

ITS In-Vehicle Message Priority

Foreword—There is a concern that multiple intelligent transportation systems may overburden drivers with information, and may present (i.e., display) messages that compete for drivers' attention. At times, multiple in-vehicle messages are presented/displayed in close temporal and spatial proximity while in-transit. The objective of the ITS in-vehicle message priority recommended practice is to help insure the orderly presentation of ITS information to the driver, considering both temporal and spatial restraints. Establishing an ITS in-vehicle message priority standard is an important step in the development of guidelines for man-machine interface (MMI) systems integration and the improvement of driving safety. Related work is being conducted by the International Standards Organization (ISO).

A critical decision associated with the design of intelligent transportation systems is the criteria used for prioritizing ITS messages. Multiple ITS messages that are displayed simultaneously while in-transit can overload drivers' information processing resources, resulting in decreased driving performance. Conversely, systems will not be acceptable or usable by drivers unless critical messages and information are presented in a timely manner. Message prioritization will provide the basis for selecting which set of simultaneously displayed messages, competing for the same display time and/or space, should be presented to the driver.

1. Scope—This SAE Recommended Practice applies to both Original Equipment Manufacturer (OEM) and aftermarket ITS message-generating systems for passenger vehicles and heavy trucks. The recommended practice describes the method for prioritizing ITS in-vehicle messages and/or displayed information based on a defined set of criteria. Each criterion has a fixed number of levels that are used to rate/rank a given message or information item to determine its prioritization value. The prioritization value is used to determine the priority in which simultaneous, or overlapping, in-vehicle messages are presented to the driver.

2. References

2.1 Related Publications—The following publication is provided for information purposes only and is not a required part of this specification.

2.1.1 ISO PUBLICATIONS—Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002.

ISO CD 16951—Road vehicles—Ergonomic aspects of transport information and control systems—
Procedures for determining priority of on board messages presented to drivers

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3. Definitions

3.1 Message Priority—Order of presentation for two or more in-vehicle information items.

3.2 Information Item—Displayed message and/or auditory signal that is presented by in-vehicle systems. Note: May represent operating conditions, alarms, commands, or supplemental data for decision-making.

3.3 Chunk or Unit—Smallest useful piece of information that can stand alone in both meaning and context.

3.4 The Information Item Filter—Process to determine if an information item is suitable for prioritization (Figure 1).

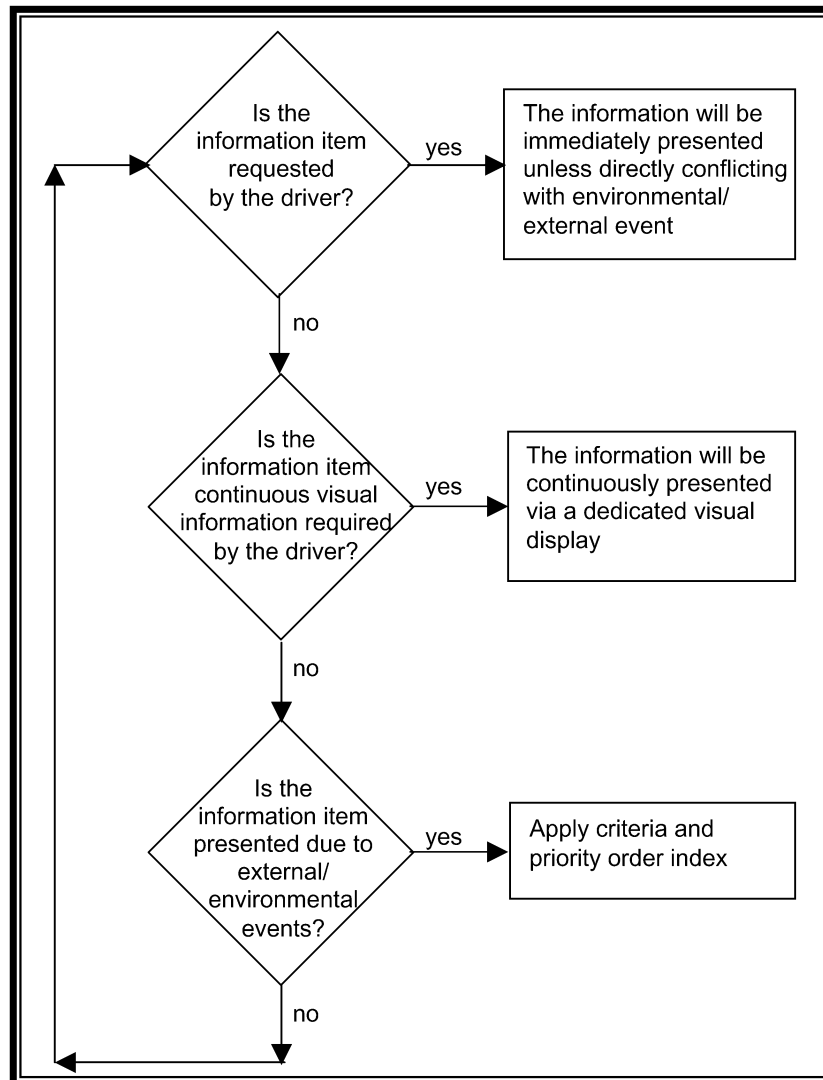


FIGURE 1—INFORMATION ITEM FILTER

3.5 Prioritization Criteria—Dimensions along which in-vehicle information items are evaluated (Table 1).**TABLE 1—PRIORITIZATION CRITERIA**

Criteria	Levels
Safety Relevance: The degree to which the information affects the safe operation of the vehicle.	Directly Relevant: The information item contains direct safety information. Direct information includes any item that has as its primary purpose communication of information that is designed to reduce the likelihood that the driver/vehicle and/or other driver/vehicle and/or pedestrian will be injured/damaged. For example, a message relaying an imminent collision notification or accident ahead warning. Indirectly/Somewhat Relevant: The information is not directly safety relevant as defined above. However, the information, if processed and responded to by the driver, may reduce crash risk by reducing error or exposure. For example, a suggested navigation route that reduces travel time/distance, or a navigation information item that will likely reduce driver navigation error such as the distance to the next turn. Not Relevant: The information item is neither directly nor indirectly safety relevant as defined above. No known change in crash risk due to the presence of safety information, a change in exposure or a change in safety-related driver error will be realized due to the presence of the information. For example, a driving convenience feature such as an incoming call indicator on a cellular phone.
Operational Relevance: The degree to which the information increases the ease and convenience of the driving task, for example, by decreasing travel time and the stress associated with driving.	Highly Relevant: Information that, if not received, will cause the driver inconvenience/expense such as delay, error or vehicle damage. For example, notification of an incident ahead resulting in traffic delay, or an engine temperature warning. Moderately Relevant: Information that is not highly relevant, as defined above. Information that may improve the ease and convenience of the driving task, but will not likely result in inconvenience or expense to the driver if not present. For example, the distance to the destination on a navigation system or the price of a toll ahead. Little or No Relevance/Insignificant: Information that will not impact the ease and convenience of the driving task. For example, a mobile internet feature or the "stereo" indicator on an entertainment system.
Time Frame: The degree to which the information is time sensitive, that is, the immediacy with which the information is required.	Emergency: 0-3 s Immediate: 3-10 s Near Term: 10-20 s Preparatory: 20-120 s Discretionary: >120 s