

Energy efficiency policies for transport

John Dulac

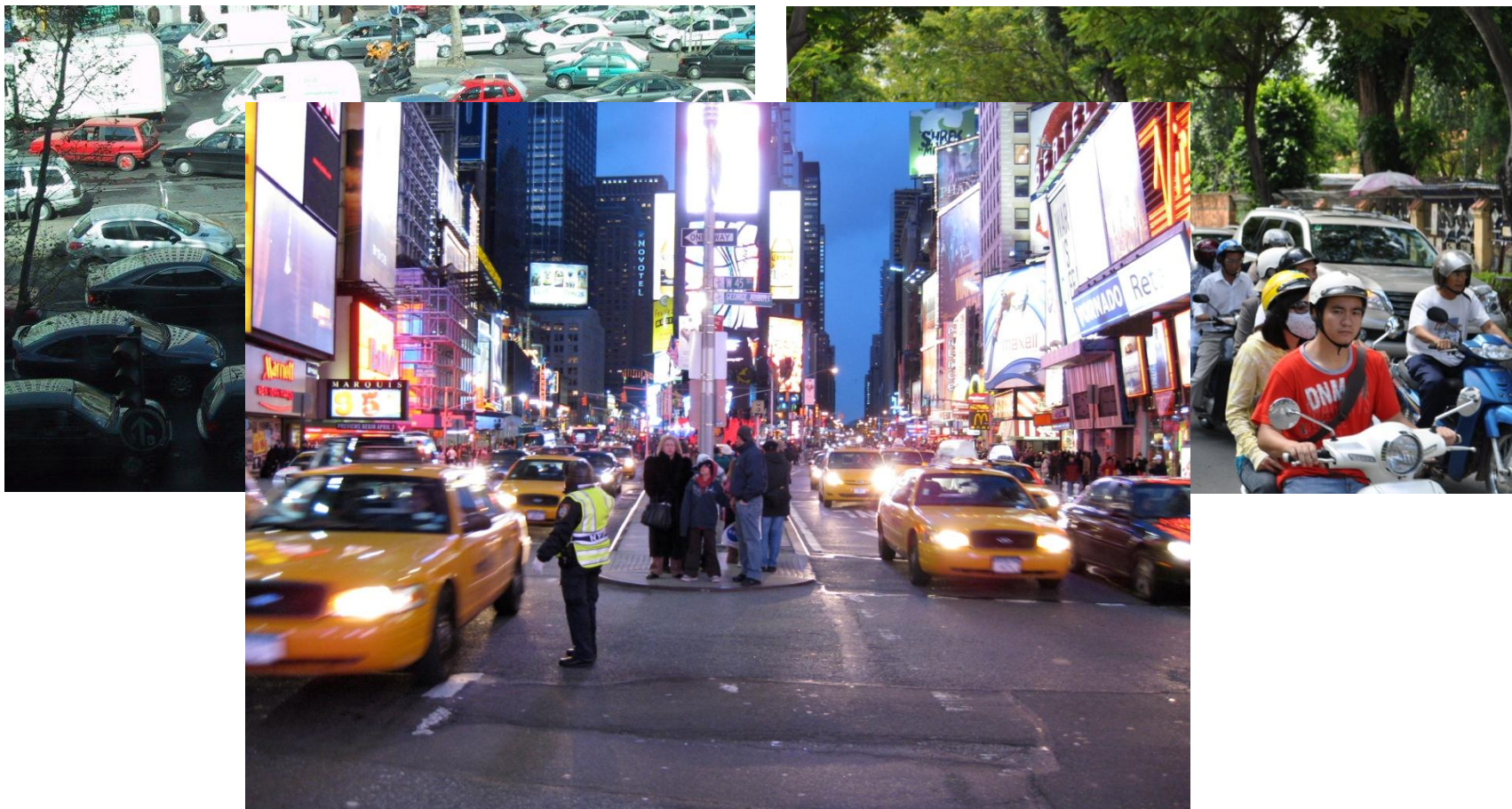
International Energy Agency

Paris, 29 May 2013



