3. Urban Transport 1

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3. Urban transport 1

**Scenario:** Demand for mobility in your city/municipality is increasing

**Question:** What are the ways to increase mobility through more efficient forms of transport?
Training Overview

1. Energy use, drivers, and impacts of transport
   • Urban transport issues and impacts
   • A case for action in urban transport
   • Transport Concepts: Avoid, Shift, Improve

2. ‘Shift’ policies
   • Policy case studies on ‘shift’
   • Strategies to shift to more sustainable modes of transport
Training Overview

• From the spatial planning perspective of the previous session, we now start looking more closely at mobility in this session.

• We begin with energy use and impacts of transport.

• We then show how mode affects transport energy use, leading to the decomposition which highlights the role of “shift”, noting that the urban planning session covered the “avoid” aspect of transport energy use.

• We use the toolkit classification of “regulatory-economic-information” as a way to guide the discussion in order to (1) be consistent in using frameworks to classify policies, and (2) to aid the understanding of how and when to apply policies.
1. Energy use, drivers, and impacts
Why transport energy use?

Transport’s share in energy use (29%) is almost as much as industry. In South Africa’s 8 largest metro cities, transport takes about 62%

Share of sectors in the global final energy consumption (9717 mtoe) in 2017

- Industry: 29%
- Residential: 21%
- Transport: 29%
- Services: 8%
- Agriculture: 2%
- Others: 11%

Average energy consumption by sector across South Africa’s 8 largest metro areas (2011)

- Transport: 62%
- Industrial: 15%
- Residential: 11%
- Commercial: 6%
- Losses: 5%
- Government: 1%
- Others: 11%

The transport sector contributes a huge amount to emissions, especially NOx, reaching more than 3Mt in 2015. The bulk of these are from trucks and LDVs which are often concentrated in urban areas.
<table>
<thead>
<tr>
<th>Rank</th>
<th>World Rank</th>
<th>City</th>
<th>Country</th>
<th>Congestion Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17</td>
<td>Cairo</td>
<td>Egypt</td>
<td>44% ↓ 2%</td>
</tr>
<tr>
<td>2</td>
<td>90</td>
<td>Cape Town</td>
<td>South Africa</td>
<td>31% ↓ 1%</td>
</tr>
<tr>
<td>3</td>
<td>105</td>
<td>Johannesburg</td>
<td>South Africa</td>
<td>30% − 0%</td>
</tr>
<tr>
<td>4</td>
<td>182</td>
<td>Pretoria</td>
<td>South Africa</td>
<td>25% ↑ 1%</td>
</tr>
<tr>
<td>5</td>
<td>261</td>
<td>East London</td>
<td>South Africa</td>
<td>20% ↓ 1%</td>
</tr>
<tr>
<td>6</td>
<td>308</td>
<td>Durban</td>
<td>South Africa</td>
<td>18% ↓ 2%</td>
</tr>
<tr>
<td>7</td>
<td>391</td>
<td>Bloemfontein</td>
<td>South Africa</td>
<td>12% − 0%</td>
</tr>
</tbody>
</table>

Source: https://www.tomtom.com/en_gb/traffic-index/ranking/?country=EG,ZA
Drivers of transport energy use

1. Socio-economic
   - Higher population means higher transport energy consumption due to mobility needs of each person
   - Higher economic activity and purchasing power means more mobility requirements

2. Physical Structure
   - Distance of key activity centres to residential areas increase mobility needs, greater distances requiring vehicles as opposed to walking/cycling
   - In urban areas, this is the urban form and the associated urban sprawl as discussed in the earlier sessions

3. Mode of transport
   - Choice of mode of transport (rail, bus, low-duty vehicle) affects the energy use for a given mobility requirement
The percentage of South African urban households that owns cars increased to 32.6% in 2013 from 22.9 % in 2003 with associated urban congestion problems.
Drivers: mode of transport

Transport energy intensity by mode, in MJ per passenger-kilometer (p-km) and tonne-kilometer (t-km)

The ‘mode’ of transport influences the energy use for similar activities, measured in passenger-km and tonne-km. Public transport such as rail and buses show higher efficiency.
Global transport activity is rising and behaviours are shifting to less efficient practices. Strategies to address this could be classified as Avoid, Shift, and Improve.
2. ‘Shift’ Policies
‘Shift’ Policies

Make more efficient modes of transport...

