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Strategies for Reducing Driver Distraction from In-Vehicle Telematics Devices: Report on Industry and Public Consultations

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<p>16. Abstract</p> <p>“In-Vehicle Telematics” refers to devices incorporating wireless communications technologies to provide information services, vehicle automation and other functions to drivers. Transport Canada is concerned that in-vehicle telematics devices are a threat to road safety because they can increase driver distraction and cause an increase in distraction-related crashes. This concern is based on a substantial and mounting body of evidence indicating that using these devices impairs driving performance.</p> <p>In the spring/summer of 2003, Transport Canada engaged vehicle manufacturers, industry associations, the provinces and territories and the general public in consultations that explored the issue and the potential response/role of the federal government. Public awareness and education campaigns regarding distracted driving were strongly supported by all, and most were in agreement that a non-regulatory approach to limit driver distraction caused by in-vehicle telematics by Transport Canada should also be initiated.</p> <p>Transport Canada is currently negotiating an agreement known as a memorandum of understanding (MOU) with automotive manufacturers, which would deal with the safety of in-vehicle telematics devices. The two main elements of this agreement would be commitments by industry to a) incorporate a safety design and development process, and b) adhere to industry-developed performance guidelines, in telematics’ device design and development. The MOU would address safety concerns, be adaptive to continued technological advancement, and not burden the industry unnecessarily.</p> <p>This document summarizes results from the consultations and describes the initiatives underway at Transport Canada to address driver distraction from in-vehicle telematics devices.</p>					
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16. Résumé <p>Le terme « télématique de bord » renvoie aux dispositifs intégrant des technologies de communication sans fil qui permettent d'offrir aux conducteurs des services d'information, l'automatisation des véhicules et d'autres fonctions. Transports Canada est d'avis que les dispositifs télématiques de bord représentent un danger pour la sécurité routière car ils augmentent le risque de distraction des conducteurs et le nombre de collisions attribuables à la distraction. La position de TC est fondée sur un ensemble de preuves considérable et croissant qui indiquent que l'utilisation de ces dispositifs nuit à la conduite automobile.</p> <p>Au printemps / à l'été 2003, Transports Canada a entrepris des consultations auprès des constructeurs automobiles, des associations de l'industrie, des provinces et territoires et du public en général dans le but d'examiner la question ainsi que la réponse et le rôle potentiel du gouvernement fédéral. Les campagnes de sensibilisation du public contre les dangers de la distraction des conducteurs réunissaient le ferme appui de toutes les parties, qui convenaient pour la plupart qu'une approche non réglementaire pour réduire la distraction des conducteurs causée par les dispositifs télématiques de bord doit être initiée par Transports Canada.</p> <p>Transports Canada négocie actuellement un protocole d'entente (PE) avec les constructeurs d'automobiles, qui traitera des questions relatives à la sécurité des dispositifs télématiques de bord. Les deux principaux éléments de cette entente consisteront en des engagements pris par l'industrie a) à incorporer un processus de conception et d'élaboration du dispositif pour tenir compte des aspects liés à la sécurité et b) à se conformer à des lignes directrices en matière de performance élaborées par l'industrie, relativement à la conception et à l'élaboration de dispositifs télématiques. Le PE traitera des inquiétudes en matière de sécurité, s'adaptera à l'avancement continu de la technologie et ce, sans causer un fardeau supplémentaire à l'industrie.</p> <p>Le présent document renferme une compilation des résultats des consultations et décrit les initiatives entreprises actuellement à Transports Canada pour résoudre la question de la distraction des conducteurs causée par les dispositifs télématiques de bord.</p>					
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Executive Summary

“In-Vehicle Telematics” refers to devices incorporating wireless communications technologies to provide information services, vehicle automation and other functions to drivers. Transport Canada is concerned that in-vehicle telematics devices are a threat to road safety because they can increase driver distraction and cause an increase in distraction-related crashes. This concern is based on a substantial and mounting body of evidence indicating that using these devices impairs driving performance.

While cellular telephones are currently the most common type of telematics devices used in vehicles, other technologies and applications, such as navigation, adaptive cruise control and Internet access, are increasingly entering the market. It is expected that these devices will become standard features in vehicles in the near future. While provincial and territorial governments are responsible for regulations pertaining to the safe operation of vehicles, including the use of aftermarket equipment, many telematics devices will be offered as original vehicle equipment and, as such, potentially be subject to the federally administered Canadian Motor Vehicle Safety Act.

The issue has warranted urgent and close scrutiny, as many telematics devices are in intensive development. In the spring/summer of 2003, Transport Canada engaged vehicle manufacturers, industry associations, the provinces and territories and the general public in consultations that explored the issue and the potential response/role of the federal government. All parties agreed that driver distraction from these devices was an issue; however, they also agreed that it is inappropriate to regulate products themselves, as there are currently no established test procedures or safety criteria. Public awareness and education campaigns regarding distracted driving were strongly supported by all, and most were in agreement that a non-regulatory approach to limit driver distraction caused by in-vehicle telematics by Transport Canada should also be initiated.

The government of Canada’s “Smart Regulation” initiative is intended to modernize the regulatory system while supporting innovation and economic growth. By promoting the use of innovative consultative mechanisms and alternative regulatory instruments, Smart Regulation attempts to maximize the benefits of regulation in a manner that reflects the pace at which new knowledge develops, consumer needs evolve and business now operates.

With that in mind, Transport Canada is currently negotiating an agreement known as a memorandum of understanding (MOU) with automotive manufacturers, which would deal with the safety of in-vehicle telematics devices. The two main elements of this agreement would be commitments by industry to a) incorporate a safety design and development process, and b) adhere to industry-developed performance guidelines, in telematics’ device design and development. The recommended safety design and development process would outline general human factors principles and process elements that a company should follow to ensure that driver performance is considered during product design, development and testing. The performance guidelines would specify quantifiable criteria regarding physical device design, location, and performance. The MOU would address safety concerns, be adaptive to continued technological advancement, and not burden the industry unnecessarily.

This document summarizes results from the consultations and describes the initiatives underway at Transport Canada to address driver distraction from in-vehicle telematics devices.

