Improvement of Urban Transport System in Colombo Metropolitan Area

The way forward

Colombo Metropolitan Transport Master Plan and Areas for International Cooperation

Presented by;

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Ministry of Transport
Sri Lanka

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Colombo Metropolitan Area (Colombo City and the suburbs)
Urban Transportation - General Overview

- Being the largest city and the Capital of Sri Lanka, Colombo attracts more than 1 million daily commuters by 160,000 vehicles.

- Travel demand in the city is rapidly increasing due to increased mobility of the people after 30 years of war, ongoing massive urban development projects and increased number of privately owned vehicles with economic growth of the country.

- Modal share of public transport is decreasing rapidly. (*in 2004, 67% - in 2013, 58%*)

- Average speed of vehicles in peak time in major transport corridors falls below 10km/h.
Colombo Metropolitan Area (CMA)  
995.5 sq.km (27% of Western Province)

Note) CMA area was identified in CoMTrans Study

<table>
<thead>
<tr>
<th>District</th>
<th>No. of DSDs in CMA</th>
<th>Land area Sq.km</th>
<th>Population Mn (2012)</th>
<th>Population density per sq.km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colombo</td>
<td>11</td>
<td>429.1</td>
<td>2.131</td>
<td>4,966</td>
</tr>
<tr>
<td>Gampaha</td>
<td>6</td>
<td>386.3</td>
<td>1.101</td>
<td>2,850</td>
</tr>
<tr>
<td>Kalutara</td>
<td>3</td>
<td>180.1</td>
<td>0.449</td>
<td>2,493</td>
</tr>
<tr>
<td>Total /Avg.</td>
<td>20</td>
<td>995.5</td>
<td>3.682</td>
<td>3,436</td>
</tr>
</tbody>
</table>
At present, due to variety of reasons, urban transport system of the CMA cannot satisfy the mobility needs of the people efficiently.

- **Traffic congestion in Greater Colombo area**
  
  *The congestion cost is estimated around 12 billion per annum with consideration of peoples’ journey time while wasting their valuable time and other resources.*

- Shortage of parking spaces in urban areas
- Inadequate pedestrian walkways and facilities
- High rate of road traffic accidents
- Energy inefficiency and increased air pollution
- Lack of comfort, efficiency and safeness in public transport services
- Insufficient and unregulated para transport infrastructure facilities
Per Capita CO$_2$ Emissions in Transport Sector in 2012

kilogrammes CO$_2$/capita

Source: International Energy Agency 2014
New Registration of Motor Cars by Fuel Type in Sri Lanka

- Petrol
- Diesel
- Hybrid

<table>
<thead>
<tr>
<th>Year</th>
<th>Petrol</th>
<th>Diesel</th>
<th>Hybrid</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>23000</td>
<td>3000</td>
<td>1000</td>
</tr>
<tr>
<td>2013</td>
<td>15000</td>
<td>5000</td>
<td>2000</td>
</tr>
<tr>
<td>2014</td>
<td>10000</td>
<td>1500</td>
<td>3000</td>
</tr>
</tbody>
</table>
Urban Transport System Development Project for Colombo Metropolitan Region and Suburbs (CoMTrans) 2012 – 2014
Prepared under JICA Technical Cooperation

Urban Transport Master Plan for Colombo Metropolitan Region and Suburbs (towards 2020, 2025, and 2035)

Vision
Shaping the Future of Urban Transport System in Colombo Metropolitan area and the Suburbs by Promoting Public Transport System
Population Growth Patterns in Western Province

Annual Growth Rate 2001-2012

- Population is increasing in the areas to the east of CMC, while the growth rate is less in the CMC area.
- This can be explained by the changes in land use – in CMC inner city area commercial activity is increasing and in the suburbs to the east, residential activity is increasing.

Source: DCS
Calculated by CoMTrans
- Concentration of mixed development projects in Colombo center
- Relocation of government agencies and Defence complex in Battaramulla
Rapid Increase of Private Vehicles

No. of Vehicles* in the Western Province (in 1,000)

AAGR = 8.0%

*The number of motor vehicles with valid revenue licenses.
Migration from Public to Private Transport

Unit: 1,000 Passengers per day, Both Direction

Historical data for passenger flow at CMC boundary (1985 – 2013)

Public Transport (Bus and Railway) are losing their modal share.

