

# ELEVATING SAFETY CRITERIA IN ROAD PROJECT PLANNING

## SOUTHEASTERN REGIONAL PLANNING AND ECONOMIC DEVELOPMENT DISTRICT (SRPEDD)

### Objective

SRPEDD is the designated staff to the metropolitan planning organization (MPO) serving southeastern Massachusetts. Since the 1980s, SRPEDD has made safety a key planning factor during evaluation and selection of projects for the Transportation Improvement Program (TIP). Several years ago, SRPEDD staff agreed that the State's guidance for project selection criteria did not fully meet the needs of their region. As noted by Jim Hadfield, the Director of Highway Planning at SRPEDD, "we decided early on in the evaluation criteria process, that a great emphasis on safety was necessary." The Southeastern Massachusetts MPO agreed to modify the project selection criteria giving a higher weight to those projects that showed potential for improving documented safety problems. For nearly 20 years, SRPEDD has made the safety of the region's transportation system and its users a priority.

### Approach

By modifying their safety selection criteria ranking, SRPEDD did not eliminate any of the state-advised planning considerations. The Criteria – Road and Highway Projects scoring matrix includes assessments of environmental impact, land use, community effects and support, infrastructure condition, mobility, and safety. Projects are evaluated on a scale of +3 to -3 in each of these categories, except for safety. The safety assessment criteria is based on a scale of +6 to -3. Evaluators must use data to document how the project would directly address a documented safety problem, affect the crash rate in that location, address the severity of crashes at that location, bicycle and pedestrian safety.

SRPEDD also considers safety projects through measures of crash severity and crash probability. SRPEDD maintains a database of crash records representing every intersection and roadway in southeastern Massachusetts. The data are used to calculate two separate crash rates: Equivalent Property Damage Only (EPDO) index; and Accidents per Million Entering Vehicles (ACC/MEV) rate. The EPDO index ranks intersections based on the severity of collisions, giving greater importance to those crashes in which injuries or fatalities have occurred. The higher the EPDO index, the greater the severity of the crashes. An intersection with an EPDO at or above 20.0 is considered a problem in the SRPEDD region. SRPEDD's priority is to: address these locations because they are the most expensive in terms of human suffering and personal cost. The ACC/MEV rate is a ranking system based on traffic volume. This system allows SRPEDD to compare intersections with different traffic characteristics, ultimately providing the probability of being in a collision at a given intersection. The average ACC/MEV rates for southeastern Massachusetts are 0.84 at signalized intersections and 0.59 at unsignalized intersections (average rates as of July 2006). An intersection with an ACC/MEV rate above the regional average is considered a problem. SRPEDD's priority is to: address these locations because they are the most dangerous in terms of crash probability.

SRPEDD conducts outreach to the communities in its region on a regular basis. Jim Hadfield attributes SRPEDD's success at planning for safety in the region to close working relationships with community leaders, law enforcement officials, and the public. Raising the public's awareness of safety problems and the reality that there are limited funds to correct safety problems encourages collaboration among all stakeholders.

