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Road Infrastructure for Road Vehicles Automation

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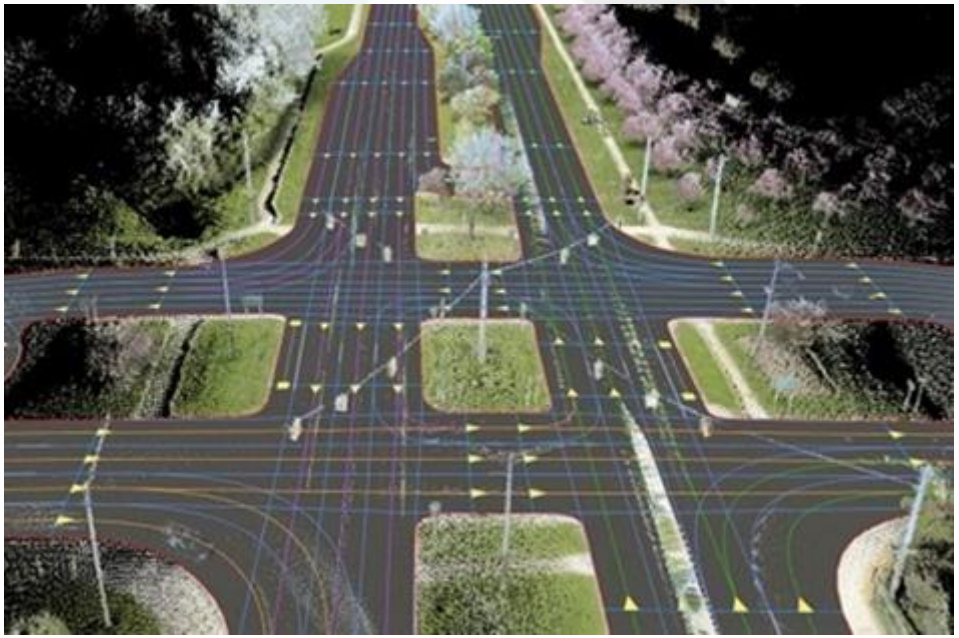
The advance of vehicle technology is placing new demands on transport infrastructure for data connectivity and changing operational practices. This is placing a new challenge for transport infrastructure to be far more flexible in use and easier to adapt quickly to changing and especially rising demands.



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There are significant challenges to infrastructure owners and operators to develop infrastructure that is as efficient as possible for the expected demand, but that has better levels of **flexibility** and **adaptability** to changing demand than is currently the case. Advanced traffic management systems and infrastructure asset monitoring can help maintain high operational performance on sensitive critical transport infrastructure.

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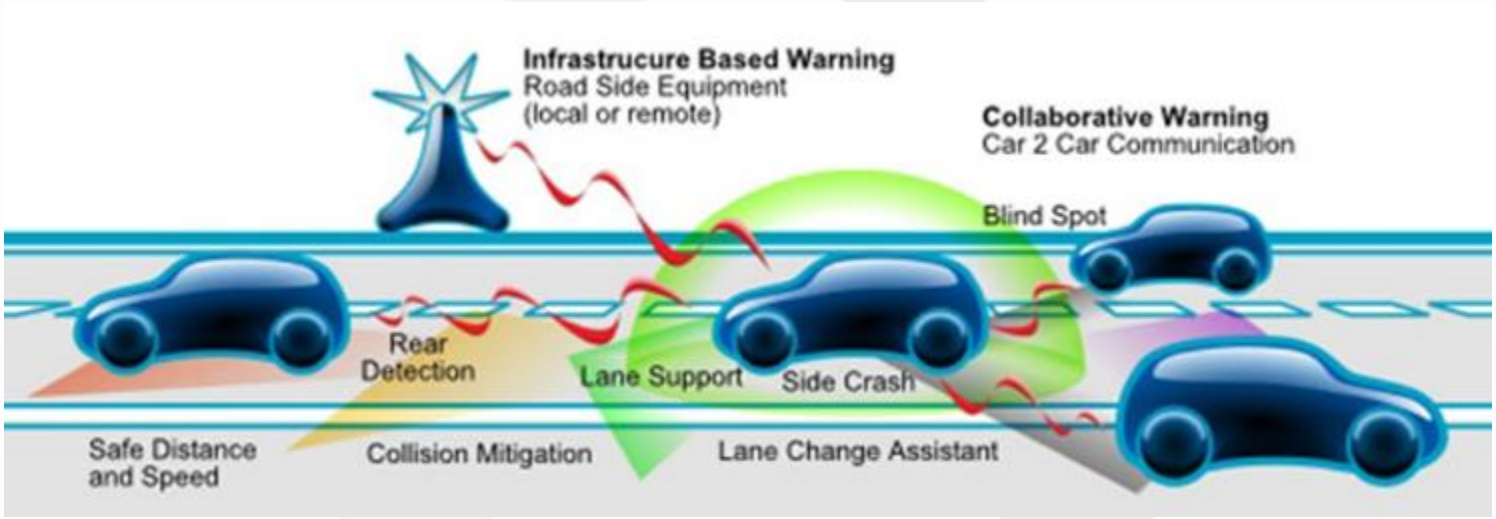
It is essential to ensure the full **convergence** of all developments under Cooperative, Connected and Automated Mobility (CCAM), making use of the digitalization of transport



