THAILAND’S ENVIRONMENTAL SUSTAINABLE TRANSPORT MASTER PLAN

24 April 2013

Bali, Indonesia

Ministry of Transport, Thailand
TOPIC

• Current situations

• Environmental Sustainable Transport Master Plan
Bangkok Metropolitan Region, BMR
POPULATION: 17.5 millions
AREA: 7,760 sq.km.
GDP 68% of National GDP
Bangkok’s Land Use (Urban Sprawl)

การขยายตัวเมืองจากภาพถ่ายดาวเทียมปี 2531-2545

1988

2002

ขอบเขตพื้นที่สีเหลือง

ขอบเขตพื้นที่สีแดง
Bangkok situation
Number of Vehicle registration: 2003 - 2012

Source: Department of Land Transport
Quality of Life

The CO₂ PROBLEM IS A TRANSPORT PROBLEM, PREDOMINATELY CARS AROUND URBAN AREAS
Air Pollution

- Health Impact
- Air pollution from transport sector (Bangkok)
  - 75% of CO
  - 80% of NOx
  - 54% of PM
Social Impact

- Road Accident
- Injuries
- Death
- Stress
GHGs Emission by Sector: 2011

- Energy: 87,162, 39%
- Transportation: 59,806, 27%
- Industry: 54,600, 25%
- Other: 19,891, 9%

Source: Thailand Energy Statistic 2012
Volumes of Greenhouse gas released by Thailand’s Transport Sector

Source: National Greenhouse Gas listing
11th Thailand National Economic and Social Development Plan
(Transport Sector During Year 2010-2015)

- Change to Alternative Energy, Green Energy and Efficiency use in Energy
- Road and Rail integrated Network around country and Neighboring Country
- Improve Multi-modal Transportation
- Improve Transport System, Efficiency, Effectiveness, Accessibility, Safety, Transport for all, (Aging people and Handicap)
- More Public Private Participation (PPP) Investment

Green Transportation
Ministry of Transport

Vision: Toward Sustainable Transport

Transport and Traffic Development Master Plan 2011 - 2020

Economic prosperity
- Decrease economic loss (VOT, VOC)
- Increase Competitiveness

Sustainable Transport

Environmental friendly
- Energy saving
- Energy efficiency
- Reduce air emission
- GHGs reduction

Social & Quality of life
- Safety
- Accessibility
- Equity
- Sufficiency
Master Plan Development

Internal Driving force

Environment
Economic
Social

International Driving Force: EST forum, Rio+20, UNFCCC

Environmental Sustainable Transport Masterplan
SUSTAINABLE TRANSPORT MASTER PLAN

Bangkok Declaration
EST 2010 - 2020

Avoid Shift Improve

Infrastructure and Demand Management Measure

Reduction of GHG and Transportation Emission

Public Transport and Non-Motorized Mode

Information and Technology Measure

Policy and Regulation Measure

Awareness On Environment Measure
**Strategic Master Plan**

**Strategic 1**
Upgrade capability of agencies and personnel for the development of an environmentally sustainable transport system.

**Strategic 2**
Establish appropriate plans and mechanisms for interfacing and monitoring of transport and traffic work plans/measures/projects; and to move them forward to implementation.

**Strategic 3**
Establish comprehensive and interconnected transport infrastructure.

**Strategic 4**
Efficient transport management for sustainability and greenhouse gas reduction.

**Strategic 5**
Promote transport R&D and adoption of environment-friendly innovations and technologies.

**Strategic 6**
Promote public awareness of the environment.

**Tools/Measures for Developing Sustainable Transport System**

1. **Avoid**
   - Infrastructure planning & trip management
   - Incentive through policy & regulation
   - Economic inducement
   - Awareness of sustainable transport & environmental cost
   - Use of pollution reducing technologies

2. **Shift**
   - Evaluation of GH gas reduction in transport sector

3. **Improve**
   - Plans / Period / Budget
<table>
<thead>
<tr>
<th><strong>Vision</strong></th>
<th><strong>Mission</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;An efficient transport model that is environment-friendly, appropriate for the development of sufficient and sustainable socio-economic infrastructure for Thailand&quot;</td>
<td>Every concerned agency shall be committed to sharing of knowledge and experience; engaged in own personnel development, and shall work with other parties in the effort to reduce greenhouse gas emission in the transport sector.</td>
</tr>
</tbody>
</table>

**Purpose**

To achieve a Master Plan, comprising a short-term programme (2013–2017) and a long-term plan (2018–2030), with the reduction of greenhouse gas emission in the transport sector as its primary aim.
**Strategy 1:** Upgrade capability of agencies and personnel for the development of an environmentally sustainable transport system.

