

Self-driving cars and city planning: expectations and policy implications

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Knowledge for Tomorrow

Automation is expected to arrive soon at the gates of cities...

- Automation:
 - from distant vision to reality (technology platforms expect fully autonomous cars within the next 10 years)
 - first tests in real environment already now
 - Significant impacts expected but not well understood: on transport system, travel behaviour and even land use
- Relevance for Planning:
 - because effects are within the domain of planning, and
 - the expected time frame is within the time frame of strategic urban development plans
- The consequence:
 - planning needs to deal with the topic – now?!



What implications might automation have from an urban planning perspective?



What expectations do planning practitioners have regarding likely effects?

Do expectations match existing planning objectives and frameworks?



How are planning practitioners preparing for the potential introduction of automated driving in urban areas?

What priorities for actions do they see?



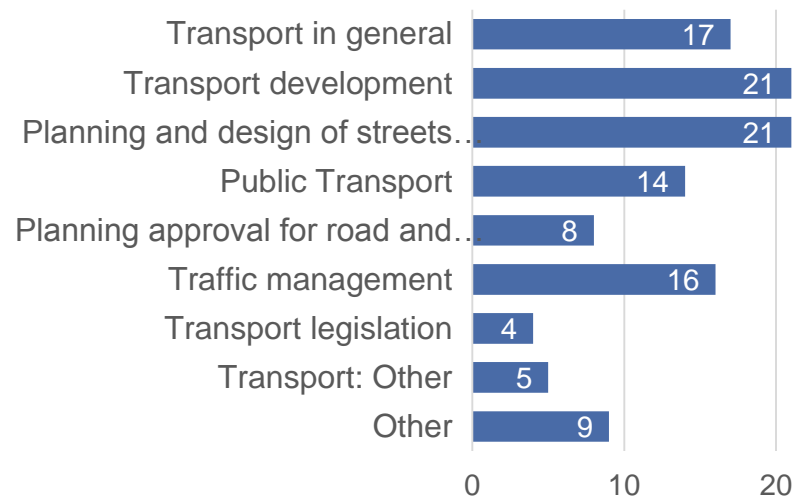
What recommendations and implications follow from these findings for planning action policy?



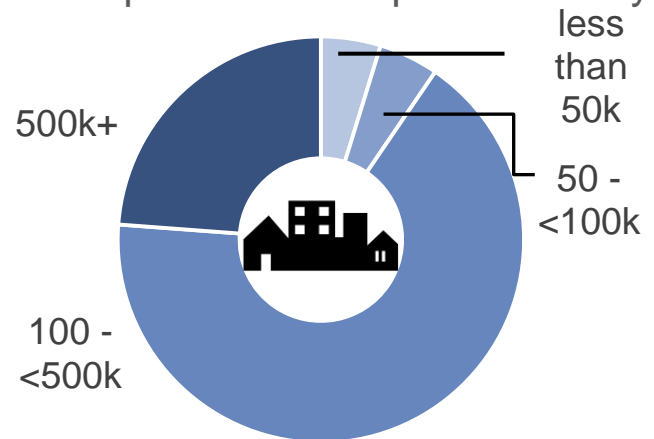
Asking German planners for their point of view...

- Web-based survey amongst members of the Association of German Cities' expert commission on transport (Deutscher Städtetag)
- 24 of 48 members answered in Sept. 2016 – interviewees opinions!
- Transport development / planning and street / road design as main occupational activities
- Mainly stemming from 100 k+-cities
- Survey complemented by guided in-depth interviews in Jan/ Feb 2017 with members of cities with activities ongoing/planned

Respondent's specific field of activity



Population of respondent's city



Evaluation was asked for four different uses cases

Autonomous Park Pilot (APP)



After all passengers get off, the vehicle can travel alone to a predetermined parking and from there back to a given pick-up address.

A Shared Autonomous Vehicle is a vehicle that drives its occupants without a driver. Users can no longer drive themselves in such a vehicle, as there are no steering wheels or pedals.

