

# URBAN TRANSPORT MASTER PLAN

## For Colombo Metropolitan Region and Suburbs



Democratic Socialist Republic of Sri Lanka  
Ministry of Transport



Japan International Cooperation Agency



Oriental Consultants Global Co., Ltd.

## Urban Transport Problems and Planning Issues in Colombo Metropolitan Area

Colombo is the most developed city in the Western Province of Sri Lanka. Colombo Metropolitan Area (CMA) is set around Colombo and defined by:

- 1) areas that are already urbanised and those to be urbanised by 2035, and
- 2) areas that are dependent on Colombo.

The urban transport master plan is formulated for CMA.

**CMA;** Area: 996 km<sup>2</sup> /Population: 3.7 million (2012), 5.1 million (2035 projection)

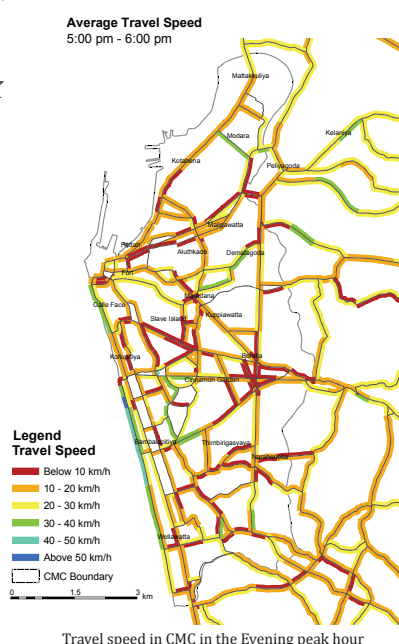
Traffic congestion has been worsening in recent years on the road network in the central area of CMA. Traffic congestion has brought about huge economic losses by increasing vehicle operating cost as well as the economic cost of travel time.

### Low Level of Public Transport Service

The level of service of the public transport in CMA has deteriorated causing a shift to private modes of transport.

### Insufficient Road Network

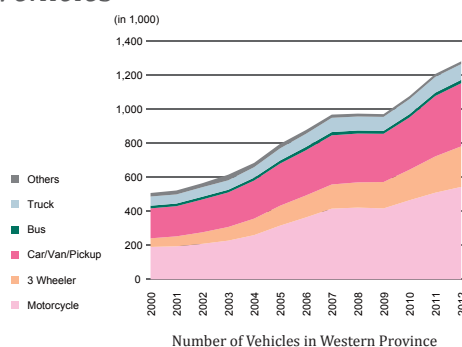
Road network capacity is not sufficient and has not caught up with the increase of private vehicle ownership. The road density in suburban area, in particular, is still low and requires road widening and new road construction.



### Increased Number of Vehicles

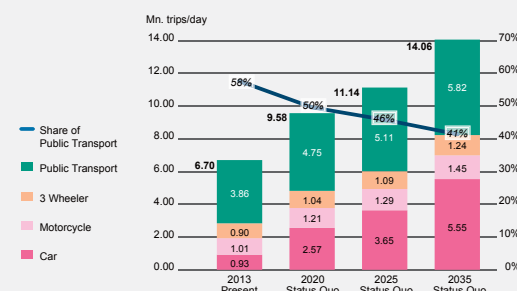
The number of vehicles increased 2.5 times since the year 2000.

In particular, motorcycles and 3-wheelers showed a significantly rapid increase.



### Future Transport Demand Increase

Due to the population increase and increase of expected real household income, traffic demand made by private modes of transport is anticipated to grow rapidly and will result in further traffic congestion and related problems. In 2035, the total person trip production in the CMA would increase to almost 14.1 million person trips per day, which is approx. 2 times the present demand of 6.7 million person trips per day as illustrated in Figure below.



