

Urban Mobility at the crossroads: social megatrends, tech options, policy choices

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International Transport Forum

At the FIA Mobility Conference Week – The Hague, 13th September 2013



MISSION:

“To foster a deeper understanding of the role of transport as a key to economic growth and of its impact on the environmental and social dimensions of sustainability.”

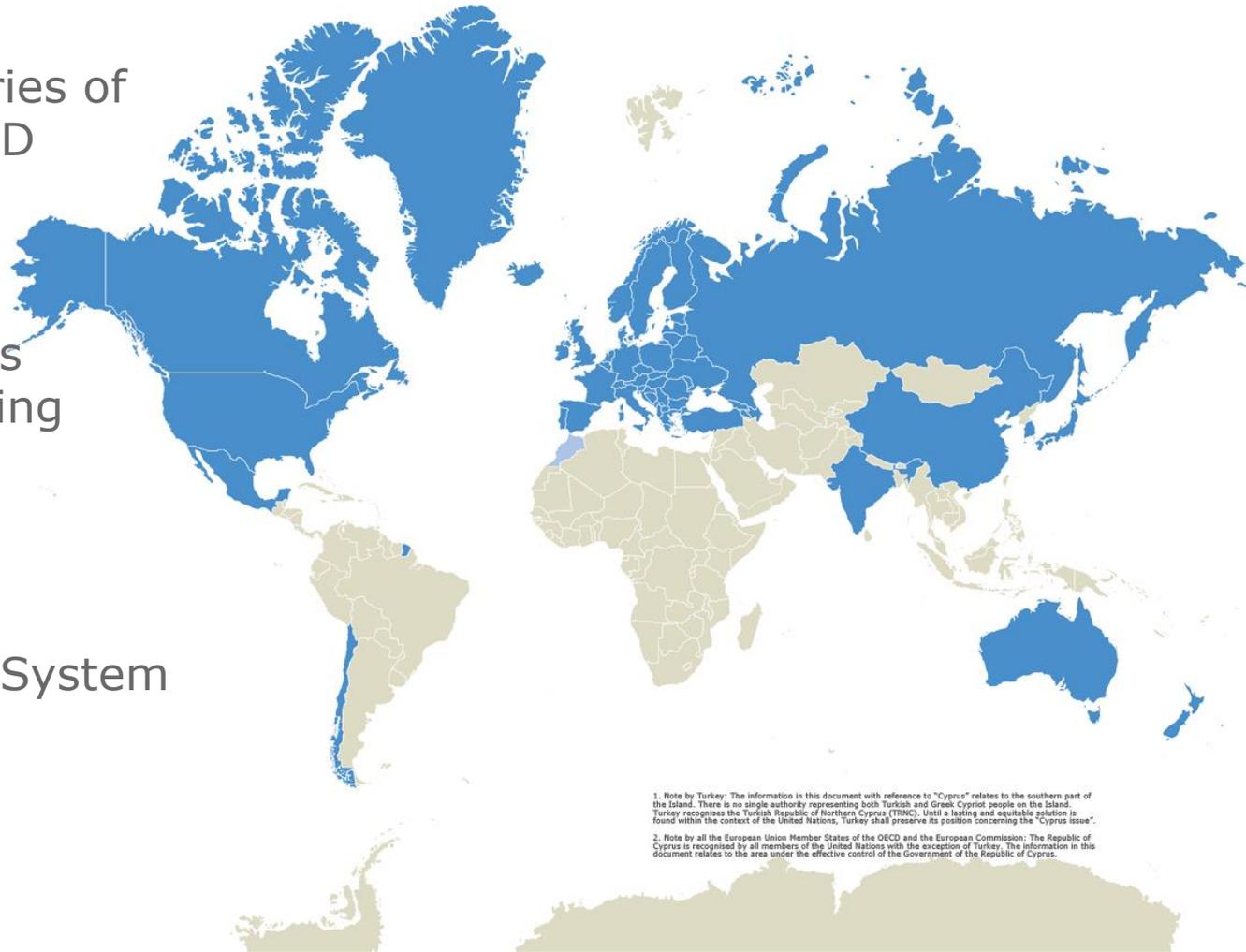
Intergovernmental Organisation

54 member countries of
which 21 non-OECD

Housed by OECD

Council of Ministers
of Transport, rotating
Annual presidency

Legal instruments:
European
Multilateral Quota System
(Road Freight)



1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Commission: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Think Tank

Evidence-based research
and analysis

Data and statistics

Identification of
best-practice policies

Institutionalised in OECD/ITF
Joint Transport Research Centre
(JTRC)

