PRACTICAL GUIDELINES FOR
MINIMIZING TORT LIABILITY
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TRANSPORTATION RESEARCH BOARD
NATIONAL RESEARCH COUNCIL
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DECEMBER 1983
Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

In recognition of these needs, the highway administrators of the American Association of State Highway and Transportation Officials initiated in 1962 an objective national highway research program employing modern scientific techniques. This program is supported on a continuing basis by funds from participating member states of the Association and it receives the full cooperation and support of the Federal Highway Administration, United States Department of Transportation.

The Transportation Research Board of the National Research Council was requested by the Association to administer the research program because of the Board's recognized objectivity and understanding of modern research practices. The Board is uniquely suited for this purpose as: it maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; it possesses avenues of communications and cooperation with federal, state, and local governmental agencies, universities, and industry; its relationship to its parent organization, the National Academy of Sciences, a private, nonprofit institution, is an assurance of objectivity; it maintains a full-time research correlation staff of specialists in highway transportation matters to bring the findings of research directly to those who are in a position to use them.

The program is developed on the basis of research needs identified by chief administrators of the highway and transportation departments and by committees of AASHTO. Each year, specific areas of research needs to be included in the program are proposed to the Academy and the Board by the American Association of State Highway and Transportation Officials. Research projects to fulfill these needs are defined by the Board, and qualified research agencies are selected from those that have submitted proposals. Administration and surveillance of research contracts are the responsibilities of the Academy and its Transportation Research Board.

The needs for highway research are many, and the National Cooperative Highway Research Program can make significant contributions to the solution of highway transportation problems of mutual concern to many responsible groups. The program, however, is intended to complement rather than to substitute for or duplicate other highway research programs.
A vast storehouse of information exists on nearly every subject of concern to highway administrators and engineers. Much of this information has resulted from both research and the successful application of solutions to the problems faced by practitioners in their daily work. Because previously there has been no systematic means for compiling such useful information and making it available to the entire highway community, the American Association of State Highway and Transportation Officials has, through the mechanism of the National Cooperative Highway Research Program, authorized the Transportation Research Board to undertake a continuing project to search out and synthesize useful knowledge from all available sources and to prepare documented reports on current practices in the subject areas of concern.

This synthesis series reports on various practices, making specific recommendations where appropriate but without the detailed directions usually found in handbooks or design manuals. Nonetheless, these documents can serve similar purposes, for each is a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems. The extent to which these reports are useful will be tempered by the user’s knowledge and experience in the particular problem area.

This synthesis will be of special interest to transportation administrators; designers; construction, operations, and maintenance engineers; attorneys; and others concerned with minimizing tort liability. Guidelines are presented for reducing the risk of legal liability in transportation activities.

Administrators, engineers, and researchers are continually faced with highway problems on which much information exists, either in the form of reports or in terms of undocumented experience and practice. Unfortunately, this information often is scattered and unevaluated, and, as a consequence, in seeking solutions, full information on what has been learned about a problem frequently is not assembled. Costly research findings may go unused, valuable experience may be overlooked, and full consideration may not be given to available practices for solving or alleviating the problem. In an effort to correct this situation, a continuing NCHRP project, carried out by the Transportation Research Board as the research agency, has the objective of reporting on common highway problems and synthesizing available information. The synthesis reports from this endeavor constitute an NCHRP publication series in which various forms of relevant information are assembled into single, concise documents pertaining to specific highway problems or sets of closely related problems.

Transportation agencies are subject to increasing numbers of tort suits brought against them for improper performance and alleged deficiencies. The objectives of this
synthesis are to familiarize organizations and their employees with this changing situation, make them aware of their duties and responsibilities to the traveling public, and recommend steps that can be taken to mitigate tort liability. Specific recommendations are set forth to minimize tort liability under each of a typical agency's functional areas—managing, planning, designing, constructing, operating, and maintaining facilities. The proposed actions are directed primarily toward public agencies having responsibilities for highway systems. Much of the information presented, however, should also be of interest and value to other groups and functions. The same principles are applicable to all facets of a department of transportation. Much of the material is also pertinent to quasi-public agencies, such as toll highway authorities, and to private companies, such as highway contractors.

To develop this synthesis in a comprehensive manner and to ensure inclusion of significant knowledge, the Board analyzed available information assembled from numerous sources, including a large number of state highway and transportation departments. A topic panel of experts in the subject area was established to guide the researcher in organizing and evaluating the collected data, and to review the final synthesis report.

This synthesis is an immediately useful document that records practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As the processes of advancement continue, new knowledge can be expected to be added to that now at hand.
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SUMMARY

Transportation agencies today are faced with a changing situation regarding their vulnerability to tort suits arising from alleged dangerous conditions on streets and highways. Improvements that have been made to the highway network, such as the development of the Interstate system, have in turn created a demand for higher levels of service by the traveling public. A new concept of social justice has evolved in which a “deep pocket” is sought to recompense those who have suffered severe damages. There is now general acceptance that drivers make mistakes and that roadways should not overly punish them for minor transgressions. As a result, the “forgiving roadway” approach to highway design has been established.

Concurrently with these changes, sovereign immunity has been eroded or lost completely. Moreover, a series of court decisions in several states has severely limited the common law defenses of discretionary and design immunity. This loss of protection has occurred during a time of litigation growth caused by the snowballing effect of successful suits and the increasing sophistication of attorneys in the field of highway tort liability.

Changes in the law, which varies among the states, have increased potential payments for tort judgments. The movement from contributory negligence to comparative negligence no longer bars judgments simply because the driver was also at fault. Furthermore, it should be recognized that public agencies generally are held to higher standards than motorists. The principle of joint and several liability is particularly onerous for public agencies, as it enables plaintiffs to collect their entire awards from any one defendant. Recent court decisions have also expanded the scope of equitable indemnity to parties not named in the original suit, thus increasing cross complaints that may be filed against agencies, utility companies, and contractors.

The principal recommendation of this synthesis is that tort liability risks must be managed. The implementation of an effective risk-management program requires several steps that include establishing organizational structure, staffing the requisite functions, publishing policies and procedures, and training agency personnel.

One portion of an overall program concerns pre-accident actions. The risk of an accident is inevitable in the construction and operation of a highway system. In the long run, a program that reduces the risk is the best method of reducing liability. The elements of such a program encompass every facet of an agency’s operation, however, and the subject is well beyond the scope of this report. Nevertheless, it should be recognized that a well-organized and documented accident-reduction program will strengthen defense capability when accidents do occur.
One problem that an agency faces is that a plaintiff need only attack the department's actions at the accident site, whereas the agency may be forced to defend its whole program for the entire road network under its jurisdiction. For example, it may be claimed that an obsolete feature should have been upgraded to accommodate changing traffic characteristics. The agency must explain why it elected to utilize its resources elsewhere on the system. A well-organized highway programming procedure is essential to defend against such allegations. The agency must show that it has the following program elements in place and operating efficiently: an ongoing data collection and analysis system to monitor its operations and identify problem locations, a method of selecting appropriate countermeasures, a procedure for prioritizing needs and scheduling improvements, and a means of evaluating project and program effectiveness. With this information in hand, it may be possible to show that the reason that a planned improvement is scheduled for a future year is keyed to the level of funding provided by the legislature. There is a responsibility, however, to warn the public of dangerous conditions that have not been eliminated and to seek low-cost, temporary measures for reducing hazard levels when such means are available.

Post-accident actions that may reduce liability risks include the following: instructing personnel as to their responsibilities if they are at the scene when an accident occurs, and agency investigations to augment information in police reports. Accident information must be evaluated, as it may make notice of dangerous locations.

To prepare for trials, procedures need to be established with regard to the release of information and production of documents. Agency personnel should be instructed as to what to expect and how to respond properly during depositions. In many instances expert witnesses may be needed, particularly when such experts are utilized by the plaintiff. It is recommended that a cadre of agency experts having good communications skills be trained and utilized. In-house experts are best used to explain agency procedures and actions. In those situations where an expert opinion is desired to affirm the level of safety provided or the appropriateness of performance, outside experts may well be perceived as less biased by members of a jury.

Exhibits of various kinds can be most helpful in explaining site characteristics and features to a jury. Consideration should be given to obtaining enlarged ground and aerial photographs and to the preparation of display boards and models. Other techniques, such as site reconstructions, have been used—for example, where a work site condition is no longer in place.

An effective loss-mitigation program includes many facets. An aggressive program to achieve legislative change to place reasonable bounds on liability is an important program component. Consideration must be given to the means of funding tort liability judgments. The relative merits of commercial and self insurance should be explored along with coverage variations that are available. Either way, payments need to be budgeted. A decision needs to be made as to the merits of having the transportation administrator responsible for all costs associated with providing and operating the highway system including the cost of liability judgments, as opposed to such payments being made from the general fund. Risk shifting to other parties, such as contractors and lessors of agency property, can be accomplished through both indemnity agreements and insurance clauses.

Organizing the risk-management function involves staffing arrangements for both legal and engineering activities. Within the transportation agency a risk manager may be needed along with any additional staffing that is in order. If the organization is large, district claims officers may be needed on either a full-time or collateral basis. A tort liability committee is a useful means of involving top supervisors in each functional area. Impediments to efficient operation relative to processing claims and case preparation should be identified and corrected. Examples include facilitating out-
of-state travel for obtaining depositions, adequate compensation of witnesses, simplified procedures for obtaining expert witnesses, and rapid techniques for purchasing evidence items.

The management of claims should encompass established procedures for identifying potential suits, receiving claims, maintaining the confidentiality of claims files, controlling the release of information, and claims investigations. Other related elements that need to be established are a settlement program and safety-related training activities. To manage risk one must know the character and magnitude of the problem. Procedures are needed that quantify potential claims and judgments and relate these to agency functions (design, construction, maintenance, etc.) and to highway elements and features (ditches, guardrails, sign supports, etc.).

The last chapter of the synthesis contains specific action guidelines for each agency function. These may be used as a checklist of ideas for consideration and implementation.
CHAPTER ONE

LEGAL DUTY AND LIABILITY

BACKGROUND

Evolution of the Highway System

During the early portion of the twentieth century, highways in the United States were undergoing a development and growth phase. The objectives were to achieve all-weather roads and to provide mobility, such as from farms to markets. After World War II the Interstate system was conceived to facilitate cross-country travel and to interconnect major metropolitan areas. During this time the emphasis was on constructing and completing the several functional systems of the overall highway network—primary, secondary, urban, and interstate. Basic mobility was the primary consideration and facilities were designed to obtain the most mobility for the construction dollar.

The 1970s brought a new phase in which the highway system matured. The major challenge shifted from construction to operation of the highway system. The change in emphasis to one of maximum service brought several operational criteria to the forefront—environmental quality, social concern, and safety. With system maturity came a broadening of public concerns and a mandate to fine-tune the system. For example, during the development period, in response to the public’s priorities, pavements were designed to carry vehicles and roadside ditches were constructed to carry water. At present, ditches within the clear roadside area are designed not only to carry water but to be traversable by vehicles as well.

Snow removal is another example of changing priorities. Earlier in this century people considered themselves fortunate to be able to travel within a few days after a major snowstorm. More recently the public wanted the capability to travel during a storm. The high level of snow and ice control provided by highway agencies now has created an expectation that one should be able to travel during the storm at near normal speeds.

Changing Public Attitudes

The attitudes regarding driver responsibility have also changed. In earlier times, in keeping with the spirit and hardships of the pioneering days, people undertook most activities at their own risk. More recently there has been an understanding that drivers make mistakes and that they should not suffer excessively for such transgressions. Thus, the concept of the forgiving highway has evolved.

The point is that times have changed and will continue to change. Highway facilities and the manner in which they are operated must continually be adjusted to conform to social concerns, new concepts, and public priorities.

Modern Concept of Social Justice

With the maturing of society, a new concept of social justice has developed. People involved in highway accidents may well incur costs far beyond their financial capabilities. The development of sophisticated medical techniques and the improved chances of survivability have increased costs for accident victims. Society has come to believe that such financial needs must be met.

Thus, the “deep pocket” theory evolved, wherein, when the needs are great, the one who has the deepest pocket should pay. Government, having the greatest financial resources, is the first choice. The second choice would be a large corporation, such as a highway contractor. Individuals, commonly having “small pockets,” would be a distant third. The concept amounts simply to saying that society should pay—through the tax base in the case of governments or higher construction costs to cover contractors’ increased insurance premiums.

Growth in Litigation

Another factor to consider is the snowballing effect of litigation. When someone sues and wins, it encourages others to do the same. There has been a large growth in litigation in the product liability and medical malpractice areas as well as in the highway field.

Figure 1 illustrates the growth in tort liability litigation during the past 12 years for the state of California. Sovereign immunity was lost in 1961 and the state’s tort liability legislation was enacted in 1963. As is typical, the significant growth in claims started several years later. States that have lost their immunity more recently may experience a similar future growth in cases and claims.

Attorneys have found tort law to be expanding and lucrative. There are now many lawyers who concentrate on highway tort liability and who have become very knowledgeable on the subject. They study agency manuals and standards and, in some instances, become more familiar with these documents than practicing highway engineers.

LEGAL RESPONSIBILITY

Sovereign Immunity

The defense of sovereign immunity emerged in the United States as an extension of a doctrine that had existed in England before the American Revolution. In a series of early decisions the Supreme Court held that federal and state governments were immune from suits commenced without their consent. The rule was based on an expansion of the English common law, which held that “the king could do no wrong.” Thus, it evolved that the king (government) was immune from suits for wrongs committed by his agents (employees).
be prepared for new concepts. In one state, for example, the legislature was put on notice that if it did not enact comprehensive tort claims procedures in the near future, the doctrine of immunity would be abrogated by the state supreme court. In another, the concept of sovereign immunity was declared unconstitutional.

An overview of the status of laws affecting tort liability in the various states can be found in publications by AASHTO (1) and the Institute of Traffic Engineers (2).

**Liability of Local Jurisdictions**

The immunity situation for local jurisdictions, such as counties, cities, and towns, differs somewhat because of variations in state law. In some instances immunity was afforded to local jurisdictions on the basis that it was derived directly from the state. Traditionally, some immunity from tort liability existed for those functions that were governmental in nature. Some incorporated municipalities, on the other hand, were fully responsible for their tortious acts, just as any other corporation.

Basically, local jurisdictions have been more vulnerable than the states. Furthermore, when a state loses its immunity, its local jurisdictions lose theirs as well.

**Liability of Individuals and Corporations**

Since the emergence of common law, individuals have been responsible for their acts and subject to tort actions. For governmental employees the immunity of the government meant that the only avenue available for recovery of damages was the employees themselves. After an agency has lost its immunity, however, it generally is not worthwhile suing employees, as their resources are minuscule compared to government. Employees may still be named in a suit, but this is done more as a matter of strategy than for any potential judgment against an employee.

Juries are likely to be much more sympathetic toward an individual employee, knowing the limited resources of most people. This sympathy does not hold for government, however, especially where the plight of the plaintiff is severe.

Corporations have the same legal status as individuals, and as such are fully responsible for tortious acts. Juries, however, will likely consider a corporation as better able than individuals to pay a large judgment.

**BASES FOR LEGAL ACTIONS**

**Tort Liability**

A tort is a civil wrong or injury. The purpose of a tort action is to seek repayment for damages to property and injuries to individuals. The following elements must exist for a valid tort action.

1. The defendant must owe a legal duty to the plaintiff.
2. There must be a breach of duty; that is, the defendant must have failed to perform or to properly perform that duty.
3. The breach of duty must be a proximate cause of the accident that resulted.
4. The plaintiff must have suffered damages as a result.
The first element, the matter of duty, is relatively easy to establish in a highway-related tort, as those having jurisdiction over highways owe the public reasonably safe travel. Likewise, the fact that the plaintiff suffered damages is readily established in accident cases. Damages may take the form of auto repairs, medical expenses, or lost income, for example. The dollar value of damages suffered, however, is an issue that may involve a considerable portion of a court proceeding.

Proximate Cause

The question of causation is more difficult to establish. A proximate cause is one that in a natural and continuous sequence produces the injury, and without which the result would not have occurred. Note that the breach of duty does not have to be the only cause; in fact, most accidents are the result of multiple factors. The proximate cause issue may be downplayed by a jury where the injuries are enormous or emotion laden, such as when a badly injured child is involved. When the jury is searching for a “deep pocket,” they may be satisfied with a minimal linkage, negating the proximate cause criterion. For example, it may be sufficient in some instances merely to show that the traffic control procedure employed was not in accord with acceptable standards (i.e., negligence) and an accident occurred at the site.

Trial by Jury

The manner in which tort trials are conducted varies by state. In many states, particularly those in which sovereign immunity has been abandoned, tort trials are conducted in a similar manner as other civil litigation. Trial by jury can be requested by the plaintiff in such cases as a basic right guaranteed by the U.S. Constitution. In some states tort statutes have been enacted which tort liability cases are handled as an administrative rather than a judicial process, thus no jury is involved. In a few states a special tribunal has been established in which the judge also renders the verdict; for example, the Court of Claims in New York.

