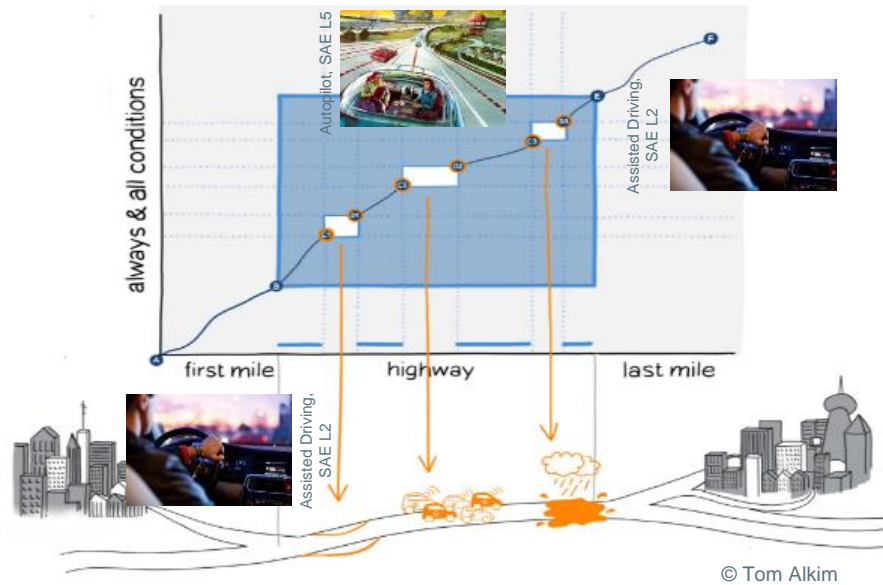


Infrastructure Supported Automated Driving

Jacqueline Erhart
EUCAD 2020
15.05.2020

Challenges to enable safe and reliable mixed traffic flow

Operational Design Domains for Automated Driving



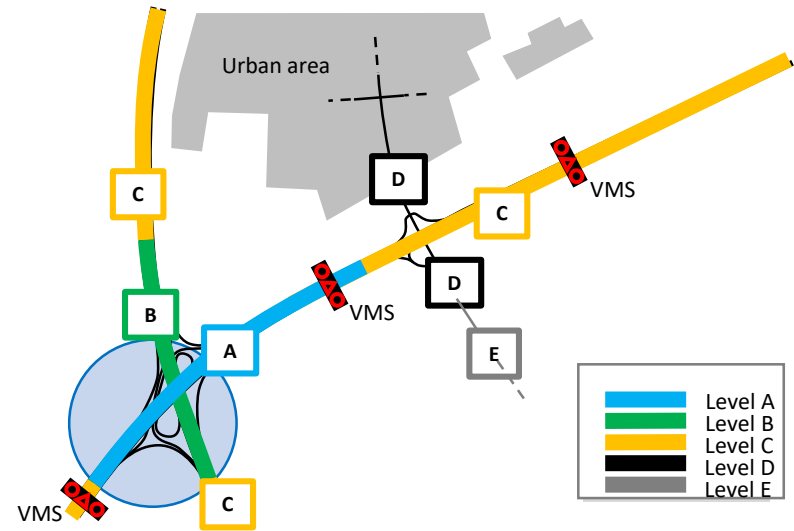
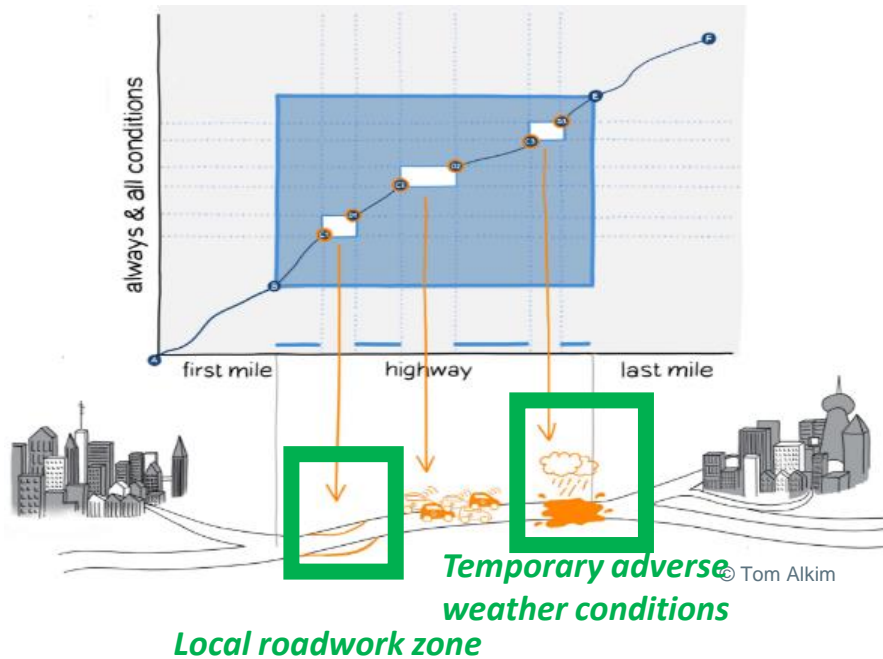
Different traffic situations



