Work zone traffic safety risk management guide

Highway work zones are a high-risk environment for workers and the traveling public. Travelers firmly believes that contractors who carefully manage all aspects of their work, especially safety, make the best clients. Because highway contractors face unique problems associated with working under live traffic, effective work zone traffic safety management is an essential element of a company’s overall management process. With the number of traffic fatalities in highway work zones rising, an effective work zone safety program can help save lives and positively affect a company’s profitability. Travelers has developed this guide to provide information on work zone safety and ideas for creating a customized program for your company.

A serious risk

Statistics compiled by the U.S. Department of Transportation reveal that traffic fatalities in highway work zones continue to climb, reaching 1,010 deaths in 2006. More than 40,000 people are seriously injured every year in work zone traffic crashes. Estimates prepared by the Federal Highway Administration (FHA) placed the costs of these accidents at $4.4 billion in 2000, or nearly 5 percent of the $100 billion spent each year in the U.S. on highway construction and maintenance. While most people killed and injured are motorists passing through the work zone, workers also pay a heavy toll. Accidents involving vehicles traveling through work zones, combined with accidents involving contractors’ vehicles and equipment, are the greatest risk faced by construction workers. More than half of the worker skilled in highway construction each year, about 75 out of the 120 to 130 annual fatalities are victims of vehicle and equipment accidents. Accidents involving workers and vehicles are one of the main reasons why the highway construction industry experiences fatality rate more than six times greater than all other American industries combined.

Contractors benefit from work zone traffic safety

Like any other successful program or product, good safety programs require adequate funding and other resources. In a nutshell, successful contractors manage work zone safety because:

1. It’s the right thing to do.
2. It’s profitable!

Safety is caring about people

The first reason is obvious — people shouldn’t get hurt in order to complete a project. It should be a basic company goal to see that every employee gets to go home at the end of the day. The most difficult task any manager has to face is informing an employee’s family that a loved one will not be coming home because he or she was the victim of a workplace accident. The burden is even greater when management realizes an accident may have been preventable.

Safety means profitability

Accidents are expensive. The $4.4 billion annual cost of work zone traffic accidents estimated by the FHA does not begin to cover all the costs that a contractor incurs when an accident happens on a project.

Productivity and constructability

Everyone knows that accidents interrupt work and interfere with a contractor’s ability to complete a quality product on time, because the work stops or slows down until the accident is cleared and things get back to normal. Other adverse impacts may be less apparent. The loss of workers to injuries and supervisory time spent on investigating and reporting the accident is always a problem. In the current tight labor market, it may be difficult to replace good
employees. Accidents adversely impact the entire project work force and production invariably declines in the aftermath of a serious accident. When workers perceive that safety is not a project priority and they may be at risk, morale suffers and employees are less inclined to perform at full ability. As a result, the quality and quantity of work often declines. Increasingly, project owners select contractors based on their ability and past record. During this selection process, quality of the finished product, timely completion and management of safety are all often factored into the decision of who gets the contract.

Traffic impacts

Good attention to work zone traffic management not only protects the public and workers from accidents, it minimizes adverse impacts of the highway project on the community. When traffic flows smoothly and safely through a project, everyone benefits. For the contractor, goods and materials arrive on time, equipment can be moved to where it is needed and managers can move easily around the work zone. For the public, significant traffic delays in work zones result in driver frustration and economic losses when commercial vehicles sit in traffic. Reduced access to businesses also translates into real economic losses and may spell ruin for small businesses that depend on easy customer access. In addition to delays and loss of access, poor traffic management often means more noise and increased vehicle emissions. Funding for highway projects and acceptance of individual projects is highly dependent upon public acceptance of highway construction efforts in general. Poor work zone traffic management harms the public acceptance of the industry which may ultimately mean less funding.

Liability

Lawsuits are a fact of life in America, and when a serious injury occurs, everyone involved is at risk of being sued. Settlements in the millions of dollars are not uncommon, especially when the injuries are severe and the damage is long-lasting. Nearly everyone carries liability insurance to guard against major claims, but even with good coverage, defending against lawsuits results in significant costs, even if the defense ultimately prevails. In the worst-case scenario, a small or even medium-sized contractor may be forced out of business by a large liability claim, even if the contractor was only partly at fault. And it’s not just major claims that are costly. On a typical construction project, vehicle damage claims alone may represent a considerable cost that reduces profits of the job. It is well recognized that the best defense against liability claims — large or small — is good safety management that holds risks to a minimum and provides a good safety management that holds risks to a minimum and provides a good affirmative defense when the unforeseeable accident does occur, especially if it was caused by the negligence of someone other than the contractor.

Profitability — the bottom line

Well-managed work zone safety typically results in a better quality product, in less time and at lower cost, which may increase the availability of future work. Unfortunately, many of the cost benefits are easily overlooked.