Jury trials tend to be advantageous for plaintiffs. When the damages are great, a jury may be very sympathetic to the injured parties.

Throughout this report reference is made to juries. It should be recognized, however, that in some instances and in some states, no jury will be present in tort liability trials.

Negligence

Breach of a legal duty, the second element of a tort as described above, is the major issue in most tort liability cases. Negligence is the failure to exercise such care as a reasonably prudent and careful person would use under similar circumstances. The essence of negligence is the adequacy of performance. There are two ways in which one can be judged negligent—wrongful performance (misfeasance) or the omission of performance when some act ought to have been performed and was not (nonfeasance).

Nuisance

There is another avenue of law that may be used by plaintiffs against highway agencies, yet it is not as well understood as negligence. Nuisance, unlike negligence, does not deal with tortious behavior or performance. A nuisance is a physical condition that unreasonably interferes with the rights of the public. When nuisance is the issue, the focus is on the effect of the alleged condition, rather than its cause. The essence of nuisance is a condition that is continuous or reoccurring and invades a public right (§ 12-2).

This difference between negligence and nuisance is of concern in cases involving alleged roadside hazards, a highway in need of repair, and work activities within the highway right-of-way. The issue is simply whether or not the condition existed and whether it interfered with the public’s right of reasonably safe travel.

In the instance of nuisance, plaintiffs may ask for an injunction to remove the nuisance, in addition to a suit for damages.

Standard of Care

It may be seen from the foregoing discussion that the critical issue in highway tort liability is the care with which highway responsibilities are exercised. If conduct falls below a reasonable standard of care, then the responsible persons and/or organizations may be held liable for injuries and damages that resulted from such conduct.

There are factors that may limit one’s ability to act. One has a responsibility to act in a manner that is reasonable, based on the information at hand and the resources available. The question of information (notice) is presented later in this chapter. The issue of resources is a difficult one, as many highway organizations have a large backlog of deficiencies, many of which may have safety implications. This matter is discussed in the following chapter.

When a potentially hazardous condition exists, the reasonableness of action must take into account the following factors, particularly when resources are not available to correct all such conditions:

- gravity of harm posed by the condition,
- likelihood of harm,
- availability of a method to correct the situation,
- usefulness of the condition for other purposes, and
- burden of removing the condition.

Many items of information may be brought into court to aid in establishing the prevailing standard of care. One of the strongest types of evidence will be the agency’s own guidelines and policies. Regulations adopted by the agency may define in detail the minimum requirements. A reasonable person would follow such rules and orders. Other sources of information bearing on the standard of care include:

- agency directives and policies (4);
- directives of a superior agency (e.g., federal/state or state/local agency);
- guidelines and policies of other agencies (to demonstrate the state of the art).
• guides developed by national and professional organizations (such as, American Association of State Highway and Transportation Officials, Institute of Transportation Engineers, and National Association of County Engineers);
• engineering texts and manuals;
• professional journals;
• research publications; and
• opinions of expert witnesses.

Obligation to Warn

Where existing hazards cannot be eliminated immediately, there is at least a duty to warn motorists of the existence of such known hazards. For example, say that a settlement in a fill causes ponding of water. Proper correction requires reconstruction, which is programmed for a few years hence. In the interim, a “SLIPPERY WHEN WET” sign with an advisory speed plate could be used to alert motorists of the condition.

Other Pertinent Legal Concepts

Notice

The duty to correct a dangerous condition or take other appropriate action arises when notice is received. Reasonable people would not act until they knew that there was a problem. Once informed, however, there may be an obligation to respond. In some states there may be a requisite statutory response period, such as five days. If the defect is extreme, however, such as the collapse of a bridge, the reasonable action would be to close the roadway as quickly as possible.

Notice is generally considered to have been received once a report is filed with any agency of the jurisdiction having responsibility. Thus, notice is received when a police report is filed, even though the highway agency that should respond has yet to receive a copy of the report. There is clearly a need for rapid and effective communications between such agencies.

Constructive Notice

Under the concept of constructive notice, the duty to act may arise when the agency should have known of the existence of a situation. Thus, it may not be necessary to prove that actual notice was given. For example, an agency may be held responsible for a missing stop sign, when the evidence shows that it was missing for two weeks before an accident. A history of prior accidents has also been used to establish constructive notice of a dangerous condition.

This concept has important implications for a highway agency with the responsibility for a dispersed roadway network—notably, the obligation to inspect the condition of its facilities on a regular basis. Furthermore, when there is reason to suspect that recent damage may have occurred, special inspections may be in order; for example, checking bridges and culverts after a flood.

Concurrent Causation

The principle of concurrent causation recognizes that highway accidents often have more than one causation factor. When applying the concept to negligent care of a highway, for example, it is not necessary to find that the negligence was the exclusive cause of the accident. It must merely be shown that it was a proximate cause (defined previously) that combined with the concurrent negligence of the driver or other persons to cause the accident. The fact that neither party could reasonably anticipate the occurrence of the other concurrent cause will not shield the agency from liability as long as its negligence was one of the causes of the injury.

Furthermore, it is well established that when the proximate cause of an injury is the negligence of two or more persons acting independently but concurrently, both are liable and the degree of culpability is immaterial. Therefore, an agency cannot escape liability by showing that its negligence was only a minor departure from reasonable care, whereas the negligence of the motorist was gross. Only where it can be established that the negligence of the driver was the sole cause is a court likely not to impose some liability on a public body [3, § 9-2(c)].

Contributory Negligence

One defense that is often cited by highway agencies is that the driver shared a responsibility for the accident through carelessness or contributory negligence. In many states, the doctrine of contributory negligence operates to bar any recovery by a driver whose actions contributed to an accident, even if another party was primarily at fault. A trend has developed away from this doctrine because in some cases it unfairly penalizes those whose driving is only slightly negligent. A number of limitations have evolved to the use of contributory negligence as a bar to governmental liability; some examples follow [3, § 14-2(b)].

• Foreseeability has been held to be a necessary element of contributory negligence. Thus, it must be shown that a reasonable person would have foreseen the exact consequences of negligent driving.
• There is a reluctance to find that the violation of a safety statute by the motorist is, in and of itself, negligence; for example, exceeding the speed limit.
• The negligence of the governmental agency may be judged an intervening cause between the motorist’s negligence and the accident that is sufficient to exonerate the motorist.

Highway agencies should not assume that the roads are used only by alert, intelligent, and cautious drivers. The highways should be designed and maintained as sufficiently “forgiving” to accommodate the vast mainstream of drivers, for reasonable people do sometimes have lapses as well.

Comparative Negligence

The defense of contributory negligence has been replaced by comparative negligence in many states. Under comparative negligence doctrines, negligence is measured in terms of percentage. Any damages allowed are diminished in proportion to the
amount of negligence attributable to the person seeking redress. Where negligence by both parties is concurrent and contributes to the injury, recovery is not barred, but plaintiff’s damages may be reduced proportionately.

The application differs depending on a state’s statutes or court decisions. In some instances recovery is barred if the plaintiff’s proportion exceeds that of the defendant. Further, the plaintiff may need to show that in the exercise of ordinary care, he or she could not have avoided the consequences of the defendant’s negligence after it was or should have been apparent.

**Joint and Several Liability**

Under the laws of many states a defendant who is liable for a claimant’s injuries is jointly and severally liable for all damages with any other defendant who is also held responsible. This means that the plaintiff can collect the entire award from any one of the defendants held liable.

Government agencies are especially vulnerable under this provision. Other defendants, particularly private parties, lacking sufficient resources or insurance, may be unable to pay, thus shifting the entire burden to the public agency. This may occur irrespective of the proportional burden assigned under comparative negligence, a fact unknown to the jury that makes the determination. Thus, a state held 5 percent responsible could end up paying for 100 percent of the award.

**Equitable Indemnity**

Under the concept of equitable indemnity, parties jointly responsible for an injury are entitled to partial indemnity from each other in an amount proportionate to their percentage of fault. Thus, in the example just cited, the state, after making payment, may then sue other defendants to recover their proportionate share. Such suits would have little value if defendants are without assets.

This concept has been extended, however, and the result will likely be burdensome for government agencies. In a recent case it was held that the right of equitable indemnity was not limited to the parties sued by the plaintiff. Therefore, any defendant can seek indemnity against other parties and bring those other parties into the suit by means of a cross-complaint. In states where this interpretation is made, public agencies, utility companies, and contractors will increasingly find themselves brought into lawsuits, often years after an accident, by a negligent defendant seeking to shift some part of the financial burden of tort liability (5).

**PUBLIC LIABILITY**

**Types of Functions**

There are two basic types of functions performed by governmental bodies and they have completely different implications with regard to tort liability (6).

**Ministerial Functions**

Ministerial functions involve clearly defined tasks. They are performed with minimum leeway as to personal judgment and do not require the weighing of alternatives. Highway maintenance is often cited as an example of a ministerial function. The work to be performed is typically well defined for each maintenance activity. Persons involved in ministerial functions are generally open to tort liability suits.

**Discretionary Functions**

Discretionary functions, on the other hand, are those requiring the exercise of independent judgment in arriving at a decision or choosing a course of action. An exemption from liability for discretionary activity is rooted in the common law. Under the separation of powers doctrine in the United States, the courts are reluctant to second-guess discretionary decisions made by executive bodies. Moreover, it is believed that a jury of untrained laymen is not competent to evaluate the appropriateness of discretionary decisions.

In the highway field, design activities are generally held to be discretionary; thus, there is common law immunity from liability. However, exceptions to this immunity will occur where a design (a) is arbitrary, unreasonable, or made without adequate consideration; (b) is prepared without adequate care; or (c) contains an inherent, manifestly dangerous defect (6).

**Governmental versus Proprietary Functions**

At the municipal level an important distinction related to immunity is whether governmental or proprietary functions are involved. In those states where some immunity passes on to municipalities, the law has attempted to distinguish between the dual character of municipalities and limit immunity to only governmental or public functions. A municipality’s proprietary functions are not immune and may result in tort liability.

Governmental functions are those that can only be performed adequately by a governmental unit. Examples of these are police, fire protection, and the court system. Proprietary functions are those that a city performs, but that could be supplied as well by a nongovernmental organization. As a rule of thumb, where a city derives revenue from a service, the operation could be considered proprietary; for example, supplying water or gas, or renting halls. There are many overlapping court interpretations on this subject; but the construction and maintenance of public streets, highways, and sewers have generally been regarded to be proprietary functions in most states. This distinction may no longer be important, however, in states where sovereign immunity has been abandoned.

**Design Immunity**

The design of a highway has generally been held to be discretionary, and thus carries some limited immunity. Several states have enacted design immunity statutes in an effort to further immunize governmental bodies and employees from liability when the design was in accord with current criteria for reasonable safety.
The courts, however, have noted exceptions to design immunity where:

- the approval of the design was arbitrary or unreasonable,
- a plan or design was prepared without adequate care, and
- it contained an inherently dangerous defect from the beginning of use.

The status of immunity varies widely among the states. Many jurisdictions have enacted tort claims acts based on the federal act, which provides for immunity for discretionary functions or duties. Conversely, a Nevada decision held that the common law duty to use due care to make roads reasonably safe was superior to the provisions of the state's Tort Claims Act, which was identical to the federal act just described (7).

Responsibility to Upgrade Facilities

A second issue relates to the responsibility to upgrade facilities that were designed and constructed in accord with practices that prevailed at that time. An extension of the common law principle of design immunity generally holds here. It is recognized that it would be far beyond the capability of agencies to continually reconstruct existing facilities as design criteria are changed and improvements are made to safety appurtenances.

There are notable exceptions to the above principle, however. Where conditions have changed significantly from those envisioned in the original design, remedial action may be deemed necessary to provide reasonable safety for motorists.

PERSONAL LIABILITY

Duty Owed by Individuals

The duty owed to the public for reasonably safe travel extends to all parties responsible for the highway system, including individual employees of public agencies and private contractors. Basically, all individuals have the obligation to conduct themselves in a manner that does not negligently cause harm to any other person. An individual who violates this general duty of care can be sued for damages.

If a court or jury decides that an individual is liable, then a judgment for damages can be returned against the individual. Recovery of punitive or exemplary damages may be one reason for suing an individual employee, especially where the public agency is immune from paying such damages. From a practical standpoint, however, employees are not often held responsible for payment of awards, particularly government employees. Because the individual's assets are so small as compared to that of government or even a large corporation, the "deeper pockets" will most likely be targeted for recovery of damages. Nevertheless, being named as a defendant in a lawsuit is a serious experience.

Protection Afforded Government Employees

The degree of protection afforded government employees varies among the states. Many states have enacted a statutory provision whereby employees of government agencies are protected against financial loss resulting from tort liability claims. Employees should be aware, however, that a common clause in such provisions limits such indemnification to situations in which the employee was acting within the scope of employment at the time in question. Other exceptions to indemnification that may exist include times when the employee acts fraudulently or maliciously (8).

In such instances where employee indemnification is afforded, the obligation of the public agency employer typically includes retaining an attorney to defend the employee and payment of all expenses incurred in such defense, including any judgment that may result. In return, the employee is required to cooperate in the defense of the case.

Another mechanism used to protect government employees is a provision in the law whereby injured parties who instigate an action against a public agency are precluded from bringing an action against an employee of that agency. Under most circumstances this provides employees with adequate protection as, under the "deep pocket" practice, plaintiffs will seek awards against the parties who are most capable of paying.

Protection Afforded Private-Sector Employees

Although individuals employed by contractors and other privately owned organizations do not have the same protection as public employees, the general practice of such employers is to provide liability insurance that extends protection to the employees of the private organization. Generally, the insurance company provides counsel to defend both the private organization and its employees in any liability lawsuits.

Again, however, as in the instance of government employees discussed previously, limitations on the scope and amount of insurance coverage will exist. Insurance policies have a ceiling beyond which the insurance carrier is not responsible. No such ceiling applies in the case of government employee indemnification.

There is an increasing trend for private-sector engineers to obtain personal liability and malpractice insurance. This trend is also evident in the public sector, despite immunities and indemnification statutes (2).

EMPLOYER/EMPLOYEE RELATIONSHIPS

Recovery from Negligent Employees

A potential concern of employees is the ability of an employer to recover an award paid to an injured party as a result of an employee's negligence. The law generally permits redress from negligent employees, but such reparation is seldom sought in the United States today. Civil service regulations, union agreements, social and political pressures, and modern personnel management principles serve to discourage or preclude actions against employees (2).

Employee Suits against Employer

Employee tort suits against an employer are uncommon. From a practical standpoint they would not be productive with
respect to job longevity. The normal course of action is redress under workers' compensation acts. These state statutes provide for awards to employees or their dependents in case of employment-related accidents. Federal employees are covered by the Federal Employees Compensation Act.

The effect of most workers' compensation acts is to make the employer strictly liable to an employee for injuries sustained by the employee within the scope of employment, without regard to the negligence of either the employer or employee. Where the act applies, it has been uniformly held that this remedy bars employee tort suits against the employer. In essence, the employer has already paid for damages through insurance premiums.

Supervisor's Responsibility for Subordinate's Acts

A supervisor is not responsible for the tortious acts of subordinates because the doctrine of respondent superior is not applicable to public officers (8). There would be responsibility only if the supervisor had participated in the tortious conduct or had not exercised due care in selecting a subordinate.

Acting under Orders

There is often a concern about the predicament that arises when one is instructed to do something that could create a dangerous condition. The courts have held that acting under orders is a good defense in this situation. From a practical standpoint, to hold workers responsible when working under orders would be unmanageable and unfair. In extreme cases, however, there may be a duty for a person acting under orders to attempt to mitigate a dangerous condition and to bring the hazard to the attention of superiors.

The concept of acting under directives has also been employed by organizations as well as individuals. However, the courts in some states have fairly consistently held that this is not necessarily a good defense. For example, the argument might be applied by construction contractors to try to exonerate themselves from liability by asserting that they performed in complete accord with contract specifications. The findings may well follow that encountered in the following case. The defendant railroad was sued for a grade-crossing accident, and it tried to defend on the grounds that it was simply following Public Utilities Commission orders on grade crossings. The court indicated that the order merely established a minimum standard and the railroad could still be negligent for not providing a higher level of protection (9).

CHAPTER TWO

REDUCING THE RISK OF LIABILITY: PRE-ACCIDENT ACTIONS

SAFETY CONCEPTS AND OBJECTIVES

Weighing Multiple Objectives

The provision and operation of a highway system is a complex undertaking. Many criteria need to be considered and evaluated, and trade-offs must be made among competing ones. Safety is but one of several principal objectives. Others include mobility, convenience, economy, and protection of the environment. The process involved is one of optimization. If the attempt were made simply to maximize safety, the result would most likely minimize mobility. For an extreme example, a section of roadway could be operated in a manner similar to an airport landing strip—one vehicle at a time. Safety would be improved immensely, but at an enormous reduction in capacity.