1. Introduction

New electronic devices, known as “telematics,” are becoming more common in vehicles. Through a combination of computing, communications and sensor technologies, telematics offer drivers many new functions. While these technologies may assist drivers and increase productivity, they may also distract them and increase the risk of collision. Transport Canada (TC) is concerned that some telematics devices may be a threat to road safety, and that current efforts by industry may not adequately limit their potential to distract drivers.

In the summer of 2003, the Standards Research and Development Branch of TC’s Road Safety and Motor Vehicle Regulation Directorate began a consultation process with automotive telematics industry stakeholders and the Canadian public regarding the issue of driver distraction from in-vehicle telematics devices. The objectives of this consultation were to obtain detailed information regarding what industry is doing and/or planning to do to limit driver distraction from these devices and to understand what federal interventions are feasible, appropriate, and expected by Canadians.

Industry consultations began with the publication of a TC discussion document on driver distraction from in-vehicle telematics devices in Part 1 of the Canada Gazette (TP 14133, 2003). The discussion document was also distributed to stakeholders, and made available to other industry and the public via TC’s Road Safety website. In addition, a stakeholder workshop was held to further discuss the problem of driver distraction, and to explore various potential solutions.

Concurrently with industry consultations, TC used a ‘deliberative democracy’ methodology to explore public opinion regarding driver distraction from telematics devices and possible solutions. Sixty Canadians chosen from an initial survey sample of over 1500 participated in in-depth focus groups, allowing TC to better understand the public perception regarding in-vehicle telematics, and what the public sees as the most effective type(s) of potential government intervention.

This report is divided into three sections. The first presents background information, while the second and third describe the consultations with industry and the Canadian public, respectively. For a more complete description of the issues prompting these consultations, the reader is referred to the document “Strategies for Reducing Driver Distraction from In-Vehicle Telematics Devices” (TP14133, 2003).

2. Background

2.1. Definition of ‘Telematics’

While cellular phones are currently the most common type of telematics device used in vehicles, other telematics technologies and applications are entering the automotive market. In-vehicle telematics is a general class of device that features information- and computer-based technologies. Within the category of in-vehicle telematics, a distinction is made between technologies intended to increase driver productivity or support information and entertainment demands (infotainment systems) and technologies intended to support the driver in the performance of the driving task (driver assistance

systems). While infotainment systems include navigation systems and a variety of telecommunications devices and services that deliver information and entertainment to drivers (e.g., email, Internet access, and location-based information such as gas stations, restaurants, traffic and weather), driver assistance systems include collision warning, adaptive cruise control, lane departure warning, lane change aides, and parking aides. The distinction between infotainment and assistance systems is becoming increasingly blurred, as telematics functions grow more and more interrelated. One issue that arose during the consultations related to the definition of “telematics device” and how this definition could affect the outcome of the consultations. While distraction is often cited as a criticism of infotainment systems, the potential for distraction from driver assistance systems is no less important. However, it remains an issue whether these two types of systems should be subject to the same government initiatives intended to limit driver distraction.

2.2. Description of Discussion Document

The discussion document, entitled “Strategies for Reducing Driver Distraction from In-Vehicle Telematics Devices” (<http://www.tc.gc.ca/roadsafety/tp/tp14133/en/menu.htm>), was prepared by the Standards Research and Development Branch of the Road Safety Directorate. It outlined TC’s concerns with driver distraction from in-vehicle telematics devices, and presented various potential solutions for dealing with the issue. Non-regulatory options included public awareness initiatives and/or a Memorandum of Understanding (MOU) or advisory between government and industry concerning appropriate design guidelines and/or design processes to be implemented by manufacturers. Possible regulatory initiatives included standards that limit the access of drivers to certain device functions, impose limits on the amount of visual distraction, or prohibit certain features of telematics devices (e.g., open architectures) that would allow the use of untested, after-market applications.

The discussion document was published in the Canada Gazette (TP 14133, 2003) and distributed to a variety of industry stakeholders who were invited to provide comments. These comments are summarized in Section 3 of this report.

2.3. Goal of Consultations

The main goal of the consultations was to solicit feedback regarding various potential initiatives that would limit driver distraction from in-vehicle telematics devices. TC invited industry, the provinces and territories, road safety interest groups and the public to comment on potential initiatives and to provide feedback on alternative approaches for reducing driver distraction. The information obtained from the responses to the discussion document and follow-up consultations was expected to help TC understand the need for, and characteristics of, potential government intervention, helping to identify the most suitable and effective initiative.

3. Stakeholder Consultations

The objectives of these consultations were to obtain detailed information on what the industry is currently doing and/or planning with respect to driver distraction from in-vehicle telematics devices, and to understand what federal interventions may be feasible

and appropriate. The discussion document was published in Part 1 of the Canada Gazette and made available via the Road Safety Directorate's web site in June 2003. At the same time, it was distributed to 19 government, industry, public safety, and international stakeholders including the provincial and territorial ministries of transportation, the Association of International Automobile Manufacturers of Canada (AIAMC), the Canadian Vehicle Manufacturers' Association (CVMA), the Canadian Council of Motor Transport Administrators (CCMTA), the Alliance of Automobile Manufacturers (AAM) and numerous non-governmental organizations. Concluding each of 10 sections in the document was a specific question relating to the preceding material. Interested parties were asked to provide general comments and/or specific responses to the questions by September 2003. An invitation was also extended to attend a telematics discussion workshop hosted by TC in October 2003.

TC received 16 written responses to the discussion document ranging in length from one paragraph to 22 pages. Respondents included industry associations, transit associations, small businesses and consultants, other governmental jurisdictions and a driver advocacy group. While it is recognized that the comments received may not capture the views of all stakeholders, they are believed to represent those of the most active and involved.

Respondents to Discussion Document:

Alberta Transportation	Association of International Automobile Manufacturers of Canada (AIAMC)
Automotive Multimedia Interface Collaboration (AMI-C)	Applied Computer Technologies, Inc. (Applikompt)
ATX Technologies	German Federal Highway Research Institute (BAST)
Canadian Trucking Alliance (CTA)	Canadian Automobile Association (CAA)
Canadian Urban Transit Association (CUTA)	Canadian Vehicle Manufacturers Association (CVMA)
Canadian Wireless Telecommunications Association (CWTA)	Ontario Community Transportation Association (OCTA)
Ontario Ministry of Transportation (MTO)	Robert H. Lane and Associates, Inc.
La Société de l'assurance automobile du Québec (SAAQ)	Truck Manufacturers Association (TMA)

All respondents agreed that driver distraction of all kinds is a concern. Most agreed that a public awareness or education campaign addressing the issue of driver distraction from in-vehicle telematics devices would be of great value, as would a non-regulatory, voluntary agreement by industry to address the issue. While there were many common opinions expressed by the respondents, there was limited consensus on the proposed solutions, particularly the nature and scope of any non-regulatory initiative.

