

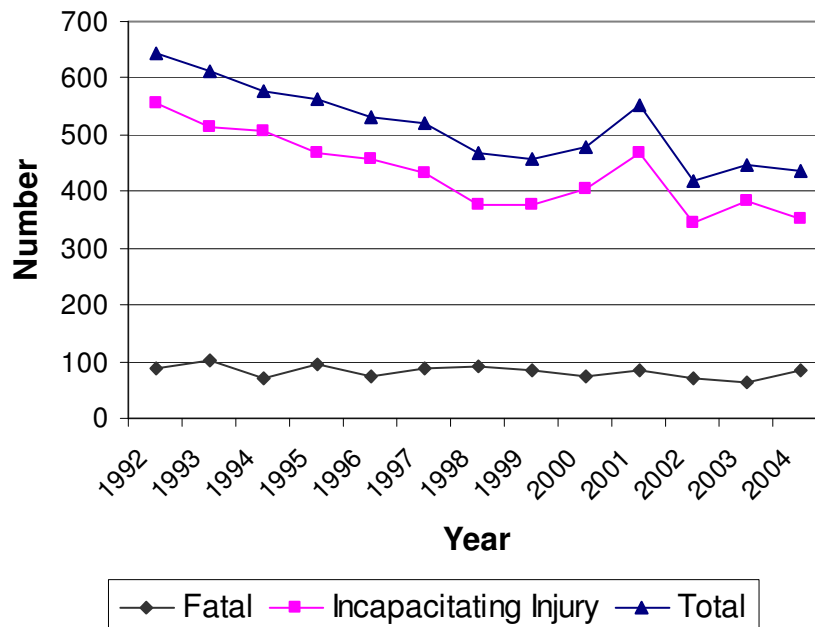
# Strategic Highway Safety Plan for Vermont

## 1. Background and Purpose

In Vermont, for the last five years, an average of 700 persons has been seriously injured and another 83 persons have been killed each year in a motor vehicle crash. The consequences to individuals, families and society are considerable. The social and economic future of any family can be forever shattered when a family member, especially the "bread winner", is killed in a traffic crash. Likewise, a business can be equally devastated with the loss of a valued employee and the potential loss of business. While the human suffering is enormous and immeasurable, the economic impact of major crashes also bears consideration. Based on National Highway Traffic Safety Administration (NHTSA) estimates, Vermont's economic losses caused by fatal and serious injury crashes were at least \$483 million in 2004.

Figure 1 displays the historical trend in crashes that resulted in fatalities and incapacitating injuries<sup>2</sup> in Vermont between 1992 and 2004. As is evident in this Figure, the total number of major crashes steadily declined between 1992 and 1999 before increasing in 2000 and 2001, declining again in 2002, and increasing somewhat again in 2003 and 2004. Overall, the total number of major crashes was substantially less in 2004 (437 crashes) than in 1992 (643 crashes), representing a 32 percent decrease in the annual number of major crashes during the time period.

**Figure 1. Vermont Major Crashes, 1992-2004**



<sup>2</sup> In this plan, crashes that result in fatalities and incapacitating injuries are referred to as "major crashes".

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Although the efforts that have been made in the past clearly contributed to the overall reduction in major crashes in Vermont over the last fifteen years, improvement has leveled off. A stronger approach is needed if we, as a State, are to make more significant gains in reducing deaths and injuries on Vermont roads.

The American Association of State Highway and Transportation Officials (AASHTO) has developed a framework for comprehensive highway safety planning that has the promise of making those significant gains beyond current numbers. This framework emphasizes addressing areas where significant reductions in crashes can be achieved through the involvement of safety stakeholders from all jurisdictions within a State. This is accomplished by evaluating the State's safety needs based on hard data and formulating and implementing countermeasures to improve safety. This framework is referred to as the Strategic Highway Safety Plan (SHSP).

