4. Urban Transport – improving efficiency

John Dulac

Paris, 21 May 2019

IEA #energyefficientworld

4. Urban Transport – improving efficiency

Trainer(s): John Dulac

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

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

4. Urban Transport – improving efficiency

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**
   - Avoid-Shift-Improve vs Regulatory-Economic-Information Grid
   - Map out stakeholders

10 mins

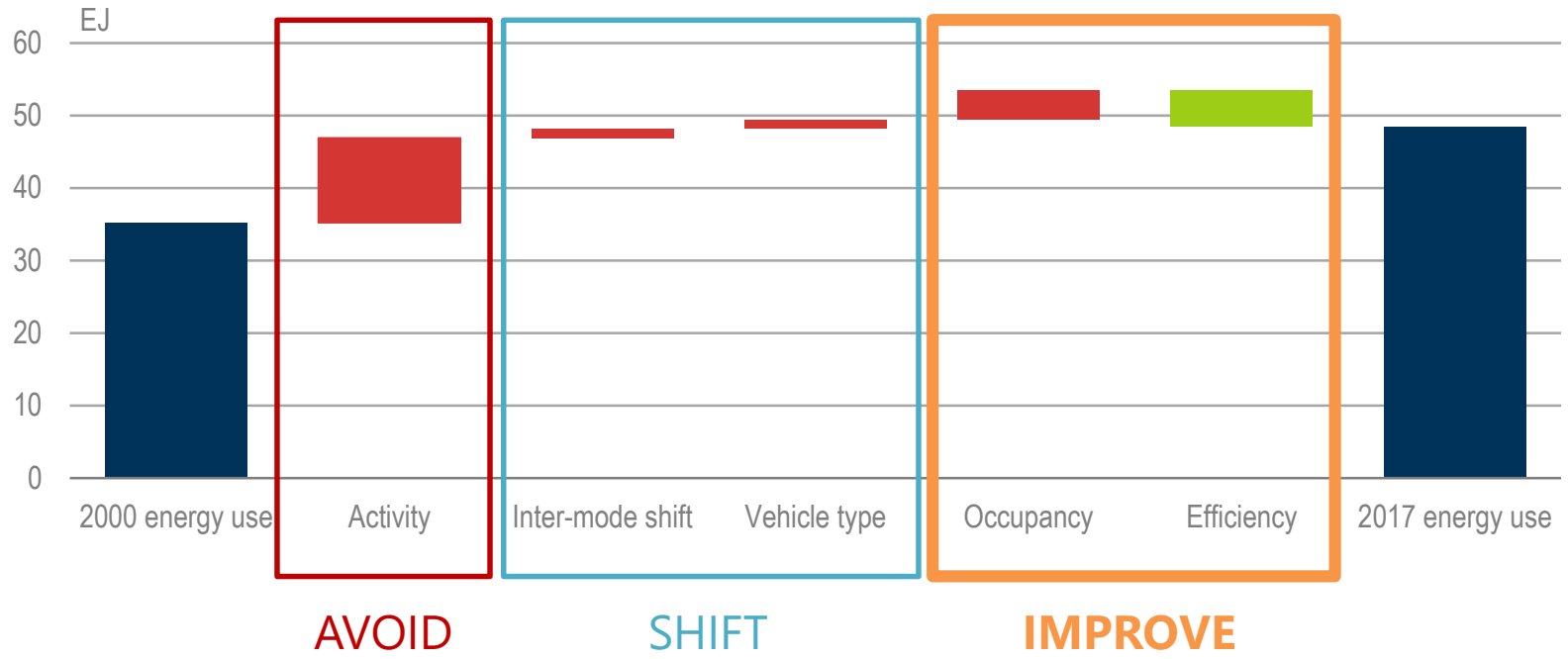
20 mins

40 mins

1. Improving efficiency

1. Improving efficiency

Decomposition of passenger transport final energy use, 2000-17



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

Source Energy Efficiency 2018

1. **Improving efficiency.** Potential to improve

Opportunity in IEA's Efficient World Scenario (EWS)

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

Key policy actions

NATIONAL

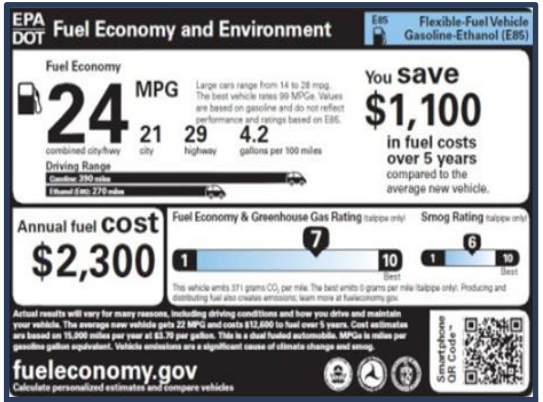
- Improve coverage and strength of transport policies for cars and trucks and non-road modes.

