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Socio-economic impact assessment

Spatial and Transport Impacts of Automated Driving

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CONFERENCE

Connected and Automated Driving

TOGETHER, SHAPING THE FUTURE

03-04
April 2017
Brussels

Spatial and Transport Impacts of Automated Driving

TU Delft

European Commission

Dutch society and economy depend on transport

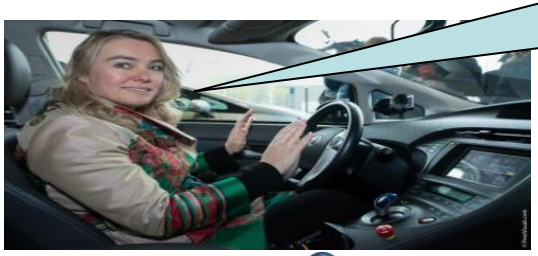
Dense road network

Port of Rotterdam

High traffic volumes

Schiphol airport

Strong governmental support



Automated vehicles can improve traffic efficiency and safety

Netherlands to facilitate large scale testing of automated vehicles

Driver assistance/ Partial automation

Driver needs to be able to intervene at all times

Automated parking, autocruise

Conditional/ High automation

Vehicle in control in special conditions

Taxibots, platooning, automated highways

Comfort, efficiency, safety, costs

Mode choice, location choice, urban and transport planning

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Car driving more attractive!