The basis of the SHSP concept is the recognition that highway safety is not the responsibility of only one organization in one specific domain, but is the responsibility of many organizations in many domains. In the world of highway safety, these domains are referred to as the four E's, namely, Engineering, Education, Enforcement and Emergency Services. Also at the basis of this concept is the understanding that resources are limited and that resources should be used where the return is expected to be the greatest. AASHTO has identified twenty-two such emphasis areas where it is believed that a significant number of major crashes could be prevented. These twenty-two areas are listed in Table 1.

Currently, State, regional and local organizations have been carrying out a number of independent safety initiatives that individually have helped to reduce injuries and fatalities on highways. The Strategic Highway Safety Plan provides a detailed guide for multiple jurisdictions to collaborate on delivering safety services more efficiently and effectively and where they can make the most impact.

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**Table 1. AASHTO's 22 Emphasis Areas**

| <b>Emphasis Areas</b>              |  |
|------------------------------------|--|
| Part 1: Drivers                    | <ol style="list-style-type: none"> <li>1. Instituting Graduated Licensing for Young Drivers</li> <li>2. Ensuring Drivers are Licensed and Fully Competent</li> <li>3. Sustaining Proficiency in Older Drivers</li> <li>4. Curbing Aggressive Driving</li> <li>5. Reducing Impaired Driving</li> <li>6. Keeping Drivers Alert</li> <li>7. Increasing Driver Safety Awareness</li> <li>8. Increasing Seat Belt Use and Improving Airbag Effectiveness</li> </ol> |
| Part 2: Special Users              | <ol style="list-style-type: none"> <li>9. Making Walking and Street Crossing Easier</li> <li>10. Ensuring Safer Bicycle Travel</li> </ol>  |
| Part 3: Vehicles                   | <ol style="list-style-type: none"> <li>11. Improving Motorcycle Safety and Increasing Motorcycle Awareness</li> <li>12. Making Truck Travel Safer</li> <li>13. Increasing Safety Enhancements in Vehicles</li> </ol>   |
| Part 4: Highways                   | <ol style="list-style-type: none"> <li>14. Reducing Vehicle-Train Crashes</li> <li>15. Keeping Vehicles on the Roadway</li> <li>16. Minimizing the Consequences of Leaving the Road</li> <li>17. Improving the Design and Operation of Highway Intersections</li> <li>18. Reducing Head-On and Across-Median Crashes</li> <li>19. Designing Safer Work Zones</li> </ol>  |
| Part 5: Emergency Medical Services | <ol style="list-style-type: none"> <li>20. Enhancing Emergency Medical Capabilities to Increase Survivability</li> </ol>   |
| Part 6: Management                 | <ol style="list-style-type: none"> <li>21. Improving Information and Decision Support Systems</li> <li>22. Creating More Effective Processes and Safety Management Systems</li> </ol>  |

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Source: AASHTO Strategic Highway Safety Plan

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## 2. Vermont's SHSP Development Process

The Vermont Agency of Transportation, along with the Vermont Department of Public Safety, the Vermont Department of Education, the Vermont Department of Health and the Vermont Department of Labor coordinated the development of the Strategic Highway Safety Plan for Vermont. Because the responsibility for highway safety is spread among a large number of entities, it was the intent that this plan be developed in conjunction with other safety partners from agencies and organizations at the State, local and private sector levels.

To assure collaboration and communication, organizations responsible for highway safety in Vermont were sent a letter from the Governor inviting them to attend a kick-off meeting in December 2005 to explain the purpose of the Strategic Highway Safety Plan and to seek their opinions as to problem safety areas. The same organizations were invited in January 2006 to a second meeting, to review crash data results from the previous meeting and to organize seven task teams to develop strategies for the selected critical emphasis areas. These task teams met on a regular basis for the next several months. Organizations responsible for highway safety in Vermont were again invited in September 2006 to a meeting to finalize the set of strategies to be included in the SHSP.

