket selling staff training (education)
4-7-1	Training before joining the company
4-7-2	If "YES", period and content Training after joining the company
4-7-3	Monthly training (Lecture)
4-7-4	Training (Education) for staff given a complaint
4-7-5	Training (Education) for treating passengers (i.e.: manners course)
4-8	Implementation status of (health) medical checkup
4-8-1	Before joining the company
4-8-2	Annually implementing
4-A	Issues / problems with operation management
5	Safety driving management
5-1	Traffic accident
5-1-1	Cause analysis
5-1-2	Creation of accident statistics
5-1-3	Meeting on accident analysis
5-2	Bus Operation
5-2-1	Passengers getting on-and-off only at the busstop
5-2-2	Strict adherence to legal speed
5-2-3	Proper use of turn signals when turning left or right, changing lanes, or arriving at and departing from bus stop

7	Bus Vehicle Maintenance
7-1	Bus vehicle maintenance plan (annual or monthly)
7-2	Contents of inspections
7-2-1	Contents and frequency of regular inspections
7-3	Place where maintenance is carried out
7-3-1	In-house
7-3-2	Outsourced to other maintenance shop
7-4	Creation of maintenance record book for each bus vehicle
7-5	Performer of daily inspection (in the morning)
7-6	Inspection items (list) of daily inspection (in the morning)
8	Bus Vehicle
8-1	Update frequency of bus vehicle replacement
8-2	Purchase cost per unit
8-3	Vehicle equipments
8-3-1	Air conditioner
8-3-2	Wi-Fi
8-3-3	USB port
8-3-4	Display of destination
8-3-4-1	Front
8-3-4-2	Side
8-3-4-3	Rear
8-3-5	Bus stop information broadcasting equipment
8-3-6	Display of fare
8-3-7	Display of bus stop
8-3-8	Buzzer for getting off
8-3-9	Advertisement
8-3-9-1	Poster or paper
8-3-9-2	Digital Signage
8-3-9-3	At the side or rear of bus vehicles
8-3-10	Shading (colored) windows
8-3-11	Special equipments for operating in tropical areas
8-3-12	Convenient and comfortable equipment requested from passengers
8-4	Low Emission Bus Vehicle
8-4-1	EV
8-4-2	CNG
8-4-3	Hybrid
8-5	Stand (or Station) that can be used around depot
8-5-1	EV
8-5-2	CNG
8-6	Emission regulations which the bus vehicles are currently enrolled
8-6-1	EURO1
8-6-2	EURO2
8-6-3	EURO3
8-6-4	EURO4
8-6-5	EURO5
8-6-6	EURO6
8-6-7	Equipped DPF
8-6-8	Equipped Urea SCR
8-7	Gender
8-7-1	Accesible of wheelchair
8-7-1-1	If "YES", numbers of bus vehicles
8-7-1-2	Slope for wheelchair
8-7-1-3	Place to fix for wheelchair
8-7-1-4	Belt to fix for wheelchair
8-7-2	Seat for elder and handicapped
8-7-2-1	If "YES", numbers of seats in each bus

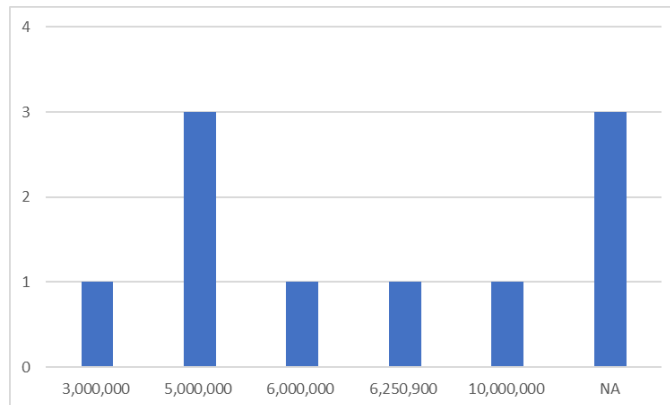
9	Others	
9-1	Compensation package	
9-1-1	Basic pay	
9-1-2	Contents of additional benefit (perquisite)	
9-1-3	Possibility of introducing a flat rate system from a commission system	
9-1-4	Possibility of introduction to pay perquisite for the operating distance (Service Contracting Program) from the commission system	
9-2	Average annual income	
9-2-1	Driver	
9-2-2	Ticket selling staff	
9-3	Gender	
9-3-1	Employment	
9-3-1-1	Female driver	
9-3-1-2	Elder	
9-3-1-3	Handicapped	
9-3-2	Consideration for work style	
9-3-2-1	Female driver	
9-3-2-2	Elder	1
9-3-2-3	Handicapped	
9-4	Labor Union (Association)	
9-4-1	Existence of labor union	
9-4-2	What kind of requests are received from the labor union?	
9-5	Coordination of bus operation planning (timetables and routes) between other bus operators	
9-5-1	Necessary of coordination	
9-5-2	If "YES", do you think you can provide more efficient bus services or operations?	
9-5-3	And also, will users be pleased and will they be able to switch from private cars?	
9-6	Do you think that the number of users will increase if there is a transfer discount with the metro or jeepney?	
9-7	Advantages and inferiorities compared to other bus operators	
9-8	Contents and issues that would like to improve in the future	
9-9	What you want to request from the country	

Image of Questionnaire using Google Sheet

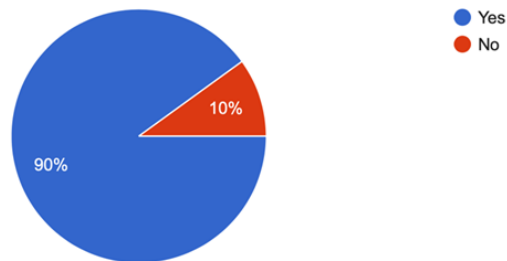


3. Survey Results

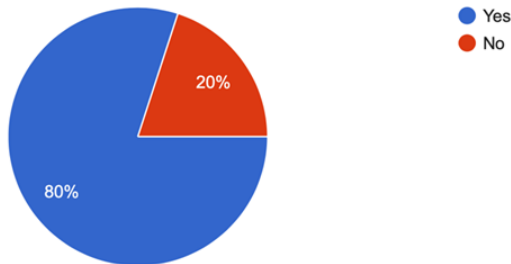
1) Company capital (in PHP)



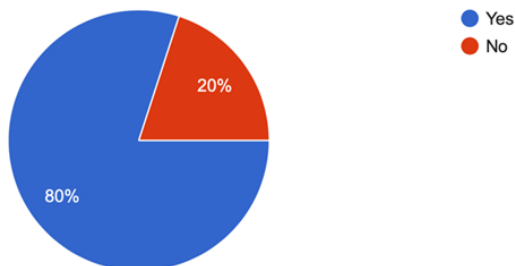
2) Alcohol detection test



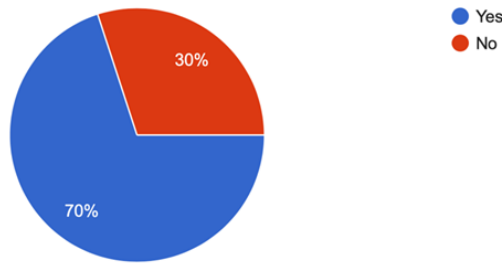
3) Analysis of GPS data



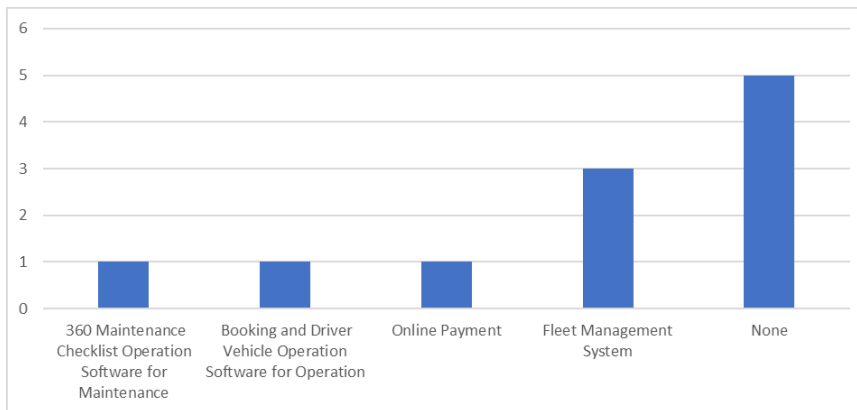
4) Reflection of GPS data in operation planning



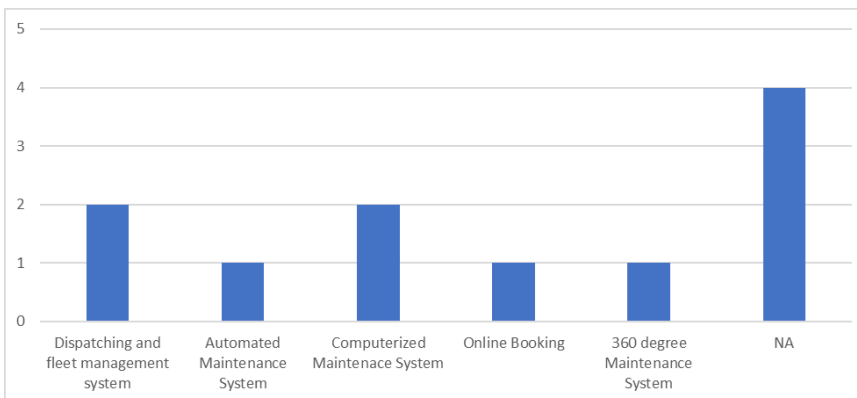
5) Operation management using GPS such as the arrangement of substitute bus in case of delay



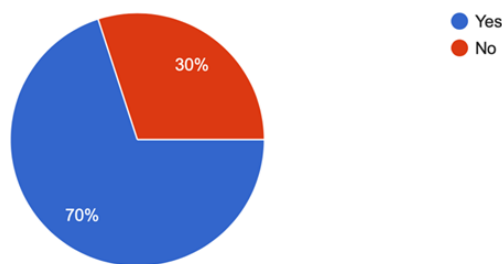
6) Software using for controlling bus operations



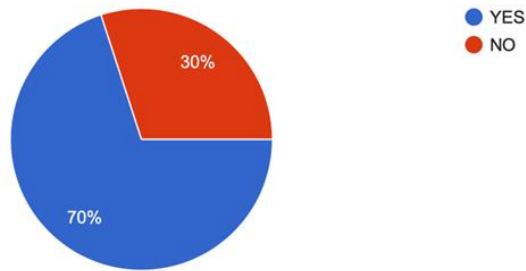
7) System to be needed (except GPS)



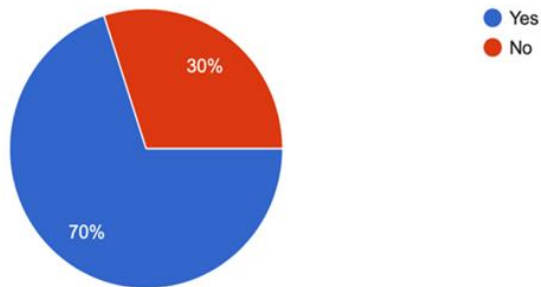
8) Usage of surveillance camera (such as analyzing traffic accident, situation of complaints from passengers, driving attitude of bus driver, etc.)



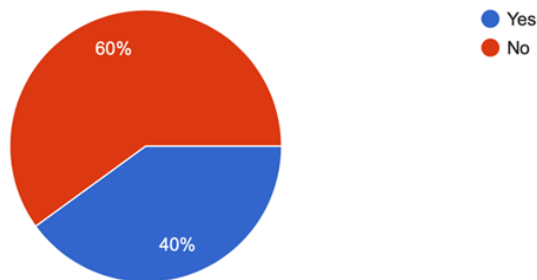
9) Annual aptitude test



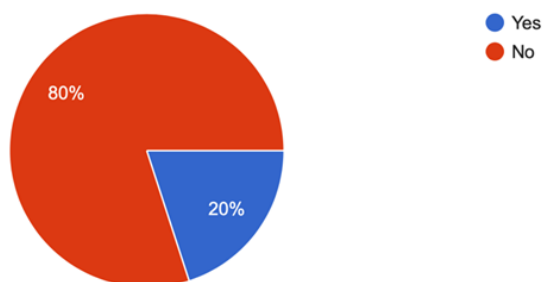
10) Monthly training in lecture



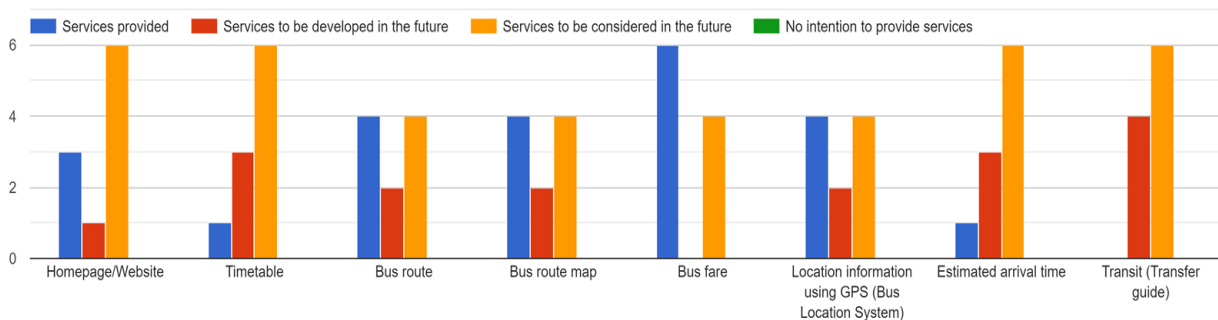
11) Statistics and cause analysis of road crash



