provide the safest driving environment available resources will permit. He has a duty to discover hazards or defects by reasonable inspection and to correct them, or at the minimum adequately warn the highway user of their presence.

Knowledge of highway liability law can help to make the highway engineer a more effective dicisionmaker. For example, knowledge that deviation from the standards of the MUTCD may result in a finding of negligence encourages the engineer to carefully document decisions that adopt treatments not specified in the Manual.

Knowledge that although the engineer may be engaged in a discretionary activity the state may have the burden of showing that discretion was in fact exercised, enables the engineer to understand the importance of documenting that he made a considered decision after consciously balancing the risks and advantages.

Knowledge of tort liability law integrated with the consistent exercise of sound engineering judgment will result in more effective decisions and reduced potential liability.

REFERENCES

1. Harrison v. Escambia County School Board, 419 So. 2d 640, 655 (1982).
2. W. Prosser, Law of Torts, 23 (4th Ed. 1971).
3. AASHTO, Survey on the Status of Sovereign Immunity in the States (1983).
4. Fraley v. City of Flint, 221 N.W. 2d 394, 397 (Mich. 1974).
5. See Dalehite v. United States, 346 U.S. 15 (1983).
6. Harrison, 419 So. 2d 640, 650 (1982) (Ervin, J., dissenting).
7. 336 N.W. 2d 416 (Iowa).
8. 384 N.Y.S. 2d 545 (1976).
9. Id. at 546.
10. 602 P.2d 755 (Cal. 1979).
11. 544 P.2d 1153, 1155 (N.M. 1976).

A Highway Engineer's Perspective

David Henry

The problem of tort claims involving roadside safety is one of obsolete roads and deep pockets. I say obsolete not from the standpoint that the roads are worn out, hazardous, or nonfunctional, but from the standpoint that our standards have changed. Design standards affecting safety have been in a continuous state of change for the past 30 years while most of our existing roads were being built. Consequently, very few roads completely conform with the latest standards regarding shoulder width, slopes, guardrail, and fixed objects.

The drivers using our roads vary greatly in skill and their willingness to take risks. Consequently, accidents are inevitable. And, whenever accidents result in very large economic losses or severe disabilities, there is a good chance that someone will be looking at the road to see if lack of modern standards can be tied into the accident cause or severity.

According to law, nonstandard does not equal hazardous, i.e., "a substantial risk of injury when used with due care." However, when a jury is feeling very sympathetic toward a badly injured plaintiff which they would sincerely like to help, it doesn't take much to give them an excuse to award damages.

This is where the "deep pockets" come in. It sometimes appears that the mere need of an injured plaintiff is sufficient justification to award damages when the defendant is perceived as the "rich" state.

The number of new tort cases against the State of California has doubled in the past ten years and continues to rise as shown in Exhibit A. In the 1982/83 year there were 512 new cases filed with prayers totaling $1.25 billion. Our estimate of exposure, of course, is much smaller than the actual prayers.

Our best defense against tort suits is a systematic, prioritized program of highway safety improvements. Not only can you reduce accidents, and the severity of accidents, but you can also demonstrate to a jury that you are acting in a reasonable and responsible manner.

Our effort to upgrade roadside safety on freeways started in 1966 with a program we called CURE (Clean Up Roadside Environment). Under CURE we converted all ground-mounted sign posts to breakaway, installed slip bases on all electrolliers, and installed guardrail at all bridge rail ends, piers, and abutments. Upon the completion of CURE, we went into our programn of clearing fixed objects from freeway off-ramp gores, or protecting them with crash cushions.

The CURE program together with the incorporation of safe roadside standards in all new freeway construction resulted in a dramatic reduction in the fatality rate from run-off-the-road accidents. Exhibit B compares the fatal accident rate for various kinds of accidents on California freeways in 1980 with the rate in 1965. Note that in most categories, including run-off-road, the rate has dropped to about half the 1965 rate.

It is interesting to note that the category of accident with the lowest rate (cross median) is the one most often involved in tort suits. Our most vulnerable situation from the standpoint of tort suits is the lack of median barrier where our own "warrants" would indicate that a barrier is needed. In the median barrier case, you usually have the totally innocent victim who was in no way responsible for the accident.

Our safety program includes a Median Barrier Monitoring System in which we conduct an annual review of cross-median accidents and traffic volumes to identify locations which warrant the installation of a barrier. All locations which meet the warrants are added to our inventory for programming as soon as funds are available. Our current inventory of median barrier needs amounts to about $50 million.

Blanket-type programs of improving safety on freeways by upgrading standards has proven to be very cost-effective, but applying the same concepts to the conventional highway system is a vastly different matter since (1) usually speeds are lower on conventional roads, (2) traffic

volumes are lower, and (3) there are many more roadside obstacles. Thus, the economic factors are not the same.