The Strategic Highway Safety Plan is data driven and focuses on the four E's as well as a subset of AASHTO's 22 emphasis areas. The key elements of the Strategic Highway Safety Plan include a measurable goal, a manageable number of critical emphasis areas and a set of related critical strategies. For each critical strategy, a work plan is proposed. The work plans describe in general how a strategy will be implemented and include directions as to the time frame, the organizations involved and the performance measures sought. An action plan is the tool used to implement a work plan (two examples are presented in appendix A. More will be prepared as part of the implementation phase and will be available on the website - <http://highwaysafety.vermont.gov/>). An action plan is specific to an individual organization and explains how and when the organization will implement the assigned strategies. The final implementation of a strategy is the responsibility of an individual organization.

### 2.1 Management & Oversight Structure

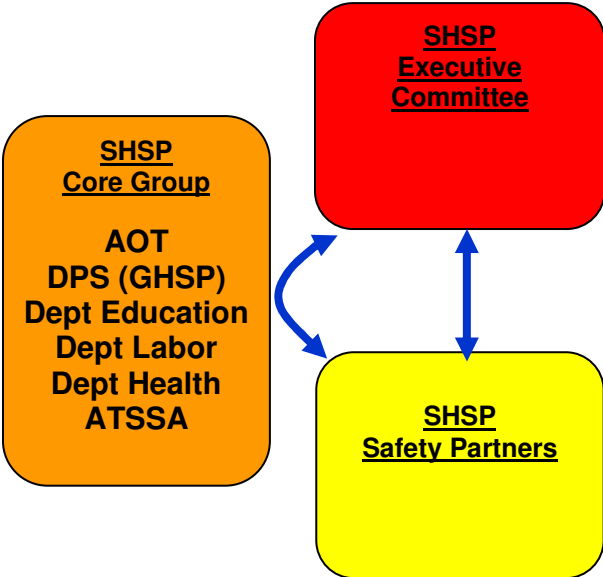
Top management's support for safety planning is critical to ensure consistent and comprehensive plan development and successful implementation. For this reason, the safety planning structure illustrated in Figure 2 is being followed for the development and implementation of the SHSP. This structure involves three principal groups, namely, an Executive Committee, a Core Group, and the Safety Partners.

The **Executive Committee** provides overall direction to the plan development and makes key decisions. This committee is primarily composed of the leaders of the following State Agencies and Departments: Agency of Transportation, Public Safety, Education, Health and Labor. Membership on this committee is open to other leaders of groupings of safety partner organizations (e.g., Chiefs of Police Association).

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The **Core Group** is composed of the Vermont Agency of Transportation, the Governor's Highway Safety Program, the American Traffic Safety Services Association and the Vermont Departments of Education, Health, and Labor. The Federal Highway Administration is also participating in an advisory role. This group provides the continued overall management of the plan development and implementation. They interact directly with the Executive Committee and the Safety Partners.

**Figure 2. Management & Oversight Structure**



The **Safety Partners** guide the technical work of the process, including developing goals, objectives, and alternatives. This group is composed of all the individuals from all the safety related organizations that have volunteered to participate in the development of the Strategic Highway Safety Plan. Safety Partners are further divided into Task Teams, one for each of the critical emphasis areas.

These **Task Teams** are composed of individuals from a diverse group of safety partners and are responsible for developing strategies and work plans. Table 2 lists, for each Task Team, the names of the organizations that have participated in the development of the plan.

