Fourth Regional EST Forum

Presentation of Myanmar

24-26 February 2009
Seoul
Republic of Korea
Total land area
676,577 Km²

Population
58.846 million (October 2008)

Road Length
91240 km (2008)

Major Public Transport
-Railways
-Airways
-Internal Waterways
-Road Transport
-Coastal Shipping
EXISTING LAND USE PATTERN OF YANGON CITY

LEGEND

- **NEWTOWNS (1989-2000)** – 139 sq-mile (360 sq-km) (60%)
- **SATELLITE TOWNS (1958-1960)** – 13.9 sq-mile (36 sq-km) (6%)
- **INDUSTRIAL ZONES (1995-2002)** – 16 sq-mile (41 sq-km) (6.5%)
- **COMMERCIAL AREA** – 3.5 sq-mile (9 sq-km) (1.5%)
- **GREEN & RECREATION** – 7.7 sq-mile (20 sq-km) (3.5%)
- **INNER CITY & OLD SUBURB & OTHERS** – (22.5%)

YCDC AREA – 231 sq-mile (598.75 sq-km)

THANLYIN-KYAUKTAN
INDUSTRIAL DEVELOPMENT ZONE
## Road infrastructure in Yangon (1988-2008)

<table>
<thead>
<tr>
<th>No</th>
<th>Type</th>
<th>1988 (miles)</th>
<th>2008 (miles)</th>
<th>Growth (miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tar Concrete Tar Concrete</td>
<td>274</td>
<td>447.125</td>
<td>1084.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>599</td>
<td>1358.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>312.625</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>Gravel</td>
<td>-</td>
<td>4.875</td>
<td>4.875</td>
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<tr>
<td>3.</td>
<td>Hard Core</td>
<td>184</td>
<td>285</td>
<td>101</td>
</tr>
<tr>
<td>4.</td>
<td>Earth</td>
<td>264</td>
<td>303.125</td>
<td>39.125</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>722</strong></td>
<td><strong>1951.75</strong></td>
<td><strong>1229.75</strong></td>
</tr>
</tbody>
</table>
Institutions relating to EST

• National Commission for Environmental Affairs (NCEA)
• Ministry of Rail Transportation (Road Transport Administration Department)
• Ministry of Transport
• City Development Committees
• Road Transport Administration Department (RTAD) is the most responsible organization because urban transportation mainly depends on bus system
Growth of the Number of Vehicles in Myanmar (2002 – 2008)
Current Status of Yangon

Urban Transportation
(Mainly depends on bus system)

- Bus Routes - 310 Nos
  (15 Main Organizations)
- Bus Fleet - 6330 Nos
- Bus Trip/day - 30876 Trips
- Passenger/day - 3.14 Millions

Millions
Types of Public transport vehicles in Yangon
Number of Parami Taxi in Yangon: 239

Number of City Taxi in Yangon: 17533
Current Status in Yangon

Existing situation of Circular Rail (2008)

- Myanmar Railways runs 21 sets of train
- Total 200 trips are running every day, carrying about 130,000 passengers per day.
- Carrying about 48 million passengers per year.
- 10 number of river ferries/day to other side of Yangon (1184984 passengers)
Non-motorized transport

• Bicycles and trishaws are used in the suburbs of Yangon and other major Cities
• Bicycles are widely used in Mandalay
• NMV are used in all country sides (except hilly regions)
• NMV are limited to CBD of Cities during day time

Special lane for non-motorized vehicles
NMT in Big Cities (Nay Pyi Taw, Yangon and Mandalay)

- City Development Committees of Nay Pyi Taw, Yangon and Mandalay are responsible agencies for the enforcement of City Development Committee Laws.
- Rules and regulations for NMT management is a part of the city Development Committee Laws (e.g. Licensing and monitoring of NMT vehicles).
- Rules applicable to pedestrians are also included in the Motor Vehicles Law.
- For the road safety, some areas are prohibited NMT vehicles.
- Pedestrians overpaths and bicycle lanes are constructed in some areas.
NMT in other cities

• NMT takes a major role for public transport in other cities and rural areas.
• Under the Ministry of Progress of Border Areas and National Races, City Development Committees issue licenses and monitor NMT vehicles.
• Awareness activities especially for school children are conducted by City Development Committees and Traffic Police.
Some land use measure

Yangon

Mandalay
Measures to traffic congestion and problems

- Traffic police patrols are placed along the main roads of Yangon
- Using one-way road system
- Defining no entry zone for slow moving vehicles
- Defining no entry zone for over 3 tons vehicles
- Prohibited car parking at a particular roads
- Prohibited car parking at a particular roads in the morning and evening hour
- Permit only passenger buses to use right way of the road
- Defining "No Horn Zone" in CBD area
Some measure to traffic congestion