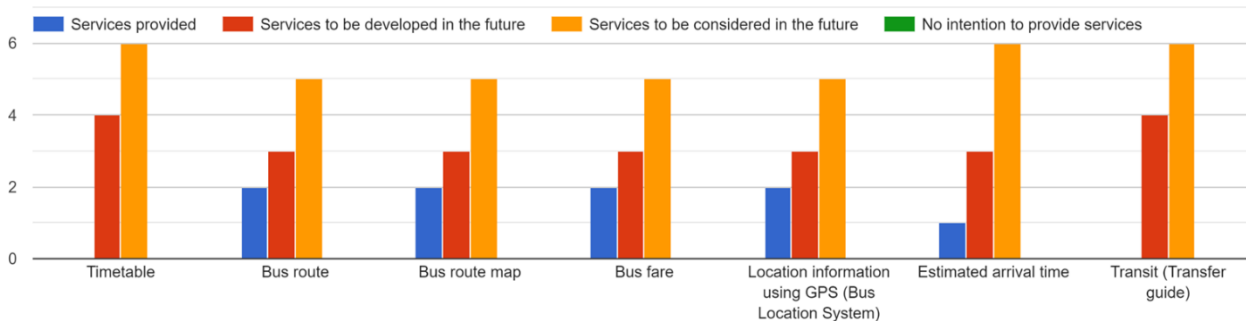
12) Access in reporting system in other bus operators



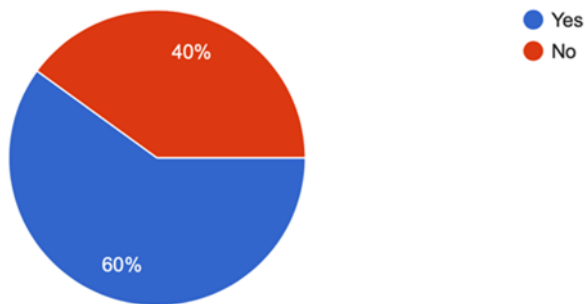
13) Homepage/Website



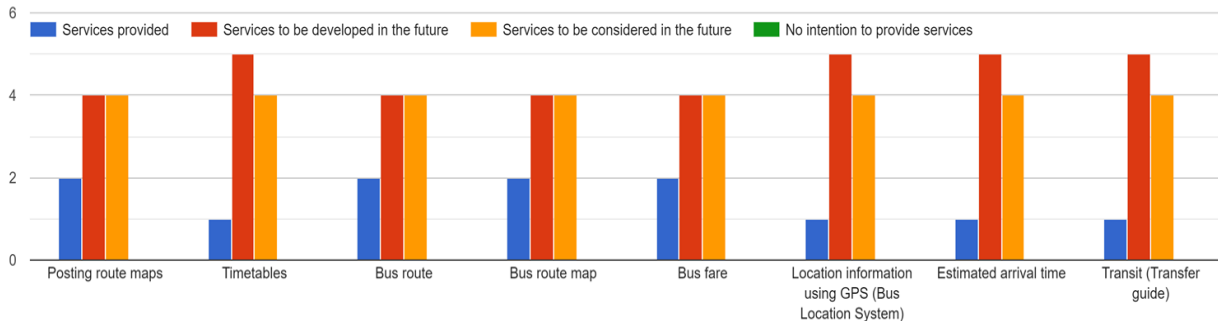
14) Mobile Apps



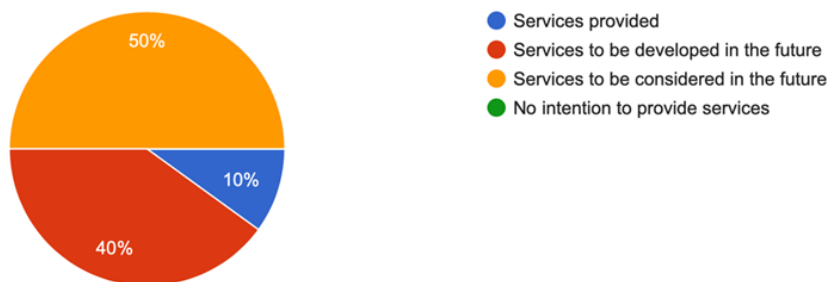
15) Social Networking Service (Facebook, Twitter, Instagram)



16) Information at bus stop



17) Information inside the bus (Display of destination, route map, next bus stop, fare, etc.)



18) Request received from bus users

More accessible public transport/route	2
More bus stops in carousel	1
Lesser Transfer	2
Senior/pwd friendly stops	1
Acceptance of cash and afcs	2
Bus operation information	1
Schedule	1
Lost and Found	2
Additional units	1
TV	1
Wi-Fi	1

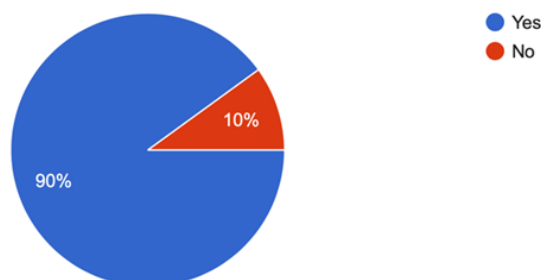
19) Complaints received from bus users

Attitude towards work	3
Arrogant drivers	2
Conductor's attitude	1
Driver driving complaint	1
Departure/Arrival Schedule bus stop is not on time	1
Unmannered grounds personnel	1

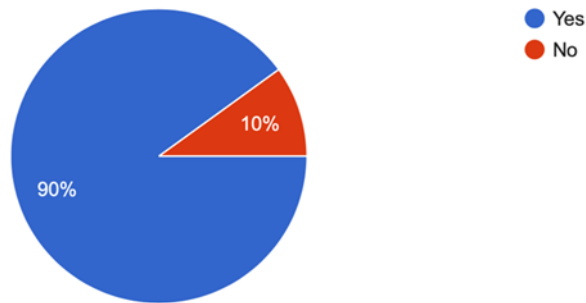
20) Vehicle equipment

Items	Yes	No
Air conditioner	10	0
Wi-Fi	8	2
USB port	7	3
Display of destination (Front)	7	3
Display of destination (Side)	4	6
Display of destination (Rear)	4	6
Bus stop information broadcasting equipment	6	4
Display of fare	8	2
Display of name of bus stop	4	6
Buzzer for getting off	5	5

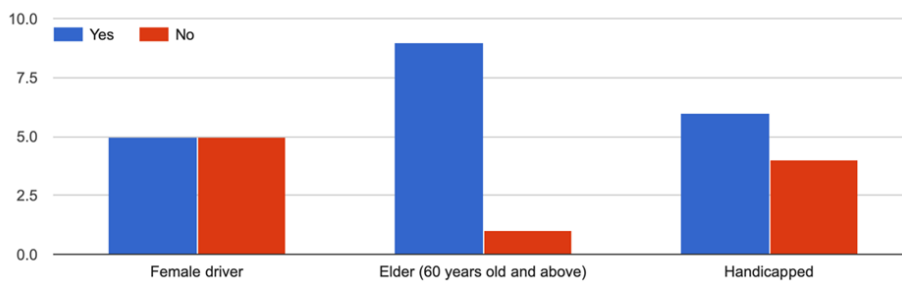
21) Possibility of introducing a flat rate system from a commission system



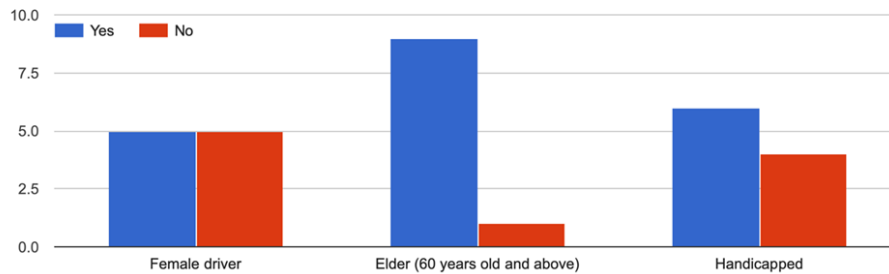
22) Possibility of introduction to pay perquisite for the operating distance (Service Contracting Program) from the commission system



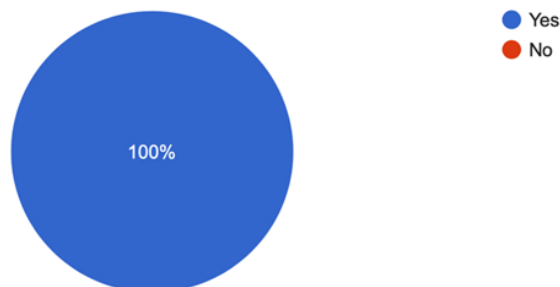
23) Employment regarding to Gender



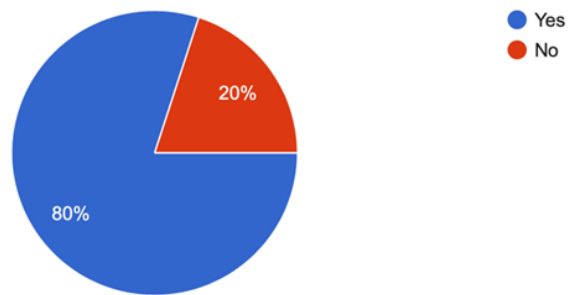
24) Consideration for work style



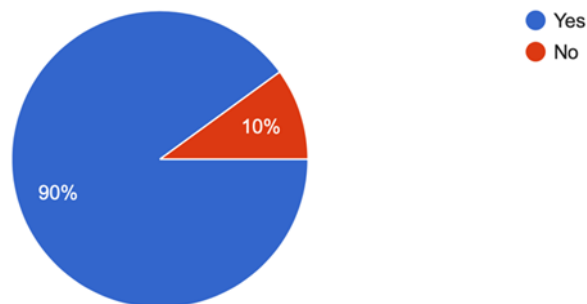
25) Necessities of coordination of bus operation planning between other bus operators



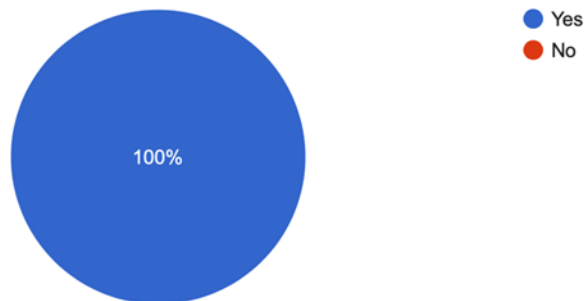
If “YES”, do you think you can provide more efficient bus serviced or operations?



If “YES”, do you think users will be pleased and will they be able to switch from using private cars?



26) Do you think that the number of bus users will increase if there is a “Transfer discount” with the Metro or Jeepney?



Appendix 2: Results of Bus User Questionnaire Survey

1. Gender	
Male	30
Female	42
I prefer not to answer	1
total	73

2. Age	
< 20 years old	1
21-29 years old	25
30-39 years old	19
40-50 years old	21
> 51 years old	7

3. Occupation	
Student	5
Office employee (8-hour working in office)	42
Workers (Shift work)	5
Leaders of branches, administration levels and units	1
Freelancers	2
Small business owners	4
Seasonal labor	0
Housewife	4
Retired	0
Others	10

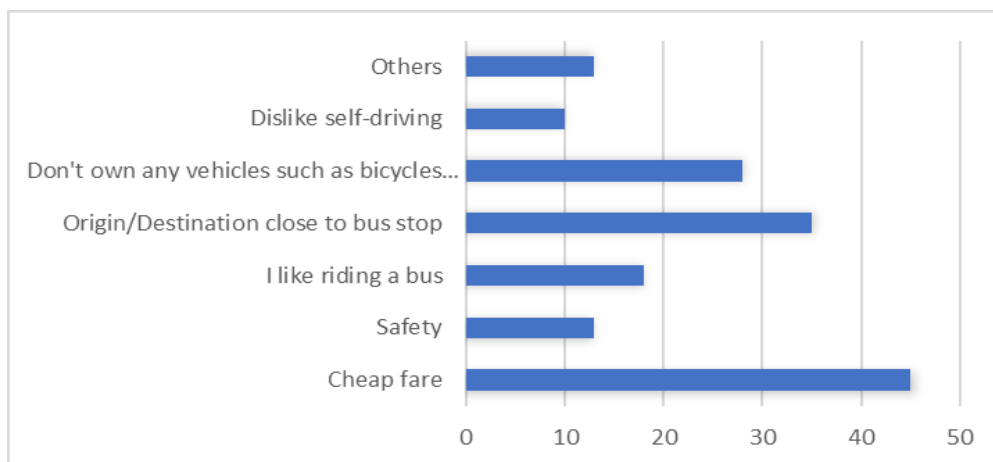
4. What is your individual income per month?	
No income	8
<PhP 10,000	18
PhP 20,000 - 29,000	15
PhP 30,000 - 49,000	12
PhP 50,000 - 99,000	15
PhP 100,000 - 250,000	4
>PhP 250,000	1

5. Where do you live?	
Manila	5
Quezon City	30
Caloocan	3
Las Piñas	1
Makati	5
Malabon	1
Mandaluyong	1
Marikina	0
Muntinlupa	3
Navotas	0
Parañaque	1
Pasay	0
Pasig	2
San Juan	0
Taguig	3
Valenzuela	2
Pateros	0
Rizal	5
Bulacan	3
Cavite	5
Others	3

6. Which of the following vehicles do you own? Choose all that apply.	
Car	20
Motorcycle	10
Bicycle	12
None	39

9. What is the purpose of this trip?	
To Home	5
To Work	38
To School	4
At Work / Business	3
To send/To pick up other family members or friends	2
To go shopping/market	8
To eat (not at home)	2
To exercise	0
Joy riding	0
Social/Recreation/Religious	3
Other private purposes	8

