

Blank Best Practices Recognition Form

Part 1 - Project Summary

Project Title: Plan4Safety: Online Crash Analysis Software

Project Description (three sentences or less):

Developed by the Transportation Safety Resource Center (TSRC) at Rutgers' Center for Advanced Infrastructure and Transportation (CAIT) and funded by the New Jersey Department of Transportation (NJDOT), Plan4Safety is a free, web-based comprehensive crash analysis software application that helps New Jersey safety professionals and enforcement officials to accurately analyze and proactively focus on high-incident sites in their geographical areas.

The software houses every crash record, and every piece of data from New Jersey's official crash form (NJTR-1) from 2003 onward, and allows for contributing factor frequency analyses, countermeasure diagnostics, intersection analyses, GIS mapping functions linked to Google StreetView to "hone in" on crash cluster areas, a hotspot finder, and much more.

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Lead Agency for Project: Funded by

NJDOT

Participating/Cooperating Agencies (if any):

Plan4Safety was developed by TSRC, a funded program of NJDOT. The Bureau of Safety Programs (BSP) at NJDOT plays a vital role in data collection, verification, and analysis.

Which National Agenda goals apply?

Involve a leader(s) who promotes the importance of highway safety information systems, used for safety policy and program decision-making?

Mitra Fetrat, TSRC Engineering Researcher, and Carissa Sestito, TSRC Outreach Coordinator, are heavily involved in data collection and the quantitative and qualitative organization, writing, and design of New Jersey's Comprehensive Strategic Highway Safety Plan (CSHSP). TSRC's flagship program, Plan4Safety, has the ability to recognize trends and behavior-driven data by determining sequence of events.

Several emphasis areas, including engineering improvements in roadway design and intersection improvement will be included in the next edition of the CSHSP with the aid of data provided by Plan4Safety.

The New Jersey Division of Highway Traffic Safety (DHTS) has enlisted TSRC to provide data for all nine focus areas of their state Highway Safety Plan: alcohol-related crashes, young driver crashes, motorcycle crashes, pedestrian crashes, bicycle crashes, older driver crashes, speed-related crashes, distracted driver crashes, and aggressive driver crashes. Plan4Safety data shaped the report's recommended countermeasures, driving culture insights, and action items for state safety agencies to employ.

Involve the coordination of the collection, management, and use of highway safety information among various organizations responsible for highway transportation policy?

With over 2.8 million crash records in the Plan4Safety program, the vitality of the software's effectiveness thrives on accuracy. A New Jersey Bureau of Safety Programs (BSP) team is assigned solely to data collection and entry work with multiple fact-checking resources and state-of-the-art comparison software. Each crash record is then intensively scrutinized for accuracy before entry into the system.

Due to the reliability of the data, a multitude of New Jersey organizations utilize Plan4Safety to display various aspects of traffic and crash data. In particular, TSRC engineering researchers are actively performing problem identification and analyses for the 2012 DHTS Highway Safety Plan. This plan uses crash data and calculations directly from Plan4Safety to provide a tool that will allow safety professionals to make data-driven decisions in safety to mitigate safety issues in the state's road safety emphasis areas: : alcohol-related crashes, young driver crashes, motorcycle crashes, pedestrian crashes, bicycle crashes, older driver crashes, speed-related crashes, distracted driver crashes, and aggressive driver crashes.

DHTS has used *Plan4Safety* for other statewide initiatives. In 2011, TSRC performed a complete analysis on all teen crash data for the DHTS *2010 Teen Driver Report*. In 2012, TSRC will also run a complete analysis for the next iteration of the Comprehensive Strategic Highway Safety Plan (CSHSP)—or the official state safety plan, as directed by the 2005 SAFETEA-LU Act.

Represent an example of integrating the planning of highway safety programs with highway safety information systems?

According to SAFETEA-LU Act of 2005, each state in the nation is required to actively participate in creating, drafting, promoting, and adopting highway safety best practices. TSRC members have

served on this executive committee board to draft and update the first and subsequent editions of New Jersey's Comprehensive Strategic Highway Safety Plan.

Plan4Safety, in the past, has provided data on the eight emphasis areas determined by the executive committee tasked with drafting the plan: roadway departure crashes, improving intersection operation, reduce drunk driving, improve senior citizen mobility, reduce pedestrian/rail/bicyclist conflicts, and improve young driver safety. This year, Plan4Safety data will be used to update New Jersey's CSHSP.

