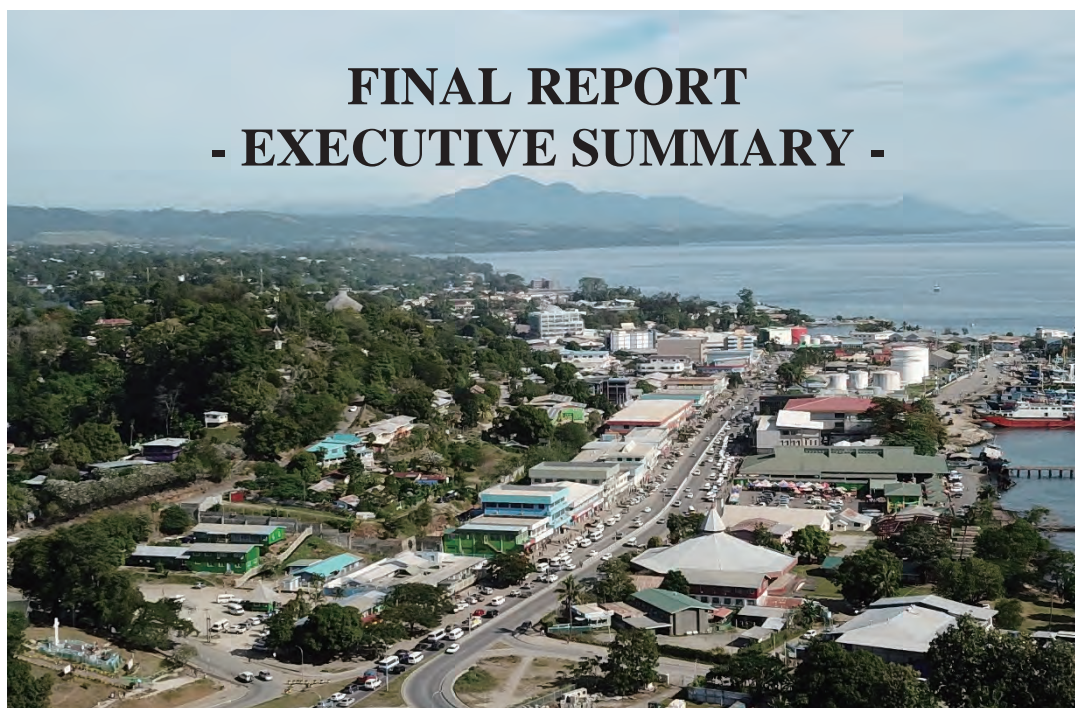


**SOLOMON ISLANDS
MINISTRY OF INFRASTRUCTURE DEVELOPMENT**



THE PROJECT FOR GREATER HONIARA TRANSPORT MASTERPLAN STUDY

FINAL REPORT - EXECUTIVE SUMMARY -



MARCH 2022

JAPAN INTERNATIONAL COOPERATION AGENCY

**KATAHIRA & ENGINEERS INTERNATIONAL
INGEROSEC CORPORATION**

FUKUYAMA CONSULTANTS CO., LTD.

ORIENTAL CONSULTANTS GLOBAL CO., LTD.

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Exchange Rate

1USD = 7.968 SBD

1SBD = 13.2544 JPY

As of October 2020, JICA Exchange Rate

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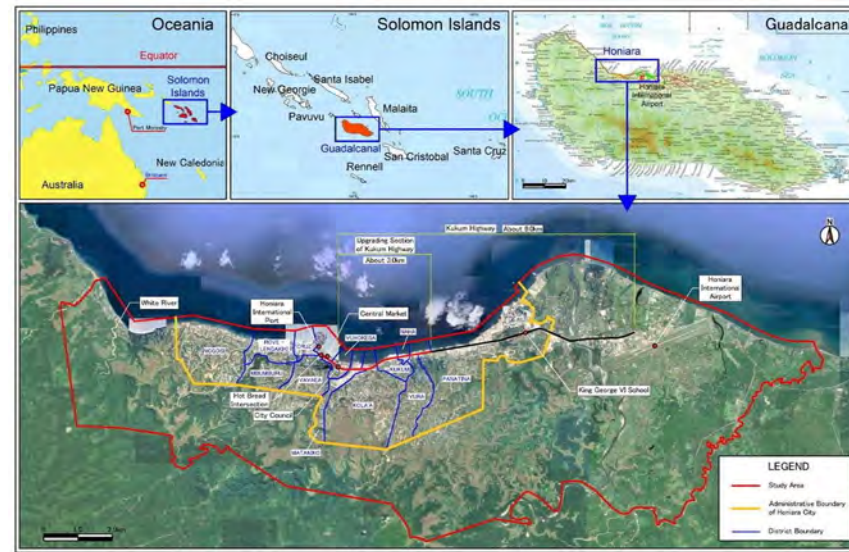
LIST OF ACRONYMS

ORGANIZATIONS

ADB	: Asian Development Bank
AUSFAT	: Ministry of Foreign Affairs and Trade, Australia
CAASI	: Civil Aviation Authority of Solomon Islands
CPIU	: Central Project Implementation Unit
ECD	: Environment and Conservation Division
GHATA	: Greater Honiara Area Transport Authority
GPPOL	: Guadalcanal Plains Palm Oil Limited
HCC	: Honiara City Council
HEC	: Hyundai Engineering Corporation
HIPTA	: Honiara Indigenous People Transport Association
IDA	: International Development Association
IMF	: International Monetary Fund
IPCC	: Intergovernmental Panel on Climate Change
IRD	: Inland Revenue Division Solomon Islands
JCC	: Joint Coordination Committee
JICA	: Japan International Cooperation Agency (Japan)
JST	: JICA Study Team
K-water	: Korea Water Resources Corporation
MAL	: Ministry of Agriculture and Livestock
MCA	: Ministry of Communication and Aviation
MECDM	: Ministry of Environment, Climate Change, Disaster Management and Meteorology
MHMS	: Ministry of Health and Medical Services
MID	: Ministry of Infrastructure Development
MLHS	: Ministry of Lands, Housing and Survey
MLIT	: Ministry of Land, Infrastructure, Transportation and Tourism (Japan)
NDC	: National Disaster Council
NDMO	: National Disaster Management Office
RSIPF	: Royal Solomon Islands Police Force
RTB	: Road Transport Board
SIACL	: Solomon Islands Airports Corporation Limited
SIG	: Solomon Islands Government
SIMA	: Solomon Islands Maritime Authority
SIMS	: Solomon Islands Meteorological Service
SIMSA	: Solomon Islands Maritime Safety Administration
SINSO	: Solomon Islands National Statistic Office
SINU	: Solomon Island National University
SIPA	: Solomon Islands Port Authority
THL	: Tina Hydropower Limited
WB	: World Bank
WMO	: World Meteorological Organization
WWF	: World Wildlife Fund

◇What is the GHTMPS?

The Greater Honiara Area (GHA) is composed of Honiara, the capital city of the Solomon Islands, and its surrounding urban areas. The number of people living in GHA in 2019 is estimated to be about 130,000. Recently in GHA, traffic congestion is getting severe and traffic jams occur at many places due to the increase of vehicles and heavy traffic concentration, and as a result, civil life and industrial activities are facing serious problems. It is therefore urgent to study and formulate a long-term transport improvement plan after investigating the traffic situation in GHA and estimating future traffic conditions.



Greater Honiara Area (GHA)

In this regard, the Greater Honiara Transport Master Plan Study (GHTMPS) is conducted with support of Japan International Cooperation Agency (JICA) to study for formulating strategic transport masterplan in GHA from January 2019 to March 2022.

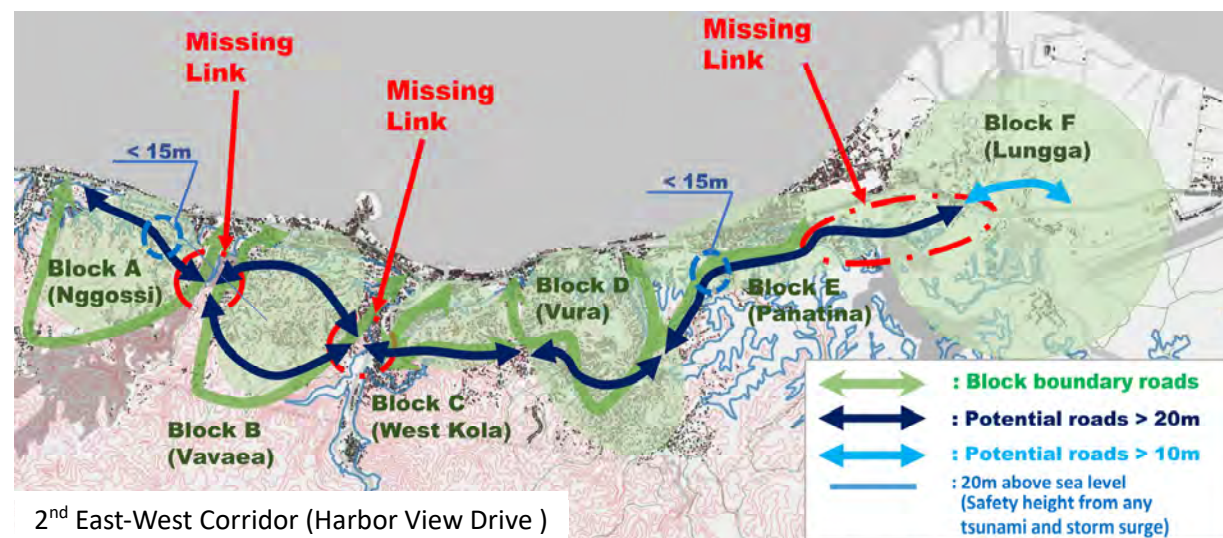
◇What are the objectives of GHTMPS?

GHTMPS aims to develop a transport master plan for the GHA, thereby contributing to the long-term development of transport infrastructure, especially roads and bridges, in the urban area and contributing to improving the convenience of citizens' life and economic activities.

◇What is the policy of the Transport Master Plan?

The vision of the Transport Master Plan is set as “Realize Organized and Optimized Road and Transport System for GHA”. Its goals are set as follows:

- Road network that supports disaster prevention and is resilient: Protection against storm surge and flooding, Alternative east-west corridor.



2nd East-West Corridor (Harbor View Drive)

- Transport that enhances social welfare: Connectivity to hospitals and clinics, Pavement and drainage improvement, Road maintenance improvement, and Car parking development.
- Attractive public transport with sustainability: Organized bus system, and Bus operation management.
- Enhance transport management; Road safety, Driver management, and Traffic demand control.

◇What are the Priority Projects?

GHTMPS proposes 20 projects for road and bridge development, transport improvement and capacity improvement. Projects are prioritized and categorized in the view of development period as short/ middle / long terms about 5-year periods from 2022 to 2036.

◇What does the GHTMPS cover?

- 1) Road
- 2) Public Transport
- 3) Transport Management
- 4) Road Safety
- 5) Flood
- 6) Other Transport
- 7) Environmental and Social Considerations

◆Conclusions and Recommendations

1) Road Network

- Complete upgrading the main road from between the Henderson Airport and Nggosi.
- Construct the 2nd East-West corridor (other than main road) as the highest priority project:
 - ✓ it will support decentralization and regional development, and
 - ✓ it will enhance disaster prevention in road network.
- Take measures to reduce traffic congestion in the central business district.
- Specify structural standards of primary, secondary and tertiary roads.
- Mark road reserve/ Right of Way (ROW) on the ground.

2) Road Maintenance

- Improve road surface conditions and safety facilities of steep road sections.
- Increase length of paved roads.
- Install road drainage facilities and reduce recurring road surface erosion.

3) Public Transport

- Enhance bus operation management.
- Reform bus networks, and revise bus fare system.
- Introduce larger buses to replace present minibuses.
- Reform bus terminals with considering bus pool for waiting passengers.

4) Road Safety

- Upgrade traffic accident report system to add detailed location information and accident causes.
- Install road safety facilities at proper locations.
- Install traffic safety measures around schools especially for kindergarten and primary schools
- Organize traffic safety campaigns.
- Introduce drivers' license system with periodic renewal reflecting penalties for traffic violations.
- Install street lights for traffic safety and public safety aspects, start from main feeder road at the hill side and following prioritized area based on scientific research.

5) Parking

- Formulate parking management policy.
- Construct new service roads that allow short time parking on selected sections.
- Encourage parking within house premises.

6) Traffic Demand Management

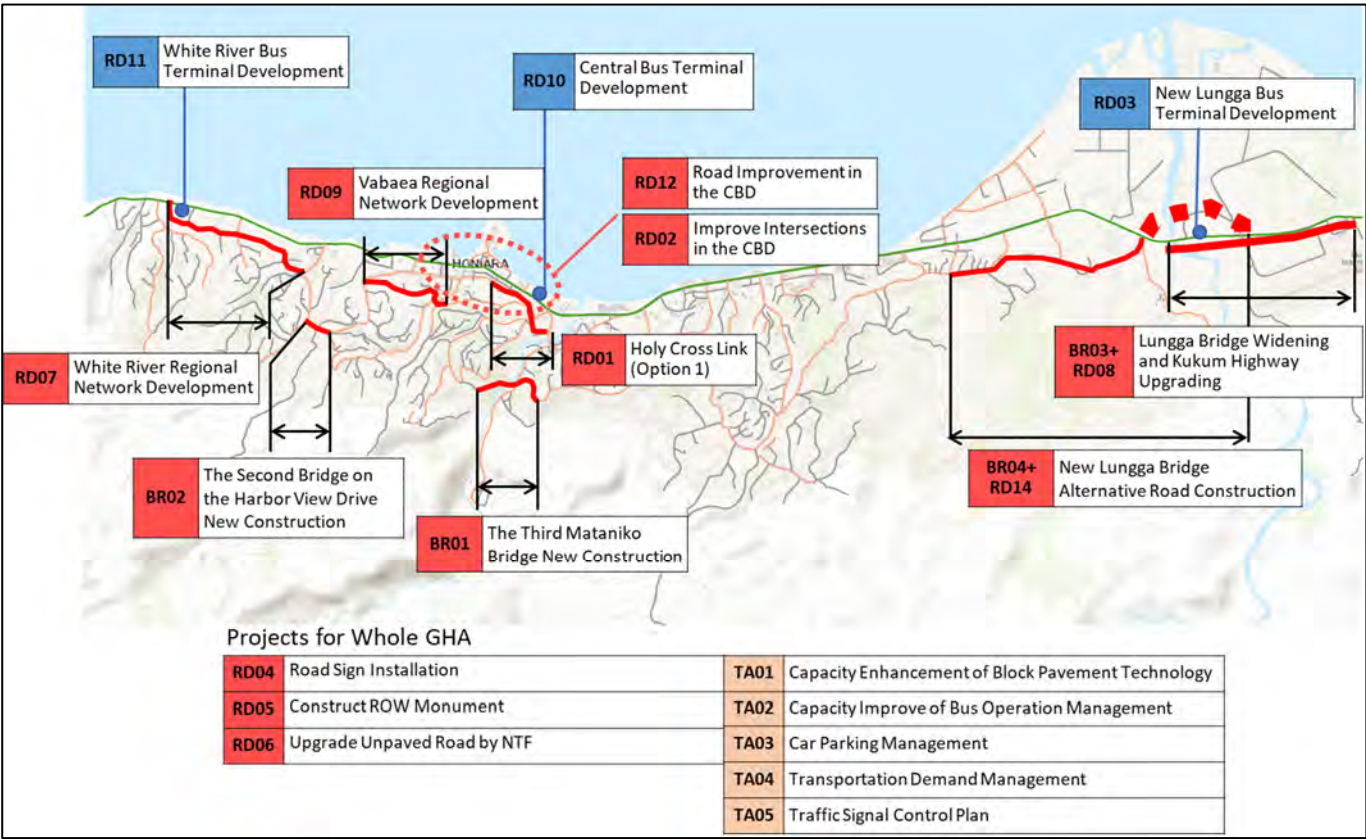
- Discourage private car use.
- Encourage public transport use.
- Promote Non-motorized Transport (NMT).
- Operate school bus service.

