



U. S. Department of Transportation
Federal Highway Administration

Meeting the Customer's Needs for Mobility and Safety During Construction and Maintenance Operations

Model Work Zone Traffic Management Program and Self Evaluation Guide



Office of Program Quality Coordination

September 1998

HPQ - 98 - 1

Notice

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

The contents of this report reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official policy of the Department of Transportation.

This report does not constitute a standard, specification, or regulation.

The United States Government does not endorse products or manufactures. Trademarks or manufactures' names appear herein only because they are considered essential to the object of this document.

*Meeting the Customer's Needs for Mobility and Safety During
Construction and Maintenance Operations*

**Model Traffic Management Program
and
Self Evaluation Guide**

TABLE OF CONTENTS

I. Model Traffic Management Program	1
II. Self Evaluation Guide for Benchmarking	11

**Model Traffic Management Program
to
Minimize Motorist Delay and Enhance Safety
During Construction and Maintenance Operations**

I. Model Work Zone Traffic Management Program for Construction and Maintenance Operations

“The impatience of the traveling public and its growing intolerance for delays and inconvenience”¹ during construction and maintenance is not a recent development. Work zone delays and safety have also been a major concern to highway agencies for some time. The concept of *managing traffic during construction and maintenance operations*, as opposed to *controlling traffic in the work zone*, has been promoted by transportation officials for a number of years. However, our customers have told us that we are not meeting their expectations for mobility and safety in work zones.² Therefore, it is incumbent upon each of us, as part of our commitment to the Quality Journey, to strive for continuous improvement.

The FHWA’s Office of Program Quality Coordination (OPQC) conducted a quality improvement review entitled “Meeting the Customer’s Needs for Mobility and Safety During Construction and Maintenance Operations” between December 1997 and June 1998. As part of this review the OPQC review team (hereafter refer to as the Review Team) prepared a ***Model Work Zone Traffic Management Program*** to assist all transportation agencies in their continuous improvement efforts. This model program was developed by combining traffic management concepts reported in research studies and papers with the effective techniques currently being used by States to minimize motorist delays and enhance work zone safety. During the scanning portion of this review, the Review Team discussed these traffic management concepts and techniques with transportation officials in order to validate them. The Review Team concluded the key ingredients listed below are essential to any Traffic Management Program (TMP) if it is to be effective in minimizing motorist delays and enhancing work zone safety. While the model is idealistic, it is presented to provide transportation agencies with an effective tool for benchmarking. Since benchmarking implies a baseline from which quantitative measurements can be made, a ***Self Evaluation Guide*** is provided (Page 11) to assist agencies in quantifying the results of their benchmarking efforts. The key ingredients listed in the model are applicable to every project. However, it is recognized that there is no one solution for every project since every project is different. Obviously, traffic volumes, available capacity, project location, and project complexity will dictate the number of techniques to be used and the level of effort required.

A. Commitment of Top Management

Management must be totally committed to moving goods and people safely and efficiently through construction and maintenance work zones. This commitment must be reflected in the personal involvement of key decision makers, in partnerships with the leadership of major stakeholders, in written Agency Traffic Management Policies, and assignment of the required staff time and resources needed to carry out that agency’s comprehensive traffic management program.

“We decide on the best way to manage the traffic, then we design the project.”
.... Toll Authority Official

¹ - Bureau of Public Roads - Circular Memorandum dated August 26, 1957 .

² - Section 1090 of the Intermodal Surface Transportation Efficiency Act of 1991 and The 1995 NQI Survey .

B. Customer Focus/Orientation

While Federal, State, and local highway officials are charged with planning, designing, constructing, operating, and maintaining highways, the bigger responsibility of safely and efficiently moving people and goods cannot be overlooked. This bigger responsibility gets to the day-to-day operations. As noted previously, our customers have told us that we are not meeting their expectations for mobility and safety in work zones. In the National Quality Initiative (NQI) Survey, our customers said they want a smooth ride that is built quickly with minimum interruptions and which will last. Without exception, Toll Authority officials advised that they decide on the best way to manage the traffic before they begin the detail design needed to correct the deficiency.

“The impact to traffic drives the design of the project.”
..... Toll Authority Official

City highway officials advised their first concern is the impact to the residential and business communities affected by the project. They actively involve the affected residential and business communities in all phases of the project.

“We have to remember we are building the project for the public to use.”
.... City DOT Official

C. Performance Goals and Measures

Measuring the performance of services and programs from the customer's perspective is recognized as a critical component of a DOT's management strategy. Performance goals set the Agency's vision, expectancies, and direction. Performance measures provide accountability in meeting the customer's needs for mobility and safety during construction and maintenance operations. Performance goals and measures should be established for the maximum acceptable delay in work zone and fatalities and/or crashes rates.

D. Statewide/Area-wide Traffic Management Policy

While policies do not ensure performance, they do keep all parties focused on the Agency's desired result. Another major benefit of a policy statement, is the consensus-building that takes place during the development and updating of the policy.