- Provide incentives to support uptake and sustainable use of efficient vehicles.
- Information to support efficient vehicle uptake and mode shift.

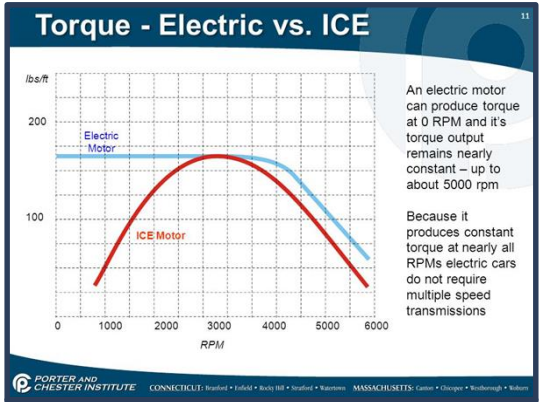
NATIONAL & LOCAL

1. **Improving efficiency.** More efficient vehicles

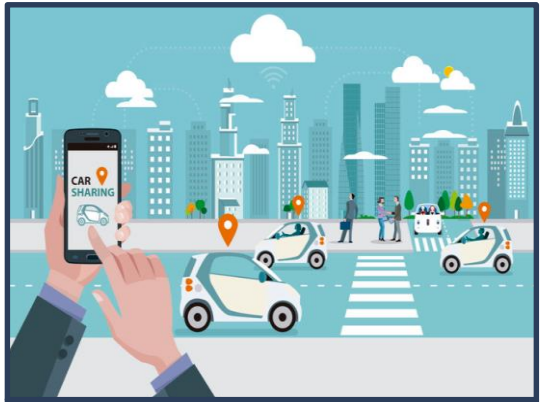
More efficient vehicles…



Consume Less Fuel



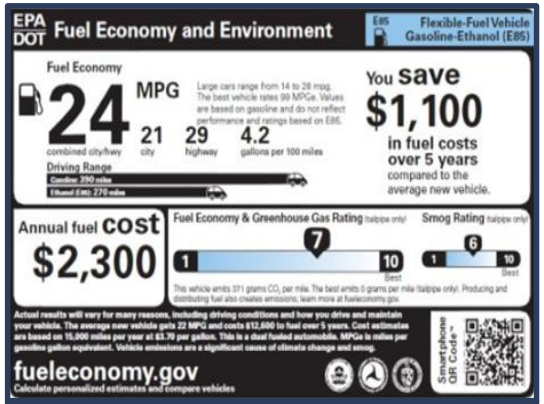
Use more efficient powertrains



Transport more people

1. **Improving efficiency.** More efficient vehicles

Where to start? | Tools | What are the steps?



Consume Less Fuel

- Increasing the fuel economy of engines and vehicles directly "improve" the efficiency. This is done on a national level.

ICE potential, through hybridization and light-weighting

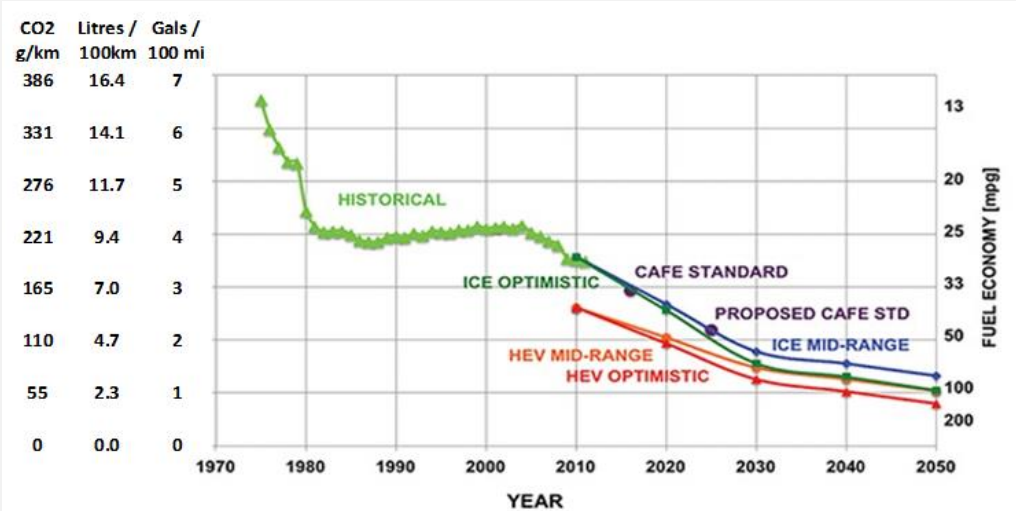
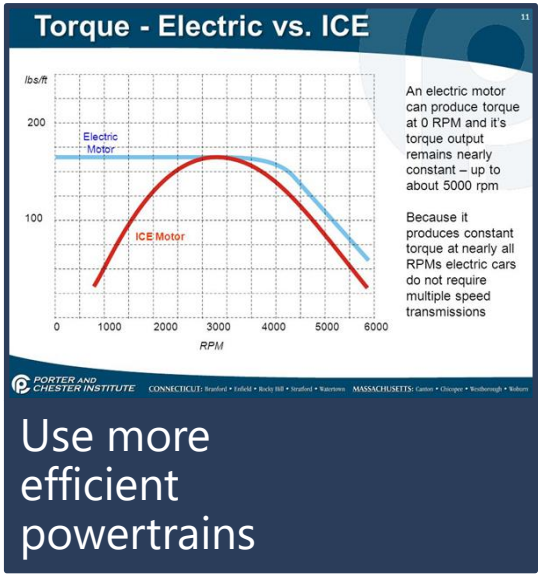