10. What are the reasons for using the bus service? (maximum 3 options)	
Cheap fare	45
Safety	13
I like riding a bus	18
Origin/Destination close to bus stop	35
Don't own any vehicles such as bicycles or motorcycles	28
Dislike self-driving	10
Others	13



11. How often do you use the bus?	
One time trip	8
Few times a month	28
Few times a week	19
Daily	17
More than once a day	1

13. To reach the final destination of this trip, how many times do you need to transfer between different routes? (please include all modes like Jeepneys, Tricycle, Pedicab, etc)	
1	21
2	23
3	21
4	8
5	0
6	0
6 and above	0

14. What is your method of payment?	
Cash (Single-journey ticket)	63
Beep card	10

15. If cash, how much?	
PhP 10 - 20	16
PhP 21 - 50	33
PhP 51 above	24

16. If beep card, how much?	
PhP 10 - 20	19
PhP 21 - 50	33
PhP 51 above	21

18. Institution of Origin	
Residence	58
Office / Bank	1
Government Office	4
Factory / Warehouse	1
School / University	0
Medical / Welfare	0
Religious / Social	0
Wholesale / Retail	2
Restaurant / Entertainment	1
Park / Green Space	0
Others	6

20. How did you get to the bus stop?	
Walking	26
Bicycle - driver	1
Bicycle - passenger	2
Motorcycle - driver	0
Motorcycle - passenger (NOT Angkas TNVS)	5
Car - driver	1
Car - passenger (NOT taxi/Grab)	1
Taxi / Grab	3
Motorcycle taxi (Angkas)	1
Bus	1
Jeepney	20
Others	12

22. Institution of Destination	
Residence	10
Office / Bank	26
Government Office	12
Factory / Warehouse	1
School / University	4
Medical / Welfare	2
Religious / Social	1
Wholesale / Retail	6
Restaurant / Entertainment	4
Park / Green Space	1
Others	6

24. How will you get from the bus stop to your final destination?	
Walking	43
Bicycle - driver	0
Bicycle - passenger	0
Motorcycle - driver	1
Motorcycle - passenger (NOT Angkas TNVS)	2
Car - driver	1
Car - passenger (NOT taxi/Grab)	1
Taxi / Grab	3
Motorcycle taxi (Angkas)	0
Bus	4
Jeepney	13
Others	5

27. For bus routes which you often use, please assess bus speed.	
Very slow	3
Slow	31
Fast	36
Very Fast	3

28. For bus routes which you often use, please assess frequency of bus service.	
Very Frequently	8
Frequently	35
Occasionally	22
Rarely	5
Very Rarely	3

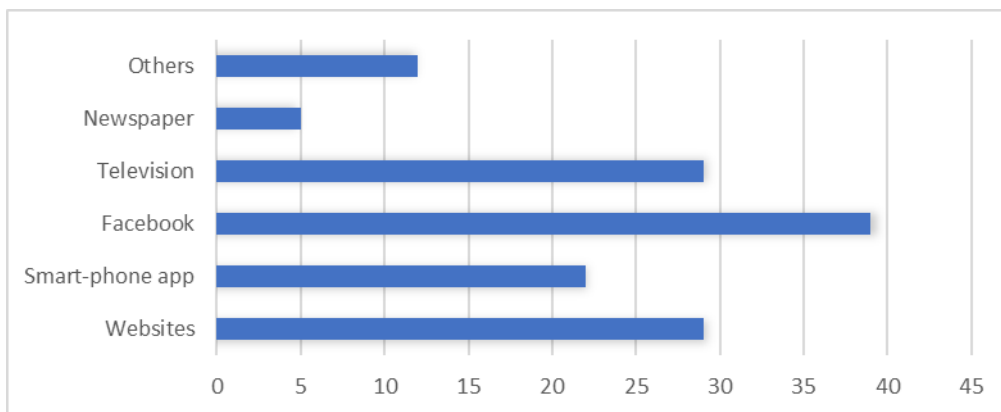
29. In your opinion, what is the main reason for the decreased frequency of the bus service?	
Traffic congestion	46
No prioritized/exclusive bus lanes	15
Skills of bus drivers	3
Frequent vehicle breakdown	0
Others	9

30. Please indicate your opinion on the necessity of prioritized/exclusive bus lanes.	
Unnecessary	2
Not sure	8
Necessary	35
Very necessary	28

31. For the bus stops which you often get on/get off, please assess the following aspects.						
	Content of information provision	Method of information provision	Sidewalk space for boarding/alighting	Seating capacity	Coverage of bus shelter	Street lighting in evening
Enough	15	15	12	16	15	15
Neutral	33	29	26	32	25	27
Not enough	25	29	35	25	33	31

33. Please assess the following items.					
	On-board information system	Stop button	Cleanliness/Sanitization	Air conditioner	Bus floor and staircase for boarding / alighting
Very bad	5	14	8	4	5
Bad	24	25	27	23	23
Neutral	34	26	21	22	27
Good	9	7	15	20	14
Very good	1	1	2	4	4

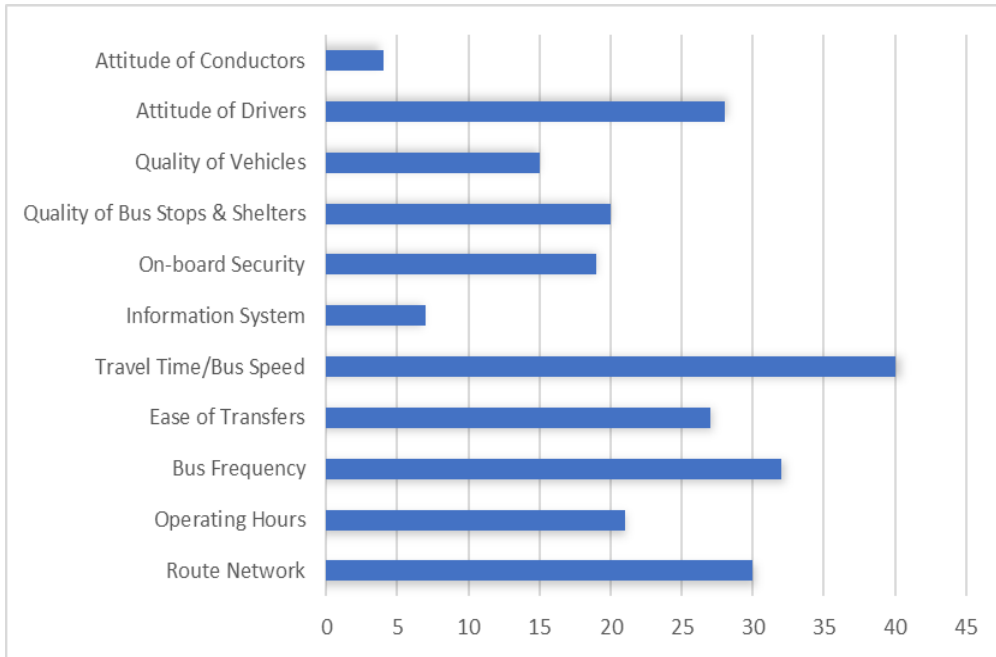
34. What kind of tools do you often use to get the bus information (maximum 3 options)	
Websites	29
Smart-phone app	22
Facebook	39
Television	29
Newspaper	5
Others	12



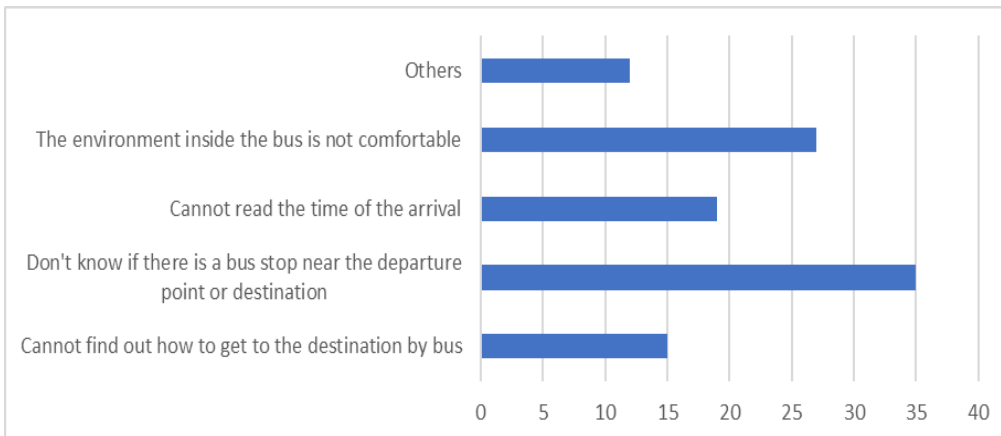
35. Please rate the following aspects of bus services in general.

	Route Network	Operating Hours	Bus Frequency	Ease of Transfers	Travel Time/Bus Speed	Information System	On-board Security	Quality of Bus Stops & Shelters	Quality of Vehicles	Attitude of Drivers	Attitude of Conductors
Very bad	6	2	4	9	9	8	13	14	5	5	3
Bad	9	9	17	18	22	21	23	23	16	8	8
Neutral	38	32	36	35	25	32	30	26	40	41	45
Good	17	24	15	7	14	9	5	7	9	17	16
Very good	3	6	1	4	3	3	2	3	3	2	1

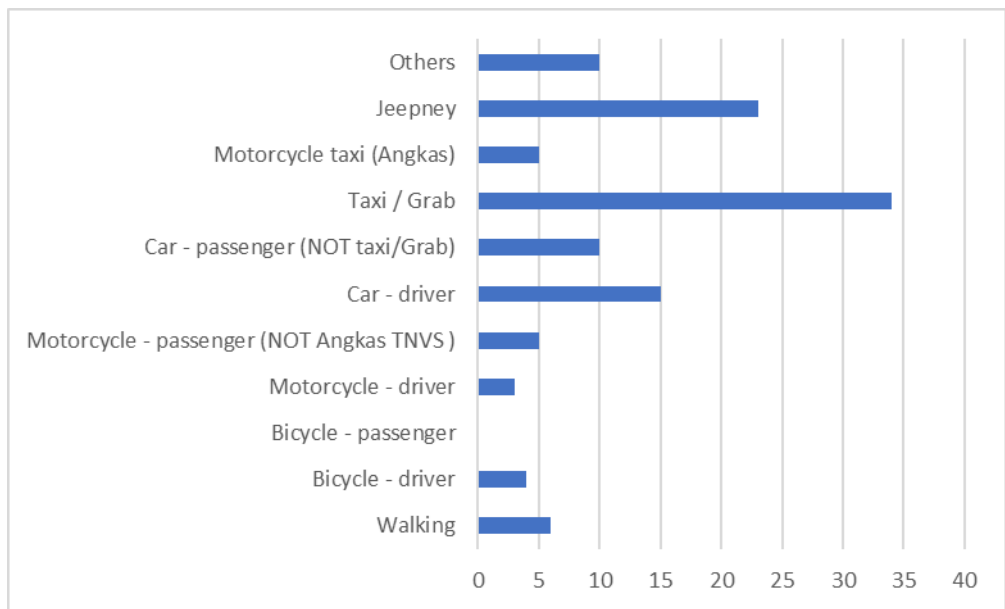
36. Among the 11 above-mentioned items, please select THREE (3) most important ones to travel by bus.	
Route Network	30
Operating Hours	21
Bus Frequency	32
Ease of Transfers	27
Travel Time/Bus Speed	40
Information System	7
On-board Security	19
Quality of Bus Stops & Shelters	20
Quality of Vehicles	15
Attitude of Drivers	28
Attitude of Conductors	4



37. Your reasons for not using the bus service.	
Cannot find out how to get to the destination by bus	15
Don't know if there is a bus stop near the departure point or destination	35
Cannot read the time of the arrival	19
The environment inside the bus is not comfortable	27
Others	12



38. What will you use if the bus is not available?	
Walking	6
Bicycle - driver	4
Bicycle - passenger	0
Motorcycle - driver	3
Motorcycle - passenger (NOT Angkas TNVS)	5
Car - driver	15
Car - passenger (NOT taxi/Grab)	10
Taxi / Grab	34
Motorcycle taxi (Angkas)	5
Jeepney	23
Others	10



Appendix 3: Proceedings of Workshop

TABLE OF CONTENTS

1. PROGRAM.....	1
2. OPENING REMARKS.....	2
3. HIGHLIGHTS OF DISCUSSIONS.....	3
4. CLOSING REMARKS.....	9
5. ATTENDANCE LIST.....	10
6. PHOTOS.....	11
7. PRESENTATION MATERIALS.....	15

1. PROGRAM

Date: 21 April 2022

Venue: Zoom (online)

Organized by JICA Study Team

Time	Activity	Speaker
13:30– 13:35	National Anthem & Invocation	Ms. Vivanne Valiente Project Development Officer II, Road Sector, DOTr
13:35–13:40	Opening Remarks	Mr. Yosuke Nishii Senior Deputy Director, Southeast Asia Division 5, JICA
13:40–14:10	Presentation of Study Results	Dr. Tetsuji Masujima Team Leader, JICA Study Team
14:10 – 14:25	Q&A	
14:25 – 14:45	Presentation: Practices of Improving Bus Services in Japan	Mr. Eijiro Otsuka Business Management Planner and Public Transport Expert, JICA Study Team
14:45 – 15:00	Q&A	
15:00 – 15:20	Closing Remarks	Atty. Jocelyn Tataro Land Transportation Franchising and Regulatory Board

Ms. Kimberly M. Afundar
Road Transport and Infrastructure, DOTr
Facilitator

2. OPENING REMARKS

“Colleagues from Department of Transportation, Land Transportation Franchising and Regulatory Board (LTFRB), and all the colleagues from related agencies and stakeholders, very good afternoon to you all and thank you very much for joining us today. It is my greatest pleasure to join today’s workshop for Data Collection Survey on Improving Road-based Public Transport System in Metro Manila and delivery keywords on behalf of JICA.