“Without a work zone policy, your people are wasting time and resources going in different directions.”
..... State DOT Official

Therefore, all of the major stakeholders (elected officials, highway users, business associations, highway user groups, contractor organizations and consultant organizations) should be involved in developing and up-dating the policy. The policy should encourage innovation and reflect the State's commitment to provide work zones that do not unduly restrict mobility and ensure maximum safety for the motorist and the worker. For the greatest impact, the policy should cover **all** construction and maintenance operations performed by the State DOT, utilities, and local governments. At a minimum, the policy should address:

- The use of road-user cost and crash-cost data in decisionmaking;
- Inclusion of design features and traffic management infrastructure in today's projects to minimize work zone impacts during future construction maintenance operations;
- The use of life cycle-cost in selecting materials;
- Work zone geometric standards (minimum lane width, shoulder width, offset to barriers, sight distance, crossover length, maximum cross slope, and degree of curve for reduced widths);
- Incentives for early completion, minimum geometric standards; and
- The maximum allowable:
 - C Number of lane closures,
 - C Delay to the motorist,
 - C Speed differentials/reductions,
 - C Length of restricted areas, and
 - C Length of contract time.
- Traveler and Traffic Information Programs

E. Impact Analysis

One of the first steps in the process is to complete a traffic and operational crash analysis for each alternative being considered at the scoping stage. This analysis is needed to ensure that the congestion, delay, and safety impacts to the traveling public, as well as, impacts to the residential and business community are adequately considered in the comparative analysis of alternatives that take place in the project planning phase. The traffic impacts and safety implications of each alternative, including closing the facility during construction, must be predicted early in the process to insure adequate time for public input, as well as for the owner to program and provide the needed resources to implement the desired plan and mitigative measures.

During the project design phase, a detailed comparative analysis of alternate TMPs is needed to ensure that congestion, delay, and safety impacts to the traveling public and the residential and business community are adequately considered.

Predictive modeling is also needed during the construction phase to evaluate any changes to the traffic control plan proposed by the contractor.

F. Focus on Reducing Exposure

Work zone traffic management is a proactive approach that uses performance modeling to predict traffic and crash impacts. This provides decision makers with quantitative data to make sound decisions on which cost-effective mitigative approaches should be implemented. By reducing the exposure of the motorist and the highway worker, motorist delays will be significantly reduced and crash rates will be reduced. The exposure of the motorist and the highway worker are reduced by:

- (1) Reducing the volume of traffic going through the work zone:

The volume of traffic going through the work zone can be reduced by diverting traffic to other routes, detours or modes of transportation, changing driver behavior and trip times during the life of the project, and/or closing the facility during construction.

- (2) Reducing the length of time work zones are in place:

The length of time work zones are in place can be reduced by time-based bidding (A+B), providing incentives for early completion (I/D Clauses), putting disincentives in the contract for restricting traffic (lane rental), forcing the contractor to concentrate on shorter sections within the overall project length, partnering, constructability reviews, and/or receiving contractor input on the sequencing of the construction project during the early phases of project design.

- (3) Reducing the frequency that work zones are established to perform construction and maintenance operations:

The frequency that work zones are established can be reduced by extending the life of the facility, using the corridor approach, designing for success, and/or an effective preventive maintenance program. Additional information on these principles follows.

The alternative to work zone traffic management is a reactive approach where the project personnel initiate appropriate cost-effective mitigative measures to handle the traffic impacts encountered during the construction and maintenance operation.

G. Corridor Approach

The corridor approach to traffic management is a systematic process for upgrading, operating, and maintaining the highways in a traffic corridor. It combines engineering, economics, customer service, and business principles into a logical decisionmaking process to cost-effectively address both short and long-term needs.

A corridor approach to traffic management evaluates all options for safely moving people and goods through a corridor versus a specific route. This involves identifying alternate routes, modes, and detours in the corridor. A corridor approach versus a project approach to traffic management also addresses long-range corridor needs. All of the planned pavement, bridges, traffic operations construction, and preventive maintenance needs in a corridor are identified for the next 20 to 50 years. The corridor needs are sequenced and grouped into projects that will have the minimum amount of disruption to the traveling public.

Multi-disciplinary teams (pavement, bridge, construction, design, safety, maintenance, traffic operations, finance, and environment) are essential to accomplish this type of corridor traffic management. A multi-agency approach (elected officials, local governments, road-user groups, residential, and business associations) to public involvement is also needed to receive the desired input and public support.

An integral part of the corridor approach involves the scheduling, sequencing, packaging, and coordinating all inter-agency and intra-agency construction and maintenance activities.

“ It doesn’t cost the owner any more money to package the roadway and bridge work into one project; to stay competitive we would joint venture the project rather than subcontract the work.”
..... Construction Company Owner

H. Integration of Traffic Management into the FHWA Planning and National Environmental Policy Act (NEPA) Process

In order to implement the corridor approach, traffic management principles must begin early in the project planning phase and be integrated into the FHWA planning and National Environmental Policy Act (NEPA) process. Traffic management strategies must be developed early in the project development phase to ensure public input and acceptance. Resource agency approval/permits may be required since traffic management strategies may include, but are not necessarily limited to, shoulder and bridge widening, detours, improvements to other routes in the corridor, total closures, and parking lots for alternate modes.

