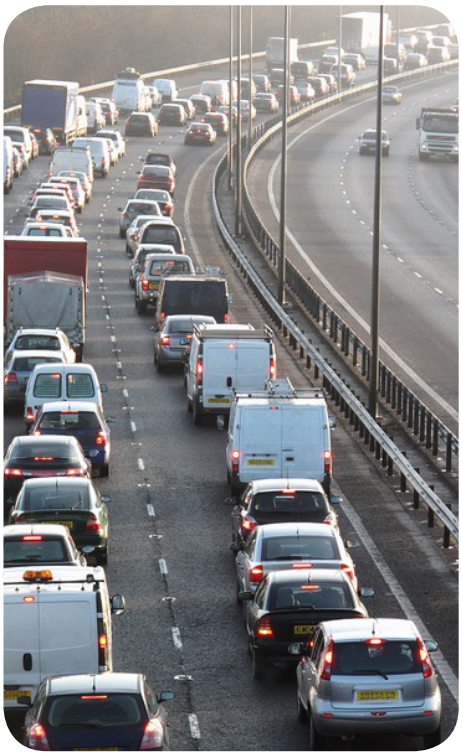
Spring 2010

Safe Highway matters

A Platform for Safety Service Patrol Programs

Secondary Highway Incidents:

Assessing the Effectiveness of Safety Service Patrols



By Susan Kristoff

The logic seems clear: Mitigating the impact of accidents and incidents would seem to reduce secondary accidents and incidents, but how do we really know this? And, just how effective are Safety Service Patrols in reducing secondary accidents? To answer these questions, we turn to those who have measured cost benefits of Safety Service Patrols to see how the "prevention of an occurrence" is treated.

Benefits of Safety Service Patrols

According to Lance Dougald of the Virginia Transportation Research Council: "Virginian taxpayers' investment in these Safety Service Patrols pays a five-fold return not just in cost, but also in congestion reduction, customer service improvements and safety enhancements. The Safety Service Patrols also help prevent secondary accidents, saving additional delays and saving lives." Dougald's statement is based on a cost-benefit analysis that the Virginia DOT performed to examine the benefits of one of its service patrol programs.[1]

Similarly, a study of Florida's Road Ranger patrol program found that "the benefit-cost ratio of the entire Road Ranger program is estimated to be in excess of 25:1."[2] These benefits are measured in terms of "reduced delays, fuel consumption, air pollution, increased safety, and security."

In a study performed by Gang-Len Chang of the University of Maryland, secondary incident research was based on a static threshold; that is an incident occurring within a specific time after a primary incident, and within a certain distance of the primary incident.[4] The variables were expected to change depending on location, weather, season, etc..

Based on these standards, the study found that there was a 28.71% reduction of primary incident duration due to Safety Service Patrols and emergency services response, which would theoretically result in the reduction of secondary incidents. However, this result is theoretical, and does not provide a clear picture of how secondary incidents are truly affected by Safety Service Patrols.

Despite the published success of these examples, the vast majority of organizations could not quantify the benefits of their service patrols directly

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Profile: Harvey L. Heaton

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What gave rise to the launch of the FSP in Hawaii this past June?

Hawaii Department of Transportation (HDOT) began planning for implementing an FSP program a number of years ago. Interest in FSP is based on cost-benefits realized by other areas, reduction in congestion, safety improvements and the reduction in secondary crashes.

What is the source of the "pilot" funds and how long will the pilot last?

HDOT secured a Federal funding of $3.51 million and the state of Hawaii contributed $390,000 for the two-year demonstration project.

What are the criteria for evaluating the pilot?

A consultant for HDOT will use a performance measures model designed by UC Berkeley's Partners for Advance Transit and Highway (PATH) to evaluate the FSP program. PATH worked with California DOT (Caltrans) to create this model for determining the benefit to cost ratios for specific FSP routes. The California statewide FSP average Benefit to Cost ratio is about 8 to 1.

In developing the FSP program, what different business models did you consider?

