

# **STRATEGIC AGENDA FOR REDUCING DEER-VEHICLE CRASHES**

Results from the Conference

## **Deer-Vehicle Crash Reductions: Setting a Strategic Agenda**

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16. Abstract In October 2005 approximately 65 people involved with or interested in the reduction of deer-vehicle crashes (DVCs) attended the “Deer-Vehicle Crash Reductions: Setting a Strategic Agenda” conference. The primary objective of this meeting was for the attendees to collaborate and brainstorm strategic agenda action items for DVC reduction research and data collection, funding, partnership building, and technology transfer and education. A focus group was created to discuss each of these subject areas, and the content of this report is a summary of those discussions. Each group was initially asked to identify the concerns/problems they thought should be resolved to help reduce DVCs overall and specifically within their subject area. They were then asked to provide goals/objectives that could be achieved within their subject area during the next three to five years, along with the strategic agenda action items that could help accomplish these goals/objectives. Each group provided a list of concerns/problems, goals/objectives, and strategic agenda action items. These lists are provided in this document. The focus area of each group was different and in some cases their strategic agenda action items were very specific. In other cases, however, similar suggestions were provided from more than one group. Multiple agenda item suggestions show strong support for their inclusion within the strategic agenda by many of the meeting attendees. Four common themes or categories were generally identified among the strategic agenda action items. The first group of action items will help facilitate and guide intra- and inter-agency coordination with respect to the DVC problem. The second group of action items will increase the general awareness of the DVC issue by effectively and efficiently providing the correct message to a wide range of audiences. The third group action items will encourage the consistent collection of DVC-related data, and the fourth group promotes the development, evaluation, and implementation of potential and existing DVC countermeasures. All the action items are provided in this document to assist those individuals and groups interested in advancing the reduction of DVCs.					
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## INTRODUCTION

Deer-vehicle crashes (DVCs) in the United States are a significant and increasing transportation safety problem. It has been estimated that more than a million deer-vehicle crashes occur each year (1). The number of fatalities resulting from collisions with animals in the United States has also increased from 131 in 1994 to 204 in 2004 (2). A large percentage of these animals are deer. It has been estimated that approximately 13,000 injuries are the result of animal-vehicle collisions (3). Overall, the estimated annual cost of DVCs is over a billion dollars (1).

The DVC problem and its potential countermeasures are complex interdisciplinary national issues that have transportation safety and ecological implications. For example, the statistics summarized above even require assumptions to calculate because police-reported DVCs and roadside carcass removal data are not consistently collected throughout the United States. In addition, there have been numerous DVC countermeasures implemented or proposed for many decades, but the proper and consistent evaluation of their overall safety and ecological impacts has been sporadic.

The complexity and interdisciplinary nature of the DVC problem and its countermeasures requires adequate research/data collection funding, partnerships, and technology transfer/education. A strategic approach is needed that addresses these issues and suggests potential action items for their improvement. This strategic agenda report was created in response to this need. It is the product of the Deer-Vehicle Crash Information Clearinghouse (DVCIC) “Deer-Vehicle Crash Reductions: Setting a Strategic Agenda” meeting. The objective of this document is to help guide individuals and groups that would like to assist in the reduction of DVCs.

## AGENDA DEVELOPMENT PROCESS

The content of this report is a summary of the brainstorming activities completed at the “Deer-Vehicle Crash Reductions: Setting a Strategic Agenda” meeting. This meeting was hosted and cosponsored by the DVCIC and the Midwest Regional University Transportation Center (MRUTC) in Madison, WI on October 24-25, 2005. Other sponsors of this meeting included:

- American Automobile Association of Minnesota/Iowa,
- American Automobile Association of Wisconsin,
- Defenders of Wildlife,
- Iowa Department of Transportation,
- Montana State University - Western Transportation Institute,
- North Carolina State University - Center for Transportation and Environment,
- Sand County Foundation,

- United States Department of Transportation Federal Highway Administration, and
- Wisconsin Department of Transportation.

More than 65 people involved with or interested in DVC reduction activities attended this meeting. The attendees and their affiliations are listed in an appendix to this report. The attendees include transportation safety and ecology university researchers, State Department of Transportation (DOT) and Department of Natural Resource (DNR) representatives, Federal Highway Administration employees, motor vehicle and motorcycle club members, law enforcement, farmer representatives, state/regional/county/town government employees, United States Department of Agriculture Forest Service personnel, non-profit ecology and transportation safety advocates, and trucking representatives. The primary objective of the attendees at the meeting was to collaborate and propose DVC reduction strategic agenda action items in the following subject areas:

- Research and Data Collection
- Funding
- Partnership Building
- Technology Transfer and Education

During the meeting, attendees reviewed the progress made toward the reduction in DVCs since a similar meeting in 2000. They then listened to national and international speakers discuss the subjects listed above and recent/ongoing projects related to DVC reduction. Interdisciplinary focus groups of 10 to 20 people were then created for the four subject areas listed above. These groups spent a day formulating the material, including the strategic agenda action items, summarized in this report.