The following section summarises the written responses to each question in the Discussion Document that were received by TC.

3.1. Responses to specific questions

Question 1. Is the status quo in dealing with this problem of driver distraction sufficient? We invite industry to provide us with a detailed description of their current and planned efforts to limit this problem of driver distraction from in-vehicle telematics devices.

Nearly all respondents agreed that distraction from telematics is a problem, and that countermeasures are needed to limit the risks of distraction. There was, however, some disagreement as to whether current efforts to address this problem were sufficient. Five of the nine who provided an answer to this question thought that the *status quo* was not sufficient, while the other four thought it was. One industry group felt there was insufficient evidence of the risks of driver distraction to warrant any countermeasures. They indicated that more data are needed, and felt that education is currently the most effective means of addressing the driver distraction issue. Three respondents who indicated that the *status quo* was sufficient explained that industry was making a “dynamic” effort to solve the problem of driver distraction. These respondents provided some details on their efforts to address the problem: the use of voice recognition and activation technologies and other technology designed to assist drivers, such as workload managers and warning systems; driver distraction research efforts; research on the effectiveness of educational campaigns and on provincial efforts to ban cell-phone use.

Question 2. Should a public awareness campaign be initiated to warn people of the dangers of driver distraction from telematics devices?

All seven respondents to this question supported the need for a public awareness campaign related to driver distraction. Two industry groups and one provincial transportation department indicated that they had been active with public safety campaigns on driver distraction; however, no campaigns directly concerned distraction from telematics devices. Most respondents felt that any public awareness campaign should include information on driver distraction in general, and not be limited to distraction from telematics devices. One respondent cautioned that the benefits of such a campaign would first need to be weighed against the costs of its development. Another stressed that efforts to increase public awareness cannot be the only solution. They felt that guidelines, MOUs, or regulations based on proven research would have a larger impact.

Question 3. Should MOUs be negotiated to voluntarily commit the automotive industry in Canada to follow certain human factors design guidelines, provide telematics information on event data recorders (EDRs), contribute to a vehicle features database and apply a driver-system integration process when designing telematics devices?

Five of the six respondents to this question agreed that an MOU between industry and government was a suitable approach to deal with the problem of distraction from telematics devices. The other respondent, an industry association, considered any governmental initiatives to be premature at this point in time.

Most respondents who agreed that an MOU would be appropriate stressed that it should be based on clear guidelines and standards, and that it should apply to all of the automotive telematics industry, including third party suppliers, and not only original equipment manufacturers (OEMs). One automotive industry association stated that any MOU should be focused on performance-based standards that provide objective criteria. On the other hand, another industry association felt that an MOU should focus on the telematics system creation process, use of design guidelines, and adherence to testing standards.

For the question of event data recorders (EDRs), two of four respondents endorsed their use in collecting telematics information from vehicles. One industry association felt that using EDRs would be problematic for their industry, while another industry association thought that the inclusion of EDR specifications in any MOU would be likely to reduce the chances of successful implementation.

Only two respondents addressed the question of whether an MOU should require manufacturers to provide telematics information on a vehicle features database: one industry association thought it was a good idea, as it would facilitate investigations of the collision risk between vehicles fitted with telematics devices *vs.* those that are not. The other respondent, also an industry association, felt that it would not be applicable to their specific industry, where vehicles are, essentially, custom-built.

Of the five respondents who agreed with the notion of an MOU, only two mentioned the prospect of applying a driver-system integration process during product design as a method to limit distraction from telematics devices. One industry association felt that the implementation of a process whereby the “key process elements that a manufacturer would incorporate during system design and development to address safety and driver-system integration considerations would be identified” was a good idea. The other respondent (also an industry association) felt that it was not a good idea, and that performance-based standards that provide objective criteria would be a better alternative.

Question 4. Should an advisory be issued to industry stating the need to follow strict safety guidelines and a driver-system integration process when designing telematics devices?

Three of the six respondents to this question thought that an advisory might be a good method to address the distraction issue. A driver advocacy group felt that, while an advisory may be useful from a policy standpoint, it should be developed in conjunction with appropriate industry standards and guidelines. A provincial transportation department stated that an official advisory from TC might be a good ‘starting point’, but they encouraged TC to undertake other methods as well. An industry association thought an advisory (to both OEM and third-party suppliers) would be advantageous, as it might help to raise awareness of the driver distraction issue in their member companies’ decision-making departments (for example, in marketing and senior management). They recommended that it contain estimates of typical cost and timelines for product development programs that use a driver-system integration process, as a way of “benchmarking” credible processes.

Of the three respondents who did not feel that an advisory should be issued, one industry association thought that it would be redundant, as they felt the automotive industry already follows strict safety guidelines and internal design and product development processes. Another respondent felt that an MOU would be sufficient in dealing with these issues. Finally, another industry association felt that an advisory would not be effective, as it would affect only OEM equipment.

Question 5. Should a regulation be made requiring manufacturers to follow a human factors process standard for designing telematics devices?

Only one of seven respondents, a driver advocacy group, felt that TC, “through a Canadian research organization”, should develop and refine appropriate regulation for human process standards.

Of those who did not think a regulation should be made, one foreign transportation department asked industry if they were in compliance with the European code of practice for telematics (EU Statement of Principles on human machine interface, 1999) and concluded that the principles “should retain their recommendation character” and not take the form of a regulation. Two other respondents thought that any kind of regulation on this matter would stifle innovation in the industry, and would have limited scope (as it would affect only OEM manufacturers).