Shared Autonomous Vehicle (SAV)



Autonomous Delivery Vehicle (ADV)



A small self-propelled vehicle, which may, if required, also drive on footpaths or cycle paths, takes over the last mile for goods deliveries to customers or to parcel boxes.

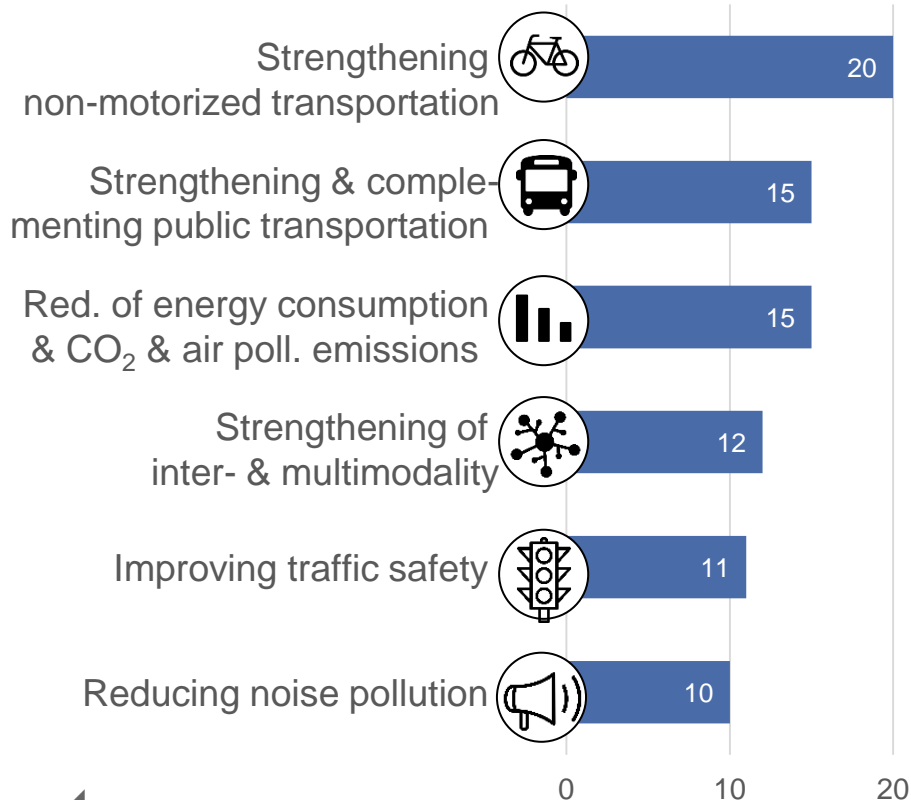
On request or if necessary, the vehicle can take over the driving task. During this time, the driver does not have to pay attention to the traffic and can execute other activities.

Private Autonomous Vehicle (PAV)

