Recommended OICA Worldwide Distraction Guideline Policy Position

- March, 2015 -

Introduction

Vehicle designers have long recognized the importance of supporting a driver's ability to maintain eyes on the driving environment, including the monitoring of in-vehicle displays and vehicle operating controls while the vehicle is in motion. With the proliferation of both integrated and nomadic (portable) telematics systems, the automotive industry and government agencies have responded to concerns over driver distraction with the generation of voluntary guidelines covering the visual-manual driver vehicle interface associated with vehicle integrated systems and docked or tethered devices. If properly implemented in accordance with appropriate human-machine interface (HMI) guidelines, much of the telematics and information capabilities desired by drivers can be safely provided by in-vehicle integrated systems and interfaces when the driver judges that driving conditions allow for it.

The efficacy of applying the appropriate guidelines for integrated devices is supported by examining real world crash data. For example, in the ten year period following the release and wide-spread voluntary adoption of the Alliance of Automobile Manufacturers (the "Alliance") Voluntary Guidelines by the automotive manufacturing industry in the United States, the level of police-reported crashes coded for involvement of an integrated device/control has remained stable at a very low crash rate (0.5% of all police-reported crashes)[1]. The proper implementation of devices and systems, such as navigation, has been shown to provide a net safety benefit when compared to, in this example, drivers using paper maps. This contrasts with naturalistic driving study research that demonstrates that some visual-manual tasks, such as manually texting using a hand-held portable cell phone, are not compatible with the driving task and, as a result, present significantly elevated crash risk. For example, a recently completed SHRP-2 naturalistic driving distraction study reported that off-road glances associated with rear-end crashes were mostly due to visual interaction with carried-in portable electronic devices, not to in-vehicle integrated systems.[2]

---

[1] In the United States, recent US Department of Transportation crash data show that 17 percent (an estimated 899,000) of all police-reported crashes reportedly involved some type of driver distraction in 2010. Of those 899,000 crashes, distraction by a device/control integral to the vehicle was reported in 26,000 crashes (3% of the distraction related police-reported crashes). Thus 0.5 percent (26,000/5,409,000) of the 2010 police-reported crashes involved a driver reported as distracted while using or adjusting a device or controls integral to the vehicle, such as audio or climate controls, windows, or mirrors. Page 11201, Federal Register/Vol. 77, No. 37/Friday, February 24, 2012/Notices

[2] Victor, T., Bärgman, J., Boda, C-N., Dozza, J., Engström, J., Flannagan, C. A., Lee, J. D., Markkula, G. (2014). Analysis of Naturalistic Driving Study Data: Safer Glances, Driver Inattention, and Crash Risk. SHRP2 Research Report. Prepublication draft. Available: http://www.trb.org/StrategicHighwayResearchProgram2SHRP2/naturalisticdrivingstudy.aspx

There are a number of HMI guidelines applicable to telematics devices intended for use by the driver that cover various parts of the globe, including Europe, North America and Japan. The automotive industry, government and standards development organizations continue efforts to update and maintain existing guidelines as new research becomes available. These efforts include potential development and expansion of guidelines to address newer HMI technologies. These documents provide HMI guideline references to assist designers of telematics and other systems intended for use by the driver that are regionally-appropriate and include high-level HMI design guidance. In many cases, these references also include specific performance criteria and verification procedures.

However, the rapid emergence of hand-held smart phones has introduced significant safety challenges when such products are brought into the vehicle and used in an uncontrolled manner. A recent National Highway Traffic Safety Administration (NHTSA) funded naturalistic driving study[3] found that a) cell phone listening/talking subtasks did not increase safety-critical event (SCE) risk; b) visual-manual (VM) subtasks did significantly raise SCE risk; and c) collapsing across both types of subtasks, hand-held (HH) cell phone use significantly increased SCE risk but hands-free cell phone use did not, with integrated hands-free systems having the lowest reported SCE risk ratio of all.