Contractors today operate on very small profit margins. An accident in a work zone can generate both direct and indirect costs for the constructing company. Direct costs include deductibles and higher insurance premiums. Indirect costs, such as loss of productivity and equipment, and expenses associated with replacing workers, are often hidden. Indirect costs are frequently greater than direct costs and may not be covered by insurance.

Both direct and indirect costs can affect a company’s bottom line. For example, a project was bid with a 4 percent profit margin. If the project experiences a $10,000 loss, $250,000 worth of work must be performed just to break even because of the resulting direct and indirect costs. It’s not surprising that more company owners are holding supervisors accountable for safety on their projects. Accountability standards are good business.

Added work required to recover an accident loss for a given profit margin

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<th>Profit Margin</th>
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<tr>
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<tr>
<td>3%</td>
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<tr>
<td>4%</td>
<td>$250,000</td>
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<td>5%</td>
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An excerpt from an editorial sums it all up:

“Companies with good risk management and loss-control programs, safe work practices and emphasis on profitability over size will be well-positioned to make competitive strides against less fortunate firms in the marketplace that will be paying a lot more for insurance of all types.” Engineering News Record 11/12/01

Objectives and basic principles

Understanding the importance and advantages of work zone safety is an essential starting point, but safety goals can be reached only when everyone involved in the process understands the basics. Managers at all levels need to understand the basic objectives and principles of work zone traffic control so that program elements and procedures can be effectively communicated to other managers and to the workers who must implement the procedures on the highway.
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Objectives of work zone traffic control

Regardless of terminology, three basic objectives support the need for traffic control in highway work zones:

1. Provide a high level of safety for the traveling public and workers. While absolute safety cannot be guaranteed, reasonably foreseeable risks can be identified and controlled, and measures can be provided to minimize exposure to hazards that are likely to cause harm.

2. Minimize inconvenience and adverse impacts on the traveling public and the community where the work is being conducted. Traffic delays, blocked business access, increased vehicle emissions, noise and other adverse impacts entail costs to society, and controlling these costs is now a main objective in the overall management of America’s highway programs. In other words, highway projects that cause major disruption to travel and quality of life in a community are not acceptable.

3. Allow for the timely completion of a quality project. Although it seems at times that it is almost an afterthought, the third objective is to provide adequate access to the highway so the contractor can complete the project and provide good quality to ensure that the project lasts. Equally important, “profit” is not a four-letter word — contractors need to make a profit over the course of the project to stay in business. While these three objectives obviously compete, achieving two out of three isn’t enough when it comes to work zone traffic control. It’s important to manage the project in a way that achieves a reasonable balance of all three objectives at acceptable levels for each.

Basic principles

It’s not realistic to expect that all construction managers and supervisors will be expert traffic engineers. However, familiarity with eight basic principles of work zone traffic control is essential to project management:

1. Control of road users through a highway work zone is an essential part of the highway construction process. Adequate planning, management programs and procedures are essential to compensate for the unusual or unexpected situations faced by road users and workers.

2. Road user movement should be inhibited as little as possible to ensure smooth, orderly traffic flow through the work zone. The safest project is one that a traveler can traverse with minimum delay and inconvenience.

3. Positive guidance is essential to guide drivers and pedestrians through a project safely and efficiently.

4. Signs, markings, route guidance and other information must be provided in a clear, consistent manner.

5. Routine day and night inspections of work zones are essential to provide acceptable levels of operations. Conditions can change abruptly and unexpectedly, and traffic control devices may be damaged or displaced by traffic or environmental forces.

6. Attention to maintaining an acceptable level of roadside safety in work zones is important, just as it is on all highways. In work zones, increased conflicts and unexpected conditions increase the risk of an accident.

7. Each person whose actions affect work zone safety — from upper level managers and designers to field workers — must receive training. Training must be appropriate to the job decisions each individual is required to make.

8. All traffic control devices must be removed as soon as practical when they are no longer needed. Unneeded traffic control devices annoy travelers and lessen the credibility of warnings.

9. Finally, work zone traffic control must be based on the legal authority of the agency having jurisdiction over the highway where the work takes place. It is essential that a contractor gets legal authorization from the highway owner before establishing a work zone.