GHTMPS Executive Summary [General Overview]

◆Priority Projects

Code	Master Plan Project	Lead Agency	Source of Fund	Estimated Cost (Mill. SBD)	Estimated Cost (Mill. USD)	2022-2025	2026-2030	2031-2036
BR01	The Third Mataniko Bridge New Construction	MID	International	249.0	31.2		✓	
BR02	The Second Bridge on the Harbor View Drive New Construction	MID	International	233.9	29.4		✓	
BR03+RD08	Lungga Bridge Widening and Kukum Highway Upgrading	MID	International	141.1	17.7	✓		
BR04+RD14	New Lungga Bridge Alternative Road Construction	MID	International	161.5	20.3			✓
RD01	Holy Cross Link (Option 1)	MID	ADB	159.4	20.0	✓		
RD02	Improve Intersections in the CBD	MID	SIG	4.0	0.5	✓		
RD03	New Lungga Bus Terminal Development	MID/ G Province	SIG	75.4	9.5		✓	
RD04	Road Sign Installation	MID	SIG	0.8	0.1	✓		
RD05	Construct ROW Monument	MID	SIG	0.8	0.1	✓		
RD06	Upgrade Unpaved Road by NTF	MID	SIG	8.0	1.0	✓		
RD07	White River Regional Network Improvement	MID	International	135.8	17.0			✓
RD09	Vabae Regional Network Improvement	MID	International	120.7	15.1		✓	
RD10	Central Bus Terminal Development	MID/HCC	International	226.3	28.4		✓	
RD11	White River Bus Terminal Development	MID/HCC	SIG	75.4	9.5			✓
RD12	Road Improvement in the CBD	MID	International	750.7	94.2	✓		
TA01	Capacity Enhancement of Block Pavement Technology	MID	International	15.9	2.0	✓		
TA02	Capacity Improve of Bus Operation Management	RTB	International	8.0	1.0	✓		
TA03	Car Parking Management	RTB	International	8.0	1.0		✓	
TA04	Transportation Demand Management	RTB	International	8.0	1.0		✓	
TA05	Traffic Signal Control Plan	MID	International	8.0	1.0			✓

* MID: Ministry of Infrastructure Development, HCC: Honiara City Council, G province; Guadalcanal province, RTB: Road Transport Board



◆Priority Project for Road Pavement: Inter-Locking Block Pavement (TA01)

One of the priority projects as a Technical Assistance is the introduction of Inter-locking Block Pavement (ILBP), a new pavement technology that is a cheaper, easier and high-quality alternative road pavement method for secondary and tertiary roads in the Solomon Islands. ILBP entails laying out concrete blocks that interlock with each other and can be produced locally. It requires cement solidification at the edges to firmly fix blocks, which improves the resilience to rainwater erosion and durability of road pavement.

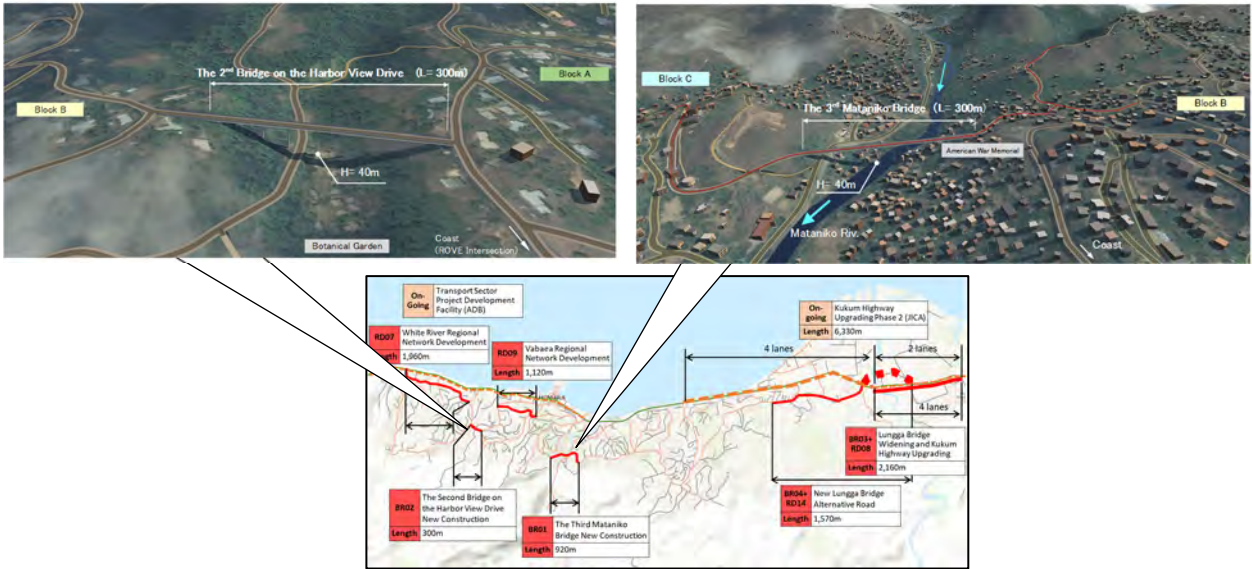
To introduce ILBP, there is a need to customize it to the local context and establish standards for secondary and tertiary roads. While there is no fabricator of ILBP in the Solomon Islands yet, there are some existing factories that produce hollow concrete blocks and other concrete products whose capacity could be developed to become fully capable of producing ILBP in the future. The feasibility of ILBP as road pavement in GHA was successfully demonstrated in a pilot project on a secondary road section between Mendana Avenue and Hibiscus Road in July to December 2020 and was met with favorable feedback from road users.



◆Priority Projects for Road Network Development: Develop 2nd East-West Corridor “Harbor View Drive”

Among proposed projects for Transport Master Plan, six (6) road network developing projects, which comprise the 2nd East-West Corridor (Harbor View Drive” are selected as priority projects.

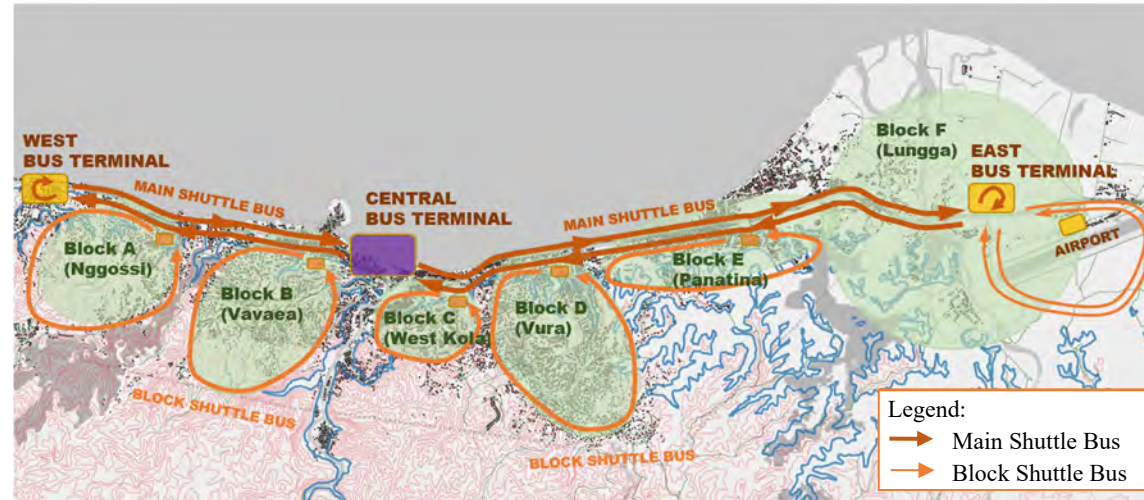
No.	Code	Project	Lead Agency	Estimated Cost (Mill. SBD)	EIRR	BCR	NPV
1	BR01	The Third Mataniko Bridge New Construction	MID	249.0	24.0%	3.33	758.5
2	BR02	The Second Bridge on the Harbor View Drive New Construction	MID	233.9	16.1%	1.97	295.6
3	RD07	White River Regional Network Improvement	MID	135.8	14.7%	1.55	100.4
4	RD09	Vabae Regional Network Improvement	MID	120.7	13.9%	1.49	76.9
5	BR03+RD08	Lungga Bridge Widening and Kukum Highway Upgrading	MID	141.1	12.9%	1.35	74.3
6	BR04+RD14	New Lungga Bridge Alternative Road Construction	MID	161.5	12.3%	1.38	68.0



GHTMPS Executive Summary [General Overview]

◆ Priority Project for Public Transport Improvement (TA02)

Another priority project focuses on the improvement of public transport through the establishment of public transport policy including setting the vision and operation scheme, forecasting bus passenger demand, expansion of the bus network and creation of bus terminals in the eastern, central and western parts of GHA, and reforming the bus fare system while balancing financial sustainability and social equity. In particular, a trunk-and-feeder bus network is proposed wherein main shuttle bus routes operate on the main road between bus terminals while block shuttle buses run as loop buses in residential blocks. Moreover, the East and West Bus Terminals are envisioned to serve provincial buses to limit their entry into the central city area and improve traffic flow.



◆ Improve intersections in the CBD (RD02)



◆ New Lungga Bus Terminal Development (RD03)



◆ Central Bus Terminal Development (RD10)



◆ Improve Road in the CBD (RD12)



◆ Car Parking Management (TA03)



CHAPTER 2 PROFILE OF GREATER HONIARA AREA

2.1 Natural Conditions

The climate in GHA is characterized by high and rather uniform temperature and relatively high humidity. Rainy season occurs from November to April, wherein the peak of monthly rainfall occurs in February to March, and the annual rainfall is mostly within the range 1,200 to 3,000 mm. The average frequency of cyclone occurrence is between one and two per year.

The terrain of the GHA can be divided into three characteristic areas. The coastal area on the west side is the central urban area of Honiara City, a flat land about 200 meters to 300 meters wide. On the other hand, the east coast area is broad floodplain with two kilometers including Honiara International Airport, which forms an alluvial plain. In addition, the southern part of the central urban area is a hilly area where the topography rises sharply by about 40 meters on land 200 meters to 300 meters from the coast, and gradually rises in the form of terraces. This hilly area is finely carved in the valley.

The Lungga River flows in the south of Honiara City from the west to the east and then turns north and flows into the Pacific Ocean, which forms the hydrological boundary of the Honiara City Area. Landslide prone areas are located in the hills and valleys on the south side of Rove-Lengakiki district in Honiara city and on the south side of Kola'a district where many informal settlers reside. Also, landslides are likely to occur on the southern bank of the Lungga River, which flows in the eastern region outside the city limits. There are no protected areas located in the GHA.

As with other countries in the Pacific, the Solomon Islands are vulnerable to climate change, which is foreseen to cause temperatures and sea levels to rise, leading to an increase in warm spells, heat waves, heavy rainfall, droughts, tropical cyclones, extreme high tides and storm surges. Increased adaptation costs are necessary to make engineering structures climate-resilient.

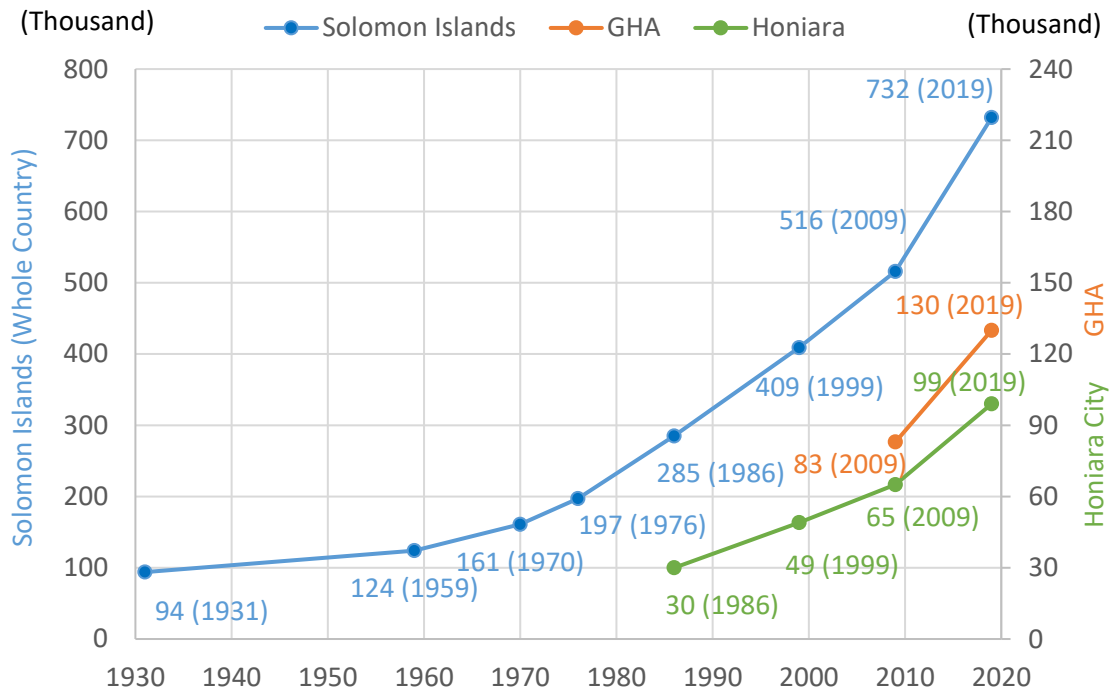
2.2 Past and Present Flood Conditions

JICA Study Team (JST) conducted field surveys to grasp the flooding condition in notable flood areas, namely, Poha and Tanasava Rivers, White River, Rove Creek, Mataniko River, Burns Creek, Lungga River, Alligator Creek and Tenaru River. The field surveys indicate that recent flooding in 2014 caused erosion, overtopping and destruction around low-lying areas of the affected rivers.

Moreover, even if rivers and waterways do not cause flooding, the road surface may overflow due to road drainage problems. One of the issues is the poor capacity of road surface drainage or the blockage by debris (earth and sand) due to poor maintenance. In such a case, cars have to run in the middle of the road and causes traffic congestion. As another issue, there is an existence of unstable flow area.

2.3 Socio-Economic Conditions

The 2009 census estimates the population of Honiara and Guadalcanal Province by 2050 by gender and age group using the cohort factor method. JST estimated the GHA population for 2019 based on the projected future population based on certain in-migrant and out-migrant assumptions. According to this forecast, Honiara will increase its resident population from 63,000 in 2009 to 99,000 in 2019, increasing from 83,000 to 130 thousand in the GHA as a whole. The average annual growth rate for 10 years is 4.5%.



Source: 2009 Population and Housing Census, SINCSO

Figure 2-1 Population in Solomon Islands, Honiara and GHA

The population density and population growth rate by zone in GHA are shown in the figures below.