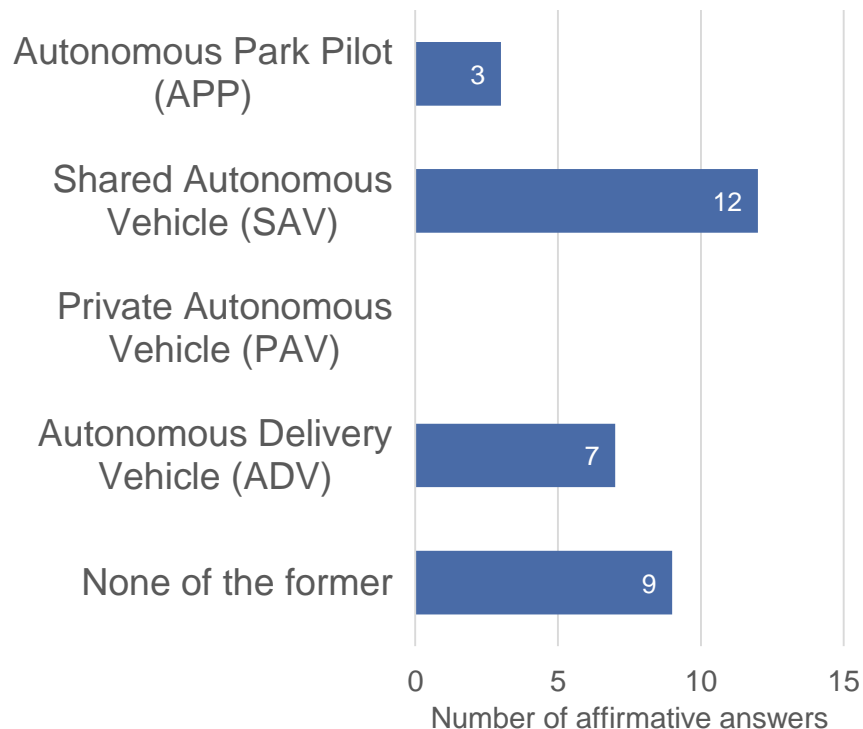


Do expectations match existing planning objectives and frameworks?

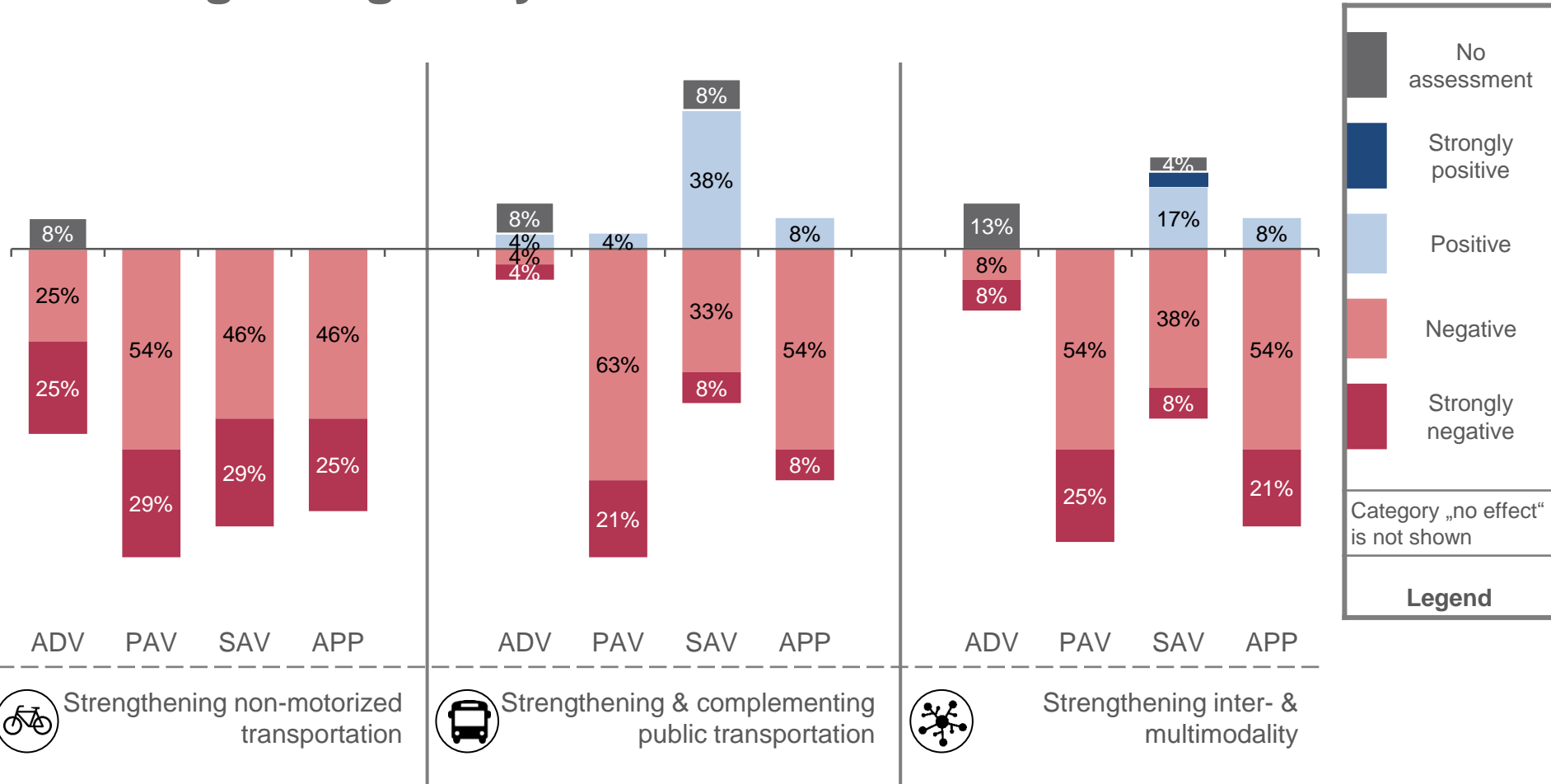
Stated objectives of urban and transport planning in the municipalities