Represent an example where managers and users of highway safety information have utilized or were provided the necessary resources to select the appropriate technology to meet their information needs?

In New Jersey, red-light running (RLR) cameras are used to deter unsafe driving behaviors. Through a data-driven application, local law enforcements can apply for RLR funds to initiate the program in their jurisdictions. Through Plan4Safety, TSRC has provided this crash data to multiple police departments around the state.

Represent examples of highway safety professionals being trained in the analytic methods appropriate for evaluation of highway safety information?

TSRC hosts several classes each month for users of Plan4Safety at our state-of-the-art facility within the CAIT laboratories. These biweekly sessions not only train engineering, enforcement, and planning safety professionals, but DHTS project award grantees for a seamless exchange of crash data information across industries and state-level organizations.

Involve the promotion and use of technical standards for characteristics of highway safety information systems, critical to the development and management of highway transportation safety programs and policies?

Additionally, TSRC provides Highway Safety Manual (HSM)-compliant training to New Jersey's metropolitan planning organizations (MPOs) to help them use the tool as a compass in officiating safety campaigns.

These MPOs use a Plan4Safety-devised ranking methodology to identify and allocate resources to regional high-risk roadway segments. To expand on this process, the Plan4Safety development team is creating HSM-compliant performance measures to help users monitor and evaluate safety efforts. These additional safety performance functions are currently under NJDOT review.

Which steps in the management process does the project support?

Plan4Safety supports each of the major steps outline in the management process of safety:

- (1) Establish Safety Goals
- (2) Identify Problems
- (3) Plan Programs/Countermeasures
- (4) Implement Programs
- (5) Monitor Program Operations
- (6) Evaluate Effectiveness.

Reference the priority in your traffic records strategic plan to which this project applies:

Extent of Project Implementation:

Beginning stages of Plan4Safety development began in 2005, with funding from NJDOT. Over the past seven years, the user base has grown from 10 traffic safety professionals to over 600. That number continues to grow exponentially as TSRC staff members actively promote and aid state, county, and local agencies in their proactive decision-making plans.

Summary of Project Benefits: What was improved, who benefited, and how?

Plan4Safety has grown from a CD-ROM database to an online crash analysis platform accessible for free by all registered public safety professionals. Since its conception, Plan4Safety has assisted in hundreds of safety plans, grant applications, engineering improvements, and TSRC-participated projects and groups. With traffic fatalities decreasing each year, Plan4Safety is helping to effect change through proactive, rather than reactive, plans in over 500 departments and agencies, including all three New Jersey metropolitan planning organizations (MPOs), the State Police, DHTS, NJDOT, the Brain Injury Association of New Jersey (BIANJ), and numerous local and county police departments. To streamline communications, federal agencies have urged state organizations to adopt HSM-compliant performance measures; the Plan4Safety team is assisting this effort through the development of HSM-compliant analysis tools and functions.

Part Two: Project Detail

Project Description:

Developed by the Transportation Safety Resource Center (TSRC) at Rutgers' Center for Advanced Infrastructure and Transportation (CAIT) and funded by the New Jersey Department of Transportation (NJDOT), Plan4Safety is a free, web-based comprehensive crash analysis software application that enables New Jersey safety professionals to accurately analyze and decide how best to focus on high-incident sites in their geographical areas.

Implementing the same methodologies that MPO and federal level safety traffic engineers utilize, Plan4Safety can easily rank high-risk areas so traffic safety professionals can more accurately and consistently budget for most-needed improvements. A "must-have" tool for anyone determining traffic safety procedures, Plan4Safety offers 144 distinct pieces of data about any given crash, including crash type, injury level, cell phone use, alcohol impairment, occupant restraints, age, gender and much more from the NJTR-1 official crash reporting form.

Receiving an average of 300,000 NJTR-1 crash records per year and integrating them into Plan4Safety effectively reduces time spent on sifting through piles of crash form paperwork collecting information. The software filters through these crash records in seconds and outputs analysis reports of areas and crash types based on user-defined parameters. Users can view analyses of incident frequency, compare crash types against other areas or other types, find clusters of crashes on state roads, and visually conceptualize cross-sections of any of the 144 data points on a functional table. Additionally, interactive GIS tools plot filter data onto a map to help traffic professionals visualize the issues at stake to help plan for future projects to improve road safety. GIS map data can be customized through a series of panning and zooming tools, as well as area and geographic markers.