Figure 1. SRPEDD Regional Map



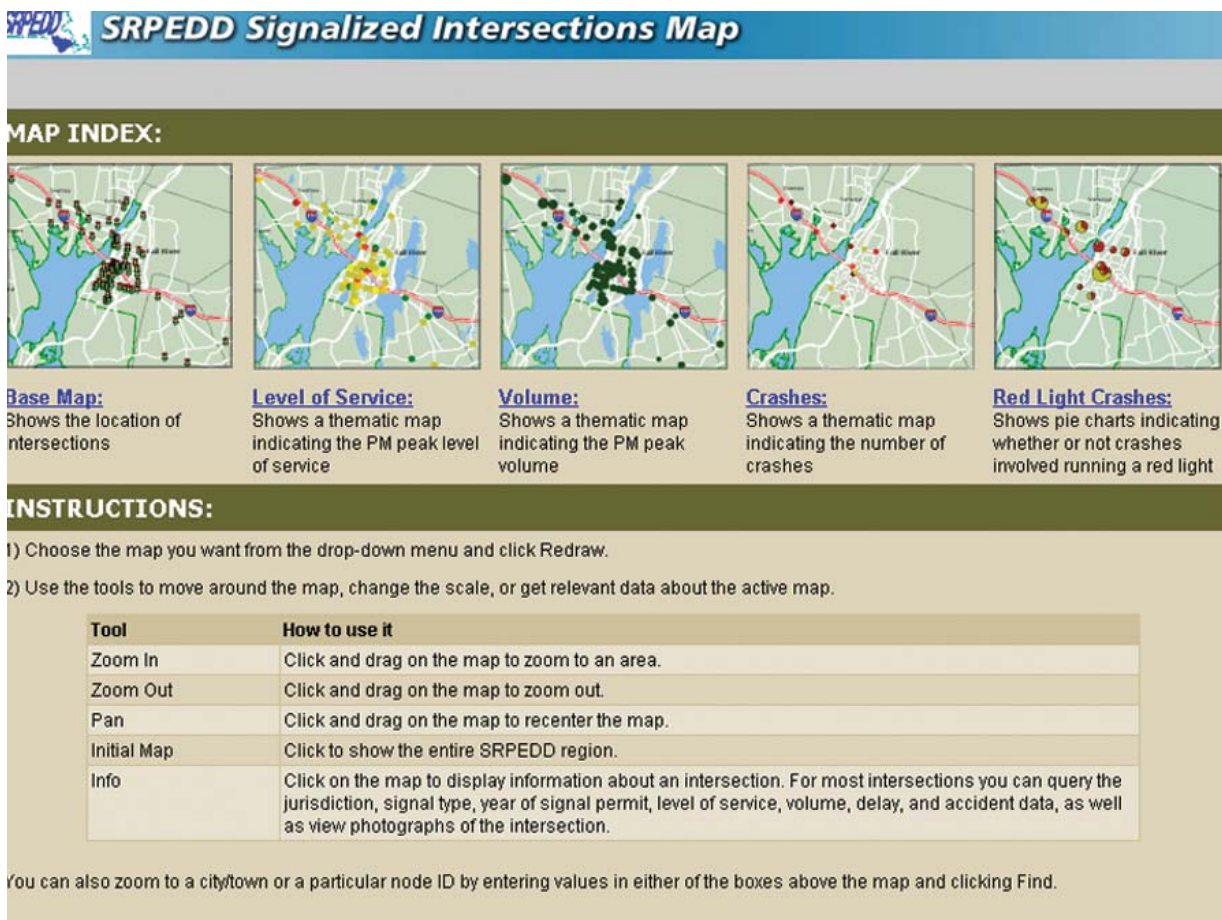
Another innovative approach adopted by SRPEDD is its tri-annual publication of a report entitled The Top 100 Most Dangerous Intersections in Southeastern Massachusetts. Publication of the report receives extensive media attention. The report contains a list of the most dangerous intersections in the region, and it is available via SRPEDD’s web site. The goal of this effort is to:

1. Identify intersections and roads that are experiencing safety problems;
2. Inform local officials and the public about the location of safety problems in their communities, and their standing in a regional context; and
3. Provide technical assistance to the communities to determine the nature of the problem and identify possible solutions.

SRPEDD provides technical assistance to communities by conducting planning studies of the safety problem locations and, in some cases, provides design analysis for communities that do not have funding to conduct the required design study. This assistance often allows the communities to nominate a safety project for inclusion in the TIP, determine if local funds should be identified to expedite a safety project, or gives them the design plans needed to move forward with a planned project. This service also helps communities identify what type of countermeasure is needed to mitigate a safety problem, as some solutions may require changes in driver behavior.