Legal and technical requirements for work zone traffic control

Work zone traffic control is subject to a number of legal and technical requirements that dictate how it is to be carried out. Effective and safe traffic control must comply with these requirements for a number of reasons. First and foremost, drivers depend upon uniformity and consistency to understand the directions provided. Traffic controls and safety features that are not consistent with accepted standards and practices are not as effective as they should be in conveying information and protecting workers and the public. Equally important, traffic regulations imposed in work zones may not be enforceable if not in compliance with the appropriate regulations. As a result, violators might not be cited by police or the citations could be dismissed in court. Finally, a contractor may be exposed to liability if a non-standard device is involved in an accident. Generally, a contractor is held to meeting “accepted practice,” which is defined by the generally accepted technical and legal requirements. Following are the primary requirements that must be met in addressing work zone traffic control:
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**Manual of uniform traffic control devices (MUTCD)**
Issued by the U.S. government, this manual is also known as 23 C.F.R., Part 655, Subpart F. It comprises the national standard for traffic control devices, and it is essential that contractors with responsibilities for Work Zone Traffic Control are familiar with its requirements, as well as any state MUTCD that may apply.

**Vehicle and traffic laws (VTL)**
Traffic regulations are provided in VTLs issued by individual states. While there are major differences from state to state, there also is considerable consistency regarding “rules of the road” and other basic regulations. *The Uniform Vehicle Code and Model Traffic Ordinance* prepared by the National Committee on Uniform Traffic Laws and Ordinances provides a model for states to follow, and provides a basis for the MUTCD.

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**OSHA regulations part 1926**
OSHA regulations, such as *Safety and Health Regulations for Construction*, spell out both general and specific requirements that contractors must meet in terms of protecting worker health and safety. A number of the requirements pertain to risks associated with working in or adjacent to traffic.

**Highway agency specifications, plans and standards**
Most highway work is done under contract to a highway agency, or is performed under permit from an agency when the work is for a utility or property owner adjacent to the highway. In either case, all of the work, including the Work Zone Traffic Control, must typically be performed in compliance with the requirements of the controlling agency.

**Work zone traffic accidents — the problem defined, solutions proposed**
A large portion of work zone accident costs are paid for out-of-pocket by the contractors engaged in highway construction and maintenance. These staggering costs deserve the attention of construction company managers and may motivate them to manage this risk effectively on projects under their control. However, cost-effective management of any program requires information and knowledge of the issues to be managed. Therefore, knowing what risks are most likely to cause accidents and injuries, and what countermeasures can be most effective in controlling these risks, is essential. The following are a few summary statistics that point to the risks involved, and some useful countermeasures that can be employed:

- Work zone traffic accidents are most frequent where traffic disruption is greatest. Nearly half occur in or approaching lane closures.
- Nearly half of work zone accidents are rear-end collisions, which demonstrates the importance of effective advanced warning and maintaining driver attention.
- Work zone accidents involving pedestrians and bicyclists are rare, but account for up to 16 percent of serious accidents.
- Nearly 40 percent of injured workers are on foot. While there is concern for motorists, half of the injured workers on foot were struck by their own equipment and vehicles.
- Safety features (impact attenuators, temporary barriers, etc.) are effective in protecting the work space, but these features also can cause devastating injuries if not installed correctly. Nearly one-third of accidents involve some feature of the work zone, such as traffic control devices, pavement discontinuity, equipment, excavations and others.
- Most work zone accidents occur during the active workday. However, a high percentage of serious and fatal accidents occur during the days and hours when no work is being performed.

As informative as these statistics may be, they are of little value unless they point to measures that can be used to reduce risks in work zones. These accident trends point out the following:

- Adequate advance information is essential to guide drivers and pedestrians safely through work zones. Surprises often spell problems.
- Adequate accommodations for pedestrians and bicyclists must be provided where appropriate.
- Positive separation of the travel space and work space is essential to protect both travelers and workers.
- Lane closures are a high-risk feature in work zones and should be used only when necessary.
- Good flagger training is essential to ensure that drivers are given clear guidance in flagger-controlled work zone situations.
Workers must be made aware of the risks associated with working near traffic. Procedures should be implemented to minimize conflicts between traffic and workers on foot.

Construction vehicle and equipment operators need to be trained and knowledgeable in work zone operations. Operators especially need to be aware of the danger they pose to workers on foot.

Because traffic control devices and safety features are frequently involved in work zone accidents, it is important that they meet all applicable safety requirements, and that they are properly installed and maintained.

Work zone traffic controls must be maintained in good condition when work is not active.

Other aspects of managing work zone traffic safety

To encourage its clients to develop and implement effective work zone traffic safety programs, Travelers intends to make its support and services available to assist contractors in this effort. At the same time, management of work zone traffic safety will be one of the criterion examined by Travelers as part of its underwriting process. It is our intention to seek to do business with those contractors who share our views concerning work zone traffic safety and to reflect that philosophy in our rate structure.