The Hawaii FSP program is largely based upon the California FSP model. This model has proven very successful for rapid detection and quick clearance of freeway incidents. It requires the FSP trucks to continually roam the

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in terms of the reduction of secondary incidents. Paul Jodoin, Traffic Incident Management Program Manager, of the FHWA Office of Transportation Emergency Transportation Operations Traffic Incident Management Team explained: "We don't have any definitive numbers on the topic. The assumption

exists that service patrols can help with reducing secondary incidents because one of their duties, for most service patrols, but not all, is to provide traffic control, and the better the traffic control, the more apt you are to reduce secondary incidents. Safety Service Patrols by the nature of their role are often in a position to arrive at an incident scene quickly to enable early safety protection and traffic control which helps to prevent another related incident."

The FHWA also noted that its self-assessment tool showed that in 2009 less than 10% of the TIM respondents were able to accurately track the performance of TIM teams in reducing secondary incidents. [3] Safety Service Patrols are a subset of these TIM Teams. Part of the problem was finding a precise definition of 'secondary incidents.'

Categorizing Secondary Incidents

In 2005 the FHWA established the Traffic Incident Management Performance Measures Focus States Initiative (TIM PM FSI), eleven states which engaged to define incident management performance measures and conduct field tests. The final report published in December 2009 revealed difficulties in coming to a consensus on the precise definition of secondary accidents. While there is consensus that secondary accidents occur in proximity of time and space to a primary incident, concerns were raised that "if responders had properly handled a primary incident, the secondary incident would not have occurred; therefore, the secondary incident is the direct responsibility of the responders."[5]

Other issues discussed by participants while formulating a definition of secondary incidents included whether or not incidents that occurred during recurring congestion were secondary and specifically whether or not rear-end crashes should be filtered out in order to avoid overstatement of the number of secondary incidents.

Participants concluded that incidents occurring during recurring congestion were not secondary. Also, rear-end collisions that occur when a roadway is at or above capacity should not be classified as secondary incidents even if they occur within proximity of a primary accident. Only rear-end crashes that occur within proximity to a primary incident when roadways are at less than capacity would be classified as a secondary incidents.

Participants also considered the need to define time or distance metrics in relation to the primary incident and the need to provide training to incident responders on how to identify a secondary incident. While the time or distance was not defined, one state suggested that secondary incidents "are defined as incidents that occur within 2 miles and/or 2 hours of a primary incident. The State also indicated that incidents occurring within one-half mile and/or one-half hour of a primary crash in the opposite direction are also considered secondary."[6] This suggestion, however, was never agreed upon entirely. All states did agree, however, that training of first responders would be necessary in order to secure accurate categorization of secondary incidents.

After these careful considerations, the eleven states agreed upon the following definition:

> *Secondary incidents are unplanned incidents (starting at the time of detection) for which a response or intervention is taken, where a collision occurs either a) within the incident scene or b) within the queue (which could include the opposite direction) resulting from the original incidents.*[7]

The FHWA backs this definition as the standard national definition for secondary incidents. It was determined that a follow-up study would be necessary to conduct field tests on the reduction in the number of secondary incidents.

New Methods of Categorization

According to a report by Karlaftis et al., "the likelihood of a secondary crash increases by 2.8% for each minute the primary incident continues to be a hazard."[8] In a study performed by the University of Missouri – Columbia and the Midwest Transportation Consortium, researchers have proposed a new methodology for categorizing secondary incidents.[9] The researchers in this study used extensive traffic alert data from the St. Louis, Missouri area and found that the static threshold methodology mistakenly categorized up to 30% of the accidents as either false positives or false negatives. The

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researchers proposed a dynamic threshold that more accurately categorized incidents as primary or secondary incidents.

According to the conclusions of the study, if transportation agencies do not have exact categorization for each incident that occurs, they can "utilize the existing [progression incident] curves [i.e. parabolic-shaped curves showing the variation of queue length throughout an incident] to estimate the number of secondary accidents occurring in a given year. This information can help evaluate the safety performance of the agencies' incident management systems or other transportation systems." These curves can also help agencies categorize the incidents that they do have data on more accurately.