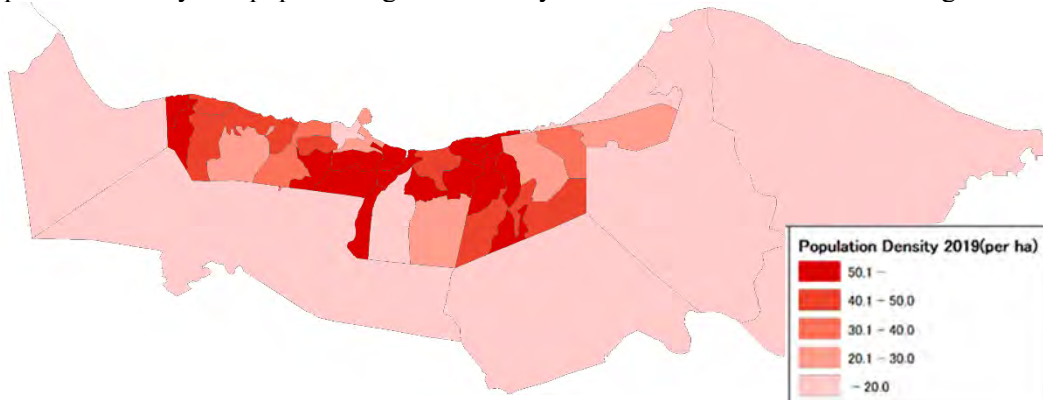


Figure 2-2 Population Density by Zone (2019)

The following figure shows the population growth rate from 2009 to 2019. It highlights the urban area expansion indicated by high growth rate at the suburban zones.

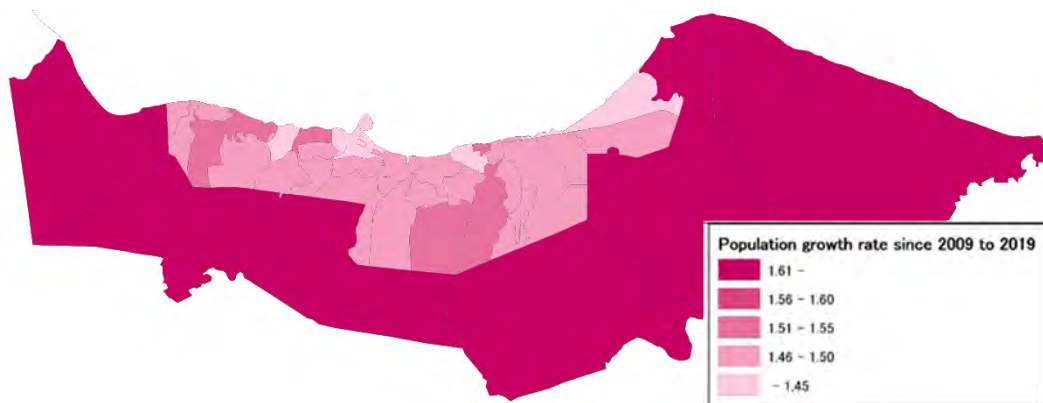
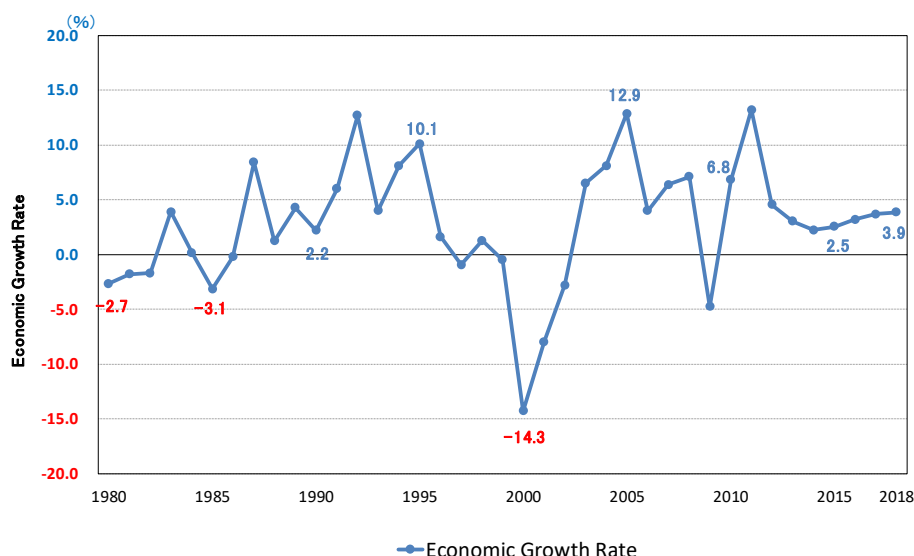


Figure 2-3 Population Growth Rate by Zone (2009 to 2019)

The historical trend of GDP growth is shown in the figure below.



Source: IMF World Economic Outlook Database

Figure 2-4 GDP Growth of Solomon Islands

2.4 Transport Management and Administration

The organization of transport management and administration in GHA is summarized below.

Table 2-1 Organizations of Transport Management and Administration in GHA

Organization	Jurisdiction of Transport
Ministry of Infrastructure Development (MID)	<ul style="list-style-type: none"> Responsible agency for road and transport management in the Solomon Islands Planning and implementation of road and transport projects Road and transport infrastructure maintenance Vehicle registration and inspection Driver's license test
Inland Revenue Department, Ministry of Finance (IRD, MOF)	<ul style="list-style-type: none"> Application of driver's license Drivers' information management Vehicle license issuance
Ministry of Land, Housing and Survey (MLHS)	<ul style="list-style-type: none"> Land acquisition for public works
Honiara City Council (HCC)	<ul style="list-style-type: none"> Business license for bus and taxi service in Honiara City Regulate bus routes in Honiara City
Guadalcanal Province (GProv)	<ul style="list-style-type: none"> Business license for bus and taxi service in Guadalcanal Province Regulate bus routes in Guadalcanal Province
National Traffic Department of the Royal Solomon Islands Police Force (RSIPF)	<ul style="list-style-type: none"> Traffic regulation enforcement Traffic safety
Road Transport Board (RTB)	<ul style="list-style-type: none"> Formulating, implementing, monitoring and reviewing national transport policy

CHAPTER 3 NATIONAL AND REGIONAL DEVELOPMENT POLICY AND PLAN

The National and Regional Development Policies and plans are briefly summarized in Table 3-1.

Table 3-1 Summary of National Infrastructure Investment Plan, Urban Plan and Regional Development Strategy

Plan	Responsible Agency	Outline
Solomon Islands National Infrastructure Investment Plan 2013 (SI NIIP)	Solomon Islands Government (SIG)	<ul style="list-style-type: none"> Present the priorities and the strategic direction for major initiatives in economic infrastructure for 5 to 10 years from 2013. Honiara Urban Development, Honiara Main Road Project are listed in the Top 19 projects
National Development Strategy 2016 to 2035 (NDS 2016-2035)	Ministry of Development Planning and Aid Coordination (MDPAC)	<ul style="list-style-type: none"> A visionary pathway to guide socioeconomic development in Solomon Islands. A guideline of development plan of each region.
Solomon Island National Transport Master Plan 2017-2036 (NTP 2017-2030)	National Transport Fund Secretary (NTFS)/Ministry of Infrastructure and Development (MID)	<ul style="list-style-type: none"> Policies, priorities and plans for major transport infrastructure for 20 years based on NDS 2016-2035 Honiara EW Link-Inner BP (LPS01), Honiara CBD Outer BP (LPS02), Honiara Hwy (CPIU02-04), Vura/Kukum BP (CPIU05), Honiara Master Drainage Works (CPIU15a), W Kola Ridge Settlement Rds (DCC35), Ranadi Industrial Roads Rehab (MID01), Honiara Feeder Roads Tranche 2 (NIIPR19)
Honiara Local Planning Scheme 2015	Ministry of Lands, Housing & Survey (MLHS) Honiara City Council (HCC)	<ul style="list-style-type: none"> To be used to guide and control land use and development applications to develop Zoning control and layer control Design standards for roads, lot size and densities. Car parking and access standards
Henderson Local Planning Scheme 2016 (Draft)	Ministry of Lands, Housing & Survey (MLHS) Guadalcanal Province	
Greater Honiara Urban Development Strategy and Action Plan (GHUDSAP)	Ministry of Lands, Housing & Survey (MLHS) Asian Development Bank (ADB)	<ul style="list-style-type: none"> Urban development master plan for 2035 in GHA, which includes development strategies and action plans. Has prioritized project lists with project cost estimations.
National Transport Core (NTC) Initiative	Office of the Prime Minister Government of Australia	<ul style="list-style-type: none"> Road and bridge projects in Guadalcanal, Malaita and New Georgia RoRo ports and vessels development as virtual sea-bridges

CHAPTER 4 ROAD

4.1 Road Conditions

The terraced hills are divided into ridges and valleys, and the valleys have dirt roads distributed like veins. These dirt roads join the branch roads running along the ridges, and the branches merge to some extent before connecting to the Kukum arterial road (Kukum Highway) that runs east and west along the coast at a T-shaped intersection. Therefore, there is no alternative route that runs east to west except for the Kukum Highway along the shore and the road network in the GHA area forms a comb-shaped road network that relies on only one route running east and west along the coast. Due to this arrangement, congestion occurs daily at the intersection of branch lines and Kukum Highway and in the CBD, where traffic from all directions is concentrated. The road that crosses the CBD of Honiara and reaches the GHA border has only a small branch road connected to the 2-lane Kukum Highway, and the inflow of vehicles from the outside greatly decreases.



Source: MID

Figure 4-1 GHA Road Network

The following table shows the current road network issues identified in GHA.

Table 4-1 Current Road Network Issues in GHA

NO.	Road Network Issues
1	Improvement of a comb-shaped road network that has no east-west connection except for coastal roads
2	Measures to reduce traffic congestion in the CBD
3	Establish east-west complementary routes and regional planning support routes
4	Enhancement of disaster prevention in road network (river flood, road flood, storm surge and tsunami damage)
5	Measures to improve road safety (protection facilities, crossing facilities, signs, etc.)
6	Road maintenance and safety measures for steep roads
7	Measures for low pavement rate
8	Responding to lack of road drainage facilities and recurring deterioration (a lot of road damage due to rainwater) every time it rains
9	Expand road facilities (desired safety enhancement)
10	Primary, Secondary and tertiary road structural standards (lane width, shoulders, sidewalks, side roads, right of way, etc.)
11	Measures for securing land for roads (clearly marking land for roads, responding to illegal occupation)
12	Central bus stop, bus pool improvement, parking expansion

Analysis of traffic volume per capacity ratio with traffic demand in 2030 show that certain sections of the main road will become severely congested, so there is a need to widen them. Moreover, there are missing links between east and west corridor, and there is an opportunity to create an alternative East-West corridor and allow seamless connection between blocks if these links are built.



Figure 4-2 Traffic Volume per Capacity Ratio with Traffic Demand in 2030

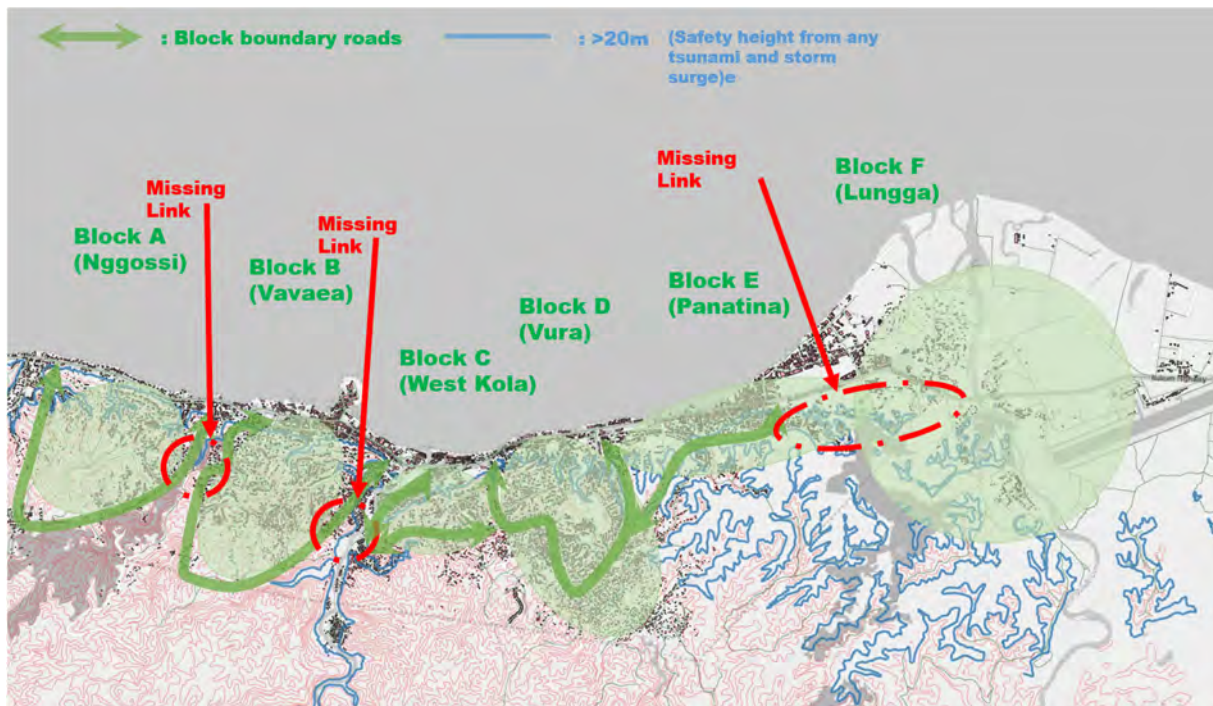


Figure 4-3 Missing Links Between Residential Blocks

CHAPTER 5 PUBLIC TRANSPORT

5.1 Current Conditions

Public transport in GHA is primarily served by public buses as well as other modes such as trucks and taxis.



12-to-15-seater bus



23-to-29-seater bus

Figure 5-1 Public Buses in GHA

At present, bus operations in GHA are under the jurisdiction of the Honiara City Council (HCC) for Honiara City and the Guadalcanal Provincial Government (GPG) in areas outside Honiara City. HCC and GPG both issue the business licenses to interested bus operators, but they do not regulate the schedule, headway or operating hours, and bus operators are free to decide to operate as they deem profitable.

The map below shows the observed bus routes in the GHA. Other long-distance buses that operate beyond the GHA are also included. Most routes originate in the central area of Honiara City, which is composed of Central Market, HCC, Point Cruz and China Town.