“ The extra time you spend in planning and design saves construction time.”
..... State DOT Official

Some States have found it necessary for the initial identification of traffic management strategies in major traffic corridors to be identified prior to submission of their Transportation Improvement Program. This is necessary to facilitate the budgeting and approval process.

I. Designing for Success

A successful design results in a facility that can be constructed, operated, and maintained safely and efficiently. It fulfills the needs and exceeds the life expectancy. To accomplish this, a multi-disciplinary

team (materials, pavement, bridge, construction, design, safety, maintenance, traffic operations, finance, and environment) approach is essential.

Obviously the design must be structurally adequate to support the future traffic demands. However, designing for success means providing a design that anticipates and includes features that facilitate future rehabilitation work. The incorporation of full-depth shoulders and adequate pavement and bridge widths provides for a safer work environment and minimizes impacts during future rehabilitation work. By providing a structurally adequate pavement platform that anticipates future traffic demands, the only pavement rehabilitation work that will be required will be surface re-profiling and preventative maintenance work. Bridge substructure and superstructure designs that provide for maintaining traffic during future rehabilitation work and facilitate future redecking are essential considerations during the initial design.

Designing for success also includes the incorporation of longer-lasting high-performance materials and strives for a maintenance free design. A maintenance mind set is needed to ensure that preventive maintenance operations are minimized and can be performed safely.

Incorporation of performance-based specifications and warranties in the contract assist in having a facility that meets the intended need and life expectancy.

J. Contractor Input and Influence During the Project Design Phase

While designers are exceptionally well qualified to make the required calculations and detail the work to be done, they may not be the most qualified to determine the most economical way to sequence the work or to construct the project. Contractors are experts in determining the most economical way to sequence the work, set up equipment, deliver materials,

*“Getting the contractors involved in sequencing the job during the preliminary design phase makes a lot of sense.”
..... AGC Official*

and the required space to construct the project. In 1976 the FHWA issued a regulation which required a detailed TCP and individual pay items in the bid documents of all Federal-aid projects. One of the results of the 1976 requirement was that State DOT designers and/or consultant engineers were placed in the position of determining the sequence of the work. To get the maximum advantage from the expertise of the designer and the contractor, contractors must be involved early in the design phase. To avoid additional costs and delays in design, and to expedite construction times, the contractor input and expertise must be received prior to the major design work taking place.

*“To get the maximum benefit of a contractor’s perspective, you have to get us involved when the plans are +/- 30 % complete”
..... AGC Official*

K. Quality Products and Workmanship

Quality products and workmanship are essential if significant gains are to be made in reducing the backlog of needed highway repairs and improvements. Quality construction begins in the design phase. Inclusion of longer-lasting and high-performance materials, performance-based specifications, warranties, and incentives to contractors for exceeding expectations, are vital parts of a quality construction program. Attention to detail throughout the construction and maintenance phases and preventive maintenance program ensure quality work and highways. We cannot afford anything less than high performance and a highway that will last. There is not, nor will there ever be, enough money to repair or replace work that does not perform as intended.

L. Preventive Maintenance

Research has proven that preventive maintenance is cost effective and that the life of a highway can be significantly increased by practicing preventive maintenance techniques; i.e., performing the right work at the right time. This increase in life results in reduced cost and disruption to the road users. Preventative maintenance work can also be completed in short time frames. Therefore preventive maintenance is far less disruptive to traffic and safer than major rehabilitation and reconstruction work.

M. Incentives for Quality and Timeliness

Under the low bid system, most contractors give the owner exactly what is in the contract; nothing more and nothing less. The contracting organizations participating in the review were very supportive of the use of A+B Contracting and I/D Clauses and stated that contracts would be completed in less time if States would use more of them. While there was not 100 percent agreement over lane rental specifications, contractors agreed that lane rental contracts make them much more aware of and responsible for motorist delay.

“We would much rather chase a carrot than run from a stick.”
..... AGC Official

Contractors also supported the wider use of “Window Specifications” and “Flexible Start Date Contracts” since these types of contracts allow time for them to improve on the efficiency of their operations, procure materials, and maximize the use of personnel and equipment. All of these items reduce the time the contractor is on the road and affecting the flow of traffic.

The method of payment for traffic control devices must be carefully considered to ensure that the over or extended use of these devices is not encouraged.

“Many States reward the contractor by having unit pay items for the traffic control devices they use rather than the ones they need.”
..... AGC Official

N. Incident Management

In the past, incident management in the work zone has been reactive. However, in work zone traffic management, all of the affected parties (DOT, police, fire, emergency medical, towing, hazardous materials, local governments, and the contractor) are involved in developing TMPs.

Work zone traffic management also utilizes the incident management detour routes in the development of the corridor traffic management plan, as well as utilizing incident management detour routes to handle unanticipated traffic back-ups and delays occurring during construction and maintenance operations.

O. Educational Programs

Education is one of the four big “E’s:” Engineering, Education, Enforcement, and Emergency Medical Services. Significant reductions in work zone crashes and delays cannot be achieved without the highway community becoming actively involved in developing and presenting educational programs. Educational programs should include information on work zone safety, the meaning of traffic control devices, the reason why the work is necessary, and what the State is doing to minimize inconveniences to the motoring public. These programs should be targeted to automobile and professional truck drivers, workers, elected officials, driver education programs, and younger school children.