**Regulatory / Institutional**
- Available to use

**Economic**
- Cheaper to use

**Information / Capacity**
- Known
- Popular
- Easy to understand
‘Shift’ Policies: Regulatory / Institutional

- **Provide** more sustainable public transport
  - Increase levels of mass transit

- **“Shared space”** sustainable modes (cycling, walking, pedicabs) alongside vehicle transport

- **Provide infrastructure for seamless integration** between different sustainable modes (bus, BRT, rail, cycling, walking). For example:
  - Cycle parking areas next to stations
  - Signposted route paths
‘Shift’ Policies: Regulatory / Institutional

- Provide more sustainable public transport.

Case study: BRT system in Jakarta
- Analysed public transport options considering the resources of an emerging economy
- What can you build with $1 billion

Adapted from ITDP 2018 IEA EETW Jakarta
‘Shift’ Policies: Regulatory / Institutional

• (1/3) Analyse limitations of Jakarta

- HUGE APPETITE FOR MOBILITY
- LIMITED PUBLIC RESOURCES
- PRIVATE VEHICLES
- LACK OF SPACE, FUNDING, DATA AVAILABILITY

START FROM WHAT WE HAVE

Adapted from ITDP 2018 IEA EETW Jakarta
‘Shift’ Policies: Regulatory / Institutional

- (2/3) measure based on existing frequency and occupancy

Public transport route

25 bus per hour, 1 every 2.4 minutes

46% occupancy level

Adapted from ITDP 2018 IEA EETW Jakarta
`Shift' Policies: Regulatory / Institutional

- Available to use

(3/3) proposed BRT line and execution

Adapted from ITDP 2018 IEA EETW Jakarta
‘Shift’ Policies: Regulatory / Institutional

- “Shared spaced” sustainable modes (cycling, walking, pedicabs) alongside vehicle transport

**Case study: New York Time Square**
- Did not worsen traffic congestion
- Allowed higher activity around the area for less transport energy use
- Additional benefits of economic activity and safer streets
‘Shift’ Policies: Regulatory / Institutional

Regulatory / Institutional

• Available to use

• “Shared space” sustainable modes (cycling, walking, pedicabs) alongside vehicle transport

Case study: Barcelona’s superblocks
- Taking back some of the road to encourage walking and bicycles

Source: Barcelona Urban Mobility Plan
‘Shift’ Policies: Regulatory / Institutional

- Superblocks create more space for walking and cycling and integrating it with public transport to increase sustainable transport use

Source: Barcelona Urban Mobility Plan
‘Shift’ Policies: Economic

- Congestion pricing
- Road pricing to reflect environmental cost of road use
- Parking charges – higher costs reduce car modal share
- Taxes on private vehicle use, or subsidies for public transport investment
‘Shift’ Policies: Economic

**Congestion pricing.** Case Study: London

**Impacts:**
- Traffic levels ↓20% (75,000 vehicles)
- Congestion reduction in zone during charging hours: ↓30%
- Pedal cycle trips across London: ↑83%
- NOx: ↓13%
- PM10: ↓15%

‘Shift’ Policies : Economic

**Economic**

- Cheaper to use

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**Congestion pricing.** Case Study: London

- What worked:
  - Centralised institutional structure and **strong political will**
  - Extensive **public communication and consultation**
  - Improved public **transport and fare integration**

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**Change in Surface Transport Shares, London 2000-2016**

- Introduction of congestion charge
- Bus speed limit reduced

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‘Shift’ Policies: Economic

- **Road pricing.** Case Study: Singapore ERP

Economic

- Cheaper to use
‘Shift’ Policies: Economic

- **Road pricing.** Case Study: Singapore ERP

- The Electronic Road Pricing (ERP) Scheme has been a key policy tool in reducing and keeping low sharp peak traffic volumes.