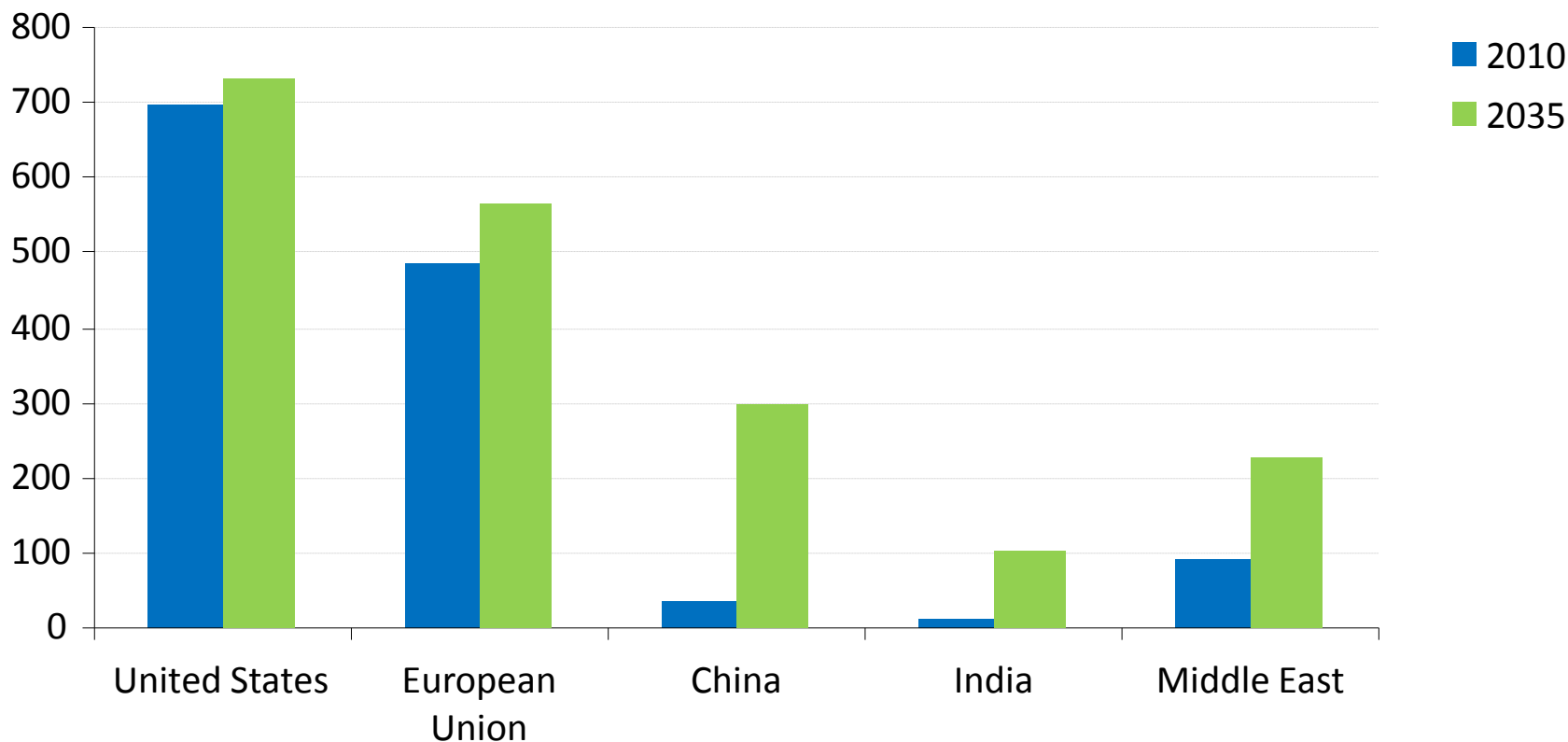
**International
Energy Agency**

Why are transport policies needed, particularly in cities?