FIGURE 2.1 Historical and projected light-duty vehicle fuel economy.
NOTE: All data is new fleet only using unadjusted test values, not in-use fuel consumption.

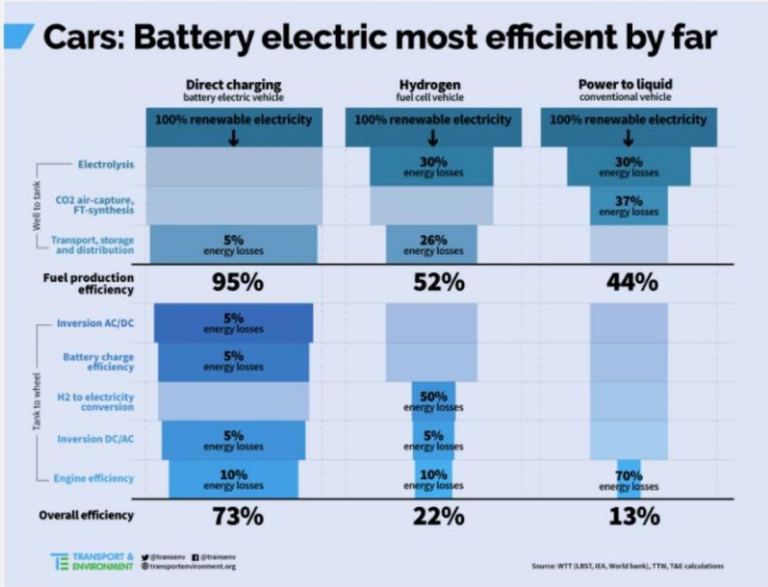
Source https://www.nap.edu/catalog/18264/transitions-to-alternative-vehicles-and-fuels

1. **Improving efficiency.** More efficient powertrains



Use more efficient powertrains

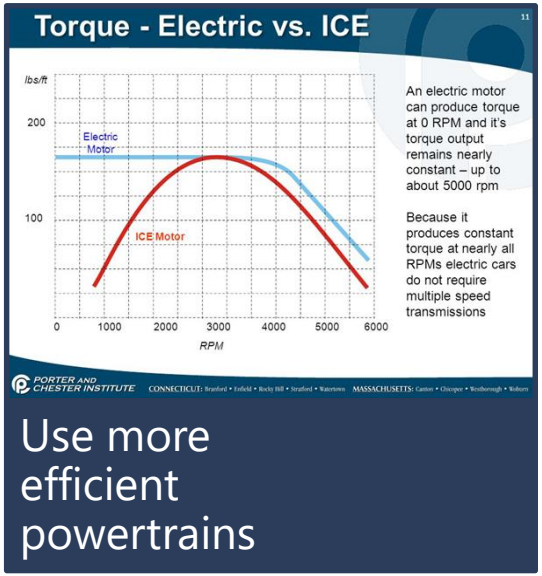
- **Well-to-wheel efficiency** of battery electric vehicles outweigh conventional internal combustion engines by **5-6 times** especially if coming from renewable resources



Source https://www.transportenvironment.org

1. **Improving efficiency.** More efficient powertrains

Where to start? | Tools | What are the steps?



Use more efficient powertrains

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

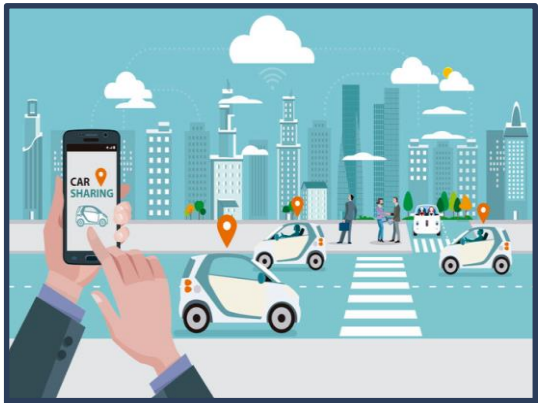
Electric 2-wheelers
China: 250 million stocks, 30 million sales/yr

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

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

1. Improving efficiency. Higher occupancy

Where to start? | Tools | What are the steps?