To illustrate the problem, Exhibit C is an inventory of the number of fixed objects on conventional state highways together with the 1974 accident data involving the fixed object. The biggest killer in this group is trees because there are so many of them. The next largest is utility poles; then comes unprotected bridge ends.

Exhibit D lists the frequency of any one fixed object being involved in an accident. This table demonstrates the problem of justifying a program of removing these fixed objects on a blanket, systemwide basis. It simply is not cost-effective.

That does not mean we can forget about trees, utility poles and bridge rail ends. It simply means we have to be more selective about what we spend our resources on. Three years ago California was a defendant in a lawsuit involing an accident where a car ran into a utility pole. The same pole had been hit on two previous occasions and each time the utility company restored the pole in the same location. The jury found for the plaintiff. We can argue that it is not cost-effective to move all poles, but we cannot justify doing nothing in the face of a recurring accident problem.

Nonbarrier (steel and concrete baluster) bridge rails, which were standard prior to 1958, are another problem. It would cost well over $100 million to upgrade all nonbarrier bridge rails. It is not cost-effective to upgrade them all, but we have developed a priority system for upgrading a select few bridge rails which have the highest potential for being impacted by out-of-control vehicles, and have dedicated $1 million per year for this program. This systematic process of dealing with a large inventory of substandard highway features provides an opportunity to demonstrate that we are aware of our safety problems and are managing our resources in a responsible manner.

EXHIBIT A.

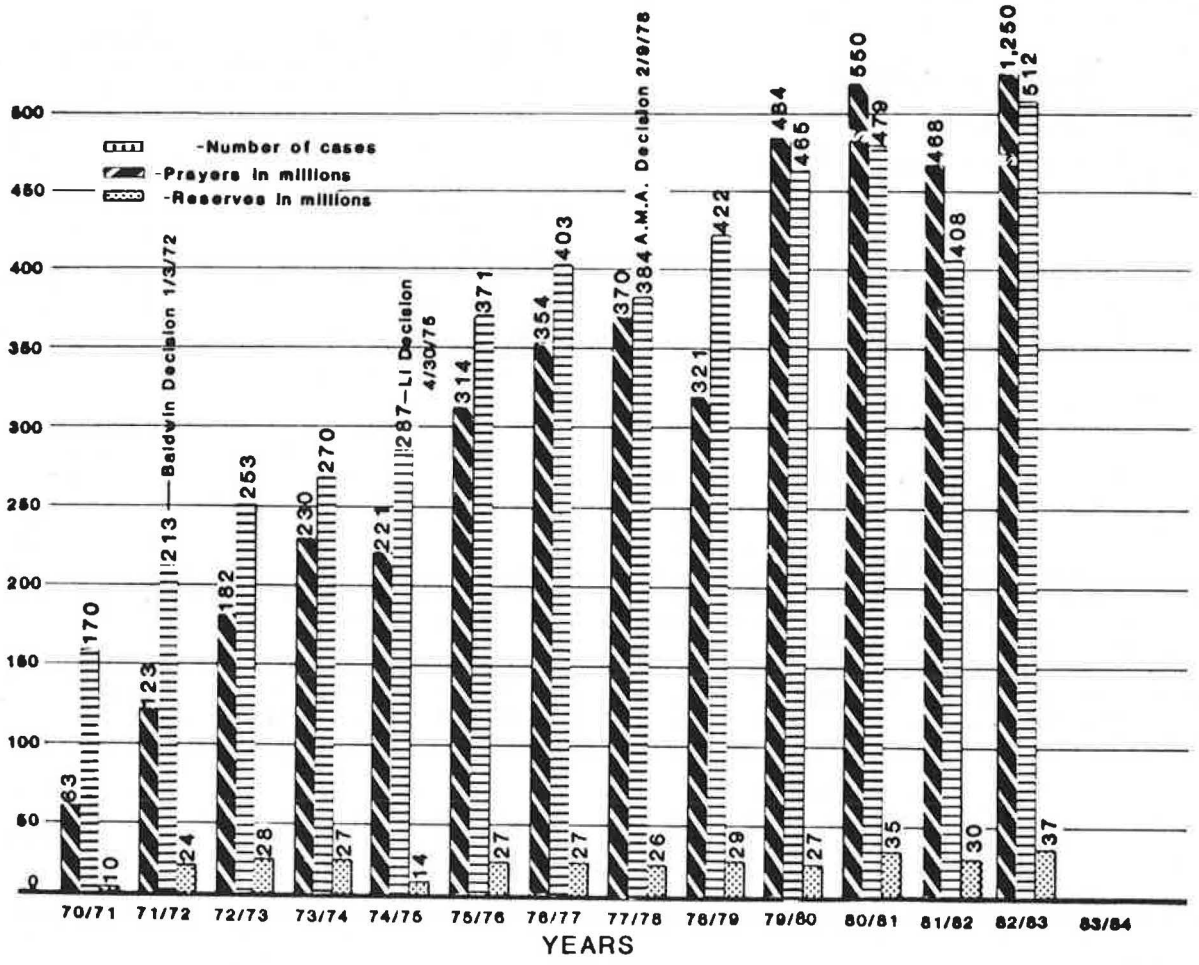

EXHIBIT B.