### Anticipated Modal Shift

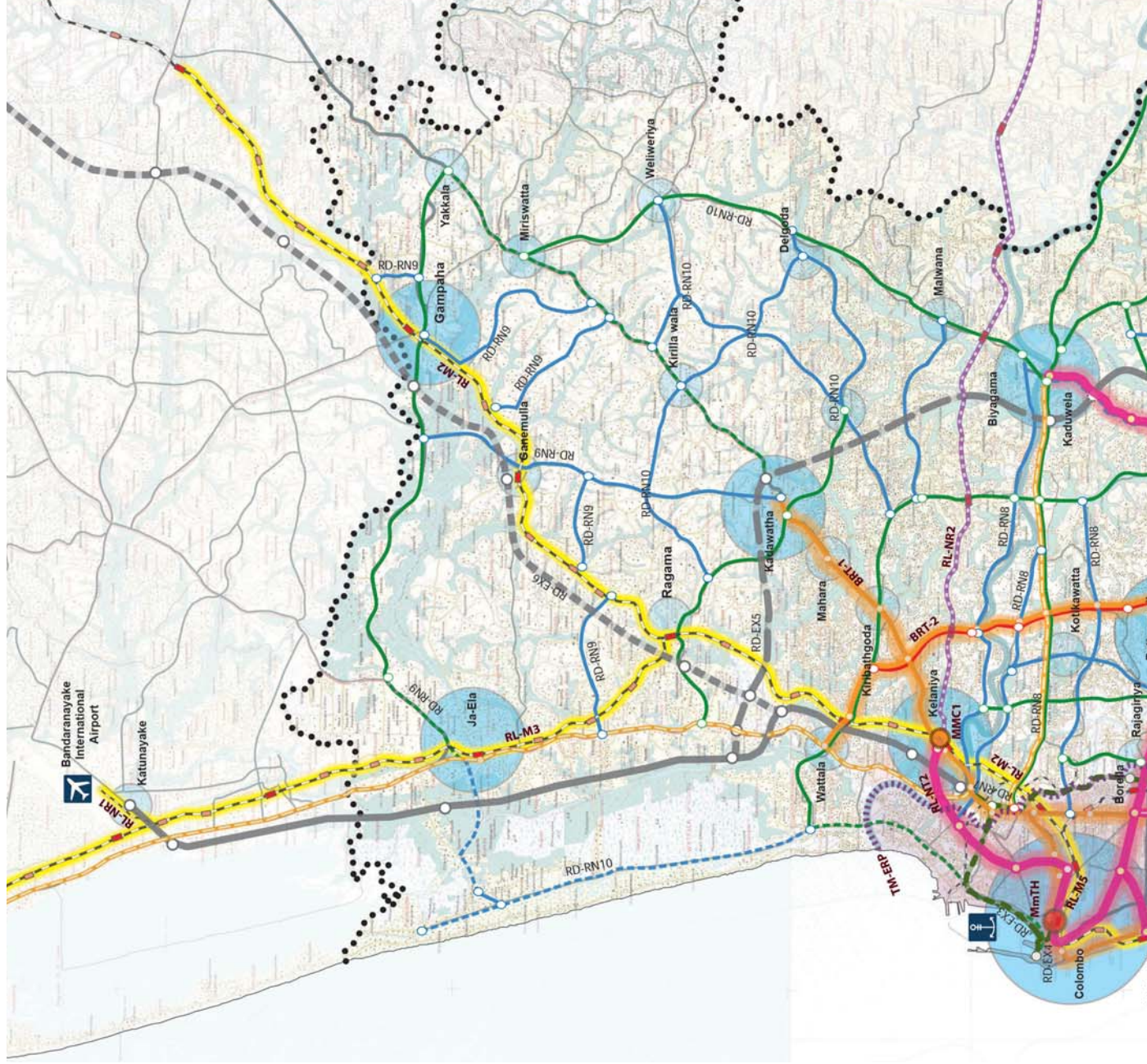
If no effective actions are taken in the future, shift to private modes of transport would be made and the share of public transport would decrease from 58% in 2013 to 41% in 2035.