“If we are to be effective in changing behaviors and attitudes, we have to get into peoples minds.”
..... State DOT Official

P. Enforcement

Studies conducted by some of the States have concluded that speed and/or the speed differential is one of the primary causes of zone crashes and excessive speed is a contributing factors to most work zone crashes. While there are differing opinions on the types of operations requiring police, the number of police required per work zone and the optimum frequency, there was universal agreement that police presence in work zones is essential to adequately controlling speed and protecting the workers. The cost and availability of police are the biggest reasons for these differing opinions on the use of police in work zones. Typically these costs come out of the State DOT’s constructions funds.

“The most effective way of reducing speed in work zones is a State trooper in a car with flashing blue lights.”
..... State DOT Official

Q. Crash Analysis

The collection and analysis of work zone crash data is essential for sound cost-effective engineering decisions and the appropriate preventive measures to be put into place. This includes an individual crash analysis which is useful to project construction personnel and compiling data on a district and statewide basis to perform a trend analysis. In order to perform a meaningful crash analysis, State police accident reports must contain sufficient work zone information in order to isolate the location within the work zone and to determine the primary and contributing causes of the crashes. Training of police is also required to ensure uniform accurate data collection.

R. Traveler and Traffic Information Programs

None of the key ingredients discussed above will be fully effective if the public is not informed about the State's Traffic Management Policy, Traffic Management Program, and provided the periodic status of upcoming reconstruction projects. Additionally the public, elected officials, road-user groups, business community, and the media need, and expect to receive, current status reports on construction projects, as well as advanced information on road or ramp closures and major changes to traffic patterns.

The ITS technology offers a number of opportunities to provide essential information to motorists in the work zone, including speed control and providing advanced real-time information to motorists out of the work zone in sufficient time for the motorist to make informed decisions on the routes they will take and the time needed to make their trip. The ITS technology can also warn motorists and as an automatic speed enforcement tool. Portable traffic management systems have been evaluated by a few States, and their future use in the work zones looks very promising and exciting.

“It is bad enough to delay people in a work zone but it is even worse not to give them advanced information so they can avoid the work zone.”
..... State DOT Official

“We don't do a good job in public relations--Our public affairs are reactive and we need to be proactive.”
..... State DOT Official

S. Evaluation and Feedback

Evaluation and feedback are essential elements of continuous quality improvement. Before and after studies, along with performance goals and measures, are necessary to track improvements and progress.

Some of the types of evaluations that need to be conducted for efficient and cost-effective work zone traffic management include:

- C Traffic flow through the work zone. Video imaging cameras provide a relatively inexpensive, efficient method of collecting and evaluating before, during, and after traffic data in the work zone.
- C Crash rates and severity in the work zone. Before, during, and after data and evaluation on a project, district, and statewide basis is needed.
- C Cost-effectiveness of TMP strategies in reducing the volume of the traffic in the work zone.
- C Cost and effectiveness of traffic control plan strategies safely moving road users through the work zone, i.e., different techniques for dropping lanes, moving traffic to the opposite roadway on freeways, separating the traffic from the workers; maximum length of lane closures, maximum length of two-way and two-lane operations for freeways.
- C Effectiveness of differing types of contracting procedures in differing conditions for reducing contract time.
- C Effectiveness of portable traffic management systems in preventing rear end crashes at the beginning of the queue, facilitating the flow of traffic, and in diverting road users to other routes.
- C Effectiveness of various types of traffic control devices in getting the driver's attention, slowing traffic down, and reducing rubbernecking and gawking.
- C Cost effectiveness of construction materials and methods in increasing the life of the product.
- C Effectiveness of the differing techniques used by the State police to reduce speeds in work zones.
- C Public acceptance of the way construction and maintenance operations are conducted.

Excellent feedback can be obtained from quality improvement teams, peer reviews in design, value engineering, constructability reviews involving contractors, and the "Adopt a Work Zone" program.

"We support and participate in constructability reviews at the 90-95 percent stage. At this stage we can identify plan errors that prevent delays, but we only have a minimum impact on the sequencing of the project at that stage."
..... AGC Official

Customer surveys are one of the best ways to know how well our customers needs for mobility and safety are being met during construction and maintenance operations.

**Self Evaluation Guide
for
Benchmarking**

II. SELF EVALUATION GUIDE FOR BENCHMARKING

Benchmarking is an essential element of continuous quality improvement. Benchmarking, by definition, is a comparison and analysis of an agency's operations against the operations of another agency that is recognized as a leader, i.e., the best of the best. Benchmarking provides an approach for understanding ones strengths and weaknesses through a comparison and analysis. Adaptation of a model to the agency's operating environment and specific circumstances is an essential part of the benchmarking process.

The term benchmarking implies quantitative measurement since a benchmark is a point of reference from which measurements can be made. Therefore, this *Self Evaluation Guide* is provided to assist transportation agencies in quantifying the results of their baselining efforts. The numeric values will enable an agency to measure the effectiveness of their process improvement efforts when future benchmarking efforts are undertaken. This self assessment guide was prepared to assist FHWA division offices and State DOTs in their benchmarking efforts. Ideally the assessments would be done jointly. However, the assessments can also be done independently and/or by any transportation agency. Benchmarking is a process and, therefore, agencies are invited and encouraged to undertake updating their benchmark on a 3 to 5 year cycle.