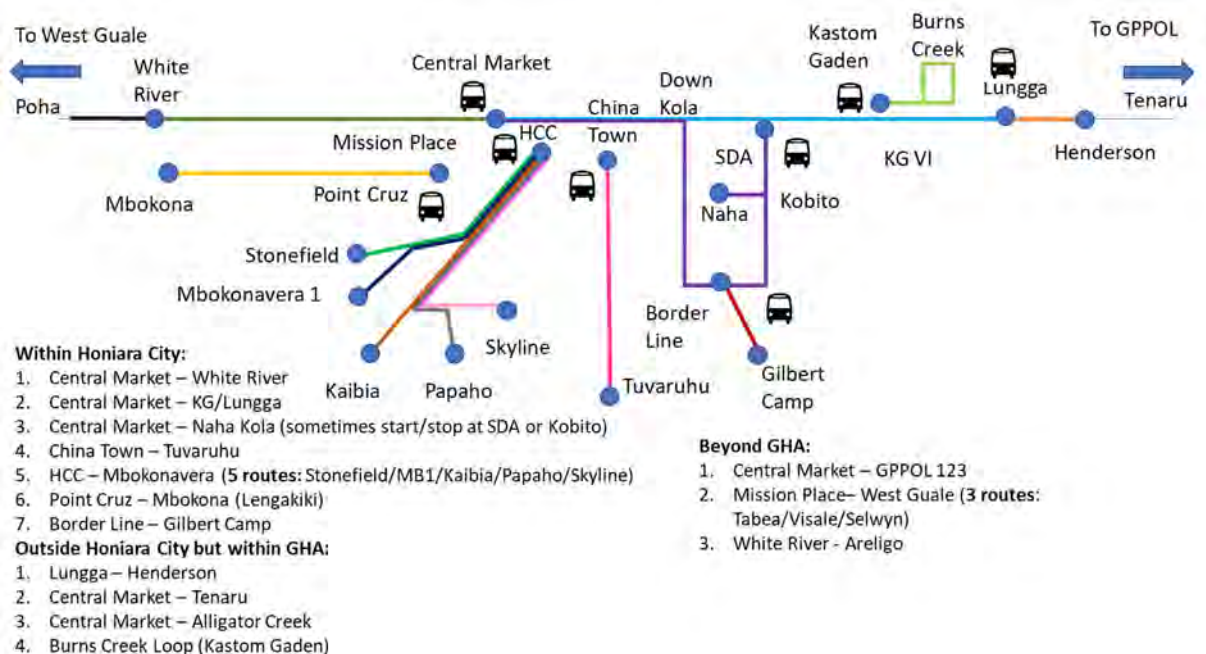
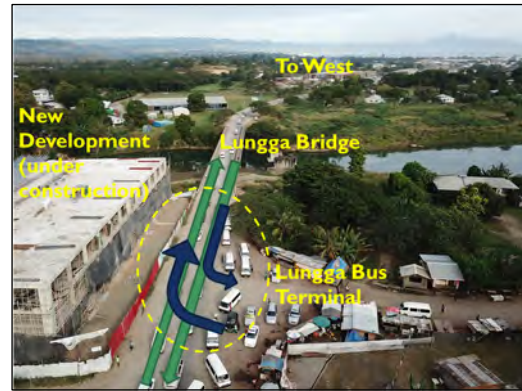


Figure 5-2 Existing Bus Routes in GHA (Observed)



Congestion due to Buses around Central Market



Congestion due to Buses at Lungga Bus Terminal

Figure 5-3 Traffic Congestion due to Buses

A summary of main public transport survey findings and issues is given below:

- Buses operating along the main highway (Kukum Highway) cause congestion around the Central Market due to prolonged queuing to wait for passengers. Congestion at Central Market bus bays is observed from the early morning to around 4:00 pm, which coincides with the time period with fewer market users. Meanwhile, bus bays are empty during the peak period of market user traffic after 4:00 pm. Thus, there is a mismatch between the number of available buses and the passenger demand at the Central Market.
- Lungga Bus Terminal, which is located on the eastern side of GHA next to Lungga Bridge, is also experiencing traffic congestion due to waiting and turning buses. Turning movements disrupt traffic flow and cause traffic congestion at Lungga especially from 8:00-9:00 am.
- In general, bus operators tend to split long routes into shorter ones (also known as “short bus routes”) due to the flat fare system that stipulates the same fare for all urban routes regardless of route length or distance traveled. The route lengths of the authorized routes range from around 3 km to 14 km, yet the fare is the same.
- Onboard bus survey results for major bus routes fully or partially along Kukum Highway (i.e., White River – Central Market, Central Market – KG/Lungga and Central Market – Naha Kola/Kukum SDA) indicate that most passengers board and alight at the Central Market and the routes’ respective terminals. Other main stops include Rove, China Town, Kukum SDA, Burns Creek and Kobito Market.

CHAPTER 6 OTHER TRANSPORT

6.1 Aviation

Honiara Airport, also known as Henderson Airport, is the main airport hub situated at east of GHA serving domestic and international flights to Australia, Fiji, Papua New Guinea and Vanuatu. The “Preparatory Survey for the Project for the Improvement of Honiara Airport” estimated the hourly peak passenger demand as 276 arrivals, which is equivalent to 92 cars with assumption of average ridership as 3.0.

6.2 Maritime Transport

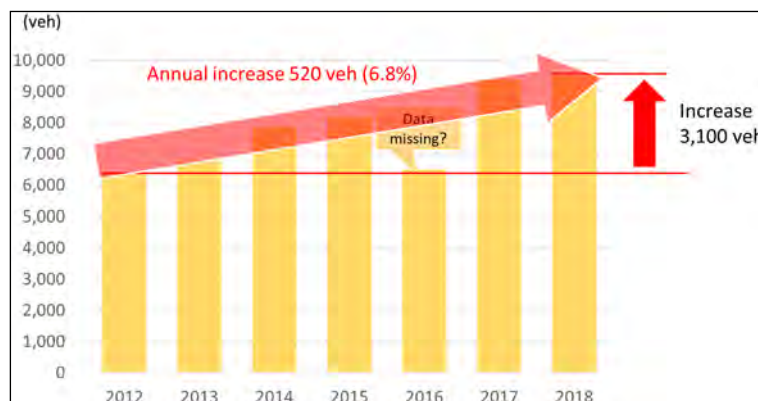
The Port of Honiara is the main port to enter Solomon Islands by sea. Several international shipping companies operate at the port and handle containers. Domestic passenger ferry services operate from Honiara's main wharf at Point Cruz. A new international wharf and a container yard were constructed by Japanese grant aid in August 2016. Further rehabilitation and expansion of the international wharves in the ports of Honiara and Noro were under study in 2019.

Outboard Motor (OBM) boat is a common means of transport between islands for short distances and is operated by private boat owners. OBM boats can cruise without license, registration, neither permission for carrying passengers, therefore there is no official statistics of OBM operation. In GHA, the Yacht Club seafront and Mataniko Bridge are major docking locations of OBM boats shipping to/from other islands in the Central Province.

6.3 Land Transport

Major land transport means in Solomon Islands are public bus, taxi, trucks and private cars. Several trailers are observed on the main road between the Port of Honiara and Ranadi Area, which is the industrial concentration area. There are no railways nor animal-drawn vehicles. A few motorcycles are observed. Bicycles are also very small in number but increasing. Wheelchairs can also be observed on the roads around hospitals.

Vehicles in Solomon Islands are mostly secondhand cars imported from Japan. Imported vehicles must pass inspection at the workshop in the MID yard and then registered at Inland Revenue Department (IRD). The number of registered vehicles in Guadalcanal has been increasing at around 6.8% year.



Source: MID Workshop Inspection Vehicle.

*Existing vehicle number is estimated by JST

Figure 6-1 Number of Registered Vehicles in Guadalcanal

CHAPTER 7 TRAFFIC MANAGEMENT AND ROAD SAFETY

7.1 Traffic Management

The simplified mechanism of traffic congestion caused by buses is explained as follows;

- The capable passing traffic on a 2-lane carriageway without obstructions is assumed to be 2,400 pcu/hour.
- Queuing buses cause one lane to close to other traffic and narrow down the remaining lane width.
- The assumed capacity under such situation is 1,000 pcu/hour.
- Traffic flow that comes through that section is more than the reduced capacity, so the congestion length prolongs to the west.
- There are no U-turn slots between Point Cruz and HCC Roundabout (RA), so eastbound traffic is forced to head west.
- When U-turn movements are part of traffic congestion, westbound traffic is also affected.

Congestion is observed to clear at the Central Market when traffic police officers come to control dwelling buses and sweep obstacles on the main road. At that time, the bottleneck moves to the western side at Point Cruz (either at Hot Bread Roundabout or Commonwealth St. Junction (JCT)).

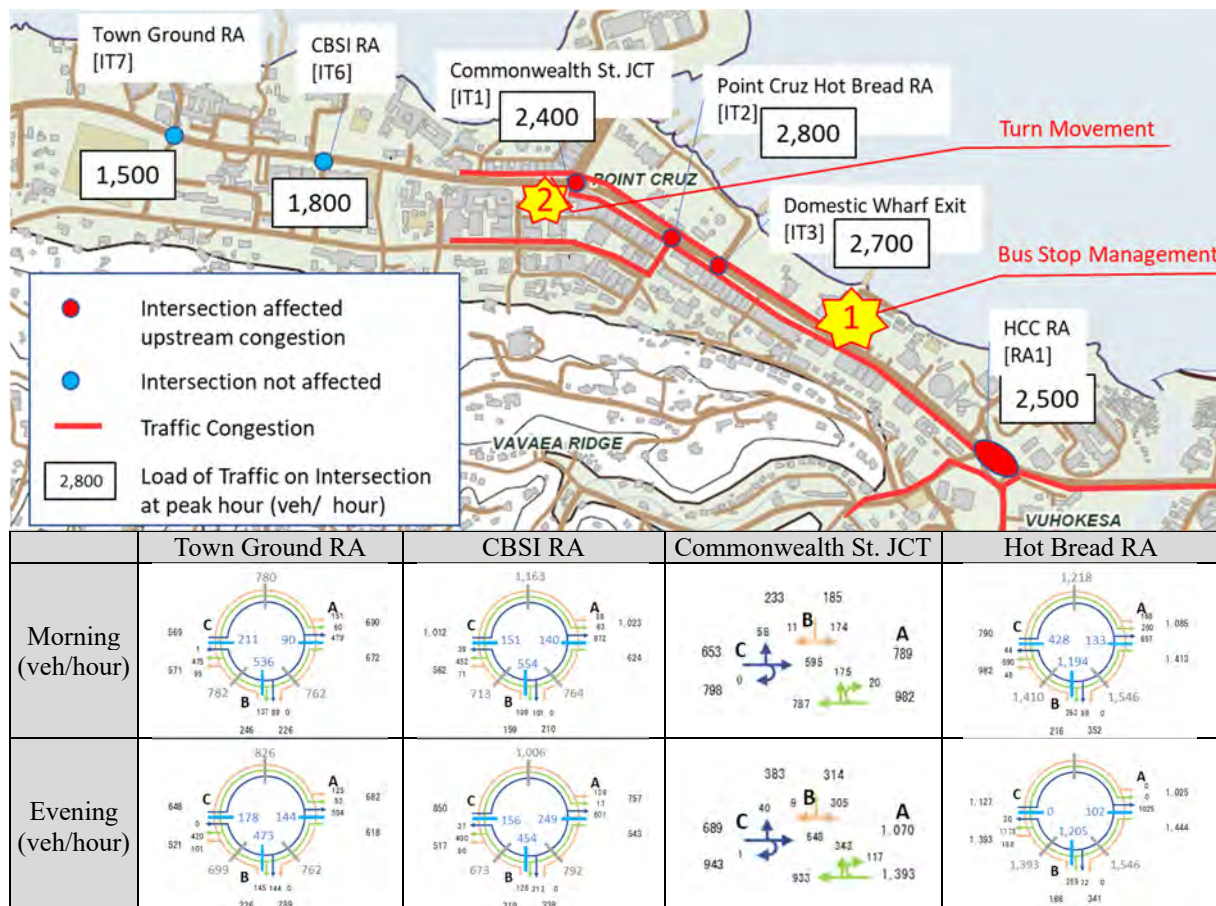


Figure 7-1 Traffic Congestion and Peak Hour Traffic Volume in the CBD

7.2 Road Safety

The number of total accidents is in the range of around 300 to 400 per year. For “fatal” and “non-fatal (with injuries)”, the trend is slightly declined from 2014. The annual traffic accident statistics report in 2018, analyzed the cause of fatal accidents or crashes are (1) Dangerous and reckless driving, (2) Defective vehicle parts, and (3) Obvious drunk or drugged driving

Table 7-1 Number of Traffic Accidents

Year	2014*	2015*	2016*	2017*	2018**
Fatal Accidents	8	9	5	6	6
Non-Fatal Accidents (With Injuries)	50	34	53	35	28
Total Accidents	320	378	405	320	369

* Traffic Accident Data from Traffic Police

**Data based on Annual Traffic Accident Statistics Report 2018

GHTMPS plotted traffic accidents on the map and it illustrates more than 85% of traffic accidents occur in flat areas, especially on the main road (Kukum Highway and Mendana Avenue). On the other hand, around 15% of traffic accidents occur in hillside areas and frequently occur are highlighted in Figure 7-2. These could be black spots and shall be taken proper counter measures.



Figure 7-2 Location of Traffic Accidents

7.3 Traffic Management Facility

GHTMPS proposes following measures to alleviate current issues;

- (1) Setting proper speed limits by condition accordingly,
- (2) Install smooth pedestrian crossing to make aware of drivers and reduce speed with physical humps and to ensure pedestrian safety,
- (3) Install guardrail at roads of hillside area whose more than 4.0m difference in height, and
- (4) Install lighting facilities at Kukum Highway, roads in central area and at least on main feeder roads in the hillside.

7.4 Traffic Safety Educations

GHTMPS proposes following measures to enhance capacity of traffic safety in GHA;

- (1) Driving License Information Shared to Related Organizations in the Traffic Management System (TMS),
- (2) Strategic Traffic Safety Awareness Campaign for Students by Traffic Police, and
- (3) Installation of Traffic Safety Measures around Schools.

7.5 Utility Management

MID shall take a key role in infrastructure information integration as a focal point, which would make coordination much easier and more precise during road and other development works based on SITAMAS, MID developed GIS data base of road assets.

CHAPTER 8 TRAFFIC SURVEY AND ANALYSIS

8.1 Outline

The following traffic surveys were conducted to estimate the future traffic demand and evaluate the transport-related problems in GHA.

Contents of Traffic Survey

Survey Items	Description	Method
A. To estimate future traffic volume		
1. Person Trip (PT) OD Survey	Household Interview Survey to 6,000 citizens (900 families)	Outsource
2. Cordon line Traffic Count+ OD Survey	Traffic count and roadside OD interview surveys at boundaries of Greater Honiara Area. 2 locations	Outsource
3. Terminal OD Interview Survey	OD interview at the airport and the port. 2 locations	Outsource
4. Screen line traffic count	3 screen lines were set to tally the total traffic volume crossing each screen line in order to estimate statistical population of OD from PT survey. 6 locations	Outsource
B. To evaluate the current problems quantitatively and qualitatively		
1. Traffic Count	Recognize Regional Road Traffic Volume. 6 locations	Outsource
2. Floating Vehicle	Conduct travel speed survey by floating vehicles with GPS. 6 routes	Direct/ Assistants
3. Directional Traffic Count Survey at Intersection (manual count)	Count the number of vehicles at intersections for 3 hours in the morning and 3 hours in the evening. 7 locations (including 2 roundabouts)	Outsource
4. Directional Traffic Count Survey at Roundabout (video/ drone record)	Record video on traffic movements at roundabout using a drone. 1 location	Direct/ Assistants
5. Parking Survey	Count number of parked vehicles in Circular road parking and major buildings in the city center every 1 hour	Direct/ Assistants
6. Market User, Vehicle and OBM Count Survey	Count the number of market users, vehicles and OBM boats at the Central Market	Direct/ Assistants
7. Central Market User and Vendor Interview Survey	Interview Central Market users (including bus passengers) and vendors	Direct/ Assistants
8. Central Market Bus Bay Occupancy Survey	Count the number of buses queuing at the Central Market bus bays	Direct/ Assistants
9. Lungga Bus Terminal Waiting and Turning Survey	Count the number of buses waiting and turning at Lungga Bus Terminal	Direct/ Assistants
10. Lungga Market User Interview Survey	Interview Lungga Market users (including bus passengers)	Direct/ Assistants
11. Bus Operator Interview Survey	Interview bus operators	Direct/ Assistants
12. Onboard Bus Passenger Count Survey	While on the bus, count the number of bus passengers boarding and alighting at all bus stops and record the travel time. Sample some buses on all urban bus routes	Direct/ Assistants
13. Road Inventory	Collect data on road class, number of lanes, carriageway width, type of pavement, surface condition, gradient, pedestrian walkways, safety equipment for pedestrian	Direct/ Assistants
14. OBM Transport Survey	Interview with boat owners and passengers at harbors and Mataniko Bridge	Direct/ Assistants

8.2 Survey Findings

Some major results are shown below. The largest traffic volume was found to be at Fishing Village (SL3) with 37,400 vehicles per day (or 43,700 pcu per day). Moreover, the most congested intersections were HCC RA (RA1), Point Cruz Hot Bread RA (IT2) and the Domestic Wharf Exit (IT3). Travel speed was also found to be low with considerable congestion lengths around Honiara City Council and Lungga Bridge.