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**Table 2. Distribution of Safety Partners among the 7 Task Teams**

**Curbing Speeding and Aggressive Driving**

Governor's Highway Safety Program  
Burlington Police Department  
Department of Motor Vehicles Enforcement  
Rutland County Sheriff's Department  
Vermont Criminal Justice Training Council  
South Burlington Police Department  
Vermont State Police  
VT Department of Labor

**Reducing Impaired Driving**

Department of Motor Vehicles  
Dept of Disabilities Traumatic Brain Injury  
Governor's Highway Safety Program  
State's Attorney's Dept  
VDH/ADAP/Project Crash  
VAOT Traffic Operations  
Essex Police Department  
Department of Corrections

**Improving Design/Operation of Intersections**

American Traffic Safety Services Association  
Vermont State Police  
VAOT Traffic Design  
Stowe Public Works  
VAOT Safe Routes to School  
VAOT Materials and Research  
VAOT Maintenance District 7  
CCMPO  
Co-Operative Insurance Company

**Keeping Drivers Alert**

VAOT Roadway Design  
Federal Motor Carrier Safety Administration  
Addison County RPC  
Central Vermont RPC  
Lamoille County RPC  
VT Department of Labor

**Keeping Vehicles on the Roadway**

VAOT Traffic Operations  
VAOT Maintenance District 7  
Barre Town Public Works  
American Traffic Safety Services Association  
Hinesburg Town Administrator

**Increasing Seat Belt Use**

VT Department of Education  
VT Department of Labor  
Governor's Highway Safety Program  
VT State Police  
Springfield Police Department

**Improving Young Driver Safety**

Rutland Police Department  
Mt. Mansfield Union High School Drivers Ed  
Co-Operative Insurance Company  
VAOT Highway Research  
VT EMS

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## 2.2 Mission and Overall Goal

The mission statement of the Strategic Highway Safety Plan provides directions for the development of the governing goal and the selection of strategies and formulation of action plans.

**The mission of the Vermont Strategic Highway Safety Plan is to minimize the occurrence and severity of crashes, related human suffering and economic losses on the Vermont transportation network. We will accomplish this by identifying and implementing achievable and effective education, enforcement, engineering, and emergency response initiatives.**

To make significant progress in achieving the mission statement, the governing goal of the Strategic Highway Safety Plan must be specific and be expressed in terms of reductions in both the number of fatal and serious injury crashes and the number of fatalities and serious injuries to be attained in a given time period. As such, collectively, efforts generated through the Strategic Highway Safety Plan will achieve the following target goal:

**The Vermont Strategic Highway Safety Plan will reduce the number of major crashes to 350 or fewer each year by 2010 resulting in 40 fewer fatalities and 26 fewer incapacitating injuries per year compared to 2004 levels.**

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## 3. Prioritization of AASHTO's Emphasis Areas

The list of 22 emphasis areas proposed by AASHTO is a comprehensive list of the areas that offer the most opportunities for improving road safety. The purpose of prioritizing this list of 22 emphasis areas is to identify the specific set of areas that offers the greatest potential for reducing major crashes in Vermont. To successfully achieve the goal of the Strategic Highway Safety Plan, this set of areas must be manageable in number due to limited resources. Accordingly, based on the guidance of peers from other States and AASHTO, the Core Group decided to identify five to seven critical emphasis areas.

To assist in the determination of these areas, two methods were followed. One involved comparing the 22 emphasis areas to Vermont crash data while the other method sought the opinions of all safety partners.

### 3.1 Prioritization Using Vermont Crash Data

Vermont crash data for the five most recent available years at the time of analysis (March 2006) was evaluated with respect to the 22 emphasis areas. The crash data used represented all the crash reports that were submitted by law enforcement agencies to the Vermont Department of Motor Vehicles during the period of interest. The Vermont Center for Justice Research (VCJR) was retained to quantify the magnitude of the problem for each of the emphasis areas by identifying historical trends for the five-year period covering 1999 to 2003.

For this five-year period, the number of major crashes totaled 2,354, with 377 fatal crashes and 1,977 incapacitating injury crashes while the total number of fatalities and incapacitating injuries was 3,028.

Table 3 provides a summary of the number and the percentages of major crashes for the 22 emphasis areas. In this table, whenever an emphasis area could not be characterized by crash data, the letters "NA" are displayed next to the emphasis area. In the case of seat belt use, the percentage shown is based on person injuries and fatalities and represents the occupants who were killed, or were seriously injured, while not using a restraint device. The percentages shown in bold represent the emphasis areas with the the largest proportions of major crashes.