Private Modes are significantly increasing.

* Total passengers at CMC boundary at all survey location was 2.1 million passengers per day (both direction).

For the comparison purpose, survey locations surveyed in ’85, ’95 and ’04 were selected.
The number of car trips will increase a factor of **6 in 30+ years**.

Is it possible to increase the road capacity to 6 times of current level?

Note: Travel speeds are assumed to be as same as 2013 condition.
Seven Transport Corridors have been identified as most important corridors taking transport volume, urbanization level, population density and network function into consideration.

Population within suburban area within 10km from CMC boundary, buffered area is set with 1km width on both sides of each roads. Census population data by GN division in 2012 is used.
Public Transport Development Options

<table>
<thead>
<tr>
<th>Transport Mode</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRT</td>
<td>Nagoya, Japan</td>
</tr>
<tr>
<td>AGT</td>
<td>Tokyo, Japan</td>
</tr>
<tr>
<td>Monorail</td>
<td>Okinawa, Japan</td>
</tr>
<tr>
<td>LRT</td>
<td>Manila, Philippines</td>
</tr>
<tr>
<td>MRT-Elevated</td>
<td>Bangkok, Thailand</td>
</tr>
<tr>
<td>MRT-Underground</td>
<td>Delhi, India</td>
</tr>
</tbody>
</table>

Passengers per hour, per direction (PPHPD)

Which transport mode will be suitable for each Corridor in CMA?
# Development Options [Seven Corridors]

<table>
<thead>
<tr>
<th>Corridor/Area</th>
<th>Development Options in 2035</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Monorail</td>
</tr>
<tr>
<td>Malabe</td>
<td>Monorail</td>
</tr>
<tr>
<td>Galle</td>
<td>-</td>
</tr>
<tr>
<td>Kandy</td>
<td>-</td>
</tr>
<tr>
<td>Negombo</td>
<td>-</td>
</tr>
<tr>
<td>High Level Road</td>
<td>Monorail</td>
</tr>
<tr>
<td>Horana</td>
<td>-</td>
</tr>
<tr>
<td>Low Level Road</td>
<td>-</td>
</tr>
</tbody>
</table>
Example: Development Option on Malabe Corridor

**MmTH**

Fort/Pettha: Multimodal Transport Hub located in the Centre of Colombo.

**MMC**

Malabe & Kelaniya: Multimodal Centre located in the Suburbs of Colombo, the terminal stations of Monorail.

**P+R**

Kotahena, Welikada, Rajagiriya, Sethsiripaya, Lumbini Temple, Malabe MMC, Kelaniya MMC, and IT Park:
Transfer stations from passengers’ cars to Monorail
Detailed locations of proposed transport facilities and network alignments will be examined and identified in the pre-feasibility or feasibility study stage.

Multi-modal Centres (MMCs) as Traffic Nodes

4 MMCs

- **Kelaniya**
  Multimodal Centre (MMC) is proposed with Monorail, Railway, BRT, Bus

- **Malabe**
  Multimodal Centre (MMC) is proposed with Monorail, Bus

- **Makumbra**
  Multimodal Centre (MMC) is proposed with Railway, Bus, Future monorail

- **Moratuwa**
  Multimodal Centre (MMC) is proposed with BRT, Railway, Feeder Bus
Multi-modal Transport Hub (MmTH)

Fort/Pettah MmTH

- Monorail Station
- Railway Station
- Bus terminal
- Interprovincial Bus terminal with access ramp from port access expressway
- BRT Station
- Parking
- Taxi
- Drop-off area

- Station plaza with smooth connection to transport modes

Western Province Bus Terminal
(Gunasinghapura Bus Stand)
10 Bays, 16 Routes, 600 Buses
WPRPTA: Western Province Road Passenger Transport Authority

