Levels of Automation

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Let's see how well the Active Lane Control works on the new Infiniti Q50S
Volvo develops the 'no death' car: Vehicles which drive themselves and are totally crashproof could be on British roads in eight years

- Vehicle will be fitted with sensors that can detect potential collisions and take action
- Firm claims 'nobody will be killed or injured in a new Volvo by 2020'

Car giant Volvo is developing 'no death' cars that drive themselves and are impossible to crash – ready for launch in showrooms within eight years.

The computerised vehicles will be fitted with high-tech sensors and will refuse to be steered into other objects.

Volvo says they will be on sale to customers by 2020, but that some of the life-saving technology will be incorporated into its vehicles even earlier – from 2014 – it says.

Scroll down for video.
Science Fiction?
Connected Vehicles?
# Levels of Automation

<table>
<thead>
<tr>
<th>SAE level</th>
<th>Name</th>
<th>Narrative Definition</th>
<th>Execution of Steering and Acceleration/Deceleration</th>
<th>Monitoring of Driving Environment</th>
<th>Fallback Performance of Dynamic Driving Task</th>
<th>System Capability (Driving Modes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No Automation</td>
<td>the full-time performance by the human driver of all aspects of the dynamic driving task, even when enhanced by warning or intervention systems</td>
<td>Human driver</td>
<td>Human driver</td>
<td>Human driver</td>
<td>n/a</td>
</tr>
<tr>
<td>1</td>
<td>Driver Assistance</td>
<td>the driving mode–specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the human driver perform all remaining aspects of the dynamic driving task</td>
<td>Human driver and system</td>
<td>Human driver</td>
<td>Human driver</td>
<td>Some driving modes</td>
</tr>
<tr>
<td>2</td>
<td>Partial Automation</td>
<td></td>
<td>System</td>
<td>Human driver</td>
<td>Human driver</td>
<td>Some driving modes</td>
</tr>
<tr>
<td></td>
<td>Intelligent Cruise Control + Active Lane Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Conditional Automation</td>
<td></td>
<td>System</td>
<td>System</td>
<td>Human driver</td>
<td>Some driving modes</td>
</tr>
<tr>
<td>4</td>
<td>High Automation</td>
<td>the driving mode–specific performance by an automated driving system of all aspects of the dynamic driving task, even if a human driver does not respond appropriately to a request to intervene</td>
<td>System</td>
<td>System</td>
<td>System</td>
<td>Some driving modes</td>
</tr>
<tr>
<td>5</td>
<td>Full Automation</td>
<td></td>
<td>System</td>
<td>System</td>
<td>System</td>
<td>All driving modes</td>
</tr>
</tbody>
</table>

Standard J3016
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Some Challenges

• Weather / Winter
• Road construction
• Legal framework
• Insurance
• Interactions with other users
Some Impacts

1. Safety
2. Road capacity
3. Increase of vehicle miles traveled
   - mobility for people who cannot drive
4. Urban planning: parking, urban sprawl
5. Car ownership: shared robo-taxis, aka Uber 2.0?
6. Jobs, jobs, jobs
Conclusion

• Remember the current alternative...
  • every year: 1.2 million dead, 50 million injured
  • history will judge us harshly if we slow down the adoption of life-saving technology for the wrong reasons

• The adoption and use of disruptive technologies are difficult (impossible?) to predict
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THANK YOU!