From this table, four characteristics stand out in their relatively strong associations with crashes that resulted in fatalities and incapacitating injuries. These areas include keeping vehicles on the roadway (38 percent of major crashes); driver under the age of 21 (27 percent of major crashes); crashes at intersections (25 percent of major crashes); and vehicle occupants fatally/severely injured not wearing a restraint device (24 percent of total fatalities/severe injuries). Three additional areas represent smaller but still sizable percentages of crashes: alcohol-related crashes (19 percent of crashes); crashes involving speeding and aggressive driving (15 percent of major crashes); and inattention (14 percent of major crashes). Five of the above areas focus primarily on driver behavior while the other two focus on road characteristics.

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**Table 3. Summary of Major Crashes by Emphasis Areas, 1999-2003**

|                                       | <b>Emphasis Areas</b>  | <b>Vermont Major Crashes</b>  | <b>Percent</b> |
|---------------------------------------|--|---|----------------|
| Part 1:<br>Drivers                    | 1. Instituting Graduated Licensing for Young Drivers           | 636 major crashes involved a driver under the age of 21 (out of 2,354 major crashes)  | <b>27%</b>     |
|                                       | 2. Ensuring Drivers are Licensed and Fully Competent           | 127 Citations for DLS/operating with no license (out of 2,354 major crashes)  | 5%             |
|                                       | 3. Sustaining Proficiency in Older Drivers                     | 164 major crashes involved a driver between the ages of 65 and 74   | 7%             |
|                                       |  | 153 major crashes involved a driver over the age of 74  | 6%             |
|                                       | 4. Curbing Aggressive Driving                                  | 347 major crashes listed excessive speed, following too closely or driving in erratic, reckless or aggressive manner as a contributing factor | <b>15%</b>     |
|                                       | 5. Reducing Impaired Driving                                   | 439 major crashes were alcohol related  | <b>19%</b>     |
|                                       | 6. Keeping Drivers Alert                                       | 336 major crashes listed inattention or fatigued, asleep as a contributing factor   | <b>14%</b>     |
|                                       |  | 84 major crashes listed driver's condition as fell asleep, fatigued, etc  | 4%             |
| 7. Increasing Driver Safety Awareness | -NA-   |   |                |
| Part 2:<br>Special Users              | 8. Increasing Seat Belt Use and Improving Airbag Effectiveness | 739 vehicle occupants fatally/severely injured (out of 3,028 total fatalities/severe injuries) were not using a restraint device              | <b>24%</b>     |
|                                       | 9. Making Walking and Street Crossing Easier                   | 160 major crashes involved pedestrians  | 7%             |
|                                       | 10. Ensuring Safer Bicycle Travel                              | 48 major crashes involved bicyclists  | 2%             |

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**Table 3. Summary of Major Crashes by Emphasis Areas, 1999-2003**

|                       | <b>Emphasis Areas</b>  | <b>Vermont Major Crashes</b>   | <b>Percent</b> |
|-----------------------|--|--|----------------|
| Part 3:<br>Vehicles   | 11. Improving Motorcycle Safety and Increasing Motorcycle Awareness    | 205 major crashes involving motorcycles  | 9%             |
|                       | 12. Making Truck Travel Safer and Fully Competent                      | 176 major crashes involving heavy trucks   | 7%             |
|                       | 13. Increasing Safety Enhancements in Vehicles                         | -NA-   |                |
| Part 4:<br>Highways   | 14. Reducing Vehicle-Train Crashes                                     | 1 major crash involving a collision with a train   | 0%             |
|                       | 15. Keeping Vehicles on the Roadway                                    | 901 major crashes involving running off the road   | <b>38%</b>     |
|                       | 16. Minimizing the Consequences of Leaving the Road                    | Major run-off the road crashes<br>- Overturned (27.0%)<br>- Collision with tree/large bush (26.9%)<br>- Collision with pole/sign (13.3%)<br>- Collision with guard rail/curb (12.7%)<br>- Collision with other fixed object (12.3%)<br>- Collision with ledge/boulder (7.8%) |                |
|                       | 17. Improving the Design and Operation of Highway Intersections        | 580 major crashes at an intersection   | <b>25%</b>     |
|                       | 18. Reducing Head-on Crashes   | 280 major head-on crashes  | 12%            |
|                       | 19. Designing Safer Work Zones   | 14 major crashes in work zones   | 1%             |
|                       | 20. Enhancing Emergency Medical Capabilities to Increase Survivability | -NA-   |                |
| Part 6:<br>Management | 21. Improving Information and Decision Support Systems                 | -NA-   |                |
|                       | 22. Creating More Effective Processes and Safety Management Systems    | -NA-   |                |