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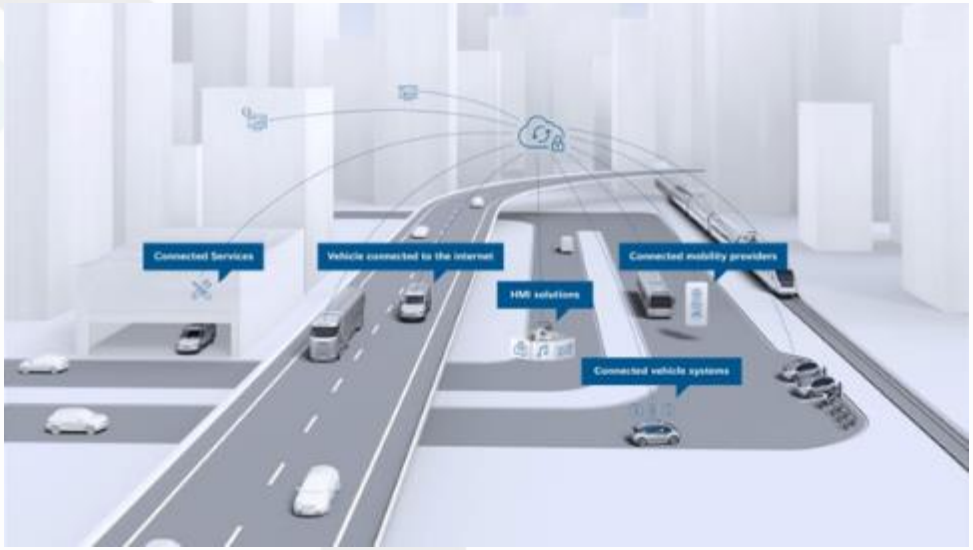
Automated vehicles shall be cooperative and connected.

This will allow to receive in real-time **key attributes of roads** relevant for automated driving, adding predictability, enlarging the decision base for using automatic mode and handle complex traffic situations.



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As support from the digital infrastructure increases,

so does the need to ensure

consistency

between the physical and the digital infrastructure.

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Regardless of where the balance will lie between vehicle autonomy and infratsructure support, a certain level of

redundancy

between the two is desirable.

