MOBILITY AND THE SHARED ECONOMY

IT'S THE END OF MOBILITY AS WE KNOW IT – SHOULD WE FEEL FINE?

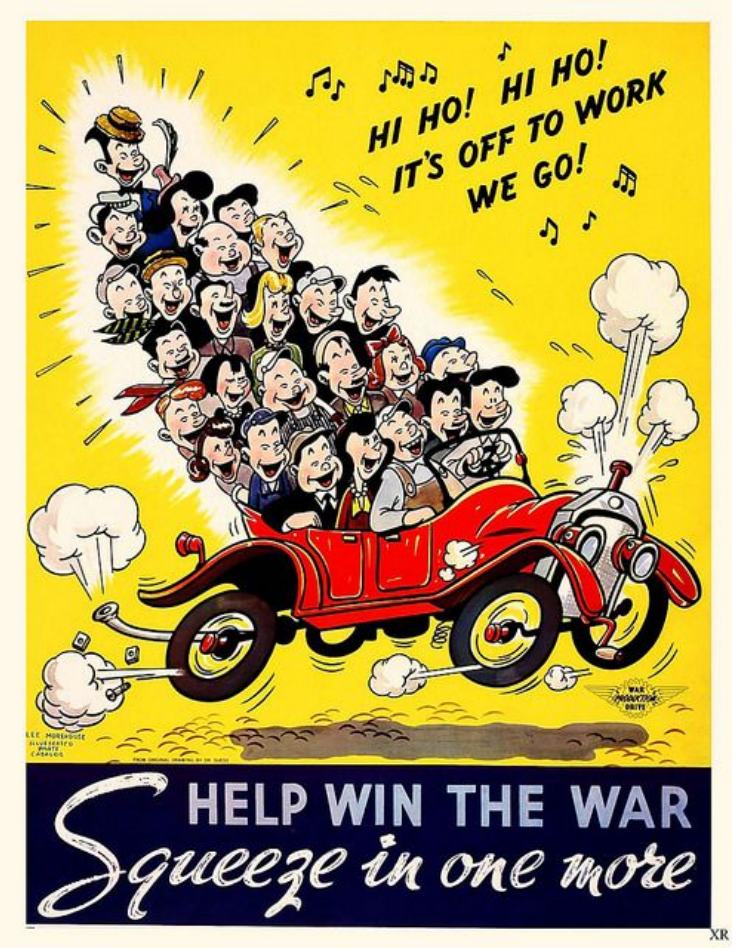
- "Sharing economy" grows rapidly and disrupts classical mobility, but with ambiguous and uncertain effects
- Automated vehicles (AVs):
  - Speed of penetration in mass markets highly uncertain
  - AVs will (probably) replace human operated vehicles
  - Beneficial impacts require integration in "shared mobility" and combination with high-capacity transit
- Electric vehicles:
  - Major breakthroughs in battery technology
  - Most performant models remain niche product
  - "Shared mobility" market models are better for limitations of EV
- developments can be mutually reinforcing, and lead to profound changes in our mobility systems

CARPOOLING OR RIDESHARING

- non-profit ridesharing between drivers & passengers with similar origin-destination
- “invisible mode”
- types:
  - Acquaintance-based ridesharing
  - Organization-based carpools
  - Ad hoc ridesharing: e.g. “slugging”
- **Benefits**
- Savings up to 2/3 of cost of commuting alone
- reduced commute stress

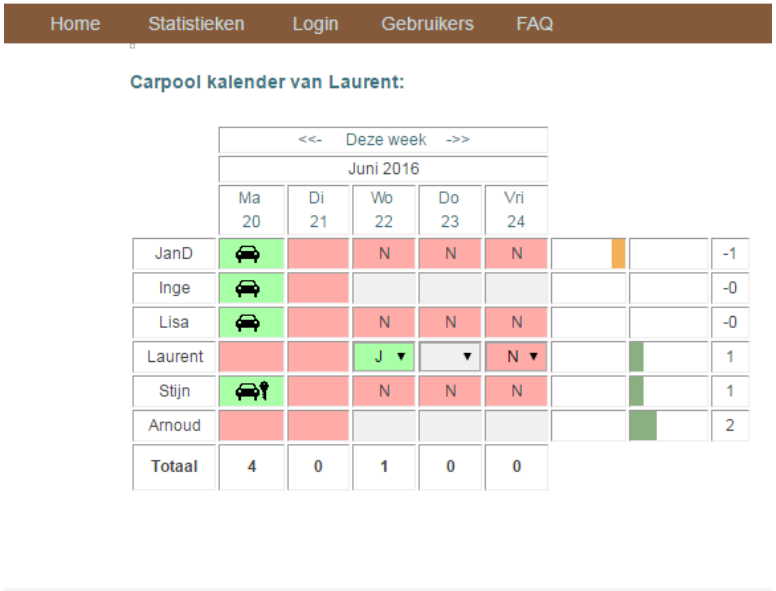
Costs

- health risks
- less flexible than private car
- need for personal space and time