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## 3.2 Prioritization by Vermont Safety Partners

A workshop to kick-off the plan development process was held on December 12, 2005. Over 100 safety partners from 63 different public and private organizations attended this kick-off meeting.

The purpose of the meeting was to invite safety partners to work together towards reducing fatal and serious injury crashes. A large part of the meeting was spent introducing the strategic highway safety planning process to safety partners and to present the results of the data analysis described in the previous section. In the afternoon, participants were divided into small groups to discuss AASHTO's 22 emphasis areas. At the end of the group discussions, each participant selected three critical emphasis areas that he or she felt were the most important areas for reducing major crashes in Vermont. Table 4 presents the results of this prioritization process for all 22 emphasis areas, with the percentages in bold representing the emphasis areas that received the most votes. A review of this table indicates that the elements identified by the safety partners as being most likely to have a significant effect on the number of major crashes in Vermont corresponded to the same emphasis areas identified in Task 1 of the data analysis.

**Table 4. Safety Partners' Priorities by Emphasis Areas**

|                    | <b>Emphasis Areas</b>  | <b>Votes<br/>(Percent)</b> |
|--------------------|--|----------------------------|
| Part 1:<br>Drivers | 1. Instituting Graduated Licensing for Young Drivers           | <b>9%</b>                  |
|                    | 2. Ensuring Drivers are Licensed and Fully Competent           | 4%                         |
|                    | 3. Sustaining Proficiency in Older Drivers                     | 0%                         |
|                    | 4. Curbing Aggressive Driving                                  | <b>16%</b>                 |
|                    | 5. Reducing Impaired Driving                                   | <b>13%</b>                 |
|                    | 6. Keeping Drivers Alert                                       | <b>6%</b>                  |
|                    | 7. Increasing Driver Safety Awareness                          | 2%                         |
|                    | 8. Increasing Seat Belt Use and Improving Airbag Effectiveness | <b>17%</b>                 |
| Part 2:            | 9. Making Walking and Street Crossing                          | 1%                         |

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**Table 4. Safety Partners' Priorities by Emphasis Areas**

| Emphasis Areas        |  | Votes<br>(Percent) |
|-----------------------|--|--------------------|
| Special Users         | Easier   |                    |
|                       | 10. Ensuring Safer Bicycle Travel                                      | 0%                 |
| Part 3:<br>Vehicles   | 11. Improving Motorcycle Safety and Increasing Motorcycle Awareness    | 3%                 |
|                       | 12. Making Truck Travel Safer and Fully Competent                      | 1%                 |
|                       | 13. Increasing Safety Enhancements in Vehicles                         | 0%                 |
| Part 4:<br>Highways   | 14. Reducing Vehicle-Train Crashes                                     | 0%                 |
|                       | 15. Keeping Vehicles on the Roadway                                    | 9%                 |
|                       | 16. Minimizing the Consequences of Leaving the Road                    | 3%                 |
|                       | 17. Improving the Design and Operation of Highway Intersections        | 10%                |
|                       | 18. Reducing Head-on Crashes   | 2%                 |
|                       | 19. Designing Safer Work Zones   | 1%                 |
| Part 5: EMS           | 20. Enhancing Emergency Medical Capabilities to Increase Survivability | 0%                 |
| Part 6:<br>Management | 21. Improving Information and Decision Support Systems                 | 0%                 |
|                       | 22. Creating More Effective Processes and Safety Management Systems    | 0%                 |

