4. Urban Transport 2

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3. Urban transport 2

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

**Question:** What are the ways to improve the efficiency of transport in your city?
Training Overview

1. Improving Efficiency
   • Potential of improving efficiency (fuel economy, electric vehicles)

2. ‘Improve’ Policies
   • Policy case studies on ‘improve’
   • Technology support policies: EV support; charging infrastructure rollout; mobility as a service

3. Activity
Training Overview

• After explaining “avoid” in urban planning, and “shift” in urban transport, we now cover “improve” which is increasing the energy efficiency of vehicles

• We explain this in the first section, by explaining what we mean by “energy efficient transport”. This is to avoid confusion from more efficient “modes” which was covered in the previous session

• The remaining section explains how policies improve transport efficiency. Again classified into “regulatory”, “economic”, and “information”. This gives policymakers an idea of the degree of intervention they can/should make. For instance, if there is market failure (e.g. fuels are taxed to reflect environmental damage, but people still buy and use them) then a regulatory intervention is warranted. This is not just an exercise of economic theory. In many countries, proving market failure is a requirement when proposing legislation. Understanding the degree of intervention helps policymakers be strategic in choosing how to deliver change.

• The policies under each classification are also categorised based on how they are delivered in reality. This helps the participant to see everything in one picture to aid decision-making
1. Improving energy efficiency
Improving energy efficiency in transport

Transport activity is rising and behaviours are shifting to less efficient practices. Energy efficiency improvements have prevented energy use equivalent to 120 million cars.

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<table>
<thead>
<tr>
<th>Activity</th>
<th>Inter-mode shift</th>
<th>Vehicle type</th>
<th>Occupancy</th>
<th>Efficiency</th>
<th>2000 energy use</th>
<th>2017 energy use</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVOID</td>
<td></td>
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<td></td>
<td></td>
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<td>25</td>
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<tr>
<td>SHIFT</td>
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<td>10</td>
<td>12</td>
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<tr>
<td>IMPROVE</td>
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<td></td>
<td>50</td>
<td>40</td>
</tr>
</tbody>
</table>
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Decomposition of passenger transport final energy use, 2000-17
### Opportunity in IEA’s Efficient World Scenario (EWS)

<table>
<thead>
<tr>
<th>Key policy actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NATIONAL</strong></td>
</tr>
<tr>
<td>• Improve coverage and strength of transport policies for cars and trucks and non-road modes.</td>
</tr>
<tr>
<td>• Provide incentives to support uptake and sustainable use of efficient vehicles.</td>
</tr>
<tr>
<td>• Information to support efficient vehicle uptake and mode shift.</td>
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</tbody>
</table>

**NATIONAL & LOCAL**

- Energy demand could stay flat, despite doubling activity levels.
- Passenger cars and trucks offer two-thirds of potential savings.

Source: Energy Efficiency 2018
What do we mean by improving energy efficiency in transport?

More efficient vehicles...

- Consume Less Fuel
- Use more efficient powertrains
- Transport more people
What do we mean by improving energy efficiency in vehicles?

- Increasing the fuel economy of engines and vehicles directly “improves” the efficiency. This is done on a national level.

Source: https://www.nap.edu/catalog/18264/transitions-to-alternative-vehicles-and-fuels
What do we mean by improving energy efficiency in transport?

Use more efficient powertrains

Passenger cars WTW GHG Emissions and Energy Demand changes from 2010 to 2020 all power trains (solid dots 2020 hollow dots 2010)

Source Figure 10 [https://theicct.org/lit-review-ev-tech-costs-co2-emissions-2016](https://theicct.org/lit-review-ev-tech-costs-co2-emissions-2016)
What do we mean by energy efficiency in transport?

- Electric mobility not limited to cars. More efficient powertrain also exist for other types of vehicles.

**Use more efficient powertrains**

- **Electric 2-wheelers**
  - China: 250 million stocks, 30 million sales/yr

- **Low Speed EVs**
  - China: ~4 million stocks, >1 million sales/yr

**Torque - Electric vs. ICE**

- An electric motor can produce torque at 0 RPM and its torque output remains nearly constant up to about 5000 rpm.

- Because it produces constant torque at nearly all RPMs, electric cars do not require multiple speed transmissions.
What do we mean by improving energy efficiency in transport?