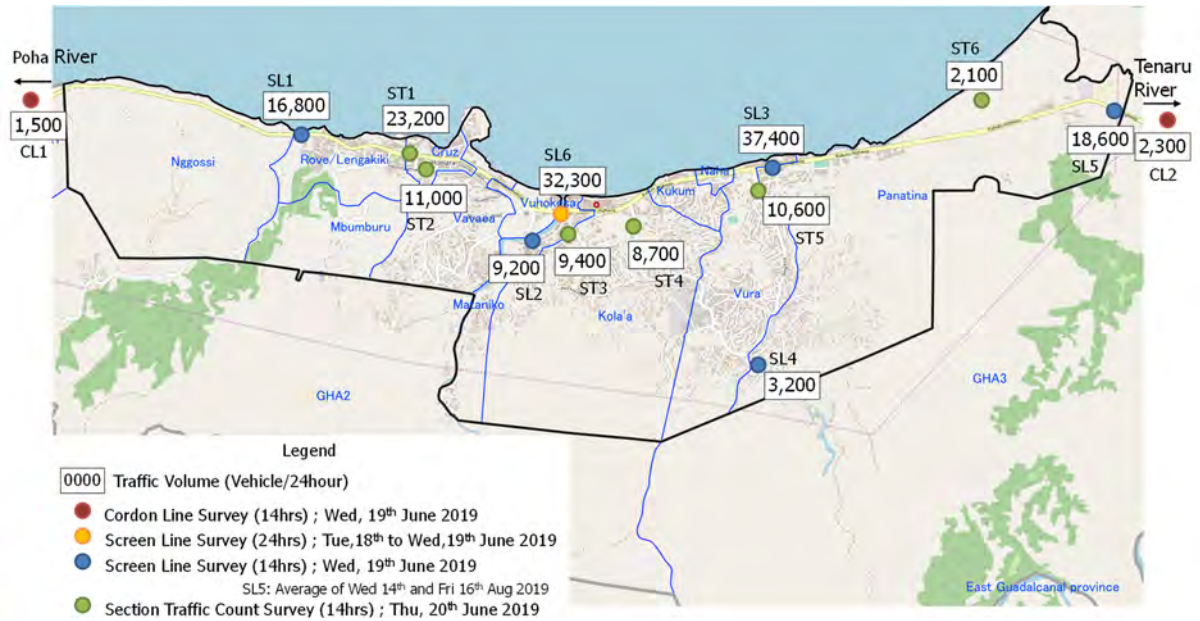


Figure 8-1 Traffic Volume (vehicles/day)

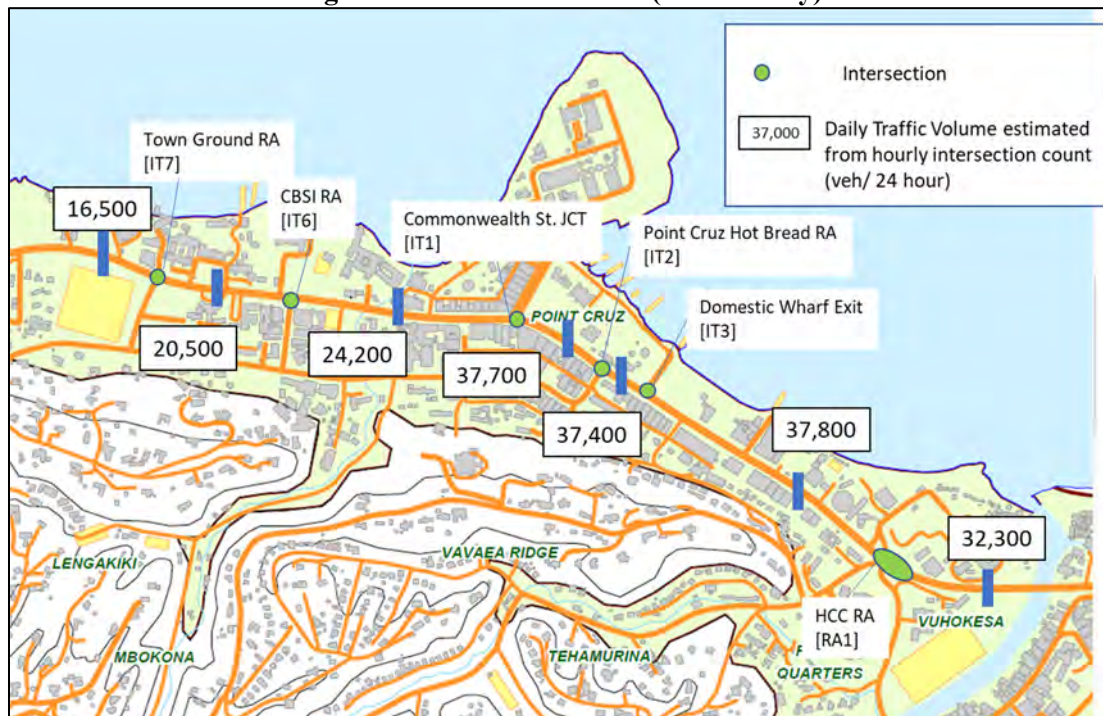


Figure 8-2 Estimated Daily Traffic Volume at Honiara City Center (vehicles/day)
<Honiara City Council>



Figure 8-3 Details of Travel Speed at Congested Section of Kukum Highway

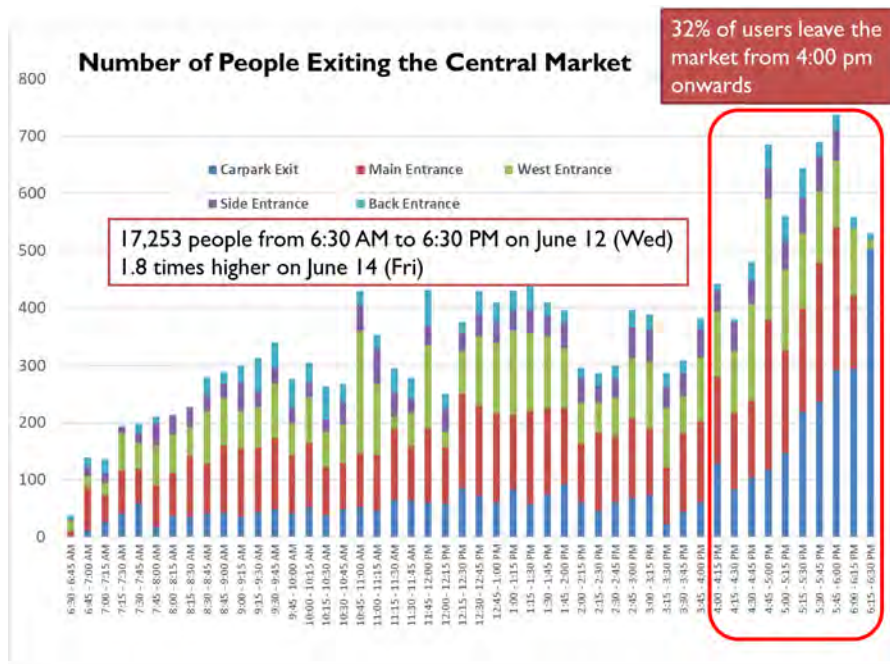


Figure 8-4 Market User Count Survey Results

The existing parking capacity in the CBD was also surveyed and capacity was estimated as follows.

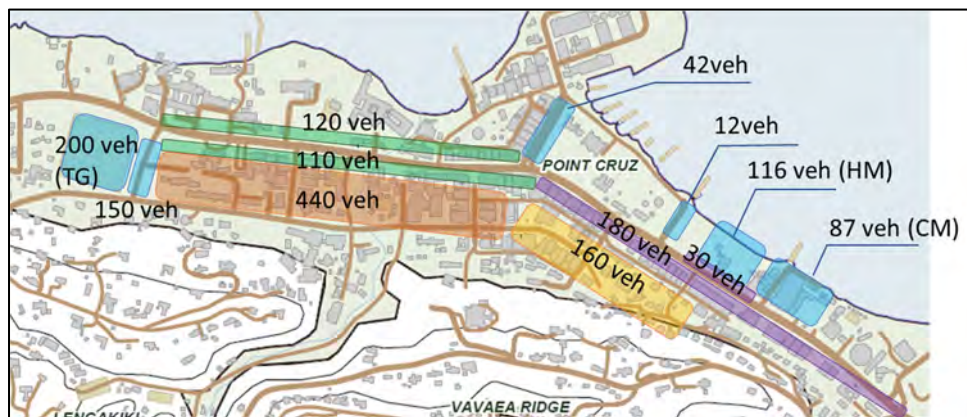


Figure 8-5 Existing Parking Capacity in CBD

The average number of trips per person for the total population (Gross) is 2.5 trips for males and 2.0 trips for females. The majority of trip modes for all purposes are made by public transport, such as bus and truck, and private vehicles, and both of them account for 37% each.

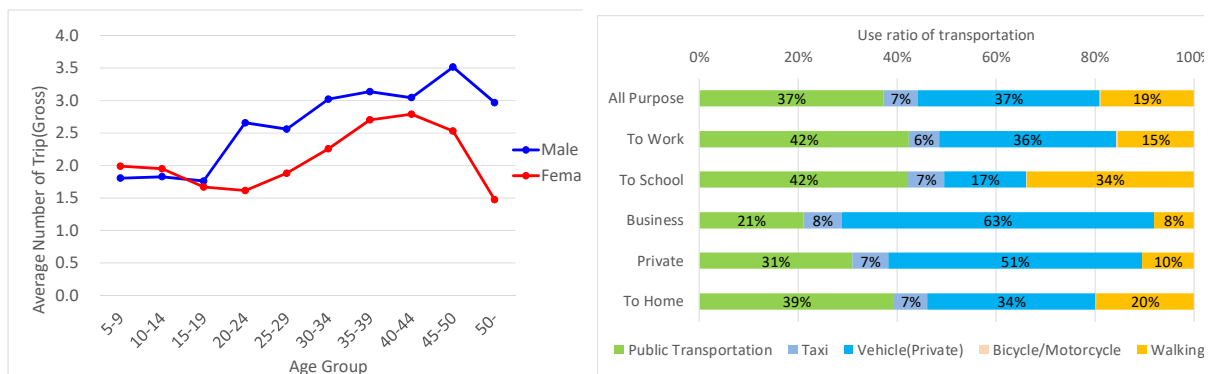


Figure 8-6 Average Number of Trips and Trip Mode for Each Purpose

CHAPTER 9 FUTURE TRAFFIC DEMAND FORECAST

9.1 Future Socio-Economic Framework

The target year for the transport master plan is 2036, and the forecast period are set as short-term (2021-2025), middle-term (2026-2030) and long-term (2031-2036).

The scenarios set by GHA for the 2036 regional development plan such as the development of residential areas and the development of public facilities will be the base for the present study. The future development scenarios are set as follows:

- Trend Case: the city is formed centering on the current urban area, with the population growth in the suburbs and the relocation and expansion of some public facilities expected
- Multipolar Dispersion Case: the population growth in the suburbs is more advanced, and the living and urban functions such as neighborhood center are also developed in the suburbs, so it does not depend on the central city area.

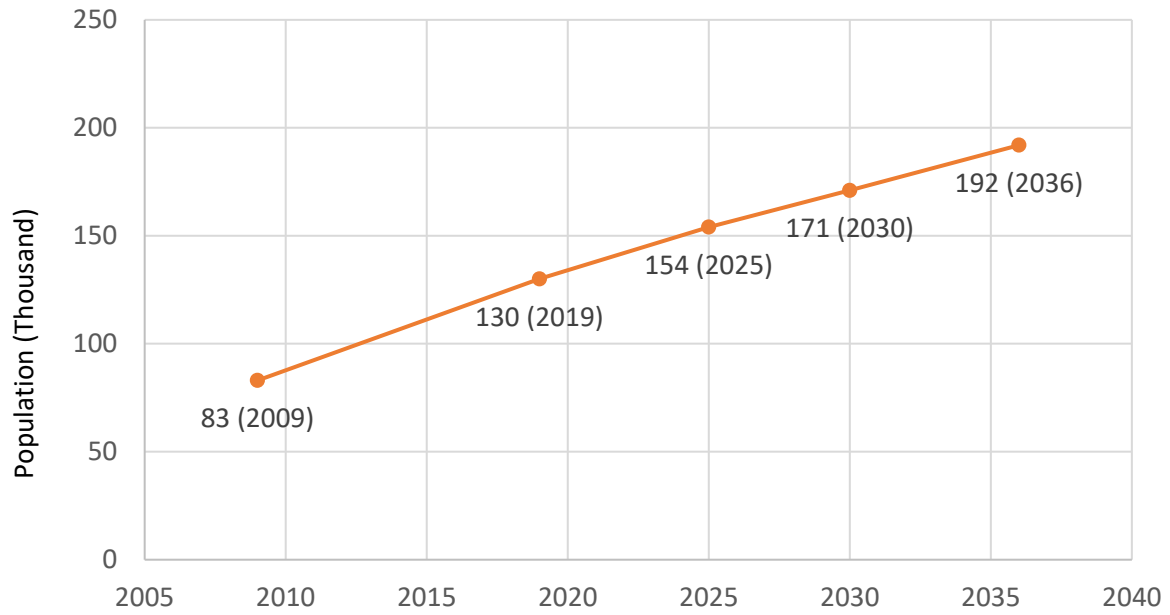
The target area is the entire GHA. The GHA is divided into 40 zones and 4 other zones as shown below. The airport and seaport are defined as individual zones. The area outside GHA is divided to east and west Guadalcanal.



Figure 9-1 Traffic Analysis Zones and Geographic Areas

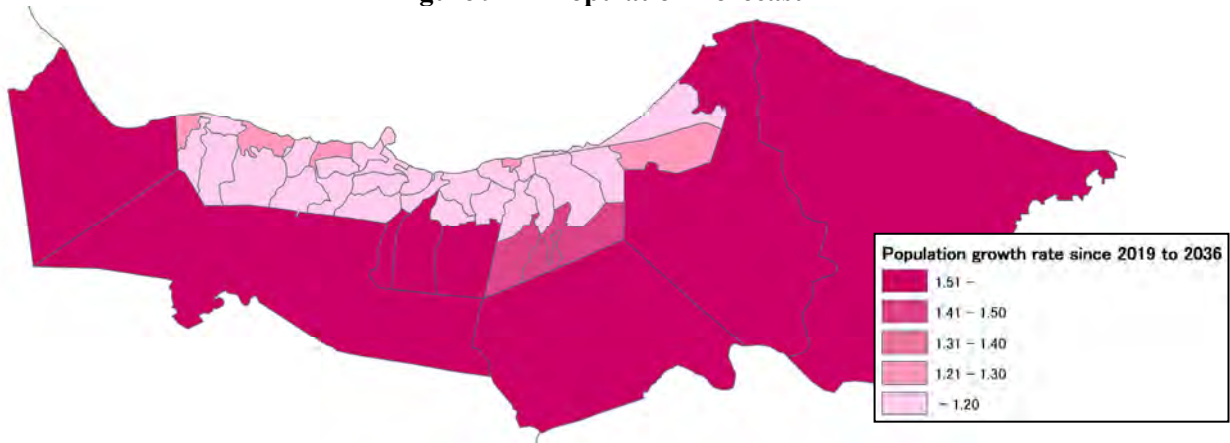
9.2 Population

Population was forecasted using the cohort factor method and by reviewing existing national statistics and the population growth forecasted in GHUDSAP. Population in the GHA will increase steadily. It will reach 192,000 by the year 2036, which is 1.5 times to 2019. Population of all age groups will increase, however, proportion of the population under the age of 19 will decrease to 37%.



