Environmentally Sustainable Transport:
Current Status in Indonesian Cities

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Outline

- Background
- Fuel, Vehicle, and Traffic/Transport Management Status
- Policy and Strategy
- Applied Program
- Conclusion
- The Next Steps

Air Pollution Disaster

Rapid urbanization, industrialization and land clearing palm oil plantation (forest fire) in Indonesia tend to cause chronic air pollution problems
Worsening Ambient Air Quality
AAQS Report 2008

<table>
<thead>
<tr>
<th>City</th>
<th>Good Air Status</th>
<th>Parameter Dominant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jakarta</td>
<td>81 PM$_{10}$</td>
<td></td>
</tr>
<tr>
<td>Bandung</td>
<td>10 PM$_{10}$</td>
<td></td>
</tr>
<tr>
<td>Semarang</td>
<td>6 PM$_{10}$</td>
<td></td>
</tr>
<tr>
<td>Surabaya</td>
<td>58 SO$_2$</td>
<td></td>
</tr>
<tr>
<td>Medan</td>
<td>16 CO</td>
<td></td>
</tr>
<tr>
<td>Palangkaraya</td>
<td>123 O$_3$</td>
<td></td>
</tr>
</tbody>
</table>

Source: Ministry of Environment 2008

Annual Concentration Air Pollution

Jakarta Case: The concentration CO exposure is very high and dominate roadside, followed by HC and TSP

Health Effect

- The concentration of mean urine t.t.-muconic acid level in exposed person in Jakarta – as bio-marker of PAH was 2193.3 mg/g creatinine meanwhile concentration of mean urine 1-hydrociproen as bio- marker benzene was 8.62 mg/g creatinine.
- In this 2 decades, respiratory infection and respiratory disease is no 1 of the most 10 diseases that affected people in the Greater Jakarta.
- Health Profile 2004 in the Greater Jakarta: 46% respiratory disease have correlation with air pollution (respiratory infection, asthmatic, eyes irritation).
- 32% mortality (predicted) was related to air pollution (cardiovascular disease, pneumonia).

Global Warming Issue

Scientific Consensus: Climate Change is Occurring & is Caused By Man

Vast areas of snow in Antarctica melted in the summer of 2005. Satellite data shows an area the size of California melted. NASA. This is the most significant thawing in 30 years. Melting in several areas including high elevations and far inland.
Transportation and Air Pollution Issue

- Motor vehicle is growing faster with old engine technology and worse on I/M
- Disaster Air Pollution:
  - Transportation is major air pollution contributor in cities
  - Transport sector absorbs significant portion of fuels
  - Contributes to 23% GHG emission
- Traffic jam
  - Increasing of transportation demand/mobility
  - Dominated by private car and motor-cycle
  - Social and economic loss almost US$ 500 million p.a. (Jakarta), and US$ 65 million p.a. (Bandung)
  - Increasing of emission load in the city.
- Low on public transport services

Vehicle Statistic

<table>
<thead>
<tr>
<th>Year</th>
<th>Total number of vehicle</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0.55 million cars</td>
</tr>
</tbody>
</table>

... annual growth? 

Total number of vehicle: dramatic growth and never ending threat to air quality?
Vehicle Standard

Unfortunately, not all car manufacturers were prepared to uphold the standard. They dragged their feet around the implementation of the regulation.

Sulfur Content in the Pump

Source: KPBB/Ministry of Environment

Global Sulfur Reduction Movement

PM$_{10}$ in The Various Cities

Source: Cohen et al, 2005
Energy for Transport Sector

![Energy for Transport Sector Diagram]

Traffic and Transport Management

- Lack of Integrated Transport Planning and Land-use Planning
- Insufficient Public Transport
- Non Motorized Transport
- Carrying Capacity

Lack of Integrated Transport Planning and Land-use Planning

- Instant policy, no environmental risk assessment, no feasibility study
- Inconsistence, contra productive

Insufficient Public Transport

- Unbalance (road base vs rail base, private vehicle vs public vehicle)
- Bias to business interest of automotive industry?
Non Motorized Transport

• No space for non motorized transport?

Carrying Capacity

• Maximum total number of vehicle in the city compare to length of road and carrying capacity
• Make longer and broader of road to solve the problem of traffic jump?

Policy and Strategy

• Rational: the strategy to curb air pollution is focused on reducing vehicle emissions, integral to increase people mobility/accessibility.