As of today, agencies still primarily rely on the static threshold model to measure the effectiveness of Traffic Incident Management teams in reducing secondary incidents. This will not likely change until the conclusion of the FHWA Traffic Incident Management (TIM) Incident-Performance Metric Adoption Campaign Study due out in October 2012. The study aims to "develop and implement an outreach, adoption and data collection program over a three-year period" and to "define issues and analyze practices for 'Secondary Crashes' so that these statistics may be uniformly defined and collected during the subsequent study" of the top 40 metropolitan areas and their resident states.[10] The end goal of these studies is to propose an annual systematic method that will maintain these statistics and measure the effectiveness of TIM programs in the top 40 metro areas.

Once there is universal acceptance of a definition and corresponding measuring parameters, jurisdictions can apply them and compare incident reports. According to FHWA's Paul Jodoin: "Once we get a handle on gathering data on secondary accidents in general and if it's showing that those areas across the country with service patrols have fewer secondary accidents, then we can point our fingers at that and show a connection between the two. However, it may be years before we can identify an exact connection [between secondary incidents and Service Patrols]."

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1 http://vtrc.virginiadot.org/PubDetails.aspx?PubNo=07-R33
2 http://www.dot.state.fl.us/research-Center/Completed_Proj/Summary_TE/FDOT_BD544_14_rpt.pdf
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5 Owens, Nicholas, et al., Federal Highway Administration Focus States Initiative: Traffic Incident Management Performance Measures Final Report, December 2009
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7 ibid.
8 Karlaftis, Latoski, Richards, Sinha: "ITS Impacts on Safety and Traffic Management: An Investigation of Secondary Crash Causes," ITS Journal, 1999, Vol. 5, pp.39-52.
9 http://www.intrans.iastate.edu/mtc/reports/secondary-accidents.pdf
10 Vasconez, Kimberly C., Federal Highway Administration Scope of Work: Traffic Incident Management (TIM) Incident-Performance Metric Adoption Campaign, October 2009

Driver Question of the Quarter

What "trick of the trade" does your patrol utilize?

"For years we have been using inflatable kiddie pools when dealing with hazardous spills. Wedging these inflated pools under leaking vehicles has been an effective way to contain fluid from putting other motorists in danger. Additionally, the kiddie pools don't take up too much space, so they are easy to store in the trucks."

-Gary Millsaps, Georgia DOT

"The Illinois DOT Emergency Traffic Patrol (ETP) uses an aggressive posture with safe quick clearance techniques. Our drivers have been trained by Wreckmaster, a premier towing and recovery trainer. Using the information learned from this course, our Minutemen can safely and quickly hookup to disabled and wrecked vehicles using our medium-duty, fully hydraulic wheel lift towing system."

-Jim McKay, Illinois DOT

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designated FSP freeway routes. More than 80% of stranded motorists and traffic collisions are located within the zero to 10 minute range of occurrence.

The Hawaii FSP program uses conventional light/medium duty tow trucks for this project. The tow trucks were designed & built to provide low maintenance long-term service for four years or more. Each truck accrues an average monthly mileage of about 5,900 miles and patrols approximately 36 miles of Honolulu freeways.

The project's Standard Operating Procedures (SOP) manual was developed from a blend of the best practices/policies and procedures used in FSP programs in California, Florida and Northern Virginia.

Hawaii is a unique state in so many ways. Is there anything that is especially unique or distinctive about the nature of the HFSP?

The HDOT contract required light bars and arrow boards mounted on the FSP tow trucks. Telvent Farradyne chose a combination light bar and arrow board rather than two distinctive units. These combination units offer superior emergency lighting performance and an effective arrow board in one compact unit.

In addition, the HDOT contract also required the FSP tow trucks be equipped with a Global Positioning Satellite system to track the movements of the trucks. Telvent Farradyne chose the Track Star® GPS system manufactured by Transportation Information Systems, Inc.. These GPS units provide "real time" information, i.e., FSP tow truck direction, speed and position. Our FSP dispatcher monitors the movements of the tow trucks and redirects the FSP tow trucks to ensure even freeway coverage and selecting the closest truck(s) for motorist assists and accidents. The traffic data from motorist assists and accidents are being collected using PDAs and our FSP dispatcher log.

This GPS system is currently being enhanced to also collect data that includes time of incident and lat/long locations every time the arrow boards are activated. Once this new system is up and running we will discontinue using the PDAs and coordinate all data collected using the GPS system and our FSP dispatcher log.