When we look back to the background of this survey, when we started, the real question that led to implementation of this survey was how we can mitigate heavy urban traffic congestions that is posing economic loss in your country. We understand that one of the keys to solving the important question and the important theme of this survey was to encouraging the modal shift from private transport to public transportation.

Our intention through this survey was to contribute to Philippine government in this regard where we try to identify needs and potential improvement measures of road-based public transport in Metro Manila, which will contribute to the modal shift that I have just mentioned.

When we look at recent significant reduction in the number of COVID-19 new cases in the Philippines, it is truly amazing. Strong recovery of various economic activities is without doubt a truly welcoming news for your country. We highly respect Philippine government’s strong leadership behind this achievement. However, it is also bringing us back to face the traffic congestions issues. It is once again reminding us of the importance and urgency of providing reliable, affordable, safe, and convenient public transport system including railway systems and road-based public transport service which are key in encouraging the modal shift from private transport to public transport and which will be essential for sustainable economic growth in the future of your country.

JICA has been joining working actively especially in the railway sector, such as MRT-3, North–South Commuter Railways, Metro Manila Subway project, among others. This is thanks to good cooperation with all our counterparts including DOTr and other related agencies. While we expect potentials of these railway projects to come in your future, we also recognize the role of road-based public transport is also becoming more and more important. It has become an essential piece for building the whole public transport network including feeder services and enhancing the connectivity throughout the network.

I hope that the output of the survey to be presented by the survey team today will enable us to understand the bottlenecks and gaps in the current road-based public transport system and assist in the Philippine government in keeping discussions in effective countermeasures and technologies so we really look forward to having a fruitful discussion today with all of you and your comments

and inputs all of them are indeed very, very crucial to us in understanding this survey undertaking the survey.

Finally, before I close, I would like to recognize and express my sincere appreciation to the DOTr and LTFRB for all their support in conducting this survey. So, thank you very much.”

Delivered by **Mr. Yosuke Nishii**, Senior Deputy Director, Southeast Asia Division 5, JICA

3. HIGHLIGHTS OF DISCUSSIONS

1) Open Discussions

Question/Comment	Response
<p>There are 400 units ready to be replaced for safe and modern high-capacity units, supposedly as planned. But with the requirements of the government banks, there have been delays that are costing more money/expenses and delay in provision for good riding service for the public. Is there a possibility to proceed immediately regardless of the requirements? Additionally, what is the status of MUCEP route rationalization considering the delays encountered in the modernization project?</p> <p>—Mr. Cheryl Fontanilla <i>San Pedro Resettlement Area</i></p>	<p>[LTFRB – Ms. Bermudez] She will return to this question.</p>
<p>To JICA: Based on the studies, how long will it take to adapt the plan? To the government agencies: Aside from Land Bank and DBP, it might be productive to invite and include other private banks into the modernization and particularly for the plans of JICA.</p> <p>—Mr. Geraldo <i>Espana Blumentrit Modernization Operators Corporation</i></p>	<p>[JST – Dr. Masujima] The roadmap is not only short-term, and the PUV system is not only road-based. There are also railway developments that will be connected to form a railway system. It will take some time to complete the proposal. But road-based transport, particularly bus and jeepney, will be improved (in parallel with railway development) in the short term. Many actions are to be complete in the short-term by 2025–2030, which is the timeframe for major proposals to be implemented.</p> <p>[LTFRB – Ms. Bermudez] The IRR for the inclusion of private banks for equities and subsidies is being drafted. They're constantly in communication with the guarantors.</p> <p>[DOTr-Road – Ms. Rivera] They have been given Php 1 billion funding (through the general appropriations act for 2022) for the provision of equity and subsidy this year, and there are also special provisions that they should engage with both public and private financing institutions. With this, the DOTr released DO 2022-005, which includes expanding the provision of equities and subsidies to other financing institutions as well as other modes of public transportation.</p>
<p>For further improvement, also consider the voice of the public transport users. The route rationalization conducted by LGU did not consult commuters. We cannot implement a proper dispatching system.</p>	<p>[DOTr-Road – Ms. Rivera] On route planning, based on the DILG-DOTr JMC, the stakeholder consultation process, and the LPTRP manual, the transport sector should have a representative in the technical</p>

Question/Comment	Response
<p>As an example, with PUVMP, most operators and drivers do not understand it. They still do not believe in the program. We should first have firm policies that will not change. We should also consult transport leaders.</p> <p>To DOTr or LTFRB: For full implementation of PUVMP, how can we involve the bank if they require the MUCEP and LPTRP? What is the guarantee that the program will push through in the next administration?</p> <p>—Mr. Leonard Bautista PAGUNOVA TSMPC</p>	<p>working group on the route planning team of the LGU. In the case of MUCEP route rationalization, a stakeholder consultation process is expected to be conducted after the route plan is somehow finalized so operators and commuters can comment before implementation. As for the policies that will be implemented on the rationalized routes and new routes, the stakeholders should also be consulted and made aware of the process. DOTr, with LTFRB and DILG, will check if the policies are implemented.</p> <p>Regarding government financing institutions that the DOTr has partnered with during the first phase of PUVMP, applications to these institutions are held off now due to the lack of LPTRP or approved MUCEP route rationalization plans. DOTr has been coordinating since the issue surfaced. They're suggesting various alternatives to ensure operations are sustained even after the implementation of LPTRP. There might be concerns about the changes that may occur; however, LTFRB is expected to release an MC on the transfer plan to be formulated as part of the route plan that will ensure that displacement of units or stoppage of operations will be minimized. Various circulars may have advised on the issue, but maybe the public and even the banks have yet to understand such policies. We will try to make them understand more by the MC that will be developed by LTFRB.</p> <p>As for the continuity of the program, the next administration will see the benefits of the program and support it and all its components. They have pending bills in the House and Senate, pushing for PUVMP and some amendments for the provision of assistance, especially on financial subsidies and livelihood training assistance. Maybe the concerned stakeholders can help lobby Congress to institutionalize the program through a Republic Act.</p> <p>[LTFRB – Ms. Bermudez] In addition to Ms. Rivera's response, LTFRB is crafting a manual that will ensure involved operators, regardless of the results of the LPTRP, will have routes to ply on. Regarding banks, they involve private banks to help the government banks that cannot accommodate operators that are still waiting for pending LPTRPs.</p>

Question/Comment	Response
<p>Appreciates knowing the proper procedure for ensuring the LPTRP but believes it is not happening. Does the LPTRP submitted by an LGU have the signature of even one transport sector representative before implementation? Is it possible to include cooperative banks in the program?</p> <p>—Mr. Leonard Bautista PAGUNOVA TSMPC</p>	<p>[LTFRB – Ms. Bermudez] Unsure of the possibility to include them with private banks but will try to give an update.</p> <p>[DOTr-Road – Ms. Rivera] The inclusion of cooperative banks and other kinds of banks might also be discussed during the formulation of IRR. They need to consult with the proper authorities on it. Regarding the signature(s) of cooperatives or representatives from the transport sector on the LPTRP, I think they are included in the EO. Some members of the transport sector are identified to be part of the route planning team. However, there are no signature-type documents attached to the plan. Maybe they can discuss with the DILG to have a certain document to certify consultations if not the signatures of the attendees.</p>
<p>Has an observation regarding the provision of the JMC 2017-001 Item 4 Section 13 wherein the LGUs must prepare LPTRP but since Metro Manila is excluded and the three adjacent provinces, is there any comment or clarification from LTFRB regarding this provision.</p> <p>—Ms. Emelita V. Danganan DILG</p>	<p>[DOTr-Road – Ms. Rivera] Her understanding is on the initial rationalization study done by LTFRB that was applied right after the lifting of ECQ. Some routes have been modified by LTFRB during ECQ prior to allowing public transport operations. We should clarify this practice is not really by the MUCEP route rationalization plan which is still being finalized with their consultant. She requested LTFRB for the considerations for this change as well as the consultations, if any.</p> <p>[LTFRB – Ms. Bermudez] The latest updates on the MUCEP route rationalization were already given to the board, so they are waiting for updates. Further details regarding the concern by the DILG representative and Ms. Rivera will be to follow.</p>
<p>Asked when the bus operator survey was conducted and who responded from the operators.</p> <p>—Mr. Mario Cartagena Jr. Mega Manila Consortium</p>	<p>[JST – Mr. Otsuka] The Study Team received a list from LTFRB, the local team contacted the bus operators, and the survey was via Google Forms. The team does not know who exactly responded.</p>
<p>Noticing that the practices are mostly on database management, can the Japanese introduce the systems or incorporate them in DOTr programs so all fleets can use them to reduce costs of the needs of the fleet system.</p> <p>—Mr. Ferdie M. Lupangosy Sandigan TSC</p>	<p>[JST – Mr. Otsuka] The systems are made for Japanese, so they need to be translated into English. After that, maybe they can be introduced to Metro Manila.</p>
<p>Where could we download or get a copy of that safety recorder?</p>	<p>[JST – Mr. Otsuka] Each office has a computer for the safety recorder where they can access the</p>

Question/Comment	Response
— Mr. Mario Cartagena Jr. <i>Mega Manila Consortium</i>	information.
What are the challenges faced by the Japanese government in implementing these systems? — Mr. Eddie Francis Rano <i>LTFRB_NPMO</i>	[JST – Mr. Otsuka] The systems must be purchased by each operator without a subsidy from the government. Bus operators could have more problems, particularly in procuring or acquiring the software.
To LTFRB: If they have a long-term plan after completing the compliancy of units, are there any plans to improve further the transport system in the country. — Mr. Erwin Balunsat <i>Itawit Ybanag Ilocano Transport Corp</i>	[DOTr-Road – Ms. Rivera] The PUVMP has 10 strategic components to achieve the potential for transforming the entire transport system. It will go beyond modernizing public transportation. We envision a fleet management system to be a requirement for all cooperatives and corporations. She thinks this is already in the MCs released by LTFRB. Another MC is expected from LTFRB that will provide guidelines and with DOTr to conduct capacity building to use this kind of system and other possible technical assistance on transitioning to this system (such as financial management and operations). There are a lot of plans that will soon be laid out. All stakeholders will be informed, or at least those nominated for the pilot that will, in turn, cascade to other operators.
Just a suggestion, for JICA to fully implement this program, the Philippines should have better network connectivity. Since it is online, the internet connection should also be improved. — Mr. Leonard Bautista <i>PAGUNOVA TSMPC</i>	

2) Comments in Chat Box

Agency/Name	Comments/Questions
Wilmalyn Falcunaya <i>eSakay</i>	How does DOTR and LTFRB plan to proceed on the suggested actions and solutions by JICA?
Mr. Mario Cartagena Jr. <i>Mega Manila Consortium</i>	Question from Mega Manila Consortium to the Implementing Agencies (DOTr, LTFRB). Bus operators now is really just surviving some routes not even because of the routes given to us, we are constantly exposed with competition with smaller modes of PUV's like UV, Jeep and MPUV, when will be the final Metro Manila Route Rationalization plan will be launched or implemented, and can we ask for the progress of the said plan, so bus operators under MMCC could

Agency/Name	Comments/Questions
	<p>plan and foresee our next steps in providing public service to passengers.</p> <p>What is the role of the PUV operators in drafting these rationalized routes?</p>
<p>Mr. Leonard Bautista <i>PAGUNOVA TSMPC</i></p>	<p>May we suggest to include CDA-REGIONAL CLUSTER ORGANIZATION in consultation process of LTFRB to ensure proper information dissemination to all transport leaders in the country?</p>
<p>Mr. Yubelle B. Dela Cruz <i>Malabon LGU</i></p>	<p>Not sure if this has been discussed earlier or even part of the topic for today, but I'd like to take this chance to suggest the development of a website or an app that could guide commuters, much like Sakay.ph but more comprehensive, and gives realistic and correct instructions as to which transport line to take to reach their destination. I think this could help the commuters and encourage them to take public transport instead. Thank you!</p>

4. CLOSING REMARKS

“Good afternoon, JICA.

Good afternoon, participants.

On behalf of our principal, the Land Transportation Franchising and Regulatory Board, I would like to thank and commend JICA for facilitating this event. This study and the presentations presented during this campaign is highly commendable because this will enable the regulatory agencies in the transport sector to improve the pending and ongoing projects and infrastructures. For the other participants, members of cooperatives and corporations that are supportive in the modernization program of the government your concerns are duly noted and rest assured they are relayed upon to our principal and to the board. That’s all for this day. Thank you very much.”