**Strategy 2:** Establish appropriate plans and mechanisms for interfacing and monitoring of transport and traffic work plans/measures/projects; and to move them forward to implementation.

**Strategy 3:** Establish comprehensive and inter-connected transport infrastructure.

**Strategy 4:** Efficient transport management for sustainability and greenhouse gas reduction.

**Strategy 5:** Promote transport R&D and adoption of environment-friendly innovations and technologies.

**Strategy 6:** Promote public awareness of the environment.
Strategy 1: Upgrade capacity of agencies and personnel for the development of an environmentally sustainable transport system. (11 plans/projects)

- Upgrade capability of bus services quality
- Development and Training in “Global warming and transport”

Strategy 2: Establish appropriate plans/mechanisms for interfacing/monitoring of transport and traffic work plans/measures/projects; forward to implementation (19 plans/projects)

- Plan for development of public transport in regional cities
- Study of sustainable and environmentally-friendly water and air transport

Strategy 3: Establish comprehensive and interconnected transport infrastructure (44 plans/projects)

- Mass rapid transit projects (15 projects)
- Construction of Sea port in Chumporn province
Strategy 4: Efficient transport management for sustainability and greenhouse gas reduction (22 plans/projects)
- Procurement of new efficient buses with low pollution emissions (BMTA’s 3183 NGV buses)
- Study of standards for parking control/fee collection of parking lots

Strategy 5: Promote transport R&D and adoption of environmentally – friendly innovations and technologies (15 plans/projects)
- Promotion of R&D of efficient high-tech equipment
- Promotion of the use of eco-friendly vehicle

Strategy 6: Promote Public awareness about environmental issues (9 plans/projects)
- Holding public relations activities and provision of knowledge about eco-friendly driving
- Study and production of national public relations materials to disseminate information about global warming
GHGs emission from Transport sector
## Potential GHGs reduction in Transportation Sector

<table>
<thead>
<tr>
<th>Year</th>
<th>GHGs at BAU (Million tons CO₂ e)</th>
<th>Potential of GHGs reduction (Million tons CO₂ e)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>57.52</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2017</td>
<td>67.53</td>
<td>11 - 13</td>
<td>16 - 19</td>
</tr>
<tr>
<td>2020</td>
<td>74.02</td>
<td>15 - 16</td>
<td>20 - 22</td>
</tr>
<tr>
<td>2030</td>
<td>102.82</td>
<td>27 - 30</td>
<td>26 - 29</td>
</tr>
</tbody>
</table>
Avoid – Shift – Improve Concept

Expected City

Car oriental city

Public transport as backbone of the city

Urban Planning and Land use designed

Mono-centric

Low density dispersion

Poly-centric decentralization
Mass Rapid Transit Master plan

Previous plan

1994
MRTS MASTER
LAN (MTMP)

1999
24 km

2000
URMAP Revised

2004
20 km

URMAP (BMT)

2005
IMAC MRT

Modernization

2006

2009
2.2 km

2010

2014-16

2019

2029

12 lines
509 km

236 km

391 km

Shift
Railway Development Master Plan

- **Restructuring (urgent Phase: 2010-2014)**
  - Track rehabilitation
  - Refurbishing Locomotive
  - Breaking Bottle neck
  - Reducing intersection between rail and road

- **Improvement (Phase II: 2015-2029)**
  - Double Track Extension
  - Sub-Region Connecting
  - High Speed Train

- **Enhance Efficiency (Phase III: 2020-2025)**
  - High Seed Train Network extension
  - New Logistic Routes
Non-Motorized Transport: is one of travel choices,

- **Bicycle lanes** alongside motor lanes or running through public parks have been built.

- **Bicycle parking spaces** and other cycling facilities have been provided.