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Profile: Harvey L. Heaton... continued from page 3

How has your previous work at the California Highway Patrol (CHP) as the FSP manager influenced the Hawaii FSP Pilot program?

My previous 31-year work experience with the CHP has been invaluable with setting up and managing the Hawaii FSP project.

My first 16 years with CHP was spent as a field officer and sergeant. I thought I knew a lot about Traffic Incident Management (TIM). However, it wasn't until I took over the statewide FSP program in California that I realized TIM was much more complex than my previous field experience had taught me.

My last ten years of my CHP career was spent managing the statewide FSP program. (California's 13 regional FSP programs daily deploy about 350 tow trucks.) In this capacity I worked alongside Caltrans, regional transportation management agencies, first responder management groups and the California towing industry.

The towing industry is one of the most complex entities to work with and many times overlooked and/or discounted by the general first responder community. In a number of states towing groups have stated that FSP has improved the image of the towing industry.

Many times the towing community has been excluded, rather than included in the general TIM planning process. I feel this is a big mistake since towing plays a significant role in most TIM operations.

What do you wish others would, but don't seem to, understand about highway safety?

At times some may lose sight of the big picture with TIM. That is, ensuring the safety of all motorists in and around incidents on the freeways. Our true beneficiaries of FSP are all those motorists who are not impeded by traffic-related incidents due to FSP's quick response and clearance. When this occurs we have done our job correctly.

All too many times the focus is on the primary victims of incidents and not the other motorist (secondary victims) who are also negatively impacted by the initial incidents.

Secondary victims must be a strong consideration in any TIM planning process. In addition to the delay factor, these motorists are also exposed to becoming involved in secondary collisions, which can be more severe than the original traffic incidents.

Progressive states have implemented procedures that take into account the plight of these secondary victims by establishing policies for mitigating incidents quickly. Tow trucks rather than utility pickup trucks expedite removal and relocation of stranded and accident-involved vehicles.

What are the most important qualities and skills required for Hawaii FSP drivers?

Hawaii FSP drivers are the main ingredient for sustaining a successful FSP program. FSP driver applicants that express their desire to help people are an important quality not to be overlooked.

Spending the required time and money to thoroughly interview and train the drivers pays big dividends down the road so to speak. When FSP drivers come in from their shifts, I listen to them explain how they have applied what they have been taught. Also, I take note of their enthusiasm for the job they are performing and watch their dedication grow as each day passes.

What kind of training do the Hawaii FSP drivers receive?

Our minimum hiring age is 25 and all drivers are required to be CDL licensed. My experience has shown that mature drivers are more likely to stay with the program and provide better services to the public.

The first week of our four-week training course is spent in the classroom where they are taught the FSP policies and procedures outlined in our SOP, advance traffic control techniques, safe driving practices, First Aid (including CPR and Automated External Deliberator device), HazMat recognition and basic fire extinguisher use.

Following the classroom training, the FSP driver trainees begin tow truck operations training. They are given a proficiency test at the end of this training period to ensure they are ready to go on the road by themselves.

What would you like other states to know about Hawaii's FSP?

In our planning and progress meetings with HDOT and briefings with our FSP drivers and dispatchers, we continually discuss the need for flexibility and adaptability when changes are needed to improve service and safety to the public.

HDOT and Telvent Farradyne are committed to providing the best possible FSP program in the country.

The Hawaiian community has fully embraced the Hawaii FSP program. Feedback from our assisted motorist survey cards indicate that many express their sincere appreciation for the FSP services being provided and want the program to remain and even expand. We are currently receiving survey cards with an average of 93% excellent service rating from assisted motorists.

Even though the motoring public experiences many services provided by HDOT, when they are personally assisted and even saved from the perils of being stranded on the freeway, they express how their tax dollars are being used wisely.

What would you like to know about other states' safety service patrols?

In this severe economic climate, how have the other state's FSP programs been affected? If other states' FSPs have been forced to reduce services, what criteria were used by these other states to continue to provide optimum services?

News & Notes

Road Ranger Helps Resolve Silver Alert!