Oil demand is driven higher by soaring car ownership

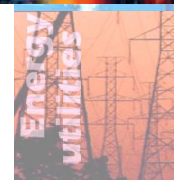
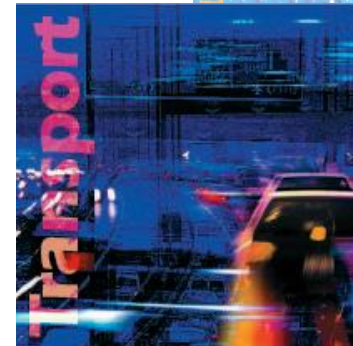
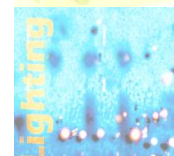
Vehicles per 1 000 people in selected markets



The passenger vehicle fleet doubles to 1.7 billion in 2035; most cars are sold outside the OECD by 2020, making non-OECD policies key to global oil demand

Transport

- 16** Mandatory vehicle fuel-efficiency standards
- 17** Measures to improve vehicle fuel efficiency
- 18** Fuel-efficient non-engine components
- 19** Eco-driving
- 20** Transport system efficiency

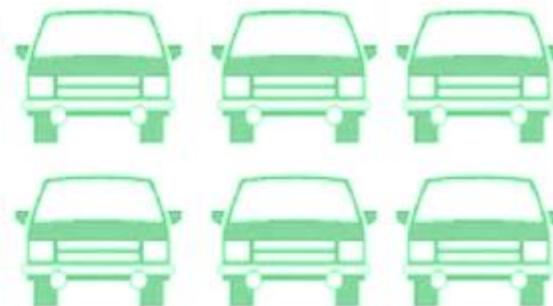


Avoid-Shift-Improve: Q&A

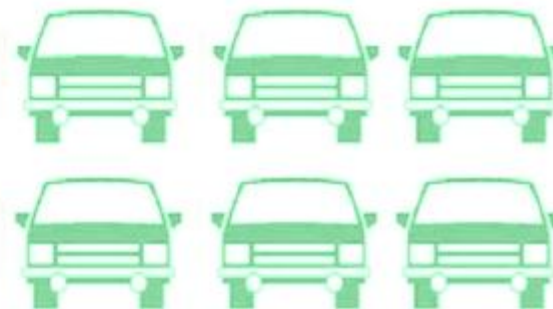
AVOID
unnecessary trips
REDUCE km



SHIFT modes



IMPROVE vehicles
low carbon fuels



Transport energy use

A. Avoid

- Land use, urban design, telework

B. Shift

- Low carbon transport modes

C. Improve

- Efficient vehicles, technology

Avoid transport energy use

- The most energy efficient trip is the one that is not performed
 - Land use planning
 - Parking policy
 - Urban design



Avoid - land use planning

- **A 10% increase in urban density reduces per capita travel vehicle kilometer by 1% - 3%**
- **Compact development policy:**
 - Population near employment
 - Access and proximity to transit
 - Mixed-use development
 - Pedestrian, bicycle and transit-friendly design