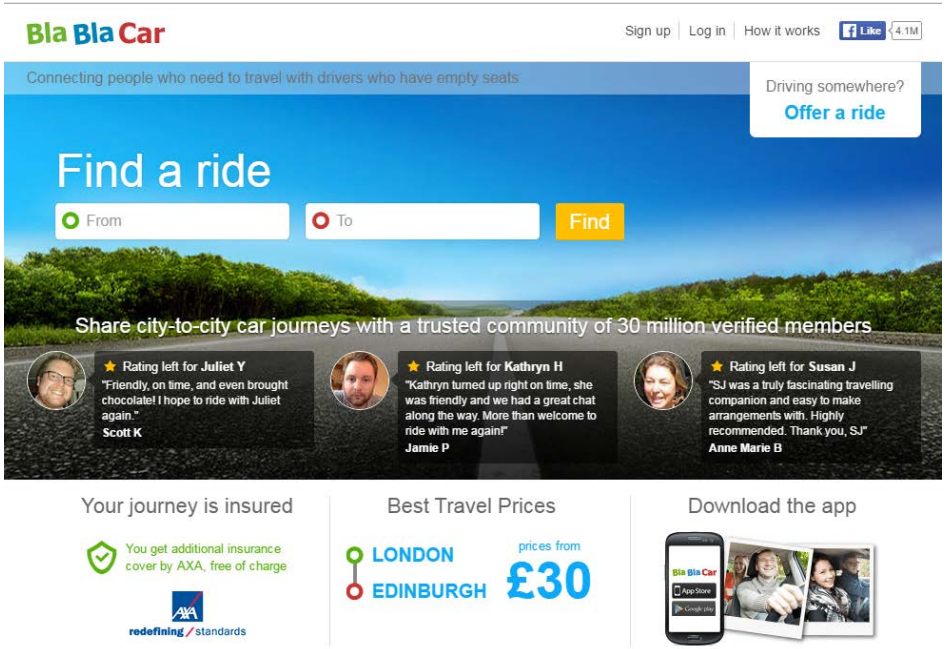
CARPOOLING: ORGANISATION AND TECHNOLOGY (1)

- Until recently: informal and disorganized.
- End of 1990s: first Internet based matching agencies
- Real breakthrough required mobile apps



CARPOOLING: ORGANISATION AND TECHNOLOGY (2)

- "peer-to-peer ridesharing"
  - Specialised internet services can facilitate
  - Digital recordkeeping, links with on-line social networks and rating systems
  - mobile application and GPS enable dynamic ridesharing
  - but: no guarantee of finding a drive back from certain destinations



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PERSPECTIVES

- Behavioural barriers:
  - flexibility and convenience of private automobile;
  - desire for personal space and time
  - reluctance to share rides with strangers
- Future developments of ridesharing:
  - improved interoperability among databases and standards for sharing open source data enable “ridematch aggregators” and multimodal integration
  - “Meeting places” such as casual carpooling sites
  - Supportive policies: free or reduced-price access to high-occupancy toll lanes, parking cash-out and pretax commuter incentives
- Similarity in matching process => TNCs enter market
- Net impacts on transport system are highly situation specific
- Public policy is key

CARPOOLING IS JUST ONE MANIFESTATION OF SHARED MOBILITY

- Conceptually: ‘transportation strategy that enables users to gain short-term access to transportation modes on an “as-needed” basis’
- Carsharing
  - Roundtrip Carsharing
  - One-Way Carsharing
  - Personal Vehicle Sharing (PVS)
- Scooter sharing / Bikesharing
- On-demand ride services
  - Ridesourcing/Transportation Network Company (TNC) Services
  - Ridesplitting
  - E-Hail Services
- Ridesharing
- Alternative transit services (DRT, jitneys)
- Courier network services
- Next step: MaaS

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WHAT IS MOBILITY AS A SERVICE(MAAS)?

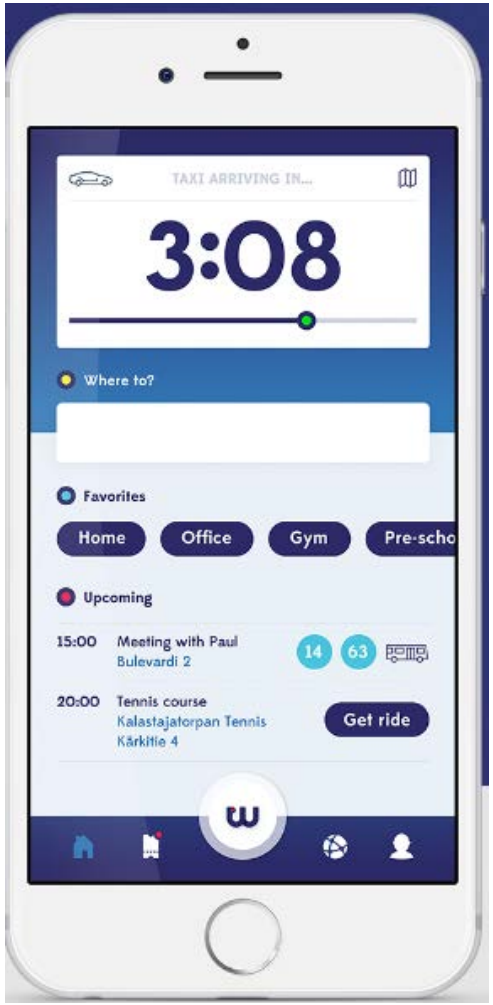
Kamargianni et al. (2015):

consumers buy mobility services provided by same or different operators by using just one platform and a single payment.

platform provides an *intermodal journey planner*, a *booking system*, a *single payment method*, and *real time information*.