Transport more people

- 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 respondants **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)

Source http://innovativemobility.org/wp-content/uploads/2016/07/Impactsofcar2go_FiveCities_2016.pdf

2. ‘Improve’ Policies

What are the policies to encourage the uptake of more efficient vehicles?

2. ‘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

2. ‘Improve’ Policies. Regulatory/Institutional

Regulatory / Institutional

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

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

2. ‘Improve’ Policies. Regulatory/Institutional

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

2. ‘Improve’ Policies. Regulatory/Institutional

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

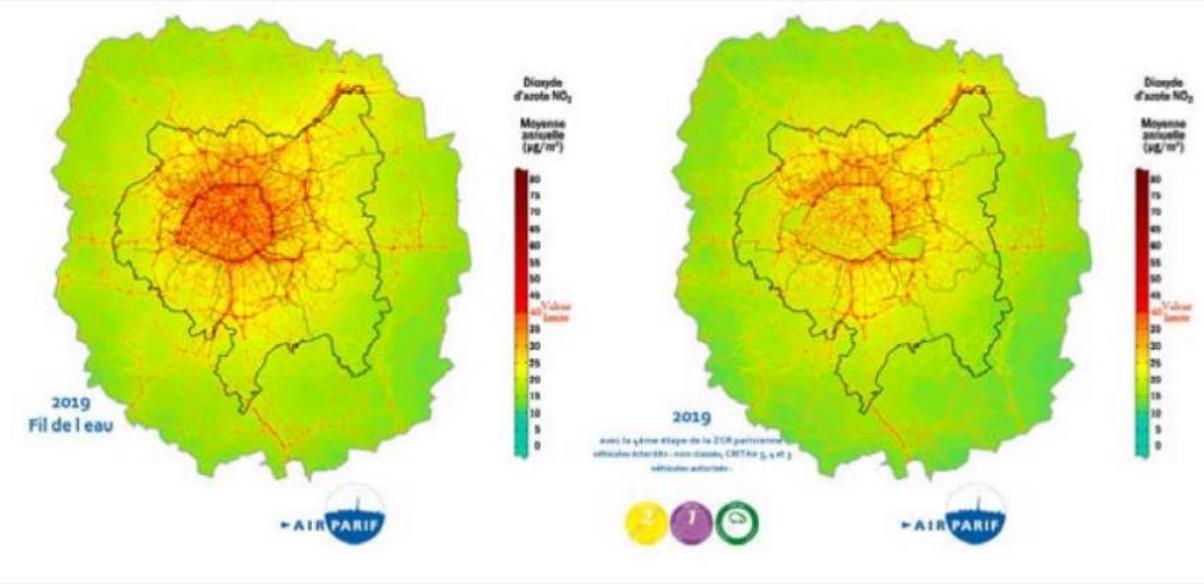
Source: https://www.toi.no/getfile.php?mmfileid=49204

2. ‘Improve’ Policies. Regulatory/Institutional

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

2. 'Improve' Policies. Regulatory/Institutional

Regulatory / Institutional

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

- **Case Study:** Differentiated access for vehicles in Metro Manila
  - Freight trucks banned between 6AM-10AM and 5PM-10PM everyday except Sunday and holidays

- Reduced congestion and improved overall throughput

Source http://www.cartrextrucking.com/metro-manila-truck-ban/

2. ‘Improve’ Policies. Economic

Economic

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

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

2. ‘Improve’ Policies. Economic

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)

2. ‘Improve’ Policies. Economic

Economic

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

- 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

Source https://www.nordicenergy.org/wp-content/uploads/2017/10/gupea_2077_53160_1.pdf