### **FOCUS GROUP CONCERNS/PROBLEMS AND GOALS/OBJECTIVES**

The first task of each focus group was to identify the concerns/problems that they believed should be resolved to help reduce DVC within their particular subject area (research/data collection, funding, partnership building, and technology transfer/education). More general DVC-related concerns/problems were also welcomed. Then, the goals and objectives that might be achieved in three to five years and the strategic agenda action items that could help accomplish these goals/objectives were discussed. More specifically, the focus groups were asked to answer the following questions:

1. What is/are the primary concern(s) or problem(s) in your subject area that may be impeding deer- or animal-vehicle crash reduction?
2. What should the general objectives/goals in your subject area be to advance deer- or animal-vehicle crash reduction?

3. What type of action items/projects can your group suggest to advance toward that goal in the next three to five years?
4. Are there any other problems and action items you think should be included in the strategic agenda report produced from this meeting?

The answers provided by the focus groups for the first three questions are listed in this report. Responses to the final question are incorporated as appropriate. The similarities found in the individual focus group action item lists are summarized in the final section of this report.

### **Research and Data Collection**

This focus group identified the concerns and problems they believe exist with the state-of-the-knowledge and practice of DVC reduction research and data collection. These concerns/problems are listed below. The goals and objectives they believe respond to these concerns and problems follow. The strategic agenda action items suggested by this focus group to advance the goals and objectives they recommend are in the next section.

#### *Concerns and Problems*

- A better understanding of which animals (species) are being hit along roadways is required.
- The “under-reporting” of DVCs needs to be addressed.
- Lack of DVC-related data that are location-specific and/or accurate enough (e.g., carcass removal data) for evaluation or countermeasure implementation.
- Inconsistent documentation of the defining criteria for existing DVC-related data that are available. For example, different DVC-related data may be collected and reported within one agency (e.g., reported DVCs and carcass removal) or in separate agencies (e.g., DOT and DNR). Similar and understandable terminology and definitions are also necessary in the documentation of existing DVC-related data.
- Access to existing DVC-related data and summary reports should be improved.
- The introduction of an abbreviated DVC report form is not sufficient and can result in lost and non-collected data.
- Improved recognition is needed that different species may require different mitigation.
- A general lack of understanding and/or research conducted about migration patterns (i.e., wildlife being near the roadway) and/or the temporal and spatial probability of an animal being near or on the roadway.
- The need to consider the relationship between DVCs and non-roadside features such as habitats, landowner behavior, land-use planning, etc.
- Lack of understanding of the physiological characteristics of white-tailed deer (e.g. eyesight, color sensors, auditory reaction, etc.), and what attracts deer to the roadside (e.g. vegetation, migration patterns, etc.)

- The need for better knowledge on the manipulation of deer behavior and/or habitat to influence the location and type of crossings and/or mitigation employed.
- Need to investigate the impact of roadside vegetation on attracting deer to the roadway or obscuring deer from driver vision.
- Too few DVC safety data models that have broad applicability.
- More attention needed toward DVC issues related to other non-motor vehicles: aviation, railway, and also DVCs at interchanges and intersections.
- The relationship between number and severity of crashes to vehicle type and/or size (e.g. big trucks, cars, motorcycles) is not understood.
- There appears to be conflicting objectives in the design and manufacture of automobiles that needs to be evaluated (e.g. aerodynamics vs. the impact of a deer hit on the vehicle).
- Economic benefit, in the form of a cost-benefit analysis, is not available to assist transportation agencies in matching appropriate mitigation to the funds available.
- There is an inconsistency in the application of sign placement and threshold guidelines as well as a non-existence of warrants for mitigation techniques.
- A better understanding of the DVC problem (compared to other crash types) in terms of number, fatalities, dollar amounts, etc. needs to be shown and publicized.

### *Goals and Objectives*

The concerns and problems suggested by the research and data collection focus group (listed above) could be addressed by accomplishing the following goals and objectives:

- Promote and achieve more well defined DVC-related data collection. Improve and standardize national and statewide DVC-related data collection.
- Continue to properly evaluate DVC mitigation strategies to determine those that are most effective and those that are largely ineffective.
- More widely disseminate fact supported DVC-related information and education. List decisions and actions that might help reduce the DVC problem.
- Establish a national database/clearinghouse of information important to the DVC problem and its reduction.
- Provide definition and better information about the DVC problem across disciplines and agencies.
- Continue to focus on the fact that the DVC issue and its countermeasures have both ecological and transportation safety impacts.
- Pursue a better understanding of the true cost of the DVC problem to the insurance industry and the public.