Pedestrians footpath and overpass
Implementation of National Road Safety Action Plan

- To establish National Road Safety Council and its technical sub-committee
- To set up the National Road Safety Fund (allocate from National Budget + Private sector funding)
- To establish Nationwide comprehensive Road Accident Data System
- To achieve effective partnerships of civil society and private sector
- Target for reduction of traffic accidents (2004-2009)
  - To reduce 50% of traffic accidents
  - To reduce death rate by 25%
<table>
<thead>
<tr>
<th>Year</th>
<th>Number of registered vehicles</th>
<th>Accident Index</th>
<th>Accidents</th>
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<tbody>
<tr>
<td>1998</td>
<td>387016</td>
<td>1277 8471</td>
<td>5360</td>
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<tr>
<td>1999</td>
<td>423958</td>
<td>1217 8871</td>
<td>4703</td>
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<tr>
<td>2000</td>
<td>438834</td>
<td>1177 9273</td>
<td>4932</td>
</tr>
<tr>
<td>2001</td>
<td>445167</td>
<td>1207 8985</td>
<td>4478</td>
</tr>
<tr>
<td>2002</td>
<td>461692</td>
<td>1247 8454</td>
<td>4908</td>
</tr>
<tr>
<td>2003</td>
<td>476350</td>
<td>1308 9299</td>
<td>5375</td>
</tr>
<tr>
<td>2004</td>
<td>960341</td>
<td>1377 9505</td>
<td>5905</td>
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<td>2005</td>
<td>978522</td>
<td>1339 10502</td>
<td>6686</td>
</tr>
<tr>
<td>2006</td>
<td>991566</td>
<td>1362 11567</td>
<td>6778</td>
</tr>
<tr>
<td>2007</td>
<td>1024372</td>
<td>1638 13067</td>
<td>6939</td>
</tr>
<tr>
<td>2008</td>
<td>1994358</td>
<td>1778 11558</td>
<td>6484</td>
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</tbody>
</table>
Current Plans

- Enhancing to increase driving training schools
- Compulsory attendance to driving training schools before driver license test
- Cancellation & withdrawal of driving license
- Traffic education & publicity
- Educative exhibition, talks & traffic rules competition
- Road safety research
- Administrative actions & effective actions
- Using CCTV cameras at peak junctions
- Active cooperation and coordination
Cleaner fuel

- Road Transport Administration Department has been equipped inspection devices to respond automobile source air pollution.
- Using CNG in place of petrol and diesel (short term) and bio-fuel (long term)
- Number of vehicles (December 2008)

<table>
<thead>
<tr>
<th></th>
<th>Gasoline</th>
<th>Diesel</th>
<th>CNG</th>
<th>LPG</th>
<th>Total</th>
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<tr>
<td></td>
<td>1763594</td>
<td>209070</td>
<td>21653</td>
<td>41</td>
<td>1994358</td>
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</table>

List of CNG Station

<table>
<thead>
<tr>
<th>No.</th>
<th>Location</th>
<th>No of Station</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Chauk</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Yanan Gyaung</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Yangon</td>
<td>39</td>
</tr>
<tr>
<td>4</td>
<td>Paleik</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Mandalay</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>44</strong></td>
</tr>
</tbody>
</table>

- The Government is encouraging the use of CNG for City transportation & commercial vehicles
Jatropha Curcas Plantation

Government is encouraging the plantation of Jatropha throughout the country since 2004

- Total plantation area - 1 million acre (0.4 million hectares)
- No of plants per acre - 480 nos.(1190 nos. per hectare)
- Oil produce per acre - 120 to 160 gallons per year
- Oil produce per hectare - 1340 to 1795 liters per year
Vehicle emission control, standards, Inspection and maintenance

• Motor Vehicle Law (1964) and Motor Vehicle Rules (1989)
• Practicing Standard of Road Transport Administration Department - Exhaust Emission (Smoke) <50% Bosh Unit
• Prohibition of aged cars (over 20 years of manufacturing) to be registered out of the Yangon City Development Area.
• Renewal interval
  - Annually for motor vehicles
  - Bi-annually for motorcycles
Types of inspection for emission control
1. Annual inspection (renewal registration) & initial inspection
2. Surprise check inspection
3. Patron inspection

System of inspection for emission control
1. Visual inspection
2. Theoretical inspection
3. Inspection with equipment

Enforcing Activities for extreme smoking vehicles
1st phase  -  give warning notice and force to maintain the exhaust system of vehicle
2nd phase  -  withdraw the issued vehicle registration certificate and vehicle inspection certificate
3rd Phase -  take punishment
Traffic noise management