Therefore, the objective of the highway agency is to provide a reasonable level of safety, commensurate with other system needs. There is a potential pitfall in this that must be guarded against. After an accident has occurred, others attempt to show that safety could have been increased at the accident site. That is often the case, but only at the expense of not doing work in some other location or function. Furthermore, there is typically a backlog of needs that far exceeds the highway agency's capabilities.

Considerable effort must be expended in planning and conducting highway programs to ensure, on a system-wide basis, that a reasonable balance is achieved between safety and other objectives. The optimization process involves many facets not ordinarily perceived by laymen, and a jury is composed of such persons. Therefore, these programs must be not only technically sound, but also developed and documented in a manner understandable to the public.

Preparation for Inevitable Claims

Accidents are better described as major failures of the driver-vehicle-roadway system (10). When any of these three elements does not perform properly with respect to any other element, a failure occurs. That failure may result in property being damaged and/or people being injured. When some defect in the roadway contributed to the failure, liability may ensue for persons and organizations responsible for the roadway.
It is an enormous challenge to provide and operate highway systems because of the following characteristics:

- The system extends over the countryside and is used in all kinds of weather.
- Vehicles range in size from motorcycles to tractor trailers—differing in age and mechanical condition.
- Operators are mostly nonprofessionals—with widely varying levels of competence.

Accidents are inherent in the system, however, and cannot be avoided completely. That is all the more reason to prepare for inevitable claims. Activities should be conducted in a manner that lays the groundwork for an effective defense, for use whenever needed.

**Accident Reduction**

The best method of limiting liability is to reduce accidents. As this effort involves almost every facet of a highway agency, guidelines for accident reduction are far beyond the scope of this report. Nevertheless, it must be emphasized that accident reduction is an essential aspect of the total overall risk reduction program. In recognizing that accidents will continue to occur, however, the remainder of this chapter focuses on laying the groundwork for a good defense beforehand.

Attention must be given to the type of accident that is being reduced. In terms of mitigating costs associated with liability, generally it is not an effective utilization of resources to take actions that do nothing more than reduce the risk of minor "fender bender" types of accidents. Priority should be given to an accident-reduction program that is directed toward fatal and serious injury-producing accidents; for example, providing and maintaining median barriers on divided highways.

Citizen input is a useful source of information on potential problems, but there can be an overreaction. For example, after numerous complaints a traffic signal is installed at a "high-accident" location. Although such a signal might be justified in terms of improving the operational characteristics of the intersection, there may be little justification from the standpoint of reducing tort liability concerns. This is because routine property damage accidents typically do not result in lawsuits; and if they do, the cost of handling such suits is fairly modest.

The use of public information and media to alert the public to traffic conditions is valuable from a safety standpoint as well as from its public relations value. Alerting the traveling public to construction and major maintenance activities may encourage route diversion, which will enable traffic to be accommodated more safely at the work site. Particular attention should be placed on law enforcement as an accident-reduction tool (e.g., programs against drunk driving).

**SAFETY ASPECTS OF HIGHWAY PROGRAMMING**

Programming is the process of identifying needs, prioritizing activities, and scheduling the work for accomplishment. A well-conceived and well-administered safety-improvement program is an essential element of the overall plan to minimize tort liability on two counts. First, an effective programming effort can reduce accidents, especially the more severe ones that can result in large claims. Second, in the event of a trial, a logically formulated and well-documented programming procedure is a necessary tool for the defense to show the propriety of the agency's actions.

Guidelines for highway safety improvement programs were established by the federal government in the Highway Safety Act of 1966 and later expanded in legislation passed in 1973 and 1978. The essential elements of such programs are included in the following discussion (11). Figure 2 is a flowchart depicting the interrelationship of safety-related components of the highway programming process.

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**FIGURE 2. Interrelationship of safety-related components of highway programming process.**
Routine Data Collection Methods

Public agencies have a fundamental obligation to be aware of conditions and monitor operations of systems for which they are responsible. Therefore, highway agencies should establish and maintain adequate information sources and record systems to provide current facts about existing conditions. Such systems will vary in complexity with the size of the street and highway network. Large jurisdictions will need some form of automated or computerized information filing, processing, and retrieval system to handle the task.

Inventory

Inventory procedures should provide reasonably current information about the physical features and conditions of existing transportation facilities. Several methods are typically used, including strip maps, photologging, condition ratings, and traffic-control-device inventories.

Inspection

A system of regular inspection should be established and maintained on a continuing basis. These inspections should cover the physical features and conditions of facilities and operational characteristics.

Some features, such as traffic signs and markings, need to be inspected both during the day and at night. Examples of reasonable inspection frequencies are:

- twice yearly for traffic signals,
- as needed for pavement markings, particularly in early spring,
- before the rainy season for drainage features, and
- daily for temporary traffic controls at work sites.

All employees should contribute to the inspection process. A sense of responsibility and awareness needs to be imparted to all agency employees, even nontechnical ones in administrative and support capacities. In their daily travel, agency personnel should be instructed to be on the lookout for vandalized or nonfunctioning devices and potential problem areas. Internal policy memoranda should be circulated periodically to remind personnel of this obligation and to define the reporting procedure.

Design and Operational Reviews

Design and operational reviews should be conducted both before and after installing any traffic control elements in the field. Reviewers should be alert for changing conditions, such as increased traffic movements or changes in the mix of vehicle types. Inspections are needed for active and completed projects.

One objective of operational reviews is to identify potential problems before accidents occur. Although not widely used, available techniques include conflict analysis, observing near collisions, or measuring critical traffic-flow characteristics, such as velocity changes or lateral placement (12). Skid marks are another form of evidence that may pinpoint a location where accidents are likely to occur.

Designers must obtain feedback on the adequacy of their designs. One means is to have them participate in the field evaluation of facilities after construction is completed. It is also important to establish a continuing dialogue between designers and maintenance forces who have to “live” with the results of the designs.

Identification of Problem Areas

Reference System

An essential element in processing traffic accident data is the establishment of a field reference system for identifying the location of accidents and correlating them with physical features and operational characteristics of the road network (13). The ultimate objective is to be able to identify causal factors of highway accidents.

Accident Reporting and Recording System

All states and most of the larger jurisdictions have a system for reporting accidents, coding relevant information, and recording the data in a form for later processing and analysis. All agencies have a responsibility in this area. In some instances small local jurisdictions, such as towns, may utilize the system of the larger jurisdiction of which they are a part (i.e., the county or state). Periodic tabulations and statistical summaries are then prepared, as a minimum on an annual basis. Such data can and should be used to pinpoint problem locations, to identify accident types that are susceptible to reduction, and to track trends.

Input from Field Forces

Maintenance records provide information about the type and character of recent repair and replacement activities. Damage to such items as guardrail and sign supports may occur without accident reports being filed. Excessive repair activity may indicate the need for corrective treatment. Sometimes damaged elements are merely replaced in kind, whereas the frequency of damage indicates the need for different hardware or a changed location. For example, continual damage to a sign installation on a curve could be caused by a slippery stretch of pavement or could call for relocating the sign. Therefore, it is important that knowledgeable persons scrutinize maintenance records for clues to potential problems and their solutions. Similar information concerning traffic controls on construction sites might be obtained from construction records.

Citizen Input

An established procedure for the handling of complaints and reports should be developed and maintained, with persons designated to receive and record all such reports and institute appropriate action. Effective handling of citizen input has legal as well as public relations benefits. Correspondence is readily
filed, but some form of log is needed to record oral messages such as telephone calls.

Media Reports

Articles and editorials are other sources of information that need to be gathered and maintained. Once a problem has been covered in the press, it is assumed that all parties will have been informed about it.

Evaluating Claims Data

There is a need to evaluate data on claims and lawsuits to detect areas of liability concern. Problem locations are easily spotted by this means. It is much more difficult, however, to identify functional areas or highway elements. This is because most plaintiffs' complaints will allege that all conceivable aspects of the site were faulty, as a means of strengthening their cases. For example, it is not uncommon for the plaintiff to claim that the facility at the accident site was improperly designed, constructed, and maintained.

Regardless of the difficulty in analyzing claims data, they need to be reviewed by knowledgeable persons to identify problem areas and to target resources for improving such facilities. One objective of a public agency is to use public resources in the most effective manner to provide and operate the highway system. Engineers may not recognize that claims and judgments can be a major financial drain; thus it is proper to expend funds for no other reason than to improve tort liability posture.

Accident Analysis

There needs to be a well-organized program to develop and implement recommendations for correction of hazards. Without such a program, the documentation of defects or problem locations simply becomes a road map for plaintiffs' attorneys to prove their cases. In addition to physical improvements, data should be evaluated in terms of initiating operational, procedural, or policy changes so as to mitigate tort liability.

Commonly used identification methods include frequency, accident rate, frequency rate, rate quality control, and accident severity methods. The selection of which method or methods to use depends on the data available and the level of sophistication that is appropriate and/or desired (14).

Developing Countermeasures

When any of the several problem identification measures just described yield problems that are subject to alleviation or correction, the best manner to accomplish such improvement should be sought. Both physical and procedural measures should be investigated (15, 16).

The steps involved in developing an engineering solution are as follows:

- analyze accident characteristics and patterns,
- select candidate countermeasures,
- predict accident reduction capabilities of potential countermeasures,
- perform economic analysis of candidate solutions,
- select preferred alternative, and
- define project and take appropriate action.

Long-term solutions often involve the time-consuming processes of planning, budgeting, and implementation. In the interim, it may be advisable to utilize inexpensive, temporary measures, such as installing warning signs.

Not all problems indicate or require a project to correct physical conditions. In some instances, indicated improvements may be routine and can be accomplished by operations or maintenance forces; for example, making changes in the timing plan of a newly installed traffic signal. Also, some problems may indicate the need for procedural and administrative improvements.

Prioritization of Needs and Scheduling Improvements

Rational procedures for ranking proposed improvements should be established and followed. They should be based on the potential for reducing the number and/or severity of accidents. Consideration must be given to the cost-effectiveness of various alternatives, with the high-yield improvements programmed first (17).

Scheduling must be accomplished within budgeting constraints. Safety-related improvements must be merged with other vital aspects of the agency's mission, such as accommodating operational needs and correcting physical and functional obsolescence. If called on in a subsequent trial to explain why an improvement was not implemented earlier, the agency must be able to show that it utilized and consistently applied a logical project prioritization and programming procedure.

Project and Program Evaluation

Evaluation is an assessment of the value of an activity as measured by its success or failure in achieving predetermined goals and objectives. It is an essential component of a comprehensive improvement program; nevertheless it is sometimes overlooked. Evaluations need to be conducted at two levels (11, Ch. X).

Evaluations made at the project level are site-specific. The purpose is to determine whether the work undertaken to correct or improve conditions has been effective. For safety improvement projects evaluation may be either accident or nonaccident based. For the former, the measure of effectiveness is the reduction in accidents, as compared with the before situation or that of a control section. When accident data are not available, changes in traffic characteristics or road user behavior may be observed.

The key point is this: an agency cannot merely assume that corrective measures have achieved the desired result. It has an obligation to monitor its facilities. When modifications are indicated to work previously done, such needs must then be input into the programming process.
Program evaluation should be accomplished periodically at the management level as a review of overall program effectiveness. The two areas of particular relevance are accident reduction and tort liability mitigation. This review should focus on such items as policies, procedures, guidelines, utilization of resources, and management and organizational concerns. The main purpose is to refine the ability to estimate effectiveness of future programs.

CONSTRUCTIVE PRACTICES THAT STRENGTHEN DEFENSE CAPABILITY

Utilizing Human Factors Principles

Since World War II, a new field of human factors engineering has evolved from the cooperative efforts of applied psychologists and engineers. Until recently, this subject was not included in traditional engineering curricula; thus many practicing engineers are not familiar with it. This body of knowledge, however, is directly applicable to the interface between the driver and the other two elements of the highway system, the vehicle and the roadway.

Proper planning, design, and operation of the highway system must be based on the characteristics and limitations of the vehicle operators and pedestrians who use the highway and street system. It is incumbent on designers and traffic engineers to make use of state-of-the-art knowledge in their activities. Moreover, plaintiffs’ attorneys have become aware of this new science and are utilizing human factors experts to pinpoint highway deficiencies.

Treatises in human factors and driver behavior are available (18). The following points summarize key principles. When full consideration and proper application of these principles can be shown, the ability to subsequently defend one’s actions is greatly enhanced.

- Recognize that drivers have limitations and driver mistakes are not uncommon.
- Design for all drivers legally on the road, not the average driver.
- When practicable, provide time to enable erring or impaired drivers to detect and correct their mistakes.
- Recognize that the requirements for perception-reaction time are not constant, but increase with lack of familiarity, complexity, and the number of choices involved.
- Where practicable, provide a forgiving roadside environment to mitigate the severity of major system failures (accidents).
- Apply the principle of primacy, wherein at any point motorists should be supplied with the information that is most important to them.
- Utilize the concept of expectancy by building constructively on motorists’ past experiences to lead them to recognize and accept a proper course of action.
- Consider redundancy, as appropriate, to improve the opportunity for all motorists in the traffic stream to obtain important information and to enable the system to continue functioning even though a component is lost. (For example, if a pavement width transition sign is missing, pavement markings can provide proper path guidance.)

Evaluation of Alternatives at All Levels of Activity

There are many alternatives that are available at every stage of planning, design, and operations of highway. Too often decisions are made without giving full consideration to the options available. Sometimes the task is undertaken in a particular fashion merely because that is the way it has been done in the past.

Difficulties are created in court when questions arise as to whether other courses of action were considered and why the procedure employed was selected. An essential ingredient of a good defense is to be able to demonstrate that comprehensive and logical procedures were utilized. Basic steps in decision making, which should be employed at all levels, are:

- consideration of a range of feasible alternatives,
- analysis of reasonable alternatives, and
- evaluation of the alternatives to determine the preferred one.

For example, alternatives are available throughout the planning and design for a highway construction project. A few of those that may be considered are:

- detour versus work under traffic;
- lane closure versus crossover;
- day versus night work;
- restrictions on working hours to accommodate traffic needs versus no restrictions;
- normal versus special construction techniques, equipment, and materials; and
- periodic versus continuous surveillance of the traffic control zone.

Analyze the Results of a Systems Failure

The principle here is to employ the “what if” approach to project planning. Consider the types of mistakes that drivers might make, the likelihood of a failure in the driver-vehicle-roadway system, and the magnitude of the “accident” that may occur. The probability of an eventual major failure increases with:

- traffic volume,
- exposure time (project duration), and
- the complexity or unusual nature of the driving task involved.

Examples of varying degrees of accident severity are listed below in increasing order:

- single vehicle off-the-road accident,
- crash between two vehicles traveling in the same direction,
- crash between two opposing vehicles, and
- multiple collisions.

In application, the principle involves employing stronger and more positive measures to preclude those accidents that are more apt to occur and for which the anticipated consequences are most severe. For example, consider the situation where a vehicle might leave an overpass and fall on a high-volume roadway
below. The multiple collision potential of this type of failure may warrant a barrier to prevent such an occurrence.

**Basic Rules for Designing Safe Facilities**

**Simplicity**

Make use of the principle of simplicity, wherein the best solution is the simplest and most direct one that will work. Avoid giving the drivers choices, simply tell them what they need to do. Multiple choices, when necessary, should not be required at one location. Separate the choices longitudinally along the roadway with adequate time provided for the drivers to recognize and evaluate them.

**Consistency**

Supply a consistent highway environment for motorists. Utilize standard design features and uniform traffic control devices. Avoid changes in design speed along any stretch of roadway. Select design components and traffic control procedures that are consistent with the degree of hazard involved. Avoid surprises by utilizing driver expectancy in a positive manner.

**Compensation**

The rule of compensation states that when unable to meet a guideline, compensate by providing more than the minimum requirements in another form or location. The idea is to give the motorist a comparable level of safety even though one aspect may be less than desired. Although guidelines should be met, where practicable, there will always be situations where one must adjust to field conditions and competing requirements. For example, if at a work site there is not sufficient room for a full taper length, one might compensate by providing additional warning signs and utilizing supplemental devices, such as an arrow board.

**DOCUMENTATION AND RECORD KEEPING**

A document is an instrument on which information is recorded, usually in written form. Documents include correspondence, notes, computations, maps, plans, and diaries. In accordance with the rules of evidence, a written instrument is regarded as the primary evidence, whereas the recollections of a witness would be considered secondary.

Records are a written account, generally prepared under proper authority and designed for long-term or permanent evidence as to what was found or performed. Records are generally gathered in accordance with a designated uniform procedure and compiled in a standard format. Record keeping is often mandated by administrative, accounting, or contractual requirements.