- **Pedestrians walking street**
1. Vehicle Emission Standards

- New Vehicles
  EU4 standards, implemented since the end of 2012

- In-use Vehicles

- The emission standards are used as reference standards for inspection and maintenance programme, consisting of Black Smoke, CO, HC, White Smoke, and Noise
Shift

Rail Improvement
(Year 2010-2514 Total Cost Bt153 billion)

- New Double-track Rail 767Km.
- Improve Sleepers (Wood to Concrete)
- Buy new Locomotives
- Improve Train-Road Barriers

Rail in Thailand
- 4,346 Km.
  in 47 provinces
Bangkok Metropolitan Region (BMR) Mass Transit Master Plan (2010-2029)

1. Commuter Train lines and Airport Link 3 lines 176 Km. (Existing 36.4 Km.)

2. Mass Rapid Transit 5 lines 217 Km. (Existing 43 km. Under Con. 20 Km. In process 23 Km.)

3. Light Rail Transit 4 lines 102 Km.
Railway Development Master Plan

- **Restructuring** *(urgent Phase: 2010-2014)*
  - Track rehabilitation
  - Refurbishing Locomotive
  - Breaking Bottle neck
  - Reducing intersection between rail and road

- **Improvement** *(Phase II: 2015-2029)*
  - Double Track Extension
  - Sub-Region Connecting
  - High Speed Train

- **Enhance Efficiency** *(Phase III: 2020-2025)*
  - High Seed Train Network extension
  - New Logistic Routes
Shift

Deep Seaport
Pakbara (Andaman Sea)

Project Information

<table>
<thead>
<tr>
<th>Duration</th>
<th>Investment</th>
<th>Type</th>
</tr>
</thead>
</table>
| 6 Years (Yr 2011-2016) | Cost 12,434 MB  
- Civil Work 9,585.58 MB  
- Project Supervision 150.85 MB  
- Environment 7.7 MB  
- Tools and Equipments 2,692.9 MB | PPPs (BTO)         |

Return on Investment

<table>
<thead>
<tr>
<th>Discount rate</th>
<th>IRR</th>
<th>B/C</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>12%</td>
<td>14.31</td>
<td>1.1</td>
<td>726.5 MB</td>
</tr>
<tr>
<td>8%</td>
<td>14.31</td>
<td>1.15</td>
<td>3,494.90 MB</td>
</tr>
</tbody>
</table>
Barriers for Towards Sustainable Transport

- Policy Barriers
- Institutional Barriers
- Technical Barriers
- Market Barriers
- Economic and Financial Barriers
- Information Barriers
Barrier Removal Activities

- **Capacity building** (e.g., financial evaluation, technology application, energy-integrated urban transport planning)

- **Institutional strengthening** (e.g., regulatory frameworks, vehicle emission standards)

- **Investments** (e.g., demonstration & replication projects)

- **Training** (e.g., design, operation, maintenance of vehicles and transport systems)

- **Targeted research** (e.g., adaptation of technologies, techniques, practices to local conditions)

Ministry of Transport
Conclusion

Avoid
- Urban planning
- Complex city

Shift
- Mode of Transport: public and mass transit
- Freight: road to rail

Improve
- Vehicle/fuel standard
- Technology

Cross cutting
- Safety: Decade of road safety
- Climate Change
- Awareness

Thailand’s EST Master Plan
120 projects/plans/policies

Most difficult
- Not yet

Implementing
- Largely Implemented
Thank you
Pilot Project

A Study of the Local Public Transport System:
Case Study on Klaeng District, Rayong Province, Thailand
Location of Klaeng District, Rayong Province, Thailand
With the corporation of Local authority and community, considerable plans on climate change that reduce the amount of CO$_2$ emission was introduced as follow:

- Reduce vehicle use and fuel consumption
- Increase the mobility of traffic
- Introduce local public transport called “Klaeng’s Public Transport System”
Klaeng’s Public Transport

- Headlights
- Rearview mirror
- Backlights
- Bell signals
- Tire wheels
- Gasoline engine cars converted to use LPG
Services and Operation

- **Free** service for everyone
- **4** Cars
- Provide early morning and evening services
- Accommodate **40-50** passengers/vehicle
- Serve more than **300** students and **170** people per day

- A service range is about **3-13** kilometre
- Average speed is **12-18** km/hr
- Travel time is about **15-35** minutes
Outcome of the operation

• Reduce fuel consumption, approximately 7,250 litres/year
• Reduce CO2 emission, approximately 16 tons/y
Benefits to Community

- Alternative travel choice which is convenient, safe and improve quality of life for community.
- Decrease in traffic and improve the environment in the city.
- Release parental time burden, thus, have more time to earn income for the family.
- Create a strong cooperation and connection between member of community.
- Effectively encourage people to engage in physical exercise

“Some say they won’t go exercise if there is no Klaeng’s Municipal Tram System services”
Conclusion

Green Growth Development

Environmental Sustainable Transport

National Policy for Climate Change
Thank you

Further information, please contact
chutinthorn.p@gmail.com