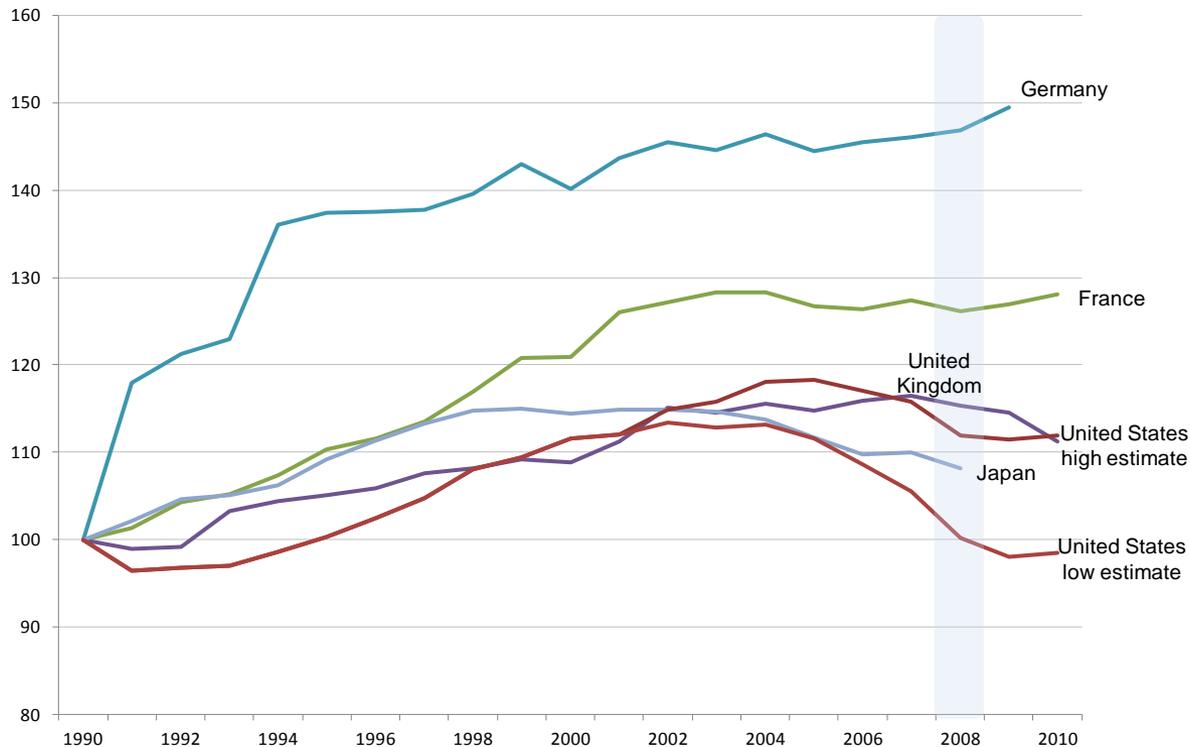


Social Mega-trends

- From 7 bn population, with 50% urbanized now to 9 bn population with 80% urbanized in 40 years, urban population goes from 3.5 to 7.2 bn (more than doubling, mostly in emerging countries)
 - What paradigm for this huge growth: mega-cities even bigger, medium-large cities going mega, new cities?) → key drivers should be access provision (physical and virtual) under cost and environmental constraints
 - What will mobility look like in crowded urban areas (mega-cities and medium-large cities?) Will the patterns broadly be the same as what we have seen in the past or will new patterns develop?
 - Another big challenge possibly coming from the increasing income gap, with vanishing middle class in many countries
 - Peak driving in developed countries: Is this stable, possibly associated with travel-time budget?
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The evolution of car use in rich countries

Passenger-kilometres by private car and light trucks, 1990 – 2010
(index 1990=100)



The high estimate for the USA assumes car occupancy rates remain at the level measured in 2001, and the low one that they decline as of 2001 to the level observed in the most recent household travel survey



Technological evolutions

- Very positive trends in fuel economy and emissions reduction of internal combustion engines
 - Striking differences remain between tested and on-road performance
 - Possibly for several decades a mix of energy vectors in the market
 - Increasing electrical component, via batteries and or fuel cells
 - Deep penetration of mobile telecoms, high levels of connectedness, increasing integration of things and systems
 - IT uptake by workplace/households (virtual access to jobs, services, shopping)
 - Increasing autonomy of vehicle movements
 - Initially for safety enhancement and comfort, later for efficiency, flexibility
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Increasing Vehicle Autonomy

- Vehicle to infrastructure and (initially more likely) autonomous, self-sensing communicative vehicle.
 - Investment by road infrastructure managers (governments) vs. by telecoms and other service providers;
 - Main bottleneck seems to be limited wireless/telecom bandwidth availability (and competition for this bandwidth);
 - Key technological challenge is managing the vehicle to human hand-off in “hybrid” human/autonomous drive vehicles;
 - High regulatory hurdles due to requirements for fail-safe performance and liability issues, but they may be lessened by a stepped introduction of autonomous driving.
- Full blown autonomous driving strips out the “fun to drive” attribute of cars thus increasing the relative importance of the “mobility service” provided by the car.