## **Funding**

This focus group first identified the following concerns and problems connected to the future funding of DVC reduction activities. The goals and objectives they believe respond to these concerns/problems follow. The strategic agenda action items suggested by this focus group to advance the goals and objectives they recommend are in the next section.

### *Concerns and Problems*

- An inequity of funds exists among and within state agencies. Flexibility in the use of existing funds seems lacking. For example, some states are small in area, roadway mileage, and/or population but have large DVC or animal-vehicle crash concerns and funding needs. In addition, restrictions on how both environmental and transportation funding can be spent often limits exploration into DVC reduction activities.
- Overall, there is a general lack of funding at the state and local levels of government. Government investment in infrastructure related to DVC reduction is small.
- The DVC problem and its impacts and countermeasures are understood less, and can be more complex, than other transportation safety problems. This lack of understanding can result in less funding for the subject area. An overall understanding of DVC impacts is needed.
- There are likely a number of funding sources that are generally unknown to practitioners in the DVC reduction area. These sources may include private sector assistance (e.g., insurance companies, trucking companies, etc.). The benefits and costs incurred by these companies, if they assist in the reduction of DVCs, need to be evaluated and expectations of their fiscal involvement adjusted appropriately.
- Public understanding of the DVC problem can be minimal and sometimes based on misinformation. In some cases, concerns or questions related to a DVC problem are directed to the incorrect agency or combination of agencies. There is often a lack of understanding about what agency is responsible for DVC mitigation. Many drivers also believe that DVCs are an unchangeable fact of living and driving in many areas of the United States.
- A determination of the economic effectiveness of potential DVC countermeasures is needed. Funding should be used on the most effective measures.
- Overall, proper research into the effectiveness of potential DVC countermeasures needs to be funded, conducted, and documented.
- There is generally a lack of incentive for state DOTs to include DVC reduction in their budgets. A high level of personnel turnover also makes it difficult to maintain consistent “champions” for DVC mitigation funding.

### *Goals and Objectives*

The concerns and problems suggested by the funding focus group (listed above) could be addressed by accomplishing the following goals and objectives:

- Increase the awareness of the public to the significance of the DVC problem.
- Identify public and private funding sources that might be used to reduce DVCs.
- Improve our understanding of the overall costs of the DVC problem and its countermeasures. The safety and ecological costs and benefits of each countermeasure should be included.
- Increase intra- and inter-agency communication at all levels of government among the groups that are interested in the DVC problem.
- Work to increase the flexibility of how funding can be spent and encourage sharing of funds amongst agencies.
- Prioritize the spending of funding for DVC reduction more clearly.
- Identify champions within DVC-related agencies to promote the message of this agenda.
- Better identify the benefits of DVC reduction to the private sector, government agencies and personnel, and the general motoring public. It is of particular importance (due to limited budgets) that the public, decision-makers, and funding agencies be properly informed of the DVC problem.
- Recognize and reward organizations that work toward a reduction in DVCs.

### **Partnership Building**

This focus group identified the following concerns and problems related to the building of partnerships to reduce DVCs. The DVC issue and its potential countermeasures impact a wide range of people with varying backgrounds. The complexity of DVC mitigation, therefore, requires the active participation and interaction of a variety of disciplines. Some of the concerns and problems noted by this focus group are general in nature and focus on the need to improve and expand on the overall understanding of the DVC issue and its potential solutions. Other concerns/problems specifically consider those needed to develop partnerships within an organization or group. The goals and objectives discussed later in this report are related to the development of these partnerships.

### *Concerns and Problems*

- The need to build DVC-related partnerships can be logistically problematic. For example, physically bringing experts from different fields together to discuss DVCs can be difficult. Transportation and ecology personnel from DOTs and DNRs can have different “peak” work times during the year and all agencies have limited meeting budgets. Representatives from different agencies involved with DVC reduction also rarely attend or are invited to strategic planning meetings of their potential partners.