**The Need for Documentation**

The key to winning cases in court is advance preparation, and good preparation must start well before an accident occurs or a claim is filed. Merely performing in a reasonable and prudent manner is not sufficient; one must be able to prove it in court. The key to such proof is good documentation and record keeping.

One of the comments most frequently heard from the attorneys charged with defending highway agencies concerns the inadequacy of documentation. It is often said that the agency and its people are basically doing a good job, but the documentation is simply not available to prove it to a jury.

Written accounts describing the basis for a decision can be invaluable to anyone subsequently reviewing the decision-making process. It also tends to ensure a more complete consideration of all relevant factors. Good documentation is not only helpful in establishing reasonable conduct; it may be critical in proving such defenses as design immunity or discretionary conduct as the basis of discretionary immunity. A case in California demonstrates the importance of documentation.

The Harland case involved a cross-median head-on collision on the Benicia/Martinez Bridge (19). The state was held liable for not installing a median barrier in accordance with its own warrants. The jury members were interviewed afterwards and stated that they did not reach their verdict on the basis of the opinions of the plaintiff's expert, but instead solely on the basis of the state's own policies (unpublished data, 1982). They felt the accident could have been prevented if a median barrier had been installed in accord with warrants developed by the highway agency. The jurors also indicated that they still might have found for the state if only department personnel had noted that the warrants were met and had made a conscious reasoned decision not to place a barrier on the bridge. When they were reminded of the testimony given by an agency engineer, that he had done so, the jurors answered that such decisions should have been recorded in writing.

Juries may well discount oral testimony made at the time of the trial, considering them to be rationalizations or self-serving. Written materials prepared at the time in question will carry far more weight.

Problems caused by poor or nonexistent documentation include the following:

- the adequacy of the agency's performance may be difficult to demonstrate,
- plaintiff's contentions may be hard to disprove,
- people forget,
- responsible persons may no longer be available to testify, and
- oral statements made at a later date carry less weight than timely, written documentation.

**Impediments to Documentation**

There is a general concern that written records will be obtained by plaintiffs under the rules of discovery and used against the agency. If such documentation is compiled in accordance with the principles discussed herein, the argument is not sound. The point is that if the agency is acting negligently, it will likely lose cases regardless of its documentation. If it is acting prudently, however, the documentation is needed to prove it in court.

Another reason why documentation is often poor or lacking
is a dislike for paperwork, especially by field people. Proper documentation requires organization and effort. If one’s supervisor does not insist on it being performed, it may simply not be done. The lack of uniform procedures, forms, and review by superiors also contribute to inadequate documentation.

**Characteristics of Good Documentation**

Caution must be exercised in the manner in which problems are described. Words such as “hazardous” and “unsafe” should be avoided. Conditions calling for some type of corrective action can be described in a more objective fashion. The basic rule is to record facts, not opinions. The documentation should be prepared in a manner that allows its authenticity and authorship to be demonstrated.

Properties of good documentation are evident if the documents are:

- prepared in a timely manner,
- complete,
- dated,
- signed, and
- filed in a manner facilitating retrieval.

Characteristics of good record-keeping systems include:

- employment of uniform and consistent procedures,
- universal use within the organization,
- editing for accuracy and completeness,
- efficient storage and retrieval, and
- automation insofar as practical.

**Photographic Documentation**

Photographs and photographic techniques, such as photologging, may provide very effective documentation for certain activities and events. The advantage is that a large amount of data can be obtained quickly and economically. Furthermore, pictorial information is more easily understood by lay persons on a jury than are engineering plans and diaries.

As with any form of documentation, photographs must be filed in a manner facilitating their retrieval. A written description may be necessary to explain the subject matter, viewing direction, location, project number, date, photographer’s name, and so on. If feasible, the file copy should be dated and signed by the person taking the photo. Without such annotations or the testimony of the photographer, it may be difficult to have photographs entered into evidence.

The opportunity to obtain desired photographs may be time limited because of changing conditions. Examples include documenting a construction project by phase and recording a field condition before remedial work is undertaken. Consideration should be given to providing camera access and training to selected construction and maintenance field personnel.

**Protection for the Individual**

The situation sometimes arises where an individual is asked or directed to take some action that he or she considers to be improper and/or unsafe. Documentation can be very helpful in such instances for protection from future tort actions. The individual has a responsibility to bring the problems and hazards involved to the attention of a superior. The strongest defense is obtained when the person insists on a written directive. This is entirely appropriate in dealings between a contractor and the agency or between a subcontractor and the general contractor.

The put-it-in-writing approach, however, may pose problems between an employee and supervisor. Other mechanisms available in descending order of effectiveness are as follows. Although it may not be practical to force the supervisor to write a letter, it is always possible for the subordinate to write to the superior. The letter can describe the situation and confirm the instructions given. If the supervisor does not write back promptly denying the instructions, the documentation strongly supports that the subordinate was acting under orders.

Another method is for the subordinate simply to prepare a memorandum-to-the-file describing the situation and noting that the superior was informed as to the possible consequences of the directive. When properly signed, dated, and filed, such written records are much stronger than oral testimony given at a trial. In further strengthening the documentation, make it clear that it was not prepared later and then pre-dated. Methods to affirm the authenticity of such a memorandum include: having it typed by a secretary, having it countersigned and dated by a fellow worker, and referencing it in a log or diary.
REDUCING THE RISK OF LIABILITY: POST-ACCIDENT ACTIONS

ON-SITE ACTIONS

Responsibilities of On-Site Personnel

Personnel involved in construction, maintenance, and utility operations have a high likelihood of eventually finding themselves at the scene of an accident either when it occurs or shortly thereafter. There is potential liability in such instances. It may be alleged that the work operation in some way contributed to the accident. Even if the accident were caused by other circumstances, the post-accident performance or nonperformance by persons at the scene may be held to have aggravated the injuries or contributed to secondary accidents.

It is important that field personnel be informed as to their responsibilities and proper course of action in such situations. It is often difficult to respond rationally at the accident scene under the tensions of the moment. Training can be most useful in overcoming such difficulties. With the organization’s policies having been stated and having had the opportunity to learn procedures and priorities in a classroom environment, the employee is much better equipped to respond in an appropriate manner.

Additional Hazards Created by Highway Accidents

A variety of problems may be created by vehicles and their contents when they are involved in highway accidents. Examples include:

- injured vehicle occupants, pedestrians, or workers;
- destroyed roadways or structures;
- downed electric wires;
- visual conflicts (gawkers) in adjacent or opposing lanes;
- slick pavements caused by oil and other materials;
- fire caused by fuel tank ruptures; and
- spills of hazardous (toxic, inflammable, explosive, etc.) cargos.

When working on the roadway, the hazards are greater than normal because of changing requirements for drivers and the presence of workers and equipment. Furthermore, if an accident does occur, there are often reduced numbers of lanes, closed shoulders, and restricted maneuverability caused by channelization. Traffic backups may occur, creating hazardous conditions upstream. Access by emergency vehicles may be blocked.

Line of Authority at Accident Scene

Law enforcement officials have the basic responsibility for on-site supervision at an accident scene; however, others may have to take action initially until a police officer arrives. Medical personnel, when they arrive, should assume responsibility for injured persons, but not for control of the site. Basically, the first person with some official status to arrive at the scene should take charge until the police arrive. A logical hierarchy for site responsibility might be as follows, in decreasing order:

- Law enforcement officials
- Other officials of emergency units, such as firemen
- Government personnel, in decreasing seniority
- Contractor or utility company employees

It is important to channel all help and corrective actions through one person, otherwise, redundant requests for assistance may be made or key requests may be overlooked.

Priorities of Action

The senior on-site individual should make an immediate and thorough appraisal of the situation. One should be alert to the possibility that the initial incident could instigate a far greater accident. Suggested priorities for action are listed below in descending order. If other persons are available to assist, with proper supervision some of these actions may be taken concurrently.

- Prevent secondary accidents by alerting other traffic.
- Determine the potential for fire or explosion.
- Identify any hazardous cargo or spillage.
- Recognize downed electric lines, potentially dangerous fumes, and other such hazards.
- Call for police assistance.
- Determine the number of injured persons and assess the extent of their injuries.
- Request other needed services—medical, fire, wrecker, utility companies.
- Restore integrity of traffic control zone if at work site.
- Establish or assist with upstream diversion, if needed.

Police officers will normally handle traffic in the immediate vicinity of the incident, but they do not have the resources or responsibility to handle the highway network when a major blockage occurs. The highway agency, on the other hand, has the capabilities and equipment necessary to inform and divert traffic upstream and to establish detour routes if long-term diversion is necessary.

Other actions that may fall under the purview of the highway agency include the following:
• assisting the police on-site with the traffic-handling function,
• emergency cleaning up of the site,
• installing temporary highway appurtenances destroyed in accident, and
• repairing the highway facility.

ACCIDENT INVESTIGATIONS BY AGENCY

Situations Warranting Agency Investigations

An agency may wish to conduct its own investigation of an accident. Reasons for separate investigations to supplement standard police reports are as follows.

• Police reports fulfill a different purpose and may be deficient with respect to information needed by a highway agency.
• If it appears that a claim may be forthcoming, additional information may be needed for the preparation of an adequate defense.
• In some instances, such as work area traffic control, corrective action may be in order before the police report is filed.
• An engineering evaluation of the situation may be required.
• The accident may establish notice of a potential problem or defect.
• Investigation enables personnel to testify firsthand as to findings.

Discretion must be exercised in determining the need, extent, and scope of additional investigations to be made by the transportation agency. The key factor is the likelihood of a significant claim resulting from the accident. This will depend on the seriousness of the accident and the amount of damage that occurred. One can anticipate that all severe personal injury and fatal accidents may result in large claims. Furthermore, if at all possible, potential plaintiffs will make an effort to include the government agency as a defendant.

Contrary to what one may think, the ability of an agency to investigate accidents may vary inversely with size. In a small municipality the traffic engineer may well be able to look personally into the more serious accidents. In a large state, however, the agency will need to be highly selective in determining those accidents deserving investigation by its own forces.

Method of Conducting Agency Investigations

The local unit of the agency should conduct an investigation and submit a report to the legal office through its claims officers when:

• requested to do so by the legal office,
• notified by the police of an accident involving a condition of the highway that appears to require examination,
• information is received directly from a potential claim or indirectly (such as newspaper articles or letters) that an accident was allegedly caused by the condition of the transportation facility or the negligence of an employee,
• an operating unit concludes after an accident has occurred that remedial work is necessary to prevent future accidents.

All investigation reports and supplements thereto should have a statement, such as the following, included in the caption.

THIS REPORT IS PURSUANT TO THE REQUEST OF AND FOR THE CONFIDENTIAL USE BY THE LEGAL OFFICE FOR THE PURPOSE OF DEFENDING (name of jurisdiction) AND ITS EMPLOYEES.

Information to Be Obtained In Agency Investigations

Field Data

The following items of information are very important in any action that may ensue, but will typically be obtained by the investigating police officer.

• Identification of vehicle involved, operators, and other occupants
• Names and addresses of witnesses
• Paths and final positions of vehicles
• Location and length of skid marks
• Position of accident-related debris
• Sketch diagram of vehicle paths
• Weather conditions
• Posted speed

The following items may or may not be recorded in the police report. Regardless, they are items with which police officers are not as familiar and for which independent observations are desirable.

• Pavement surface condition
• Type and location of all pertinent traffic control devices
• Type, size, condition, height, and lateral position of signs
• Type and condition of pavement markings
• Type and locations of traffic signal displays, controller type, settings, etc.
• Description of pertinent highway hardware and appurtenances
• Grades, cross-slopes, drop-offs, etc.
• Dimensions of roadway, shoulders, median, etc.
• Identification of agency personnel who witnessed the accident or who had firsthand knowledge of conditions at the site.

Photographs

Photographs should be obtained of the accident site, damage to the facility, and, when it can conveniently be done, the vehicles involved. While some photographs may be made by investigating officers, they may not include information of importance to the agency; for example, warning signs located upstream of the accident site advising motorists of conditions ahead.

Of foremost importance is the necessity that initial investigations and photographs be made without delay. Prompt investigation is particularly important in construction zone or work area accidents, where conditions change frequently.

Some suggestions for taking useful photographs are as follows:
● Document the conditions and traffic control devices on the approach to the accident scene.
● Take close-ups of features such as guardrail and traffic control devices to show type and condition; then take a more distant view to show location with respect to other features.
● Obtain close-up views of gouge marks, damage, etc.
● For close-ups place a scale in the field of view to show dimensions. If scale is not available use a readily identifiable object such as a pencil.
● Record pertinent information for all photographs—date, time, location, direction facing, name of photographer, etc.

Office Data

In addition to the field data and photographs previously described, the investigation file should contain the following items, if available and pertinent:

● Legible copy of police accident reports
● Legible copy of form used to report damage to public property
● Set of roadway plan sheets
● Name and address of contractor, contract number, dates of execution and final acceptance, nature of insurance coverage provided by the contractor (i.e., whether the agency is named as an additional insured)
● References to standard specifications, special provisions or change orders relating to the situation giving rise to the accident
● Map or drawing of the scene of the accident showing the location where the accident occurred and the path of travel of the vehicles involved along with pertinent measurements, location, and description of all permanent and temporary traffic control devices
● Statement from agency employees who may have witnessed the accident or who have knowledge of the situation concerning it
● Any other pertinent information that can be obtained from other public agencies
● Newspaper articles about the accident
● Copies of citizens' complaints about pertinent conditions at site

Reports should contain only factual data, not opinions or conclusions regarding the cause of the accident and liability of the agency.

Special Accident Investigation Teams

Some agencies utilize multidisciplinary accident investigation teams (MAIT) composed of a law enforcement officer, traffic engineer, and other specialists as needed, such as an automotive mechanic. In-depth team investigations are costly; thus they are usually employed only for major accidents. One state, as a matter of policy, conducts MAIT investigations for all accidents involving four or more fatalities, school buses, and police vehicles.

MAIT investigations may be able to identify vehicle defects, driver errors, and other causal factors leading to accidents. The experience has generally been favorable, although there may be occasional situations where causal elements of the highway are pinpointed, thus increasing liability. The reports produced by MAIT teams are commonly placed in the public domain, thus are available to all parties. The relative benefit for the agency will be related to how well it is performing the safety aspects of its responsibility.

USE OF ACCIDENT DATA

Evaluation of Accident Reports

Accident reports are typically processed as statistical information and then periodically, perhaps annually, presented in tabular and summary form. This is a useful and necessary function of the accident data processing unit. Such analyses can pinpoint problem locations, high-frequency accident types, and roadway features deserving attention (e.g., slippery pavements). Accident data may provide information that warrants more rapid response, however. In some instances one should not wait for a certain number of accidents to occur to establish statistical significance before taking action.

Accident reports should be reviewed in a routine and timely manner by senior knowledgeable persons to ascertain if changes in procedures are indicated and to determine if any remedial action is required. This should be done at the appropriate functional levels. For example, all accidents at construction sites should be reviewed by the construction office, those involving bridge rails should be reviewed by the bridge office, and so on.

Correction of Defects after an Accident

One question that often arises is whether to take corrective action after an accident. There is concern that such actions may be brought out at a subsequent trial and used against the agency. The proper answer is to perform as a reasonable and prudent person would under the circumstances. If the occurrence of an accident provides notice of a highway defect that can be corrected or mitigated, then it is reasonable to take such action as it is consistent with other priorities. If the defect were something that was known or should have been known to the agency beforehand, then subsequent actions may have little effect on the case. It is possible, however, that the occurrence of any accident may give additional weight to the problem, and result in a shifting of priorities.

The admissibility of subsequent actions varies among the states. In some, such evidence may not be brought before a jury. In others it is admissible only for the purpose of demonstrating that a course of action was available, but may not be used to imply that the agency knew that such corrective action was needed.
PREPARATION FOR TRIAL

PRE-TRIAL DISCOVERY

Discovery is a process sanctioned by the court in which the attorneys representing each party gather information about the case. It performs two valuable functions for trial lawyers. First, it provides revelations of essential strengths and weaknesses of the case, thus permitting an appraisal of whether a settlement may be preferable to a costly trial. Second, it enables attorneys to present their case in an orderly and effective manner in the event of trial. If information requested by the opposition is not turned over as requested, the attorney may be asked to show cause by the presiding judge. The court has the power to hold the offending party in contempt for refusal to cooperate in the discovery process, which could result in a jail term until the order is honored.

Under the general classification of discovery there are several pre-trial devices that can be used by one party to obtain facts and information about the case. Tools of discovery include: interrogatories, depositions, production of documents or things, permission to enter upon land or other property, physical and mental examinations, and requests for admission.

Interrogatories

Interrogatories consist of a series of written questions about the case submitted by one party to the other party. The person responding is usually required to sign a sworn statement asserting that the answers are true.

Depositions

Depositions are devices by which one party asks oral questions of the other parties, witnesses, or experts. The procedure is conducted under oath outside the court room, usually in one of the lawyer's offices. A word-for-word transcript is made and duly authenticated.