Only three respondents directly answered the question of whether a regulation *requiring manufacturers to follow a human factors process standard* should be made. One industry association stated that their industry does not believe in process-based standards as a regulatory tool (see answer to Question #3). This respondent perceived that, due to proprietary, internal, process-based systems already in place in many companies, the development of an external, process-based system for telematics design that allows all manufacturers an equal opportunity to develop competitive advantages would be very difficult. They thought that a process-based standard or MOU would be design restrictive, anti-competitive, and unfeasible for many companies to implement. As well, they thought that any process-based standard would be difficult to enforce, and that its implementation would have the unintended effect of increasing the number of installations of after-market devices in vehicles (as they would largely be beyond the scope of TC’s jurisdiction). A second industry association felt that this sort of regulation was unnecessary because: the industry is already very knowledgeable of human factors issues, a process-based standard would be costly to implement, and, if it was not harmonized with the U.S., such a standard would adversely affect the Canadian market. A third industry association pointed out that developing a “one size fits all” regulatory certification mandate would be difficult, as product creation processes vary widely among manufacturers. Like the others, they expressed concern that, if small automotive companies could not meet the criteria of a design process standard (due to limited resources), product installations would be pushed to aftermarket products, with less desirable results.

Question 6. Should a regulation be made requiring telematics devices to be automatically disabled when a vehicle is moving?

Two of six respondents to this question felt that TC should investigate the possibility of implementing a regulation that disables certain device functions to the driver; however, only after conclusive research has been done. A driver advocacy organization and a provincial transportation department both stressed that TC should continue to work with industry to “determine solutions that will maintain and improve road safety” while not stifling innovation and creating unnecessary rules.

The other four respondents to this question felt that this kind of regulation would impose unnecessary feature limits without consideration of their potential benefits. One industry association argued that the Alliance of Automobile Manufacturers’ (AAM) “Guidelines for Limiting Driver Distraction from In-Vehicle Telematics Devices”, which industry has reportedly been following since April 2002, already provide for limiting access by the driver to certain functions when the vehicle is in motion if they do not meet objective criteria. Another industry association felt that design standards, guidelines and “product creation” MOUs that define driver distraction limits would be a better approach, and that safety is better addressed on an individual product concept level. Another industry association questioned the practicality of such a restriction, and pointed out that passengers should be able to use in-vehicle telematics devices, which would be unlikely to affect driver distraction. They further cautioned TC “not to consider proposals that would contravene other federal departments policy statements, such as that from Industry Canada announcing that it no longer authorizes the use of jamming devices, which are capable of interfering with, or blocking cellular, radio and personal communications services”.

Question 7. Should a regulation be made requiring manufacturers to follow JAMA guidelines?

The same two of six respondents from Question #5 also encouraged TC to investigate the possibility of having manufacturers follow the Japanese Automobile Manufacturers’ Association (JAMA) guidelines. However, they also cautioned TC to first evaluate the guidelines’ effectiveness, as well as investigate other jurisdictions that have implemented similar guidelines.

The other four respondents to this question felt that the JAMA guidelines reflect the unique characteristics of the Japanese culture and driving situation, and that they may be too narrow, or limiting, if made into mandatory requirements. The kinds of limitations imposed by the JAMA guidelines (e.g., limitations on moving pictures, scrolling displays, and quantity of display characters) were seen by some industry associations as able to quickly become outdated, and could prevent the development of technological enhancements, such as text-to-speech and speech recognition, that might actually increase traffic safety and convenience. Further, the use of telematics devices by passengers would be limited by such guidelines as well. Finally, although not supportive of these guidelines as a framework for a regulation, one industry association did welcome their possible use as official design guidelines or as the basis of an MOU.

Question 8. Should manufacturers be required to limit the total glance time away from the road and maximum glance duration for in-vehicle tasks?

None of the five respondents to this question felt, at present, that limiting total glance time and/or glance duration was a good idea. One industry, and one driver advocacy, association thought that the notion of glance time and duration merited further study; however, both felt that there was insufficient information on the issue to make either a requirement. Two respondents thought that individual differences in drivers' ability would limit the usefulness of a regulation of this nature and, again, more research was recommended. The last respondent, an industry association, raised concerns that, if glance time regulations were implemented, telematics device interfaces would likely shift to the auditory modality, presenting different, unforeseen, consequences. This respondent pointed out that the quality and capacity of the auditory modality could actually lead to higher distraction levels in some cases.

QUESTION 9. SHOULD TRANSPORT CANADA MAKE A REGULATION REQUIRING MANUFACTURERS TO PROHIBIT THE USE OF OPEN ARCHITECTURES AND CONFIGURABLE INTERFACES AND SET LIMITS ON THE DESIGN AND NUMBER OF FUNCTIONS AVAILABLE THROUGH MULTIFUNCTION INTERFACES ON TELEMATICS DEVICES?

None of the seven respondents to this question thought that TC should prohibit or limit these elements of telematics devices. One industry association stressed that the interest of safety would be best served by "placing responsibility for controlling human-machine interfaces (HMI) with the automakers", and not by simply banning open architecture devices altogether. Similarly, another industry association cautioned that prohibiting the use of open architectures and configurable interfaces "would prevent the safety benefits of such architectures and interfaces ...from entering Canada". "Sudden stop" sensors, environmental controls, weather and environment warnings, and road friction sensors were given as examples of technologies that would be subject to any regulation. A driver advocacy association recommended that, rather than open architectures, TC should focus on "consistent regulation and public education". This respondent also felt that manufacturers should be made accountable for their role in educating users on the safe and proper use of their products.

An industry association stressed that manufacturers require the freedom to incorporate appropriate interfaces with their products. If not, consumers may carry aftermarket products in the vehicle, further compounding the problem of driver distraction. This respondent felt that, if they follow the AAM guideline document, manufacturers would control the design and functions available in their in-vehicle telematics devices. Another industry association preferred to have this issue addressed in an MOU, and disagreed with the concept because it would, in their opinion, limit the development and integration between manufacturers, integrators and users. Finally, another industry association felt that banning open architecture systems would be overly restrictive, and that, "given the voluntary use of proper driver-system integration design process, adherence to ergonomic guidelines, and test/validation standards, an open architecture system could have many benefits in reducing distraction". This respondent described a hypothetical user interface standard that would control driver distraction. This common interface could "allow uniformity across OEM platforms, thereby reducing the distraction issues associated with novelty and training aspects". This respondent also pointed out that, by banning

configurable interfaces, integrated telematics systems could easily become overly “feature rich”, making their navigation and use challenging. A configurable system could allow a user to choose a limited set of features, or change screen format and font size, simplifying the navigation task.