2. ‘Improve’ Policies. Economic

Economic

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

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

CHARGING INFRASTRUCTURE ROLLOUT

PARKING SPOTS FOR EV CHARGING

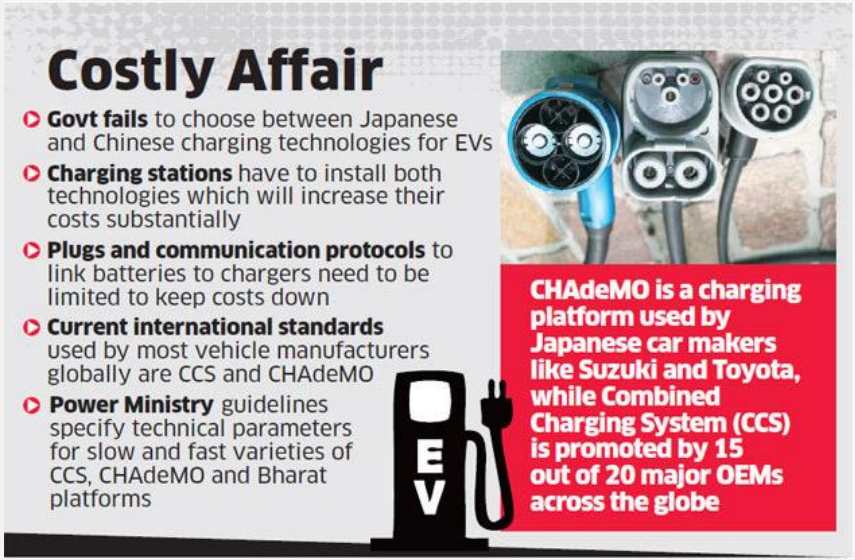
SUCCESSFUL GRID INTEGRATION

2. 'Improve' Policies. Economic

Economic

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

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

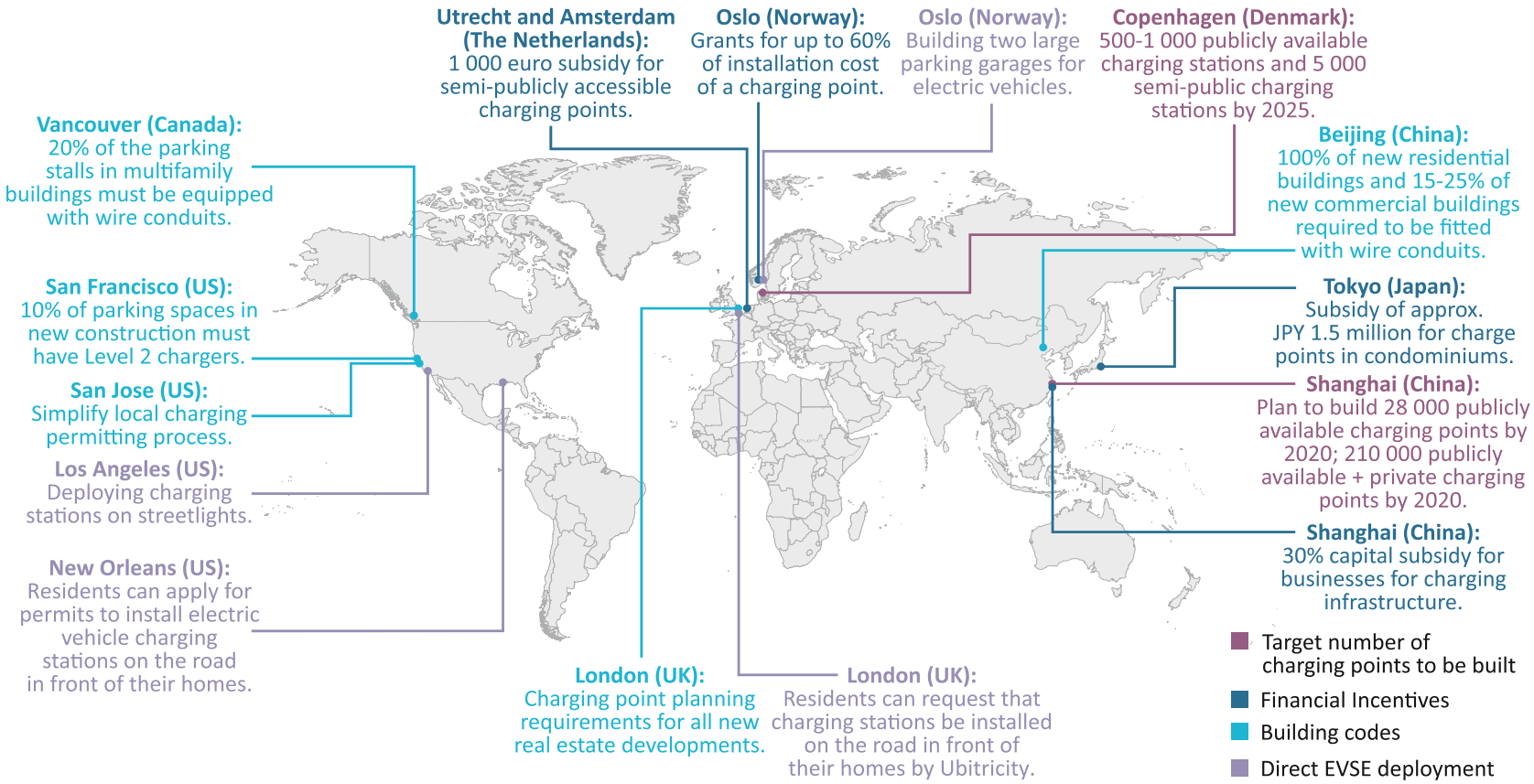


Early efforts on standardisation reduces system costs for everyone involved

Source https://economictimes.indiatimes.com/industry/auto/auto-news/ev-charging-stations-asked-to-install-both-japanese-chinese-technologies/articleshow/67120981.cms?from=mdr

2. ‘Improve’ Policies. Economic

Where to start? | Tools | What are the steps?