Production of Documents

Documents of interest include written material, such as correspondence, memoranda, logs, diaries and inspection sheets, plans, drawings, maps, photographs, and data stored in computer memory devices. Generally, requests for the production of documents are limited to parties of the legal action. Interrogatories and depositions are often used to learn of the existence of relevant documents. Then the documents themselves may be requested for inspection and copy.

EXPERT WITNESSES

Under the normal rules of evidence, witnesses can only speak of what they know firsthand. They may testify as to facts, but may not give opinions or conclusions. Ordinary witnesses are used to establish facts in the case and are called to testify as to their personal knowledge of such facts.

Role of Experts in Court Cases

Expert witnesses are used to assist the jury in understanding and interpreting areas of specialty in which ordinary persons are not skilled. An expert is one who possesses by reason of education and experience special skill or knowledge in some science, business, or profession that is not common to the average person. Expert witnesses by virtue of these capabilities are permitted to state their opinions and conclusions based on facts.

In highway tort liability cases, it is commonplace to utilize expert witnesses for the following purpose:

- Civil engineers—adequacy of highway design and maintenance;
- Traffic engineers—appropriateness of operational features;
- Mechanical engineers—vehicle dynamics and component failure;
- Human factors specialists—driver perception and response;
- Physicians—extent and significance of personal injuries; and
- Economists—estimate of pre-injury lifetime earnings.

The emphasis on the remainder of this discussion applies to obtaining expertise directly related to a highway agency's primary functions.

Selection of Experts

The initial decision to be made when selecting an expert in one of the specialties in highway and transportation engineering is whether to utilize an in-house staff member or to obtain the services of an outside engineer. The best answer depends on the situation. It may appear less costly to use people already on the agency's payroll, but this may not be the case. The best-qualified experts are senior people in the organization who are important to the ongoing activities of the agency. When such key persons are diverted from their primary activities, the agency's programs may suffer. Moreover, the cases where experts are most often used are those involving high potential liability. Any savings in conducting the defense may be foolish indeed if it diminishes its effectiveness.
The main issue is the type of testimony that is desired. When the purpose is to explain and support discretionary decisions, obviously the persons actually involved in the process would be the best witnesses. For example, a senior designer may be used to explain options that were considered and reasons why a course of action was selected. Likewise, a senior staff member in the research laboratory could best describe tests performed by the agency that relate to the issue at hand.

If, however, the function of the expert is to assess the appropriateness of the agency's action, then an independent expert may have more credibility. The opinions of an agency employee, regardless of qualifications, may be seen as self-serving by a jury. When asked whether an action is in accord with accepted engineering practice or if a situation is safe, the opinions of outside experts carry more weight. They are better able to assume an unbiased posture and examine issues in a broader context. Many agency engineers have spent their entire careers with the agency. Many outside experts have had broader experience, enabling them to speak with more authority on the state of the art and the practices of other agencies. The pretrial preparation of an outside expert should include close cooperation with the agency's staff to ensure that the expert's testimony provides a proper and sufficient foundation for justifying the agency's actions.

Qualifications and Credibility of Selected Experts

Important in proving an expert's qualifications are education, experience, articles published, lectures delivered, memberships in professional societies and organizations, awards, and recognition as expert by others in the same field.

The credibility given to experts' testimony depends principally on their qualifications, capability of expressing themselves, sincerity and conviction, and the ability to withstand severe cross-examination. They should be able to communicate clearly and should be able to explain scientific and technical matters in plain, understandable language.

The usual procedure for qualifying an expert is for the lawyer who calls him or her to ask a series of arranged questions relating to his or her education and experience. By this means the expert merely responds to the question and avoids being put in the position of being self-laudatory. The judge is the one who makes the decision as to whether or not to accept the person as an expert and to clarify the subject area in which the expert will be permitted to testify.

If the expert has appeared before the court on previous occasions the judge may not need any information to make that determination. It should be kept in mind, however, that it is important that the jury be convinced as to the witness's expertise.

In some instances the opposing attorney will immediately offer to accept the person as an expert. This is commonly done when the expert's qualifications are substantial and the opposing attorney wants to avoid a favorable impression by the jury. It is best to decline such offers and to have the jury informed about the expert's background. Also, in the instance of appeal, it is useful to have the qualifications in the record for examination by appellate judges.

PREPARATION AND USE OF EXHIBITS

Purpose of Exhibits

There are various types of information that are difficult to present to the jury, either because of their lack of familiarity with the subject or their difficulty in visualizing or understanding the situation. Various types of audio-visual aids may be most beneficial in such instances.

Without an exhibit in hand, witnesses may be asked to make a sketch of what they are discussing on a flip chart or blackboard. This presents several problems. The sketch may be poor, distorted, or out of scale. Once made however, the sketch is often offered as an exhibit and made a part of the court record. Other witnesses may then find themselves forced to refer to the inadequate drawing. Also, without exhibits in hand, witnesses may be asked to utilize the opposition's exhibits to explain a point. This may pose problems as such exhibits may have been designed to emphasize the opposition's major points.

Effective Display Formats

When a highway defect is alleged, the design of the roadway and its relationship to the roadside environment are usually key issues. Engineers may be at ease with engineering plans and contour maps, but these are not generally as well understood by others. Photographs are most easily understood by lay persons. Aerial photographs may be especially useful in giving overall views of the areas and showing alignment characteristics. Types of static exhibits include photographs, maps, and diagrams. Three-dimensional models may be especially useful to show complex sites such as interchanges, or to show the interrelationship of such features as roadway alignment, cross slopes, structures, and roadside barriers.

Under certain circumstances it may be useful to have the opposing attorney, perhaps along with his or her expert, examine a proposed exhibit before the trial and stipulate as to its accuracy. This is especially advantageous when considerable effort is involved in preparing an exhibit, such as a model. By this means, arguments before the jury about its validity can be avoided. Modifications that the opposing attorney may request, if any, often can be made with little additional effort. Sometimes, the cost of preparation may even be shared by the various parties. Basically, both sides believe that they benefit from effective displays that accurately reflect conditions at the accident scene.

In those instances where there may be a dispute over the location or existence of a feature in an exhibit, it is suggested that it be made movable. Examples would include the position of a guardrail or the existence of a sign. The item in question may be relocated or removed to satisfy needs that arise during the trial. By this means the investment in and usefulness of an elaborate display, such as a model, may be preserved, without having the exhibit declared unacceptable.

It is also useful for the person who will utilize an exhibit during testimony to pre-mark locations of key points and events; for example, the location of a vehicle, a sight distance, or start of a skid. The marks may be in a form not readily visible to others so that they will not distract from the depicted scene. Such marks are best made when they can be properly scaled and checked. If one is asked to place an "x" on an exhibit during
testimony, it can lead to problems during cross-examination if it was not placed accurately.

Exhibits should either be large enough for the entire jury to view together or small enough to be passed around to them individually. With photographs, both of these objectives can be achieved. The witness may make a presentation using large blow-ups placed on an easel, say a minimum of 32 by 40 in. (0.8 m × 1.0 m) in size. Smaller prints, say 8 by 10 in. (200 mm × 250 mm) may then be passed among the jury for examination by each member.

Regardless of the exhibit being introduced, it is important to ensure that there is only one at a time capable of being viewed and that the entire jury is looking at the same exhibit that the witness is explaining. When exhibits are passed to the jury, wait until every member has finished before proceeding with testimony.

Figure 3 is a photograph of a model prepared for use as an exhibit during a trial. It shows one quadrant of the interchange at which the accident occurred. By using a three-dimensional display, the details of the overpass and its relationship to the highway are more clearly depicted.

**Dynamic Displays and Reconstruction Techniques**

Various dynamic displays occasionally have been used in court, including motion picture film, video tape, animations, and dynamic models. As the cost of preparation for these materials can be very high, dynamic displays are generally used only when no other form of presentation will serve the purpose. One example is a model of a highway bridge that collapses when loaded in the same manner in which the failure was alleged to have occurred.

Movies and television media may be difficult to have accepted as evidence. Potential objections that may be used by the opposition include distortions and misrepresentations because of the focal length of the camera lens and so on.

Reconstruction techniques have also been used. In some instances, where it is feasible, the accident itself is recreated. Instrumentation may be used and/or the tests photographed to obtain desired data. The objective is generally to make measurements, test assumptions, and verify hypotheses. In other instances the site has been reconstructed to make observations, such as sight distances, maneuvering space, and device visibility.

**FIGURE 3.** Model of portion of interchange used as an exhibit at a trial (photo by Panoramic Studios, Philadelphia).
FIGURE 4. Photograph taken during accident site reconstruction.

It is most desirable that the expert witness who will testify participate in both the planning and conducting of such reconstructions. The information obtained may be presented through testimony of those persons conducting the tests, still photographs, and/or movies or television film.

Figure 4 is a photograph taken during the reconstruction of an accident site on an expressway. At the time the accident occurred, one roadway was closed and a median crossover was utilized. For the reconstruction, the portion of the median barrier that previously had been removed was covered with black fabric to simulate the nighttime scene encountered by the motorist.

DEFENSE OF INSUFFICIENT FUNDS

The defense that the agency did not have sufficient funds to correct an alleged defect is generally held to be irrelevant, thus greatly favoring the plaintiff. To prove its case, the plaintiff need merely show negligence with respect to one specific location, whereas the highway agency may be forced to defend its entire program to explain why action was not taken at the accident site. The only basis for bringing the availability of funds into the picture as part of the defense is to present the programming procedures, previously discussed in Chapter 3. The following key points need to be made:

- The agency is aware of the condition of its facilities.
- Deficiencies have been prioritized on a logical basis.
- Within available resources, deficiencies are being corrected in order of priority.
- When deficiencies have not yet been corrected, appropriate warnings or other interim measures have been taken to protect the public.

When an agency can demonstrate that each of these steps had been taken, it can make the point that it did what a prudent person would do; namely, performing in the best way possible with the resources available—taking care of the worst and/or most easily corrected hazards first. The fact that it had not yet worked down to a lower priority item is then a legislative function. The agency must work within the funding limits apportioned to it by the legislature, which is directly responsible to the public through the electoral process.
CHAPTER FIVE

DEVELOPING AN EFFECTIVE LOSS-MITIGATION PROGRAM

RISK-MANAGEMENT CONCEPT

In previous chapters a general strategy was described by which individuals and organizations could minimize their tort liability. This chapter addresses specific program activities that should be considered for implementation by public transportation agencies. The principal recommendation is that tort liability risk must be managed. The elements of an overall loss-mitigation program are illustrated diagrammatically in Figure 5. The risk-management function is shown together with other components of the program described earlier in this report.

The implementation of an effective risk-management program requires several steps including establishing the organizational structure, staffing the requisite functions, publishing policies and procedures, and training agency personnel. The preferred management structure varies with many factors, such as organization size, magnitude of resources, existing governmental organization, applicable legislation, and existing policies. The various elements of a risk-management program are described, along with options to be considered and steps to be taken.

The final section of the chapter describes specific actions to be undertaken by the agency's top administration, the administrator of the transportation agency, and supervisors in charge of each functional unit within the agency. These recommendations serve as a report summary and implementation check list. Many of the listed suggestions are discussed in greater detail elsewhere in this report.

LEGISLATIVE ACTIONS

An aggressive program to achieve legal change to minimize liability at the legislative level is an important element of the risk-management program. To the extent that any public transportation organization engages in attempts to promote or influence legislation, the subject of tort liability should be one of the matters addressed.

With the changing status of immunity, there are several issues where legislation can have a major impact on transportation agencies. It is only proper that the agency make the legislature aware of the problems it faces in fulfilling its mission. For those states that have not yet lost their immunity, the opportunity is available to plan for an orderly transition in keeping with the changing times.

As a minimum, the legislature should be kept informed on a regular basis of the dollar value of claims (prayers) against the agency and the estimated cost of payments that will be required as a result of tort liability actions.

Examples of Legislation Reducing Tort Liability

Where sovereign immunity has simply been abrogated by the courts, the legislature should be made aware of the ramifications with regard to the ability of the executive branch to efficiently manage the agency's transportation system. For example, several years ago the New Mexico state court declared the state's immunity in tort to be unconstitutional. Although this declaration could not be overturned, the legislature subsequently was able to enact a statute that gave the State Highway Department limited immunity in some discretionary functions.

Legislation enacted in Iowa amended the state Tort Claims Act to specifically exempt the state from substantial tort liability and effectively bar suits against the state for actions alleging negligence in design and operation of highways. It was passed in response to an appellate-level decision that was adverse to the state, holding that the state was responsible for upgrading obsolete roadway elements. When the legislature was given the estimated cost of upgrading, which was in the amount of several billion dollars, the pressure was sufficient to successfully enact remedial legislation. The legislature went so far as to describe its intent in the bill by explaining that although it specifies certain activities as excepted from the court's jurisdiction, it should not be construed that related activities not mentioned are excluded from the scope of the statute.

Another new Iowa law offers additional relief from tort liability at the county level. It provides that the County Board of Supervisors may classify secondary roads to provide for a reduced level of maintenance on selected portions of the county road system. After consultation with the County Engineer, the Board may classify the area service system into two classifications—A and B. Area A shall be maintained in conformance with applicable statutes, but roads in area B may have a lesser level of maintenance as specified by the Board. Of particular significance is the inclusion in the law that the county and officers, agents, and employees of the county are not liable for injury to any person or for any damages that occur proximately as a result of the maintenance of a road classified in area B, if the road has been maintained to the level required for area B.

Several state tort liability statutes indemnify state employees to various levels. Typical limitations are that employees must be acting within the scope of their employment and that gross negligence is excluded. A Florida statute contained the phrase, "No officer, employee or agent of the state or its subdivisions shall be held personally liable in tort for a final judgement which has been rendered against him. . . ." Being named in a suit and forced to defend oneself is extremely serious, however, even if the agency will eventually assume responsibility for any judg-
ment that ensues. A later change to the Florida law provides additional protection by barring suits against employees in most instances.

No officer or agent of the state or its subdivisions shall be held personally liable in tort or named as a party defendant in any action for any injury or damages suffered as a result of any act, event, or omission of action in the scope of his employment or function, unless such officer, employee, or agent acted in bad faith or with malicious purpose or in a manner exhibiting wanton and willful disregard of human rights, safety or property. The exclusive remedy for injury or damages suffered as a result of any act, event or omission of any officer, employee, or agent of the state, or its subdivisions or constitutional officers, shall be by action against the governmental entity, or the head of such entity in his official capacity, or constitutional officer of which the officer, employee or agent is an employee, unless such act or omission was committed in bad faith or with malicious purpose or in a manner exhibiting wanton and willful disregard of human rights, safety, or property. The state or its subdivisions shall not be liable in tort for the acts or omissions of an officer, employee, or agent committed outside the course and scope of his employment or committed in bad faith or with malicious purpose or in a manner exhibiting wanton disregard of human rights, safety, or property. (State of Florida)

This type of legislation can be helpful in maintaining employee moral and efficiency, while still providing adequate means of redress for the public.

There are other areas of legislative reform that, although not directly related to immunity, can assist in reducing potential claims. For example, one problem that all highway agencies face is the vandalism and theft of traffic control devices. Such acts are especially commonplace for portable devices used in work areas. If an important device, such as a stop sign, is missing for any length of time, the agency may well be held responsible under the concept of constructive notice. The resulting need for inspection and surveillance and the replacement of damaged or missing devices is a significant cost.

In many states traffic control device vandalism is a misdemeanor, based on the concept that the crime is related to the cost of the device. Other states have passed legislation making the vandal responsible for the hazardous condition caused by the crime. In California, for example, tampering with a traffic control device is a felony offense. Obtaining more appropriate penalties for device vandalism may help in decreasing the frequency of device damage and loss, with a corresponding reduction in liability for the transportation agency.

**FUNDING TORT CLAIMS**

Any public agency seeking to establish a risk-management program should consider and evaluate various alternatives for establishing a fund from which settlements and judgments are paid. Without such planning, payments generally have to be made from the general fund. This poses risks to the orderly functioning of government, particularly for smaller agencies. On occasion, local governments have been forced into raising their tax rate to pay for tort liability judgments.

**Establishing a Fund for Payment of Tort Awards**

It has been suggested that a special fund be established from which tort liability awards are paid. A possible source of income would be an assessment added to the motor vehicle registration fee. The assessment could be adjusted periodically to provide an operating balance. With a more readily identifiable source, juries might better recognize that judgments against public agencies are paid by those taxpayers who reside in the jurisdiction of which the agency is a part.

**Commercial versus Self Insurance**

A basic decision concerns whether to obtain insurance with a commercial carrier or to elect and develop a program of self insurance. Programs may be developed that combine elements of both approaches. From a national standpoint, a number of cities and counties and some of the lesser populated states may

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**FIGURE 5. Elements of an overall loss-mitigation program.**
well elect to utilize commercial liability insurance as a means of financially responding to tort liability claims and lawsuits. The use of insurance, however, carries some implications that make it difficult or impractical to pursue a risk-management program that will mitigate liability problems.