Unlike vehicle integrated systems, hand-held devices typically have not been designed to be used by a driver when a vehicle is in motion. Furthermore, there are no industry guidelines to specify their performance when operated in a driving environment[4]. Given the lack of industry guidance in this area, NHTSA has initiated the development of voluntary guidelines applicable to these devices, but the completion date for these guidelines is unknown. OICA supports NHTSA's efforts and encourages NHTSA to adopt its hand-held device guidelines as soon as possible. However, if NHTSA does not establish guidelines for hand-held/portable devices, it may be necessary to revise this document accordingly.

Vehicle manufacturers are also working to develop methods to automatically pair (i.e., wirelessly tether) hand-held devices to the vehicle integrated system. When properly paired, the in-vehicle integrated system is able to utilize the vehicle's controls and displays to provide hand-held supported features and functions, while managing the content and presentation to the driver in accordance with established industry guidelines.

---

[3] DOT HS 811 757, The Impact of Hand-Held and Hands-Free Cell Phone Use on Driving Performance and Safety-Critical Event Risk, April 2013. This study did not address driver usage of other smartphone features commonly available such as email and applications like Facebook.

[4] Efforts by the Consumer Electronics Associated to develop performance guidelines were initiated, but indefinitely suspended in May 2014

Guidelines

Vehicle Integrated Systems

Visual-manual driver interface guidelines for integrated systems exist in Japan, Europe and United States. They are as follows:

Japan:

Japan Automobile Manufacturers Association (JAMA) Guideline for In-Vehicle Display Systems, Version 3.0[5]

Europe:

Commission of the European Communities (2007) Commission Recommendation on Safe and Efficient In-Vehicle Information and Communication Systems; Update of the European Statement of Principles on Human Machine Interface[6]

United States:

Alliance of Automobile Manufacturers Statement of Principles, Criteria and Verification Procedures on Driver Interactions with Advanced In-Vehicle Information and Communication Systems, June 26, 2006[7]

National Highway Traffic Safety Administration Visual-Manual NHTSA Driver Distraction Guidelines for In-Vehicle Electronic Devices, April 26, 2013[8]

Hand-held/Portable Devices

There are not any industry or government guidelines currently in effect. However, in the United States, NHTSA is attempting to develop such guidelines.

Application of Guidelines vs. Regulations

[5] http://www.umich.edu/~driving/documents/JAMA_guidelines_v30.pdf
[6] ftp://ftp.cordis.europa.eu/pub/telematics/docs/tap_transport/hmi.pdf
[7] http://www.autoalliance.org/index.cfm?objectid=D6819130-B985-11E1-9E4C000C296BA163
[8] Federal Register/Vol. 78, No. 81/Friday, April 26, 2013, pages 24818 - 24890

Applicable regulations and/or mandatory standards must be adhered to by vehicle manufacturers and suppliers. Guidelines differ in that they are voluntary and can be adopted, fully or partially, based on an individual vehicle manufacturer's determinations. Decisions can include an analysis of the markets in which a vehicle is driven or other unique attributes of a vehicle.

In the event of any conflict between guidelines and an applicable regulation, the regulation takes precedence. While this is the case, at the same time, vehicle manufacturers apply region specific self-committed guidelines. The guidelines referenced in this document have many similarities, but they also contain some differences regarding scope, aspects of performance and degree of specificity contained in verification procedures.

Furthermore current HMI guidelines are designed and intended only for non-automated vehicles. With the introduction of higher levels of automated driving the operative driving task is increasingly performed by systems. Depending on the design/availability of the automated driving function more functionality may be made available for the driver during driving.

Finally, OICA is concerned that applying the technical requirements contained in the NHTSA Phase 1 guidelines will discourage tethering of portable devices to in-vehicle systems and further increase the use of portable devices on a standalone basis by drivers thus resulting in increasing the riskier behaviour of drivers

Guidance for Hand-Held/Portable Devices

Hand-held or portable carried-in devices require that two completely different situations have to be considered, namely, portable devices wirelessly tethered with the vehicle system and portable devices used in hand-held mode.