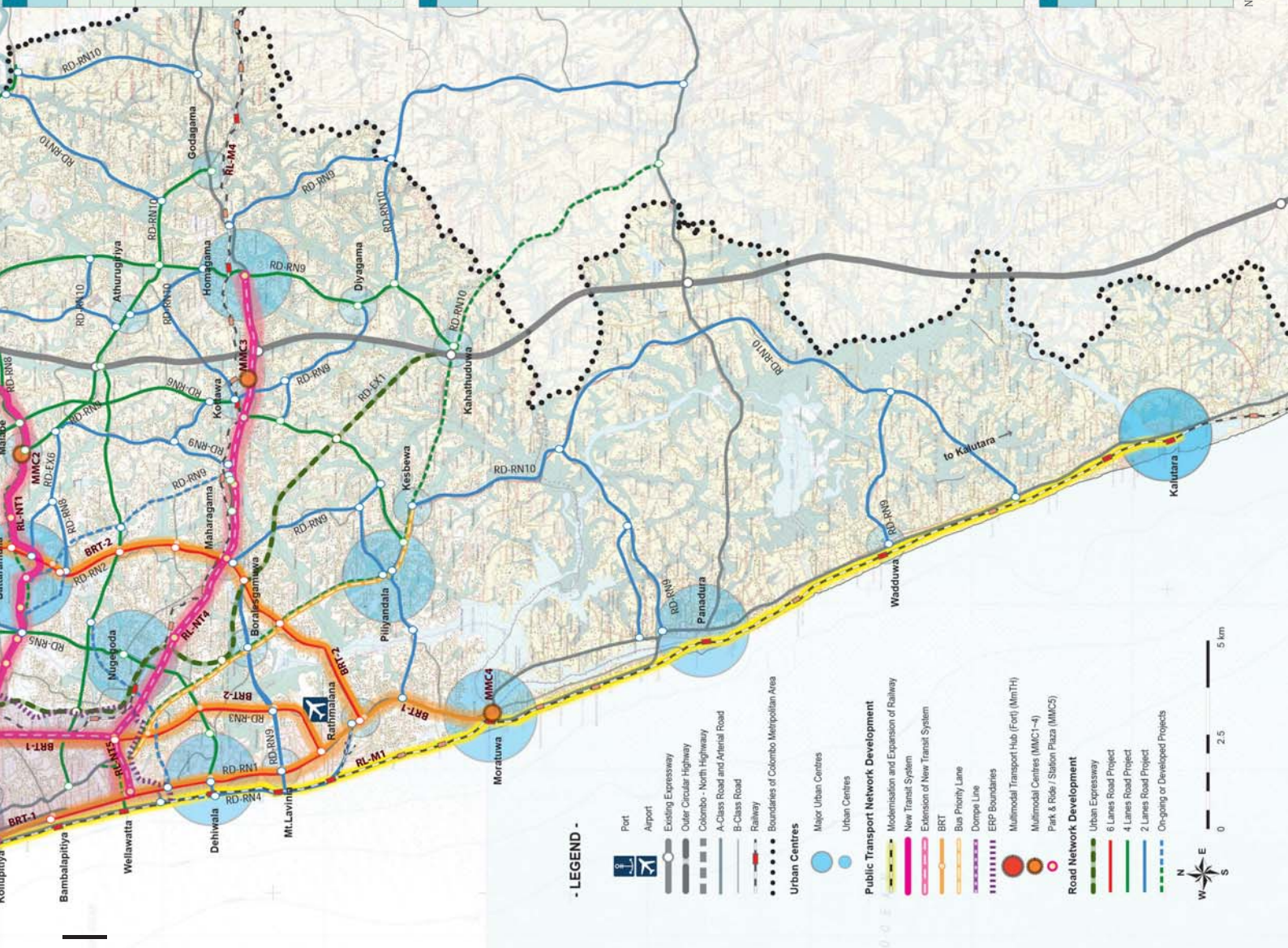
# ComTrans Urban Transport Master Plan and Urban Structure (2035)

Road		Project Name / Description	Length (km)
ID			
RD-RN1	Provision of Road Space for Introducing BRT	Galle Road Widening for BRT Corridor	14.8
RD-RN2	Securing Space for Future Development of BRT	Development of Middle Ring Road for BRT Corridor	30.2
RD-RN3	Provision of Alternate Road for Introducing BRT	Baseline Road Extension	6.2
RD-RN4		Marine Drive Extension	5.3
RD-RN5		Western Ring Road	22.8
RD-RN6	Enhancement of Traffic Distribution	Eastern Ring Road	50.6
RD-RN7	Function of Road Network	Connection between CKE-Kelani Bridge (New)-Kelanitissa JCT	2.3
RD-RN8	Enhancement of east-west connection	East-West Roads	60.1
RD-RN9	Support on feeder services for railway and monorail	Access Roads to Railway/ Monorail Station	89.1
RD-RN10	Development of Suburban Arterial Road		135.4
RD-FO	Construction of Flyover *		
RD-EX1		Urban expressway-1: Connection between SEW and CKE	25.5
RD-EX3	Construction of New Urban Expressway	Urban expressway-3: Port Access	5.0
RD-EX4		Urban expressway-4: Access to MmTH at Fort station	0.8
RD-EX5		Outer Circular Highway: 3rd Section	9.2
RD-EX6		Northern Expressway	20.0

Bus / BRT		Project Name / Description	Length (km)
ID			
BRT-1	BRT Installation Phase - 1	Route 1: Fort - Moratuwa Route 2: Fort - Siebel Avenue Route 3: Fort - Kadawatha Route 4: Kiribathgoda - Wellawatta	45.7
BRT-2	BRT Installation Phase - 2	Route 5: Borella - Moratuwa Route 6: Wattala - Maharagama Route 7: Battaramulla - Moratuwa	38.8
BT-1 / BT-2	Improvement of Bus Terminals *		
B-ST1	Improvement of Bus Stop *		
B-CD1	Capacity Development *		