The following discussion presents some of the advantages and disadvantages of insurance as contrasted with self insurance. Each agency must select its funding procedure based on its resources and perceived risks.

Advantages of Insurance

The most obvious advantage of insurance is the attainment of a means of protection against potentially large and unpredictable costs at a known and budgeted cost. Smaller jurisdictions may simply not have the resources to insure themselves. An insurance carrier, on the other hand, pools the risk among many policy holders; thus it is able to assume the high risks associated with tort liability.

A second immediate benefit is that the public agency does not have to embark on a substantial program of building staff to handle a tort liability program. This may be an insurmountable task for small agencies. For larger states it is typically a problem of adding to existing claims and legal staff in order to handle the program.

Insurance Options

Excess Insurance

Excess or catastrophe insurance is an option that possesses features of both self insurance and commercial insurance. The agency assumes the responsibility of all claims up to a stated amount, thus limiting its liability. An excess insurance policy protects the public agency against all losses above the fixed level. This method can substantially reduce the cost of insurance, while keeping the risk for the agency within acceptable bounds. It is analogous to having a large deductible amount for which the policy holder is responsible.

As large verdicts have become more common, problems have been encountered with this form of coverage. Premiums and retention amounts have increased rapidly. Furthermore, where there was a demand within the retention, carriers have pressured agency attorneys with demands that the agency settle. If the agency did not accept such demands, there is a threat of denial of coverage, based on alleged bad faith refusal to settle. If the carrier's position were accepted in such instances, the excess coverage would be of limited value. The result could be that the agency is pressured into settlements that could not otherwise be justified.

Self Insurance Pools

Another solution being used in California is for a number of the smaller public agencies to pool together under a joint powers agreement. By this means, a small agency may obtain advantages of a centralized claims service and the pooling of resources. The pool may choose to hire legal staff or to contract for legal services with private attorneys. The options available under a pooled arrangement are quite varied.

Disadvantages of Insurance

With the rapidly increasing number of tort liability claims and the very large award being made, difficulty may be encountered in obtaining insurance coverage. With mounting risks, insurance carriers may be reluctant to write such policies, and, when they do, premiums may be very substantial.

There may be gaps in coverage, which is simply another expression of the difficulty in obtaining coverage. Some insurance companies will insist on a large deductible amount. Others may impose limits on the upper end. All such gaps reduce the ability to insure against loss and affect any program to minimize tort liability.

Within the last several years, many public agencies have encountered very large and rapid premium increases, making the practicality of insurance of some doubt. In those states in which immunity has just recently been lost, the escalations may not be clearly evident. Nevertheless, the experience of others with a longer history of tort liability clearly indicates the inevitable growth in claims and the resulting growth in cost of insurance. For private highway contractors, insurance coverage has become a major cost of doing business.

An insurance carrier must seek to make a profit and is subject to certain taxes, costs that the public agency would not incur. Whether or not a public agency can operate with the same efficiency is debatable, particularly for the small agency that does not have the same ability to develop a competent professional legal staff.

With commercial insurance, there is a tendency for people in the transportation agency to think of tort liability as the insurance company's problem. This lessens incentives for units and persons within the organization to minimize tort liability.

The objectives of the insurance carrier may not be commensurate with those of the insured agency. The most obvious example of a conflicting goal is that the insurance company is most likely attempting to optimize its position in the short run; that is, the life of the contract. As insurance policies are generally written for a period of one to three years, a different carrier or the agency itself may be handling the coverage within a few years. The company will be interested in attempting to maximize its profits and minimize its losses within the policy period. Toward this end the company may be motivated to settle cases simply to avoid the high cost of claims investigation and legal defense, even though a case may have doubtful liability. This may make good sense from a business point of view. From the perspective of the agency, however, it may create a stimulus toward increasing volumes of claims in the long run. When an agency believes that a claim is unwarranted and that it performed properly, it would likely have a strong obligation to protect the public treasury if it were free to make the decision on its own.

When an insurance carrier and its claims adjusters handle all claims, it is difficult, if not impossible, to obtain feedback that would help the transportation organization avoid similar losses in the future. The insurance companies usually retain private counsel rather than staff lawyers, and they have little, if any, interest or incentive in providing information related to loss mitigation. Little experience is gained by agency personnel on which to base future risk-management activities. Potentially valuable staff training and development opportunities are lost.

There is often a long delay between payment of premiums and actual settlement or payment of a claim. The insurance
company obtains the use of these funds during this delay period, which can run several years. A self-insurance program, on the other hand, would enable the transportation organization to benefit from the use of these funds.

The single, most important disadvantage when using commercial insurance is the inability of the public agency to control its own destiny. Important elements in developing an effective long-range loss-mitigation program are not under the control of the insured transportation agency.

Example of Benefits Obtained from Self Insurance

In recent years many California cities found themselves facing ever increasing insurance premiums. Payments doubled and even tripled, and in some cases coverage was canceled altogether. In 1976 the city of Sacramento went into the insurance business for itself by instituting a self-insurance retention program that assumed the first $300,000 of liability per claim. In addition, it purchased another $20 million in backup insurance from a consortium of private companies. In the ensuing six years the city has averaged more than $600,000 savings each year. The city maintains a $1 million reserve fund, and the largest settlement to date has been $346,000. The $3.6 million saving has enabled the city to fund other beneficial programs (20).

Budgeting for Self Insurance

The method by which an agency sets aside funds to cover potential tort claims may be prescribed by law, administrative regulations, or accounting procedures. Without the establishment of a special fund, settlements and judgments will be paid from the general fund. In some jurisdictions, all payments, or all payments in excess of a stated maximum, require legislative action. The erratic and unpredictable nature of such payments can be most disruptive to orderly management and budgeting activities. Moreover, adequate funds simply may not be available for a particularly large claim or group of claims.

One means of establishing a fund from which tort liability payments are made is to establish a reserve account specifically for this purpose. In the case of a funded reserve, payments are made to the reserve account on each budgeting cycle. The size of payments will need to be adjusted on the basis of payoff experience and the backlog of pending claims. From a budgeting viewpoint, there is very little difference between this procedure and commercial insurance. From a cost standpoint, however, self insurance with a funded reserve enables the agency to earn interest on the account, which may be a substantial amount.

Regulations may require an agency to maintain a funded reserve. For example, many toll authorities must establish reserves for all foreseeable future expenses to fulfill the agreement with its bond holders.

Some agencies have an unfunded reserve. Such a reserve is merely a statement of anticipated future liabilities. It is an important financial planning tool. The argument of not funding the account is to make more effective use of present revenues.

Forecasting Tort Liability Payments

Regardless of which mechanism is used, the effective management of risk requires that an agency anticipate its probable payments that will be due to tort liability. Only when this cost is known, can management formulate programs that balance investments for the reduction of tort liability against the numerous other programs required to fulfill the mission of the agency.

Evaluating the risk is a primary and essential aspect of a risk-management program. Obviously, one cannot devise an effective solution without first understanding the magnitude of the problem. The difficulty in assessing the risk is that it is not directly dependent on the agency's own programs, nor is it susceptible to objective measurement.

The analysis of a present case load of tort litigation presents difficult questions. In many cases liability is very tenuous. However, tort cases often involve serious injuries and large potential damages if liability is found. Moreover, the possible extent of damages, the degree of liability, and the probability of a successful claim vary widely among cases. Thus, the evaluation of overall risk is a probabilistic exercise, which is best determined as the sum of the risks of all individual cases pending at any one time. The precision with which one can estimate this total is related to the size of the backlog. Small jurisdictions with a corresponding small number of cases involved should recognize that their best forecasts could be greatly in error.

To calculate the risk in terms of individual cases requires an ability to judge the likely amount of the verdict if liability were assumed, factored downward by an assessment of probable finding of comparative negligence of the plaintiff (where applicable), and the probability of a verdict for the plaintiff. To this amount must be added the expense incurred in defending the case. Where comparative negligence prevails, there is another factor to be considered—that of comparative negligence and comparative equitable indemnity of the other defendants involved. In those states where defendants are jointly and severally liable, this factor could increase the amount actually paid by a government agency, depending on the insurance coverage and financial resources of the other defendants.

The ability to calculate the likely size of a jury verdict requires experience in trying personal injury cases combined with a thorough examination of medical records and consultation with medical and economic experts. To determine the comparative negligence of the plaintiff or the chances of a verdict for the plaintiff requires a knowledge of all facts relating to the cause of the accident, an understanding of applicable law, an ability to apply the law, and experience in how trial courts do in fact apply that law. Comparative indemnity again requires the ability to apply this relatively recent field of law to the facts of the case. Finally, this may all be affected by whatever other indemnity rights the parties may have to shift the risks of loss to each other. This again involves the application of a field of rapidly changing legal principles.

The application of this procedure is complex and requires much expertise and experience. Nevertheless, the information is basic to the development of a risk-management program. As extensive legal knowledge is requisite to the task, it should be performed by senior personnel in the legal office.

ORGANIZING A RISK-MANAGEMENT PROGRAM

Staffing the Legal Function

The first step in developing an effective defense against tort actions is to obtain good legal counsel. When a legal staff already
exists, the adequacy of the unit should be evaluated. It must be recognized that tort liability is a specialty and lawyers who have not specialized or had extensive experience in this area are most likely not well equipped to serve the agency's needs. Moreover, highway tort liability is a specialized area within the tort field.

The legal staffs available to some transportation agencies have practiced primarily in the fields of administrative and contract law. Until recently the major activity for many of these staffs was right-of-way acquisition. It may be unrealistic to believe that the same staff can adjust to such drastically changed litigation. Believing that all lawyers can do any legal job effectively is the same as believing, in engineering terms, that a traffic engineer can do the same work as a foundations engineer, just because they are both civil engineers.

Some of the less populated states and smaller local jurisdictions have elected to retain private law firms to handle the defense of tort liability cases. Although this may be an expedient way to obtain experienced counsel, as discussed above, it is not effective in building a long-term close-working relationship between the agency's technical personnel and the legal staff.

Larger agencies will be able to justify maintaining their own legal staff. Again, it may be necessary to recruit expertise in tort law, if it does not currently exist within the legal staff. The next question is where to locate the legal group within the government's organizational structure. In most cases the legal staff already exists within a separate unit, such as an office of attorney general. This central legal group serves the transportation agency as well as all other governmental agencies.

Unless the transportation caseload is very small, it is recommended that certain lawyers be designated as having a primary responsibility for transportation cases. By this means they become more proficient in defending the agency and a working relationship is established between the two organizations. It is particularly useful for transportation personnel to have access to lawyers who have developed an understanding of their problems and terminology.

For a large state transportation agency with a large legal work load, consideration should be given to its having its own legal unit within the agency. This option provides the best opportunity for close coordination between legal and engineering staff. It may be seen that some of the recommendations made later in this chapter will be easier to implement when the transportation administrator has an in-house legal staff.

Staffing the Risk-Management Function

Risk Manager

It is recommended that a risk manager be designated to oversee the risk-management function. For local jurisdictions the risk manager would typically have responsibility for all activities—public works, water and sewer, parks and recreation, and so on. It may be appropriate to have the risk manager operate in a staff capacity and report to the chief administrator (e.g., the city manager). For a large organization, such as a state transportation agency, the magnitude of the risk-management task is such that the agency may need its own in-house manager.

District Claims Officer

For large organizations such as states, it will most likely be advantageous to establish and maintain a claims office in each district. A designated claims officer, together with such additional personnel as may be necessary, would handle the investigation of claims and related administrative matters for the district.

The primary mission of a district claims office is furnishing the legal office with all the information available from departmental personnel and records. Therefore, the claims office must have the cooperation of other functions in the organization. Although this may at times be a heavy burden for operating units on top of other duties considered of primary importance, it is essential that the necessary information be obtained with thoroughness, accuracy, and speed. The agency's attorneys are required by law to respond to interrogatories within specified time limits. Failure to provide information and answers can result not only in legal penalties, but might preclude the introduction of helpful evidence on the agency's behalf. Inaccurate answers can also be used to impeach agency personnel, embarrassing witnesses and adversely affecting the defense.

Tort Liability Committee

A tort liability committee should be formed within the transportation agency as a means of focusing attention on tort liability problems and risk-mitigation methods. Its basic charge should be the development of a coordinated agency-wide program. The risk manager would be a logical choice to chair the committee. Members should be appointed from each relevant function, such as legal, design, construction, traffic, and maintenance.

Risk Shifting

A fundamental means of reducing the risk from tort liability is to shift the risk to another person or entity. This can be accomplished by either indemnity agreements or insurance.

Indemnity Agreements

Transportation agencies should undertake risk shifting through indemnity agreements wherever possible. Risk is shifted in such agreements by the inclusion of a clause whereby the other party is required to indemnify the agency for certain types of liability. Activities for which such action is in order include construction contracts, encroachment permits, rental agreements, and maintenance agreements with local public entities.

Insurance

Risk can be shifted to contractors by requiring the contractor to carry adequate insurance in which the agency is named as an additional insured. Insurance is also advisable in encroachment permits and other instances where the other party may not have adequate resources to make indemnity alone meaningful.
An indemnity and insurance agreement clause used by the city of Philadelphia follows.

The contractor agrees to indemnify, defend and hold harmless, the (entity *), all its officers and subordinates, from all suits and actions of every name, nature and description brought against them or any of them for or on account of any damages or loss sustained by any part through the contractor or his agents, servants or employees in the performance or subsequent to the completion of the work under the contract whether such injury or damage be due to the negligence or the inherent nature of the work or to the negligence of the (entity), its servants, agents or employees. It is not the intention of this section or of anything herein provided to confer a third party beneficiary right of action upon any person whatsoever and nothing hereinbefore or hereinafter set forth shall be construed so as to confer upon any person other then the (entity) a right of action either under this contract or in any manner whatsoever.

In this regard, the contractor, in addition to any other insurance requirements provided for in the specifications, shall obtain and maintain in full force and effect, contractor's comprehensive liability insurance covering the performance of work under this contract. Said policy of insurance to have minimum limits of $(amount **) / $(amount) and $(amount) property damage and such insurance shall name the (entity) as a co/or additional insured. Evidence of such insurance shall be furnished the (entity) before commencement of the work on this contract. (Entity) insurance will be paid for at the contract lump sum price. (City of Philadelphia)

- Name of entity preparing contract.
- Amount of coverage for liability and property damage.

This clause, included in contracts made with the city, specifies the insurance that a contractor must carry and requires that the city be named as a co-insured party. Attention is invited to the phraseology that covers not only the negligence of the contractor, but also the negligence of the municipality, its servants, agents, or employees. The Supreme Court of Pennsylvania has held that this clause was enforceable (27).

Risk-Management Activities

Review of Policies

A systematic review should be undertaken of all the agency's relevant policies, guidelines, and manuals. Such documents essentially define the manner in which various activities are to be performed. With such information in hand, it is relatively easy for a plaintiff's attorney to establish what a reasonable and prudent person would do—simply follow the agency's written instructions.

One rule is, do not establish procedures unless the intention is to have them consistently followed throughout the organization. Although this may seem obvious, the principle is frequently ignored. An example of such a violation is often heard from contractors working for a highway agency. The complaint is that the private contractor is forced to conform to the state's traffic control manual and provide extensive devices and procedures for traffic control, whereas the agency's maintenance forces working down the road are not.

In the past, manuals were often written with strong language to force an upgrading of procedures. Little or no leeway was given in their application in order to achieve general compliance. At this time, however, the situation may well have changed.

Much of the desired improvement has been obtained, and tort liability has become a major concern. The strong language that previously served a useful purpose may now make an agency extremely vulnerable to lawsuits.

When reviewing manuals and standards, questions to be addressed are as follows. Are they:

- useful and needed?
- current and consistent with present policy?
- in the hands of those persons who need them?
- being used by all pertinent units within the agency?
- designed and written from a defensive standpoint?
- stated as a required "standard" or as a general guideline?

Once this work has been completed, a procedure should be established that provides for the review of all such new written material that may affect the agency's tort liability. It is recommended that these reviews be performed by the legal office. The attorneys may need to confer with the agency's engineers to ensure that wording is acceptable from both viewpoints.

Selection of Appropriate Terminology

Engineering tools, such as standards and warrants, are not intended to serve as a cookbook nor a substitute for engineering judgment. They serve valuable and necessary functions, providing the basis for assuring a consistent degree of quality and safety for work performed by the agency. This interpretation, although accepted among engineers, is not well understood by lay persons. It is often difficult to convince a jury that it was prudent to perform in any other manner than that specified. Because these terms serve as potential traps, the use of words such as "standards" and "warrants" should be carefully scrutinized and in most instances avoided.