SRPEDD does not limit its technical assistance to locations that appear on the Top 100 list or exceed the crash rate thresholds. SRPEDD offers assistance when local officials are under “political” pressure to respond to a citizen’s or neighborhood’s request for traffic control measures; regularly conducts speed surveys, signal warrant analyses, multi-way stop analyses, and other types of analyses; and aids local communities in preventing improper placement of inappropriate traffic control devices, which can prevent the creation of a new safety problem.

Figure 2. SRPEDD Signalized Intersections Map Home Page



**MAP INDEX:**

**Base Map:** Shows the location of intersections

**Level of Service:** Shows a thematic map indicating the PM peak level of service

**Volume:** Shows a thematic map indicating the PM peak volume

**Crashes:** Shows a thematic map indicating the number of crashes

**Red Light Crashes:** Shows pie charts indicating whether or not crashes involved running a red light

**INSTRUCTIONS:**

- 1) Choose the map you want from the drop-down menu and click Redraw.
- 2) Use the tools to move around the map, change the scale, or get relevant data about the active map.

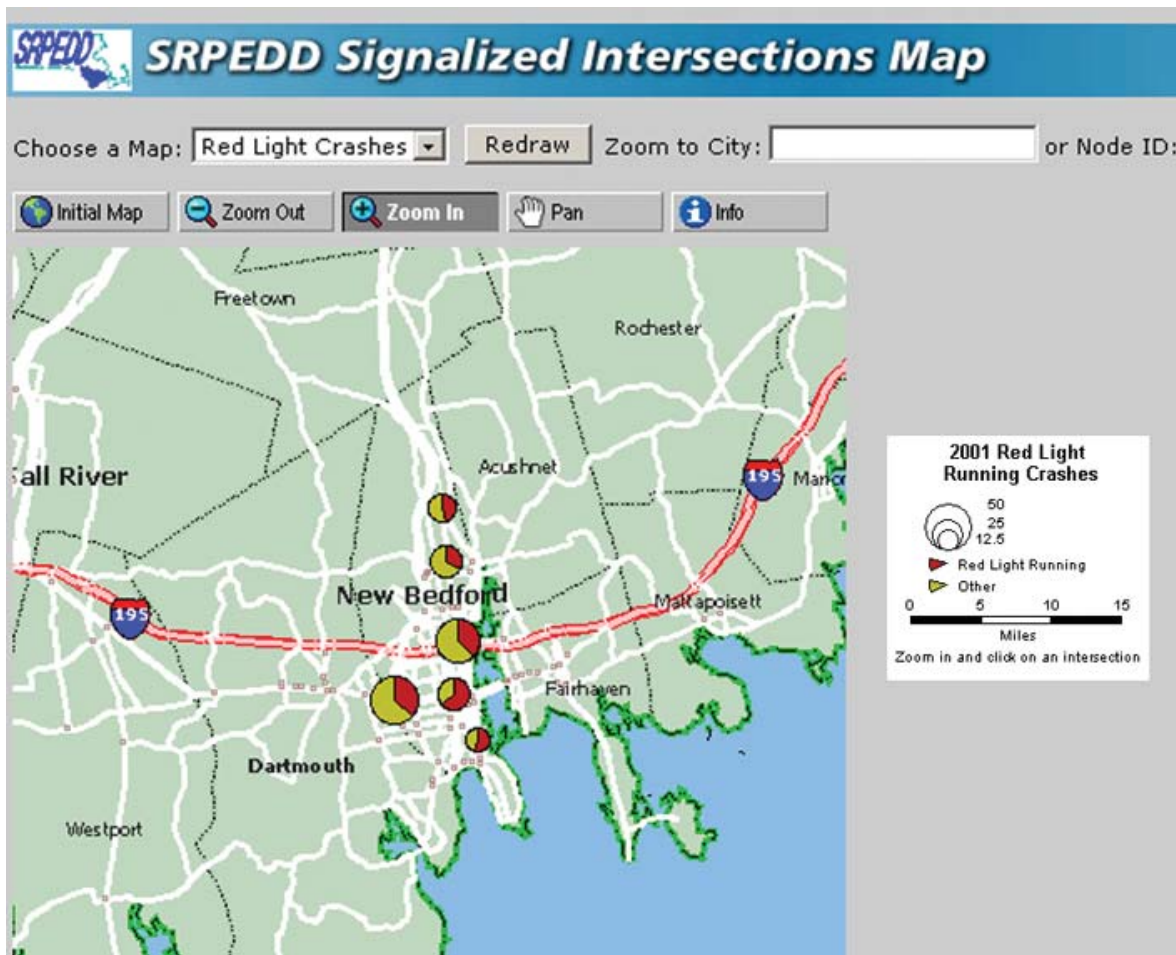
Tool	How to use it
Zoom In	Click and drag on the map to zoom to an area.
Zoom Out	Click and drag on the map to zoom out.
Pan	Click and drag on the map to recenter the map.
Initial Map	Click to show the entire SRPEDD region.
Info	Click on the map to display information about an intersection. For most intersections you can query the jurisdiction, signal type, year of signal permit, level of service, volume, delay, and accident data, as well as view photographs of the intersection.