Category I - Leadership Actions Taken to Assimilate Traffic Management Principles into the Agency's Culture, Policies, and Procedures
[Maximum 25 points]

20 - 25 Points	13 - 19 Points	7 - 12 Points	0 - 6 Points
<p>State and FHWA senior managers are personally, visibly, and proactively involved in efforts to minimize work zone delay and enhance the safety of the motorist and worker in work zones.</p>	<p>State and FHWA senior managers are proactive in efforts to minimize work zone delay and enhance the safety of the motorist and worker in work zones.</p>	<p>State senior managers are proactive in efforts to minimize work zone delay and enhance the safety of the motorist and worker in work zones.</p>	<p>FHWA senior management is proactively promoting efforts to minimize work zone delay and enhance the safety of the motorist and worker in work zones.</p>
<p>State strategic goals and performance measures have been adopted to increase work zone safety and reduce motorist delay in work zones. These strategic goals have been communicated to all stakeholders.</p>	<p>State strategic goals have been adopted to increase work zone safety and reduce motorist delay in work zones. These strategic goals have been communicated to all stakeholders. Work zone performance measures are currently being developed.</p>	<p>State strategic goals are currently being developed to increase work zone safety and reduce motorist delay in work zones. The process includes significant customer input and involvement.</p>	<p>FHWA senior management is proactively promoting the benefits of State strategic goals for safety and motorist delay in work zones.</p>
<p>State has adopted a comprehensive written statewide/area-wide work zone traffic management policy that applies to all construction and maintenance operations performed by State DOT, utilities and local governments on all State highways. This policy :</p> <ul style="list-style-type: none"> & Is based on reducing the exposure of the motorist and worker, & Focuses on reducing the frequency of future construction and maintenance operations, & Recognizes the need to include provisions in current projects to minimize the impact of future construction and maintenance operations, & Includes road-user costs as part of the decisionmaking process, & Reflects the customer's input and involvement and & Encourages innovative construction methods and contracting procedures. 	<p>State has adopted a comprehensive written statewide/area-wide work zone traffic management policy that applies to all State DOT construction and maintenance operations performed on all State highways.</p>	<p>State is currently developing comprehensive written statewide/area-wide work zone traffic management policy for State DOT construction and maintenance operations performed on State highways.</p>	<p>FHWA senior management is proactively promoting the benefits of a written statewide/area-wide work zone traffic management policy.</p>

Category I - Continued			
20 - 25 Points	13 - 19 Points	7 - 12 Points	0 - 6 Points
State DOT and FHWA organizational structure facilitates and encourages a multi-discipline approach to traffic management throughout the all phases in the life of a project.	State DOT organizational structure facilitates and encourages a multi-discipline approach to traffic management throughout all phases in the life of a project.	State DOT organizational structure is currently being modified to facilitate a multi-discipline approach to traffic management throughout all phases in the life of highly visible projects.	The FHWA division office organizational structure assures a multi-discipline programmatic approach to traffic management and provides multi-discipline reviews in each phase of full oversight projects.
Minimum acceptable statewide/area-wide geometric standards have been adopted for work zones. These geometric standards apply to all construction, maintenance and utility operations.	Minimum acceptable statewide/area-wide geometric standards have been adopted for construction, maintenance, and utility operations on freeways.	Minimum acceptable statewide/area-wide geometric standards for construction, maintenance, and utilities operations are under development.	FHWA senior management is proactively promoting the benefits of developing statewide/area-wide geometric standards for construction, maintenance, and utility operations.
State DOT and FHWA work zone traffic management values and expectations are clearly defined, documented, and communicated to the public and all State DOT and FHWA employees.	State DOT work zone traffic management values and expectations are clearly defined and documented. FHWA work zone traffic management expectations are currently being developed.	State DOT work zone traffic management values and expectations are under development.	FHWA senior management is proactively promoting the benefits of developing State work zone traffic management values and expectations.
The State Police Accident Report Form includes a "Work Zone" block to easily identify work zone crashes and the form contains sufficient data elements to identify the location in the work zone and any work zone features contributing to the crash. The State has adopted a definition for work zones and the State police have received training in completing the work zone information on the State Accident Report Form.	The State Police Accident Report Form includes a "Work Zone" block to easily identify work zone crashes and the form contains sufficient data elements to identify the location in the work zone and any work zone features contributing to the crash. The State has adopted a definition for work zones	The State Accident Report Form includes a "Work Zone" block to easily identify work zone crashes and the form contains sufficient data elements to identify the location in the work zone and any work zone features contributing to the crash.	FHWA senior management is proactively promoting modification of the State Accident Report Form to include a "Work Zone" block to easily identify and analyze work zone crashes.
Full time State police are assigned to the State DOT on a full-time basis. These State police have received work zone training and are proactively involved in all phases of work zone traffic management.	State police have received work zone training and they are proactively involved in all phases of work zone traffic management.	State Police have received work zone training and are frequently involved in selected phases of work zone traffic management.	FHWA senior management is proactively promoting the involvement of State police in all phases of work zone traffic management.
State DOT and FHWA have an active partnership involved in work zone safety and educational programs with the GHSR, State Department of Motor Vehicles Licensing, Driver Education Programs, the State police and the media.	State DOT periodically participates in work zone safety educational programs with the GHSR, State Department of Motor Vehicles Licensing, Driver Education Programs, and State police.	State DOT occasionally participates in work zone safety educational program with the GHSR, State Department of Motor Vehicles Licensing , Driver Education Programs, and/or State Police.	FHWA senior management is proactively promoting work zone safety educational programs with the GHSR, State Department of Motor Vehicles/ Licensing and State Police.