Regardless of what terms are used, however, there will be times when special problems constrain the direct application of such tools and, in such instances, appropriate adjustments must be made. From a liability standpoint, there are two steps that are essential when guidelines are not followed. First, one must show that the guideline was considered, but on the basis of an engineering analysis a decision was made to handle the situation in a different manner. Second, the reason for such variation and its approval by competent authority must be documented. The point is to be able to show at some future time that a conscious, considered judgment was made, rather than an omission or oversight.

Variations from agency guidelines should be approved at the same level in the organization at which they were established. This procedure ensures that all pertinent factors are considered. While some delegation of this authority may be granted for routine matters, it is important that the persons or office that promulgated the guidelines be apprised of variations that ensue.

Review of Documentation Procedures

Periodically a systematic review should be undertaken of the agency's data collection and documentation procedures. Items of concern include accident statistics, accident reports, design computations, project diaries, inspection reports, and mainte-
nance records. The basic questions to be asked are twofold. First, is the agency taking notice of information that it has in hand and responding to it in a timely and appropriate manner? Second, is the agency documenting what it is doing and why it is being done in the manner selected? If any areas are found where these questions cannot be answered in the affirmative, remedial procedures are indicated. To protect itself in a court case, an agency must be able to prove that it is performing its mission in a reasonable and prudent manner. A primary method of proof is good, clear, orderly, and consistent documentation.

From a procedural standpoint, key questions to be addressed during the documentation review follow. Is the information being:

- obtained that may be needed for potential litigation?
- prepared in a positive and helpful manner from a defense standpoint?
- reviewed and acted upon?
- recorded in a form whereby needed items can readily be retrieved?
- held for the proper period of time?

Incorporating Risk-Reduction Measures in Agency Program

A formal reporting procedure should be established whereby those monitoring tort liability concerns provide input to the development of the agency’s transportation-improvement program. Alternative units to which this responsibility could be assigned are: (a) the legal office, when this unit is part of the transportation agency, (b) the head of the risk management unit, or (c) the tort liability committee.

Regardless of how the assignment is made, the tort liability committee should be utilized in the development of such recommendations. At least one such report should be submitted annually, with such submission coordinated with the agency’s annual program preparation.

Miscellaneous Actions

Administrative procedures that may affect the functioning of the risk-management program should be reviewed to determine if changes are needed to make the system simpler and more efficient. What may be needed are the elimination of unnecessary layers of administration and special approval for routine activities in risk management.

Easing Travel Restrictions

Often key witnesses are out of state and their statements or depositions are the only means of obtaining their testimony. In many instances other parties in the action have scheduled a deposition and, in these cases, it is necessary for an attorney to be present to protect the agency’s interest. When special approval must be sought for each such out-of-state trip, the time required may be excessive. A blanket approval for travel in such instances is recommended.

Compensation of Witnesses

The meager witness fee allowed for may provide no real compensation to witnesses who must take time off from their jobs to assist the agency with its case. Insurance companies are able to reimburse such witnesses for the amount of their lost wages. It is recommended that the legal office be authorized to enter into service agreements to pay witnesses for lost pay.

Simplified Procedures for Retaining Expert Witnesses

Standard contractual procedures for retaining consultants usually require a competitive process or special justification. Such procedures do not meet the special needs for retaining expert witnesses, as it is often necessary to hire experts on short notice and have the witness work quickly before evidence disappears. A simplified purchase order process is desirable for the retention of experts for tort litigation activities. An alternative procedure might be to establish a panel of approved experts with prearranged fee schedules for each of the various specialties in which such expertise may be needed.

Some agencies have a fee ceiling for outside services or require special approval for fees in excess of a stated amount. Limits of this type may be entirely inadequate for retaining expert witnesses. It must be recognized that qualified experts in tort liability litigation command a high level of remuneration. Furthermore, it is most desirable that the credentials and professional stature of the defense’s experts be comparable to those of the plaintiff’s experts.

Acquiring Evidence

Simplified procedures are needed for the rapid purchase of evidence items. Obviously, when one attempts to obtain the vehicle that was involved in an accident, the low-bid approach is totally unacceptable. Time is critical, as once a wrecked vehicle goes through a crusher the evidence is lost forever.

Sometimes it may be best to purchase the entire vehicle from an owner or junkyard. More often, the purchase may involve only a component, such as a tire or brake cylinder. A secure area is needed to store evidence (often for long periods of time) to prevent tampering or loss.

Automotive Fleet Liability

A large transportation agency may wish to undertake the complete management of its own automotive and equipment fleet liability risk. This is one area of the agency’s risk that is susceptible to management by non-lawyers, as it consists of a large number of small claims. Automobile insurance companies manage their risks with claims adjusters, retaining legal counsel only when settlement cannot be achieved.

A special problem may occur with commercial automotive insurance. A conflict of interest arises with attorneys hired by the motor vehicle insurance carrier where the claimant has alleged both negligent operation of the vehicles and the dangerous condition of the highway. The carrier’s attorney may seek to place liability on the highway as a part of the defense of the agency’s vehicle.
MANAGING CLAIMS ACTIVITIES

Management of risk includes processing, investigation, negotiation, and settlement of claims; conducting court cases; and handling appeals.

Identifying Potential Claims

Certain types of evidence may soon disappear, such as highway conditions and traffic control procedures in work areas. Likewise, damaged vehicles may be repaired or junked. Therefore, it is important to identify potential claims as soon as possible, recognizing the actual filing may occur one year or more after an accident, depending on state law. Early identification enables the agency to assess potential liability and to make preliminary investigations, when warranted.

Potential claims may be picked up in several ways. Police accident reports are a primary source. A procedure is needed whereby operating personnel report incidents they suspect might give rise to claims. Requests for information received from investigators, adjusters, and attorneys should be screened to identify possible lawsuits. The types of data sought include accident statistics at specific locations, traffic signal malfunctions, and maintenance records. Media reports and complaints from private parties are other indicators.

Receiving Claims

All claims for damage against the agency must be filed in accord with applicable laws. Regulations should be developed to define and standardize the filing procedure, obtain all information required, and name the proper receiving unit. Employees should not accept claims nor act as forwarding agents.

When letters or bills for damages are received, indicating that payment is anticipated or that a claim may be forthcoming, they should be forwarded immediately to the claims office, together with a memorandum explaining the circumstances of their receipt, when appropriate.

Maintaining Claims Files

A filing system should be maintained in the custody of the claims officer wherein all known information pertaining to potential claims, claims, and legal actions will be readily available to the legal office. The claims officer and investigators of the legal office, as agents of the attorney general, should have access to all the agency's file and should be authorized to interview and take statements of employees.

All copies of communications made with reference to any potential claim, claim, or law suit should be forwarded directly to the claims officer for transmittal to the legal office. All copies of correspondence and reports relating to investigations of potential or actual claims should be retained only in the files of claims officers and the central legal office. Documents placed in these special files should be clearly marked with a statement that the document is confidential and that the contents are for the purpose of defending the agency in potential or actual litigation. In most states this procedure is essential to ensure that the attorney/client privilege is not waived, thereby exposing the agency to the possibility that information given to the agency's attorneys could be disclosed to an adverse party pursuant to a court order. Such confidential files must be closely controlled. If the information in them is disseminated too far, the privileged nature may be disallowed.

Release of Information

It is imperative that caution be exercised in the matter of supplying engineering plans, photographs, reports, or other data in response to requests by private attorneys or investigators where the data will or might be used in connection with a pending or potential claim. To maintain control over the release of such information, all such requests should be referred to the claims officer or legal office. Information or data should not be released without prior authorization from these parties. Records or materials pertaining to pending litigation to which the agency is a party or to claims made against it are not deemed to be public records until such litigation or claim has been adjudicated or settled.

Claims Investigations

The legal office will cause supplemental investigations to be conducted where necessary to contact the claimant, the claimant's attorney, investigating police officers, third parties, and witnesses. This may include the taking of statements and the checking of hospital and medical records. Depending on the circumstances, this supplemental investigation will be performed by the attorney handling the case, investigators of the legal office, or by the district claims office. The decision to undertake such work will be made by and under the direction of the legal office.

Whenever an investigation reveals a situation or problem that affects the operation of the transportation agency, it will be made known to the appropriate department head within that agency.

Settlement Program

A well-administered settlement program is a key element of the risk-management program. This program component should be the basic responsibility of the legal office. The decision-making group, however, should include both legal and engineering expertise. An example of the importance of technical input is as follows. For a case in which a truck struck a bridge pier, it was alleged that highway defects caused the truck driver to lose control of his vehicle. An engineer studying photographs taken at the accident scene was able to show that the truck was badly overloaded. This information formed the basis of a successful defense.

The first step is an assessment of the agency's degree of fault. If the internal investigation clearly shows that the agency was negligent, then a vigorous attempt should be made to settle the case. It may not be possible, however, because of statutory or administrative settlement ceilings or the inability for the two sides to agree on a fair settlement amount. If a settlement is agreed on, both sides avoid the expense of litigation and the plaintiff receives payment sooner. It may even be considered unethical for an agency to expend public funds to defend itself.
in the instance where it believes itself to be at fault. The only valid reason to pursue such a case is the inability to agree on a fair settlement.

The second step is an evaluation of the risks involved in going to trial and the relative probabilities of a successful defense or a sizable verdict against the agency. Such assessments must be made by highly knowledgeable and experienced attorneys. When there is one or more badly injured party present in the courtroom, a sympathetic jury may find for the plaintiff, regardless of the appropriateness of the agency’s actions.

Effective utilization of resources calls for concentrating on those cases having the greatest potential for savings. It must be recognized, however, that routine or automatic settlement of small nuisance suits sets a bad precedent, one that is likely to increase the number of such suits.

Settlement decisions should be made by those who do not have a vested interest in the case. Engineers and supervisors closely associated with the persons or unit that were alleged to have been negligent may have an emotional involvement and want to try the case regardless of the risks involved. On the other side, the lawyer who will have to handle it may have a personal bias, wanting either to try the case or, conversely, to avoid a difficult case to build a winning record.

On occasion, the defense knows that the agency either erred or is extremely vulnerable, and the real issue is not a question of fault, but the magnitude of damages. In some states, an unrealistically low statutory cap on settlement amounts precludes conducting an orderly and fair settlement program. In such instances a legislative remedy should be sought.

When a settlement appears to be in the best interests of both parties, the trial judge may pressure the attorneys in an attempt to reach a settlement at the pre-trial hearing. If the judge believes that the defense is being arbitrary or elusive in not settling, it is possible that the conduct of the trial will be more difficult for the defense.

The Commonwealth of Pennsylvania has established an open-door policy on settlements. To facilitate the operation for plaintiffs' attorneys, a representative of the Attorney General's office holds periodic settlement conferences in various regions of the state. The dates and locations are advertised in legal journals and appointments are scheduled on request. This procedure has proved to be an effective method of utilizing the limited resources of the legal staff and has also been useful from a public relations viewpoint.

Other Settlement and Payment Techniques

Arbitration is an alternative means of resolving tort disputes in some cases, and it is being considered in some states. It may be necessary that enabling legislation be enacted and procedures be prescribed before this method can be instituted in a particular jurisdiction.

One means of controlling the rapid escalation in the amount of awards would be to remove much of the process from the judicial system. Tort claims could be handled by an administrative tribunal using a compensation schedule patterned after workmen's compensation. This approach would require legislative action, and it might be difficult to achieve in those states in which immunity has been abandoned.

Structured settlements are now being used in several states as an equitable means of paying large awards. In essence, as part of the award the defendant purchases an annuity that provides for regular payments made to the plaintiff during the remainder of his or her life. As payments are stretched out and the fund earns interest, the cost to the agency is greatly reduced. The plaintiff is guaranteed a regular income, which cannot be dissipated through poor financial management.

Selecting Cases to Appeal

The basis for appealing a court decision is an alleged error in trial procedure or application of the law. The cost involved in an appeal makes it impractical to be concerned about small awards. Cases that result in large awards should be reviewed and, where there appears to be a valid basis for appeals, such action should be undertaken.

There is a more important criterion for appeal, however. Adverse court decisions can build up a body of case law that may substantially affect governmental liability in the transportation area. A well-conceived loss-mitigation program will carefully select those cases for appeal that will set adverse precedents. This approach will be far more beneficial in the long term than merely focusing on those cases involving large monetary verdicts.

Targeting Problem Areas

Data regarding claims and lawsuits should be studied, categorized, and summarized to identify areas of high actual or potential liability. Because of the long lead time, which may be several years, between accident, claim, trial, and appeals, the agency cannot afford to respond only to completed actions. All potential, pending, and active cases must be continually scrutinized.

The objective is to classify functional areas and geographic locations that are most likely to generate law suits and large judgments. Once such problems are recognized, it makes sense to target resources into improving facilities for which the agency is most vulnerable. There are many factors to be considered in developing transportation improvement programs. The point is that improving the agency's tort liability posture is a legitimate and integral part of the process. Data on claims and lawsuits are also very useful in terms of initiating policy, procedural, and operational changes to mitigate tort liability.

TRAINING PROGRAMS

Need for Training

Training programs are an important part of an organization's risk-management program. Employees must be made aware of the safety aspects of their activities and must be familiar with agency policies and procedures. Some training has been included in federal regulations; for example, the statement in the Federal Aid Highway Program Manual that, "all persons responsible for the development, design, implementation, and inspection of traffic control shall be adequately trained" (22). One can foresee a plaintiff's attorney asking what steps an agency has taken to meet this need.

Employee training may be defined as the process of aiding
employees to gain effectiveness in their present or future work through the development of appropriate skills, knowledge, and attitudes. It should be recognized that training is continuous, whether it is organized or not. If it is not planned, the training may be adverse to the agencies objectives. For example, through a lack of concern by supervisors and management.

A training program, however, is a planned sequence of actions taken by an organization. Key steps in the development of such a program are:

- recognition of training needs;
- executive mandate to meet the organization's training needs and objectives;
- full support throughout the management structure;
- identification of current needs that can be met through training;
- analysis of the present knowledge and skills of proposed participants;
- provision of personnel, equipment, and resources for training;
- selection of trainees;
- conduct of the training program;
- evaluation of training effectiveness;
- modification of the program in response to the evaluation; and
- up-to-date maintainence of the program content.

The need for training in an organization arises from several of the following factors:

- changes in work techniques and procedures;
- improved equipment and materials;
- new standards or job requirements to be put in effect;
- turnover in personnel; and
- reminder, reinforcement, and updating of previous training.

Note that by the very nature of these needs, particularly the last two listed, training must be a continuing activity.

Types of Training

There are many types of training activities, all of which may be used as part of an overall comprehensive training program. One approach is characterized as individual methods. With on-the-job training, the trainee learns while performing the work. Training is accomplished by apprenticeship, job enlargement, special assignments, individual coaching, and work with supervisors. With off-the-job training, methods such as job rotation, membership in technical groups, and directed study are utilized. Programmed learning is the application of systems engineering to learning by exposing the trainees to small increments of knowledge wherein they progress step-by-step at their own pace.

Individual training methods are limited by the fact that there is no opportunity for interchange of ideas with other trainees and instructors. Progress is largely regulated by individual initiative.

With group training methods, the participants are brought together as a class to be trained by one or more instructors. An advantage is the ability to control the application of knowledge. The most common group method is the lecture/discussion in a classroom setting. A seminar approach may be more appropriate for senior supervisory and engineering personnel, in that there is a sharing of knowledge among participants, rather than an instructor/student relationship. When using a workshop technique, learning is accomplished by working out solutions to actual or hypothetical problems individually or in teams.

Sources of Training Materials

Several training courses and audio-visual training aids have been developed that are related to transportation safety and tort liability concerns. Sources of information include the National Highway Institute of the Federal Highway Administration and the Institute of Transportation Engineers.¹

One means of obtaining good training materials at modest effort is to utilize, adapt, and/or expand training materials prepared by others. Training materials dealing with legal matters should be reviewed by the legal office to ensure that the information presented is consistent with the laws of an individual state. In addition, it is recommended that the personnel from the legal office actively participate in the development and presentation of training dealing with tort liability.

Smaller transportation agencies may find that they do not have the resources to develop training on their own. Some states, recognizing the needs and problems of local jurisdictions, have either included local agency personnel in state programs or have presented programs especially for local agencies. Some local agencies have obtained training by having several agencies in the region jointly sponsor such courses.

Certification Programs

Some training is performed in conjunction with certification programs. The certification states that the participant has successfully completed a training program and is qualified to perform a designated activity. To be responsible and meaningful the certification should:

- require prior training and/or acceptable experience,
- involve the passing of an examination, and
- be time-limited (i.e., require recertification periodically).

Examples of such programs directed toward improved worker and public safety are the flagging certification programs of a few western states. In those states all persons, whether employees of public agencies or private contractors, must have current certification before acting as a flagger on a public highway or street.

