



Countermeasures for Distracting Technology

Peter C. Burns
Road Safety and Motor Vehicle Regulation

DRAFT



Outline

- Need for countermeasures
- Strategies for limiting distraction
- Status of TC initiatives



Focusing on Distraction

- Transport Canada has been investigating the issue of driver distraction for a number of years.
- This research was in response to trends in vehicle technology.



Concerns about distraction

- Many different telematics devices are appearing in vehicles.
- They offer a wide variety of designs and features.
- May be unsuitable for use while driving.
- Devices will become standard equipment in vehicles.
- Difficult to capture data on the risks.
- Canadians are concerned - with 37% believing that distracted drivers represent a “serious or extremely serious problem” (2003).



Distraction Countermeasures

A. Target the drivers

- **Awareness and Education**
- **Deterrence**

B. Target the distractions

- **Design standards (e.g., display legibility, no moving images)**
- **Performance standards (e.g., level of safe driving)**
- **Human Factors design procedures (e.g., iterative user testing)**
- **Mitigation (e.g., adaptive interfaces)**

Target the Distractions: Design Standards



There are basic principles that can help designers limit distraction

- ✓ Principles to protect driving performance (e.g., 25° down angle requirement).
- ✓ Set basic restrictions (e.g., no TV/video entertainment when vehicle is in motion).
- ✓ Standardize (e.g., ISO symbols - the same everywhere for everybody).
- ✗ Although they provide clear criteria for design and assessment, design standards can restrict design and innovation.
- ✗ Many standards would be required for complex devices.
- ✗ Need to be continuously updated or they can become obsolete as technology changes.



Design Standards

There are a number of international efforts by industry and governments to develop best practice guides to designing telematics.

- European Statement of Principles (ESOP)
- Japanese Automobile Manufacturers Association (JAMA)
- Alliance of Automobile Manufacturers (AAM)



Alliance of Automobile Manufacturers (AAM) Statement of Principles

- North American voluntary “best practices” document addressing safety aspects of driver interactions with telematics devices
- Applies to 2006 model vehicles and beyond.
- Based on the European Statement of Principles, but also has verification procedures and criteria.
- Annexes may be added in time (e.g., speech-user interfaces, ADAS).

**Statement of Principles, Criteria and
Verification Procedures on Driver
Interactions with Advanced In-
Vehicle Information and
Communication Systems**

Draft Version 3.0

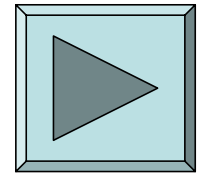
Driver Focus-Telematics Working Group

June 17, 2003

AAM Statement of Principles



- 1. Installation** - e.g., Principle 1.2 “no part of the system should obstruct the driver’s field of view as defined by applicable regulations.”
- 2. Presentation** - e.g., Principle 2.1 “systems with visual displays should be designed such that the driver can complete the desired task with sequential glances that are brief enough not to adversely affect driving.”



AAM Statement of Principles (continued)



3. **Interaction** - e.g., Principle 3.1 “the system should allow the driver to leave at least one hand on the steering control.”
4. **System Behaviour** - e.g., Principle 4.1 “visual information not related to driving that is likely to distract the driver significantly (e.g., TV, video, and continuously moving images and automatically scrolling text) should be disabled while the vehicle is in motion or should be only presented in such a way that the driver cannot see it while the vehicle is in motion.”
5. **Instructions** - e.g., Principle 5.1 states that “the system should have adequate instructions for the driver covering proper use and safety-relevant aspects of installation and maintenance.”



Target the Distractions: Performance Standards

- Product development processes require performance standards to determine if targets have been achieved.
- Testing is a key part of product development
- This requires assessment methods and safety performance criteria.
- There are currently no methods or criteria that have been proven effective in setting limits on distraction across a range of technologies.



Performance Standards

- A practical method for determining whether tasks are compatible with safe driving.
- A method that is also meaningful, objective and repeatable.
- There are currently no such standard assessment methods available.



Possible methods include:

- **Secondary task performance**
 - **Static (e.g., total task time)**
 - **Dynamic (e.g., errors)**
- **Measuring the driver (e.g., glance behaviour)**
- **Measuring the device and tasks (e.g., number of button presses)**
- **Driving performance (e.g., SDLP)**
- **Surrogate driving performance measures**
 - **Peripheral detection task (PDT)**
 - **Lane Change Test (ADAM, ISO)**
 - **Occlusion (ISO, SAE, AAM, JAMA)**



Conclusions

- Driver distraction is a significant road safety concern.
- There are no standard tests for distraction available yet.
- Feasible and effective countermeasures for distraction exist.
- Lastly, co-operative harmonized research efforts are needed to tackle this problem.



Thank you