Delivered by **Atty. Jocelyn Tataro**, Land Transportation Franchising and Regulatory Board

5. ATTENDANCE LIST

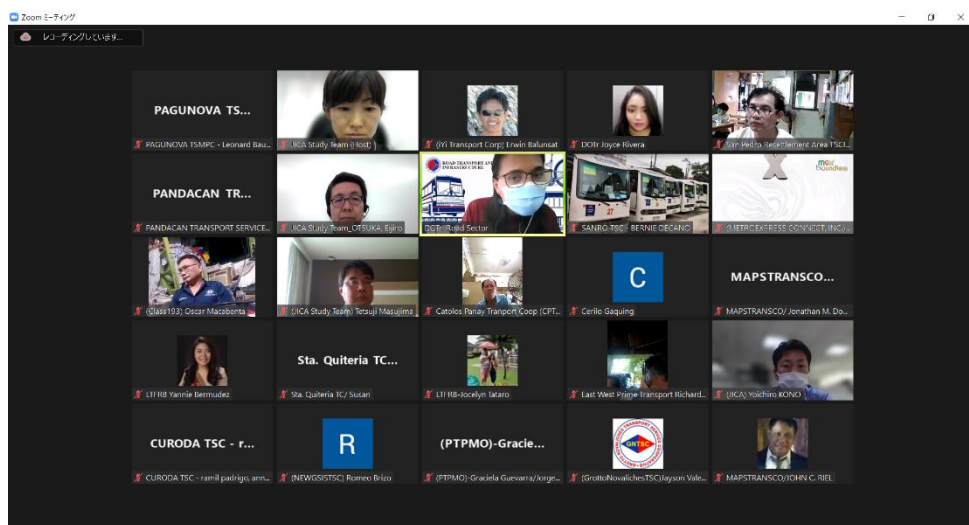
No.	Agency	Name	Agency/Office
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3		Kimberly Afundar	DOTR Road Sector
4		Ma. Lourdes T. Pagtalunan	DOTr-Road Transport Planning Division
5		Romeo Ben Manangu	DOTr/Road Transport Planning Division
6		Shaira	
7		Vianne Valiente	Department of Transportation - Road Sector
8	LTFRB	Enp Dayanara Bermudez	LTFRB
9		Jocelyn Tataro	
10		Jonie B. Fontiveros	LTFRB - PUVMP
11			PUMVP-NPMO
12		Randy C. Noora	LTFRB NCR Regional Office
13	OTC	Christian Oberio	
14	DILG	Emelita V. Danganan	Bureau of Local Government Supervision
15		Joe Vincent Ds. Dela Cruz	Bureau of Local Government Supervision
16	MMDA	Arlene Parafina	
17		Danneedee V. Bobadilla	Traffic Engineering Center
18		Francis Salazar	
19		Francisco Pesino Jr.	
20		Ryan Tacbad	
21	LGU	R. A. Sanson	Las Piñas City/ Traffic and Parking Management Office
22		Jose Gonzales	Las Piñas City/ Traffic and Parking Management Office
23		R. A. Sanson	Las Piñas City/ Traffic and Parking Management Office
24		Yubelle B. Dela Cruz	Malabon City LGU/ City Engineering Dept.
25		Alex Santos	Mandaluyong City/ Traffic and Parking Management
26		Flordeliza Alampay	Manila City/ Dept. of Engineering and Public Works
27		Francis Dervin Q. Aquino	Manila City/ Dept. of Engineering and Public Works
28		Matthew Angelo Bartolome	Marikina City
29		Danidon M. Nolasco	Muntinlupa City
30		Famela Anne Concepcion Macanas	Muntinlupa City/ Traffic Management Bureau
31		Rolan S. Letetacion	Navotas City
32		Jerson S. Austria	Paranaque City/ City Engineering Office
33		Graciela Guevarra	Pasay City/ Traffic Parking and Management Office
34		Jorge Mendiolo, Jr	Pasay City/ Traffic Parking and Management Office

No.	Agency	Name	Agency/Office
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37			Bacoor Transport
38		Marianne Daylo	Bagong Silangan Transport Service Cooperative
39		Chris	Basicano Transport Service and Multi-purpose Cooperative
40		Melvin Dela Cruz	Basicano Transport Service and Multi-purpose Cooperative
41		Randy Aquino	C5 Transport Corporation
42		Luisito Villa	Catolos Panay Transport Cooperative
43			CERILO GAQUING TRANSPORT
44		Maria Fe Gaspe	CUBARO Transport Service Cooperative
45		Virgie Delos Santos	CUBARO Transport Service Cooperative
46		Anne Vigilla Ramil Padrigo	CURODA Transport Service Cooperative
47		Eva D. Eugenio	Daanghari Modern Jeepney Transport Cooperative
48			D Sakremento Transport Corporation
49		Geraldo	Espana Blumentrit Modernization Operators Corporation
50		Richard Vitto	East West Prime Transport
51		Angelito C. Roque	Fairthron Transport Service Cooperative
52		Karina Puapo	Fairview-New York, Lantana Transport Service Cooperative
53		Catherine S. Longbian	Greater Fairview Land Transport Service Cooperative
54		Ed Santos	Green Frog Hybrid Bus
55		Jayson Dc Valerio	Grotto Novaliches Transport Service Cooperative
56		Erwin Balunsat	Itawit Ybanag Ilocano Transport Corp
57		Ma. Victoria P. Gilbuena	Jeepney Ride Dagat Dagatan Navotas Transport Cooperative
58		Rolan S. Leteracion	JRDNT Cooperative
59		Misael Ful A. Melinas	Juan Transport Services Cooperative
60		Francisco O. Domanais	Kartujoda Transport Cooperative
61		Eugene Avila	Lagro Novaliches
62		Abraham C. Riel	Makabayan Bagong Silang Transport Corporation
63		Marlyn Ramos	Malabon Jeepney Transport Service Cooperative
64		Ricardo Galvez	Majesa Transport Service and Multi-Purpose Cooperative
65		Jonathan M. Domantay	Maps Transport Services Cooperative
66	John C. Riel	Maps Transport Services Cooperative	
67	Mario Cartagena Jr.	Mega Manila Consortium Corporation	
68	Ed Comia	Metro Comet	
69	Jacqueline A. Reyes	Metro East and West Transport Service Cooperative	
70	Almond Matinez	MetroExpress Connect Inc.	

No.	Agency	Name	Agency/Office
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72		James Trinidad	Metroval Transport Services Cooperative
73		Regina Cerdeno	MTPRATC
74		Romeo Brizo	New GSIS Transport Service Cooperative
75		Honesto B. Reponia	Novaliches Malinta JTSC
76		Jose P. Brondial	Novaliches Malinta JTSC
77		Laurence Bahia	ON US Solutions Inc
78		Leo Gonzales	ON US Solutions Inc
79		Leonardo Silvero Bautista	Pagunova Transport and Multi-Purpose Cooperative
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81		Darwin Mora	Pasig Green City Transport Cooperative
82		Erick Quilana Domasig	Phase9 Package 3 BLK 32 Lot 45 Bagong Silang Caloocan City
83		Jaime P. Eborra	Project 4 Cubao Transport Cooperative
84		Ronnie D. Gonzales	Responsible Operators and Drivers Transport Service Cooperative
85		Floro C. Duller	San Andres Transport Service Cooperative
86		Ferdie M. Lupangosy	Sandigan Transport Service Cooperative
87		Robert C. Ochoa	San Dionisio Transport Service Cooperative
88		Bernie Decano	San Juan Rosario Transport Service Cooperative
89		Cheryl Fontanilla	San Pedro Resettlement Area TSCI
90		Jeick Cruz	SETSCO
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92		Noly Razote	Spark Transport
93			Speed Wheelers Transport Corporation
94		Ronald Salvacion	The New Sta. Quiteria Trasnport Cooperative
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97		Ma. Victoria F. Egera	Victorious Legacy Transport Corporation
98		Marlotte Fe V. Corcuera	Zamora Operators and Drivers Co.
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101		Jerome Ballarta	UP NCTS
102		Glenn Simon Latonero	UP NCTS
103		Sahid Kamid	UP NCTS
104	ADB	Yidan Luo	ADB
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108	JICA	Yosuke Nishii	Senior Deputy Director, SE Asia Division 5
109		Keisuke Yamagami	Assistant Director, SE Asia Division 5
110		James Kazumori Watson	Country Officer, SE Asia Division 5
111		Miu Nakazono	Assistant Director, IM Division Transportation group
112		Yoichiro Kono	Project Formulation Advisor, JICA Philippines
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114		Carla Bautista	Program Officer, JICA Philippines
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117	Eijiro OTSUKA		Business Management Planner of Public Transport
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119	Hanna Pablo		Project Coordinator/Research

6. PHOTOS



7. PRESENTATION MATERIALS



Data Collection Survey on Improving Road-based Public Transport System in Metro Manila, Republic of the Philippines

Final Workshop
21 April 2022
JICA Study Team

Contents

1. Introduction
2. Current Situation and Issues on **Road-based Public Transport System** in Metro Manila
3. Current Situation and Issues of Road-based Public Transport **related Agencies**
4. Current Situation and Issues of **Bus Operators**
5. Current Situation and Issues on **Intermodal Transfer Facilities**
6. Identification of **Needs for ICT** Implementation in Public Transportation and Its Applicability
7. **Proposal on Possible Solutions** for Road-based Public Transport

2



1. Introduction

- **Background**
Concentration of Urban Migration + Insufficient Infrastructure

= **Economic losses due to heavy traffic congestions**



The government aims to encourage the **modal shift** from private transport to **public transport** by various pull-/push-measures.

As one of key pull-measures for modal shift, improvement of the following road-based public transport services is as essential as urban railway development.

- | | |
|---------------------|---------------------------------|
| (i) accessibility | (iv) adequacy |
| (ii) availability | (v) convenience and reliability |
| (iii) affordability | |

3



- **Objectives**

To identify needs and propose improvement measures for the road-based public transport in Metro Manila.

- **Surveys Conducted**

1. **Bus Operator Survey** (by questionnaire): Aimed to collect information for better understanding of the situation of bus companies.
2. **Bus Operator Interview** (online): For any follow-up questions after the Bus Operator Survey.
3. **Bus User Survey** (by questionnaire): Aimed to collect information to understand the situation of bus users and their assessment of the current bus services.
4. **Intermodal Transfer Facility Survey** (site visit): Aimed to determine the situation of intermodal transfer facilities around the LRT or MRT stations.

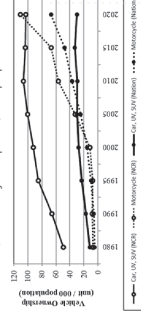
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2. Current Situation and Issues on Road-based Public Transport System in Metro Manila

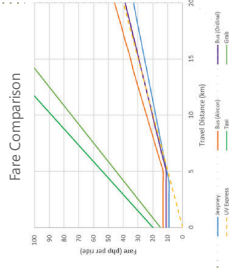
Socio-economic Characteristics

- Population growth & suburbanization have progressed
- The **ownership ratio of motorcycles is higher than cars** today.
- The traffic volume at some survey stations declined in 2020 compared to previous years, partly due to the COVID-19 pandemic.

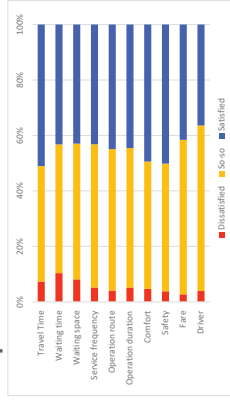


Existing Road-based Public Transport Systems

- Existing Modes
 - Bus
 - Jeepney
 - FX, AUU/UV Express
 - Tricycle
 - Taxis
 - Ride Hailing Service
- DOT secured **PHP15.97 billion budget for various road transport sector projects nationwide in 2022.**



People's Evaluation on Road-based Public Transport



Reason to Use Private Cars

- They can go anywhere. (84.1%)
- They can go many places at a time. (83.1%)
- They like riding a car. (69.7%)
- Commuting by car is safe and secure. (68.9%)
- Riding a car makes me refreshed. (68.2%)



Convenience & safety are important for modal choices of private car users.



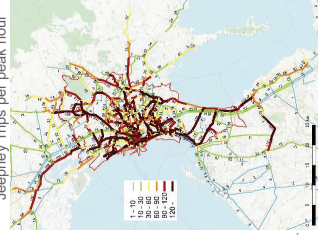
Characteristics of the Demand Forecasting Database in Metro Manila

- MUCEP2 Study is reviewed (but as of February 2022, survey results have not been received)
- Transit lines with operation speed, frequency and fare structure could be utilized for route planning.

- Example of the Utilization:** For a section with high frequency that may cause serious traffic congestion at or around the stops:
- creation of dedicated boarding and alighting spaces with regulations;
 - reduction of the number of trips; and
 - improving capacity (substitute into high-capacity vehicle, introduce priority lane, PTPS, BRT).

The database must be verified or calibrated through actual data.

Jeepney Trips per peak hour





■ Issues on Road-based Public Transport System in Metro Manila

- **Safety:** Not only a matter for the operator. Passenger behavior can also cause accidents.
- **Security:** Pickpocketing and robbery are reported. CCTV is being introduced.
- **Convenience:** Much room for improvement in terms of service frequency, punctuality, congestion at stops/on-board, fare system, and transfer environment.
- **Comfortability:** Waiting and on-board environment are required to be improved.
- **Planning Public Road Transport:** Issues related to planning public road transport
 - Lack of database to formulate the road-based public transport plans,
 - Lack of updates for person-trip survey data,
 - Lack of methodology to consider post-COVID-19 situation,
 - Absence of office units and/or human resources to formulate the route plan in LGUs.

9

3. Current Situation and Issues of Road-based Public Transport related Agencies

■ PUV-related Agencies

1. Planning and Project Development Office (PPDO), DOTr
2. Road Transport and Infrastructure Office (RTI), DOTr
3. Land Transportation Franchising and Regulatory Board (LTFRB)
4. Land Transport Office (LTO)
5. Office of Transportation Cooperative (OTC)
6. DPWH
7. MMDA
8. LGUs

■ Tasks of Central Government Agencies

Task/Role	RTI	PPDO	LTFRB	LTO	OTC	DPWH	MMDA
1. Planning/Design of related facilities	Yes	Yes	Yes	No	No	Yes	Yes
2. Operation	No*	No	No	No	No	No	No
3. Management	No*	No	Yes	No	No	No	No
4. Regulation	No*	Yes	Yes	Yes	No	No	Yes
5. Monitoring and evaluation	No*	Yes	Yes	No	Yes	No	Yes

*through related agencies

11

■ Current Situation of LGUs

- No specialized office for transport planning in LGUs, except Pasig City.
- The City Planning Office and Traffic Management Office handle PUV-related matters.

■ Results of Self-Capacity Assessment

In general, the assessment of the agencies are:

- a. the number of staff is insufficient for their duties,
- b. the staff's know-how is not adequate, and
- c. they need more training opportunities.



Training programs in key aspects of public transportation are necessary. Transport planning office needs to be established in LGUs.