- Car sharing brings modest but important benefits in transport efficiency by increasing occupancy rates.

  - Between 2% and 5% of the service's members sold a car due to their use of carsharing.
  - 7% to 10% of the respondents did not buy a vehicle thanks to carsharing.
  - Each vehicle of the service removed 7 to 11 vehicles from city roads. In total, it could represent as much as 28,000 vehicles off the road.
  - Users report a 13% increase in cycling and 19% increase in walking.
  - A 4% to 18% (average 10%) reduction in greenhouse gas (GHG) emission across the study population.
  - A 6% to 16% (in average 11%) reduction in vehicle miles traveled (VMT).

2. ‘Improve’ Policies
‘Improve’ Policies

Make more efficient vehicles...

**Regulatory / Institutional**
- Mandatory-to-buy/sell
- Mandatory-to-use

**Economic**
- Cheaper / easier-to-buy/sell
- Cheaper / easier-to-use

**Information / Capacity**
- Known
- Popular
- Easy to understand
‘Improve’ Policies

- Fuel economy standards (National Level)
- Phase-out of older and polluting vehicles (Local/National Level)
- Sales quota for dealerships (Local/National Level)
‘Improve’ Policies

Regulatory / Institutional

• Mandatory-to-buy/sell
• Mandatory-to-use

• Differentiated access for vehicles in the city
  • Low Emissions Zone (LEZ)
    • ICE of high emissions standard, alternative fuel vehicles, hybrid vehicles, electric vehicles
  
  • Zero Emissions Zone (ZEZ)
    • Strictly all-electric vehicles
‘Improve’ Policies

Regulatory / Institutional

- Mandatory-to-buy/sell
- Mandatory-to-use

**Case Study:** Differentiated access for electric vehicles, Paris
- Visible stickers related to emissions are placed on the windshield

Source: https://www.toi.no/getfile.php?mmfileid=49204
‘Improve’ Policies

Regulatory / Institutional

- Mandatory-to-buy/sell
- Mandatory-to-use

**Case Study:** Differentiated access for electric vehicles, Paris
- Reduced NOx, and more modern fleet composition

Source: https://www.toi.no/getfile.php?mmfileid=49204
‘Improve’ Policies

- Purchase incentives (often National Level)
  - Differentiated taxation or subsidies
  - Fee-bates
  - VAT exemptions

Economic

- Cheaper / easier-to-buy/sell
- Cheaper / easier-to-use
‘Improve’ Policies

**Economic**

- Cheaper / easier-to-buy/sell
- **Cheaper / easier-to-use**

• Fuel taxes (often National Level)

• Circulation incentives
  - Emissions-based road pricing
  - Free / dedicated parking
  - Access to special lanes (e.g. bus lanes)

• Roll-out of support infrastructure (e.g. charging for EV and/or hydrogen vehicles)
‘Improve’ Policies

- Circulation incentives
  - **Free / dedicated parking:** Sweden found net positive impacts on EV use and circulation caused by free parking for EV only, delivered along other EV incentives

Economic

- Cheaper / easier-to-buy/sell
- **Cheaper / easier-to-use**

‘Improve’ Policies

- Roll-out of support infrastructure (e.g. charging for EV and/or hydrogen vehicles)

Economic

- Cheaper / easier-to-buy/sell
- Cheaper / easier-to-use

CHARGING INFRASTRUCTURE ROLLOUT

PARKING SPOTS FOR EV CHARGING

SUCCESSFUL GRID INTEGRATION
‘Improve’ Policies

Economic

- Cheaper / easier-to-buy/sell
- Cheaper / easier-to-use

Roll-out of support infrastructure (e.g. charging for EV and/or hydrogen vehicles)

Costly Affair

- Govt fails to choose between Japanese and Chinese charging technologies for EVs
- Charging stations have to install both technologies which will increase their costs substantially
- Plugs and communication protocols to link batteries to chargers need to be limited to keep costs down
- Current international standards used by most vehicle manufacturers globally are CCS and CHAdeMO
- Power Ministry guidelines specify technical parameters for slow and fast varieties of CCS, CHAdeMO and Bharat platforms

Early efforts on standardisation reduces system costs for everyone involved

‘Improve’ Policies

- Fuel economy labelling (National Level)
- Open data and apps to show public transport (shift policy) and car-sharing options (improve policy) for point-to-point travel