- There is a need to reconcile what can be long-held conflicts of interest or perspectives of different groups on the DVC subject and its potential countermeasures. The objective of a partnership, for example, can be DVC reduction, but there may be different opinions on the causes and significance of the DVC problem and the priority/veracity of mitigation attempts.
- There is sometimes a general lack of awareness regarding the significance of the DVC problem. This misunderstanding is demonstrated by both the general public and potential stakeholders. Because there are comparatively few human fatalities associated with DVCs, awareness campaigns related to it must focus on different aspects (e.g., levels of injury, property damage, and trauma). Disseminating appropriate information about deer population control is also important, but a hotly debated political topic in many states.
- The lack of accurate data regarding the number of DVCs that occurs also influences partnership building. Different stakeholders use different databases and, depending on their perspective, the extent of the problem is either over- or under-represented. This confuses the general public and different stakeholders may not realize the extent to which DVC impact them as individuals or a group. This misunderstanding, in turn, may lead to an unwillingness to commit time, money, or energy to DVC reduction efforts.
- The DOT and DNR are key players in reducing DVCs in each state. The interaction between these organizations can be non-cooperative. It should be recognized that the public react differently to the DVC problem depending on which agency is disseminating information. For example, a DNR that recognizes an unhealthy deer population size also often has to serve and respond to competing interest groups

### *Goals and Objectives*

The concerns and problems listed above have partnership building impacts but some were also recommended by the research/data collection and funding focus groups. The goals and objectives suggested by these other two groups, along with those listed below, address the concerns and problems provided by the partnership building focus group. However, there must also be goals and objectives that focus on what is needed to encourage the creation of DVC reduction partnerships within an individual agency or between multiple stakeholders. These points (listed below) would be included as portions of an agency management plan to create internal or DVC-related external partnerships.

- Properly define the scope and complexity of the DVC problem by considering and documenting the DVCs and DVC reduction relationship with driver behavior, animal behavior and management, highway design, and habitat management/property rights. Increase awareness of the DVC problem by broadly sharing this information.
- Cast a broad net to include as many stakeholders as possible for a final partnership group. Organizers should also recognize that they might not have identified all potential players. Additions to the partnership should be allowed as other stakeholders are identified. Examples of stakeholders

- include the driver, ecologist, transportation personnel (planning, design, operation, and maintenance), farmers, hunters, motorcyclists, etc.
- Identify individual stakeholder issues and specific interests in the DVC problem. Identify the breadth and extent of the expertise of each stakeholder with respect to the DVC problem. Recognize the structure and objectives of the agency within which each stakeholder may work. Confirm stakeholders' goal to reduce/mitigate DVCs.
  - Coordinate partnership by creating a structure to the group with defined roles for individuals. Confirm motivation of group and benefit of achieving goals. Establish an operating plan, including strategies for communication and administration.
  - Based on the information and decisions discussed above - set achievable goals and timetable for the partnership to promote DVC reduction. Some of these goals may be related to assisting with the accomplishment of the strategic agenda action items listed later in this report.

### **Technology Transfer and Education**

This focus group identified what it believed were the primary concerns and problems connected to properly sharing information about the DVC problem and its reduction. Not surprisingly, all three of the previously described focus groups also identified the need for a general improvement in the sharing of DVC data and DVC reduction information. Information sharing, however, was the primary discussion point of the technology transfer and education group. The goals and objectives that need to be accomplished to address DVC-related technology transfer and education efforts follow. These types of efforts can focus on communications between experts, experts and the public, and/or intra- or interagency discussions.

#### *Concerns and Problems*

- There is a need to identify the key stakeholders that can play a role in technology transfer and education efforts related to DVCs. Several general categories of stakeholders include government agencies (e.g., DOT, DNR, local, metropolitan planning organizations, law enforcement, and Federal Highway Administration), general public (e.g., drivers and hunters), elected officials/legislators, and others (e.g., interest groups, insurance companies, farming, international groups, tribal authorities, universities, and automobile/motorcycle manufacturers).
- The public perception of the DVC problem needs to be improved. In general, this problem, its impacts, and its potential countermeasures are not clearly understood. Overall, the problem and its relationship to herd management/population control, DVC reduction roadway measures, and transportation planning/land use decisions need to be better recognized, understood, and publicized. Improvements to the public understanding of why and how deer populations need to be controlled were of particular interest to the focus group.
- There appears to be a general lack of coordination between key stakeholders. Improvements are needed that facilitate intra- and inter-

agency coordination related to defining the DVC problem and its potential countermeasures. The message provided to the public, etc. that comes from different groups sometimes appears to be inconsistent. Of particular interest are improvements in DVC-related data collection, analysis, management, and countermeasure application.

- There is a need to educate policy makers and legislators about the DVC problem, its significance, and what is known about its potential countermeasures. It is important to obtain the support of legislators and policy makers who can enact legislation and encourage funding.

### *Goals and Objectives*

The goals and objectives identified by the technology transfer and education group are listed below. These goals/objectives could be accomplished through the technology transfer and education strategic agenda action items suggested in the next section of this report.

