SAE Standards Related to Driving (and other topics)

panel session - Human Factors and Ergonomics Standards: An Overview

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Standards an important way to get research into practice.
The standard development process SAE uses is typical.

Process is managed by SAE Safety & Human Factors Committee (~35 members)
4-5 hr conference call 3 times/year
Must attend meetings vote on ballots (~1/month); miss and you are off

New
Motion passes for a new standard,
committee of volunteers is formed

Revision
Motion passes to update standard,
committee of volunteers is formed

\[
\begin{align*}
\text{years} & \quad \text{Regular subcommittee meetings to draft/edit a document (and email)} \\
& \quad \text{Subcom. approves draft} \\
& \quad \text{Safety & Human Factors Committee ballot} \\
& \quad \text{After ballot, need to address all comments} \\
& \quad \text{re-ballot if technical changes} \\
& \quad \text{Motor Vehicle Council ballot} \\
& \quad \text{Published}
\end{align*}
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## Selected SAE Safety & Human Factors Standards

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>J2365</td>
<td>Calculation of the Time to Complete In-Vehicle Tasks</td>
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<tr>
<td>J2395</td>
<td>In-Vehicle Message Priority</td>
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<tr>
<td>J2395</td>
<td>Definitions and Measures of Driver Visual Behavior</td>
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<tr>
<td>J2399</td>
<td>Adaptive Cruise Control (ACC) User Interface</td>
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<tr>
<td>J2400</td>
<td>Forward Collision Warning Systems User Interface</td>
</tr>
<tr>
<td>J2808</td>
<td>Blind Spot Monitoring System (BSMS) User Interface</td>
</tr>
<tr>
<td>J2830</td>
<td>Comprehension Testing of In-Vehicle Icons</td>
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<tr>
<td>J2831</td>
<td>In-Vehicle Alphanumeric Messages</td>
</tr>
<tr>
<td>J2889</td>
<td>Measurement of Minimum Noise Emitted by Road Vehicles</td>
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<tr>
<td>J2944</td>
<td>Operational Definitions of Driving Performance Measures and Statistics</td>
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<tr>
<td>J2972</td>
<td>Definition of Road Vehicle Hands-Free Operation</td>
</tr>
<tr>
<td>J2988</td>
<td>Speech Input and Audible Output</td>
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SAE Recommended Practice J2944, Operational Definitions of Driving Performance Measures and Statistics, is being developed to overcome a lack of repeatability between studies.

| Body (116 pages of 171) | How to cite definitions (>50 measures & stats)  
Terms used in other definitions  
General measurement requirements  
Lateral control measures  
Longitudinal control measures |
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<tr>
<td>Appendix (55 pages)</td>
<td>Original calculations &amp; derivations (TTC, TLC, etc.)</td>
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Principles followed: 1 name but many definitions, self contained, use core documents, etc.
Examples of terms that are defined (~50)

Time & distance gap (and headway – 3 options)
CG and spatial center distance separation
Range
TTC (2 options) & min, min adjusted, time exposed, time integrated, inverse
Required deceleration
Coherence, gain, phase angle, time delay

Mean lateral position (3 options)
SDLP
Lane departure (11 options)
TTC (3 options) and derivatives similar to TTC

Lane change (5 options) ....
We need help with writing standards and with including research in them.

Example: SAE J3048: Driver-Vehicle Interface Considerations for Lane Keeping Assistance Systems
to provide guidance for the implementation of driver-vehicle interfaces … for lane-keeping assistance systems

Audible Alert
Audible LKAS alerts … may be provided at the manufacturer’s discretion. If provided, they should be designed in accordance with applicable provisions of ISO 15006.

Haptic Alert
Haptic LKAS alerts … may be provided at the manufacturer’s discretion. If provided, they should be designed in a manner that will not be masked by road feedback through the vehicle chassis.