12



4. Current Situation and Issues of Bus Operators

■ Current Situation of Bus Operators

- 1. Income and Expenditure:** Income and expenditure in FY2020 was less than FY2019 due to COVID-19.
- 2. Operation Planning:** DOT/LTFRB formulate the operation plan, but bus operators can request to open new routes. Bus operators monitor No. of passengers using fare revenue and ticket sold.
- 3. Operation Management:** **GPS and surveillance cameras are not always used in operation planning and daily operation management. Ability to create data-based aggregates and statistics** is lacking. Regarding education and training for bus drivers, training programs, especially **hands-on training programs for safe driving** are lacking.
- 4. Fare Revenue Management:** Cashless payment is not introduced for all buses. There is a discount for vulnerable transport users (20% discount).
- 5. Information for Passengers:** Information through operator's website is rarely provided. **Information at bus stops and on buses is scarce**, making it inconvenient for non-daily users.



15



■ Current Status of Bus Operators

□ Basic Information

Basic information on bus operators were requested, but not shared by LTFRB during the Study.

Items	Unit	At present (during COVID-19)	Before COVID-19
Number of operators	operator	208	222
Number of routes	route	35	161
Number of bus vehicles	vehicle	4,581	5,678
Average speed	km/h	11	18
Average length of route	km	22.64	36.7

Source: Several web-sites

□ Conducted Bus Operator Survey

- Questionnaire response: 10 out of 76 listed by LTFRB
- Interviewed : 1 out of 10 questionnaire responded
- Summary of Results
 - a) Responders: medium- to relatively large-sized bus operators.
 - b) Have similar trends in the responses, operation management, operation plans, and the problems/issues.

14

6. Services for Bus Users: Lack of transfer discount system between various transportation modes causes a financial burden on users.

7. Bus Vehicles and Vehicle Maintenance: Frequency of vehicle replacement is 10-15 years. Vehicle maintenance is performed on a regular basis, and **some operators wish to systemize its records.**

8. Working Conditions for Driver and Conductor: Bus operators are facing the shortage of bus driver. Many operators have a **strong tendency to rely on overtime work, and long working hours are the norm.**

9. Others: Regarding gender, about half of the bus operators are hiring female drivers and person with disabled.

Requests to the government agencies include **changing bus routes due to road congestion** and improve connections between buses and MRT.

As for future outlook, the operators responded that **measures to improve user convenience are needed** (introducing new bus vehicles, introducing bus exclusive lanes and widening online payment options).



16



■ Current Issues of Bus Operators

1. Lack of Monitoring

- Introducing and utilizing drive recorders including GPS and surveillance camera
 - To improve bus route and to reflect in operation planning
 - To improve awareness of safe driving
 - To educate drivers for preventing accidents and for safe driving.
- Utilizing the data, improve the capacity of route and operation planning for relevant agencies and bus operators by transferring knowledge from developed countries.

Cooperating with PUV Modernization Program



- 2. Lack of Operation Management System**
 - Systematization of tasks that are managed on a paper basis according to operation management should improve the efficiency and facilitate information sharing.

3. Poor Employee Education and Training System

- Introducing practical training, which is being implemented by bus operators in developed countries, will allow the drivers to acquire the skills as a "professional".
- By enhancing education, not only contribute to safe driving but also to recruit new drivers and eliminate the shortage of drivers.



17



■ 4. Lack of Sales Measures

- As there are various modes of public transportation in Metro Manila, it needs to work toward a seamless fare structure including transfer discounts.
- Consider introducing payment systems that are mainstream in developed countries, and also MaaS apps.

■ 5. Poor Information Dissemination

- By utilizing GPS and Google Maps/Waze, enhance the dissemination of bus-related information, such as providing estimated arrival times, to promote the use of buses.
- As information dissemination inside the bus and at bus stop is described in PUV Modernization Program, consideration may be given to implementation in developed countries.

Public Transport Information Management Center



■ 6. Necessity of the Service Contracting Program

- Most of the operators is favored with the introduction of a fixed salary for drivers.
- Establishing the system by the program is expected break away from long working hours.
- Reviewing the experiences in other countries for strengthening the institutional system and restructuring operators, working environment of drivers/conductors would be improved.

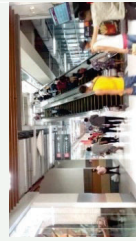
18



5. Current Situation and Issues on Intermodal Transfer Facilities


■ Existing Intermodal Transfer Facilities

Provincial Bus Terminal	P2P Bus Stop	Bus Stop
<ul style="list-style-type: none"> Well-equipped with facilities (e.g., comfort rooms, parking lots, internet connection, CCTV, information counters, benches) PITX is integrated with office buildings. PITX and TCITX are close to future railway stations. 	<ul style="list-style-type: none"> Equipped with shelters 11 out of 46 LRT/MRT stations have P2P bus stops nearby. 	<ul style="list-style-type: none"> Some bus stops, including EDSA Carousel stops, are equipped with shelters and benches. Some are lay-by types while others are roadside.



20



Loading/Unloading Bay	Tricycle Terminal	Sidewalk
<ul style="list-style-type: none"> No facility provided About 100–1,000 m away from the station 	<ul style="list-style-type: none"> Located along main roads within barangays in general. Some have shelter. 	<ul style="list-style-type: none"> Has an average width of 1.2 m Situation varies per area, but CBD area has better walkability. Disability infrastructure and amenities need to be provided. Obstacles should be removed. 

21



Related Laws, Regulations, and Guidelines

	PUV Facilities	Sidewalks
IRR of the National Building Code	<ul style="list-style-type: none"> Loading/Unloading space at stations Size of parking slot 	<ul style="list-style-type: none"> Specification of sidewalks
Department Order No. 58 (DPWH)	<ul style="list-style-type: none"> Dimensions of loading/unloading bays General Guidelines 	<ul style="list-style-type: none"> sidewalk width near turnout
DPWH Road Safety Design Manual Part I		
IRR of BP344-Accessibility Law		<ul style="list-style-type: none"> Specification of sidewalks
MC 2017-030 Guidelines for Off-Street Terminal	<ul style="list-style-type: none"> Requirements for off-street terminal 	
Local Public Transport Route Manual Vol. 1	<ul style="list-style-type: none"> Location Requirement for Terminal 	



Many facilities are not complied with the regulations.
Specifications are not set by the needs/traffic volumes.

22



COVID-19 Measures by Public Transport

- "no vax no ride" scheme started on 17 January 2022.
- Commuters have to show certification, and those not fully vaccinated are prohibited from riding public transport.
- But the verification of the vaccination certification are not really conducted at local transport.



Verification of the Vaccination Certification at Entrance of PITX



IC-Card Charge Station
(Cashless payment is promoted)



Advertisement of Ride-Hailing Application: required to use an own helmet during the pandemic.



23



Issues on Intermodal Transfer Facilities

- Lack of facilities especially walkable sidewalk.
- Lack safety and security (incl. barrier free).
- Lack of clear development direction.
- Insufficient data.
- Insufficient standards.
- No considerations on integrating railway and PUV services.
- No scheme to involve private sectors.
- No enforcement of regulations (planning, PUV operators, PUV users).

24



6. Identification of Needs for ICT Implementation in Public Transportation and Its Applicability

Situation and Issues for Bus Users and Bus Operators



- Internet usage trends and mobile device proliferation
 - Bus connections are necessary to get around
 - Lack of information on buses
- GAP
- Service fragmentation by mode of transportation and operators
 - Few publicly available information
 - Lack of industry standards
 - Failure to utilize digital technology



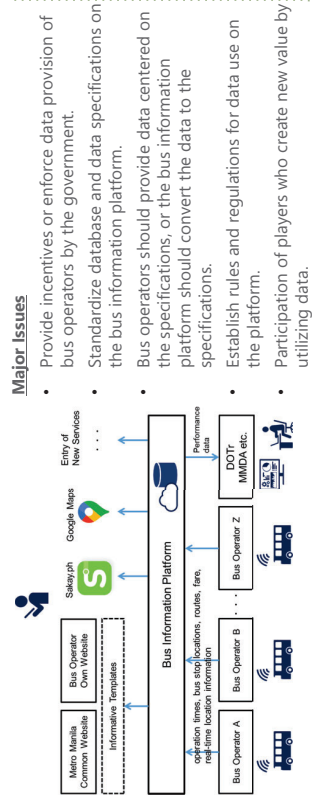
Software needs to be improved and enhanced.

26



Development of Bus Information Platform

Internet-based information dissemination and service improvement measures

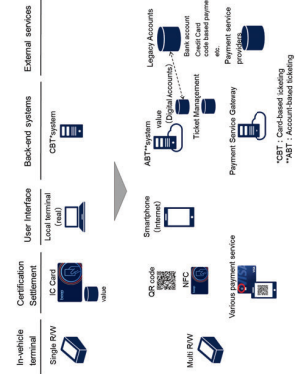


27



Enhancement of Electronic Payment System Functions and Services

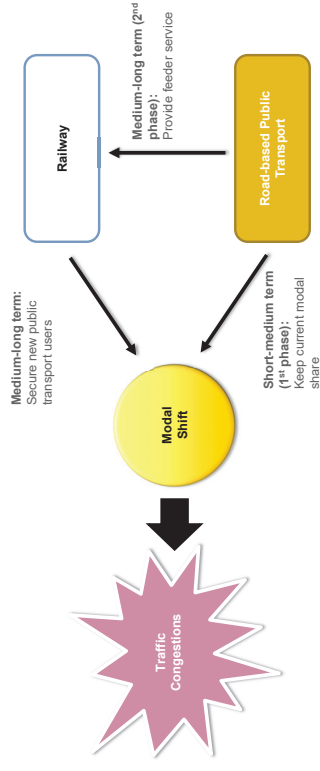
Joint use of ABT and open-loop system



28

7. Proposal on Possible Solutions for Road-based Public Transport

Role of Road-based Public Transport



Concept Plans to solve the Issues

The following objectives are tentatively set with **providing a better traveling environment with public transport** as the goal:

- 1) To **increase the accessibility** to road-based public transport;
- 2) To **assure the safety and security** of road-based public transport passengers;
- 3) To **add better amenities** to road-based public transport services; and,
- 4) To **strengthen the capacity** of road-based public transport-related agencies.

Both the **government agencies** and **PUV operators** need to play their roles to fulfill the above objectives.

The proposed strategies / roadmaps for each objective are as follows.

31

1) Increase the Accessibility to Road-based Public Transport

Strategy	Action	Implementing Body	Schedule
Introduce universal design to realize inclusive public transport	1. Formulate an inclusive public transport plan.	DOT	-25
	2. Remove barriers from main access roads and sidewalks.	DOT/DPWH/ MMDA/LGU	-25 -30
	3. Design and provide barrier-free intermodal transfer facilities.	DOT/MMDA/ LGUs/Operator	
	4. Introduce more low-floor fleets.	DOT/Operator	
Provide more information on road-based public transport	1. Disseminate the PUV basic information (route, fare, operation schedule, estimated travel time, etc.) on the DOT website.	DOT	
	2. Establish PUV information platform.	DOT	
	3. Improve the website/SNS of operators.	Operator	
	4. Introduce information provision system on PUVs.	Operator	
Provide more reliable, frequent and fast services	1. Introduce an information provision system at the loading/unloading sites.	DOT/Operator	
	2. Establish the periodic PUV route rationalization system.	DOT	
	3. Introduce PUV operation and management system.	DOT/Operator	
	4. Introduce public transport priority system (PTPS).	DOT/MMDA	
Integrate with other travel modes including railways	1. Integrate the ticketing system among public transport including railway (incl. transfer discount system).	DOT/Operator	
	2. Introduce the ticketing system collaborating with share cycling.	DOT/LGU/Operator	
	3. Provide the transfer facilities among the travel modes.	DOT/MMDA/ LGU/Operator	
	4. Introduce MaaS.	DOT	

32

2) Assuring the Safety and Security of Road-based Public Transport Passengers

Strategy	Action	Implementing Body	Schedule
			-25 -25-30 -30-
Strengthen traffic safety education for PUV operators, drivers, conductors and passengers	<ol style="list-style-type: none"> Upgrade the proper traffic accident database of road-based public transport. Improve the Driver's Academy of LTO to include the practical classes conduct upgraded programs. Establish and conduct the PUV driver aptitude test. Conduct the traffic safety education by the PUV operators periodically. Improve the traffic safety monitoring system of each operator. Conduct the information and education campaign for PUV users. 	DOTr DOTr DOTr/Operator Operator Operator DOTr	
Improve PUV maintenance system	<ol style="list-style-type: none"> Continue PUV fleet renewal programs. Introduce computerized PUV maintenance system. 	DOTr/Operator Operator	
Improve safety of the road and pedestrian infrastructures along PUV routes	<ol style="list-style-type: none"> Prepare the road inventory along PUV routes. Improve/Widen the roads/sidewalks along PUV routes. Provide loading/unloading facilities. 	DOTr/MMDA/ LGUs DOTr/DPWH MMDA/LGUs DOTr/DPWH MMDA/LGUs	

33



Strategy	Action	Implementing Body	Schedule
			-25 -25-30 -30-
Strengthen the surveillance system at waiting areas of PUVs and inside PUVs	<ol style="list-style-type: none"> Establish the crime database related to road-based public transport. Study the necessity of security cameras at waiting areas of PUVs. Mandate the installation and monitoring of CCTV on PUVs. Monitor the waiting area and on-board situation via CCTVs. 	DOTr/PNP DOTr DOTr/ Operator DOTr/ Operator DOTr Operator	
Improve the waiting area of PUVs and inside PUVs	<ol style="list-style-type: none"> Increase the visibility of the waiting area of PUVs. Improve the visibility/inside PUVs. 	Operator	
Enhance awareness of PUV users on crimes related to the PUV system	<ol style="list-style-type: none"> Conduct an information and education campaign for PUV users. 	Operator	