> 200,000 vehicles/day

< 20,000 vehicles/day

Digital infrastructure services for temporary or local missing information



ISAD...infrastructure supported automated driving classification

Infrastructure Support for Automated Driving Classification

	ISAD	Name	Infrastructure side	AV side	Digital information provided to AVs			
					Digital map with road signs	VMS warnings, incidents, weather	Microscopic traffic situation	Guidance: speed, gap, lane advice
Conventional Infrastructure	E	Conventional infrastructure / no AV support		Road geometry and road signs have to be recognized by AVs on their own				
	D	Static digital information / map support	Digital map data (including static road signs) complemented by physical reference points	Traffic lights, short term road works and VMS have to be recognized by AVs on their own				
Digital Infrastructure	C	Dynamic digital information	All static and dynamic information can be provided to the AVs in digital form	AVs perceive infrastructure support data				
	B	Cooperative perception	Infrastructure is capable of perceiving microscopic traffic situations	AVs perceive infrastructure support data in real time (C-ITS Day 1)				
	A	Cooperative driving	Infrastructure is capable of perceiving vehicle trajectories and guide single AVs (or AV groups)	AVs are guided by the infrastructure in order to optimize traffic flow (C-ITS Day 2+)				

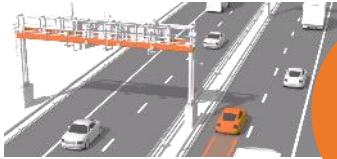
Classification D – Static Maps



Photo by Talles Alves on Unsplash

Classification C – Digitalized regulation and dynamic information

All static and dynamic information can be provided to the AVs in digital form



Traffic Regulations



Incidents

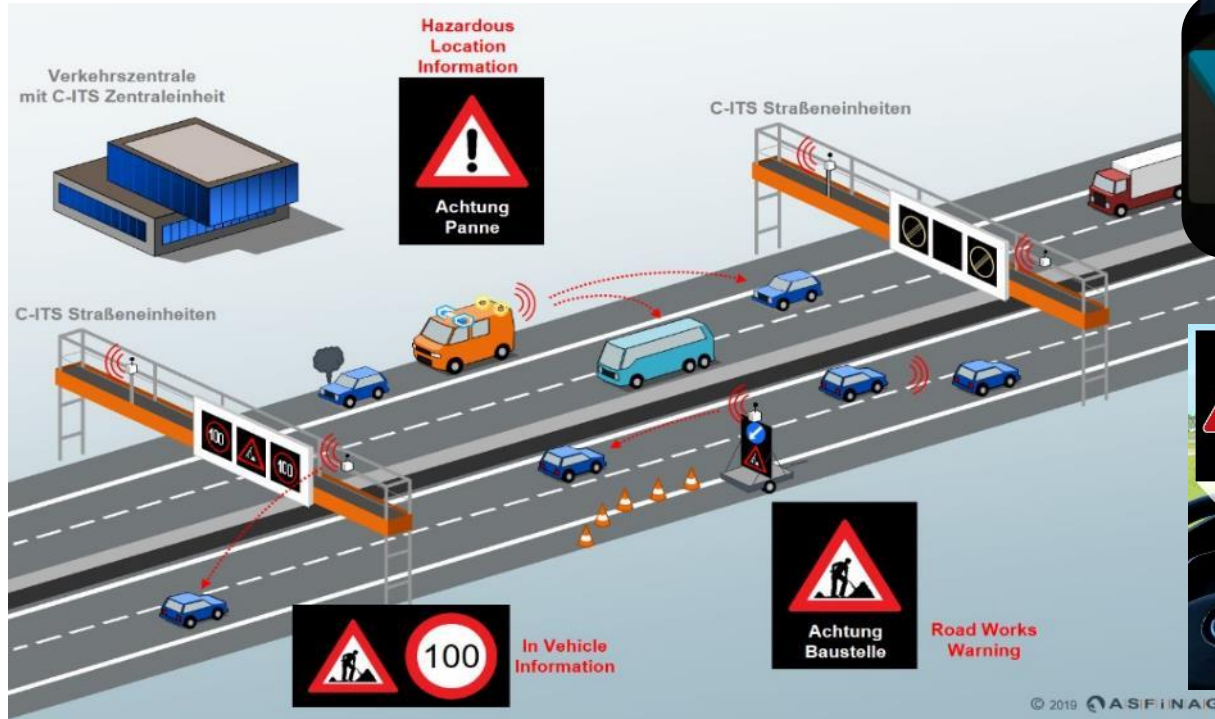


Roadworks



Variable Message Signs

Classification B – Traffic Information

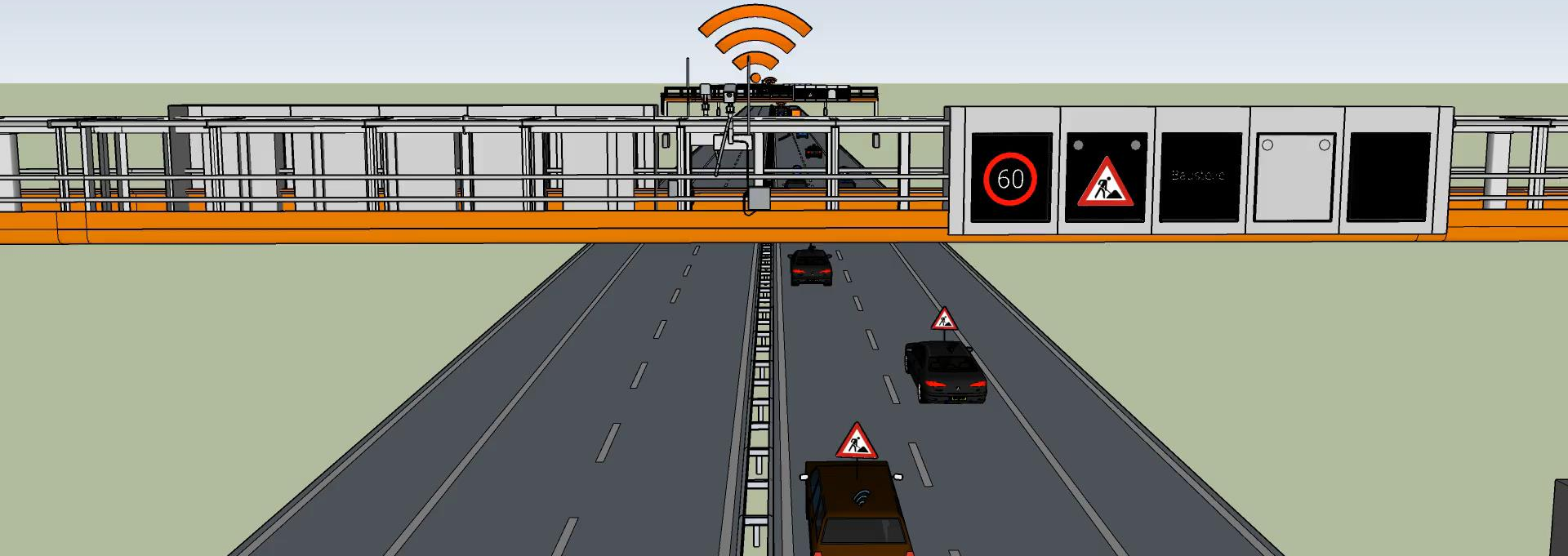


Source: VW Newsroom

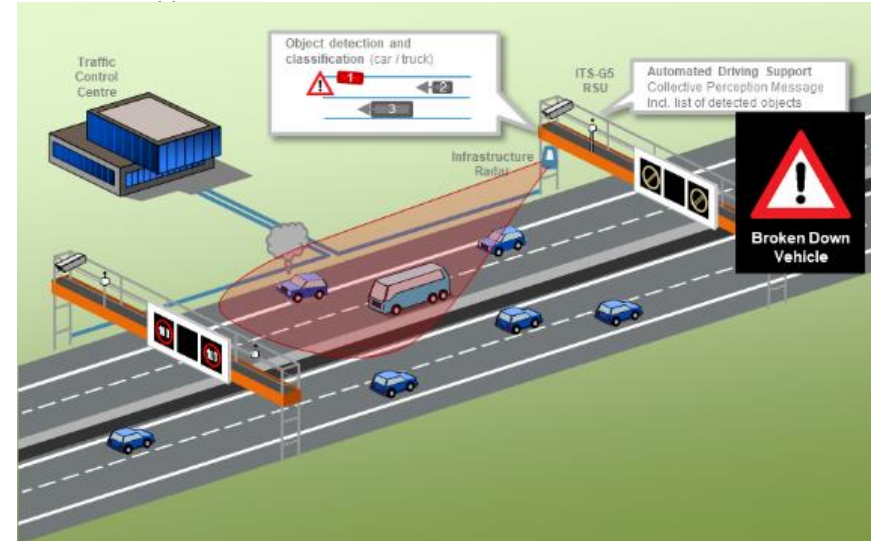
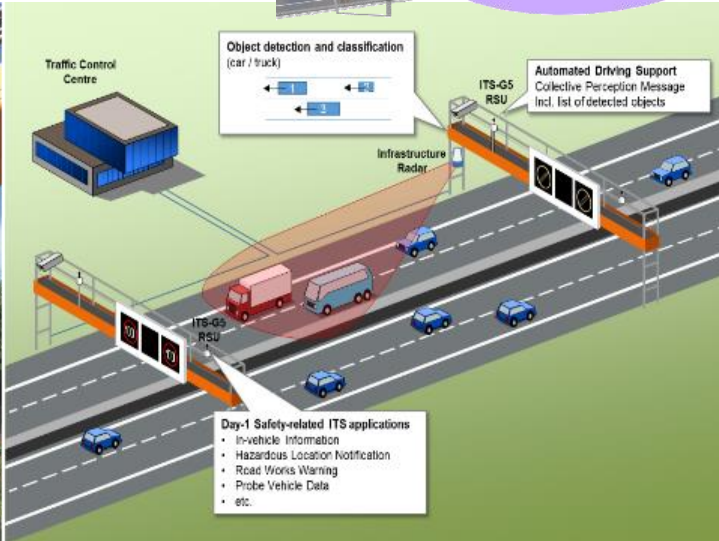
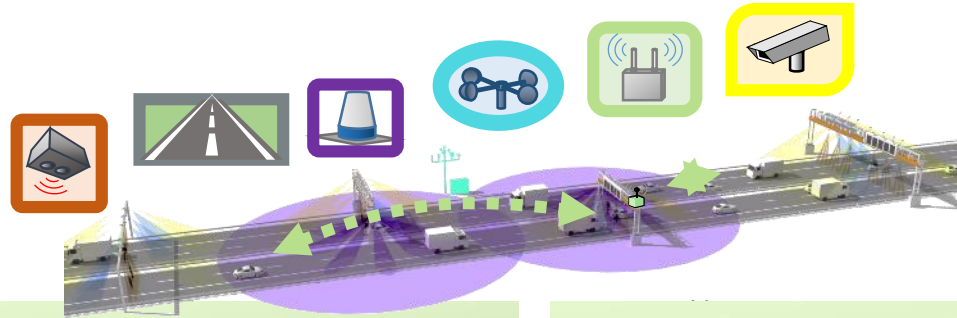


