

HOW'S YOUR SAFETY CONSCIOUSNESS?

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FHWA SAFETY DRIVE SINCE '64

The theme of the general session is "Making Better Use of Existing Facilities." Improving highway safety is certainly one of the ways of so doing and is an area of primary concern of the Federal Highway Administration (FHWA).

FHWA has accelerated significantly these efforts in the recent past. As an example, of the almost \$4 billion FHWA has obligated for specific safety improvements since 1964, almost 80% were obligated within the last five years. This \$4 billion represents about 24,000 safety improvement projects undertaken by the states since 1964. We feel certain that these improvements have made a significant contribution to highway safety.

States such as California, Pennsylvania, and Virginia have reported that for every dollar spent on safety improvement projects, the public receives a \$5 benefit in reduction of accidents alone. We have recently evaluated the highway safety construction program and the preliminary results are very encouraging. In Table 1, fatal accident reductions under three of these programs have been between 48-68%. These are not the only examples of the effectiveness of highway improvements in reducing accidents. The fatal accident rate on our interstate highway system is less than one-half the rate on the nation's other roadways.

TABLE 1—COST AND BENEFITS SUMMARY

Funding Program	Total Cost of Projects Completed (\$1,000)	Total Cost of Projects Underway (\$1,000)	Total Cost of Projects Evaluated (\$1,000)	*Annual Cost of Projects Evaluated (\$1,000)	Severity	Average Annual Accidents			*Annual Cost Per Accident Reduced (\$1,000)	
						Before	After	Reduction		
										Number
Rail-Highway Crossings	22,144	103,335	13,723	2,233 n = 10 yrs.	Fatal	37	17	20	54	112
					Fatal and Injury	163	117	46	28	49
					Total	292	206	86	29	26
Pavement Marking Demonstration	22,968	35,214	3,115	3,427 n = 1 yr.	Fatal	188	167	21	11	163
					Fatal and Injury	4,739	4,257	482	10	7
					Total	10,649	9,556	1,093	10	3
High-Hazard Locations	60,852	77,463	17,131	2,788 n = 10 yrs.	Fatal	65	34	31	48	90
					Fatal and Injury	1,752	1,413	339	19	8
					Total	4,305	3,238	1,067	25	3

Roadside Obstacles	25,977	45,810	4,349	708 n = 10 yrs.	Fatal Fatal and Injury Total	28 522 1,778	9 444 1,444	19 78 334	68 15 19	37 9 2
Safer Roads	63,707	81,594	6,077	989 n = 10 yrs.	Fatal Fatal and Injury Total	51 2,188 8,214	30 2,214 7,803	21 (+) 26 411	41 (+)(N.S.) 5	47 2
Interstate	107,848	139,962	**62,880	7,386 n = 20 yrs.	Fatal Fatal and Injury Total	215 4,022 **10,298	108 3,370 **9,256	107 652 **1,042	50 16 **10	69 11 **7
All Other	158,789	270,185	92,099	14,989 n = 10 yrs.	Fatal Fatal and Injury Total	210 3,772 12,355	93 2,990 9,690	117 782 2,665	56 21 22	128 19 6

Perhaps you didn't know that freeways opened after 1966 have an even lower rate than the original interstate system. Figure 1 shows this improvement. This is the result of improved safety design concepts. We in the highway profession can be proud of our contribution to highway safety. However, we are not without shortcomings.

FHWA SPECIAL SAFETY ATTENTION TO CONSTRUCTION SITES IN '77

In our zeal to produce improved roads in a hurry, we have often created temporary and needless hazards during the construction period. For some reason, engineers seem to accept substandard design and operating practices during highway construction which they would never tolerate in new highway design.

FHWA is giving special attention this year to construction site safety. This is a serious national problem. Recent national reports have estimated that somewhere between 500 and 1,000 highway fatalities each year are related to construction and maintenance zones. This, of course, includes motorists, pedestrians, and workmen in these locations. Studies conducted in individual states indicate that accident rates at construction sites may jump between 20-100% over the pre-construction experience. Even more dramatic is the fact that fatality rates at these same sites increase between 100-300% during construction. Yet, experience in California indicates that with proper consideration and careful design, accident rates at construction sites need not be higher than preconstruction rates.

POOR PRACTICES AT CONSTRUCTION SITES

Poor practice in construction zones is not an isolated problem. The following is a listing of common construction problems found in a survey of 18 states last year.

- Confusing pavement markings—see Figure 2.
- Confusing signs—see Figure 3.
- Inadequate barricade protection—see Figures 4 and 5.
- Hazards caused by construction materials, equipment—see Figure 6.
- Nonuniform signs.
- No advance warning.
- Unnecessarily low speed limits, therefore ignored.