Question 10. Are there any suggestions for other regulatory initiatives, including provincial/territorial restrictions on driver behaviour, or non-regulatory initiatives that could be explored to limit the risk of collisions caused by driver distraction from telematics devices?

Regulatory initiatives: There were no suggestions from any of the respondents regarding possible regulatory initiatives, including provincial/territorial restrictions on driver behaviour. One industry association felt that legislating a particular distraction is not in the public’s best interest, and unlikely to increase road safety. They believed that current provincial and territorial Highway Traffic Acts already allow police to charge drivers who are not driving with due care and attention.

Non-regulatory initiatives: In their responses to previous questions, most respondents recognized the need for public awareness campaigns and driver education. In response to this question, a driver advocacy group underscored the need to educate new drivers on the issue of driver distraction. This organization would like to see provincial and territorial authorities include a section on distracted driving in their educational curricula and in their driver’s license manuals.

Most respondents pointed out the need for more research into the issue of driver distraction. A telematics company suggested that TC look more closely at collision reports to investigate the risk of telematics. The same company also suggested that a Technical Advisory Group be appointed to advise TC on applications (such as voice recognition) that may mitigate distraction risk. An industry association added that it would be beneficial to study the risk of telematics in other applications, such as public transit.

Another industry association stressed that manufacturers are already dedicated to ensuring driver distraction from in-vehicle devices is minimized. The development and ongoing refinement of the AAM’s statement of principles is intended, by industry, to ensure that all telematics devices, both OEM and aftermarket, are installed and implemented in a safe manner. AAM member companies have, as of April 2002, voluntarily agreed to abide by these guidelines in their design process.

Another industry association urged more cross-OEM collaboration in support of non-regulatory solutions to the product design and development process. They encouraged OEMs and suppliers to come together to work through the research topics needed to strengthen the currently available design guidelines and standards, rather than pursuing regulatory solutions.

Finally, a provincial transportation department urged TC to develop an “integrated framework for considering countermeasures in combinations in addition to looking at

each initiative in isolation”. They further suggested that experiences with countermeasures in other jurisdictions be evaluated.

Other Comments

There were several points that were repeated by more than one respondent. First, several industry associations and a driver advocacy association thought TC should broaden their consultation to include all forms of driver distraction, and not limit it to distraction from telematics devices. Two respondents also requested a change to TC’s definition of “telematics”. A telematics manufacturer thought a distinction should be made between wireless telecommunications devices, aftermarket electronics devices, in-vehicle entertainment and audio systems, in-vehicle navigation systems, and traditional embedded telematics systems. This respondent felt that this distinction would be critical because each subgroup not only carries varying degrees of potential distraction, but varying degrees of mitigating safety benefits to drivers. An industry association pointed out that the definition of “telematics”, as applied by the industry, refers to devices or features that incorporate the use of driver/occupant-mediated (as opposed to vehicle/device-mediated), off-board communications technology. Using this definition, “cell phones, navigation and internet access are telematic devices, but adaptive cruise control, other advanced driver assistance systems (ADAS; e.g., warning/avoidance systems for lane departure, frontal collision, back-up, etc.), DVD players and, usually, such dedicated interactive features such as automatic toll collection and remote diagnostics, are not considered telematic devices”.

All respondents supported public education and driver education regarding not only distraction from in-vehicle telematics devices, but in all forms.

A driver advocacy organization expressed concern that any public policy initiatives would require more than just voluntary industry initiatives to be effective. At the same time, and unlike some other respondents, an industry association expressed a preference for a process-oriented, MOU approach that does not set out performance requirements for the end product. This respondent felt that this option would better support flexibility in design and would not inhibit innovation.

Another point raised by several respondents was that the discussion document failed to acknowledge the safety benefits of some telematics devices, nor did it discuss the manner in which telematics might benefit the Canadian economy, through reduced energy use and increased productivity.

Finally, two respondents, both from industry, thought that more collaborative research should be done between TC and major stakeholders such as the CAA, CVMA, and CWTA, looking at the comparative risk across a diverse range of devices.

3.2. Stakeholders’ Workshop

A stakeholders’ workshop was held in October 2003, the goal of which was to provide an opportunity for three-way discussion among industry, the provinces and territories, and Transport Canada, on the issues raised in the discussion document. TC presented results

and comments from the stakeholder and public consultations, and participants had an opportunity to present their own positions. There were 41 attendees, including 26 from the automotive and telecommunications industries, eight from provincial transportation departments, six from Transport Canada, and one from a driver advocacy group. Several issues were identified during the workshop as needing clarification. The first was the definition of “telematics”, and how that would shape any potential regulatory initiatives. Most industry stakeholders were of the opinion that, for the purposes of the consultation and any resultant restrictions or guidelines, the term “telematics” should not refer to advanced driver assistance systems (ADAS), such as collision and lane departure warning systems, but should include devices that use driver- or occupant-mediated, off-board communications technology. The inclusion of in-vehicle entertainment systems, such as DVD players and audio systems, was also suggested.

An issue of central importance to most attendees was how to deal with aftermarket telematics devices. Whatever the form of the chosen initiative, those present agreed that any guidelines and standards should apply equally to OEM and aftermarket devices. The concept of a human factors design process was further explained, as written feedback from stakeholders indicated some initial misunderstanding of this term.

3.3. Meetings with Industry Stakeholders

In addition to the stakeholders’ workshop, TC met privately with several OEM companies after the workshop to discuss, in general terms, the concept of ‘human factors design process’, and its potential as subject of a standard or MOU. As well, the manufacturers each presented their respective company’s current design process for telematics equipment, detailing the steps taken to ensure that human factors principles were being considered during the design phase.

TC now believes that any confusion regarding the concept of a design process standard has been resolved. Initially, manufacturers had expressed concern that a company’s proprietary design processes would be revealed when certifying to a process-oriented standard. However, it was explained that, as long as the key organizational elements of the process standard were met, there would be no need to disclose proprietary trade information. A manufacturer would merely need to provide details of the steps they were taking to meet the various elements of the standard.