## 3.3 Selected Critical Emphasis Areas for Vermont

To establish the set of critical emphasis areas that will serve as the focus of the Strategic Highway Safety Plan for Vermont, the Core Group reviewed the information obtained from the two prioritization methods performed. Table 5 summarizes this information for the top seven emphasis areas from each method. As can be seen, the two prioritization methods generated the same list of critical emphasis areas. Consequently, the emphasis

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areas listed in this table represent the critical emphasis areas selected for the initial phase of the Vermont Strategic Highway Safety Plan. Note that, in this table, the critical emphasis areas are ranked in descending order of their percentages of major crashes.

**Table 5. Critical Emphasis Areas Selected for Vermont**

| <b>Emphasis Areas</b>   | <b>Vermont Major Crashes</b>                            | <b>Major Crashes (Percent)</b> | <b>Partners' Votes (Percent)</b> |
|---|---|--------------------------------|----------------------------------|
| Keeping Vehicles on the Roadway & Minimizing the Consequences of Leaving the Road | Vehicles leaving the road                               | 38%                            | 12%                              |
| Young Drivers   | Drivers under the age of 21                             | 27%                            | 9%                               |
| Improving the Design and Operation of Highway Intersections                       | Crashes at intersection                                 | 25%                            | 10%                              |
| Increasing Seat Belt Use & Improving Airbag Effectiveness                         | Vehicle occupants fatally/severely injured unrestrained | 24%*                           | 17%                              |
| Reducing Impaired Driving   | Alcohol related   | 19%                            | 13%                              |
| Curbing Speeding and Aggressive Driving   | Aggressive driving                                      | 15%                            | 16%                              |
| Keeping Drivers Alert   | Inattention   | 14%                            | 6%                               |

\*Percent based upon total fatalities/severe injuries

Table 5 identified broadly the type of major crashes affected by each of the seven critical emphasis areas. More specifically, the definitions listed below, as they relate to the Uniform Crash Reporting Form, are used to describe the seven emphasis areas.

**Keeping Vehicles on the Roadway** includes the major crashes in which a vehicle ran off the road and/or overturned and/or collided with a tree, a pole or a sign, a guardrail, ledge or boulder or any other fixed object.

**Improving Young Driver Safety** includes the major crashes in which drivers were under 21 years of age and that resulted in fatal or incapacitating injuries.

**Improving Design/Operation of Intersections** includes the crashes that took place at an intersection and that resulted in fatal or incapacitating injuries.

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**Increasing Seat Belt Use** includes the crashes in which vehicle occupants who were not using a restraint, such as shoulder and lap belt, shoulder belt only, lap belt only, child safety restraint and/or airbag, suffered fatal or incapacitating injuries.

**Reducing Impaired Driving** includes the major crashes resulting in fatal or incapacitating injuries and for which the crash reports indicated that at least one driver was operating under the influence of medicine, drugs or alcohol or had been drinking; and/or that a driver was cited for DUI, and/or that the BAC or drug test result was positive.

**Curbing Speeding and Aggressive Driving** includes the major crashes that resulted in fatal or incapacitating injuries and in which at least one of the drivers was reported to either have driven at an excessive speed, followed too closely or driven erratically, recklessly or in an aggressive manner.

**Keeping Drivers Alert** includes the major crashes that resulted in fatal or incapacitating injuries in which a “contributing circumstance” to the crash was, for at least one of the drivers, inattention, being distracted, being fatigued or asleep. This CEA also includes the major crashes in which the crash reports listed, for at least one of the drivers, fell asleep or fatigued as an “apparent operator condition”.