SLTB Bus Terminal
(Public, Intra/Interprovincial)
(Central Bus Stand)
30 Bays, 102 Routes, 900 Buses
SLTB: Sri Lanka Transport Board

NTC Bus Terminal
(Private, Interprovincial)
(Bastian MV Bus Stand)
42 Bays, 171 Routes, 1,600 Buses
NTC: National Transport Commission

Beira Lake
Monorail System (Simple Beam Structure)

Simple Beam Structure installed at center median of roads

- Minimize Land Acquisition
- Minimize Initial/O&M Cost
- Less Daylight Interference
- Aesthetical
Video on Colombo Monorail
Cooperation with Development Partners in realizing the Master Plan

- World Bank
- ADB
- JICA
- KOICA
- Indian Exim Bank
- Chinese Exim Bank
- Private Sector
### Local Benefits of the Low Carbon Scenario

#### Economic Benefits

<table>
<thead>
<tr>
<th>Description</th>
<th>Baseline (SQ)</th>
<th>LCS</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VOC: Vehicle Operating Cost</strong></td>
<td>964 bn. LKR/y</td>
<td>823 bn. LKR/y</td>
<td>388.8 bn. LKR</td>
</tr>
<tr>
<td><strong>Travel Time Cost</strong></td>
<td>1,727 bn. LKR/y</td>
<td>1,269 bn. LKR/y</td>
<td>1,102.4 bn. LKR</td>
</tr>
<tr>
<td><strong>Loss due to Traffic Accidents</strong></td>
<td>11.8 bn. LKR/y</td>
<td>11.5 bn. LKR/y</td>
<td>1,066 mil. LKR</td>
</tr>
</tbody>
</table>


*1 Based on the guideline of “Assessing Public Investment in the Transport Sector 2001” by Ministry of Finance and Planning*

*Assuming projects are implemented in accordance with the short, intermediate and long terms, evaluation period: 2015-2044.*

#### Other Benefits

<table>
<thead>
<tr>
<th>Description</th>
<th>Baseline (SQ)</th>
<th>LCS</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Modal Share (Public Transport %)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2035</td>
<td>41% (car 39%)</td>
<td>55% (car 30%)</td>
<td>Ref. year of 2013 58% (car 14%) Estimated by CoMTrans</td>
</tr>
<tr>
<td><strong>Travel Speed (average speed in Western Province)</strong></td>
<td>13.7 km/h</td>
<td>18.0 km/h</td>
<td>Estimated by JICA-STRADA model, CoMTrans</td>
</tr>
<tr>
<td><strong>Population in the Public Service Area</strong></td>
<td>0.73 mil. pop</td>
<td>1.40 mil. pop</td>
<td>defined as the area within 800m radius from railway stations and BRT stations in CMA. Ref. 2013: 0.63 mil. People (17% of CMA’s population (3.68mil.)) Estimated by CoMTrans</td>
</tr>
<tr>
<td><strong>Reduction of Emissions: NOx, SOx, SPM, Dusts from motor vehicles</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Promoting regional economy and creating new employments</strong></td>
<td></td>
<td></td>
<td>by domestic Bio-fuel production industries</td>
</tr>
</tbody>
</table>
The way forward

In revolutionizing the City’s transport system with creating modern infrastructure facilities, traffic management measures and new transport modes to make the city with having user friendly transport system, minimized traffic congestion contributing to the government effort on upgrading the city infrastructure and amenities based on the garden city concept.

Measures:

• Realization of the viable transport projects and strategies identified through the recently prepared Urban Transport Master Plan.

• Receive assistance from the international development partners for financing and implementing viable development projects.

• Enhance private sector participation for development of transport infra facilities and services.
Expected Outputs

1. Transport oriented urban development strategies

2. Finalized feasibility studies for all transport corridors

3. Colombo Central - Multi Modal Transport Hub (MmTH) and MMCs with user friendly modern transit facilities and amenities

4. Established Transport Demand Management strategies to establish an efficient, safe and comfortable urban transport system

5. Integrated organizational set up for the management and operation of the system
Thank you

for your attention