• Strategy and approach: improvement of cleaner fuel/energy, introduction of low emission vehicles, improvement of traffic management, and land use planning, stringent emission standards, and law enforcement.

• Prior agenda for traffic management improvement programme:
  • Mass public transportation, non motorized mobility, and transport demand management (TDM)
  • Arranged as strategy based on the idea of Environmentally Sustainable Transport (EST).

Increasing of Vehicle Utility

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>PM10</th>
<th>CO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>0.17</td>
<td>244</td>
</tr>
<tr>
<td>Taxi</td>
<td>0.40</td>
<td>586</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>0.42</td>
<td>98</td>
</tr>
<tr>
<td>Bajaj</td>
<td>1.00</td>
<td>300</td>
</tr>
<tr>
<td>BRT - diesel</td>
<td>0.01</td>
<td>22</td>
</tr>
<tr>
<td>BRT - CNG</td>
<td>0.0005</td>
<td>22</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>1.2</td>
</tr>
<tr>
<td>Taxi</td>
<td>0.5</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>1.2</td>
</tr>
<tr>
<td>Bajaj</td>
<td>0.5</td>
</tr>
<tr>
<td>BRT - diesel</td>
<td>65</td>
</tr>
<tr>
<td>BRT - CNG</td>
<td>65</td>
</tr>
</tbody>
</table>
**Policy and Strategy**

- **Mass public transportation system**
  - BRT, minimum services standard, park and ride facility, to reform public transport management, and TOD

- **Solve traffic jam:**
  - TDM, Parking controls and management, Regulatory controls such as “odd-even” schemes and its variants, Physical measures such as pedestrianization, bus priority, etc., Pricing & charges, through fuels, annual taxes, etc., Congestion charging, through cordon pricing or area licensing/pricing, Restraint through land use development controls
  - NMT: pedestrian, bike-lane, car-free day.
  - Law enforcement

- **Promote lower emission vehicle technology and methods**
  - I/M, fuels economy, *Increasing of Vehicle Utility.ppt*

- **Cleaner fuels diversification**
  - Gaseous fuels (CNG and LPG), Bio-fuel (bio-diesel and bio-ethanol)

**Status**

- **Improve transportation system:**
  - Operate and completing BRT Corridor
  - Add city train series, road network system

- **Promote Cleaner Fuel and Vehicle:**
  - Using of gases fuels for public transport,
  - Promoting bio-fuels,
  - Promoting Euro 2 Standard of car

- **I/M:**
  - Decentralized (self financing system) periodic inspection (I/M) for in-used vehicle

- **Prevention Effort:**
  - Town reboization,
  - Promoting flexible hours (for school)

- **NMT and Raising Awareness:**
  - Pedestrian, Promoting bike-lane, Car-free day,
  - Public campaign.

**Status (2)**

- Cities have being started to replicate what has been done in Jakarta, e.g. mass public transport, non motorized mobility, car-free day:
  - Implemented partially, and its have not developed in the frame of grand design of EST – include what have been implemented in Jakarta –
  - Misleading on EST concept and its program details on implementation

- Trigger to implement EST (by correct definition with integrated, and holistic approach) in the city:
  - e.g. Bandung, Surabaya, Bogor, Yogyakarta, Surakarta, Pekanbaru, Palembang, Makassar, and Batam.

**The challenges**

- Air pollution is still being a threat for most cities in Indonesia
  - Transportation is major air pollution contributor in cities
  - Lack of mass public transportation system, NMT, and TDM encourage people tend to use private car/motorcycle for their mobility
  - Traffic jam increases emission load in the city.

- EST is prior to solve vehicular emissions integrated to increase mobility/accessibility.
The challenges

• Capacity building to avoid misleading on EST concept and its program details on implementation:
  – As integrated and holistic approach that would be cover all the key elements of EST
  – Program exchange, technical assistance, and technical/financial support from other cities in the region as well as international cooperation (bilateral and multilateral)
  – Participatory approach must be taken to formulate EST and localized it in the city which will involve all element and stake holder in the city.

• Coordination to binding commitment and gain political will among key stake holder:
  – Harmonize current regulation and continuing legislation process to complete policy and regulation on EST
  – An effective budgeting to cover funding limitations

• To raise public awareness => affective

Terimakasih

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