34

3) Adding Better Amenities to Road-based Public Transport Services

Strategy	Action	Implementing Body	Schedule
			-25 -25-30 -30-
Provide better waiting environment and facilities	<ol style="list-style-type: none"> Provide Wi-Fi at loading/unloading spots. Introduce commercial facilities at loading/unloading spots such as vending machines, delivery box, etc. Introduce smart bus stops 	DOTr DOT DOTr/Operator Operator	
Improve on-board environment and facilities	<ol style="list-style-type: none"> Provide Wi-Fi and an electric outlet on PUVs. Mandate air conditioners provisions. 	DOTr/Operator DOTr/Operator	
Conduct other promotion activities	<ol style="list-style-type: none"> Study the possibility to provide shopping/tourist site discount tickets combined with PUV tickets. Conduct the PR activities to emphasize the benefits of public transport services considering the local and global issues such as climate change, etc. Introduce the one-day pass for tourists/visitors. 	DOTr/Operator DOTr/Operator	

35



4) Strengthening Capacity of Road-based Public Transport related Agencies

Strategy	Action	Implementing Body	Schedule
			-25 -25-30 -30-
Increase the planning and implementation capacity of relevant agencies	<ol style="list-style-type: none"> Conduct the capacity enhancement program for DOTr/LTFRB. Establish the transport planning unit in LGUs. Establish the periodical review system of road-based public transport plans/projects. 	DOTr/LTFRB DOTr/LGUs DOTr/LTFRB	
Enhance the regulatory capacity on traffic enforcement	<ol style="list-style-type: none"> Conduct the capacity strengthening program for traffic enforcers. Review the relevant regulations. 	DOTr/MMDA/LG Us DOTr	
Establish the planning and management database	<ol style="list-style-type: none"> Establish the system to update traffic data including person trip data periodically. Establish the database of PUV operators utilizing ICT. 	DOTr DOTr	

36



Proposed Short-term Actions

Considering the on-going/planned projects, the following programs are proposed as short-term actions:

- 1) **Capacity Enhancement Program on Public Transport Planning and Management**
 - Strengthening **route planning and management** capacity
 - Strengthening **intermodal transfer facility** (including station plazas) **development** capacity
 - Planning and management of **database establishment**
- 2) **Capacity Enhancement Program on Improving Traffic Safety of Road-based Public Transport**
 - Improving traffic safety **education** for PUV operators
 - Strengthening the capacity of **traffic enforcement**
 - Traffic safety **campaign** for public transport users
- 3) **Verification Survey for Technology Adaptation for Road-based Public Transport Optimization**
 - ICT such as GPS, drive/safety recorder, digital tachometer, etc.
 - System such as for operation/fleet management, vehicle maintenance/management, electronic payment, bus information platform, Maas/SaaS, etc.

Salamat Po!

Any questions and comments?

Proposed Programs

Several projects/programs including the donor projects are under implementation. However, the **capacity enhancement activities of the national government, PUV infrastructure/facilities development, improvement measures for the PUV operators are still lacking**. Therefore, three programs are proposed as the result of this study.

No.	Program	Counterpart		Related Impact ^{1/}			
		Main	Minor	Safety	Security	Convenience	Comfortability
1	Capacity Enhancement Program on Public Transport Planning and Management	DOTr/LTFRB	DPWH, MMDA, LGUs	B	C	A	B
2	Capacity Enhancement Program on Improving Traffic Safety of Road-based Public Transport	DOTr/LTO	DPWH, PNP, MMDA, LGUs	A	B	C	B
3	Verification Survey for Technology Adaptation for Road-based Public Transport Optimization	DOTr/LTFRB/PUV Operator	LGUs	-	-	-	-

1/ A: High, B: Fair, C: Low
 No.3 is a survey, so that related impact cannot be determined.



Practices of Improving Bus Services in Japan

Final Workshop
21 April 2022
JICA Study Team
Eijiro OTSUKA



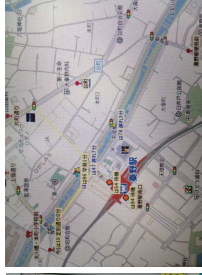
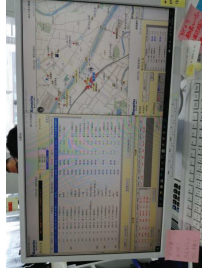
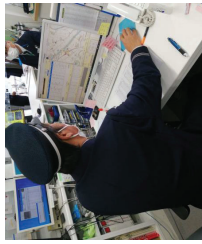
Current Issues of Bus Operators in Metro Manila

- 1. Lack of Monitoring
- 2. Lack of Operation Management System
- 3. Poor Employee Education and Training System
- 4. Lack of Sales Measures
- 5. Poor Information Dissemination
- 6. Necessity of the Service Contracting Program



1. Lack of Monitoring → Monitoring Bus Operation

Operation manager at each service office monitors the situation of operation using the Bus Location System.

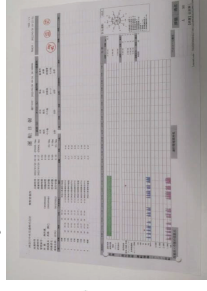
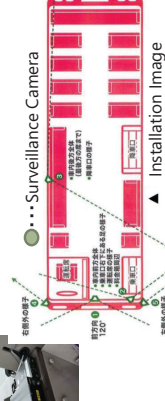


When buses are delayed, the operator provides a substitute service using a reserve vehicle and driver.



1. Lack of Monitoring → Monitoring the Operation Records

Operation managers provide safe driving education based on operation records by drive recorder (digital tachograph or safety recorder).

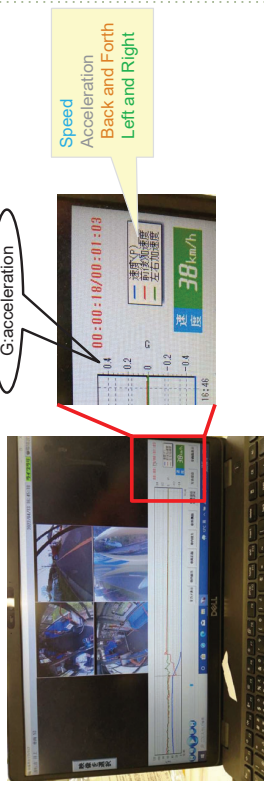


Since the drive recorder constantly records the driving behavior of drivers, it does not only record the occurrence of accidents but also the prevention of accidents.



1. Lack of Monitoring → Monitoring the Operation Records

Drive Recorder

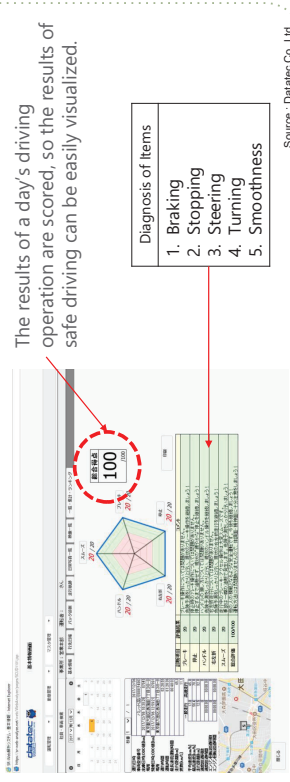


5



1. Lack of Monitoring → Monitoring the Operation Records

Safety Recorder



Source : Datalec Co., Ltd.

6



1. Lack of Monitoring → Monitoring the Attitudes of Drivers

Monitoring the driving operations and attitude in customer service by the bus operator staff and consumer monitors (users or citizens).

Examples of Monitoring Items

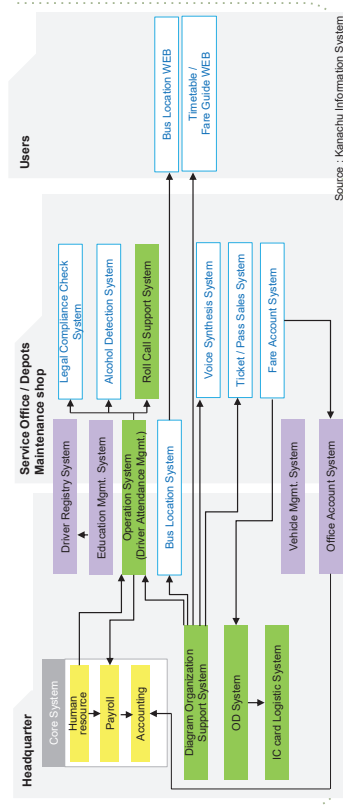
- Uniform of staff
- Safety confirmation by point and check aloud
- Hospitality (Guidance) (Words of appreciation)
- Microphone use
- Degree of cautions in hazardous areas
- Opening/Closing door method
- Speed
- Safe following distance (between bus and vehicle in front)
- Degree of safety when stopping
- Safety attention to pedestrians
- Waiting position at bus stops

Provide instruction to drivers on how to improve hospitality by boarding actual buses.

7



2. Lack of Operation Management System → System introduced in Bus Operator



Source : Kanachu Information System

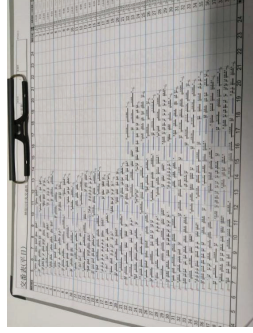
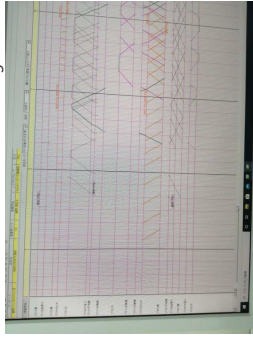
8



2. Lack of Operation Management System
→ System introduced in Bus Operator

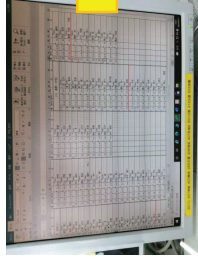
Bus operators in Japan have introduced systems necessary for bus operations and have worked to improve operational efficiency by linking them together.

Diagram and operation schedule



2. Lack of Operation Management System
→ System introduced in Bus Operator

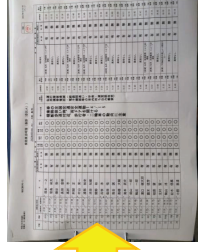
Daily operation plan



Call by operation manager



Record

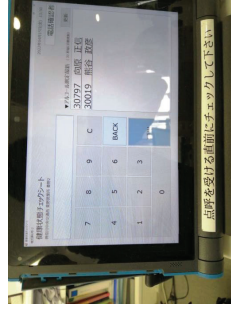


2. Lack of Operation Management System
→ System introduced in Bus Operator

Alcohol detection

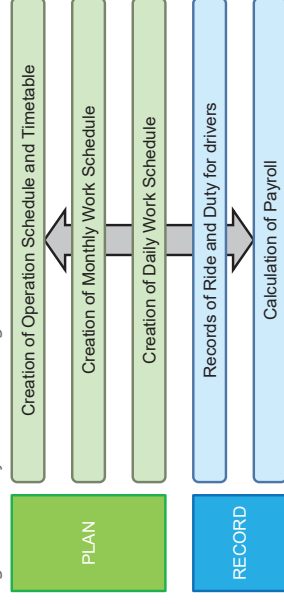


Health check



2. Lack of Operation Management System
→ Systems introduced in Bus Operations

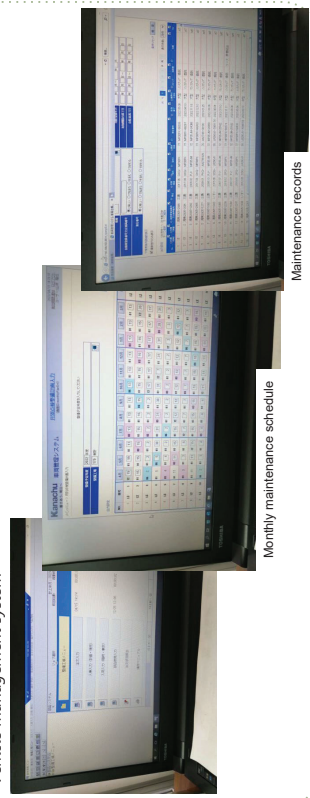
Image how the systems work together





2. Lack of Operation Management System
→ System introduced in Bus Operator

Vehicle management system



Monthly maintenance schedule

Maintenance records



2. Lack of Operation Management System
→ Creating Operation Schedule Using Data

Bus operators reflect the operational status obtained from GPS, such as delays, and OD data obtained from IC cards and fare payment records in the operation schedule and timetable once or twice a year.

Record of delay

バス番号	バス種別	バス線	バス名	バス種別	バス線	バス名	バス種別	バス線	バス名
1001	普通	1001	1001	普通	1001	1001	普通	1001	1001
1002	普通	1002	1002	普通	1002	1002	普通	1002	1002

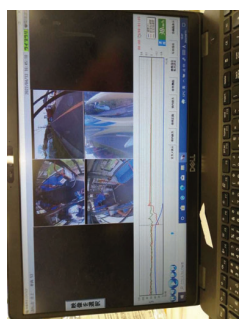
OD data

バス番号	バス種別	バス線	バス名	バス種別	バス線	バス名	バス種別	バス線	バス名
1001	普通	1001	1001	普通	1001	1001	普通	1001	1001
1002	普通	1002	1002	普通	1002	1002	普通	1002	1002



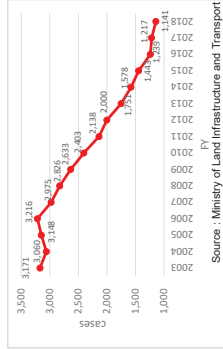
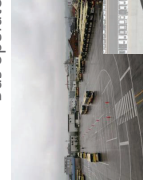
2. Lack of Operation Management System
→ System for Accident Prevention

Drive recorder (digital tachograph or safety recorder) is used to analyze the cause of the accident (road crash) as well as share this information with other bus operators or relevant organizations useful for accident prevention education in similar situations.