2. ‘Improve’ Policies. Information / Capacity

Information / Capacity

- Known
- Popular
- Easy to understand

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

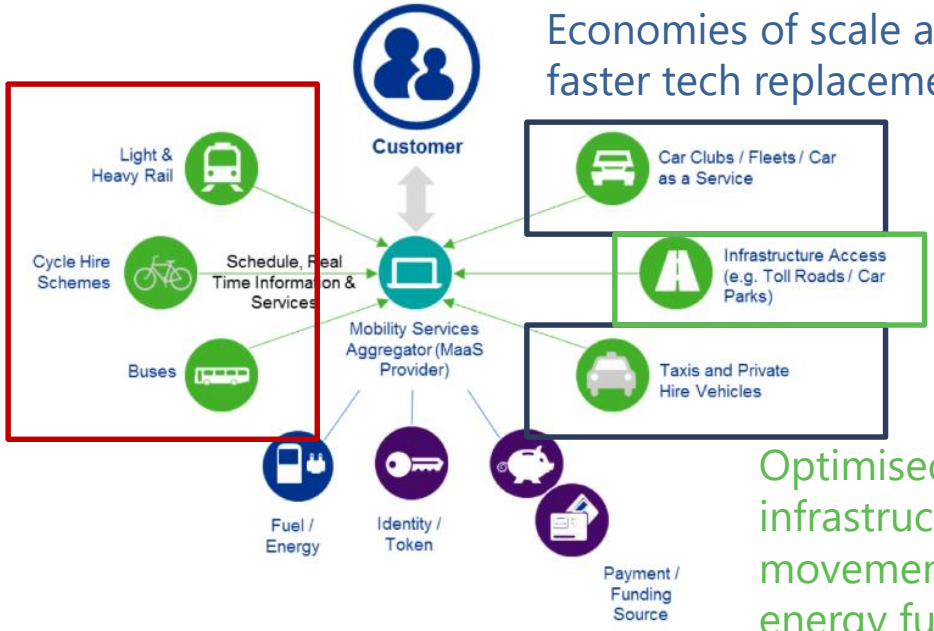
2. ‘Improve’ Policies. Information / Capacity

Information / Capacity

- Known
- Popular
- Easy to understand

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

Greater integration with more sustainable transport



Economies of scale allow faster tech replacement

Optimised infrastructure and movement saves energy further

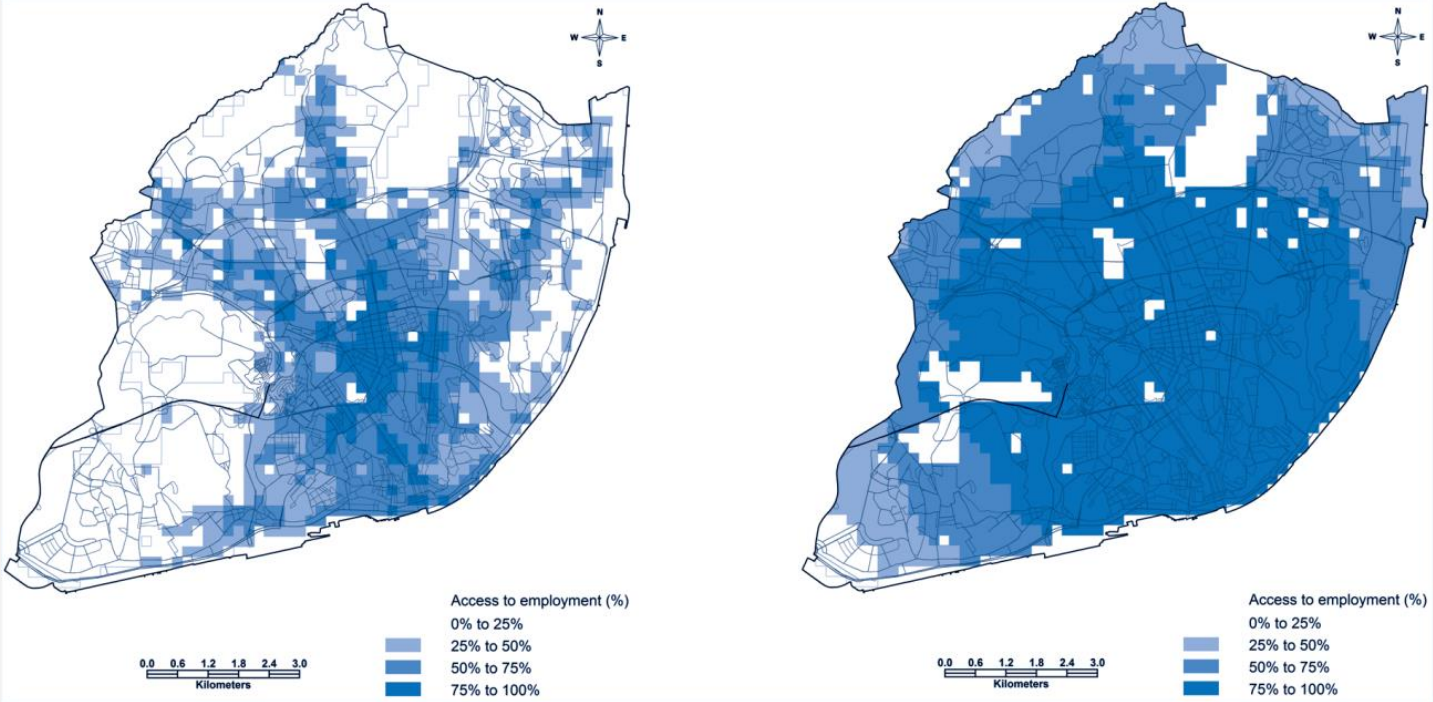
Source: https://transportknowledgehub.org.uk/case-studies/mobility-service-west-midlands-elsewhere/

