















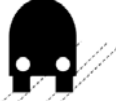


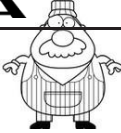

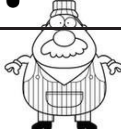



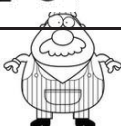


















NHTSA LEVELS OF AUTOMATION

Kati Rubinyi, AIA, ia, Civic Works

LEVEL 0	 AND 		driver controls steering and brakes
LEVEL 1	 OR  BY VEHICLE		driver controls steering or brakes
LEVEL 2	 AND  BY VEHICLE		driver has to be ready to take control
LEVEL 3	 AND  BY VEHICLE		ample warning in rare conditions that driver has to control vehicle
LEVEL 4	vehicle can drive itself empty or with a passenger		

TRANSIT LEVELS OF AUTOMATION

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2014	 	 	 	 
2020	 	 	 	 
2035	 	 	 	 
2050	 			



Guideway/ Level of Segregation



Level of Automation

SAE LEVELS OF AUTOMATION

Summary of Levels of Driving Automation for On-Road Vehicles

This table summarizes SAE International's levels of *driving* automation for on-road vehicles. Information Report J3016 provides full definitions for these levels and for the italicized terms used therein. The levels are descriptive rather than normative and technical rather than legal. Elements indicate minimum rather than maximum capabilities for each level. "System" refers to the driver assistance system, combination of driver assistance systems, or *automated driving system*, as appropriate.

The table also shows how SAE's levels definitively correspond to those developed by the Germany Federal Highway Research Institute (BASI) and approximately correspond to those described by the US National Highway Traffic Safety Administration (NHTSA) in its "Preliminary Statement of Policy Concerning Automated Vehicles" of May 30, 2013.

**	Name	Narrative definition	Execution of steering and acceleration/deceleration	Monitoring of driving environment	Fallback performance of <i>dynamic driving task</i>	System capability (<i>driving modes</i>)	U	B
<i>Human driver</i> monitors the driving environment								
0	No Automation	the full-time performance by the <i>human driver</i> of all aspects of the <i>dynamic driving task</i> , even when enhanced by warning or intervention systems	Human driver	Human driver	Human driver	n/a	SS	0
1	Driver Assistance	the <i>driving mode-specific</i> execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the <i>human driver</i> perform all remaining aspects of the <i>dynamic driving task</i>	Human driver and system	Human driver	Human driver	Some driving modes	i	1
2	Partial Automation	the <i>driving mode-specific</i> execution by one or more driver assistance systems of both steering and acceleration/deceleration using information about the driving environment and with the expectation that the <i>human driver</i> perform all remaining aspects of the <i>dynamic driving task</i>	System	Human driver	Human driver	Some driving modes	.. i	2
<i>Automated driving system</i> ("system") monitors the driving environment								
3	Conditional Automation	the <i>driving mode-specific</i> performance by an <i>automated driving system</i> of all aspects of the <i>dynamic driving task</i> with the expectation that the <i>human driver</i> will respond appropriately to a <i>request to intervene</i>	System	System	Human driver	Some driving modes	''' S - f '''	3
4	High Automation	the <i>driving mode-specific</i> performance by an <i>automated driving system</i> of all aspects of the <i>dynamic driving task</i> , even if a <i>human driver</i> does not respond appropriately to a <i>request to intervene</i>	System	System	System	Some driving modes	S ILI	314
5	Full Automation	the full-time performance by an <i>automated driving system</i> of all aspects of the <i>dynamic driving task</i> under all roadway and environmental conditions that can be managed by a <i>human driver</i>	System	System	System	All driving modes	.	