In addition to these discussions, the industry meetings allowed several manufacturers to update TC on their recent telematics-related research activities.

4. Public Consultations

The public consultations used linked quantitative and qualitative research methods to investigate public views of in-vehicle telematics devices and road safety. Specifically, the objectives were to ascertain the public’s general views on road safety and driver distraction, and to provide policy guidance to TC’s Road Safety Directorate based on the representative and considered views of the general public.

Deliberative democracy, also referred to as deliberative polling, involves recruiting a representative sample of the general public, surveying them to determine their initial

views, then bringing them together at a single location. Participants receive balanced information about an issue, question experts, and engage in group discussions before they are polled again. In this way, government obtains the views of well-informed members of the public on a given issue. While the deliberative democracy approach is sometimes referred to as a consultation in this report, it is in fact a citizen engagement exercise. Citizen engagement differs from consultation as it includes an education component and seeks to foster deliberation on the issues. Using this approach, citizens dialogue not only with government but also amongst themselves and with subject matter experts to arrive at a recommendation on how the government should proceed.

Public consultations consisted of three components: a public opinion telephone survey, focus group discussions, and a follow-up survey. The following sections describe each phase in more detail, including the most significant findings from each.

4.1. Public Opinion Survey

The first phase of the public consultations comprised a short public opinion survey that looked at attitudes towards telematics and road safety. In early May 2003, EKOS Research Associates (Ottawa, ON) conducted a telephone survey of a random sample of 1504 Canadians aged 16 years and older. The data from the survey was statistically weighted by age, gender, and region to ensure that findings were representative of the Canadian population aged 16 and over.

The purpose of this initial survey was to assist TC in the development of potential policy responses to the telematics issue. It also served as a baseline measure for data collected during the next two phases of public consultations (qualitative and post-session survey results from the deliberative democracy sessions). In addition to demographic variables, twelve questions addressed respondents' opinions regarding a variety of road safety issues.

4.1.1. Results

Most respondents (73%) drove on a daily basis, with others driving occasionally (14%), rarely (5%), or never (9%). When asked to rate the severity of various potential threats to traffic safety, 'drivers using cell phones' ranked third (with 53% of respondents rating it as a serious problem) after drunk driving (77%) and speeding (58%). The problem of 'drivers being distracted' ranked fifth (48%) after driver fatigue (50%). On the other hand, while 40% of respondents felt that the problem of drunk driving had improved over the past five years, only 3% thought that driver distraction had improved (63% felt that it had gotten worse vs. 22% for drunk driving).

Fifty per cent of respondents reported not being at all familiar with in-vehicle telematics devices, while 9% reported being 'very familiar'. This was a similar ratio to how frequently respondents used a cellular phone while driving, with 49% reporting 'never' and 6% reporting 'during most trips'. Not surprisingly, 83% of respondents agreed with the statement "collisions are the result of drivers not paying enough attention to the road"; 64% thought telematics would make vehicles more dangerous, while only 13% thought they would make vehicles safer. Forty-two per cent felt that it was the drivers

themselves who could do the most to reduce the potential dangers associated with telematics devices, followed by the vehicle manufacturers (32%) and government (23%).

With respect to legislative requirements concerning telematics devices, 49% of respondents believed that telematics devices are currently tested to ensure that they are not too distracting for the average driver. Seventy-four per cent thought that the use of handheld cell phones while driving should be banned, while fewer (47%) agreed with a ban on hands free models. Finally, 35% of respondents thought that imposing tighter restrictions on the types of devices that can be installed in vehicles would be the most effective means of combating driving dangers associated with using telematics devices while driving. Thirty-four per cent thought that laws banning drivers from using certain electronic devices would be most effective. Only 7% thought that allowing industry to develop its own code of conduct regarding telematics devices would be the most effective option.

4.2. Focus Group Discussions

The qualitative component of the public consultations comprised three deliberative focus group sessions held in Toronto, Montreal, and Calgary in August 2003. A total of 60 people, who had completed the initial telephone survey, participated (20 in each session). The groups' composition matched the larger survey population with respect to gender, age, and beliefs concerning the impact of telematics and their potential impact on road safety.

A ten-page background document that presented the issues to be discussed was provided to participants in advance of the sessions. The document was an abridged version of the Discussion Document that had been published in the Canada Gazette. It contained factual information regarding the issue of driver distraction from in-vehicle telematics, and outlined the regulatory and non-regulatory initiatives that could be used to address the issue.

Two bilingual moderators facilitated the sessions using open-ended questions to generate discussion of the key issues. A TC resource person, with expertise in automotive ergonomics, answered participants' questions. Sessions lasted approximately 3.5 to 4 hours. An overview of the session agenda is presented in Table 1.

Table 1: Session Agenda

ACTIVITY	DURATION
1. <i>Introduction</i>	15 min
2. <i>Preliminary discussion</i> – Initial views of participants	15 min
3. <i>Review and discussion of first half of the background document</i> – Review of the driver distraction issue, telematics, and development of questions	40 min
4. <i>Question session with resource person</i>	15 min
5. <i>Dinner break</i> – Participants encouraged to continue discussions	20 min
6. <i>Review and discussion of second half of the background document</i> – Participants review proposed options, weigh the pros and cons, and develop questions	70 min
7. <i>Question session with resource person</i>	15 min
8. <i>Discussion and selection of recommended options</i> – Participants decide on a preferred course of action and provide rationale	40 min
9. <i>Post-discussion survey and wrap-up</i>	10 min

Sessions were based on alternating plenary and working group segments. The plenary sessions, for which all 20 participants were gathered together, were used to introduce the project, review the agenda and, later, to allow participants to question the resource person. At the conclusion of the focus groups, participants completed a questionnaire that replicated the initial telephone survey and evaluated the consultation process.

4.2.1. Results

Focus group discussions

Participants expressed general concern regarding other drivers' inability and/or unwillingness to drive safely. Distracted driving was identified as a major and growing threat to road safety. The use of handheld cellular phones while driving was believed to account for a large part of the current distraction problem, and participants thought that the introduction of telematics devices would likely exacerbate the situation.