Source: ATTC event 2019

Classification B – Traffic Management

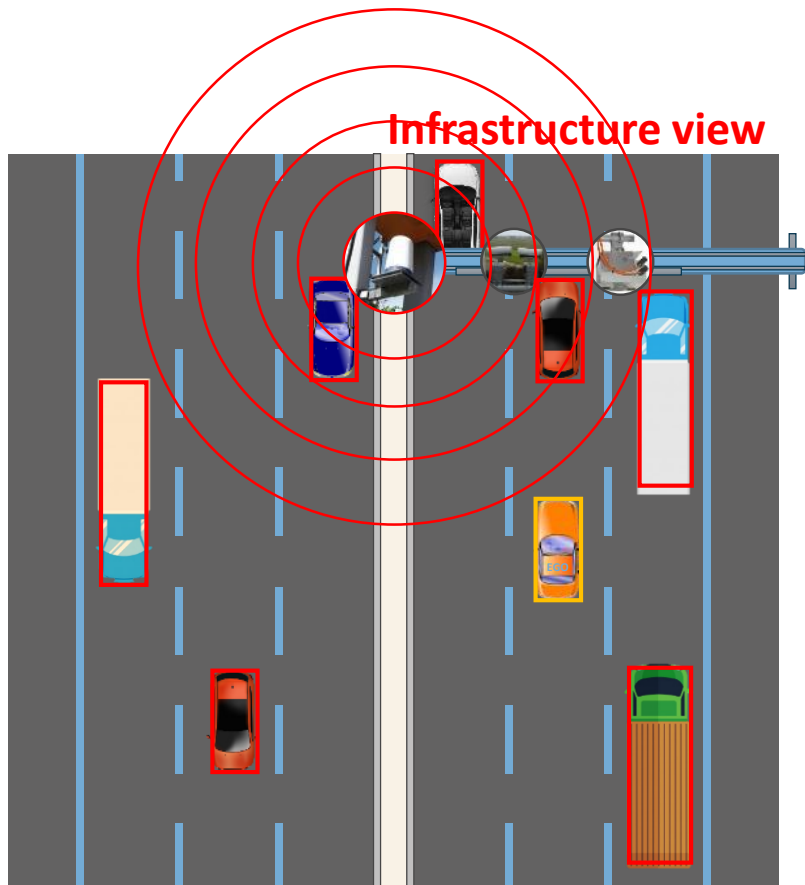


Classification A – Next generation traffic management