Category II - Leadership Actions Taken to Integrate Traffic Management Principles into the FHWA Project Planning and NEPA Processes
[Maximum 20 points]

16 - 20 Points	11 - 15 Points	6 - 10 Points	0 - 5 Points
<p>State DOT routinely uses long range corridor plans to minimum disruptions to the traveling public on all major traffic corridors. All scheduled pavement, bridge and traffic operations construction and preventive maintenance operations are optimized, sequenced, and grouped into projects that will have the minimum disruptions to the traveling public. These corridor plans have the support of the elected officials and the public.</p>	<p>The State DOT is in the process of identifying long range construction and preventive maintenance needs on all major traffic corridors. The pavement, bridge and traffic operations needs will be sequenced and grouped into projects that will have the minimum disruption to the traveling public. The optimized plans will be communicated to elected officials and the public.</p>	<p>State DOT occasionally uses long range corridor plans to minimum disruptions to the traveling public on all major traffic corridors. All scheduled pavement, bridge and traffic operations construction and preventive maintenance operations are optimized, sequenced, and grouped in to projects that will have the minimum disruptions to the traveling public.</p>	<p>FHWA senior management is proactively involved in promoting the benefits of long range corridor planning to minimize motorist delays on major traffic corridors.</p>
<p>Computer modeling is routinely used on all construction and maintenance projects to predict the degree of traffic congestion and the accident exposure to motorist and workers during the construction phase. The results are use to evaluate and compare the alternatives being considered.</p>	<p>Computer modeling is routinely used on all high visibility and/or controversial projects to predict the degree of traffic congestion and the accident exposure to motorist and workers during the construction phase. The results are use to evaluate and compare the alternatives being considered.</p>	<p>Computer modeling is used on high visibility or controversial projects to respond to questions regarding the degree of traffic congestion and the accident exposure to motorist and workers during the construction phase.</p>	<p>FHWA senior management is proactively involved in promoting the need for and benefits of computer modeling to predict the degree of traffic congestion and the accident exposure to motorist and workers during the construction phase.</p>
<p>Corridor traffic management plans are routinely developed by multi-discipline teams for all major traffic corridors. These teams continue to be involved throughout all of the remaining phases in the life of a project. These corridor traffic management plans are used as input to Transportation Improvement Plans, Major Investment Studies and/or Environment Documents. The public, road users organizations (automobile and truck) and business community are actively involved in the development of the traffic management plan.</p>	<p>Corridor traffic management plans are routinely developed by multi-discipline teams for all major traffic corridors. These teams continue to be involved throughout all of the remaining phases for the life of the project. Input is routinely sought from the public, road users organizations (automobile and truck), and business community in developing the traffic management plan.</p>	<p>Corridor traffic management plans are routinely developed by multi-discipline teams for selected highly visible major projects. Input is sought from the public, road users organizations (automobile and truck), and business community in developing the traffic management plan.</p>	<p>FHWA senior management is proactively involved in promoting corridor traffic management plans and the need for involving the public, road users organizations (automobile and truck), and the business community in developing traffic management plans.</p>
<p>Corridor traffic management plans are routinely presented to the public on all projects as part of the participatory process.</p>	<p>Corridor traffic management plans are routinely presented to the public on all high visibility or controversial projects as part of the participatory process.</p>	<p>Project traffic management plans are routinely presented to the public on all projects as part of the participatory process.</p>	<p>FHWA senior management is proactively involved in promoting the need to present traffic management plans as part of the public participatory process.</p>

Category II - Continued			
16 - 20 Points	11 - 15 Points	6 - 10 Points	0 - 5 Points
Comparisons of the estimated total construction time and the time to maintain traffic through the work zone are routinely made with closing the highway on all projects alternatives. Road user cost are calculated and used in the comparison of alternatives.	Comparisons of the estimated total construction time and the time to maintain traffic through the work zone are routinely made with closing the highway on all projects alternatives.	Comparisons of the estimated total construction time and the time to maintain traffic through the work zone are routinely made with closing the highway on all alternatives on selected highly visible major projects.	FHWA senior management is proactively involved in promoting the need for comparing the estimated total construction time, the time to maintain traffic through the work zone and projected road user cost on all projects alternatives.
Public relations campaigns are routinely initiated during the project planning phase on all major projects to present the corridor traffic management plans and inform the public of the steps being taken to minimize motorist inconveniences and delay.	Public relations campaigns are initiated during the project planning phase on highly visible major urban projects to present the corridor traffic management plans and inform the public of the steps being taken to minimize motorist inconveniences and delay.	Public relations campaigns are occasionally initiated during the project planning phase on major projects to present the corridor traffic management plans and inform the public of the steps being taken to minimize motorist inconveniences and delay.	FHWA senior management is proactively involved in promoting the benefits of public relations campaigns during the project planning phase to minimizing motorist inconveniences and delay.