Most participants were not familiar with telematics devices and relied on the background document and discussion to form their views. Many were surprised that emerging telematics technology could soon allow drivers and passengers to access e-mail, the Internet and a range of other office functions. Based on this understanding, participants concluded that telematics devices were not inherently dangerous. Instead, they saw risks to road safety resulting from how drivers would use (or misuse) the more distracting devices. And, while they saw the proliferation of in-vehicle telematics devices as being "inevitable", they did not want to prevent Canadian drivers from having access to them. Instead, participants focused on finding workable approaches that would limit telematics-related distraction.

It was clear that participants had a good understanding of the relationship between telematics device design, functionality, and potential to distract. For example, many suggested that certain telematics devices, such as location-based services and navigation systems, could be voice-activated to reduce the potential for distraction. They also agreed that the most distracting devices should not be operable in a moving vehicle.

Participants' understanding of the research evidence outlined in the background document appeared to be limited. Drawing more on common sense, they suggested that future safety-related telematics research be conducted by organizations that "are as objective as possible". While government was thought to be more credible than industry, a "neutral third party" (such as a university) was put forth as being most likely to generate credible results. Many participants thought the best option would be a consortium of stakeholders; "That way everyone could keep an eye on everyone else."

Preferred policy options

Participants' initial understanding of the issues suggested that they overestimated the ease with which the federal government could pass and implement regulation; however, they appeared to grasp the main differences among the potential policy options, and what each entailed. The most difficult policy concept for participants to understand was the "Safety Design Process" (aka 'human factors design process'). Many participants also seemed to find it difficult to consider the design of telematics with levels

of federal government involvement in an integrated manner, as indicated by their tendency to describe recommended courses of action without referring to the terminology and concepts outlined in the background document.

Participants' views evolved during the consultations. Generally, they were less likely after the discussions to see the issues in terms of absolute black and white, and more apt to understand that a combination of approaches would be most suitable. Also, it became apparent that adoption of regulation was much more complex and time consuming than participants had initially imagined. Moreover, it appeared that some participants had originally underestimated the level of cooperation and consultation that exists between the federal government and industry. Finally, participants gained a much better understanding of the MOU and Advisory approaches to federal government involvement.

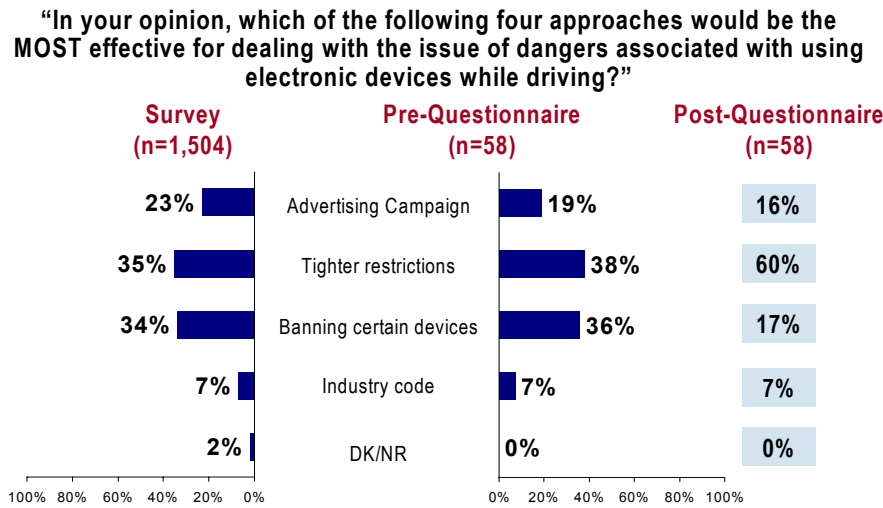
Based on the scientific evidence presented in the background document and their own anecdotal reports of drivers being distracted while using cell phones, participants felt that Canadian drivers could not be relied on to use telematics devices responsibly. Similarly, a purely voluntary, industry-developed approach to telematics safety management was thought to be inadequate. On the other hand, a regulatory approach was felt to be premature, possibly heavy-handed, and likely to be fraught with complications. Participants remained adamant, however, that public safety should in no way be compromised; telematics devices that are found to pose a risk to public safety should either be redesigned to reduce the risk they pose or be made inoperable in a moving car.

Most participants thought that a cooperative approach between government and industry should, at least initially, be adopted. The preferred method was an MOU, which would include safety testing requirements and/or manufacturing criteria and limits to ensure that telematics devices would not pose a threat to public safety. Participants thought that government should closely monitor the industry's adherence to the MOU, and be ready to move to an Advisory if conditions of the MOU were not met. If an Advisory approach also proved unsatisfactory, then legislative action (a regulation) was recommended. In addition to enacting a regulatory or quasi-regulatory approach, participants supported the need for public awareness and education campaigns regarding driver distraction and in-vehicle telematics.

Post-discussion questionnaire

The results of the linked (pre- and post-discussion) survey elements are very consistent with the qualitative findings. Whereas the options of "banning certain devices" and "tightening restrictions" were both moderately appealing to participants (and Canadians in general, based on the national telephone survey) prior to their participation in the consultation (36 and 38 per cent, respectively) "banning certain devices" became a much less attractive option after the focus groups, while "tightening restrictions" became more popular (17 versus 60 per cent; see Figure 1).

Figure 1. Most effective approaches.



5. Summary of Overall Findings

Consultations with industry stakeholders and the Canadian public in 2003 indicated that a government-industry MOU, which includes both performance and human factors design process requirements, was the preferred option to limit driver distraction from in-vehicle telematics devices. Both industry and public groups also expressed strong support for public awareness and education initiatives related to distracted driving in general, including that caused by in-vehicle telematics. Finally, more objective, carefully designed, scientific research into the issue was recommended, especially that which assesses the impact of telematics device use on collision frequency.

6. Ongoing Initiatives

A number of projects have been initiated as a result of the consultative process. What follows is a summary description of each, including its current status.

6.1. MOU on Limiting Driver Distraction from In-Vehicle Telematics Devices

The External Advisory Committee on Smart Regulation was established to recommend areas where government can redesign its regulatory approach to be more effective, responsive, cost-efficient, transparent and accountable to Canadians (www.pco-bcp.gc.ca/smartreg-regint/en/index.html). One method suggested by the Committee to help accomplish these goals is to implement alternative regulatory instruments, such as MOUs. With support from both industry and the Canadian public, TC has decided to negotiate an MOU with industry that is intended to limit driver distraction from in-vehicle telematics devices.