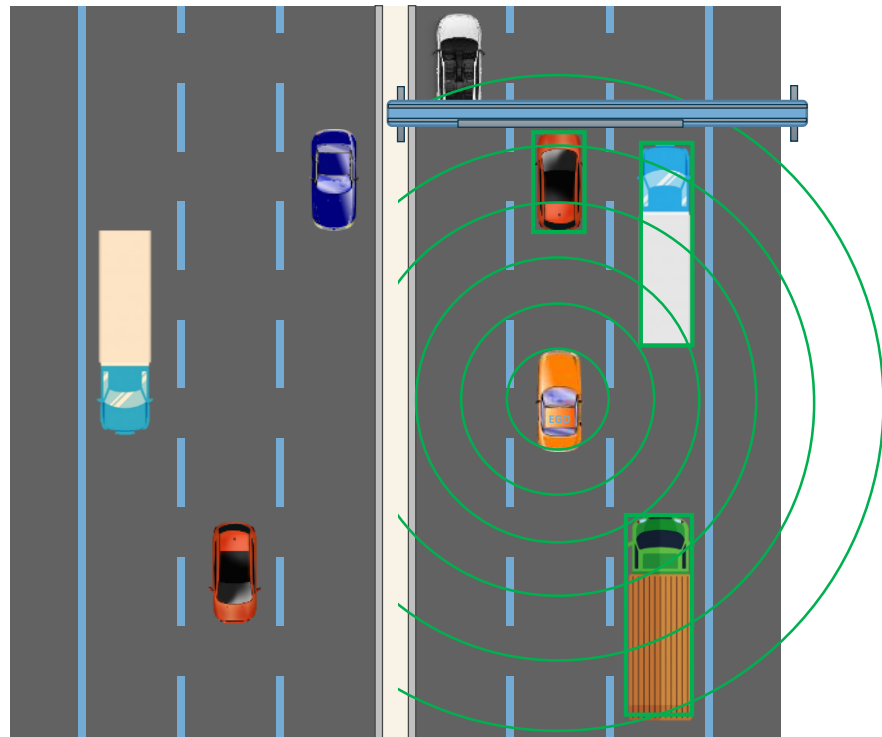




Infrastructure view



Vehicle view

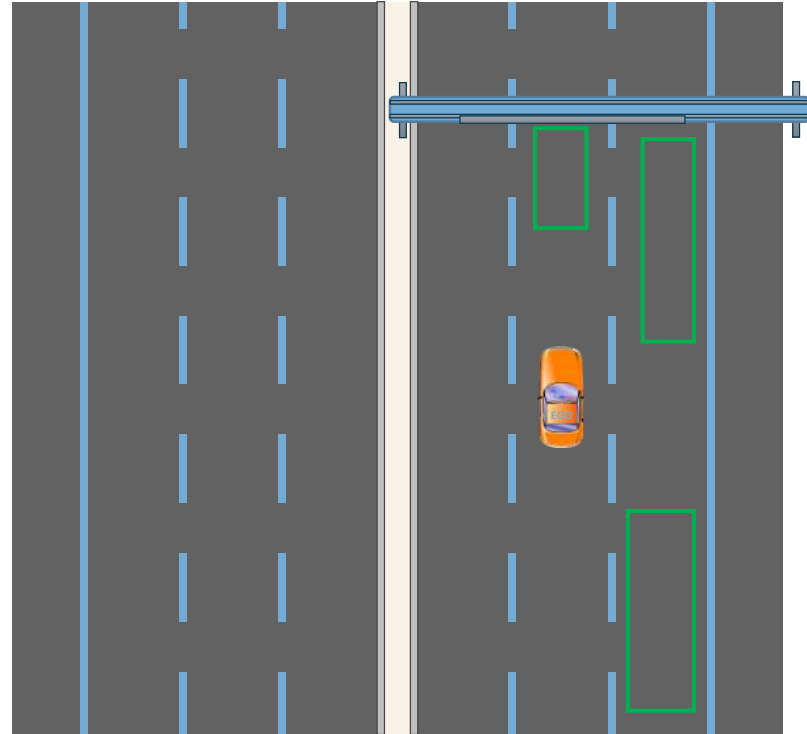
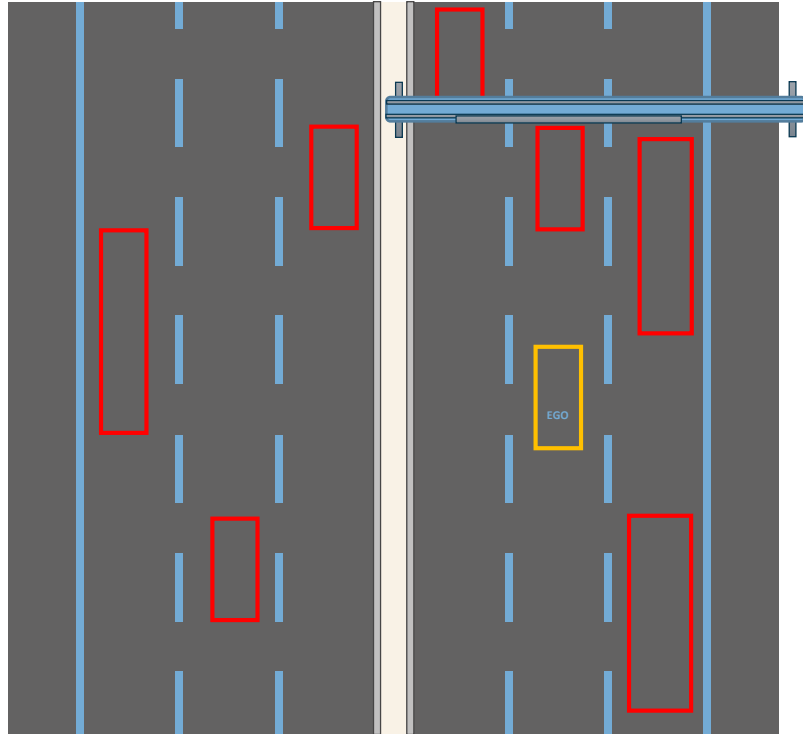