- Improve public perception of the DVC problem by increasing their understanding of its significance and impacts. Include a discussion of deer herd population management issues and the public role in this process.
- Facilitate intra- and inter-agency coordination by establishing criteria for uniform collection (and reporting) of DVC-related data. A primary location for DVC-related data should also be identified and the value of good quality data and its uses need to be clearly communicated.
- Educate policy makers and legislators on the DVC problem to help increase appropriations that address this issue. Assist in championing legislative initiatives to further a strategic approach to DVC reduction. These activities will also help legislators and policy makers acknowledge and vocalize that DVCs are a problem.

## **FOCUS GROUP STRATEGIC AGENDA ACTION ITEMS**

At the October 2005 meeting each of the focus groups previously described (research and data collection, funding, partnership building, and technology transfer and education) suggested a series of action items that they believed should be included within a strategic agenda for DVC reduction. The items are not prioritized, but were each considered important enough to include in a strategic agenda by the focus group members. In some cases the individual focus group lists (provided below) include similar items. These repeated suggestions show strong support among many of the meeting attendees. The common themes in the individual strategic agenda action item lists (provided below) are summarized in the next section of this document.

### **Research and Data Collection**

The research and data collection focus group suggested the following action items be included as activities in this strategic agenda. It is proposed that this list be used

as guidance for activities related to DVC-related research and data collection. The action items suggested by the research and data collection focus group included:

- Assess the best method to disseminate DVC-related information to the public. Focus groups could be prepared to test DVC-related messages for effectiveness.
- Identify and/or develop an independent organization that can operate as a champion for DVC reduction (something similar to Mothers Against Drunk Driving (MADD)).
- Integrate or develop policies for collection of roadside carcass data. In particular, provide appropriate information and feedback to maintenance crews that indicate why the data is being collected and how it can be used. This should improve the quality and amount of carcass removal data available.
- Promote discontinuation of the practice in some agencies of deleting DVCs when the safety of a roadway is being evaluated or reported.
- Raise awareness of the DVC issue among the practitioners making decisions that may reduce the DVC problem.
- Establish a national repository for DVC-related data.
- Analyze roadside management practices and their impact on DVCs. Identify the palatability of the roadside vegetation used for erosion control.
- Develop guidelines to help identify appropriate potential countermeasures for existing roadway crash locations with particular characteristics.
- Encourage the use of GPS or another accurate method of locational DVC data collection, and develop compatible GIS databases of factors related to DVCs. The collection of species information is also important.
- Prepare a “best practices” DVC countermeasure guideline for possible input to existing policies (e.g., American Association of State Highway Transportation Officials (AASHTO) “Policy on Geometric Design for Highways and Streets”, “Roadside Design Guide”, etc.).
- Conduct more analysis of DVC reduction “best practices” with appropriate investigation techniques and possible inclusion within the upcoming Highway Safety Manual (or future versions).
- Improve our understanding of the “causal chain of crash characteristics” related to run-off-the-road crashes and DVCs.
- Analyze and assess the trade-offs involved with roadway design decisions and the implementation of DVC countermeasures.
- Assess and better define the relationship between design, speed, and DVCs, and compare these results to those for other crash types. Determine how to improve the perception of risk by drivers. Investigate if speed reduction measures in rural areas might impact the number of DVCs.
- Evaluate and analyze “heads-up displays” that assist drivers in the identification of the potential for a DVC (including commercial issues related to selling this type of device).
- Support side-by-side testing and evaluation of existing and new DVC countermeasures and devices.

- Encourage independent and interdisciplinary DVC-related research.
- Develop a “best practices” guideline for testing DVC countermeasures with typical existing DOT capabilities.
- Encourage automakers to evaluate the impact of DVCs in vehicle design.
- Identify the demographics of drivers involved in DVCs.
- Investigate what the “state of the practice” is with respect to the implementation of DVC countermeasures and explore existing and potential warrants for implementation.
- Evaluate liability issues that may be related to DVC countermeasure implementation.