Cars

- Today's "car" will be very different from a "car" in the future.
 - Similar to change from the rotary, wire-linked phone one generation ago to the navigation/camera/communications device in our pockets today.
- For urban driving: constraints on available space and system efficiency (both in terms of speed and reliability of travel time), demands for reducing the presence of cars in favour of other uses of urban space.
- In urban areas, especially in dense urban areas and in what are now considered to be developing countries, the ultimate expression of individual driving is likely less to be something that we recognize as a "car" today, but rather something
 - Smaller in average;
 - more connected, shared and linked to other services;
 - a hybrid private/public vehicle of sorts.



Public Transport

- Well suited for dense urban cores and radial trips in regions between central cores and peripheral satellite developments
- But less suited for diffuse settlement patterns and low density flows in urban regions
- Rigid assets generate overcapacity outside of peaks and of trunk routes:
 - Funding difficulties of public transport may make this production model largely unsustainable;
 - Technology can help address this via demand-responsive, flexible routing and, ultimately, development of re-purposed, smaller, networked and autonomous vehicles:
 - Same trend towards autonomous driving as for private cars.
 - Technology can also better handle intra- and inter-modal hand-offs



New forms of motorized mobility (I)

- Private cars are one of the most under-used form of capital: 90% of the time inactive; in most cities no more than 25% of cars active at the same time
 - But flexibility and convenience can justify willingness to pay and high market share
 - IT can deliver that flexibility and convenience without ownership
 - A possible and gradual shift from car ownership to
 - car-based mobility based on vehicle sharing and even ride-sharing (quasi-public-transport system), as instruments to
 - reduce costs,
 - increase adaptability of solution (car) to problem (access requirement),
 - massive release of public space (much lower parking needs) to pedestrians and bicycles, “slow areas” in neighbourhoods, decentralized services, etc.
 - possibly reduced congestion (higher average occupation of cars)
 - Higher utilisation of fewer cars (lower cost/pax.km) should allow higher (quicker) technology incorporation, leading to faster reduction of environmental aggression
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New forms of motorized mobility (II)

- Implications of autonomous cars
 - On mobility of older citizens, no longer physically and mentally fit to drive, but still with good self-awareness and independent mobility
 - On taxi services: big cost reduction (in many cities drivers are active less than half of their duty time), single rides and shared rides
- Smaller size of middle class may push towards higher penetration of 2-wheelers (motorized, assisted, non-motorized), possibly also in time-sharing models (IT should make theft of connected vehicles more difficult)
- Traditional PT strong in dense corridors, intermediate solutions in other connections (real-time organized shared rides, in autonomous-driven vehicles, high load factor → reasonable price, no transfers)



Business models for vehicle manufacturers

- If this evolution holds, value is transferred from the object to the service: Vehicle manufacturers also as fleet managers, in direct or indirect contact with final clients
 - collecting, managing and monetizing trip-making, network performance and location data and developing the software and algorithms to exploit the data.
 - Manufacturing costs for vehicles may drop in relative terms to the point where “brand owners” source most vehicle components from quasi-generic manufacturers and have the operating system loaded onto it (plug-and-play)
 - Parallel to the smart phone/tablet industry: hardware sourced from a few non-exclusive manufacturers in Asia and Apple/Google Android/ etc. operating systems generate the commercial revenue stream.
 - Urban vehicles will not be given away in return for subscriptions (permanent availability not required), but other forms of contracts similar to the mobile phone industry: pre-paid minutes (at a certain vehicle standard) is just an obvious parallel, possibly with an option for upgrade into other vehicle categories
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Role of Automobile Clubs

- Since their creation, in support of the relation between their members and the cars they own, in this scenario they could act as
 - mobility brokers / organizers, helping their members choose in a very rich environment (many options available, not only car-based)
 - bona-fide certifiers of car-sharing companies and of joint riders,
 - Other services beyond current offers?
- Independence from vehicle manufacturers and high level of trust of middle class citizens on their performance gives them a head start
 - but there will be many competitors for those services, coming from different corners and with other competitive advantages → get ready now, think about strategic alliances



Conclusions

- Surely, very marked differences ahead:
 - In the number and size of cities
 - In the traction technologies for road vehicles
 - In the road safety hazards and losses
 - In the connectedness of people and things
 - On Urban Mobility, multiple options are open, the future is not determined, but the **policy choices** we make will have strong consequences
 - on the distribution of access to jobs and social facilities
 - on the evolution of lifestyles
 - on the evolution of the cities themselves
 - We should consider these implications when making those policy choices!
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Thank you

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