Do use case's anticipated effects match existing planning objectives & frameworks?



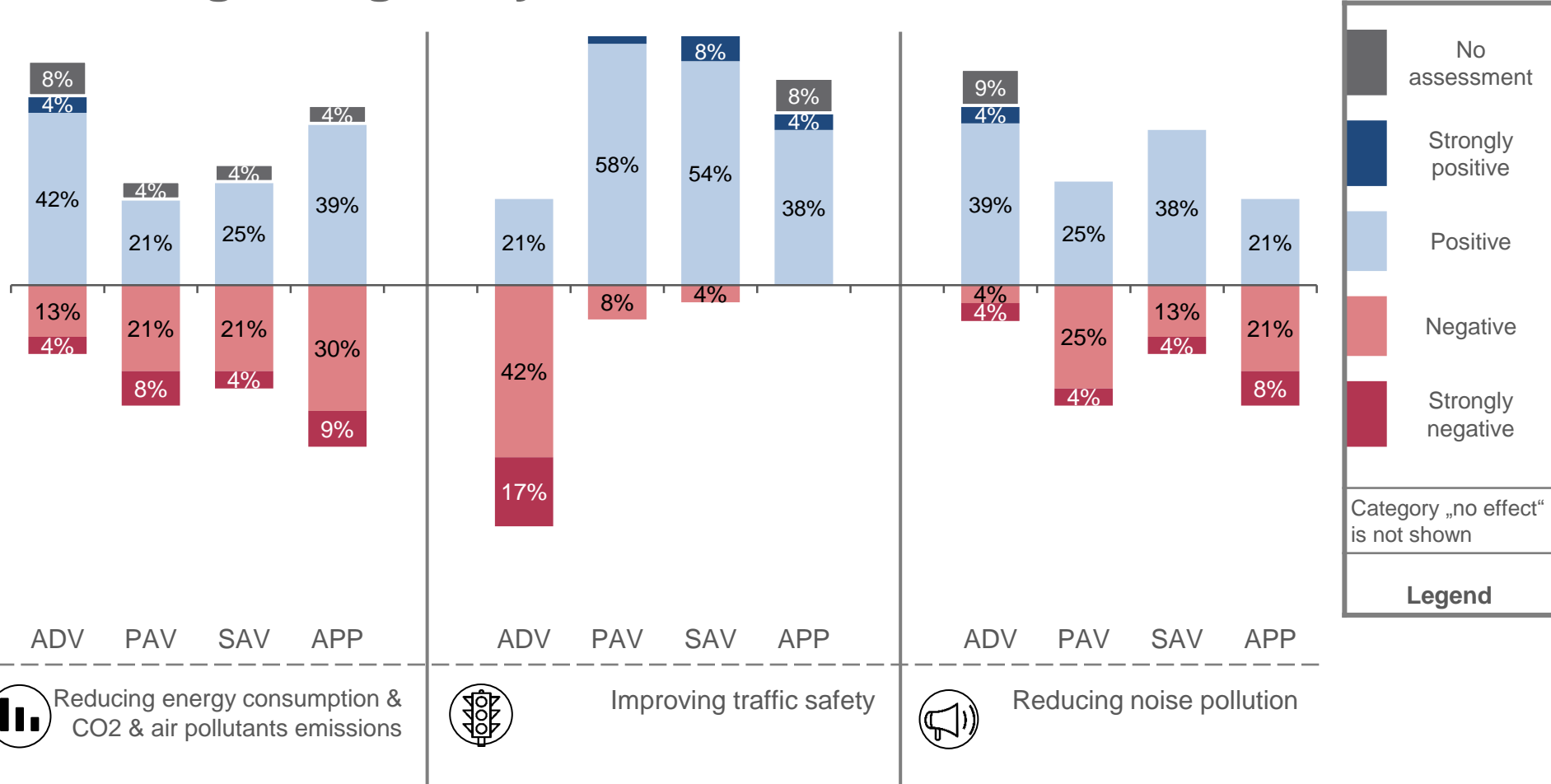
What expectations do planning practitioners have regarding likely effects?