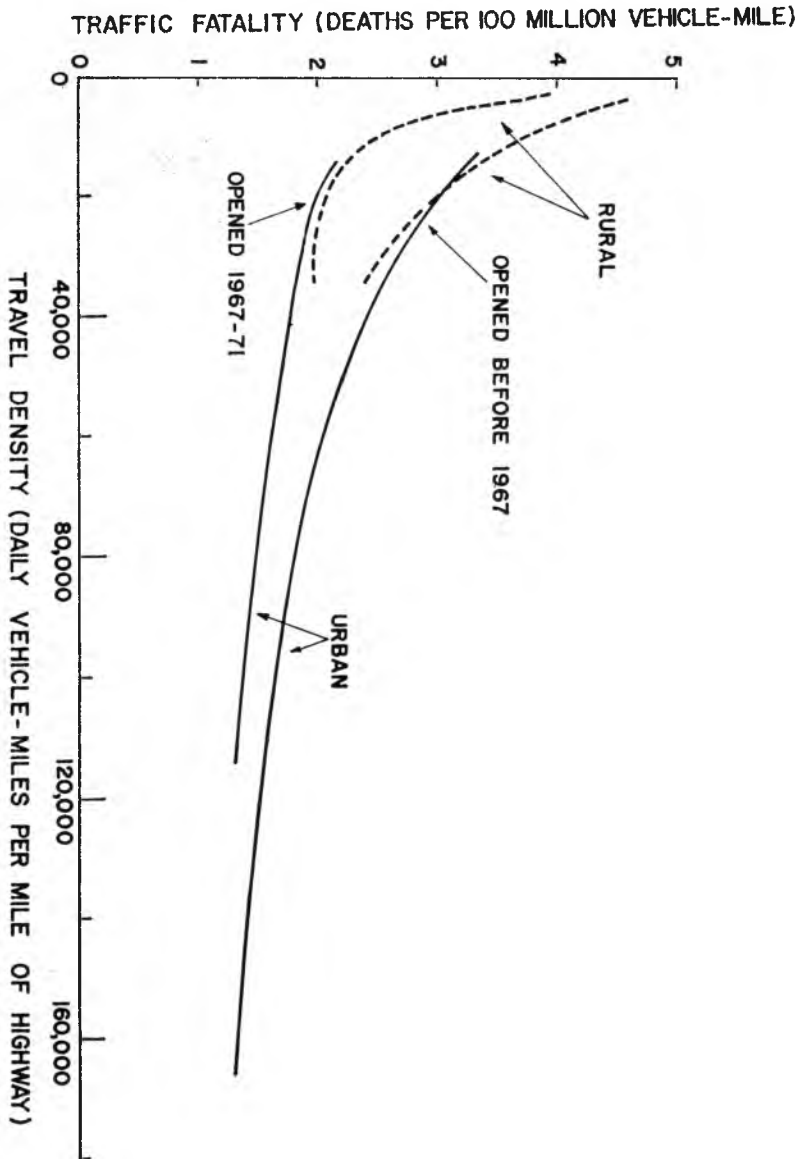


Figure 1. Freeways opened after 1966 have a lower fatality rate than the original interstate highways.

Generally, construction sites in all states surveyed needed improvement in the interest of safety. Without exception, major projects with



Figure 2. Problem obvious—also shows need for continuous inspection and maintenance.



Figure 3. Too many signs at one location can be confusing.



Figure 4. Safety improvement—not quite adequate.



Figure 5. Attempt to protect heavy pedestrian movement—at potential hazard to vehicles—better end treatment possible.



Figure 6. Obvious hazard—should be placed further from shoulder.

good traffic control were those where the traffic control devices were maintained 24 hours a day.

These deficiencies could have been corrected at a minimum of cost with a little thought and care. In fact, if you consider the lawsuits that might have resulted from these poor practices, the improvements have

a potential to save both the contractor and the public substantial sums of money.

EXAMPLES OF COST OF TORT LIABILITIES

The following will give some idea of the cost of tort liability. The city of Wolverine Lake, Michigan, entered into a consent judgment of half a million dollars; \$100,000 in lump sum paid by the village's insurer, and the city will pay the claimant \$20,000 a year for the next 20 years. Another case in which the plaintiff struck a utility pole was settled for \$1,350,000 because the county had not posted the curve warning signs. A California case in 1975 resulted in a \$950,000 settlement because of defective markings. I could go on but these are indicative of the costs of inadequate construction or highway defects.

MUTCD REVISIONS TO IMPROVE SAFETY AT CONSTRUCTION SITES

It is obvious that there are many areas of construction operations that can stand improvement. We in FHWA are taking a hard look at construction site practices to determine what can be done to improve safety. We know that the MUTCD needs revision. When revised, it probably will require such items as: (1) removal of obsolete pavement markings, (2) better design of traffic barriers and barricades and better direction on where they are to be used, and (3) more explicit requirements for the specific placement of traffic control devices.

We also believe that the states should develop statewide policies for the safe handling of traffic through construction zones. However, the real problem in construction site safety is not the MUTCD requirements or state procedures, but the attitude of the people responsible for construction and maintenance operations.

INCREASE SAFETY AWARENESS AT ALL LEVELS

Construction zones are by their nature hazardous, thus we must take special care to make them as safe as possible. We must make everyone connected with construction, from the designer to the flagman, contractor, and inspector, all realize the importance of safe operations. There is an urgent need for better safety awareness at all levels, but particularly at the operating level.