Traffic Management			Length (km)
ID	Project Name / Description		
TM-BL1	Bus Location System for BRT and Public Transport Priority System (PTPS) *	BRT Section/Phase1	
TM-BL2		BRT Section/Phase2	
TM-BL3		Bus Location System for Buses *	
TM-S1	Phase-1: Development of the central control room. Improvement of traffic signal control along the Priority Route to the 2nd Priority Route		
TM-S2	Traffic Signal Installment *	Construction of Arterial Roads and Upgrading of Road:16	
TM-S3		Construction of Arterial Roads and Improvement at current congestion points	
TM-S3		Construction of Arterial Roads and Upgrading of Road:101	
TM-TT1	Traffic Information System *		
TM-P1	Parking Information System *		
TM-ERP	ERP System		

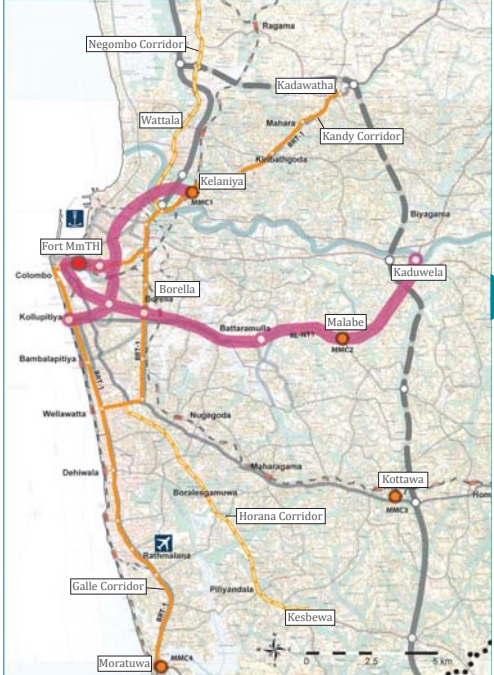
Railway			Length (km)
ID	Project Name / Description		
RL-M1	Modernisation of Existing Railway & Construction of New Railway Line Coast Line (Colombo Fort - Kalutara South)	Replacing signaling system Electrification (double track) Procurement of new train Construction of third line and track layout improvement	42.5 42.5 42.5 42.5
RL-M2	Modernisation of Existing Railway Main Line (Colombo Fort - Veyangoda)	Replacing signaling system Upgrade existing track (double track) Electrification (double track)	37.6 37.6 37.6
RL-M3	Modernisation of Existing Railway Puttalam Line (Ragama - Negombo)	Procurement of new train Replacing signaling system, Electrification, Track layout improvement, Procurement of new train	37.6 23.3
RL-M5	Modernisation of Existing Railway Main Line (Colombo Fort - Maradana)	Improvement of train operation	4.0
RL-NR1	Airport Connection Construction of New Railway Line (Katunayaka South - Airport Terminal)		2.2
RL-NR2	Dompe Freight Line Development		
RL-NT1	New Transit System	Monorail [Phase 1]	23.0
RL-NT2		Monorail [Phase 2 - 1]	11.9
RL-NT3		Monorail [Phase 2 - 2], Additional Rolling Stocks *	
RL-NT4		Monorail [High Level Road]	19.7
RL-NT5	Station Facility Improvement *	Connecting line of Monorail [HL] and Coastal Line	3.4
RL-SF1			
RL-SP1	Spare Parts, Coach Renewals *		

Transport Interchange Facility			Length (km)
ID	Project Name / Description		
MMTH	Multi-modal Transport Hub	Fort/Pettah MmTH	
MMC1		Kelaniya MMC	
MMC2	Multi-modal Centre	Malabe MMC	
MMC3		Makumbra MMC	
MMC4		Moratuwa MMC	
MMC5	Park & Ride Facility		

Note: GKE - Colombo Katunayaka Expressway / SEW - Southern Expressway.  
\* : Projects Marked with " \* " are not shown on the map.



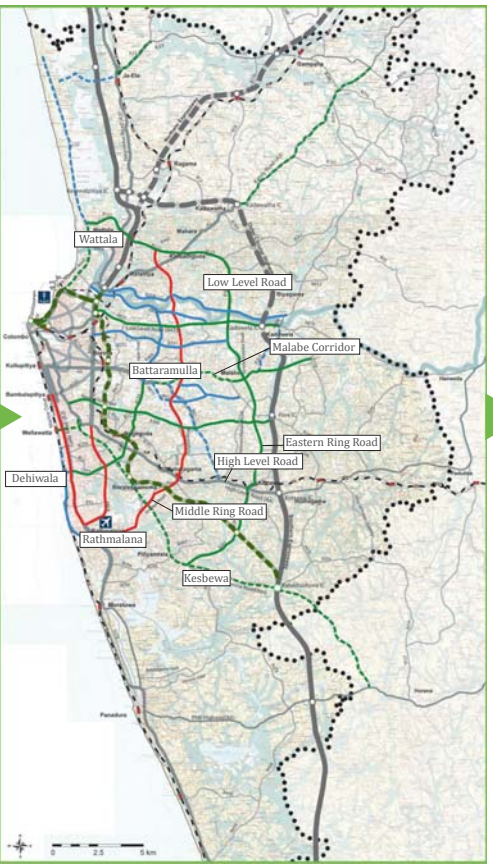
Short Term Development Plan (-2020)