Referring to the management approach to highway safety, tell how your project supports the management steps you listed in Part One:

Establish Safety Goals

Plan4Safety data shows that New Jersey roadway fatalities have dropped from 750 in 2007 to under 550 in 2011. With a continuing downward trend in pedestrian fatalities, Plan4Safety has yielded an optimistic approach toward zero fatalities in the coming years.

The primary goal of Plan4Safety is to introduce and promote the use of this crash data analysis tool to encourage data-supported, intensively analyzed transportation and safety planning decisions. The secondary, but equally important, goal is to provide a time-sensitive tool that all public safety professionals can use. Plan4Safety's interface is designed—and will continue to be optimized—for ease of use and fast and accurate crash data results.

Identify Problems

By using Plan4Safety to identify high-risk crash areas, safety professionals can make the necessary improvements and reduce vehicular incidents overall. Users can find all crash records based on their desired criteria, find high-incident crash cluster sites, identify high-risk roads, plot crashes on a map, and even see those areas on a linked Google Map.

Currently, Plan4Safety is contributing to a number of state-level projects that will identify and filter down high-risk areas, as well as areas that have significantly improved safety operations. Using federally-authored Highway Safety Manual (HSM) methodologies, TSRC is using Plan4Safety to create a high-risk road ranking methodology for the South Jersey Transportation Planning Organization (SJTPO) to help them direct funding to areas that need it most.

In addition to RLR grants, law enforcement uses Plan4Safety to plan DWI checkpoint campaigns under the DHTS-funded, "Drive Sober or Get Pulled Over" campaign. This campaign, which doles out significant funds to help police departments curb drunk driving, is directed from the National Highway Traffic Safety Administration (NHTSA) and managed by state highway safety agencies.

Plan Programs/Countermeasures

Plan4Safety data supports roadway safety assessments that yield low-cost recommended countermeasures to cash-strapped municipalities and towns.

Implement Programs

Plan4Safety has been integral in crash data support for road safety audits, obtaining safety grants, finding and targeting high crash problem areas, and providing crash data support for transportation safety educational programs with a plethora of analysis tools. The next stage of development includes an HSM-compliant network screening tool to help users identify roads with federally-recognized focus issues, like intersection and pedestrian safety.

Monitor Program Operations

Continued analysis of Plan4Safety's updated data helps users to actively focus their financial and professional resources towards their most pressing issues. Plan4Safety allows users to monitor crash cluster activity to determine efficacy of their safety plans.

Evaluate Effectiveness

Plan4Safety's growing user base warrants supplemental statistical tools. A Google Analytics web tracker therefore provides the team with an insight into the success of the program, most visited features and tools of the program (Filter Wizard, Cluster Finder, and Cross Tab), and the average time spent using the software.

Describe the major process steps for your project, including any unique aspects that enhanced success:

Conception of Plan4Safety

Local and county agencies faced difficulties creating sustainable, data-driven safety plans because of limited access to crash data; Patricia Ott, director of the NJDOT Traffic and Safety Engineering unit, realized that these agencies should be able to view and analyze the same crash data that NJDOT had access to.

Programming: From CD-ROM to Online Automation

Plan4Safety's original design warranted a PC-installation disc. To increase its availability and usability, the team moved the software online in 2007. In 2012, the development team released an upgraded version of the software, with intuitive user workflows that filter crashes, map crashes, and analyze data sets with a simple questionnaire.

Forward-Looking

Future plans include integrating external records (EMS, trauma unit, insurance, and pavement management) data into the system. This data will revolutionize the way crash trends are analyzed by providing information that is not available to the officer (i.e. a death that stems from crash injuries), or through unseen factors that are not caused by human error or roadway geometry (i.e. pavement condition). The development team is implementing a curvature model that will assist engineers in identifying a road's curve radius and road level (local, county, or state).

Provide the evidence and reasoning used to determine the success of the project:

From a reduction in traffic fatalities to the continued success of departmental safety campaigns, Plan4Safety looks forward to growing its positive effect of change to even more users. Google Analytics tracking notes that more and more users are logging in and using Plan4Safety to evaluate and improve traffic safety.

Why should this project be recognized as a best practice in traffic records?

With its unique toolset, complete and comprehensive database, and cost-effective safety planning methodology, Plan4Safety is the only software of its kind free to use by budget-wise and time-strapped safety agencies. Plan4Safety's development team realizes the importance of accurate data, intensive analysis calculations, and rapid response time in determining best practice safety efforts, and offers all of these in a free, online, and accessible platform.