3. Poor Employee Education and Training System
→ Facilities for Drivers' Education and Training

Bus operators provide education and training facilities to raise safety awareness.

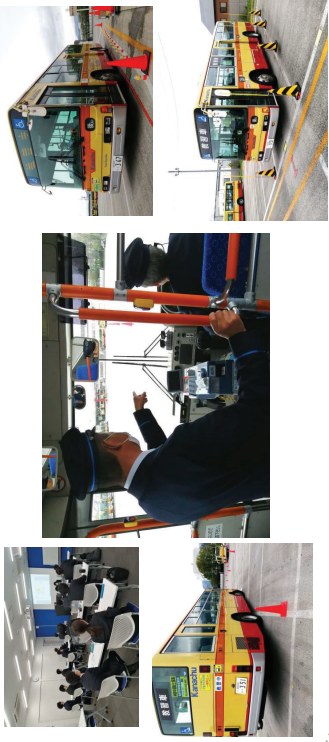


Source : Ministry of Land Infrastructure and Transport

They invest aggressively in traffic safety, and as a result, the number of traffic accidents involving transit buses has greatly reduced.



3. Poor Employee Education and Training System → Facilities for Drivers' Education and Training



17



3. Poor Employee Education and Training System → Facility for Drivers' Education and Training



Safety Driving Training Bus

18



3. Poor Employee Education and Training System → List of Drivers' Education and Training

Diverse education and training should be provided regularly for both pre-employment and post-employment.

Pre-employment	<ul style="list-style-type: none"> Education by training center Follow-up education 	<ul style="list-style-type: none"> On-the-job training on bus routes (about 3 months)
Post-employment	<ol style="list-style-type: none"> Continuous education <ul style="list-style-type: none"> Monthly education Experiential education Education by president or board members Education by outside lecturers Guidance on the streets Driver education by year Education based on aptitude test, etc. Education for drivers appointed as group leader Education for Accident Prevention Committee member Education for DWI Task Force member Education for elderly driver Education for accident induced driver Education for drivers pointed out by the audit Education for drivers given complaints Education based on health examination results 	<ul style="list-style-type: none"> Education for drivers appointed as group leader Education for Accident Prevention Committee member Education for DWI Task Force member Education for elderly driver Education for accident induced driver Education for drivers pointed out by the audit Education for drivers given complaints Education based on health examination results

Source : Kanagawa Chuo Kotsu

19



3. Poor Employee Education and Training System → Practical (On-the-job) Training

Besides classroom training, practical training is also effective.



Blind spot

Visible range

Blind spot (the area not visible from the driver's seat)

Range visible in mirror

Teaching awareness of blind spots to elementary school children is also useful.

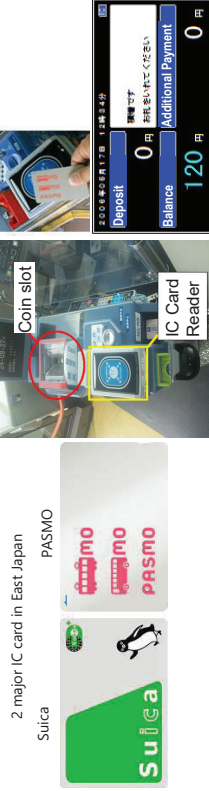
Source :
Left
http://www.kanagawa-coccolog-nifty.com/blog/2017/09/post_3341.html
Center
Right
Tokyo Traffic Safety Agency

20



4. Lack of Sales Measures → Measures implemented by Mutual Operators

In Japan, holding a single IC card allows boarding trains and buses between mutual operators.



IC card is also used to pay for goods at stores.



4. Lack of Sales Measures → Measures implemented by Bus Operators

Bus operators issue their own special tickets and discount fares.

Monthly Pass	Senior Citizen Discount Ticket	1 Day All-area Ticket	Discount Fare for Elementary School Students
<ul style="list-style-type: none"> Work, school 1/3/6 month(s) JPY100 (~PHP40) per ride for family members on weekends and holidays 	<ul style="list-style-type: none"> Age 69 or above 3/6/12 month(s) Price depends on period Additionally, JPY100 (~PHP40) per ride 	<ul style="list-style-type: none"> JPY1,050 (~PHP435) per day (for child JPY530 (~PHP220)) 	<ul style="list-style-type: none"> JPY50 (~PHP20) in cash per ride on weekends and long vacations

Source: Kanagawa Chuo Kotsu

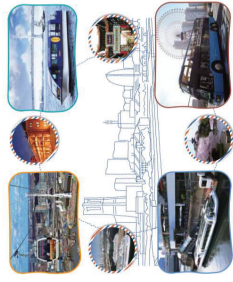
Discounts for the disabled and tickets for the elderly issued by local governments are also available.



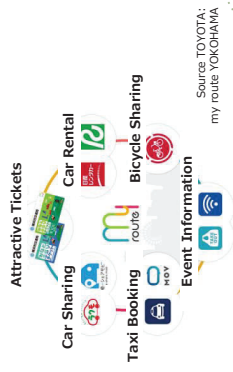
4. Lack of Sales Measures → Mobility as a Service (MaaS)

MaaS is a type of service that, through a joint digital channel, enables users to plan, book, and pay not only for multiple types of mobility services but also for commercial services, facilities, and shops.

Various Transport Means in Yokohama



Concept of MaaS in Yokohama



4. Lack of Sales Measures → MaaS Ticket by Bus Operator



- Available Hours All day (except weekday before 9AM)
- Price JPY10,000 (~PHP4,100) per month
- Feature Unlimited rides for the following month when 4 of the 40 designated facilities are used by the 25th of the current month
- Aim
 - Develop measures in cooperation with the community to revitalize the local economy and the town by creating outdoor opportunities.
 - Promote the use of public transportation by making bus travel a familiar part of the lifestyle.

4. Lack of Sales Measures → **Mobility Management**

Mobility Management, a communication-based transportation policy that encourages changes in socially and individually desirable directions (e.g., appropriate use of public transportation instead of excessive use of private vehicles), has recently been implemented.

Targets include residential areas, schools, workplaces, and specific routes.



Source : City of Yokohama



5. Poor Information Dissemination → **Using Website and SNS**

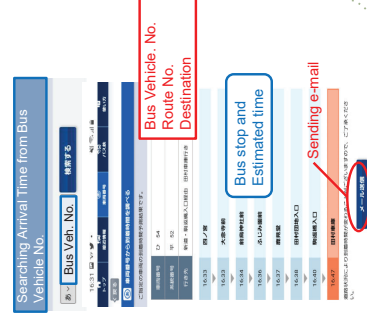
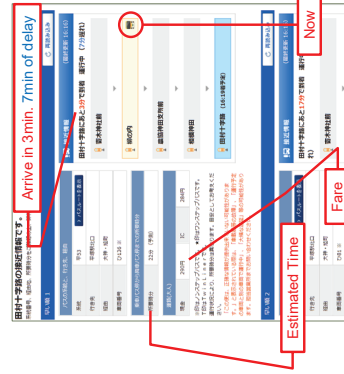
Bus operators have set up their websites to provide fixed information, such as timetables and fares, as well as real-time operation information.



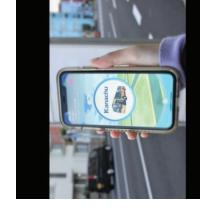
Fares, timetables, and travel times can also be searched on a map, even without knowing the name of the bus stop.



5. Poor Information Dissemination → **Using Website and SNS**



5. Poor Information Dissemination → **Using Website and SNS**



The latest information, deals, and highlights along the route are mainly posted on SNS.



5. Poor Information Dissemination

→ Using Website and SNS

Websites of some bus operators are available in multiple languages.

Source: Kinki Kyuko Bus (kinki-bus.com)

Info. on using buses

How to use buses

Route and Fare

How to get on
How to pay the fare



5. Poor Information Dissemination

→ Using Website and SNS

Information is also on the website of the bus association that unites bus operators.

In Japan, websites and mobile apps provide travel information across multiple railways and bus operators, making it easy to obtain information on travel routes from home/office to destinations.

Kanagawa Bus Information WEB

Japan Transit Planner

Source: Kanagawa Bus Association

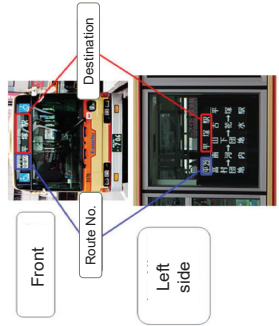
Source: Japan Transit Planner
<https://world.jorudan.co.jp/multi/en/>



5. Poor Information Dissemination

→ Information Outside the Bus

Bus route number and destination are displayed in the front, back, and side of the bus for easy identification of which bus to take.



Each bus operator has a different color scheme.



5. Poor Information Dissemination

→ Information inside the Bus

Providing easy-to-understand information for first-time bus riders and those unfamiliar with the area.

Name of bus stop & fare

Bus route map

Fare table



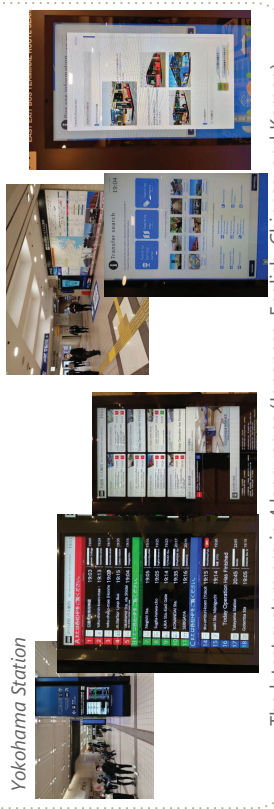
5. Poor Information Dissemination → Information at Bus Stop

- Bus stops are legally required to provide the destination, bus route number, timetable, and method of fare payment.
- Some bus stops also post real-time operation information (bus approaching information).



5. Poor Information Dissemination → Information at Bus Terminals

At terminals, such as train stations served by many bus routes and bus operators, centralized bus information is provided.

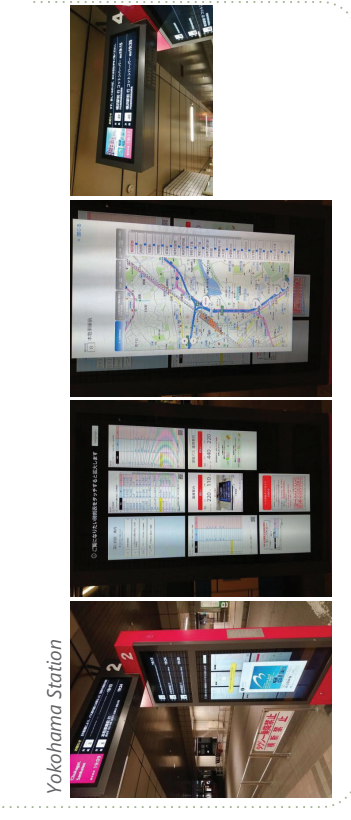


Yokohama Station

The latest system are in 4 languages (Japanese, English, Chinese, and Korean).



5. Poor Information Dissemination → Information at Bus Terminal



Yokohama Station



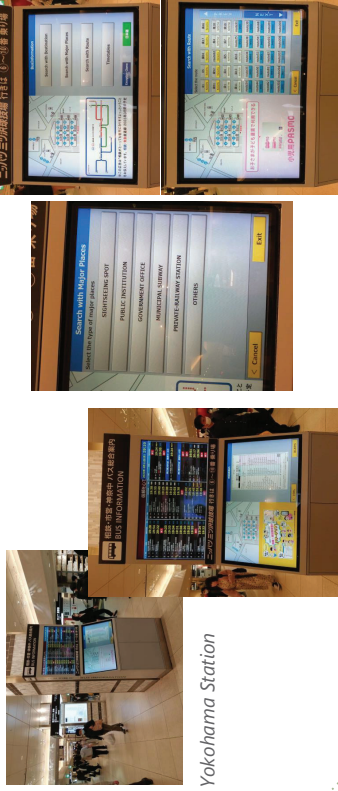
5. Poor Information Dissemination → Information at Bus Terminal



Yokohama Station



5. Poor Information Dissemination
 → **Information at Bus Terminal**



Yokohama Station



5. Poor Information Dissemination
 → **Information at Bus Terminal**

Nondigital info are still in use.

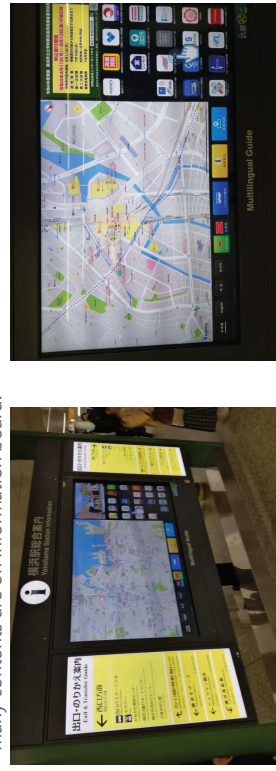


Yokohama Station



5. Poor Information Dissemination
 → **Information at Bus Terminal**

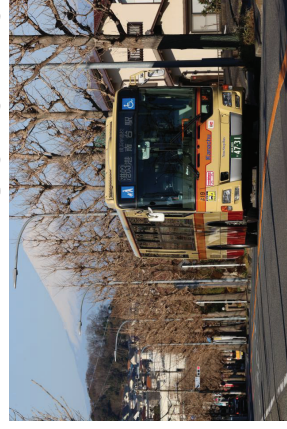
Many contents are on information board.



Yokohama Station



Salamat Po!



In cooperation with Kanagawa Chuo Kotsu