APP: Autonomous Park Pilot | SAV: Shared Autonomous Vehicle | PAV: Private Autonomous Vehicle | ADV: Autonomous Delivery Vehicle



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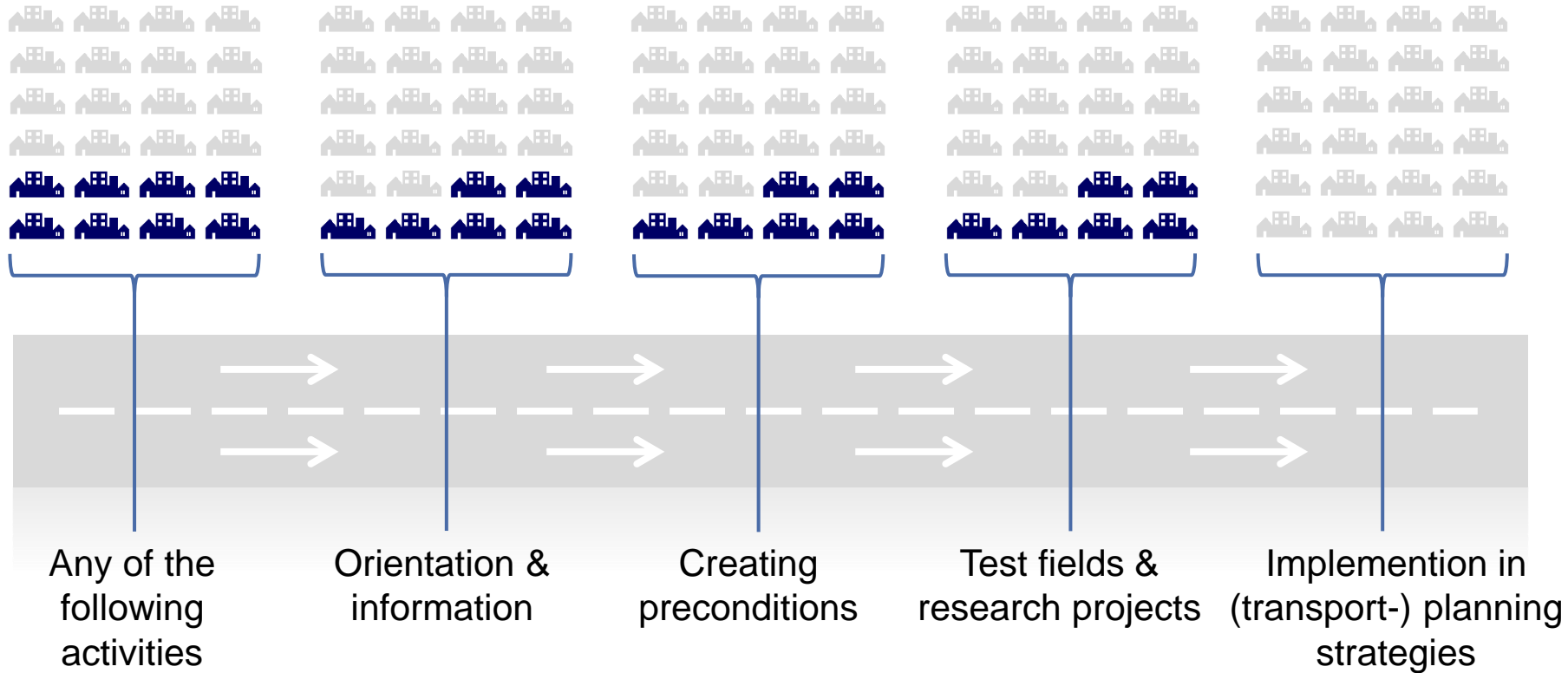