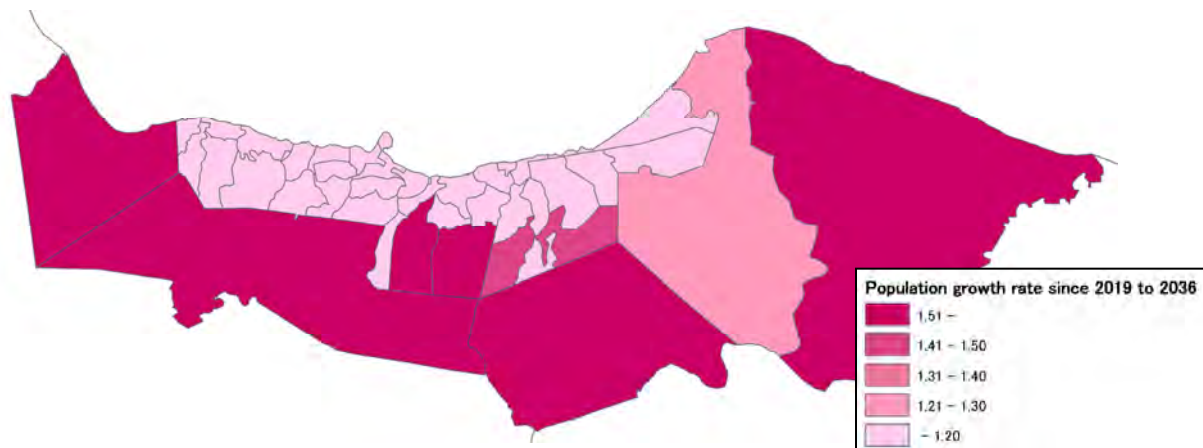
Source: JST

Figure 9-2 Population Forecast



Source: JST

Figure 9-3 Population Growth Rate by Zone (since 2019 to 2036 (Trend Case))



Source: JST

Figure 9-4 Population Growth Rate by Zone (since 2019 to 2036 [Multipolar Dispersion Case])

The number of registered vehicles in the future was estimated by taking into account historical trends and economic growth. The population in 2036 will be 1.5 times the current population, while the number of registered cars will increase 2.9 times its current number. Population is expected to increase in proportion to the number of registered cars, with car ownership ratio increasing to 42%.

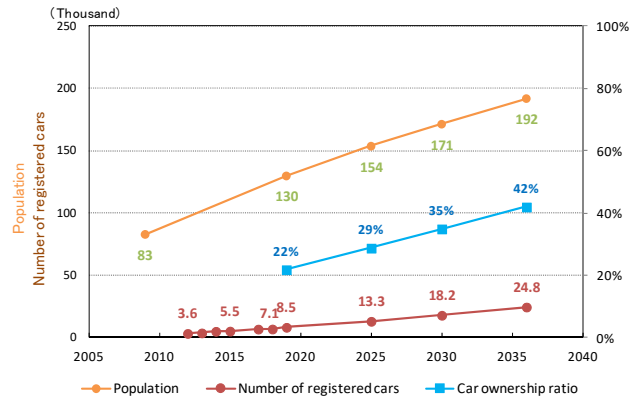


Figure 9-5 Future Number of Registered Vehicles

9.3 Traffic Demand Forecast

JST forecasted the future traffic demand of roads in GHA with traffic demand forecast model.

Comparisons of the traffic volume per capacity ratio were made for both trend case and regional dispersion case while considering scenarios with and without road development. As shown in Figure 9-7, even when the East-West corridor is developed, some congested areas remain in the main road. This indicates further countermeasures should be taken, not only constructing roads but also control number of vehicles, traffic demand management and so on. As shown in Figure 9-8, population relocations and development public transport service will mitigate traffic congestions in the main road.



Figure 9-6 Traffic Volume per Capacity Ratio (2036 Without Road Development+ Trend Case)



Figure 9-7 Traffic Volume per Capacity Ratio (2036 New Road Construction+ Trend Case)



Figure 9-8 Traffic Volume per Capacity Ratio (2036 New Road Construction+ Regional Dispersion Case)

CHAPTER 10 FLOOD

10.1 Past and Present Flood Conditions

1) Flood Caused by Natural Disaster

Literature study and field surveys were conducted. Floods in Guadalcanal are mainly caused by tropical cyclones, storm surges, and heavy rains. The impact of tsunami is relatively small in Guadalcanal. GHTMPS also conducted field surveys to grasp the flooding condition in remarkable flood areas. The field surveys assessed the situation for flood and storm surge, etc. by interviews to local residents.

- i) Flooding by Poha and Tanavasa Rivers
- ii) Flooding by White River
- iii) Flooding by Rove Creek
- iv) Flooding by Mataniko River
- v) Flooding by Burns Creek
- vi) Flooding by Lungga River
- vii) Flooding by Alligator Creek
- viii) Flooding by Tenaru River





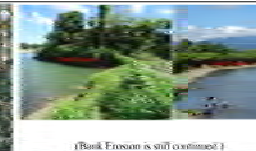


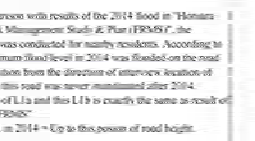
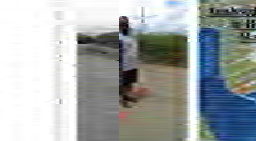
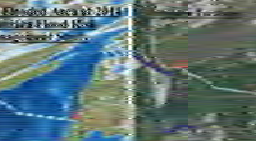

SN	Interview Spots Number	Location	X (East-ing)	Y (North-ing)	Impact of Monsoon / Rainy Seasons	Impact of Storm Surge (1991)	Flood on GL	Other Notes by Consultants	Photos / Schematic Maps
13	L1a	Lungga River (1a)	663942	8956748	The river course shifting of this area is drastic in past. This house on the riverbank is a little higher location on the road along Henderson Airport. Before the flood in 2014, the main stream of the river was located on the left bank side. But in the 2014 flood, the river flow was eroded to the right bank side by one flood and changed the flowpath to the right bank. Erosion on the right bank continues even now. According to residents of this house, maximum-high flood level in Apr. 2014 was below the riverbank on this house, and was above the floor level of the pig hut below the riverbank, and the flood has never overed the riverbank. The flood level in 2014 was the largest ever, and the floods overtopped / flowed from the nearby low road of left bank of upstream side to Henderson Airport towards Alligator Creek. HHWL < Below existing Bank Shoulder	(No impact of storm surge)	No		
									
									
									
									
									
									
									
									
									

Figure 10-1 A Part of Interview Survey Results

2) Flooding Caused by Road Drainage

One of the issues is the poor capacity of road surface drainage or the blockage by debris (earth and sand) due to poor maintenance. Another issue is an existence of unstable flow area, where the flow regime in channels is transformed from super-critical flow to sub-critical flow or strong super-critical flow to mild super-critical flow, the hydraulic jump at a changing point or the unstable flow occurs in the channel. The installation of an energy dissipator or a big catch basin for the road drainage is recommended at the changing-points to the low-lying area below a hilly area is recommended.

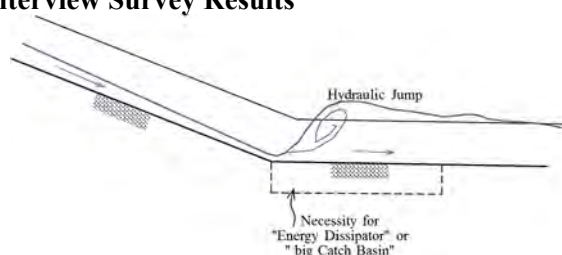


Figure 10-2 Unstable Flow Section Reach of the Road Drainage

10.2 Flood Risk Management

"National Disaster Risk Management Plan" for Solomon Islands in 2010 and "Honiara Flood Risk Management Study & Plan" (Honiara FRMS) in 2014 were reviewed and those are basis of understanding of disaster risk management and integrated flood management in the Solomon Islands. "Honiara Flood Risk Management Study and Plan" in 2019 was also reviewed and identified flood prone area. It was used to study resilient road network development in the transport master plan.

CHAPTER 11 ENVIRONMENTAL AND SOCIAL CONSIDERATIONS/STRATEGIC ENVIRONMENTAL ASSESSMENT



11.1 Outline of Environmental and Social Considerations for the Study

As the Project is at the master plan stage, a Strategic Environmental Assessment (SEA) is adopted according to the JICA Guidelines for Environmental and Social Consideration 2010. The guideline describes the SEA as an assessment that is implemented at the policy, planning, and program levels, so JICA applies the SEA instead of a project-level Environmental Impact Assessment (EIA) when conducting master plan studies.

Specifically, JST took the following steps.

- Study of the current social and environmental conditions
- Involvement of stakeholders in the working group meetings and the public consultation meetings
- Consideration of alternatives

Table 11-1 Comparison of Alternative Plans

Alternative	Alternative-1: Trend OD Pattern (Trend Case)	Alternative-2: Distributed OD Pattern (Multipolar Dispersion Case)	Alternative-3: Without Project (Do-nothing case)
Outline/ Technical Aspect	<p>Alt-1 develops transportation networks including the 2nd East-West Route by using the present roads. The urban development follows present trends. The concentration of trips in the central city area will be maintained, and as the city expands, trips from the suburbs to the central city area will increase.</p> 	<p>Alt-2 develops large-scale residential land in the suburbs, and improves living and urban functions such as public facilities for its decentralization, in addition to the 2nd East-West Route development. The urban development pattern is more distributed than the present trends.</p> 	<p>Since an alternative route of the existing East-West Road along the coast, which is the main trunk line, will not be developed, the concentration of traffic on this road and the consequent traffic issues will not be resolved.</p>
Evaluation	<ul style="list-style-type: none"> - Improves the traffic conditions with the proposed projects including the East-West Route, traffic management facilities and traffic safety measures. - Contributes to improving the convenience of citizens' life and economic activities. - Contributes to reducing the air pollution in terms of the emission of NOx, SPM and CO₂ from vehicles. - Has lower project costs due to the optimization of the use of existing road networks 	<ul style="list-style-type: none"> - Is an ideal plan because it is highly effective in lessening traffic congestion, and reducing a risk in the event of a disaster by formulating decentralized society. - high reduction of NOx, SPM and CO₂ emissions from vehicles. - Requires further studies of the regional developments so it too early and difficult to realize it. - Has exceedingly high development costs - large impact on natural and social environment due to the large-scale land developments 	<ul style="list-style-type: none"> - Has the smallest initial public investment costs. - Increases traffic volume, which will worsen traffic congestion on the present road networks and the public transportation system and cause inconvenience and economic stagnation - Is not disaster-resilient because there is no alternative road from east to west
Rating	Recommended	Recommended but less feasible than Alt-1	Not recommended

CHAPTER 12 CONCLUSION AND RECOMMENDATION

12.1 Conclusion

The conclusions are highlighted as follows:

- 1) Road Network
 - Complete upgrading the main road from between the Henderson Airport and Nggosi.
 - Construct the 2nd East-West corridor (other than main road) as the highest priority project:
 - ✓ it will support decentralization and regional development, and
 - ✓ it will enhance disaster prevention in road network.
 - Take measures to reduce traffic congestion in the central business district.
 - Specify structural standards of primary, secondary and tertiary roads.
 - Mark road reserve/ Right of Way (ROW) on the ground.
- 2) Road Maintenance
 - Improve road surface conditions and safety facilities of steep road sections.
 - Increase length of paved roads.
 - Install road drainage facilities and reduce recurring road surface erosion.
- 3) Public Transport
 - Enhance bus operation management.
 - Reform bus networks, and revise bus fare system.
 - Introduce larger buses to replace present minibuses.
 - Reform bus terminals with considering bus pool for waiting passengers.
- 4) Road Safety
 - Upgrade traffic accident report system to add detailed location information and accident causes.
 - Install road safety facilities at proper locations.
 - Install traffic safety measures around schools especially early childhood educations and primary schools
 - Organize traffic safety campaigns.
 - Introduce drivers' license system with periodic renewal reflecting penalties for traffic violations.
 - Install street lights for traffic safety and public safety aspects, start from main feeder road at the hill side and following prioritized area based on scientific research.
- 5) Parking
 - Formulate parking management policy.
 - Construct new service roads that allow short time parking on selected sections.
 - Encourage parking within house premises.
- 6) Traffic Demand Management
 - Discourage private car use.
 - Encourage public transport use.
 - Promote Non-motorized Transport (NMT).
 - Operate school bus service.

12.2 Recommendation

Each chapter considered specified targets and analyzed present and future conditions and identified issues. Countermeasures to those issues are summarized as recommendations shown in Figure 12-1.

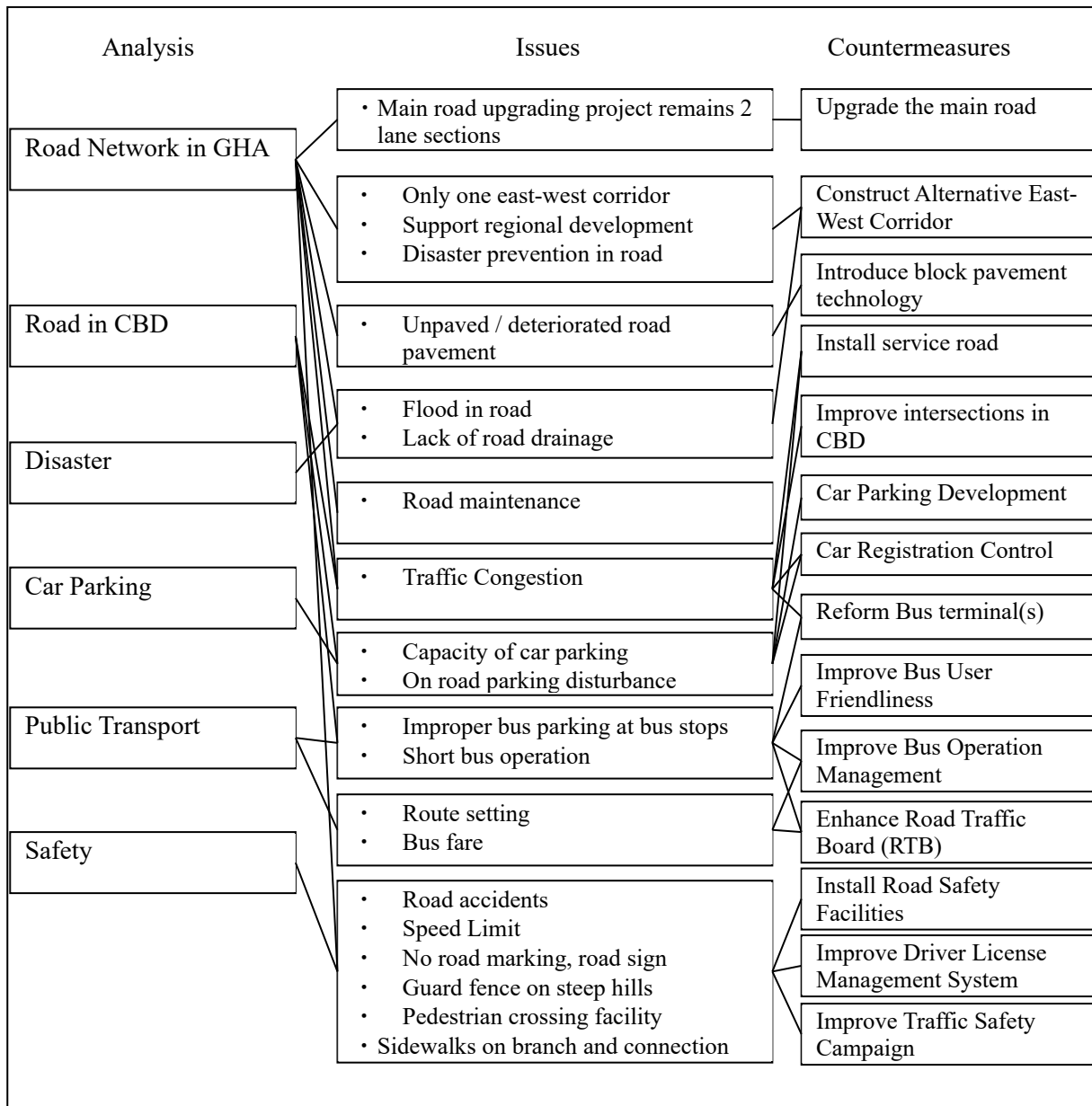


Figure 12-1 Issues and Recommended Countermeasures

CHAPTER 13 POLICY OF TRANSPORT MASTER PLAN

13.1 Formulating Vision and Goals of GHTMPS

The Greater Honiara Transport Master Plan Study (GHTMPS) shall be consistent with National and Regional Development Plans. With considering above plans' vision and strategies in the following section, JST proposes the draft vision and goals of GHTMPS and MID confirmed them at TWG Meeting on 30th January, 2020.