Intermediate Term Development Plan (- 2025)



Long Term Development Plan (- 2035)



# Public Transport Development Plan

## Short Term Development Plan (-2020)

The Monorail Network will connect between the northern area of the Colombo Municipal Council (CMC) and Fort area to provide smooth north-south passenger movement within the central area of CMC. As the first step to improve public transport services, a BRT system will be installed in Galle Corridor, Kandy Corridor, and Baseline Road where the BRT system can be installed physically with sufficient road width and potential public transport passenger demands. In addition, in Horana corridor and Negombo corridor, where it is difficult to install BRT, a Bus Priority System will be introduced and connected with the BRT network, monorail network, and the existing railway. This can realise an integrated urban public transport network even in the early stages. In order to make the public transport system more attractive and effective for use, a Multi-modal Transport Hub (MmTH) at Fort/Pettah will be built to ensure a smooth transfer to various transport modes and to provide good access to the urban centre. A Multi-modal Centre (MMC) will also be built in each of the four locations at the end points of major corridors connected by public transport.

## Intermediate Term Development Plan ( - 2025)

Modernisation and extension of the existing railways shall be completed. This implies that the development of the mass transit system will be materialised. With this development, the MMCs which are planned to be developed in the short-term will be more efficient and effective. A BRT System shall be installed on the Middle Ring Road which connects Rathmalana, Battaramulla and Wattala, and it will provide public transport service between subcentres directly, not via the centre of CMC.

## Long Term Development Plan (- 2035)

The Monorail System will be installed on the High Level Road and it will connect to other public transport systems to meet future transport demand.

## Road Development Plan

### Short Term Development Plan (-2020)

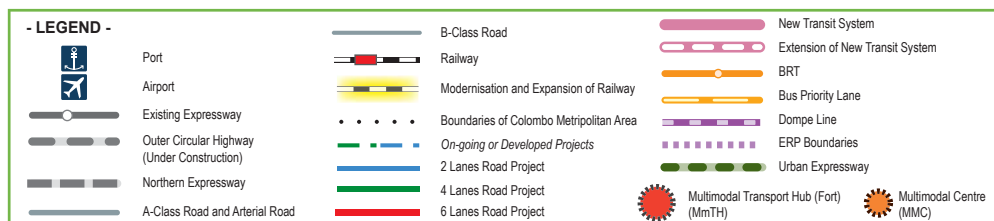
The new Elevated Road connected from Colombo Katunayake Expressway (CKE) via new Kelani Bridge to Colombo port will be constructed to prevent container trailers and port-related vehicles from running on ground level roads. In addition, once the said port-access elevated road is connected with MmTH by a Direct Access Ramp, inter-provincial buses can enter directly to the elevated road and further expressways. On-going road widening/extension projects are essential on major corridors to ensure the road traffic capacity. Especially, the Marine Drive to Dehiwala extension project and western ring-roads connected with Dehiwala, Nugegoda, and Battaramulla by two-lane road creates the diversity of route selection to major future destinations of Battaramulla. In addition to the road developments mentioned above, the urban transport master plan aims to alleviate traffic congestion, especially at peak hours, by the improvement of traffic management including traffic signal improvements at major intersections with area control systems, as well as the Traffic Demand Management (TDM) and Mobility Management (MM) for the purpose of the improvement of people's consciousness and changes in the time required for commuting. For traffic safety issues on walking environments, inter-ministerial/institutional coordination and collaboration are essential to provide enough space for sidewalks and to reduce traffic accidents

### Intermediate Term Development Plan ( - 2025)

New major roads towards CMC will be constructed which run in the east-west direction, parallel to the Malabe Corridor, High Level Road and Low Level road, so that the current concentrated traffic flow on those three corridors can be distributed. Road traffic capacity on the Galle corridor will be supplemented by Marine Drive extension for southbound traffic from Dehiwala to Rathmalana. The Base Line Road will also be extended to Rathmalana, to provide an additional route in the eastern side of CMC from Galle road. Development of the three Ring Roads as arterial roads will provide alternative routes for various trip demand movements within the metropolitan area. It will provide a detour for the Base Line road when it is congested. The Urban Expressway will connect the south side of Kelani Bridge via the CMC boundary and the Southern Expressway, so that ample traffic capacity will be provided for long-distance interprovincial travel as well as trips from the suburbs to the city centre. An Electronic Road Pricing (ERP) system as a measure of TDM shall be introduced for the heavily congested area to control private vehicle traffic entering the restricted area and to encourage drivers to shift to public transport services.