There are mixed opinions regarding tort liability associated

¹ The addresses are: National Highway Institute, HHI-20, Federal Highway Administration, Washington, D.C. 20590; and Institute of Transportation Engineers, 525 School St. S.W., Washington, D.C. 20024.
with such certification programs. One opinion is that the program may be used to help demonstrate that an agency is doing all it can reasonably be expected to do to ensure proper performance of its personnel and those of its agents. Others, however, have been reluctant to combine certification with training on the grounds that it may increase the agency's liability. In the case of work area traffic control for example, certifying maintenance foremen as "certified traffic control supervisors" may be setting them up to perform in a manner more appropriate to that of engineers.

Certification programs should be reviewed by the legal office and approved by top administration to ensure that the overall objectives of the organization are met. Once instituted, such programs must be competently administered and maintained, or the agency may find itself more vulnerable than before.

CHAPTER SIX

ACTION GUIDELINES FOR MINIMIZING TORT LIABILITY

APPLICATION AND USE OF GUIDELINES

Description

Set forth in this chapter are policies, procedures, and actions that are designed to enhance safety and reduce losses through tort liability. Guidelines are grouped by level and function. These suggestions are in part a summary of material presented previously. For a more detailed analysis of the options available and methods of implementation, the reader should refer to earlier portions of this report. General guidelines that relate to many functions within the transportation agency are presented in Chapter 3.

Application

Each organization should develop an individualized program for minimizing tort liability on the basis of its particular needs, characteristics, and constraints. As the law applicable to tort liability differs throughout the United States, it is essential to obtain input from attorneys who specialize in tort litigation in the applicable state.

The actions proposed in this report may be used as a checklist of ideas for consideration and evaluation. Essential ingredients of an effective risk-management program include commitment of top management, enabling policies and procedures, organization, personnel, and follow-through at all levels. The checklist represents an ideal that is virtually impossible to attain in all agencies. Therefore, it should be treated as a set of desirable goals rather than as a set of minimum requirements.

ACTION GUIDELINES FOR VARIOUS AGENCY FUNCTIONS

Top Administration

- Make a determination as how best to insure the agency or reserve funds for tort liability claims.

- Consider having awards for tort actions deducted from the responsible agency's budget. By this means the transportation administrator is given the overall responsibility for optimizing expenditures by considering total program costs and benefits.

- Select an appropriate organizational structure that will facilitate and ensure a close working relationship between the highway agency and the legal unit responsible for defending the agency from tort liability.

- Establish responsibility for the organization and maintenance of a risk-management program.

- Express continued interest and support for the risk-management program by the chief administrator and other top staff people.

- Submit plans and specifications for jobs that go to public bid to the city council or board of county commissioners for approval. Although such approval may be cursory in some cases, debatable or unusual elements of the design should be pointed out and considered by the governing council. The fact that the project was reviewed by a public body strengthens the defense if a tort action ensues.

- Require that the transportation and police administrators meet periodically to discuss safety and tort liability concerns. Insist that good lines of communication are established and maintained between both upper echelons and field personnel in the two agencies.

Transportation Agency Administrator

- Approve funding and personnel, as needed, to carry out a risk-management program.

- Make the decision as how best to organize the risk-management function, set in place the necessary organizational structure, designate the person in charge, and clearly define his or her responsibility and authority.

- Form a tort liability committee to facilitate cross-pollination of disciplines, concerns, solutions, etc.

- Organize a citizens' safety advisory commission that meets on a regular basis to review suggestions and complaints regard-
ing the public transportation system. Actions of the committee should be recorded and submitted to the city council or board of county commissioners. The agendas and reports of the safety advisory commission provide good background material to reconstruct and support the agency's actions.

- Require furnishing to the legal division for their review all proposed changes to manuals, guidelines, policies, etc. that may affect the agency's liability.
- Implement a procedure for receiving and processing complaints, notification of defects, and other citizen input. Clearly designate responsibility for receiving and recording all such information and initiating appropriate action.
- Restrict the routine manufacture, fabrication, and procurement of traffic control devices to those meeting MUTCD specifications. Require the prior approval of high-level traffic engineering personnel for any special devices not meeting these criteria.
- Charge a multi-disciplinary team with the development and maintenance of traffic handling plans for emergencies and disasters that may affect the highway system.
- Implement a procedure whereby operating divisions (construction, maintenance, and traffic) check with the legal office before making significant changes in the existing road system. The legal office should ascertain whether there is a pending lawsuit involving conditions at that location. It should then determine if photographs or measurements should be obtained before altering site conditions.
- Educate field people as to special hazards that may be involved in highway accidents (e.g., hazardous cargo spills), the responsibility of highway agency employees for public safety in such situations, and priorities for action.

Legal

- Provide feedback as to the kinds of cases that the agency is experiencing and highway elements that are factors in these cases.
- Whenever an investigation reveals a situation or problem that affects the operation of the transportation agency, call it to the attention of the transportation agency's management.
- Be involved in the development and conduct of training programs in which tort liability is or should be included.
- Participate in the review of manuals and policies that may affect the agency's liability.
- Develop effective communications with the transportation agency's technical staff. Consult with engineers, as appropriate, in preparation for cases and be available to serve as a resource for them.
- Establish a good, continuing relationship with state and local police officers responsible for investigating accidents. They can alert the proper persons as to problems, help preserve evidence, and act as good witnesses in the court room.
- Identify, train, and utilize a cadre of agency engineers as expert witnesses. Work with the transportation administrator and the selected individuals' supervisors to gain full support for this undertaking. The persons selected should have good communication skills and receive recognition for their contributions in testifying.
- Identify outside experts in various specialty areas, and utilize their services in instances where independent expertise may have more credibility in the court room.

Research

- Conduct research, as needed, to determine the effects of various types of alleged highway defects (e.g., pavement drop-offs and polishing aggregates).
- Serve as a clearinghouse for research done by others. Place pertinent information in the hands of the cognizant operations managers.

Planning and Programming

- Provide a balanced program of capital improvements, giving due consideration to safety-related improvements.
- Consider and address tort liability concerns in the development of the transportation-improvement program.
- Confer with the traffic unit when reviewing site plans and development plans. Assess the traffic and safety implications for all proposals involving significant increases in traffic generation.
- Investigate safety features (e.g., sight distances available) before granting access to the public highway system.

Right-of-Way

- Maintain acquired right-of-way awaiting construction in a safe and sanitary condition. Check such properties for potential hazards as excavations, abandoned wells, and barbed-wire fences. Provide for routine inspection and maintenance services, as needed.
- When the property is still in use, shift liability to lease holders and renters. Require tenants to carry insurance to protect the agency from liability. Include indemnity clauses in all rental and lease agreements.

Design (23)

- Design facilities in accord with currently applicable policies, manuals, and guidelines. When the agency has not adopted relevant criteria, then recognized national guidelines should be utilized. For example, there are several AASHTO guides that address various design elements (24).
- Decisions concerning the selection and application of design standards should be made by competent professionals, based on the advice of such persons, or reviewed by such persons.
- In instances where other-than-normal design criteria are utilized, document the need and rationale for special designs or treatments. Have the legal staff review the rationale.
- Require an independent review of plans by other competent persons who were not involved in the design process. Charge the reviewers with the examination of the safety and tort exposure features of the design. Challenge them to see what improvements could be made and justified.
- Conduct postconstruction reviews with the participation of maintenance, traffic, and enforcement personnel to identify op-
erational problems for possible correction and improvement in future designs.
- Provide feedback to designers from construction and operations personnel as to both the positive and negative features of their design efforts.
- Prepare traffic control plans (TCP) that take into account the specific needs and site characteristics of each project. Recognize that reference to typical applications contained in manuals will rarely be sufficient, except for simple, routine operations.

Construction (25)

- Consider various alternatives for assigning the responsibility for traffic control and clearly define such responsibilities in the contract documents.
- Consider unit-cost payment for the maintenance and protection of traffic functions and devices.
- Require contractors to submit and obtain approval of their traffic control plans before the start of work. Require that revisions to the traffic control plan be handled similarly and that the plan be kept current and identifiable.
- Hold a preconstruction conference of key agency and contractor personnel. Include appropriate enforcement, fire protection, transit, school district, utility, neighborhood, and business representatives to discuss traffic handling, noise, dust, work hours, etc.
- Become familiar with and comply with traffic control procedures for street and highway construction operations as set forth in manuals such as the Manual of Uniform Traffic Control Devices (MUTCD) (26) or state manuals based on the MUTCD.
- After the installation or modification of a traffic control zone, have an evaluation inspection performed by a trained and knowledgeable person to ensure that the traffic control plan is working properly and that motorists are responding in an appropriate manner.
- Document photographically the route through construction sites and on detours after the initial installation and after significant modifications.
- Provide properly functioning traffic control devices at work sites, particularly for periods when unattended, such as nighttime and on weekends.
- Inspect the traffic control zone at regular intervals to ensure reasonable maintenance of the zone and servicing of the devices. Ascertain that devices are properly in place at the end of each work day before leaving the site. Provide for nighttime inspections, as appropriate, to check for adequate night visibility.
- Record all inspections using inspection forms or diaries.
- Document all actions taken or related to traffic control procedures or devices placed in effect at work zones.
- Store material and equipment a safe distance from the traveled way whenever possible.

Bridges (27)

- Inspect all structures periodically and prepare inspection reports in accordance with current regulations (28).
- Maintain and repair bridges in a timely manner. Any work involving the integrity of the structure should be defined by a structural engineer and checked by a structural engineer after the work is completed.
- If the inspection reveals that a bridge is not able to handle full legal loads with an adequate factor of safety, post the bridge as to the maximum load to be permitted.
- Conduct special inspections as soon as practicable, when there is reason to believe that a structure may have been damaged or site conditions changed (e.g., by high water, fire, or impact by vehicle or ship).

Traffic

- Recognize that traffic engineering expertise cuts across many other functional areas. Establish procedures that ensure that the traffic unit has input and review opportunities and responsibilities for such functions as planning, design, construction, and maintenance. For example, require review and approval by the traffic unit of traffic control plans for construction projects. Traffic personnel should serve as consultants to resident engineers and maintenance personnel.
- Restrict the fabrication of signs to authorized sign shops. Make sure that such shops are fully familiar with the MUTCD, standard sign, and standard alphabet publications (26, 29, 30, 31). Further restrict the routine fabrication to those devices that fully conform to these standards. Require prior approval for all special signs by high-level traffic engineering personnel. Require that special signs be returned to the sign shop when their approved use has been completed. Require the same approval process for the release of these signs for future projects.
- When traffic signals are installed, have a knowledgeable supervisor on site when the signals are turned on. In addition, have an engineer check the installation after turn-on to ensure its proper operation.
- Establish an inspection frequency for traffic signals and maintain detailed records of all inspection and repair work performed.
- Establish a list of principal signs from a safety standpoint (e.g., STOP and YIELD). Designate the priority with which such installations should be replaced when damaged or missing.
- When other than purely engineering considerations are involved, confer with the legal unit during the review of traffic control procedure and requests for special signs.
- Include in the traffic sign inventory system data on device knockdown and repairs. Periodically, say every six months, prepare a listing of signs having excessive knockdowns. Check these sites to determine if there is a problem and what can be done to improve conditions.
- Establish and maintain a logical and well-documented system for the identification and prioritization of safety projects.
- Establish continuing and effective communications with law enforcement agencies regarding traffic problems.

Maintenance (32–34)

- Conduct field reviews of the condition of roadway facilities on a reasonable periodic basis and document the findings. Implement corrective measures where needed.
- Pedestrian facilities under the agency's jurisdiction should be similarly inspected and maintained.
- Conduct special inspections when there is reason to believe
that unusual maintenance needs may have been generated (e.g., from high winds, heavy rains, or high water).

- Annually, before the rainy season begins, inspect and clean, as necessary, all drainage facilities that could be obstructed.
- Establish maintenance levels of service and ensure that work is performed in accordance with them.
- Establish a policy for the repair of obsolete safety appurtenances, such as guardrails. Specify under what conditions replacement should be in kind and the circumstances that warrant upgrading to current standards.
- Sensitize maintenance forces to the fact that reoccurring maintenance needs may provide notice of defective conditions. For example, numerous guardrail repairs on a horizontal curve may be caused by poor superelevation or a slippery pavement condition, or excessive repairs to a sign installation may indicate that the sign should be relocated. Confer with design and/or traffic personnel, as appropriate, to ascertain the reason for excessive maintenance being generated and to seek solutions to the problem.
- Keep in mind that worker safety is interrelated with public safety and that actions that benefit one usually, but not always, benefit the other. If the motorist can be kept from getting into trouble, generally the workers will have a safe work place.
- Require that all workers and field supervisors wear approved safety clothing and properly utilize safety equipment (e.g., hard hats, seat belts, high-visibility vests, goggles, and flags).
- Organize and train emergency response teams to assist with traffic handling around major incidents and disasters.
- Plan and organize maintenance activities to keep roadway occupancy time to a minimum to reduce the exposure of both workers and motorists. Consider various crew size, materials, equipment, and work procedure options to meet this objective. Recognize that the most common reason for excessive occupancy time is poor job planning and scheduling (33).
- Establish an ongoing training program to instruct maintenance personnel on the proper procedures for handling traffic through and around work activities. Obtain assistance from the legal, traffic, and training units for the development and presentation of the training program.

Training

- Work with the legal unit to develop and conduct training that will sensitize agency personnel as to tort liability problems and familiarize them with proper actions and procedures. Determine the advisability of conducting special courses on this subject.
- Work with the operating divisions to establish and maintain a program of operator training for motor vehicles and heavy equipment.
- Include appropriate material on safety and protection from tort liability in all training programs for which the coverage of such subjects is appropriate.
- Provide logistical support for training activities and programs.
- Serve as a clearinghouse for safety-related training programs and materials.
- Track the participation of agency personnel in training activities to advise operational managers as to retraining needs that are generated by personnel turnover and/or elapsed time.

RESEARCH NEEDS

Problems

Transportation agencies have the responsibility to make effective use of public funds. Settlements and awards made for tort liability claims constitute a significant and increasing portion of such funds. The growth in litigation combined with the erosion of immunity has presented highway administrators with a rapidly changing situation in recent years. Policies, procedures, and organizational structures must be modified to deal effectively with this changing climate.

There are several characteristics of the problem that make it very difficult to grasp.

- The rapid growth in tort liability claims (described in Chapter 1) presents a "moving target," making the task of program development more difficult.
- Changing legislation, judicial interpretations, and case law are, in effect, continually altering the "rules of the game."
- The time delay between an incident, filing of a claim, trial, and possible appeal results in a final accounting that takes many years to accomplish. Thus, current factual information as to costs associated with tort liability is impossible to obtain.
- Most complaints filed in tort liability cases cite all conceivable highway elements and functions in order to have the broadest possible basis for a claim. For example, design, maintenance, and operation are frequently all cited as being negligently performed. Therefore, it is difficult to correlate risks with agency functions and/or elements of the road system.

A fundamental problem in formulating an effective risk-management program is a lack of knowledge of the magnitude, scope, and character of the risks involved. Engineers are not well equipped through training or temperament to deal with the costs imposed by courts and awards conceived by juries, as court decisions seem to defy any logical or systematic approach to providing and managing transportation facilities.

Statement of Needs

Although many of these problems are not amenable to solution through research, two areas of need stand out.

1. Procedures for Assigning Tort Liability Costs to Highway Function and Element. Effective management of the risk of tort liability requires knowledge of the sources and magnitude of the problem. Information is needed about tort liability costs by highway function (design, construction, maintenance, etc.) and by elements and appurtenances (ditches, guardrail, luminaire poles, etc.). Because these data are not directly available, some subjective assessment is required. Therefore, a procedure is needed that defines the methods of evaluating these costs together with a set of guidelines that will minimize variations between individuals making such assessments.

2. Standard Statistical Tools for Tabulating Tort Liability Costs. To develop meaningful analyses and forecasts, tort liability data from many different jurisdictions must be aggregated. To accomplish this, all data inputs must be standardized. There is a need for uniform definitions, procedures, forms, and codes.
The situation is analogous to working with highway accident data. As accidents are statistically rare events, one needs to accumulate accident data over time and/or road network to develop statistical significance. Therefore, uniform accident reporting procedures have been developed that permit the combining of data from different agencies. By this means, sufficient data are amassed to enable accident rates to be developed by system components and features.

Accidents that result in claims are statistically even rarer events. Therefore, the need for standard data collection and tabulation procedures is essential to building an adequate data base.

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THE TRANSPORTATION RESEARCH BOARD is an agency of the National Research Council, which serves the National Academy of Sciences and the National Academy of Engineering. The Board's purpose is to stimulate research concerning the nature and performance of transportation systems, to disseminate information that the research produces, and to encourage the application of appropriate research findings. The Board's program is carried out by more than 270 committees, task forces, and panels composed of more than 3,300 administrators, engineers, social scientists, attorneys, educators, and others concerned with transportation; they serve without compensation. The program is supported by state transportation and highway departments, the modal administrations of the U.S. Department of Transportation, the Association of American Railroads, the National Highway Traffic Safety Administration, and other organizations and individuals interested in the development of transportation.

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