- 1) Vision: Realize organized and optimized Road and Transport System for GHA
- 2) Goal:
 - Road network supporting disaster prevention and resilient
 - Against storm surge and flooding
 - The 2nd East-West Corridor
 - Transport enhances social welfare
 - Connectivity to hospitals and clinics
 - Pavement and drainage improvement
 - Road maintenance improvement
 - Car parking development
 - Attractive public transport with sustainability
 - Organized bus system
 - Bus operation management
 - Enhance transport management
 - Road safety
 - Driver management
 - Traffic demand control

13.2 Transport Master Plan Policy

GHTMPS aims to formulate the transport master plan for 2036 and identify priority projects. The target areas are road, public transport, traffic management and road safety.

Process of formulating the transport master plan is as shown in the following figure.

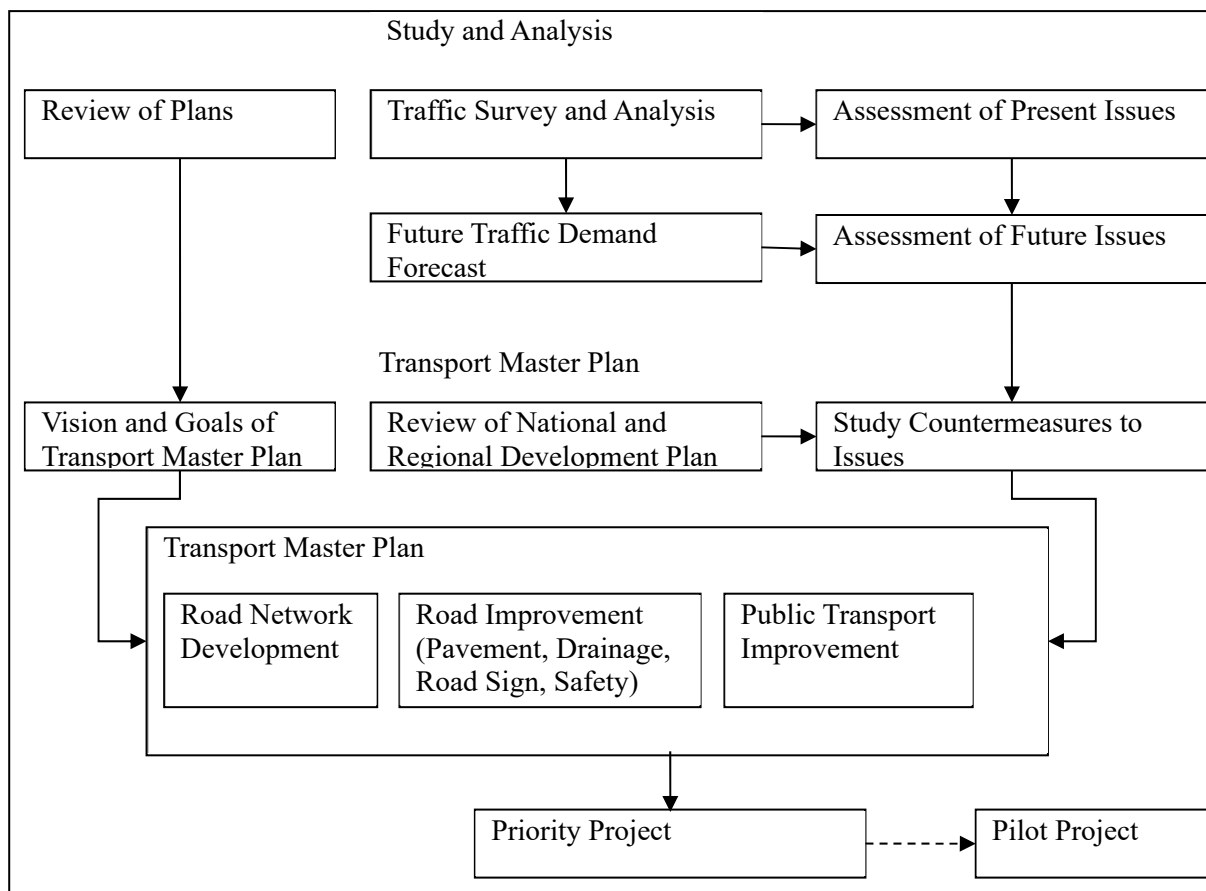


Figure 13-1 Flow of Transport Master Plan Formulation

CHAPTER 14 TRANSPORT MASTER PLAN

Transport Master Plan projects were proposed after reviewing past, ongoing and planned projects, clarifying the current issues and problems, setting future scenarios, conducting analyses and discussing with MID and stakeholders. The projects in the short term, middle term and long term are presented below:

1) Short Term (2022-2025)

- Kukum Highway Improvement in the Transport Sector Project Development Facility (ADB, on-going)
- Upgrading of the Kukum Highway Phase 2 (JICA, on-going)
- Lungga Bridge Widening Kukum Highway Upgrading (succussing project of the Upgrading the Kukum Highway Phase 2)
- Holy Cross Link (to be consistent with ADB road upgrading project)
- Improve Intersections in the CBD
- Road Sign Installation
- Construct ROW Monument
- Upgrade Unpaved Road by NTF
- Road Improvement in the CBD
- Capacity Enhancement of Block Pavement Technology
- Capacity Improvement of Bus Operation Management

2) Middle Term (2026-2030)

- The Third Mataniko Bridge New Construction
- The Second Bridge on the Harbor View Drive New Construction
- New Lungga Bus Terminal Development
- Vabae Regional Network Improvement
- Central Bus Terminal Development
- Car Parking Management
- Transportation Demand Management

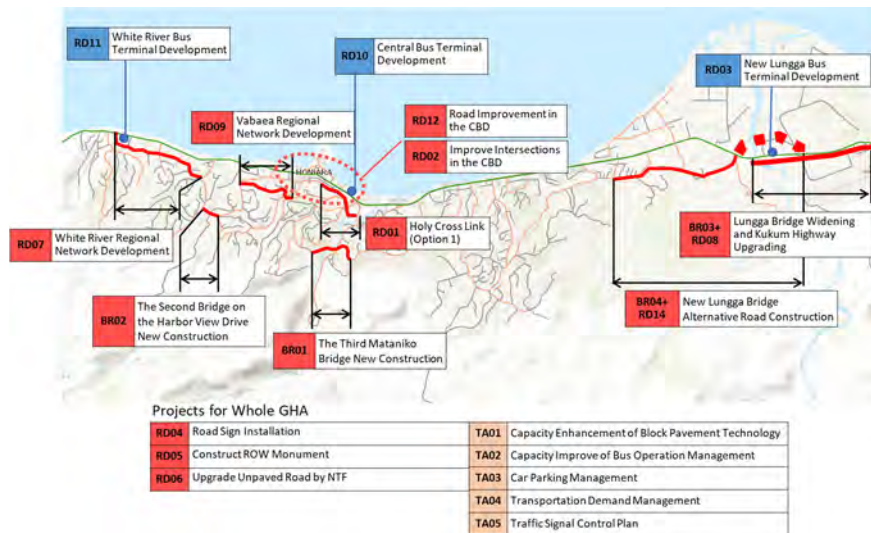
3) Long Term (2031-2036)

- New Lungga Bridge Alternative Road Construction
- White River Regional Network Improvement
- White River Bus Terminal Development
- Traffic Signal Control Plan

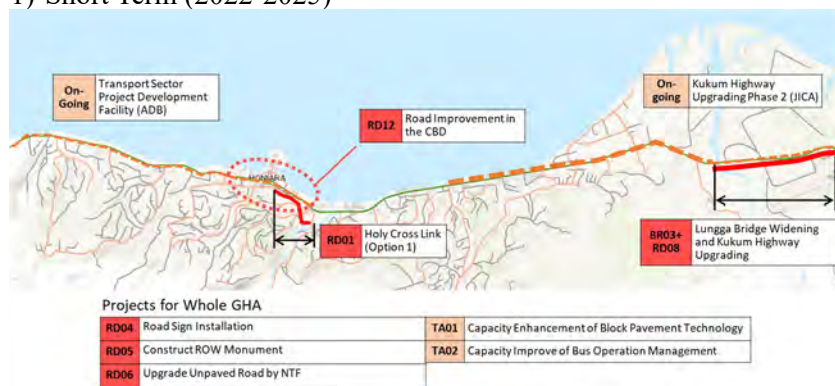
The estimated costs, fund source and implementation time for the master plan projects are summarized in the following table.

Table 14-1 Estimated Cost and Implementation Time of Transport Master Plan Projects

Code	Master Plan Project	Lead Agency	Source of Fund	Estimated Cost (Mill. SBD)	Estimated Cost (Mill. USD)	2022-2025	2026-2030	2031-2036
BR01	The Third Mataniko Bridge New Construction	MID	International	249.0	31.2		✓	
BR02	The Second Bridge on the Harbor View Drive New Construction	MID	International	233.9	29.4		✓	
BR03+RD08	Lunga Bridge Widening Kukum Highway Upgrading	MID	International	141.1	17.7	✓		
BR04+RD14	New Lungga Bridge Alternative Road Construction	MID	International	161.5	20.3			✓
RD01	Holy Cross Link (Option 1)	MID	ADB	159.4	20.0	✓		
RD02	Improve Intersections in the CBD	MID	SIG	4.0	0.5	✓		
RD03	New Lungga Bus Terminal Development	MID/ G Province	SIG	75.4	9.5		✓	
RD04	Road Sign Installation	MID	SIG	0.8	0.1	✓		
RD05	Construct ROW Monument	MID	SIG	0.8	0.1	✓		
RD06	Upgrade Unpaved Road by NTF	MID	SIG	8.0	1.0	✓		
RD07	White River Regional Network Improvement	MID	International	135.8	17.0			✓
RD09	Vabae Regional Network Improvement	MID	International	120.7	15.1		✓	
RD10	Central Bus Terminal Development	MID/HCC	International	226.3	28.4		✓	
RD11	White River Bus Terminal Development	MID/HCC	SIG	75.4	9.5			✓
RD12	Road Improvement in the CBD	MID	SIG	750.7	94.2	✓		
TA01	Capacity Enhancement of Block Pavement Technology	MID	International	15.9	2.0	✓		
TA02	Capacity Improve of Bus Operation Management	Road Transport Board (RTB)	International	8.0	1.0	✓		
TA03	Car Parking Management	Road Transport Board (RTB)	International	8.0	1.0		✓	
TA04	Transportation Demand Management	Road Transport Board (RTB)	International	8.0	1.0		✓	
TA05	Traffic Signal Control Plan	MID	International	8.0	1.0			✓



1) Short Term (2022-2025)



2) Middle Term (2026-2030)



3) Long Term (2031-2036)



Figure 14-1 Location of Master Plan Projects

CHAPTER 15 PRIORITY PROJECTS

15.1 Priority Projects for Road Network Development

Among the proposed projects for Transport Master Plan, six (6) road network developing projects are selected as priority projects given that these projects comprise the 2nd East-West Corridor.

Table 15-1 Priority Projects for Road Network Development

No.	Code	Project	Lead Agency	Estimated Cost (Mill. SBD)
1	BR01	The Third Mataniko Bridge New Construction	MID	249.0
2	BR02	The Second Bridge on the Harbor View Drive New Construction	MID	233.9
3	RD07	White River Regional Network Improvement	MID	135.8
4	RD09	Vabae Regional Network Improvement	MID	120.7
5	BR03+ RD08	Lungga Bridge Widening Kukum Highway Upgrading	MID	141.1
6	BR04+ RD14	New Lungga Bridge Alternative Road Construction	MID	161.5

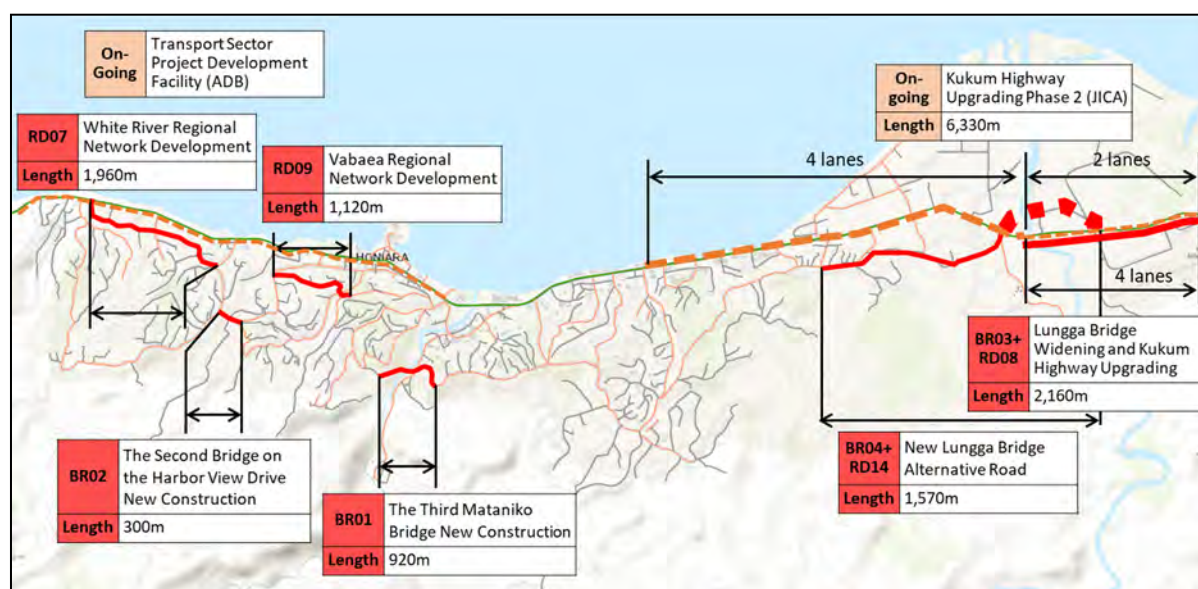


Figure 15-1 Location of Priority Projects for Road Network Development



Figure 15-2 Image of Proposed Third Mataniko Bridge (BR01)



Figure 15-3 Image of Proposed Second Bridge on the Harbor View Drive (BR02)



Figure 15-4 Image of Proposed White River Regional Network Improvement (RD07)

