U.S. Department of Transportation
Federal Highway Administration

Federal Highway Administration
RESOURCE CENTER

Safety Effects of Traffic Control Devices (TCD) / Low Cost Safety Improvements

Problem: What can be done right now, with limited funding, to improve highway safety?
Funding highway improvement projects is a long-term endeavor; many high crash locations will not be able to be reconstructed for years or decades. In the meantime people will be injured or killed. What can be done while funding is being programmed?

Putting it in Perspective

- Of the top 10 lowest cost to safety benefit measures, all are "low cost."
- Application of traffic control devices and in particular enhanced application of traffic control devices have tried and proven reduction in crashes.
- Proper use of lighting, shoulder rumble stripes, and enhanced traffic control devices can reduce overall crashes from 10% to 50%.

Solution: Put information on low-cost safety improvements into the hands of highway agencies so that they can take immediate steps to improve the safety of their streets and highways.
Our new FHWA/NHI one-day training course provides tried and proven low-cost safety measures, along with the associated safety benefits, to engineers and operations personnel of highway agencies. Although the application of traffic control devices has typically been carried out for operational reasons, research completed during the last 15 years has quantified proven safety results associated with many applications. Additionally, the positive safety benefits of edge line shoulder rumble strips and the "safety edge" are now well known. The placement of traffic signal heads, use of backplates, supplemental signal heads, signal operations, clearance intervals, signal coordination, and "late night" flashing operation have measurable safety benefits.

The application of traffic control devices (signs, markings, and the operation of traffic signals) to satisfy the minimum requirements of the Manual on Traffic Control Devices (MUTCD), provides a nominal safety performance. However, some locations still experience unacceptable numbers of crashes. By enhancing the application of low cost and readily available TCD's, crashes can be reduced to achieve an acceptable substantive safety performance. For example:

- The addition of chevron alignment signs on curves with radii less than 7 degrees can reduce crashes by 49%.
- The addition of curve warning signs with advisory speed plaques can reduce crashes by 22%.
- Doubling-up warning signs can reduce crashes by 10%.
- The addition of a warning beacon to a warning sign can reduce crashes by 30%.
- The addition of intersection lighting can reduce night-time crashes by 50%.
- Revision of traffic signal clearance times can reduce red-light-running by 50% and red-light-running crashes by 25%.
- The addition of back plates to traffic signal heads can reduce crashes by 32%.
- The addition of left turn phase can reduce left turn crashes by 36%.

Each student receives a copy of the Low Cost Safety Improvement Workshop Manual, which illustrates the various safety applications and their associated safety benefit.

What is the Low Cost Safety Improvement's Approach?
The Low Cost Safety Improvements Approach is the use of enhanced applications of readily available and low cost traffic control devices, shoulder rumble strips, lighting, and traffic signal operations knowledge to reduce crashes.

What are the advantages of Low Cost Safety Improvement's Approach?
There is a robust and immediate safety payoff. A Low Cost Safety Improvements Approach allows a highway agency to credibly respond to high crash locations on an interim low cost basis. Using Low Cost Safety Improvements' enhanced applications is truly "doing more with less."

Successful Applications: States' Results Demonstrate Success
Several States and local highway agencies have embraced the Lost Cost Safety Improvement methodology; they are:

Illinois and Maryland
Engineers for the states' DOT's apply enhanced applications of TCD's on a comprehensive basis across their highway systems and install lighting at rural intersections.

Naperville, Illinois
Although this city of 140,000 is one of the top ten fastest growing cities in the country, inclusion of a systematic program of enhanced application of TCD's and lighting of reduced its traffic fatality rate from 6.0+/100,000 population to 1.0/100,000 over a ten year period.

Benefits:

- Achieves measurable safety benefits on a shoestring
- Allows more immediate responses to high crash locations
- Uses measures and devices that are already on-hand

Additional Resources
To learn more, visit the NHI website at:
www.nhi.fhwa.dot.gov/coursec.asp.
NHI catalog Course Number 3800070A

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