2. ‘Improve’ Policies. Information / Capacity

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

2. ‘Improve’ Policies. Information / Capacity

Information / Capacity

- Known
- Popular
- Easy to understand

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

SHARING ECONOMY

Grab to integrate public transport data in Southeast Asian mega cities

Ride-hailer eyes train and bus fare payments

KENTARO IWAMOTO, Nikkei staff writer
APRIL 22, 2019 12:27 JST

Grab will integrate public transport information to the ride-hailing app in Singapore. (Photo by Kentaro Iwamoto)

Source https://asia.nikkei.com/Spotlight/Sharing-Economy/Grab-to-integrate-public-transport-data-in-Southeast-Asian-mega-cities

2. Activity

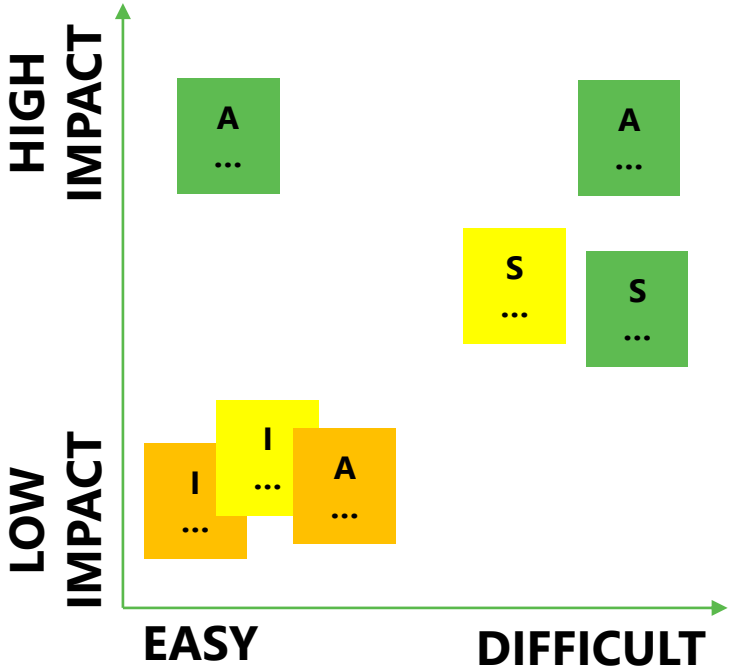
2. **Activity.** Part 1

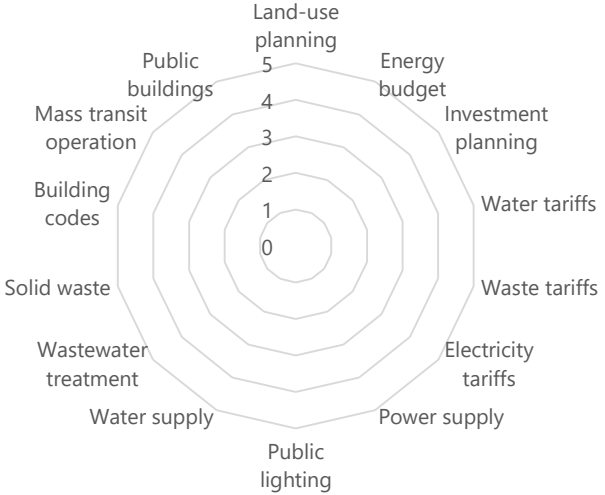
- **(15 mins)** What urban transport policies can you think of? Classify the post-its by colour (regulatory, economic, information) and label with A, S, and I (avoid, shift, improve)