## **Funding**

The funding focus group suggested the following action items be included as activities in this strategic agenda. It is proposed that this list be used as guidance for activities related to DVC-related funding. The action items suggested by the funding focus group included:

- Document current and future funding sources for DVC activities. Some potential sources include insurance and freight companies. Incentives for a funding source to participate in DVC reduction activities should be investigated.
- Investigate the combination of funding from different sources/agencies for DVC activities. This could be the result of activities completed by the coalitions recommended below.
- Create state-based DVC reduction coalitions. The coalition in Michigan could be used as an example. These coalitions should help identify and increase support/awareness for the DVC issue, raise funds for DVC activities, include diverse representation of member organizations (safety and ecological), and promote advocacy. They should also focus the use of available DVC-related funding and enhance overall communication and cooperation.
- Create state-based task forces at the agency level that focus on DVC reduction. There is a need to have “champions” or “go-to-people” for funding and priority arguments.
- Fund an independent cost-benefit analysis (CBA) that includes the defensible safety and ecological benefits and costs of DVC reduction. The results of this analysis should be documented in the form of a formula and/or methodology that can be easily transferred and applied by practitioners.
- Lobby or introduce discussions about more flexibility with legislation that could be used for DVC reduction (e.g., budget bills, etc.). This activity could also support or introduce the consideration of DVC reduction activities (and their benefits) in roadway project development and completion.
- Develop an award system for advances in mitigation of the DVC problem. This system could be an initiative of any organization interested in DVC

reduction (e.g., DOTs, AASHTO, Federal Highway Administration, etc.). The intent would be to encourage the application of DVC mitigation.

- Develop or improve criteria for prioritizing spending on roadway projects related to DVC countermeasure implementation. These criteria could include or use the results of the cost-benefit analysis proposed above and any well-designed future research on the effectiveness of mitigation techniques.
- Evaluate and/or publish information about effective and ineffective DVC countermeasures. This information, along with the cost-benefit analysis above, should help identify possible improvements that match available funding.
- Create a national professional association, group, or agency dedicated to the reduction of DVCs. It could assist with the application and development of DVC reduction strategic agendas, conduct research and public outreach, and advise on countermeasure application. This group could work closely with or possibly be within the Transportation Research Board.

### **Partnership Building**

The partnership focus group suggested a short list of the following action items be included as potential activities in this strategic agenda. It is proposed that this list be used as guidance for activities related to DVC-related partnership building. The action items suggested by this focus group include activities related to the development of partnerships within an organization:

- A mission statement and business plan must be created to focus the ideas and activities of a partnership on DVC reduction and related subjects.
- Stakeholders need to be identified and contacted. They should be diverse and include additional groups as the partnership becomes aware of their relationship with DVC reduction. The subject of DVC reduction and the individuals interested in it include many types of professionals.
- The issues most important to each of the stakeholders should be understood. It is recommended that a stakeholder survey be developed and implemented.
- Define how and when meetings with diverse attendance should be scheduled and organized. Different groups may be busy during varying times of the year. Methods should be formulated for effective communication channels based on the capabilities of the stakeholders within the partnership.

### **Technology Transfer and Education**

The technology transfer and education focus group suggested the following action items be included as activities in this strategic agenda. It is proposed that this list be used as guidance for activities related to DVC-related technology transfer and education activities. The items below generally focus on activities to advance three issues: 1) improving the public perception of the DVC problem, 2) facilitating inter- and intra-agency coordination, and 3) educating policy makers and legislators. The action items suggested by the technology transfer and education focus group included:

- Create a coalition to develop a consistent and central message to describe the activities connected to this strategic agenda. Continue to promote the importance and value of DOT, DNR, and law enforcement agency cooperation and communication.
- Facilitate the targeted deployment of DVC-related messages to the public through multiple channels (e.g., driver education classes, radio, television, etc.). The use of campaigns specifically focused on particular groups (e.g., new drivers) is suggested. In addition, the involvement of driver and conservation groups, plus their networks, to disseminate the message of the Strategic Agenda is proposed. Personal stories about the results of DVCs (e.g., injuries and fatalities) might be used to emphasize its significance.
- Promote DVC reduction success stories and continue the involvement of all relevant groups and individuals in the development and application of this and future strategic agendas.
- Facilitate intra- and inter-agency coordination by, among other things, identifying a minimum uniform critical data collection and reporting requirement to describe the DVC problem appropriately. The uniform collection of both reported DVC and deer carcass removal data should be addressed. A central repository for the sharing of the data (e.g., [www.deercrash.com](http://www.deercrash.com)), with their defining criteria, was also suggested. A “best practices” guide for the collection and dissemination of DVC-related data is needed.
- Develop a tool for anonymous reporting and proper use of DVC information provided directly from the driving public. The ability to report DVCs in this manner might decrease the number of DVCs that go unreported. The establishment of a toll-free number (e.g., 1-800-DEER-CRASH) that involves providing DVC information to an independent party (not law enforcement or an insurance company) was discussed as a potential solution. Centralize and increase DVC-related information focused on public education.
- Develop a targeted message to better educate policy makers and legislators about the DVC problem. The audience for this message may actually be their legislative staff. Also, facilitate the deployment of DVC-related messages through this audience to their constituents. The communication channel between legislators and the public was considered very important. Examples of some legislation that may help reduce DVCs include those related to the introduction of deer predators, sustenance hunt licensing, and hunting to feed low-income or homeless people. Increases in funding, hunting licenses and limits, and length of hunting season are also some examples.