Information / Capacity
- Known
- Popular
- Easy to understand
‘Improve’ Policies

Information / Capacity

- Known
- Popular
- Easy to understand

• Open data and apps >> **mobility as a service (MaaS)**

Economies of scale allow faster tech replacement

Greater integration with more sustainable transport

Optimised infrastructure and movement saves energy further

Source: https://transportknowledgehub.org.uk/case-studies/mobility-service-west-midlands-elsewhere/
‘Improve’ Policies

Information / Capacity

• Known
• Popular
• Easy to understand

**Case study:** Accessibility to jobs in Lisbon before (left) and after (right) the introduction of shared mobility solutions

Source: https://www.itf-oecd.org/shared-mobility-innovation-liveable-cities
‘Improve’ Policies

**Case study:** Grab starting to organise MaaS through its app. Singapore, Bangkok, Kuala Lumpur as testbed due to open data and organized public transport.

**Information / Capacity**

- Known
- Popular
- Easy to understand

3. Activity
Activity

- What urban transport policies can you think of? Classify the post-its by colour (regulatory, economic, information) and label with A, S, and I (avoid, shift, improve)

<table>
<thead>
<tr>
<th>Regulatory</th>
<th>Economic</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVOID (A)</td>
<td></td>
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<tr>
<td>SHIFT (S)</td>
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<tr>
<td>IMPROVE (I)</td>
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E-BIKES AND E-SCOOTERS: DRIVERS OF CLIMATE ACTION

Electric bikes and scooters are more than a convenient first-last mile solution in cities. They also reduce emissions while catalyzing a broader shift toward sustainable transport.

QUIET STREETS
E-bikes and scooters are quieter than cars and motorcycles, making streets and public spaces more pleasant for pedestrians and cyclists.

SAFE STREETS
As the number of e-bikes and scooter riders, cyclists, and pedestrians increases, streets become safer for all users.

SAFE ACCESS
E-bikes and e-scooters are attractive to— and increasingly used by—women, older adults, and other groups who have not been comfortable on traditional bicycles.

CONVENIENT ALTERNATIVES
E-bikes are competitive with cars on short trips, especially for trips up to 10km.

Quiet streets

Convenient alternatives

Safe streets

Safe access

What cities can do:

LEGALIZE
Make low-speed e-bikes and scooters legal in cities. Regulate them as bicycles, not motor vehicles, so license and insurance are not required to ride.

STANDARDIZE
Clearly define and enforce speed maximums for e-bikes and e-scooters to distinguish where they can safely share cycle lanes with pedal bicycles.

DESIGN
Ensure cycle lanes are protected and form a complete network, safely accommodating low-speed e-bike and e-scooter riders in addition to pedal cyclists.

MANAGE
Enforce rules for bike- and scooter-share operators to ensure that sidewalks are clear, and shared bicycles and scooters are well maintained.

MONITOR
Collect and analyze data on trip length, frequency of use, and destinations to better quantify personal mobility use and identify and improve shared systems.

ITDP

Choose an e-bike or scooter over a car translates to measurable emissions reductions:

A 3% increase in trips made by bicycle and electric micromobility modes instead of cars globally would reduce CO2 emissions by 7% the equivalent of taking more than 1.34 million cars off the road, by 2050.

In Portland, Oregon, 6% of e-scooter users reported getting rid of a car due to the availability of micromobility options.

ITDP.ORG TO LEARN MORE
Resources

- Government-to-government forum comprising 13 countries

- Currently co-chaired by Canada, China and the United States*, and coordinated by the IEA

- Released several analytical publications (Global EV Outlook, City casebook)

- Engaged stakeholders in high-level roundtables (CEM8 and Pilot City Forum in Beijing, June 2017)

- Instrumental to mobilize action and commitments (Paris Declaration on Electro-Mobility and Climate Change at COP21, Government Fleet Declaration at COP22)

- Just launched the EV30@30 Campaign, aiming to achieve a 30% market share for EVs by 2030
The Global Fuel Economy Initiative (GFEI) works to secure real improvements in fuel economy, and the maximum deployment of vehicle efficiency technologies across the world.
Resources

Data-Driven Transport Policy


Big Data and Transport
Understanding and assessing options

https://www.itf-oecd.org/sites/default/files/docs/15cpb_bigdata_0.pdf