	Regulatory	**Economic**	**Information**
AVOID (A)			
SHIFT (S)			
IMPROVE (I)			

2. Activity. Part 2

- **(20 mins)** Considering your power and influence (Session 1), and what we learned for the urban transport session (Session 2, 3, and 4), prioritise the policies based on ease and importance



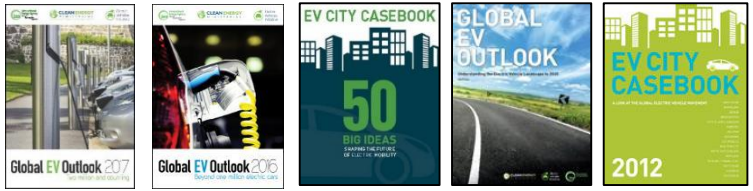


CLEAN ENERGY MINISTERIAL

Electric Vehicles Initiative

- 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.

GFEI
GLOBAL FUEL ECONOMY INITIATIVE

MARRAKECH COP22|CMP12
UN CLIMATE CHANGE CONFERENCE 2016

SUSTAINABLE ENERGY FOR ALL

ipeec

UN Climate Change
Climate Action

Global Energy Efficiency Accelerator Platform

Australia 2014

Transport Task Group (TTG)

Core partners

FIA FOUNDATION

UN environment

UCDAVIS INSTITUTE OF TRANSPORTATION STUDIES

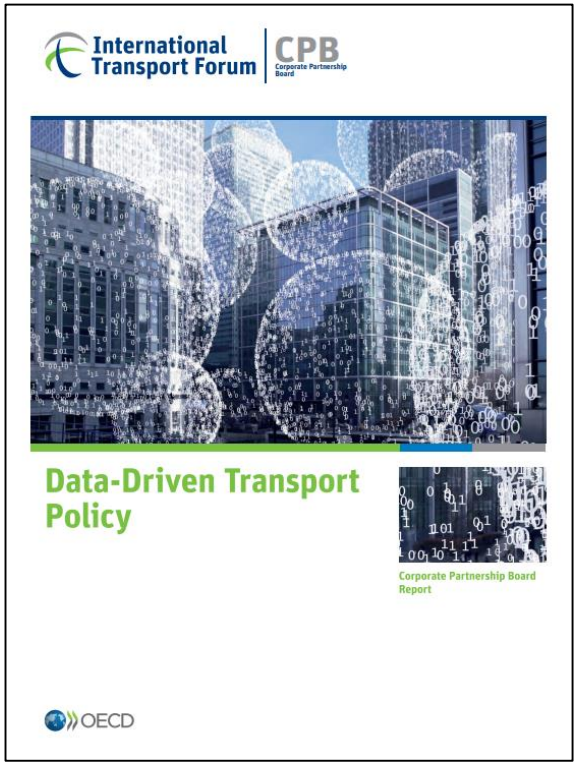
iea International Energy Agency Secure Sustainable Together

icct THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

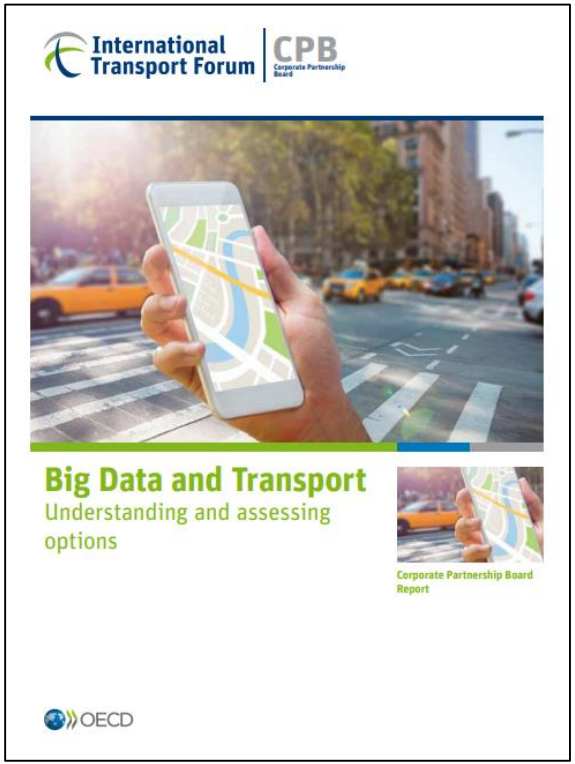
International Transport Forum

Launched in 2009, now recognized as leading vehicle efficiency initiative in energy and climate reports and discussions

Key Resources



https://www.itf-oecd.org/sites/default/files/docs/data-driven-transport-policy.pdf



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

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