You can also zoom to a city/town or a particular node ID by entering values in either of the boxes above the map and clicking Find.

SRPEDD also developed Model Curb Cut Bylaws and Drive-Thru Window Bylaws to assist local planning boards in preventing poorly designed driveways or queues extending into the road. Local planners and planning boards regularly call upon SRPEDD for an opinion on current site plans for nearly any proposed use. This assistance also helps to prevent safety problems.

In addition to technical assistance, SRPEDD provides intersection crash data to its 27 communities. The Data Center and Geographic Information Systems (GIS) department provides detailed maps of the region's signalized intersections via the MPO's web site. This tool allows users to obtain information on level of service, volume, crashes, and crashes caused by red light running at those locations (see Figures 2 and 3).

**Figure 3. SRPEDD Signalized Intersections Map**  
*2001 Red Light Running Crashes*



## Resources

SRPEDD receives PL funds from FHWA with the Massachusetts Highway Department providing the 20 percent match. A portion of SRPEDD's Transportation Planning budget is designated for safety studies through its Unified Planning Work Program. SRPEDD also has established close working relationships with community law enforcement and public officials which leverage additional resources to address safety problems in the region.

## Outcome

By giving more weight to safety projects, SRPEDD is able to identify and plan for roadway projects that may reduce motor vehicle-related fatalities and severe injuries in southeastern Massachusetts. By developing partnerships with community leaders and raising the public's awareness of safety hazards, SRPEDD aims to prevent additional crashes at these locations.

The transportation staff accepts responsibility to closely examine dangerous intersections and recommend improvements. Since 1988, more than 60 intersections and corridors have been studied to determine specific issues and develop possible solutions.

## Performance Measures

As proof that crashes can be prevented, since SRPEDD's first most dangerous intersections report in 1988, a total of 32 intersections have received some documented level of improvement, such as better sight distance, pavement marking placement/replacement, signal timing/phasing adjustments, signal system installation/replacement, or roadway reconfiguration. Figure 4 displays the reduction in crashes at the 32 improved intersections before and after the improvements were made. Crash totals subsequent to improvement reveal that an estimated 2,644 crashes have been prevented at these 32 locations since improvements were implemented, representing an annual crash reduction of 53.6 percent. An additional 18 intersections have been improved in recent years (between 2003 and 2005) but too recently to publish a record of crash reduction. Twenty-one intersections are in various stages of design as of July 2006. Thirty-eight intersections have been studied and are awaiting action on recommended improvements; and 10 intersections have studies planned or currently underway.

SRPEDD's next report of the 100 most dangerous intersections for the period 2002 to 2004 will be available in summer 2006.

**Figure 4. Annual Average Crash Totals at 32 Improved Intersections**