In October 2004, a joint industry-government working group was created to develop the key elements of the MOU. To date, four drafts of the MOU have been put forth;

however, progress has been slower than expected. The main point of discussion is the definition and introduction of a process-based safety management system for telematics device design and development. An agreement on the terms of the MOU was expected in autumn 2005, however, it now appears that discussions will extend beyond that date.

The MOU on Telematics has been identified by Treasury Board and Privy Council Office as one of Transport Canada's initiatives within the new Smart Regulation framework. This assignment has raised the profile of this initiative and gathered more support within government and industry. Compared to the alternative of regulation, the MOU approach provides for a timelier, more proactive reduction of risks, while preserving innovation and flexibility in product design. It is thus in the interest of all to foster and maintain the momentum required to make this initiative a success.

6.2. Distraction Awareness and Education

While awareness and education campaigns are reactive, rather than proactive, by nature, they are important tools that can mould public opinion and effect change. One has only to look at successful social marketing campaigns directed at issues such as drunk driving and seat belt use to appreciate their effectiveness (especially when combined with reliable enforcement).

TC is a member of the Canadian Council of Motor Transport Administrators (CCMTA), which, through a collective consultative process, makes decisions on administration and operational matters dealing with licensing, registration and control of Canadian motor vehicle transportation and highway safety. The CCMTA 'Strategy to Reduce Impaired Driving (STRID)' encourages all government jurisdictions "to develop and coordinate enforcement and awareness programs". TC, with provincial jurisdictions and other groups such as the Canadian Automobile Association (CAA) through the CCMTA, hopes to develop a driver distraction awareness and education campaign. This work would be done within the STRID sub-group on distraction. TC is also providing input to an international conference on driver distraction that will be held in Toronto in October, 2005. This conference, organized by the Traffic Injury Research Foundation (TIRF) and CAA, will cover the problems of driver distraction in general and not just from telematics devices (www.distracteddriving.ca/).

6.3. Countermeasures for Other Distractions and Aftermarket Devices

Any awareness and/or education campaign directed at driver distraction from in-vehicle devices would also apply to other distractions, both in and outside of the vehicle. As recommended from the comments, TC would also encourage provincial governments to include a section on driver distraction in their driver training curricula, and in their driver's licensing manuals.

With respect to the MOU, TC would encourage all third party aftermarket equipment suppliers to voluntarily agree to follow its terms. If TC eventually moved to regulate telematics devices, aftermarket suppliers would not be required to meet the requirements, as this type of equipment falls under provincial jurisdiction. To preclude this possibility, TC, through its work with the CCMTA, hopes to introduce model legislation that

provinces could implement regarding driver distraction caused by the use of in-vehicle aftermarket telematics devices.

6.4. Research on Distraction Countermeasures and Risks

6.4.1. Evaluation of AAM Principles

The Alliance of Automobile Manufacturers (AAM) has, since creating a working group in 2000, worked to develop principles intended to address the safety aspects of driver interactions with telematics systems. The “Statement of Principles, Criteria and Verification Procedures on Driver Interactions with Advanced In-Vehicle Information and Communication Systems” contains 24 principles, 18 of which specify information, measurement and/or performance criteria. The document was developed by consensus with industry stakeholders and continues to evolve. As of April 2002, AAM member companies have voluntarily agreed to abide by these guidelines in their design process. Although this initiative promises to improve the safety of these systems, there is some uncertainty as to the level of safety and effectiveness of the AAM procedures and criteria. Thus, there is a need to thoroughly evaluate the AAM’s principles and to measure the compliance of current in-vehicle devices to these principles as a benchmark for change.

TC is evaluating four market-available original equipment navigation systems against the Statement of Principles. The purpose is to determine how current vehicles rate on the AAM principles and to collect benchmark data to evaluate progress in the design of future telematics devices. The evaluation will also focus on the reliability and validity of principles themselves and their verification procedures and criteria.

Similarly, an MOU between TC and industry would require manufacturers to report annually which of their products fall within the scope of the MOU, and which products meet its requirements. Manufacturers would also be required to provide, on a case-by-case basis, clear evidence that their products are in compliance with the requirements of the MOU.

6.4.2. Assessing Driver Distraction

To protect the safety of drivers and other road users, test methods are needed that can identify tasks and devices that place unsafe demands on drivers’ attention. TC has an ongoing research program investigating methods for assessing the distraction potential of in-vehicle tasks and devices. The goal is to have standard meaningful, objective and reliable test procedures to identify unsafe levels of distraction.

TC has completed research associated with the European project HASTE (Human Machine Interface And the Safety of Traffic in Europe), the aim of which was to develop methodologies and guidelines for the assessment of in-vehicle information systems. This involved the cooperation of eight partners (7 European and 1 Canadian TC). The final experiments in this 3-year project have been completed and the project will be wrapping up in 2005 with only some final analyses, meetings and reports remaining.

Transport Canada has also been evaluating other test procedures to follow-on from the HASTE research. Two studies were completed in 2005; one using the Lane Change Test (LCT) and the second using the Occlusion Test. The LCT is a relatively simple and low

cost standardized test scenario designed for measuring driver distraction. The Occlusion Test measures the amount of visual distraction created by an in-vehicle device. Both the LCT and Occlusion procedures were found to discriminate between different levels of task complexity. Among other studies, there is also a plan to apply the LCT to evaluate speech-user interfaces in vehicles.

TC's research supports the development of international standards (ISO) and harmonized research in the area of driver distraction. Canada currently chairs the International Harmonized Research Activities Working Group (IHRA) on Intelligent Transport Systems (ITS), which was established to coordinate, collaborate and exchange information on research aimed at optimizing the safety performance of ITS. The primary goal of this group is to develop test procedures to assess driver-vehicle interaction as a means for determining the safety potential of ITS. TC also participates in two ISO working groups (ISO TC 22/ SC 13/ WG 8; ISO TC 204/ WG 14), which develop standards relating to the ergonomic aspects of transport information and control systems, and vehicle warning and control systems, respectively.

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