### Long Term Development Plan (- 2035)

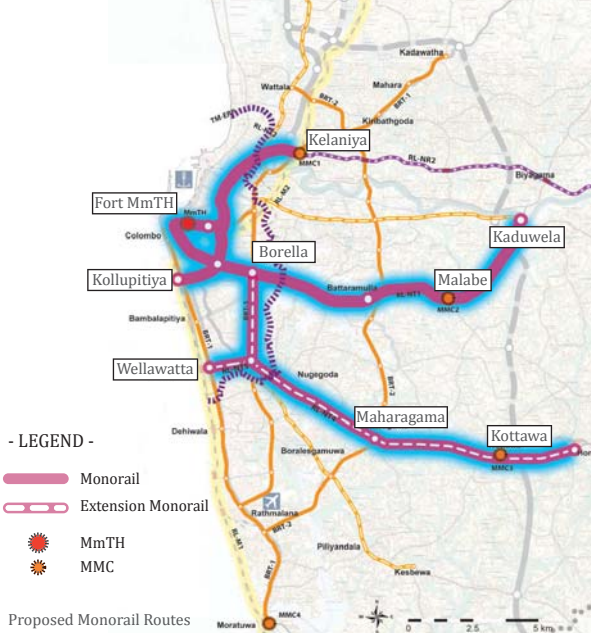
Continuous efforts to improve the accessibility by Road to Railway Stations will be made to create a more user-friendly rail-based public transport system. As the function of the basic road network in suburban areas in terms of distributors, disaster prevention and basic infrastructure to form a good urban environment, two lane roads shall be installed at intervals of 1 or 2km in the area between corridors.





## Monorail system development with MmTH, MMC and Park & Ride system

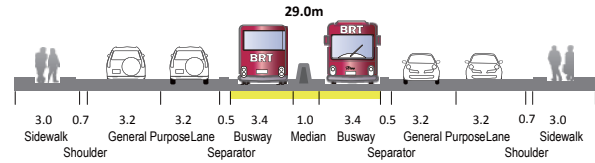
Monorail system will be installed in the Malabe Corridor where significant passenger demand is observed but the majority of people use private passenger cars.



## Introducing BRT System

To supplement the Monorail network and the Railway network, BRT is proposed to be installed in the Goal Road Corridor, Base Line Road and its extension, Kandy Road and the proposed Middle Ring Road.

Cross Section with Dedicated Bus Lanes



Jakarta

- LEGEND -

BRT Route

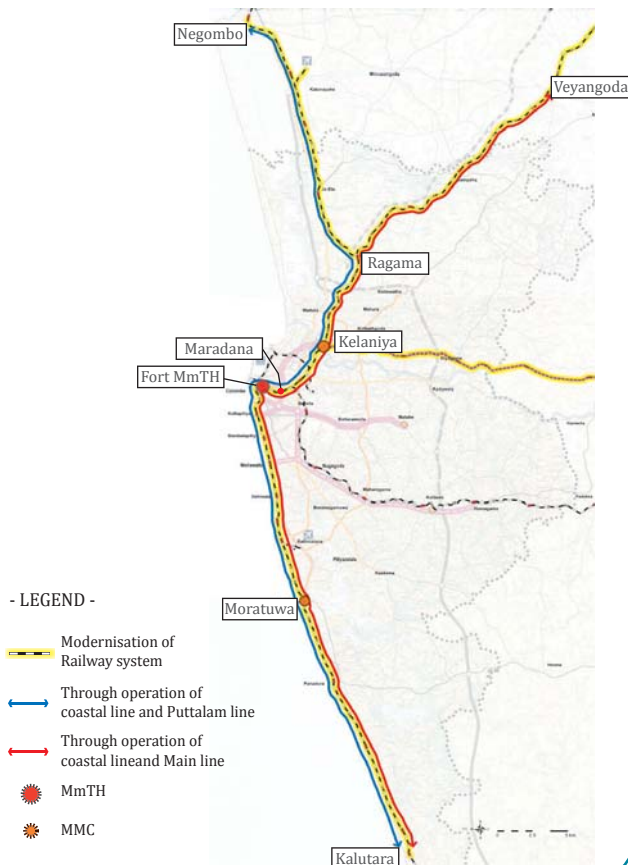
- Route 1
- Route 2, 3, 4
- Route 3, 4
- Route 5
- Route 6, 7
- MmTH
- MMC

