Automated Driving – WP29 Activities
Bernie Frost, Chairman of UNECE/WP29/GRRF
Two principle operating groups:

1. WP29 Informal Group to provide strategic direction for automated technology.  
   (Intelligent Transport Systems/Automated Driving Group (ITS/AD))

2. Developing the UN Regulation concerning vehicle steering systems to permit certain levels of autonomy.  
   (GRRF and the GRRF Informal Working Group)
Working Party 29 Activities

WP1

ITS/AD

CYBER
Software
Vehicle Classes

WP29

GRRF

Steering Automation
## SAE Levels of Automation

<table>
<thead>
<tr>
<th>Level</th>
<th>Name</th>
<th>Steering, Acceleration &amp; Deceleration</th>
<th>Monitoring of Driving Environment</th>
<th>Fall-back Performance of Dynamic Driving Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero</td>
<td>No automation</td>
<td>Human</td>
<td>Human</td>
<td>Human</td>
</tr>
<tr>
<td>One</td>
<td>Driver Assistance</td>
<td>Human &amp; System</td>
<td>Human</td>
<td>Human</td>
</tr>
<tr>
<td>Two</td>
<td>Partial Automation</td>
<td>System</td>
<td>Human</td>
<td>Human</td>
</tr>
<tr>
<td>Three</td>
<td>Conditional Automation</td>
<td>System</td>
<td>System</td>
<td>Human</td>
</tr>
<tr>
<td>Four</td>
<td>High Automation</td>
<td>System</td>
<td>System</td>
<td>System</td>
</tr>
<tr>
<td>Five</td>
<td>Full Automation</td>
<td>System</td>
<td>System</td>
<td>System</td>
</tr>
</tbody>
</table>

SAE International and J3016
# Functional Categories of Automated Function

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category A</td>
<td>Operates at a speed no greater than 10 km/h to assist the driver, on demand, in low speed or parking manoeuvring.</td>
</tr>
<tr>
<td>Category B1</td>
<td>Assists the driver in keeping the vehicle within the chosen lane, by influencing the lateral movement of the vehicle.</td>
</tr>
<tr>
<td>Category B2</td>
<td>Initiated/activated by the driver and which keeps the vehicle within its lane by influencing the lateral movement of the vehicle for extended periods without further driver command/confirmation</td>
</tr>
<tr>
<td>Category C</td>
<td>Initiated/activated by the driver and which can perform a single lateral manoeuvre (e.g. lane change) when commanded by the driver.</td>
</tr>
<tr>
<td>Category D</td>
<td>Initiated/activated by the driver and which can indicate the possibility of a single lateral manoeuvre (e.g. lane change) but performs that function only following a confirmation by the driver.</td>
</tr>
<tr>
<td>Category E</td>
<td>Initiated/activated by the driver and which can continuously determine the possibility of a manoeuvre (e.g. lane change) and complete these manoeuvres for extended periods without further driver command/confirmation.</td>
</tr>
</tbody>
</table>
Current Progress

• Category A and Category B1 – proposals agreed by WP29 for application from April 2018.

• Category C (combined with B1)
  • Target to bring proposals to WP29 in Spring 2018
Ongoing Discussion

• Categories B2, D & E to be discussed
  • Parallels with SAE level 3 and 4 capability.
• Cyber and Software recommendations for Spring 2018
• Data: Vehicle and system-status:
  • What should be stored?
  • Who should have access to it?
Some Challenges

• What can a vehicle really “see”?  
• Can a vehicle really know where it is?  
• Can a driver resume control in an emergency.  
• What controls are necessary to manage software.  
• Can the vehicle be resilient to cyber attack?

These challenges (and others) are being addressed
Thank You

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