The ideal means of addressing inappropriate use of hand-held/portable devices in the vehicle is to have such devices automatically paired/tethered to the vehicle's integrated systems when they are brought into the vehicle. All stakeholders, (manufacturers of hand-held/portable devices, vehicle manufacturers, operating system suppliers as well as app developers and service providers) are encouraged to continue collaborative efforts through forums such as Car Connectivity Consortium (i.e., MirrorLink)[9] and others to develop the necessary standardized communication and HMI protocols and to define and assign the responsibilities of each stakeholder in order to bring about such automatic pairing.

[9] http://www.mirrorlink.com/

Because many vehicles on the road today do not have the ability to pair/tether hand-held/portable devices to the vehicles integrated systems, OICA recommends that all hand-held/portable electronic devices that will likely be brought into a vehicle for operation by a driver should also be equipped with an automatic car mode. This car mode would limit the driver's interaction with the device so that the device would provide the same levels of HMI performance as specified by that region's HMI guidelines for in-vehicle integrated systems when engaged. If such performance cannot be achieved, the hand-held device should automatically preclude visual-manual interactions while the vehicle is in motion.

While robust technical solutions to automatically determine that the device is being operated by a driver have not yet been developed, if and when such device based functionality becomes available, it should be utilized to automatically select driver mode functionality when used by the driver and permit full functionality for use by vehicle passengers or when the vehicle is not in motion.

Conclusion

- Vehicle manufacturers have long recognized the importance of supporting the driver's ability to maintain proper awareness of the driving situation.
- In the US, vehicle manufacturers effectively addressed this issue through the Alliance Guidelines well in advance of government guidance.
- OICA members have worked to develop and adhere to regionally appropriate distraction guidelines for integrated systems.
- In the ten year period following the release and wide-spread voluntary adoption of the Alliance Voluntary Guidelines by the automotive manufacturing industry in the United States, the level of police-reported crashes coded for involvement of an integrated device/control has remained stable at a very low crash rate (0.5% of all police-reported crashes)
- The overly restrictive NHTSA guidelines for integrated vehicle systems are expected to push drivers toward the use of nomadic devices and thus reduce driving safety. This concern is elevated when there are no parallel guidelines addressing the far more significant distraction threat, namely, driver use of hand-held devices.
- OICA recommends that countries wishing to adopt distraction guidelines should follow one of the existing guidelines, namely, Japanese (JAMA)/ United States (Alliance)/European (ESoP) guidelines, in order to avoid unnecessary divergence among individual countries.

While OICA endorses all of the guidelines mentioned above, it should be noted that the ESoP guidelines provide relatively general guiding principles, which are independent of infrastructure and cultural characteristics. Implementing ESoP would be an option if it would be difficult to determine numeric criteria such as total glance time or number of letters in consideration of traffic conditions or cultural situation.

- OICA supports efforts by both hand-held/portable device and OEM vehicle manufacturers to develop and implement necessary communication and HMI protocols for automatic pairing/tethering of hand-held/portable devices to vehicle integrated systems.
- OICA recommends that hand-held/portable device manufacturers develop and implement automatic driver modes that meet or exceed the regionally appropriate in-vehicle HMI guidelines (this can include automatic temporary disablement of visual-manual interaction with the device while the vehicle is in motion).