## STRATEGIC AGENDA ACTION ITEM SUMMARY

The strategic agenda action item lists provided in the last section of this report contain a number of similarities. Those items mentioned by the majority of the four focus groups are summarized below. The inclusion of these action items in this strategic agenda, therefore, was important to the majority of the people attending the October 2005 meeting. The action items summarized below are grouped into four general categories.

- Facilitate and increase intra- and inter-agency coordination with respect to the DVC problem. In particular, develop state- and/or agency-based committees and/or coalitions. These groups provide a focus point or “one-stop shop” to coordinate messages, identify agency champions, and facilitate targeted deployment of funds and appropriate implementation of mitigation strategies. Some actions these groups can initiate include:
  - Identification of a central message;
  - Facilitation of the deployment of a central message;
  - Preparation and dissemination of appropriate information packages to targeted audiences – using the most effective channels available;
  - Initiation of improved coordination between key stakeholders (e.g., DOT, DNR, law enforcement agencies, etc.);
  - Creation of an award or incentive system for successful DVC reduction activities (this was suggested by one focus group and could also be a program initiated by existing transportation groups);
  - Identification of existing and potential (e.g., freight and insurance companies) funding sources; and
  - Being a central location to pool funding that is used to more effectively address the DVC reduction needs of the stakeholder membership.
  
- Increase awareness of the DVC issue through the completion of a variety of activities. The overall objective of this category of activities is to provide the correct DVC-related message to the appropriate audiences in the most efficient and effective manner. Some activities that would increase awareness of the DVC problem include:
  - Identification and consistent delivery of a central message (see related coalition activities above and data collection activities below);
  - Identification of the demographics of drivers involved in DVCs;
  - Given a particular audience, assessment and use of the most appropriate method to disseminate information. These methods could include a module in a drivers education course, billboards, newspaper articles, brochures, television and radio;

- Preparation of targeted campaigns for specific groups (e.g., young drivers, agency decision-makers, and legislators). Employment of organizations interested in DVCs that can use membership and meetings as channels for information dissemination. One group also suggested focusing on legislators to initiate discussion on key legislative initiatives;
  - Possible creation, suggested by one focus group) of a national DVC-related professional group to further develop and assist in the application of a DVC reduction strategic agenda. This group could possibly be part of the Transportation Research Board structure; and
  - Preparation of focus groups to determine and test DVC messages.
- Encourage consistent DVC-related data collection. In some instances there are multiple agencies presenting multiple DVC-related messages. This inconsistency can confuse the general public, legislators, and decision-makers. It can also confound the interpretation and/or application of research results. One source of this data collection confusion is the existence and relatively undefined use of multiple DVC-related databases (i.e., police reported DVCs and roadside deer carcass collection). Several of the action items mentioned previously begin to generally address this issue. More specific activities include:
- Identification of the minimum type and defining criteria of DVC-related data that should be collected and reported;
  - Formation of agency- and/or state-level coalitions to share this type of information and data (see related previous described activities);
  - Better understanding or definition of the discrepancies that exist between the magnitude of reported DVCs and roadside carcass removal data;
  - Provide more information to maintenance and other personnel that are or might be involved with the removal and recording roadside carcass removal data;
  - Document a “best practices” guide for the collection and dissemination of DVC-related data;
  - Create a primary point of contact for DVC-related data and information, establishment of a national DVC database, and centralize repository; and
  - Encourage the collection of more accurate DVC-related data, possibly using GPS technologies, and the collection of multiple DVC-related data that can be easily combined and appropriately compared within a GIS.
- Promote the development, evaluation, and/or implementation of potential and existing DVC countermeasures. There are a number of DVC countermeasures that have been used for many years, some that been proposed more recently, and others that have yet to be implemented.

Overall, there is a limited amount of knowledge related to the potential ecological and safety impacts of these countermeasures. The action items suggested to address this deficiency include:

- Increase (and quantify) the general understanding of the causal factors connected to DVCs (including those related to animal physiology, land cover/use, and roadway characteristics);
- Development of a “best practices” guide for the evaluation of existing and future DVC countermeasures;
- Fund and complete well-defined and reasonable cost-benefit analysis (CBA) of potential DVC countermeasures. This analysis should include safety and ecological benefits and costs. The results of the analysis should be documented in a format that allows it to be generally applied and/or calibrated;
- Preparation of a “best practices” guideline and, if possible, installation warrants, for potential DVC countermeasures. The inclusion of this type of information in generally accepted transportation manual and policies should also be attempted;
- Consideration and documentation of liability issues related to the implementation of DVC countermeasures; and
- Documentation and promotion of evaluations that identify potentially ineffective DVC countermeasures.