Category III - Leadership Actions Taken to Apply Traffic Management Principles During Project Design
[Maximum 20 points]

16 - 20 Points	11 - 15 Points	6 - 10 Points	0 - 5 Points
<p>Computer modeling is performed on all projects to predict the degree of traffic congestion and the accident exposure to motorist and construction workers. The result are use to evaluate and compare the traffic control plan alternatives being considered.</p>	<p>Computer modeling is routinely performed on all high visibility and/or controversial projects to predict the degree of traffic congestion and the accident exposure to motorist and construction workers. The result are use to evaluate and compare the traffic control plan alternatives being considered.</p>	<p>Computer modeling is performed on some high visibility and/or controversial projects to respond to questions regarding the degree of traffic congestion and/or the accident exposure to motorist and workers during the construction phase.</p>	<p>FHWA senior management is proactively involved promoting the need for computer modeling to predict the degree of traffic congestion and the accident exposure to motorist and workers during the construction phase.</p>
<p>Traffic control plans are routinely developed by multi-discipline teams on projects prior to beginning detailed design. Contractor associations, the public, road users organizations (automobile and truck), and the business community are involved in developing most traffic control plans.</p>	<p>Multi-discipline teams are proactively involved in developing traffic control plans early in the design phase of major projects. Contractor associations, the public, road users organizations (automobile and truck), and the business community are involved in developing selected traffic control plans.</p>	<p>Multi-discipline teams are involved in developing traffic control plans during the design phase of major projects. Input is sought from the contractor associations, public, road users organizations (automobile and truck), and the business community during the development of the traffic control plan.</p>	<p>FHWA senior management is proactively involved in promoting a multi-discipline team approach to developing traffic control plan as well as the need for involving contractor associations, the public, road users organizations (automobile and truck), and the business community during the development of traffic management plans.</p>
<p>Project specific public relations campaigns are routinely conducted during the project design phase on all major projects to inform the public about the project; steps the State is taking to minimize their inconvenience; and to encourage the use of alternative travel times, ridesharing, alternate routes and alternate modes to minimize motorist inconveniences and delay.</p>	<p>Project specific public relations campaigns are conducted during the project design phase on high visibility and/or controversial projects to inform the public about the project; steps the State is taking to minimize their inconvenience; and to encourage the use of alternative travel times, ridesharing, alternate routes and alternate modes to minimize motorist inconveniences and delay.</p>	<p>General public relations campaigns are conducted to inform the public about upcoming projects; steps the State is taking to minimize inconvenience; and to encourage the use of alternative travel times, ridesharing, alternate routes and alternate modes to minimize motorist inconveniences and delay.</p>	<p>FHWA senior management is proactively involved promoting the need for public relations campaigns during project design to inform the public about the project; the steps the State is taking to minimize their inconvenience; and to encourage the use of alternate transportation.</p>
<p>Critical Path Method scheduling techniques are routinely used to establish contract time on all projects effecting traffic. The results are used to evaluate traffic control plan alternatives.</p>	<p>Critical Path Method scheduling techniques are routinely used to establish contract time on high visibility and/or controversial projects. The results are used to evaluate traffic control plan alternatives.</p>	<p>Critical Path Method scheduling techniques are occasionally used to establish contract time on all projects effecting traffic.</p>	<p>FHWA senior management is proactively involved promoting the benefits of Critical Path Method scheduling techniques to establish the contract time on projects effecting traffic.</p>
<p>Time-based bidding is routinely used on all projects effecting traffic. Contractor incentives are included for early completion and/or for minimizing the inconveniences to the affected communities and motorist.</p>	<p>Time based bidding is routinely used on large, high visibility and/or controversial projects. Contractor incentives are included for early completion and/or for minimizing the inconveniences to the affected communities and motorist.</p>	<p>Time based bidding is occasionally used on projects effecting traffic. Contractor incentives are included for early completion and/or for minimizing the inconveniences to the affected communities and motorist.</p>	<p>FHWA senior management is proactively involved promoting the benefits of time based bidding on projects affecting traffic ad the inclusion of incentives for early completion.</p>