Dongton Eco City: Town of three villages

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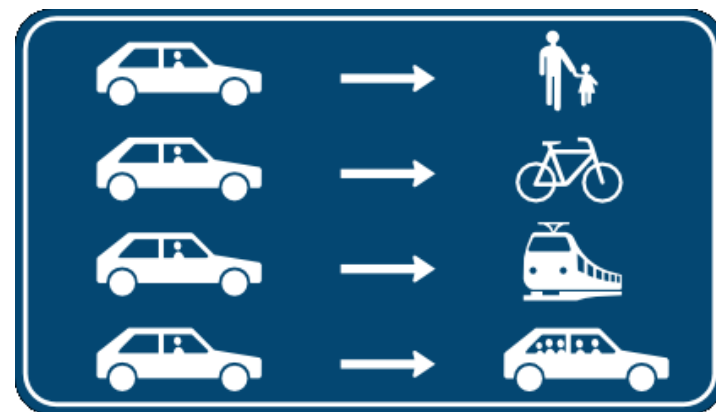
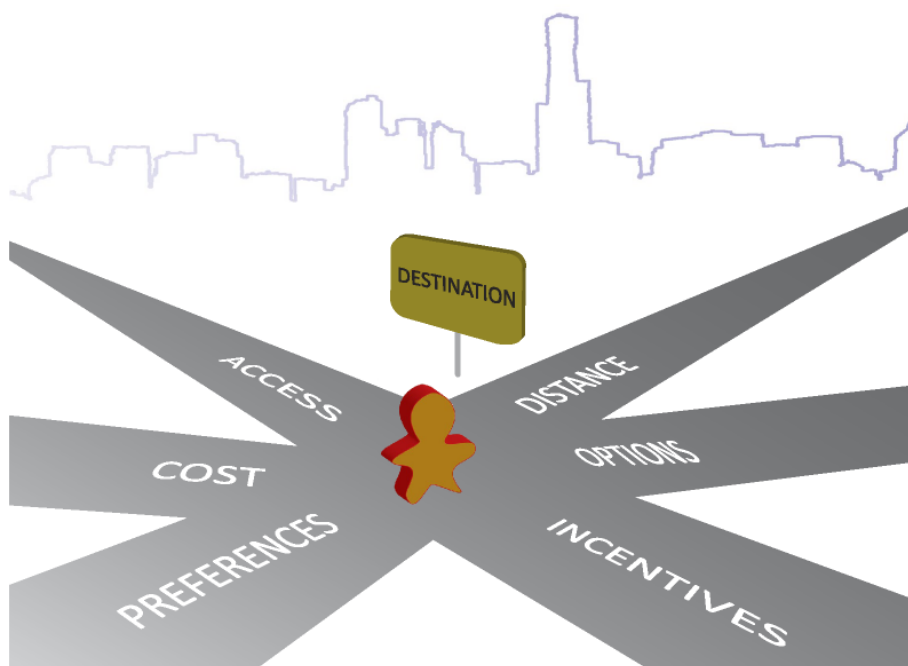
- Low carbon transport modes

C. Improve

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Shift transport energy use

- Aim is to use the most energy efficient mode
- Optimal mode depends on trip distance / location



Shift - bus rapid transit (BRT)

- **Bogota's BRT a reference: 100+ systems in world today (cities in Columbia, Ecuador, China, India, Brazil....)**
- **Significant CO₂ reduction - 25% - 39% (IEA estimate).**
- **Advantages: improved fuel efficiency, higher speeds and less stop-and-go traffic on dedicated routes**



Shift - rail

- HSR is ~15% more efficient than previous generation
- New high speed rail are built/planned in many countries
- Worldwide ~ 37 000 km of HSR tracks are under construction or planned (IEA, 2009)



Shift - car share (commuting)

- Requires users to be within convenient distance
- Participation in car sharing on average reduces car travel by 3 000 km/year
- By 2050 ~1% population in urban areas could use car-sharing
- Avoid 75 billion km vehicle travel and 12 million tCO₂



Shift - non-motorised transport (NMT)

Cycling:

- Infrastructure provisions: lanes, parking, traffic signals
- Funding / cycling mode relationship:
 - Amsterdam: US\$ 39/resident, Cycling 35%,
 - USA: US\$ 1.5/resident, Cycling 1%.
- Bicycle “sharing” (rental) services
- Viable alternative for short trips
- Best promoted for densely populated city centers



Shift - NMT

Walking:

- **Pedestrian infrastructure, amenities and services are often neglected.**
- **Pedestrian friendly policies:**
 - Safe sidewalks
 - Well marked, respected crossings
 - Car-free zones
 - Traffic calming measures
- **Walkability Index: modal conflict, security from crime, crossing safety, motorist behavior, benches and street lighting, etc.**



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Improve transport energy use

- **Technology efficiency policy**
 - Standards
 - Alternative technology
 - Components
- **Behavioural policy**
 - Promotion & awareness
 - Incentives for cleaner vehicles



TECHNOLOGY LEAPFROGGING

Improve - IEA recommendations

5.1 Fuel-efficient tyres

- Labelling on tyre rolling resistance
- Tyre pressure monitoring systems (TPMS)