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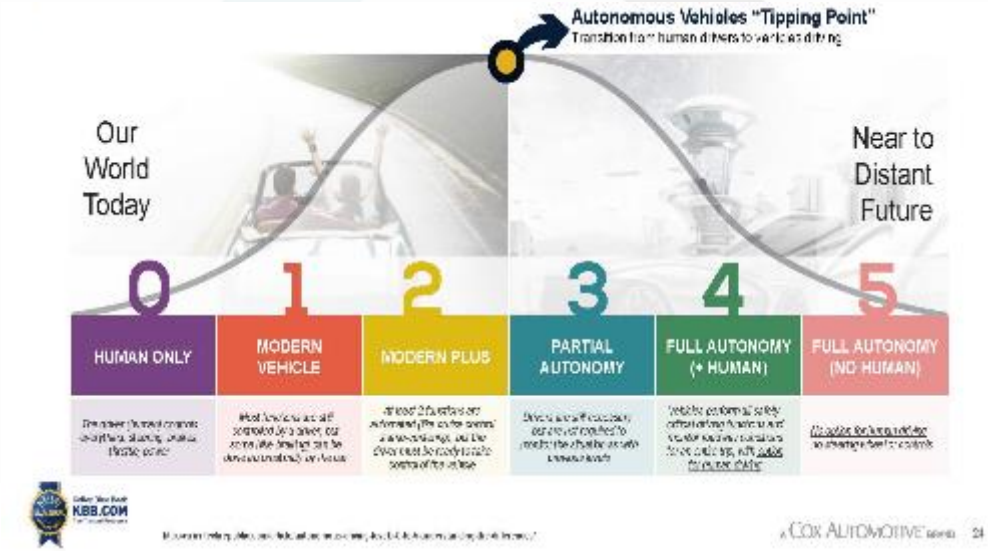
True level 5 may never happen, it also may not be needed

The focus should be on **level 4 islands** where infrastructure investment makes sense to integrate automated vehicles in the mobility system



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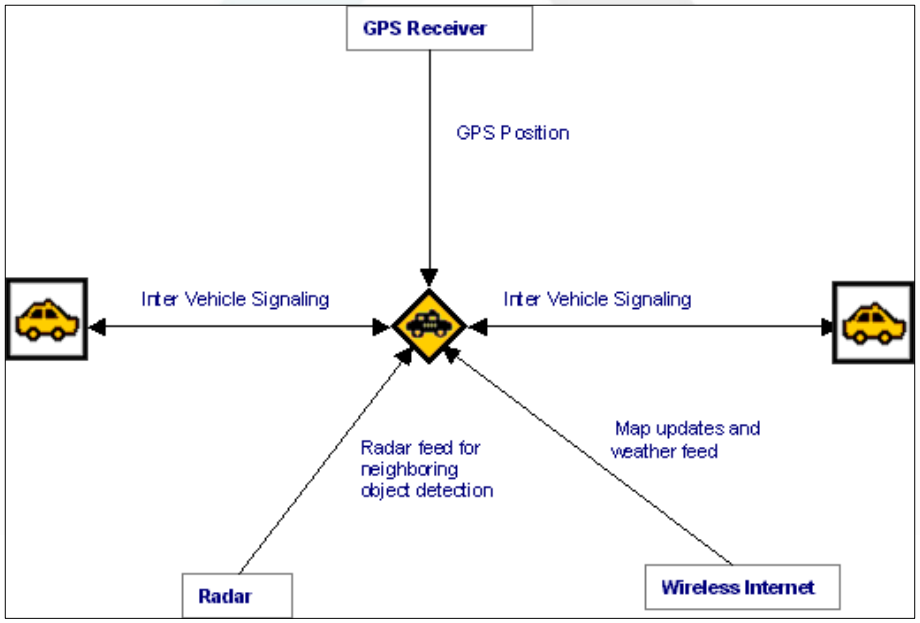
All automated road vehicles will need (lane) accurate positioning and improved GNSS alone will not be sufficient

Cameras, radars and lidars will help the vehicle "see" and position itself but these systems need **reference points** for fast matching with sensory input



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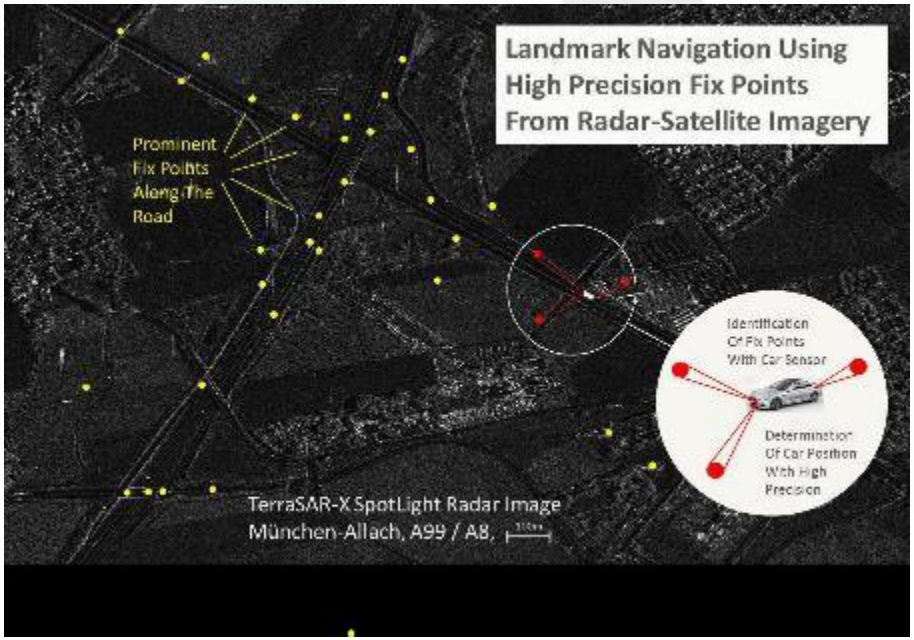
In an urban environment buildings could likely provide these reference points

