What is the Mobility of the Future?

CityCar Mobility-on-Demand
SmartCities Group, MIT Media Laboratory

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Principal Consultant, Frost & Sullivan, 24th of February 2015, UNECE
7 major challenges to be taken into account to develop the mobility of the future

2 global challenges - CO₂ emissions & end of cheap oil, 3 local challenges – pollution, congestion & parking and 2 economic challenges - unemployment & trade deficit.

2 Global Challenges

- CO₂ emissions
- End of cheap oil

3 Local Challenges

- Pollution
- Congestion
- Parking

2 Economic Challenges – rising unemployment & trade deficit
Is the private car the mobility of the future?
If these idiots would just take the bus, I could be home by now...

A 10% increase in the occupancy rate of our cars would be sufficient to get rid of most of traffic jams.
More than 75% of people live in an urban area where space is limited. We can’t afford any more to all drive our private vehicle on our own when alternatives exist.

The urban mobility of the future will be shared or won’t be.

**Paradigm Shift from Private Transport to Shared Mobility**

Transport = Private Vehicle

- Freedom
- Convenience
- Status
- Progress
- No Real Alternative

Transport = Shared Mobility

- **New Vehicles**: Electric bikes, Electric cars, Electric scooters
- **New Business Models**: Vehicle sharing, Ride sharing
- **New technologies**: Internet, Geolocalisation, Smartphones

“People will always change for a better alternative”

Source: Frost & Sullivan
To address congestion & parking issue, we have 4 solutions:
More roads, smaller vehicles, more people per car or less cars.
Vehicle sharing - car, scooter & bike - is a great alternative for urban mobility... 
... all the more as private car use is constrained in cities

Source: Frost & Sullivan
Ride sharing – taxi, public transport & car pooling - is also a great alternative
The combination of new technologies – internet, geo-localisation & smart phones – made those alternatives much more user friendly then they used to be 15 years ago

Source: Frost & Sullivan
Small cars are not an option anymore - it is a necessity to preserve our mobility

While cheap oil availability is more and more constrained especially in Europe, it is high time to develop small & light cars which are fuel efficient – 1l/100 km and affordable

- A 800 kg hybrid-air car would have a 2 L/100 km fuel consumption
- A 600 kg range extended electric vehicle would have a 1L/100 km fuel consumption

Significantly reduce vehicle weight is the most efficient way to reduce transportation energy consumption, which depends for 97% on oil

Source: Gregory Launay
What is the most efficient transport mode in a city?
Whether it is on the energy side or the physical footprint, the most efficient transport mode in a city where space is limited are bus, scooters & bikes.

<table>
<thead>
<tr>
<th>Transport Mode</th>
<th>Weight (kg)</th>
<th>Area (m²)</th>
<th>Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>1,4</td>
<td>10</td>
<td>1,3</td>
</tr>
<tr>
<td>Quadricycle</td>
<td>500</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Bus</td>
<td>12</td>
<td>42</td>
<td>30</td>
</tr>
<tr>
<td>Scooter</td>
<td>125</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Electric bike</td>
<td>20</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Bike</td>
<td>10</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Average speed in European cities (km/h):

- Car: 15
- Quadricycle: 18
- Bus: 16
- Scooter: 19
- Electric bike: 19
- Bike: 15

Source: Frost & Sullivan, PREDIT, 6t - Bureau de Recherche.
What is the urban mobility of the future?

- Electric 3-wheelers sharing
- Uber for bus - Kutsuplus
- Electric bike sharing
- Electric rickshaw
What is the mobility of the future?
The car of the future will not have a driver - The driver of the future will not have a car!