Proposed BRT Routes



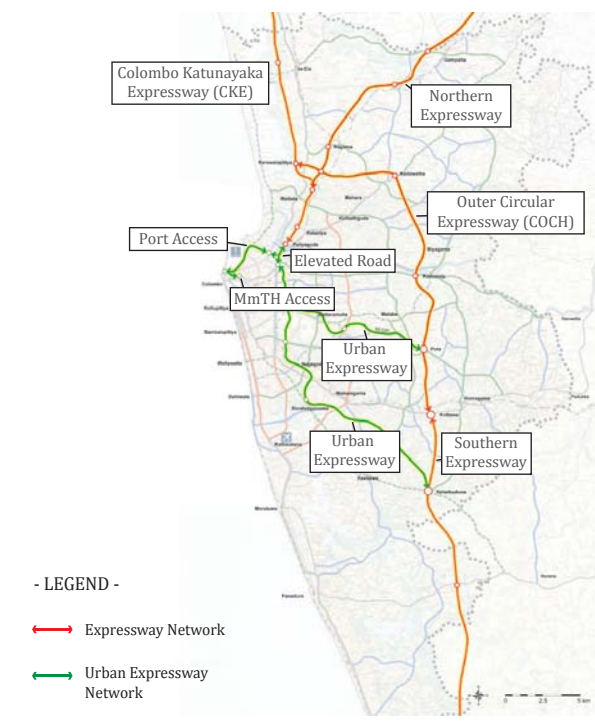
## Modernisation of Railway System

To deal with increasing passenger demand, modernisation of the railway system is essential. Through operation is recommended in Fort and Maradana section.

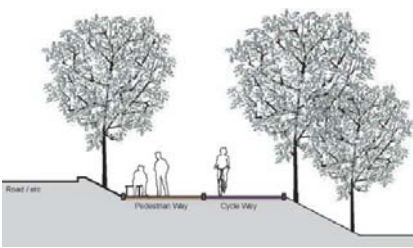


## Expressway Network Development

It is proposed to develop arterial roads in east-west directions and circumferential direction. In addition, to provide convenient access to the city centre from the inter-regional expressway, it is proposed to develop urban expressways. At the same time, road development shall support the public transport system, such as Road widening for BRT and a direct access ramp to MmTH from Port Access Road.



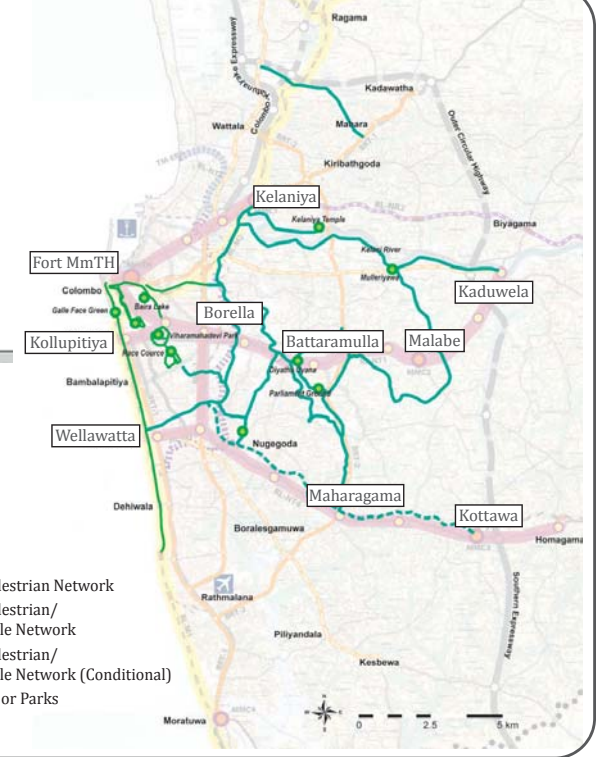
## Pedestrian Path and Bicycle Road Development



Walking and bicycling are non-motorised modes of transport that do not consume fuel. Thus, these modes are considered to be environmentally friendly means of transport. Recently, walking and bicycling has become popular since walking and bicycling are good for health. Moreover, they contribute to improve traffic safety for pedestrians. It is proposed to develop a pedestrian network as well as a pedestrian/bicycle network. The network connects parks and Beira Lake in the city centre and is located along the wetlands, coastal line, and Kelani River.

- LEGEND -

- Pedestrian Network
- Pedestrian/Cycle Network
- Pedestrian/Cycle Network (Conditional)
- Major Parks



## Implementation of CoMTrans Urban Transport Master Plan

### Total Cost for CoMTrans Urban Transport Master Plan

The total investment cost over the planning period from 2015 to 2035 is estimated at Rs. 2,780 billion, 59% of the total is for net investments and 41% for implied O&M cost.