Partial automation

Better comfort,
Less accidents
Less congestion

High automation

Travel time can partially be used for other purpose

Full automation

Travel time can fully be used for other purposes

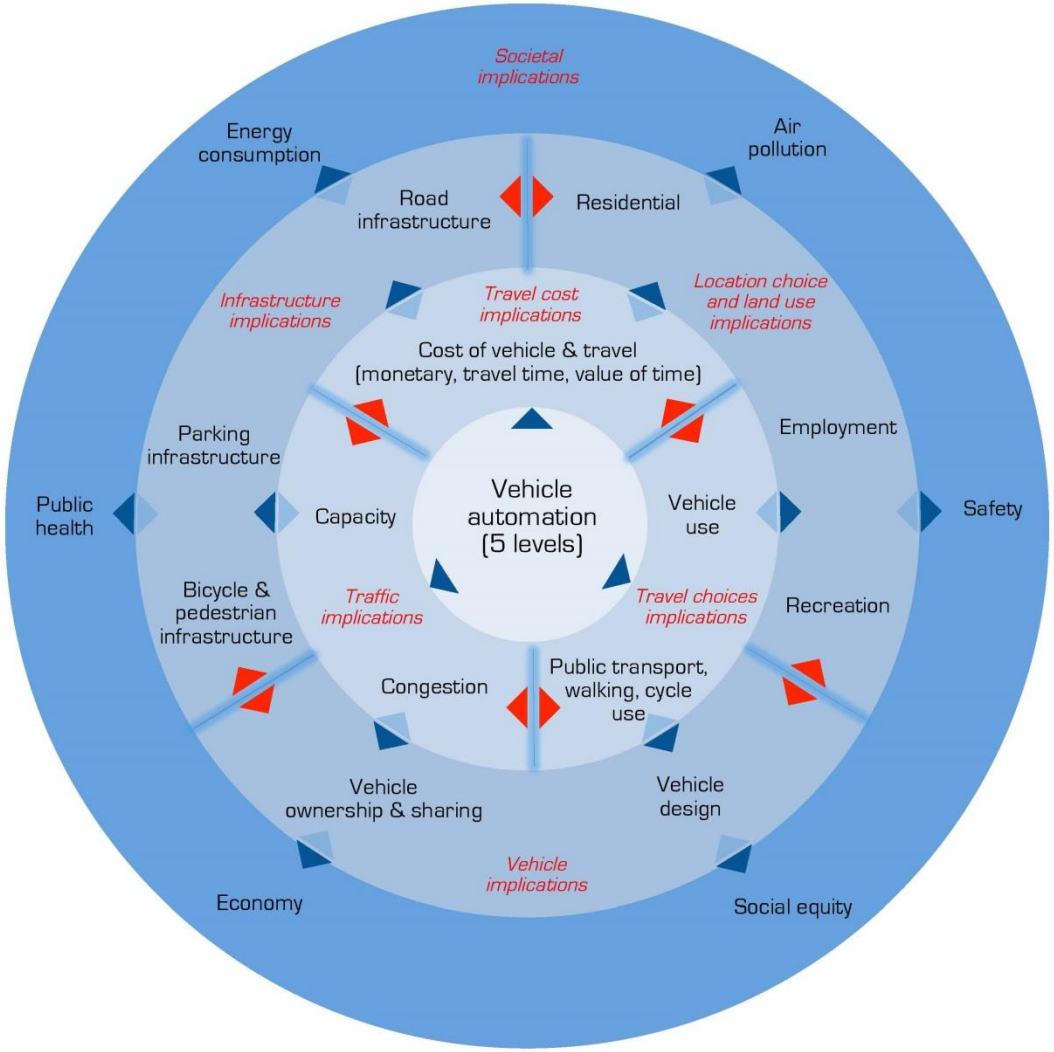
Spatial implications

Functional

- Geometric redesign of roads and junctions
- Increasing sprawl residential and employment locations
- Concentration activities by better accessibility

Spatial

- Redesign of urban, commercial, touristic areas
- No on street parking
- Combinations with car sharing, electric driving



Much progress short term and small scale impacts on driver behaviour and traffic flow.

Research on longer term, indirect, wider scale impacts on mobility, logistics, residential patterns and spatial-economic structure in its infancy.

Milakis, van Wee & van Arem (2017), Policy and society related implications of automated driving: A review of literature and directions for future research, Journal of Intelligent Transportation Systems, DOI: 10.1080/15472450.2017.1291351

Policy relevance

- Congestion and accessibility
- Safety
- Travel patterns
- Freight transport
- Public transport
- Socio-economic development
- Urban design
- Spatial structure
- Investment policies

National, regional, city authorities, public transport operators, **Multimodal hubs (**ports, airports)

Exploration using LMS

Automated Autonomous

5% capacity decrease on primary road network

	Index km travelled
Train	100.3
Car driver	99.8
Car passenger	99.7
Bus, tram, metro	100.2
Cycling	100.1
Walking	100.1
Total	99.98

Index congestion 115.7

Automated Cooperative

15% capacity increase primary road network
10% capacity increase secondary road network
10% decrease value of time commuting and business car trips

	Index km travelled
Train	98.8
Car driver	100.8
Car passenger	101.4
Bus, tram, metro	99.2
Cycling	99.3
Walking	99.4
Total	100.10

