AUTONOMOUS VEHICLES: A GAME CHANGER FOR URBAN MOBILITY?

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INTERNATIONAL ASSOCIATION OF PUBLIC TRANSPORT (UITP)
UITP MISSIONS

We engage with decision-makers, international organisations and other key stakeholders to promote and mainstream public transport and sustainable mobility solutions.

We inspire excellence and innovation by generating and sharing cutting-edge knowledge and expertise.

We bring people together to exchange ideas, find solutions and forge mutual beneficial business partnerships.
A WORLDWIDE ASSOCIATION

16 offices + 2 centres for transport excellence

EUROPE
- Main Office | Belgium (Brussels)
- Liaison Office | Turkey (Istanbul)

Eurasia
- Regional Office | Russian Federation (Moscow)
- Liaison Office | Kazakhstan (Astana)

Asia-Pacific
- Regional Office | India (Bangalore/New Delhi)
- Regional Office | China (Shenzhen)
- Centre for Transport Excellence | Singapore

Africa
- Regional Office | Ivory Coast (Abidjan)
- Liaison Office | South Africa (Johannesburg)

Australia & New Zealand
- Regional Office | Australia (Melbourne)

Latin America
- Regional Office | Brazil (São Paulo)

North America
- Regional Office | United States (New York)

Middle East & North Africa
- Regional Office | United Arab Emirates (Dubai)
- Liaison Office | Morocco (Casablanca)
- Liaison Office | Iran (Tehran)
1,400 member companies
16,000 contact members
16 liaison and regional offices across the globe

UITP members by sector of activity:

- Operators: 44%
- Industry: 32%
- Authorities: 13%
- Associations: 6%
- Other: 5%

UITP members in the world:

- Europe: 65%
- Africa: 11%
- Asia-Pacific: 7%
- Middle East & North Africa: 4%
- Latin America: 4%
- Australia - New Zealand: 3%
AUTONOMOUS VEHICLES: A GAME CHANGER FOR URBAN MOBILITY?

Not without public transport!

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UITP
ONE OF THE GREATEST CHALLENGES FOR CITIES: MOBILITY

• Urbanisation, changes in society, digitalisation

• Green, smart and sustainable mobility is part of the *top priorities* for urban decision makers

• New innovative services are on everyone’s lips, but still at small scale
CITIZEN PERSPECTIVE: LIFESTYLE & TRENDS

- Pay as you drive
- Environmentally friendly
- Ageing of population
- Changing consumer spending
- Increasing congestion
- Urbanisation
- Demotorisation
- E-ticketing systems in Public Transport
- Social media, communities
CITY PERSPECTIVE: PUBLIC TRANSPORT IS THE MOST EFFICIENT IN TERMS OF SPACE

To carry 50,000 people per hour per direction, you need:

- a 175m wide road used only by car
- a 35m wide road used only by buses
- a 9m wide railway track bed for metro

Daily trips in urban areas worldwide are going to rise from **7.5 billion** in 2005 to **11.5 billion** in 2025.
PT IS THE BACKBONE OF INTEGRATED URBAN MOBILITY

- High quality public transport is the only alternative able to fulfil the lion’s share of trips by using a minimum of space
- Without public transport, other sustainable & innovative mobility services cannot offer an affordable alternative to car ownership
LET´S WORK TOGETHER...

- Better match of supply and demand with new mobility services
- Difficulty to efficiently serve less densely populated areas
- Need for extended operational times
- Traveller’s perspective: ever more complex mobility needs

Public Transport on its own is not able to compete with the private car in terms of flexibility and convenience
WHAT FUTURE DO WE WANT?

Principles for a city:
accessible, safe, green, affordable, equitable, inclusive mobility

• Pillars:
  • Vision
  • Adequate governance
  • Long term political commitment
  • Integrated land use and mobility planning
  • Long term funding stability
WHAT FUTURE DO WE WANT?
WHAT FUTURE DO WE WANT?
AUTONOMOUS VEHICLES...

1. Wanna see the driverless car I'm testing?
2. Okay.
3. Looks more like a car-less driver...
4. We'd better call the police.
5. Hold on, guys...
6. Reports are coming in of a convoy of driverless cars driving through Snowpeak.
7. Where? Where?
8. I think I know...
9. Drive-in tonight: Cars

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AV´S: CHALLENGES FOR CITIES

Increase of individual comfort

- Time saving
- Smart driving
- Personal preferences
- Liberty

« Natural » choice for the individual
AV’S: CHALLENGES FOR CITIES (II)

Consequences
- More purchase of cars
- Average A.V. drives more
- Empty cars on the road
- Urban sprawl
- Loss of public space
- Decrease of use of PT, walking and cycling

Challenge:
Convince the individual to make a shift to shared AV’s
Public transport offers the quickest development path to full autonomy because it can start operating in a limited area.
HAVE YOU GUYS BEEN READING ABOUT THE DRIVERLESS CAR DEVELOPED BY GOOGLE?
AV’S: OPPORTUNITY FOR CITIES (III)

Positive influences if initiated by Public Transport Authorities:

- More public space and liveable cities
- Less congestion (interconnectivity + road pricing)
- Less emissions
- Data ownership
- ...
Possible applications of autonomous vehicles (AVs) as part of a diversified public transport system

- High capacity core network with fixed line service
- Swarm of AVs as Robo-Taxis and on-demand shuttles
- AVs used as feeders to public transport stations
- Area-based on-demand autonomous mini-buses
- Autonomous Car-sharing vehicles

Source: UITP / iustra
Autonomous vehicles will only help to meet public policy goals if they come as shared fleets integrated with public transport.