5.2 Fuel efficiency standards for light-duty vehicles

5.3 Fuel efficiency standards for heavy-duty vehicles

5.4 Eco-driving

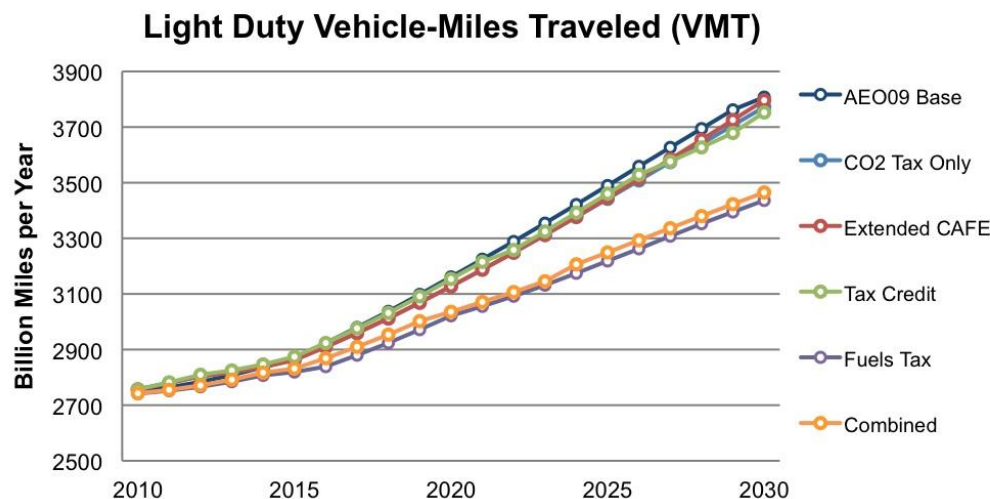
- Driver training
- In-car feedback instruments

Improve - other policy measures

- **Fuel switching**
- **Electric vehicles**
- **Pricing, subsidies and incentives**

Improve - fuel pricing

- Fuel prices strongly influence “driving culture”
 - Countries with higher fuel prices drive smaller cars and less
- Fuel subsidies skew market and are inequitable



Source: Gallagher, 2010

Improve – road pricing

- **Stockholm congestion charge**
 - Trial 1st Jan – 31st July 2006
 - Charge differed by time-of-day (€1.10, €1.60, €2.20) and levied on inward and outward journeys
 - Many exemptions (ecovehicles, taxis, public transport)
 - Increase in public transport services (7%) 4 months before start
 - Attitudes changed during trial
- **London congestion charge Feb 2003-present**
 - Congestion down 25% from pre-charge

Improve - taxes and incentives

- CO₂-differentiated purchase, registration and ownership fees, annual circulation (mileage) tax
- Scrappage schemes, feebates
- Special tax credits for hybrid or electric vehicles

Country	Registration tax	Ownership tax	other tax incentives
Belgium	based on cc + age Based on CO ₂ emissions in Wallonia	Based cylinder capacity	
Denmark	N.A	Based on fuel consumption and weight	
Germany	N.A	Based CO ₂ emissions (since 2009)	Scrappage programme
Spain	based on CO ₂ emissions (changed in 2008)	N.A	
France	based on CO ₂ emissions	N.A	Bonus malus scheme introduced in 2008
Ireland	based on CO ₂ emissions (changed in 2008)	Based CO ₂ emissions	
Netherlands	based on price and CO ₂ emissions. Since 2006	Based on weight, province	
Norway	N.A	purchase tax based on CO ₂ emissions, Changed in 2006	CO ₂ tax and fuel tax
Portugal	based on cc + CO ₂ emissions	Based on cylinder capacity and CO ₂ emissions	
Sweden	N.A	Based on CO ₂ emissions and weight	eco car subsidy
UK	N.A	Based on CO ₂ emissions and cylinder capacity	Vehicle excise duty based on CO ₂ emissions (since 2009)
Japan	reduced registration tax for fuel efficient cars (since 2001)	N.A	subsidies for efficient cars

More information:

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