Congratulations to Richard Roberts, a Florida Department of Transportation District Four Road Ranger, for his contribution in resolving a Silver Alert. A Silver Alert is similar to an AMBER Alert, but meant to broadcast vehicle information of a missing elderly person who suffers from irreversible deterioration of intellectual faculties. Thanks to his hard work and cooperation with Transportation Management Center operators, Mr. Roberts was able to quickly locate the missing person and coordinate with the Florida Highway Patrol to return him home safely.

ILDOT Reduces Clearance Times!

On Chicago urban expressways, clearance times for major incidents, involving serious injuries and fatalities, have been reduced from four to six hours to less than two hours. A critical factor in this is the high level of experience among the Illinois Department of Transportation Minuteman personnel and professional equipment used. In order to aid state police, Emergency Traffic Patrol (ETP) maintains a Total Station survey instrument so that law enforcement may immediately begin accident reconstruction efforts without the need to drive their own instrumentation from long distances costing valuable time to the clearance efforts.

Michigan DOT Adds Arrow Boards!

Michigan DOT's Freeway Courtesy Patrol recently installed lit arrow boards on the tops of patrol vehicles to aid in traffic control during incidents requiring lane closures.

CDOT Great Motorist Comment!

"I'm writing to provide my comments on the I-70 West Courtesy Patrol Program and to provide praise for Jason, who rescued us when our car broke down yesterday. Jason informed us that my car was sitting in a dangerous spot under a cliff that was known to have frequent falling rocks, and he quickly towed my car to safety in Silver Plume. Throughout our interaction with Jason, he was professional, courteous and friendly." Provided by CDOT.

Road Rangers Launch Billboard Safety Campaign!

OOCEA launched a Road Ranger billboard safety campaign in mid-April. It focuses on changing lanes for safety, underscoring courtesy and safety. Several billboards will be scattered throughout the OOCEA system carrying the messages for a year. There are four different art pieces displayed.

Bay Area FSP Tracks Comments Online!

California's Bay Area FSP hosts a website for motorists to visit and share their comments about the FSP and its services. Motorists are invited to submit and/or view other comments left by assisted motorists. The website even highlights key terms in larger red font that express the importance of the service. Some phrases currently highlighted on the page include "it was like having an angel stopping by to help us," "swiftly came to my aid and first made sure that I was emotionally okay" and "knowing that this service is available, I feel safer with my two little kids on the freeway." See the page at http://www.fsp-bayarea.org/comments.htm.

Law at a Glance

"Good Samaritan"

Safety Service Patrol drivers are often the first responders to emergency situations that arise along America's highways. The "Good Samaritan" Law aims to protect them and other first responders who help injured people during these emergency situations.

What? The "Good Samaritan" Law typically protects first responders from liability for unintentional injury or wrongful death following assistance given to another injured or ill person during an emergency situation, unless the assistance provided is deemed unreasonable or non-consensual.

Why? Due to the overwhelming tendency in the United States for civilians to pursue personal injury lawsuits, the law was designed to ensure that rescuers and bystanders could and would aid others in trouble without being fearful of an impending lawsuit.

Where? While some form of the "Good Samaritan" Law exists in all 50 states, each statute varies depending on the jurisdiction.

When? California was the first state to enact such a principle into law in 1959 when they granted immunity to doctors who give aid in emergency situations.

Who? Some states' "Good Samaritan" Laws protect all individuals who find themselves in an emergency situation where someone requires assistance, while other states' law only shield those who have completed basic first aid training and are certified by national health organizations. In some cases the "Good Samaritan" Law extends even to off-duty and volunteer first responders.

How? For more information on your state's "Good Samaritan" Law please visit: http://www.cprinstructor.com/legal.htm.

Top 5 Summer Driving Hazards

Motorists associate the winter with poor driving conditions, higher accident rates and a need to drive slow and cautiously, while the summer season brings bright skies and sunny weather, causing some motorists to throw caution to the wind and to rediscover their need for speed. Safety Service Patrol operators know this common philosophy is erroneous. Many states' patrol drivers, in fact, see an increase in traffic and motorist assists throughout the summer and for this reason, a number of states actually intensify their patrol beats, patrol hours and patrol routes in the summer.