Investigate how physical and digital infrastructure can contribute to **redundancy** and **safety** in accurate **positioning**, e.g. provide landmarks in high risk road sections or work zones



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Complexity arises from road lay-out and challenging intersections and from cross-traffic (including VRU & other modes)

C-ITS evolving from awareness

(*I share where I am*)

to perception data

(*I share what I see*)

We need specific standards on the context and the interpretation boundaries

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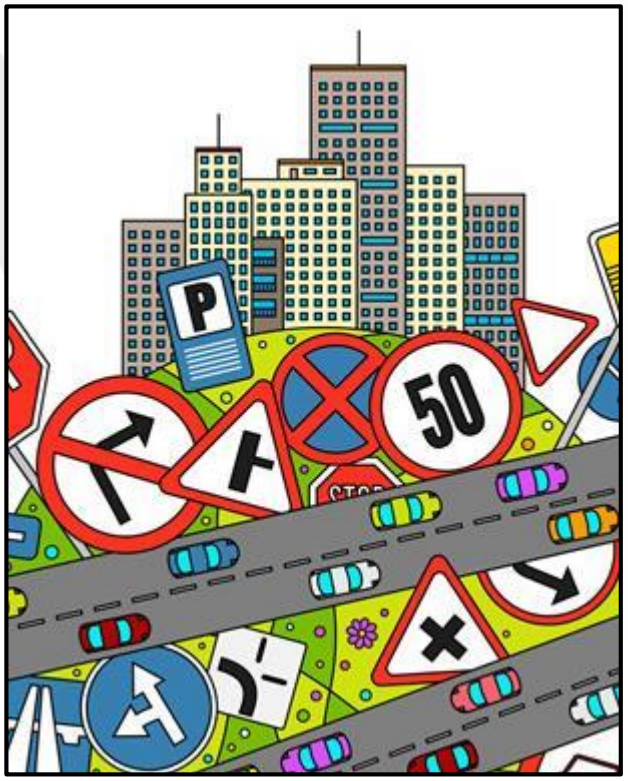
A clear legal framework – including traffic regulation – will be essential to avoid (new) conflicts between information coming from physical and digital infrastructure, and establish precedence regarding information.

It needs collective work on the accelerated and joint implementation by public and private stakeholders



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It is the role of Governments and of governance systems to connect networks, policies and strategies at different levels (administrative, network, mode, etc.) to develop a real global transport policy.