Each individual contractor must be responsible for managing traffic safety on highway projects under its control, and for establishing a strong safety culture for its managers and employees. However, there are numerous parties involved in the safety arena, and the actions and support of every one of them ultimately affects work zone traffic safety throughout the country. Even the most safety-conscious contractor can only achieve so much without the involvement of these other parties. Outreach and partnering is essential to achieving the goal of making highway work zones safe for workers and travelers. Contractors need to be involved in outreach efforts, on an individual basis, and through the various industry associations and advocacy groups that are involved in efforts to enhance work zone safety. Contractors also need to make their viewpoints known by the highway agencies for which they work. Agencies need to understand that issues effecting work zone safety are important to contractors.

Occasionally, honest disagreements arise between contractors and highway agencies as to the best way to maintain a safe work zone. Regardless of an agency’s authority to control the project and who designed the traffic control plan, the contractor may be held accountable if an accident occurs. This program includes a discussion of how contractors should proceed if this situation arises to ensure that the work progresses in a way that is safe and protects the contractor’s interest.

References:

Engineering News Record, Nov. 12, 2001
Federal Highway Administration
Manual of Uniform Traffic Control Devices
National Committee on Uniform Traffic Laws and Ordinances
National Institute for Occupational Safety and Health
U.S. Department of Labor, Bureau of Labor Statistics
U.S. Department of Labor, Occupational Safety and Health Administration
U.S. Department of Transportation
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How well does your company manage work zone safety?

A self-assessment

A good starting point in managing work zone safety is to assess how your current efforts stack up. To assist contractors in assessing their current work zone safety efforts, consider completing the following self-assessment test. The 20 questions are based on what many experts consider essential for the effective management of work zone safety.

Score each question on the following basis, then add up the total to see how your company looks.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
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<tbody>
<tr>
<td>2</td>
<td>We address this point, and carry it out on a regular basis.</td>
</tr>
<tr>
<td>1</td>
<td>We do this to some extent, but it is not formalized, and is sometimes missed.</td>
</tr>
<tr>
<td>0</td>
<td>We rarely or never do this.</td>
</tr>
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</table>

1. Company policy emphasizes work zone safety for employees and the public.
2. We have a written program in place to guide our work zone operations.
3. Executive management supports and participates in.
4. Our company employs one or more professional work zone safety managers.
5. Work zone responsibilities for field supervisors are clearly spelled out.
6. All employees are provided work zone training consistent with their responsibilities.
7. Worker awareness of work zone safety issues is reinforced on a regular basis.
8. Supervisors are familiar with work zone technical and regulatory requirements.
9. Technical and regulatory requirements are readily available to field staff.
10. Procedures are in place to acquire, distribute and maintain work zone safety devices.
11. Personal protection equipment is required and readily available.
12. Procedures are in place to enable workers to correctly set up work zone layouts.
13. Setup and takedown procedures minimize risk for workers and traffic.
14. Supervisors routinely check work zone setups and those checks are documented.
15. Technical assistance is readily available to field staff when needed.
16. Work zone accidents are reported, and investigations and follow-up are completed.
17. Work zone safety rules are clearly stated, including accountability and discipline.
18. Work zone hazards are systematically analyzed on job sites and risks are controlled.
19. Our company cooperates with police agencies to enhance work zone safety.
20. Our company is involved with industry-wide efforts to improve work zone safety.

Total
RISK CONTROL

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Total score

20 or less
You probably need to place more emphasis on work zone safety. Your employees may be at a high risk of injury in work zone accidents and your company may experience a high accident rate. It is also likely that your efficiency and profitability are adversely affected by work zone accidents, and you may experience accident claims that are difficult to defend. Consider reviewing the attached how-to guide for assistance on implementing a more detailed program.

21–32
Your company probably addresses work zone safety through a formal program, although it may not be as effective as it could be. Accident rates may still be higher than they need to be and not all of your employees are sufficiently knowledgeable on proper work zone procedures. Significant safety and other benefits can be achieved by upgrading your program using the attached how-to guide as a model.

33 or higher
Congratulations. You have a good program in place and your company takes work zone safety seriously. Based on your management approach, your workers are provided with a reasonably safe workplace, and work zone accidents are probably not an adverse factor in your profitability and competitive position. However, even if you scored 40, there is always room for improvement. Because your company is already dedicated to managing work zone safety, we recommend that you use the attached how-to guide as a model to improve an already good program.

The benefits of prompt reporting
By being proactive, you can work to minimize losses and accidents. But when a loss or accident does occur, reporting your claim promptly is extremely important. When you report your claim promptly, you benefit from:

- A proven, efficient claim handling process.
- Effective cost control for damages, injuries and other expenses.

Report a claim online or by phone:

Internet: travelers.com/claim/reportAClaim

Phone: Commercial accounts 800.238.6225
National accounts 800.832.7839

For more information, log in to the Risk Control Customer Portal at travelers.com/riskcontrol. (Need help? Read our Registration Quick Guide.) You also can contact your Risk Control consultant or email Ask-Risk-Control@travelers.com.

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