### Investment Cost and O&M Cost of CoMTrans Urban Transport Master Plan

Unit: million RS				
Cost	Short	Intermediate	Long	Total
Investment	741,100	598,100	300,900	1,640,100
O & M Cost	237,200	264,400	693,200	1,140,800
Total	978,300	862,500	994,100	2,780,900

Source: CoMTrans Estimates

### Institutional Setup for CoMTrans Master Plan Implementation

CoMTrans suggests the establishment of an Urban Transport Council under the President in line with the National Transport Policy. The council is expected to be a central high-level body that represents all main political decision-makers in urban transport, including the Western Provincial Council. The members consist of appropriate ministers and/or deputy ministers from the national government and the chief minister or transport minister of the Western Province Council.

The function of the council includes

- To coordinate and to govern all the components of urban transport.
- To support and to recommend budget allocations on urban transport in CMA to the funding agency Ministry of Finance and Planning.

The council must be established as a standing council until its functions are transferred to the envisaged urban transport authority in the future.

### Benefits of CoMTrans Urban Transport Master Plan

The benefits of CoMTrans Master Plan have been estimated in various areas; (those benefits are the difference between “with” and “without” scenario)

- CO<sub>2</sub> emission would be reduced by 8.3 million tons.
- Loss due to traffic accidents would be reduced by Rs. 1.1 billion.

It’s also estimated that Public Transport Service Area would cover 1.4 million people. Although total cost would amount to Rs. 2,780 billion, economic benefits could exceed the total cost. The net present value (NPV) would be Rs. 797 billion and the economic internal rate of return (EIRR) would be estimated at 22.9%.

### Fund Raising for CoMTrans Master Plan Implementation

If it is assumed that the maximum allocation to the urban transport sector is 2% of GRDP in the Western Province, in the short term, a shortage of development funds is expected. Consequently, to fill the gap between the government budget and amount required for investment, it should consider utilising external financial sources such as ODA for short term. For reducing the burden on the public budget, private sector involvement should be taken into account for transport infrastructure development as well as for public transport service provision.

## Objectives for Urban Transport Development

*The analysis of the present urban transport problems and the planning issues in the CMA has led to the identification of four major objectives which the urban transport system development needs to pursue.*

Equity in Transport to All the Members in Society and Affordability of Public Modes of Transport

Efficiency in Transport Systems to Support Economic Activities

Environmental Improvement and Health Promotion related to Transport

Traffic Safety and Security in Transport

## Urban Transport Policy

*To achieve the four different objectives for transport system development, the following transport policies are essential for the CMA. These four transport policies are inter-related. The promotion of public transport is a principal measure to reduce dependence on private modes of transport.*

Promotion of Public Transport Use

Alleviation of Traffic Congestion

Reduction of Traffic Pollutants/Traffic Noise and Promotion of Health

Reduction of Transport Accidents and Improvement of Security

## Urban Transport System Development Programmes

*The various policy measures proposed to achieve the urban transport policies and major projects of CoMTrans Urban Transport Master Plan are listed below;*

- Extensive Development of Quality of Public Transport Network
  - Enhancement of Intermodality (Development of Multi-modal Transport Hub, Multi Modal Centre and Park and Ride Facility)
  - Modernisation of Sri Lanka Railway Main Line, Coast Line and Puttalam Line (Electrification, Direct Operation, Improvement of Existing Railway Facilities)
  - Development of New Rail-based Transit System
  - Introducing Bus Rapid Transit (BRT) System
  - Transit Oriented Development (TOD) in the Surrounding Area of Railway Stations
  - Construction of Arterial Roads to accommodate BRT
  - Reformation of the Bus Operation Regime
- 
- Road Widening to Increase Road Traffic Capacity
  - Construction of Flyovers and Underpasses at Bottleneck Intersections
  - Arterial Road Development in Suburban Areas
  - Urban Expressway Network Development
  - Transport Demand Management (TDM)
  - Traffic Control Improvement
  - Secure Lands for Road Development (Road Network Master Plan)
  - Separation of Heavy Vehicles from General Traffic (Port Access Road)
- 
- Establishment of Environmental Management Scheme
  - Establishment and Enhancement of Air Pollutant/Noise Emission Standards
  - Enhancement of Vehicle Inspection and Maintenance Programme
  - Low Sulphur Diesel Programme
  - Promotion of Hybrid Cars and Electric Vehicles
  - Promotion of Natural Gas Vehicles
  - Promotion of Walking and Bicycles for Health
- 
- Education on Traffic Safety
  - Rehabilitation and Installation of Traffic Signals
  - Rehabilitation of Railway Signal System
  - Analysis on Causes of Traffic Accidents
  - Provision of Sidewalks and Pedestrian Crossing
  - Establishment of Urban Road Design Standard including Sidewalk
  - Improvement of Security of Women and Children in Public Transport

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