FHWA CONSTRUCTION SITE SAFETY PROGRAM PLANS

The FHWA has made a commitment to vastly improve construction site safety within a year. To accomplish this, we have launched a three-prong attack on the problem. First, we will be tightening the criteria contained in the MUTCD on operating practices and use of traffic control barriers and barricades. Second, we are developing a nationwide training program to increase the skills and safety awareness of all individuals from the site foreman to the project engineer. We are presently negotiating with the Transportation Safety Institute to develop a continuing course on construction site safety. Third, we realize that we do not have all the answers to the construction site safety problem. Therefore, we have undertaken about a \$2.5 million research effort to resolve many of the issues still facing us, such as:

- (1) What are the best barricades to use at construction sites under various conditions?
- (2) How can we efficiently and effectively obliterate unneeded pavement markings?
- (3) What minimum criteria are necessary to insure safe design and operating speeds through construction zones?
- (4) What types of guidelines should be established for flood-lighting?
- (5) What are the proper practices for the use of trailer-mounted warning sign devices in construction zones?

All of the above activities will be helpful in improving construction site safety, but the increased safety awareness of you, the road officials, combined with your ingenuity to upgrade the quality and supervision of traffic operations at construction sites, will be the key to our success. I hope you realize the importance of construction site safety and commit your resources to its improvement. We need your cooperation and assistance in spreading the gospel of the importance of safe traffic operations through construction areas.

SAFETY CONCERN HELPS IMAGE OF HIGHWAY BUILDERS

Not only will better construction site practices enhance safety, it could also have tangible benefits to the roadbuilding profession. The average driver seldom sees highway officials in action, but when he does, it's usually during construction and maintenance activities. Poor accommodation of traffic can and does cause the motorist to lose

respect for us. He doesn't know, or really care, how thick the roadway base is. He can't recognize drainage problems, or judge your concrete mixes, but he can, and does, base his opinion of your ability on the ease of his travel through construction zones.

If you are concerned for the driver's safety, it shows and he knows it. If you are unconcerned, he is also acutely aware of it. Safe and efficient accommodation of traffic through construction zones can do more to improve our public image than a million dollar public relations program.

LOOK FOR ACCIDENT PROBLEM INDICATORS

Another important application of safety consciousness is to pay attention to accident problem indicators. We often have so many things on our mind that we overlook obvious hazards in our day-to-day travels. Or perhaps we have seen it so often we don't recognize it as a hazard. Overcoming this is not easy. It takes effort, so let's look at some of these indicators of an accident problem. The following list shows some of the things to look for :

- Nicked trees.
- Ruts in the shoulder—see Figures 7 and 8.
- Skid marks—see Figure 9.



Figure 7. Problem indicator—wheel tracks in shoulder.

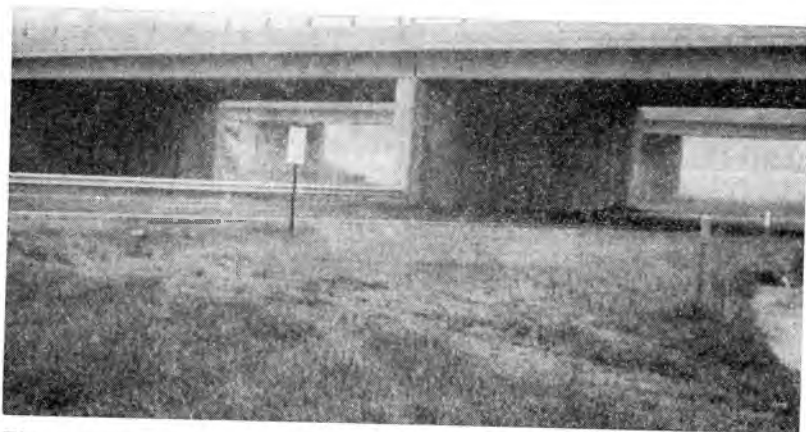


Figure 8. Problem indicator—wheel tracks between roadway and ramp.



Figure 9. Problem indicator—skid marks.

MAKE MAINTENANCE FORCES SAFETY CONSCIOUS

In addition to being observant yourselves, a major contribution to safety can be the development of the same consciousness on the part of your employees. This is especially true of your maintenance forces. They spend a great amount of their working day on your highway system and have the unique capability, in minor problem areas, of fixing it on the spot. On the other hand, if the size of the effort is such that it exceeds their capability, they should report it for appropriate action. While on the subject of maintenance, we have noted a bad national habit, namely, to replace in kind, hazardous roadway appurtenances that have been involved in accidents.

It should be the policy of each of us to do it right. In this case, "right" means to replace it in accordance with the latest and best practices. Sometimes in our efforts to improve the safety of the environment we fall short of our intended objective.

CONCLUSION

Our present system of highways has made an outstanding contribution to the reduction of the nation's accident toll. However, there are still many areas that need improvement and construction site safety should be one of the top priorities.

With the proper attitude toward safety, we can substantially reduce the number of construction site accidents within the next 12 months and identify other potential problems. You are the key to a successful safety program. In addition to the benefits for your constituents, you can derive tremendous satisfaction from the good results of a job well done. It all depends on how sensitive your safety consciousness is.