Levels of cooperation vary:

- Discounts for combined subscriptions
- Ticketing integration
- Payment integration
- ICT integration
- Institutional integration: modes owned & operated by one company
- Integration with tailored mobility packages: customers can pre-pay for specific amounts (in time or distance) of each service tailored towards their needs.



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IMPLICATIONS FOR TRANSPORT MODELLING (1)

Sharing should be analysed jointly with automated vehicles (AV)

Current "consensus" in transport modelling:

- shared AV will lead to important decreases in number of vehicles (and need for parking space) coupled with increase in vehicle miles, unless combined with ridesharing and important modal share of high capacity transit
- based on small number of studies of stylized networks, and with extreme scenarios
- BUT what about transition period to automated and connected transport system?

Growth potential

- Lack of robust and high quality evidence on impact of sharing on travel dynamics
- Recent growth important but mainly confined to niche, with specific profiles
- Main uncertainty: have mobile apps and increased modelling capacity already reached entire target population, or just "early adopters"?

IMPLICATIONS FOR TRANSPORT MODELLING (1)

AV may reduce Value of Time spent in traffic => higher tolerance of:

long travel times=> longer distances travelled and more urban sprawl

"wasting" time during congestion => higher traffic in peak hours

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IMPLICATIONS FOR TRANSPORT MODELLING (2)

What is a "travel mode"?

- new technologies and new business models => virtually boundless number of possible combinations with specific monetary and time costs

Impacts on road capacity

- AVs may be programmed to drive more cautiously than humans
- Humans don't respect required safety distances anyway.

Reactions from other economic actors

- public transport operators
- managers of parking facilities
- electric network operators
- air and rail

IMPLICATIONS FOR TRANSPORT MODELLING (3)

Impact on built environment

AVs may encourage urban sprawl

reduced need for parking space: many competing alternative uses

Ownership versus sharing

» benefits of AV more likely to be realised if integrated in sharing approach

» need to understand barriers to sharing, and assess share of people who will continue to prefer full ownership

Increasing need for understanding fundamental mobility motives of people => travel surveys limited to past and current behaviour become increasingly useless.

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BARRIERS TO SHARING

- Establishment of trust relations
- High existing levels of ownership (especially for long lived assets)
- Sign-up processes
- Need for personal space and time
- Reluctance to share rides with strangers
- For dynamic ridesharing and one-way carsharing: no guarantee of finding a drive back
- Varying levels of integration between transportation providers, and aggregation limitations of various applications

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IMPLICATIONS FOR TRANSPORTATION DEMAND MANAGEMENT (1)

Shared mobility as complement or substitute for public transit

- effective tool to bridge last and first mile in transport chain.
- "first/last mile":
  - important barrier to shift from private car use to public transit
  - barrier to mobility for poor households => spatial mismatches in access to jobs (segregation)
- if mainly substitute => vicious circle of decreased transit patronage and service levels.

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IMPLICATIONS FOR TRANSPORTATION DEMAND MANAGEMENT (1)

- design policies that harness strengths of shared mobility solutions to solve "first/last" mile problem
  - key role of Mobility as a Service
  - partial measures (integrated ticketing, provision of real-time multi-modal travel info) already go long way
  - provide infrastructure of bike-, ride- and carsharing in neighbourhood of important public transport hubs

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IMPLICATIONS FOR TRANSPORTATION DEMAND MANAGEMENT (1BIS)

The regulation of on-demand ride services

» insurance coverage and qualification and screening of drivers

» data sharing : public-private cooperation can lead to exchanges between transport authorities and providers of on-demand services

Automated vehicles

» widespread use of shared AVs could lead to an increase in vehicle distance travelled (repositioning)

» automation requires increased ridesharing and high quality public transit to mitigate this effect

IMPLICATIONS FOR TRANSPORTATION DEMAND MANAGEMENT (2)

Electric vehicles

» more competitive alternative to vehicles with ICE if shared

» mitigate negative environmental impacts of AVs

Pricing policies

» correct pricing transport

» SAVs results in mobility pricing close to dynamic distance based road sharing

» pricing of distance travelled to be coordinated with pricing of other services (parking, electricity)

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IMPLICATIONS FOR TRANSPORTATION DEMAND MANAGEMENT (3)

Public transit

- » policies could reinforce position of public transit through shared solutions.
- » in some niches, shared solutions likely to outperform traditional transit services
- » AVs will reduce opportunity cost of time spent in car travel, and undermine competitive position of transit
- » transit will/should increasingly concentrate on task it is good at: moving huge quantities of people from one transport hub to the other
- » future role of traditional bus services remains open question

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