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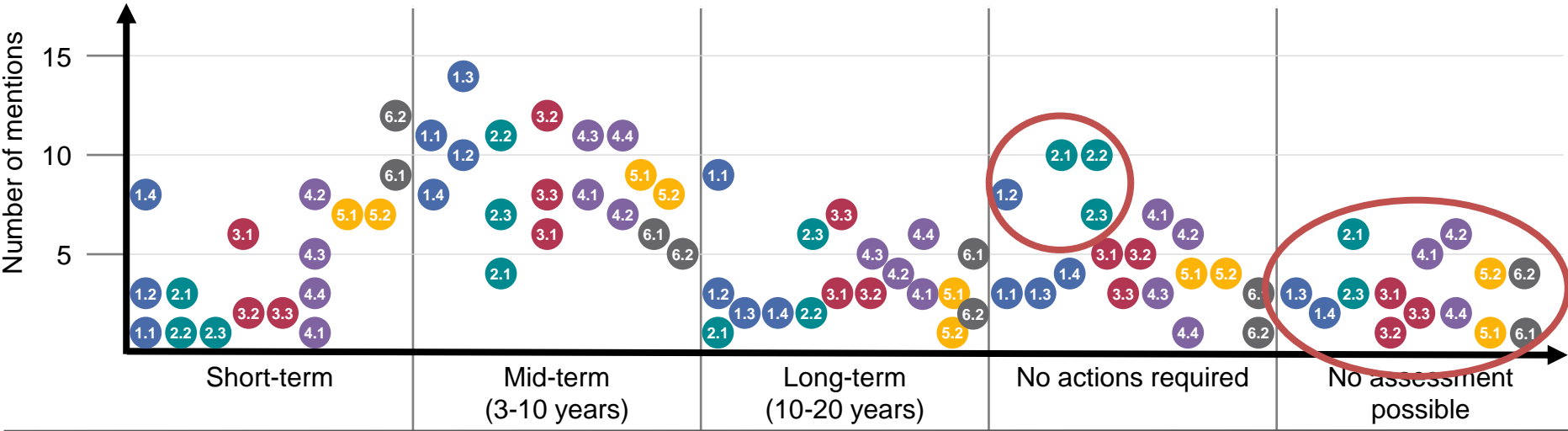


How are planning practitioners preparing for the potential introduction of automated driving in urban areas?





What priorities for actions do planners see?