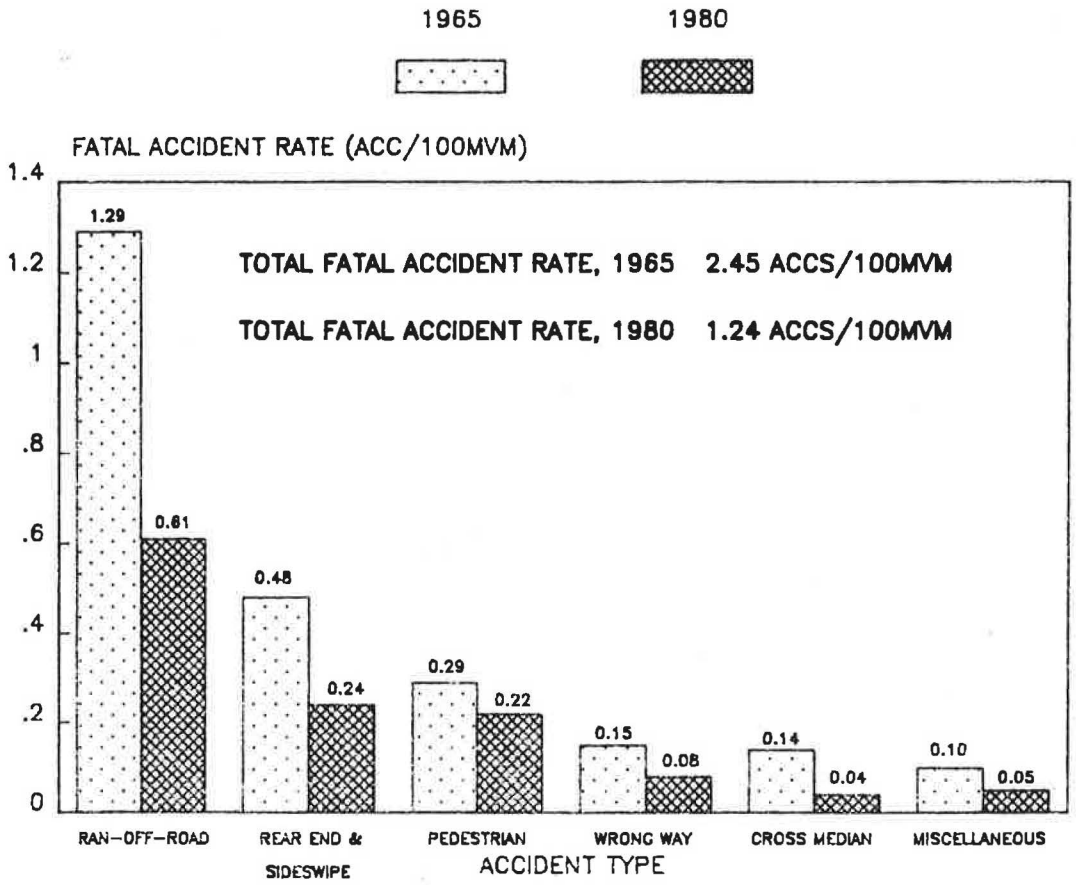

EXHIBIT C.

TYPE OF FIXED OBJECT	NO. OF OBJECTS	1974 ACCIDENTS			
		FATAL	INJURY	PDO	TOTAL
SIGN OR LIGHT SUPPORT	2,800	0	57	57	96
UTILITY POLES	94,000	16	212	262	490
TREES	210,000	30	258	175	463
BRIDGE OR CULVERT HEADWALL	16,500	8	38	30	76
BRIDGE, PIER OR ABUTMENT	620	1	8	10	19
TOTAL	323,920	55	555	534	1,144

EXHIBIT D.

CATEGORY	ACCIDENTS/OBJECT/YEAR	YEARS/ACCIDENT
SIGN OR LIGHT SUPPORT	.034	29
UTILITY POLES	.005	200
TREES	.002	500
BRIDGE OR CULVERT HEADWALL	.005	200
BRIDGE, PIER OR ABUTMENT	.031	32