**Autonomous vehicles**

**Shared fleet of vehicles**
- Strong reduction in number of cars (reduced car ownership, effective use of cars as they operate most time of the day)
- Drastically improved mobility for people that do not own a car

**Privately owned cars**
- No effect on car ownership
- No effect on number of parked cars (cars unused most of the day)
- No effects on costs/km
- No effects on mobility for people that do not own a car
- Even more car traffic (as it is even more comfortable and attractive to go by car)

**Fleet cars COMPETING with traditional public transport services**
- Street reclaiming (less parked cars)
- Improved access to public transport
- Improved mobility for people that do not own a car
- More traffic (strong increase in Vehicle Miles Traveled - VMT)
- Inefficiency (small vehicles replacing buses and trains)
- Passenger loss for traditional public transport walking and cycling

**Fleet cars INTEGRATED with traditional public transport services**
- Large scale street reclaiming
- Highly improved access to public transport
- Highly improved mobility for people that do not own a car
- Strong decrease in VMT
- High gain of efficiency (large and small vehicles perfectly mixed)
- Low costs/km

> Unsustainable, even more car traffic

> Better mobility, less efficiency

> Sustainable, better mobility and equity
Sharing, not growing

Worldwide forecast

Shared cars*
As % of total on road

Vehicle production
% change on a year earlier

2015 20 25 30

Source: Morgan Stanley

*Including taxis, excluding car rental
Shared fleet of vehicles

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» Better mobility, less efficiency
» Sustainable, better mobility and equity
RECOMMENDATIONS ON AV´S

• Public Authorities need a central and active role in the roll out of AV´s so they meet policy objectives:

Principles for a city :
accessible, safe, green, affordable, equitable, inclusive mobility

› Urban planning measures - regain urban space - integrated land use & mobility planning
› Regulate and allow trials of driverless PT shuttles
› Promote shared vehicle use in all forms (citizens´ s acceptance)
› Make tendering/concessions for shared AV fleets
› Provide integrated mobility platforms (MaaS)
URBAN MOBILITY: MORE & MORE OPTIONS

<table>
<thead>
<tr>
<th>Collective use</th>
<th>Individual use</th>
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<tbody>
<tr>
<td><strong>Public access</strong></td>
<td><strong>Taxi</strong></td>
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<tr>
<td>PT: train, tram, bus, metro, AV shuttles..</td>
<td>Rent-a-bike (a-car)</td>
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<td>DRT</td>
<td>(e-)Car-sharing (FFC, P2P,..)</td>
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URBAN MOBILITY: MORE & MORE OPTIONS

Collective use

PT: train, tram, bus, metro, AV shuttles..
DRT

Individual use

Ride-sourcing
Shared taxi

Ride-sharing/ Carpooling (private or corporate)

Taxi
Rent-a-bike (a-car)
(e-)Car-sharing (FFC, P2P,..)
(e-)Bike-sharing
(e-)Bike-sharing
(e-)Bike -sharing
(e)-Bike

Chartered services

Integrated Mobility Platforms - MaaS

Pedestrian

(autonomous) Car
Combined Mobility is the answer!

Flexibility + convenience = Door-to-door solution

Public transport +
Car-sharing
Bicycle and bike-sharing
Walking
Ride-sharing
Taxis and shared taxis
On-demand transport
...

...
Combined Mobility is the answer!

A real alternative to the private car
A key to change citizens travel behaviour
Encouraging shared mobility now will pave the way for the shared use of shared AVs in the future!
POLICY BRIEF

AUTONOMOUS VEHICLES: A POTENTIAL GAME CHANGER FOR URBAN MOBILITY

INTRODUCTION

Imagine providing affordable, sustainable and convenient mobility options to all citizens including less mobile persons, the elderly, children and people living in suburban or rural areas. Autonomous vehicles (AVs) can help to build that future.

A NEW CHANCE FOR AN EVER-PRESENT PUBLIC TRANSPORT SYSTEM

Cities play a crucial role as engines of the economy, as places of connectivity, creativity and innovation. The arrival of driverless autonomous vehicles represents a unique opportunity for a fundamental change in urban mobility and could lead to healthier, more competitive and greener cities - but only if public authorities and public transport companies take an active role now and integrate AVs into an effective public transport network. If employed as shared 'robot-cars' and mini-buses as well as used to reduce car ownership through more effective car-sharing schemes, driverless AVs could dramatically enhance public transport. This paper details the challenges ahead and outlines a way forward for the introduction of autonomous vehicles in our cities.

Indeed, a future with autonomous and connected vehicles can have various outcomes depending on how they are to be regulated and used. Will they lead to even more cars on the road, more urban sprawl and more congestion? Or will they contribute to shaping sustainable and livable cities, the reimagining of urban space, lower vehicles on the road and a higher quality of life?

Imagine providing affordable, sustainable and convenient mobility options to all citizens including less mobile persons, the elderly, children and people living in suburban or rural areas. Imagine these mobility solutions opening the way for decarbonisation, to enable your city to regain valuable urban space to be reallocated to green zones, economic activities or affordable housing and to provide flexible, around the clock on-demand transport that is safe and cost-efficient. Autonomous vehicles can help to build that future.

More information in the UITP Policy Brief on Autonomous Vehicles on www.uitp.org
«A carless driver is better than a driverless car»
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THANK YOU!

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