An increase in traffic volume with motorists looking to travel more often for vacations and fun summer outings amounts to a need for escalated awareness on the road. In case motorists are not, it could be useful for patrol operators to be aware of the top five road hazards during the summer months:

1) Increased Rainfall: The snow may have melted and the sun may shine more often than not, but with the summer comes more rainfall. Motorists should be weary of hydroplaning and should check road conditions prior to embarking on their travels to be aware of flooding and road closures. Safety Service Patrol drivers who encounter motorists who have fallen victim to this hazard can remind them not to press the brakes when hydroplaning to prevent their wheels from locking.

2) Potholes: After the winter, more roads have potholes due to frozen rain and snow expanding under the road and pushing dirt and gravel out. Increased traffic and hot temperatures put even more pressure on these holes in the road. Potholes create danger for motorists, especially when traveling at high speeds. They are often the cause of a blown tire on the highway. While DOTs and toll authorities increase efforts to repave roads during the summer months, Safety Service Patrol Drivers can help by advising motorists to check their tire pressure and their tire treads prior to leaving the house.

3) Increased Road Construction: While motorists take advantage of the warm weather by taking trips to the beach, DOTs and tollway authorities associate good weather conditions with an opportunity to fix the roadways. So, once the summer months hit, roadway construction projects pop up on highways across the country. Safety Service Patrol drivers are aware that construction projects will lead to more traffic and more traffic can lead to more incidents. It's important to remind motorists to obey the rules of the road and to move over sooner rather than later when they see "Road Work Ahead" signs on the highway.

4) Cars Overheating: Engines tend to overheat more often in hot summer weather due to the increased use of car's air conditioners and the increase in temperature in the atmosphere. Safety Service Patrol drivers can recommend that motorists change their oil and check their coolant levels, radiator, cooling fan and thermostat to be sure their car will not over heat.

5) Inexperienced Drivers: Research shows that teen driver crashes and fatalities are highest during summer months. The 101 days from Memorial Day to Labor Day give teens more opportunities to drive on unknown roadways and in unfamiliar conditions. Safety Service Patrol drivers can warn motorists to stay alert and aware of other motorists on the road in order to improve the safety of all drivers.

The beautiful summer months are enjoyable, but it's best to remember that with warm weather and sunny days, motorists can forget to be cautious and be alert while driving. For this reason, a nice summer safe driving tip for motorists who require assistance could make everyone's summer a little happier and safer.

Editor's Note

We at Safe Highway Matters and SafeHighways.org would like to extend a thank you to all of our readers who contributed to this issue, as well as to those of you who provided feedback on previous issues.

The Safety Service Patrol National Chart (featured as a supplement in the previous issue and available online at SafeHighways.org) is always being updated regularly and we encourage readers to provide the most up-to-date statistics on their patrols. We received updates from NY, MD and TX over this past quarter.

Be sure to check out the recently added News & Notes section with great highlights from Connecticut, Florida, Michigan, California and Illinois! Send your "News & Notes" to elabelle@travelersmarketing.com for inclusion in the next issue of Safe Highway Matters.

An extended version of the Profile on Harvey L. Heaton, Project Manager for Hawaii's Freeway Service Patrol (FSP) Project, is available online at safehighways.org. If you are interested in answering Harvey's final questions directed at other Safety Service Patrols, please email elabelle@travelersmarketing.com or fill out the Feedback Form on our website. Your answers could be featured in the next issue of Safe Highway Matters.

Also, we'd like to extend our special thanks to Harvey Heaton, Susan Kristoff and the FHWA for their contribution to this quarter's newsletter. We are grateful for your input and assistance in creating a thoughtful, interesting and knowledgable edition.

And we'd like to congratulate Richard Roberts for a job well done on behalf of the Florida Department of Transportation. The courage and strength exhibited by SSP drivers is commendable.

Lastly, if you or someone on your team would like to be profiled in the next issue, please be sure to contact us.

Wishing you safe travels,

Rita Gallagher
Editor in Chief

About Safe Highway Matters

Safe Highway Matters and SafeHighways.org are produced by:

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47 Church Street, Suite 301
Wellesley, MA 02482
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Safe Highway Matters is published quarterly.

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