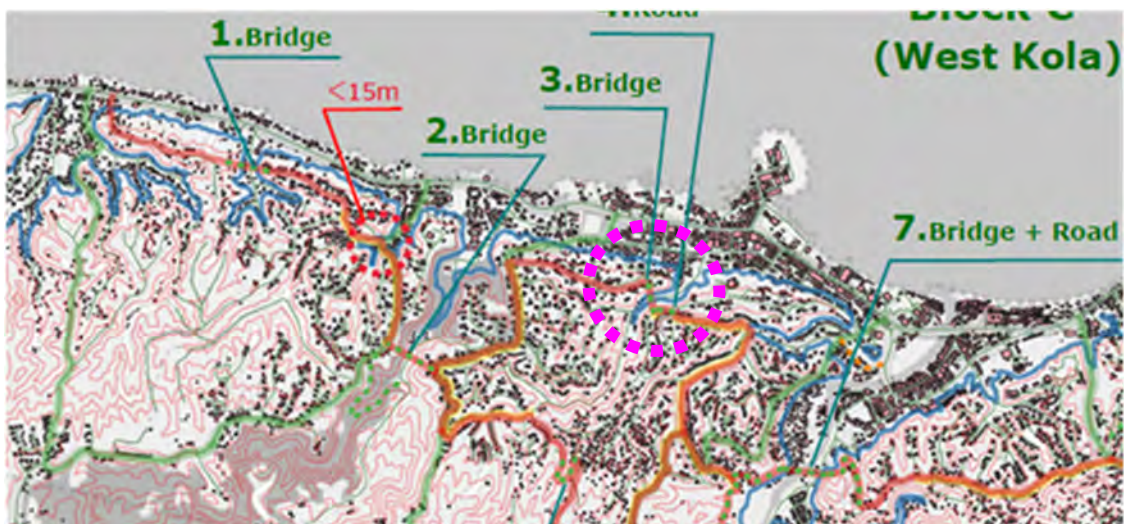


Figure 15-5 Image of Proposed Vabaea Regional Network Improvement (RD09)

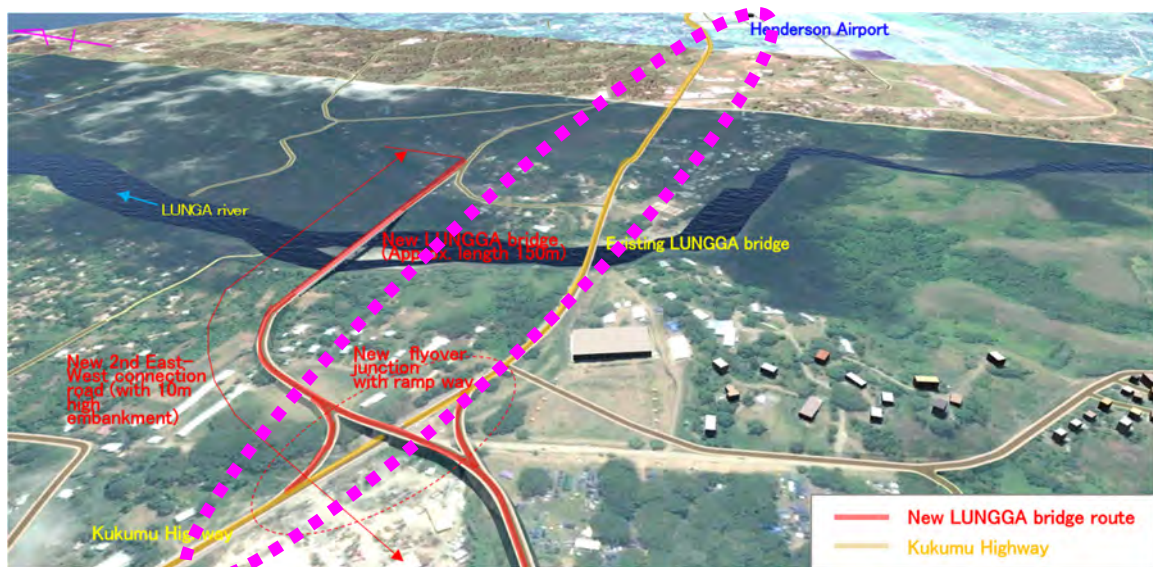


Figure 15-6 Image of Proposed Lungga Bridge Widening Kukumu Highway Upgrading (BR03+RD08)

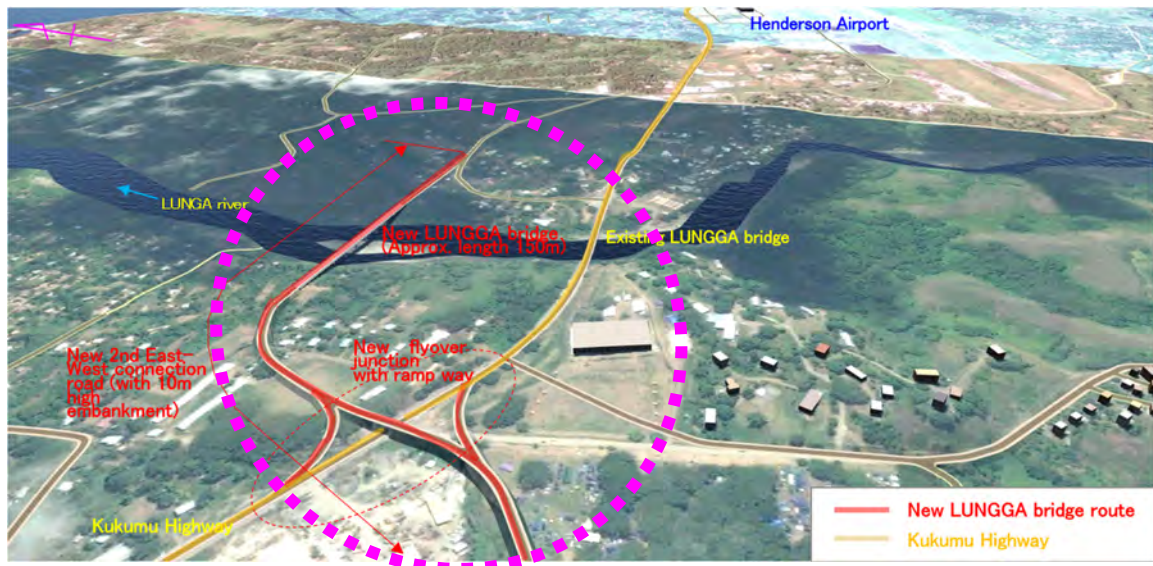


Figure 15-7 Image of Proposed New Lungga Bridge Alternative Road Construction (BR04+RD14)

The economic evaluation of the priority projects for road network development is summarized in the table below.

Table 15-2 Economic Evaluation Results of Priority Projects

Project	Rank			EIRR	BCR	NPV	Total Benefit (Mill. SBD)			Total Cost (Economic Value) (Mill. SBD)		ENPV (Economic Net Present Value) (Mill. SBD)	
	EIRR	BCR	NPV				Travel Time Cost Saving	Vehicle Operation Cost Saving	Environmental Emissions	Construction	Maintenance	Benefit	Cost
1. The Third Mataniko Bridge New Construction (BR01)	1	1	1	24.0%	3.33	758.5	5,058.9	355.0	65.3	311.5	351.2	1,083.6	325.0
2. The Second Bridge on the Harbor View Drive New Construction (BR02)	2	2	2	16.1%	1.97	295.6	3,124.6	67.4	41.0	292.7	330.1	601.3	305.4
5. Lungga Bridge Widening Kukum Highway Upgrading (BR03+RD08)	3	3	3	14.7%	1.55	100.4	1,220.5	29.8	10.5	176.4	198.9	284.4	184.0
4. Vabaea Regional Network Development (RD08)	4	4	4	13.9%	1.49	76.9	1,035.6	22.1	9.1	151.4	170.7	234.9	157.9
6. New Lungga Bridge Alternative Road (BR04+RD14)	5	6	5	12.9%	1.35	74.3	1,220.5	29.8	10.5	201.4	227.1	284.4	210.2
3. White River Regional Network Development (RD07)	6	5	6	12.3%	1.38	68.0	1,013.8	219.6	32.5	169.9	191.5	245.2	177.3

15.2 Priority Projects Other Than Road Network Development

Other priority projects focus on infrastructure development and technical assistance as shown in the table below. Photos of the priority projects are also shown.

Table 15-3 Priority Projects of Infrastructure Development and Technical Assistance

Code	Project	Lead Agency	Estimated Cost (Mill. SBD)
RD02	Improve intersections in the CBD	MID	4.0
RD03	New Lungga Bus Terminal Development	MID/ G Province	75.4
RD10	Central Bus Terminal Development	MID/HCC	226.3
RD12	Improve Road in the CBD	MID	750.7
TA01	Capacity Enhancement of Block Pavement Technology	MID	15.9



Figure 15-8 Proposed Intersection Improvement (RD02)



Figure 15-9 Proposed Lungga Bus Terminal Development (RD03)



Figure 15-10 Proposed Central Bus Terminal Development (RD10)



Figure 15-11 Proposed Improvement of Road in the CBD (RD12)



Figure 15-12 Block Pavement Technology (TA01)

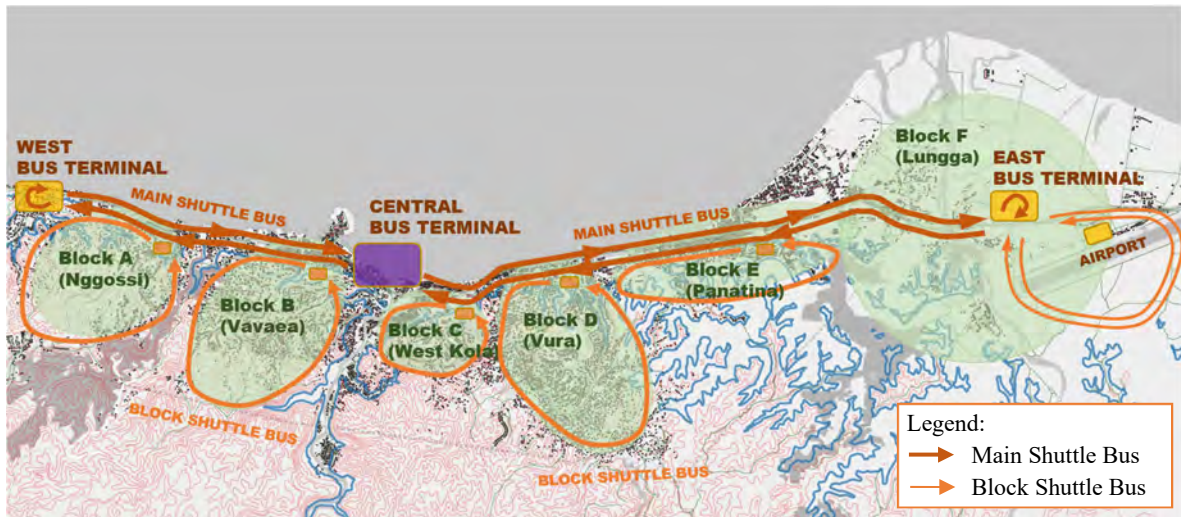


Figure 15-13 Trunk-and-Feeder System with Central, East and West Bus Terminals (TA02)



Figure 15-14 Image of Multi-story Car Parking in CBD (TA03)

CHAPTER 16 PILOT PROJECTS

16.1 Selection of Pilot Projects

Two pilot projects were conducted in this study as a demonstration of immediate transport countermeasures: (1) Inter-Locking Block Pavement (ILBP) as an alternative construction material for road pavement, and (2) pedestrian guide at Holy Cross Cathedral crossing as a countermeasure for pedestrian and road safety.

16.2 Pilot Project 1: Inter-Locking Block Pavement (ILBP)

The Solomon Islands face difficulties in keeping road in good condition. Since Solomon Islands are remote, they have to import most construction materials and equipment from other countries to upgrade roads. ILBP was investigated as an alternative construction material for road pavement given that it has the following features:

- Durability: Good quality of blocks to secure durability of road pavement.
- Job creation: Since the construction and maintenance is labor intensive, citizens can be involved in road construction and maintenance activities easily.
- Local production: Quality of blocks can be secured at factory and MID test, even there is no company producing them in Solomon at now, some companies have ability to do.
- Secondary or lower-level road pavement: ILBP is suitable for secondary or lower-level roads but not for high-speed roads in Solomon Islands



Figure 16-1 Inter-Locking Block Pavement Pilot Project

The pilot project aims to introduce ILBP for secondary roads as the standard MID road specification in the Solomon Islands. It was conducted in a section of the road between Mendana Avenue and Hibiscus Avenue. Trial construction started in July 2020 and the full inspection was completed in December 2020. ILBP blocks were required to have a strength of 20 MPa or higher and a thickness of 75 mm with a tolerance of ± 2.5 mm. The construction works measured 100 m by 5.5 m, with site clearance, protection of existing utilities, earthworks, road pavement works, sidewalk works, roadside drainage works, and fulfillment of environmental and safety requirements. The ILBP pilot project was conducted in cooperation among the Contractor, MID, regional governments and JST.

The Work was implemented as per specification. Some data were obtained for further study to utilize ILBP with various type of site condition, design requirement. The Pilot Project was implemented with the simplest site circumstance, design and other project requirement. In order to promulgate the ILBP as standard engineering solution to Solomon Islands, the followings issues should be further introduced and enhanced for both Solomon Islands Government and Private sectors.

i) Design:

- Type of Interlocking Block
- Quality control of Interlocking Block
- Type of ILBP design

ii) Cost Estimate:

- Standard Norm system
- Standard Price system
- Standard Cost Estimate methodology

iii) Construction:

- Methodology of Interlocking Block production.
- ILBP construction methodology
- Standard procedure of ILBP in various design
- Quality control guideline
- Safety and Environmental control guideline

iv) Construction site

- The pilot project of inter-locking block pavement with a length of 86.6 m and a width of 5.5 m (of which the sidewalk width is 1.0 m) was constructed between Mendana Avenue and Hibiscus Avenue.
- Site clearance, protection of existing Solomon Water, Power and Telecom, Earth Works, Road Pavement Works, Side Walk Works, Road Side Drainage Works, Safety and Environmental requirements were properly implemented.
- The mold for blocks was imported from China, but due to the influence of COVID-19, it was delayed by 4 months from the original schedule.
- No accident, incident and near miss was reported during entire work.
- The supervising of construction work conducted remotely because of COVID-19.
- During the whole work process and as of completion inspection, the works were found to be carried out as per design, TOR, approved method of statement/shop drawings and Statutory requirement.

v) Evaluation from road users

- Interview surveys of 200 persons in fine and rainy weather indicated that more than 95% rated it as "Excellent". It is almost 100% including "Very Good". Positive comments and requests for improvements such as pedestrian safety measures and anti-littering measures were also solicited.

16.3 Pilot Project 2: Pedestrian Guide at Holy Cross Cathedral Crossing

Pedestrians intermittently cross at Holy Cross Cathedral Crossing, hence, vehicles are forced to wait for long time and the vehicle queue length tends to be long, especially at the peak times.

As a first step of improvement, it is proposed to manage pedestrian crossing by the crossing guide to rectify traffic movement. Two pedestrian crossing guards were stationed on each side of the road.

The pilot project of Pedestrian guide was conducted from February 4-5, 2020 for the pre-traffic surveys and February 11-13, 2020 for the pilot project and traffic surveys.

The pre-traffic survey and traffic survey results showed that pedestrian guides are effective for reducing traffic queue length by managing pedestrians. In particular, it reduced the queue length in a direction to roundabout and hill side in the evening period. On the other hand, there was no significant improvement in the queue length to hill side in the morning.

One of the reasons is that vehicles from/to HCC parking area is located near the crossing point disturbs main traffic flow. Another reason is that other obstacles other than the crossing point cause congestion. As countermeasures, guardrails and clear markings are also recommended as well as traffic lights.

Moreover, traffic signals are positively accepted by pedestrians according to the interview survey results. For installation of traffic lights in future, 20-25 seconds for waiting vehicle and 10-15 seconds for waiting pedestrian is enough to pass in peak period based on video analysis.



Figure 16-2 Location of Holy Cross Cathedral Crossing



Figure 16-3 Pedestrian Guide Pilot Project



Figure 16-4 Proposed Road Safety Countermeasures (Image)