- Practicing Standard of Road Transport Administration Department - Noise Max db 115, Horn Max db 90
Inspection with equipments

Head Lamp Test

Brake Test

Emission Test

Side Slip Test
Key Issues and Challenges

Key Issues Identified in National Plan

- Target Group: Motorcyclists, Pedestrian, Slow Moving Vehicle (non-motorized vehicle)

- Target behavior: 90% of motor cycle helmets nationwide, 70% wearing of seatbelts nationwide
Awareness Raising

• Exhibition, Competition and Educative Talks on road safety
  - Exhibition (Naypyitaw, Yangon, Mandalay) & Competition (Nation wide) - biannually
  - Educative talks (City bus lines, driving training schools, high schools) - very often

• Motorcycle helmets campaign - currently practice
  - Public awareness - Television Billboard

• Enforcement - fine

• Speed Limit Control Campaign other activities

• Seatbelt campaign - introducing

• Safety Education for Children
Public awareness

Exhibition

Educative talks

Bill board
In terms of AQM in Myanmar, NCEA carried out the surveys on the measurement of air quality in Yangon in collaboration with Yangon City Development Committee (YCDC) and Department of Medical Research (DMR) in April 2007 and January 2008 respectively.

- Site 1 - Commercial site (Traders Hotel)
- Site 2 - Residential site (IBC)
- Site 3 - Surrounding site near to industrial zone (Forest Department Head Quarter)
Sources Air Pollution in Yangon

- Mobile Source - Vehicle
- Stationary Source - Industries
- Area Source - Waste Burning, Road Dust and Open Cooking
# Air Quality survey results in Yangon

Parameters - SPM, PM10, SO2 and NO2

<table>
<thead>
<tr>
<th>Site</th>
<th>TSP (ug/m3)</th>
<th>PM10 (ug/m3)</th>
<th>SO2 (ug/m3)</th>
<th>NO2 (ug/m3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>342.58</td>
<td>177.69</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>143.21</td>
<td>71.75</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>168.61</td>
<td>68.59</td>
<td>1.14</td>
<td>23.22</td>
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<tr>
<td></td>
<td>118.7</td>
<td>65.3</td>
<td>1.24</td>
<td>22.28</td>
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<tr>
<td>3</td>
<td>127.37</td>
<td>66.95</td>
<td>0.37</td>
<td>28.36</td>
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<tr>
<td></td>
<td>188.66</td>
<td>136.92</td>
<td>0.25</td>
<td>25.42</td>
</tr>
</tbody>
</table>

TSP = Total Suspended Particulate  
PM10 = Particulate Matter Smaller than 10 micros  
Site 1 = Commercial Area  
Site 2 = Residential Area  
Site 3 = Industrial Area
## Air Quality survey results in Mandalay

<table>
<thead>
<tr>
<th>Site</th>
<th>TSP (ug/m³)</th>
<th>PM10 (ug/m³)</th>
<th>SO2 (ug/m³)</th>
<th>NO2 (ug/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>495.87</td>
<td>112.49</td>
<td>0.86</td>
<td>32.13</td>
</tr>
<tr>
<td>2</td>
<td>213.08</td>
<td>61.67</td>
<td>0.98</td>
<td>17.80</td>
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<tr>
<td>3</td>
<td>350.57</td>
<td>131.54</td>
<td>1.50</td>
<td>19.14</td>
</tr>
</tbody>
</table>

Site 1 = Commercial Area (Zay Cho Market)  
Site 2 = Residential Area (Office of MCDC)  
Site 3 = Industrial Area (Mandalay industrial zone)
Plans, programmes to address Climate Change Issue

- NCEA is currently implementing the Initial National Communication (INC) project and National Adaptation plan of Action (NAPA) in collaboration with Department of Meteorology and Hydrology, Ministry of Transport by the assistance of Global Environment Fund (GEF).
- So far, there is no any activity for Clean Development Mechanism (CDM) under the Kyoto Protocol.
EST Relating Policies & Legislations

- National Health Policy (1993)
- Myanmar Agenda 21 (1997)
- Motor Vehicle Law (1964) & the Law Amending the 1964 Motor Vehicle Law
- The Defile Traffic Act (1907)
- The Highways Act (1907)
- The Towns Act (1907)
- The City of Yangon Municipal Act (1922) & the Law Amending the City of Yangon Municipal Act (1991)
EST Relating Policies & Legislations

- The Petroleum Act (1934)
- The Factory Act (1951)
- The Union of Myanmar Public Health Law (1990)
- The Private Industrial Enterprise Law (1991)
- The Mandalay City Development Law (1992)
- The Development Committee Law (1993)