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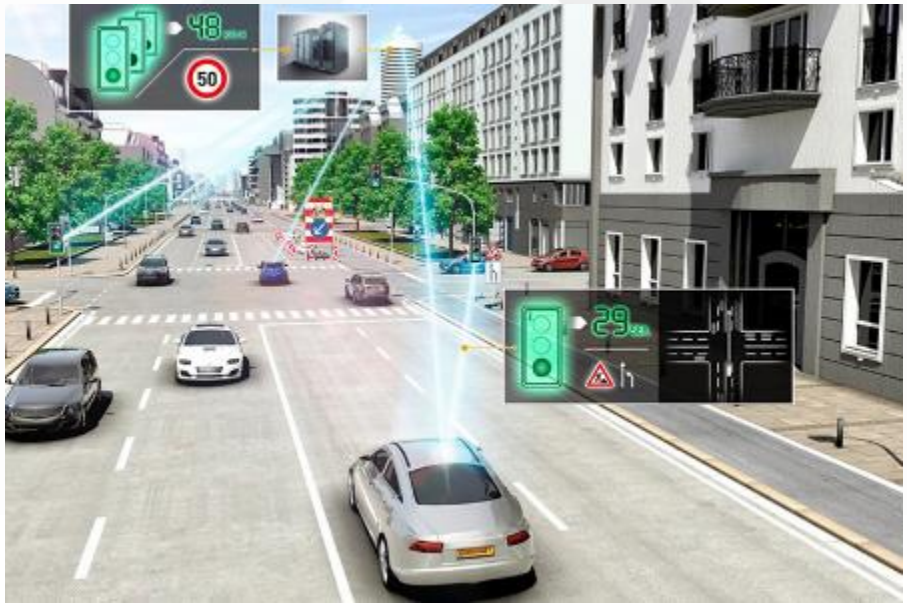
Public sector policies need to change significantly to genuinely incentivize operators to develop innovative and sustainable operations, and the public sector needs to change its appetite for risk if it is to successfully drive change in user acceptance



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Governance measures are necessary to set policies across transport, and thus for infrastructure.

Governance tools include regulation on energy and ICT provision, standardisation, and taxation. Policy will also determine the role that infrastructure owners will play in either providing or operating service networks. The most significant area is in electrification of road transport, where policy on provision and on cost recovery for vehicle charging is required.

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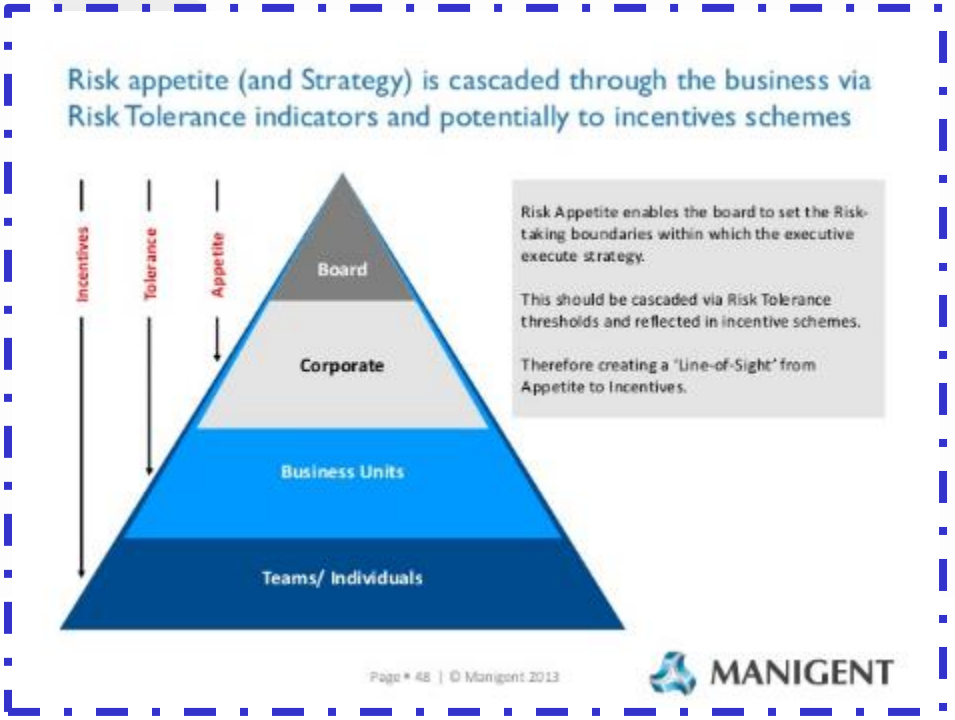
The role of the public and private sector should ensure that the most suitable party bears the risks associated with the innovation and adequate incentives exist in terms of tendering provisions so that efficiency and innovation ensue.

There is also evidence of the limited innovation potential of public agencies and there is an urgent need to identify how to include innovation in national and European transport agency work processes



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The private sector should consider more collaborative behaviour, and use industry sector organisations and trade bodies to orchestrate research and innovation for the benefit of all member companies.

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THANK YOU FOR YOUR ATTENTION

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