Infrastructure view







and

Vehicle view

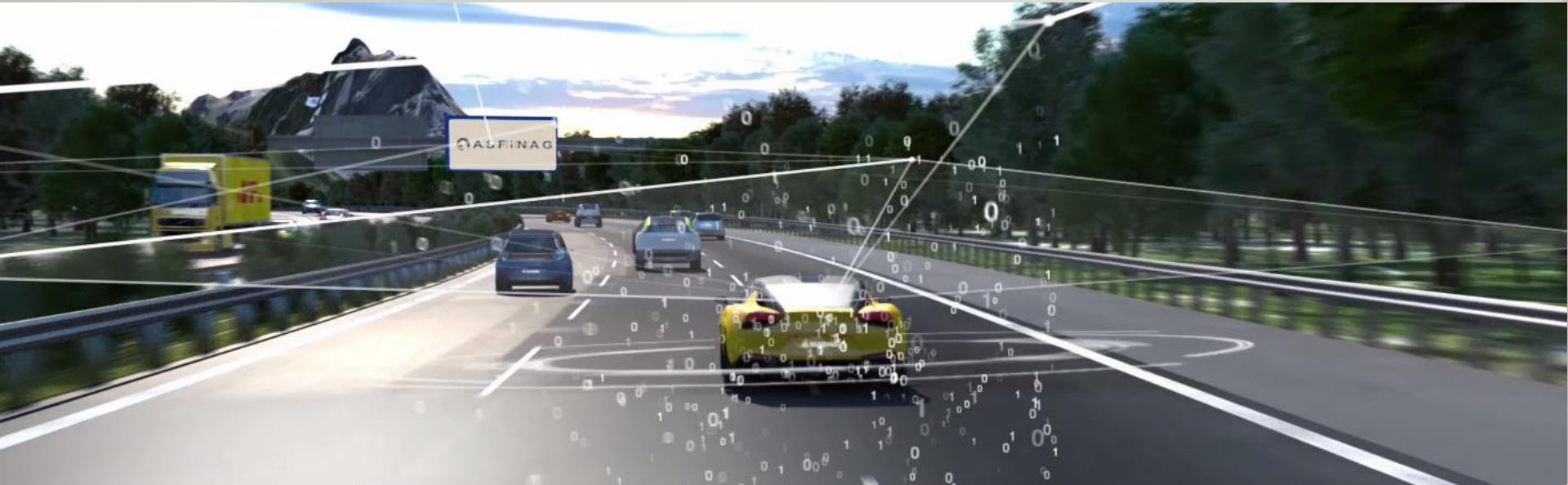


Classification A – Guided manoeuvre planning

Events

Track	Pre	Post	Event
	3	2	Lane Change
	-		Take over
	-		Take over
	3	2	Lane Change
	3	2	Lane Change





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