## REFERENCES

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**APPENDIX – OCTOBER 2005 MEETING ATTENDEES**

1. TERESA ADAMS	UNIV. OF WISCONSIN - MADISON
2. JOHN BETH	BROOKFIELD WI POLICE DEPT.
3. MICHAEL BIE	AAA WISCONSIN
4. GARY BIRCH	WI DOT
5. JASON BITTNER	UNIV. OF WISCONSIN – MADISON
6. BILL BRANCH	MARYLAND STATE HWY. ADMIN.
7. BILL BREMER	FHWA/WISCONSIN DIVISION
8. BRUINS, BILL	WI FARM BUREAU FEDERATION
9. CAMERON BUMP	WI DNR
10. PATRICIA CRAMER	UTAH STATE UNIVERSITY
11. SCOTT CRAVEN	UNIV. OF WISCONSIN-MADISON
12. GINO D'ANGELO	UNIV. OF GEORGIA - ATHENS
13. ANN DELLINGER	CTRS FOR DISEASE CONTROL/PREV.
14. MICHAEL GOSTOVICH	WYOMING DOT
15. DUSTIN GRANT	MARQUETTE COUNTY, WI
16. JONI HERREN GRAVES	SW WI REGIONAL PLANNING COMM.
17. MARY GRAY	FHWA
18. BRENT HAGLUND	SAND COUNTY FOUNDATION
19. DR. FUMIHIRO HARA	HOKKAIDO DEV. ENGRG. CENTER
20. PATRICK HASSON	FHWA
21. TOM HAUGE	WI DNR
22. CHRISTOPHER HRONES	NORTH JERSEY TRANS. PLNG. AUTH
23. DENNIS HUGHES	WI DOT
24. MARCEL HUIJSER	WESTERN TRANSPORTATION INST.
25. CATHY HUNTOWSKI	ABATE OF WISCONSIN
26. SANDRA JACOBSON	USDA FOREST SERVICE
27. BRIAN JOHNSON	NE DEPARTMENT OF ROADS
28. JOHN KINAR	WI DOT
29. HELEN KITCHEL	WI DNR
30. KEITH KNAPP	UNIV. OF WISCONSIN – MADISON
31. DAVE KUEMMEL	MARQUETTE UNIVERSITY
32. RICHARD LANGE	WI DOT
33. JOHN LEWIS	WI DOT
34. MAJOR DAN LONSDORF	WI DOT
35. KEVIN MCALEESE	SAND COUNTY FOUNDATION
36. TIM MCCLAIN	WI DOT
37. KATIE MCDERMOTT	NC STATE UNIVERSITY CTE
38. DICK MILLER	AAA MICHIGAN
39. TERRY MULCAHY	HNTB, INC.
40. DEBRA NELSON	NEW YORK STATE DOT
41. KEISUKE NOZAKI	WESTERN ILLINOIS UNIVERSITY
42. GREG PLACY	NH DOT
43. TIM RADTKE	WI DOT
44. JAIME REYES	IA DOT

45. ROBERT ROLLEY	WI DNR
46. HOWARD ROSEN	UNIV. OF WISCONSIN - MADISON
47. BRENT RUDOLPH	MI DNR
48. JACK SHAWN	TFE GROUP
49. LEONARD SIELECKI	B.C. CANADA MINISTRY OF TRANSP.
50. LESA SKULDT	UNIVERSITY OF WI - MADISON
51. ART SMITH	SD DEPT. OF GAME, FISH & PARKS
52. RICHARD STADELMAN	WISCONSIN TOWNS ASSOCIATION
53. RICHARD STARK	WI DOT
54. WILLIE SUCHY	IA DNR
55. DAVID THOMAS	IL NATURAL HISTORY SURVEY
56. RON THOMPSON	WI DOT
57. MICHAEL TONKOVICH	OHIO DNR
58. RICK TRAVER	ABATE OF WISCONSIN
59. JAY VAN-SICKLE	NV DOT
60. GAIL WEINHOLZER	AAA MINNESOTA/IOWA
61. ROBERT WEINHOLZER	MN DOT
62. JOANN WELLS	INSURANCE INST. OF HWY. SAFETY
63. PATRICIA WHITE	DEFENDERS OF WILDLIFE
64. BOB WILKE	DVCIC BOARD MEMBER
65. BRYAN WOODBURY	WI DNR
66. JULIAN ZELAZNY	DEFENDERS OF WILDLIFE