Item	JAMA	EU	Alliance	NHTSA
Scope	Display systems that are installed in vehicles, including large trucks and buses but excluding motorcycles	In-vehicle information and communication systems intended for use by the driver while the vehicle is in motion, e.g. navigation systems, mobile phones and traffic and travel information systems (TTI). Exempted: voice controlled systems, vehicle stability systems etc.	Navigation, Phoning, Messaging and Interactive Information. Exempted systems: Collision Warning and Vehicle Controls Systems, AM/FM/Satellite radio, CD/MP3, Vehicle Information Center and 'conventional' controls/displays (HVAC, Speedo, Gauges)	Human-machine interfaces of electronic devices used for performing all non-driving-related tasks as well as for performing some driving-related tasks.
Display Monitor Location	Within the 30 deg. inclination range for passenger cars. Other requirements for large trucks and buses.	No obstruction to – the driver's view of the road scene. – vehicle controls and displays required for the primary driving task. Visual displays should – be positioned as close as practicable to the driver's normal line of sight – be designed and installed to avoid glare and reflections	2D Downvison angle < 30 degrees 3D Downvision angle < Calculated MAX	2D Downvison angle < 30 degrees 3D Downvision angle < Calculated MAX
Displaying Images	Internationally standardized readability, audibility, icons, symbols, letters, abbreviations, and others are desirable	Visually displayed information presented at any one time by the system should be designed such that the driver assimilate the relevant information with a few brief glances. Internationally and/or nationally agreed standards relating to legibility, audibility, icons, symbols, words, acronyms and/or abbreviations should be used	Internationally agreed standards or recognized industry practice (legibility, icons, symbols, words acronyms or abbreviations)	Video: forbidden, except when in accordance with an existing FMVSS, and driving assistance when maneuver in which the vehicle's transmission is in reverse gear Image: forbidden displaying non-video graphical or photographic images.

Item	JAMA	EU	Alliance	NHTSA
Map Display	Prohibit displaying minor roads on scale	Should respect the main general principles: – designed such that the driver is able assimilate the relevant information with brief glances – limited in number and restricted to the relevant information (i.e. sought by the driver to satisfy a particular need)	Final recommendation still under investigation by the vehicle manufacturers. Temporary recommendations: – Alternative A: single glance duration < 2sec – Alternative B: Influence of glance < that of scientifically-accepted reference in terms of lateral position control and following headway.	Visual presentation of dynamic map and/or location info is permitted assuming compliance to all other recommendations of these Guidelines. However, the display of informational detail not critical to navigation, such as photorealistic images, satellite images, or 3D images is not recommended.
Displaying Letters	Prohibits displaying 31 or more letters (e.g., kanji, kana, and alphabets) of dynamic information Prohibits the scrolling of letters	While the vehicle is in motion, visual information not related to driving that is likely to distract the driver significantly should be automatically disabled, or presented in such a way that the driver cannot see it.	Visual information not related to driving (e.g. … automatically-scrolling text) should be disabled while the vehicle is in motion	To be avoided: – Manual Text Entry for the purpose of text-based messaging, browsing – horizontally or vertically automatically Scrolling – Presentation of books, periodical publications, web page content, social media content, text-based advertising and messages Limited amount of other types of text is acceptable.

Item	JAMA	EU	Alliance	NHTSA
Response Time	– Not applicable	– Information with higher safety relevance should be given higher priority. – Information relevant to the driving task should be accurate and provided in a timely manner. – The system's response following driver input should be timely and clearly perceptible.	Timely & clearly perceptible (250 msec)	– Response input should be timely and clearly perceptible. – The maximum device response time should not exceed 250 msec – If device response time > 2 sec, then clearly perceptible indication
Evaluation Method	Total glance time shall not exceed 8 sec. Total of shutter opening time shall not exceed 7.5 sec. in the occlusion method	Visually displayed information presented at any one time by the system should be designed such that the driver is able to assimilate the relevant information with brief glances.	– Mean Glance Duration < 2.0 seconds – Total Eyes-on-Display < 20 sec, *OR* – Total Shutter Open Time (TSOT) < 15 seconds (1.5 s open / 1.0 s closed) – Lane Position Control (# Lane Exceedances) – Following Headway (Variability)	– 85% of individual glance durations < 2.0 sec – Mean glance duration < 2.0 sec – cumulative time spent glancing away from the roadway ≤ 12.0 seconds TSOT < 12.0 seconds (1.5 s open / 1.5 s closed)