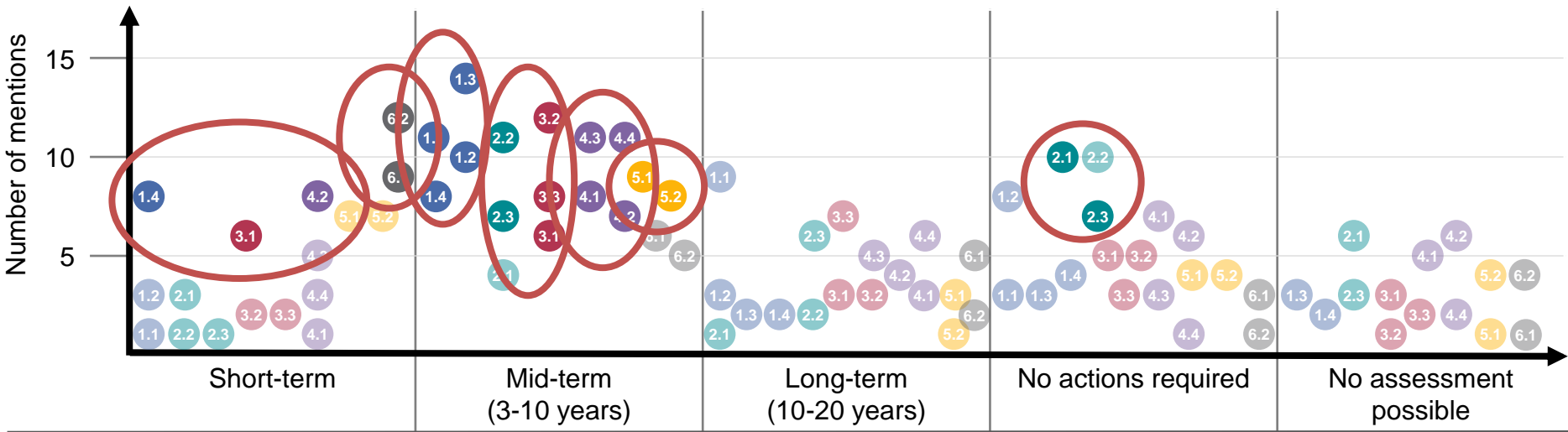


Area of action	[1] Transportation planning	[2] Traffic control	[3] Infrastructure planning	[4] Urban planning	[5] Participation	[6] Other aspects
Fields of action	<ul style="list-style-type: none"> 1.1 Update of traffic & local massive transit development plans 1.2 Adjustment of strategies to support non-motorized transportation 1.3 Adjustment of economic & business concepts 1.4 Development of prediction tools & transport models 	<ul style="list-style-type: none"> 2.1 Revision of rights-of-way 2.2 Adjustment of speed limits 2.3 Adjustment of traffic priorities 	<ul style="list-style-type: none"> 3.1 Securing, adapting & certifying road infrastructure 3.2 Adjustment of road infrastructure plans 3.3 Redesign & transformation of the road place 	<ul style="list-style-type: none"> 4.1 Update of urban development plans 4.2 Update of land-use plans 4.3 Revision of parking policies 4.4 Development of new spatial concepts for parking 	<ul style="list-style-type: none"> 5.1 Opening & encouraging societal debate on possible new uses for urban space 5.2 Opening & encouraging societal debate to increase acceptance 	<ul style="list-style-type: none"> 6.1 Creating & setting up test fields 6.2 Definition of data standards & requirements





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What recommendations and implications follow from these findings for planning action and policy?

- Specific uses cases of automation seem to strongly contradict planning goals!
- Developing a common vision and position of the desired integration in urban transport systems highly relevant:
 - How can AV technology support communal transport and land use objectives ?
 - What should be avoided ?
- Define strategy and steps required to implement this vision!
 - What needs to be integrated in the major strategic planning documents/instruments, and when?
- Cope with the considerable uncertainty!
 - Adopt learning strategies and make use of studies on the likely systemic effects.
 - Build / expand networks and partnerships outside and inside local government.
- Involve citizens and manage contradictory expectations, make sure to communicate that it is innovation!





Take aways



Rather pessimistic assessment of the role of automation for supporting cities planning objectives was found.

- Evaluation differs strongly between use cases.
- Main goals, referring to mode shift, are seen addressed most likely by SAV.
- Coherence is mainly seen for safety and environmental goals.



Automation has not really made its way into planning yet – despite the long planning horizons.

- A share of planning authorities are actively paving the desired way with a variety of actions.
- Strong need for transportation and urban planning adaptation is seen within a mid-term range – but has nowhere been started yet.



Its time to develop a vision on how best AV technology can support communal transport and land use objectives – and work jointly for it!

- Cities should think about long term impacts from the first moment.
- Go build partnerships and keep the citizens onboard.



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