**Impacts:**

- Area Licensing Scheme (ALS): ↓ 29%
- ERP: ↓ 7%

**CO2**

↓ 2,010 ktonnes
‘Shift’ Policies: Information

**Information / Capacity**

- Known
- Popular
- Easy to understand

- **Promote** sustainable urban transport (SUT) and build it as a superior brand to private car use

- **Nudge** behaviour towards SUT

- **Provide easy accessible information** on SUT to integrate informal transport services
‘Shift’ Policies: Information

- **Nudge** behaviour towards SUT

**Information / Capacity**

- Known
- Popular
- Easy to understand

Making walking option the default

[Map showing walking option as the default route]
‘Shift’ Policies: Information

**Information / Capacity**

- Known
- Popular
- Easy to understand

**Nudge** behaviour towards SUT. Ex: Gamification for behaviour change

**Case Study:** Digitalisation for behaviour change: [BetterPoint technology](#)

- deliver incentivised behavioural change programmes through a smartphone app

**Impacts of shift to sustainable transit (over 6 months):**

- Bologna, Italy:
  - 711 tonnes CO2 emissions saved
- Sutton Council, UK:
  - 7.25 tonnes CO2 emissions saved

*Source:* Adapted from BetterPoint website

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‘Shift’ Policies: Information

Information / Capacity

- Known
- Popular
- Easy to understand

Provide easy accessible information on SUT to integrate informal transport services

Streamlined routes – mapping the informal system
- Smartphones and GPS to document routes and translate data into info for traffic Apps
‘Shift’ Policies: Information

**Information / Capacity**

- Known
- Popular
- Easy to understand

• **Provide easy accessible information** on SUT to integrate informal transport services

“**Apping**” – where informal transport options can be hailed with an app

- request EZGo tuk tuks via PassApp in Cambodia
‘Shift’ Policies : Information

**Information / Capacity**

- Known
- Popular
- Easy to understand

- **Provide easy accessible information** on SUT to integrate informal transport services

**Case Study: Kochi India**
- Integration of different transport services, both formal and informal

Source: [http://urbanmobilityindia.in/Upload/Conference/d3957046-bcb5-4778-bbf7-947d8f0a8d8b.pdf](http://urbanmobilityindia.in/Upload/Conference/d3957046-bcb5-4778-bbf7-947d8f0a8d8b.pdf)
‘Shift’ Policies : Information

• **Provide easy accessible information** on SUT to integrate informal transport services

**Case Study: Kochi India**
- Included services such as e-payment in order to further increase comfort and usability
- App then allows easier nudging towards sustainable urban transport means

Source: [http://urbanmobilityindia.in/Upload/Conference/d3957046-bcb5-4778-bbf7-947d8f0a8d8b.pdf](http://urbanmobilityindia.in/Upload/Conference/d3957046-bcb5-4778-bbf7-947d8f0a8d8b.pdf)
Resources
## Resources

### Integrating Urban Public Transport Systems and Cycling
- **Summary and Conclusions**
- [Link](https://www.itf-oecd.org/sites/default/files/docs/integrating-urban-public-transport-systems-cycling-roundtable-summary_0.pdf)

### Sustainable Urban Transport Project (SUTP)
- **SUTP Sourcebook Modules**
  - Institutions, Financing and Policy Orientation
  - Land Use Planning and Demand Management
  - Public Transport
  - Walking and Cycling
  - Vehicles, Fuels and Intelligent Transport Systems
  - Climate, Environment and Health
  - Social Issues in Transport


### Shared Mobility
- **Innovation for Liveable Cities**
- [Link](https://www.itf-oecd.org/sites/default/files/docs/shared-mobility-liveable-cities.pdf)