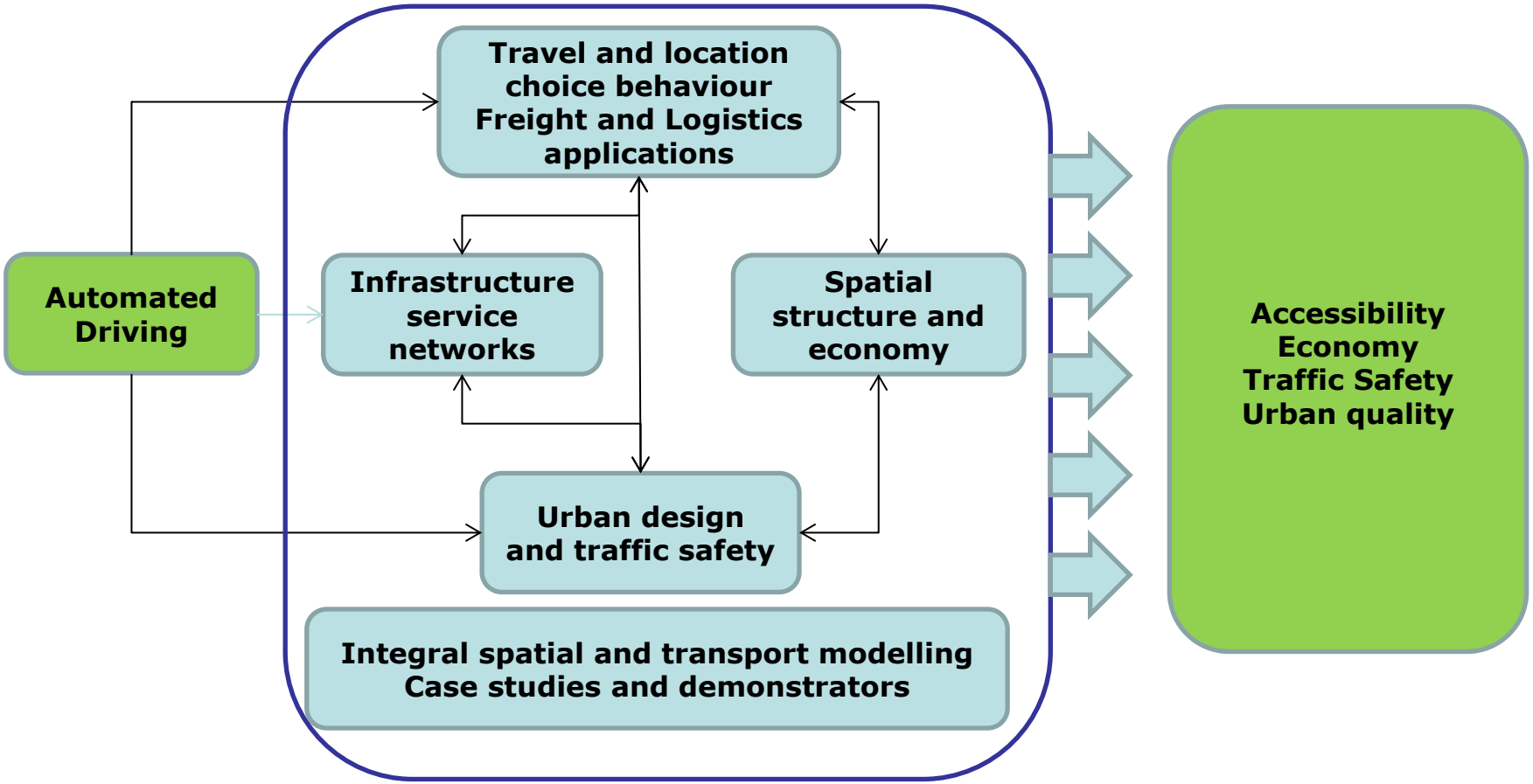
Index congestion 69.1

Scientific challenges: understanding the spatial and transport changes?

Automated Driving

Accessibility
Economy
Traffic Safety
Urban quality

Scientific challenges: understanding the spatial and transport changes



Data, theories and models

Specifications of Automated Driving

Behavioral response of traveller and companies

Spatial and transport data

Pilots, experiments,
SP/RP surveys,
public authority data

.. and others

Travel and driver behavioral theories and models

Supply chain and business theories and models

Spatial and transport network models

STAD
Integrated Model

Scientific partners,
Consultancy firms
Public authorities

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Applications

Regional case studies: passenger cars, freight, public transport, parking

Spatial impacts, urban design, agglomeration

Business cases

Modelling tools, impacts, risks, benefits

Metropoolregio Rotterdam-The Hague
Province Zuid-Holland
Province North-Holland
Municipality of Amsterdam
Rotterdam The Hague Airport
Municipality of The Hague
Municipality of Rotterdam
AMS Advanced Metropoliton Solutions
SmartPort
SWOV Institute for Road Safety Research
RET NV
Mobycon
Province Gelderland
DTV Consultants
Connekt ITS Netherlands
Municipality of Delft
Rijkswaterstaat
KiM
CROW
Transdev-Connexxion
RDW
TNO
Goudappel Coffeng

STAD

2016-2020
2,3M€
27 person year

National Science Foundation NWO
Sustainable Urban Regions of the Future
SURF Programme

Agglomeration
Accessibility
Liveability

Parking
Public transport
Freight transport
Smart roads
Spatial planning
Urban design

Safe, convenient, efficient, cheaper mobility

Challenges | Instruments | Automated driving

Stay tuned!

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ResearchGate

Dissemination tools

- Risk assessment and business case tools

External activities

- Yearly STAD event
- Newsletters & website
- International collaboration

Internal STAD activities

- 3 monthly consortium sessions
- Alignment of practical and academic partners

The STAD project is part of the VeRDuS program

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