Category III - Continued			
16 - 20 Points	11 - 15 Points	6 - 10 Points	0 - 5 Points
All construction projects and maintenance operations are coordinated with other affected DOTs. Construction projects and maintenance operations are routinely packaged and sequenced to minimize motorist delay and interference to with the affected business and residential communities.	All construction projects and maintenance operations are coordinated with other effected DOTs. Freeway construction projects and maintenance operations are routinely packaged and sequenced to minimize motorist delay and interference to with the affected business and residential communities.	All construction projects and maintenance operations are coordinated with other affected DOTs.	FHWA senior management is proactively involved promoting the need to coordinate with other effected DOTs, as well as the benefits of packaging and sequencing construction and maintenance operations to minimize motorist delay and interference to with the affected business and residential communities.
Life-cycle costing is routinely used to select pavement types and designs as well as in the selection other high performance/longer-lasting materials. Warrantees and/or contractor incentives are routinely used to reward contractors for exceeding life expectancies.	Life cycle costing is routinely used to select pavement types and designs as well as in the selection other high performance/longer-lasting materials. Warrantees and/or contractor incentives are occasionally used to reward contractors for exceeding life expectancies.	Life cycle costing is used to select pavement types and designs as well as in the selection other high performance/longer-lasting materials on large, high visibility and/or controversial projects. Warrantees and/or contractor incentives specifications are currently being developed.	FHWA senior management is proactively involved promoting the benefits of life cycle costing for pavements, the selection of high performance/longer-lasting materials, and warranty specifications.
Advertisements and contract awards are scheduled to balance the volume of work with the contractor's capacity and to take maximum advantage of the construction season. Flexible Notice to Proceed dates and "Window Specifications" are routinely used in all projects affecting traffic.	Advertisements and contract awards are scheduled to balance the volume of work with the contractor's capacity and to take maximum advantage of the construction season. Flexible Notice to Proceed dates and "Window Specifications" are occasionally used on projects affecting traffic.	Advertisements and contract awards are scheduled to balance the volume of work with the contractor's capacity and to take maximum advantage of the construction season.	FHWA senior management is proactively involved promoting the benefits of flexible Notice to Proceed dates, "Window Specifications" and advertisement schedules that minimize the motorist delays and inconveniences to the affected communities.

Category IV - Leadership Actions Taken to Apply Traffic Management Principles to Construction and Maintenance Operations
[Maximum 20 points]

16 - 20 Points	11 - 15 Points	6 - 10 Points	0 - 5 Points
<p>Contractors routinely share the responsibility for executing the traffic control plan and for minimizing road-user delay and inconveniences to the effected business and residential communities. Performance measures for delays and crashes are included in all construction and maintenance projects affecting traffic. Incentives are given for exceeding the delays and crashes performance goals established for the project.</p>	<p>Contractors routinely share the responsibility for executing the traffic control plan and for minimizing road-user delay and inconveniences to the effected business and residential communities. Performance measures for delays and crashes are included in all major construction and maintenance projects affecting traffic.</p>	<p>Contractors routinely share the responsibility for executing the traffic control plan and for minimizing road-user delay and inconveniences to the effected business and residential communities. Performance measures for work zone delay and crashes are currently being developed.</p>	<p>FHWA senior management is proactively promoting the need for contractors to share the responsibility for executing the traffic control plan, minimizing road-user delay and inconveniences to the effected business and residential communities as well as the benefits of performance measures for work zone delay and crashes.</p>
<p>State police are routinely used for all construction, maintenance, and utility operations on freeway projects effecting traffic.</p>	<p>State police are routinely used for all construction, maintenance, and utility operations requiring closures and/or major changes to traffic patterns.</p>	<p>State police are occasionally used for major construction, maintenance and utility operations effecting traffic.</p>	<p>FHWA senior management is proactively promoting the benefits of utilizing State police in construction, maintenance and utility operations effecting traffic.</p>
<p>Traffic management systems (fixed or portable) are routinely used to monitor and facilitate traffic flow. Real-time traffic information is given to the motorist to warn them of traffic conditions as they approach the work zone as well as for them to make informed trip routing/planning decisions.</p>	<p>Traffic management systems (fixed or portable) are routinely used on large high visibility projects to monitor and facilitate traffic flow. Real-time traffic information is given to the motorist to warn them of traffic conditions as they approach the work zone as well as for them to make informed trip routing/ planning decisions.</p>	<p>Existing fixed traffic management systems are routinely used to monitor and facilitate traffic flow. Real-time traffic information is given to the motorist to warn them of traffic conditions as they approach the work zone as well as for them to make informed trip routing/planning decisions.</p>	<p>FHWA senior management is proactively promoting the benefits of Traffic Management Systems to monitor traffic flow and provide real-time traffic information to the motorist.</p>
<p>Incident Management Teams actively participate in most preconstruction conferences. Motorist services provisions are routinely included in all high volume projects with restricted work areas.</p>	<p>Incident Management Teams actively participate in preconstruction conferences on large/high visibility projects. Motorist services provisions are routinely included in all high volume projects with restricted work areas.</p>	<p>Incident Management Teams are invited to attend preconstruction conferences for large/high visibility projects. Motorist services provisions are routinely included in all high volume projects with restricted work areas.</p>	<p>FHWA senior management is proactively promoting the benefits of having Incident Management Teams involved in preconstruction conferences as well as the need for motorist services provisions to be included in all high volume projects with restricted work areas.</p>
<p>Project specific traveler and traffic information is routinely made available throughout the construction project on all major projects to inform the public about the status of the project; the steps the State is taking to minimize their inconvenience; and to encourage the use of alternative travel times, ridesharing, alternate routes and alternate modes to minimize motorist inconveniences and delay.</p>	<p>Project specific traveler and traffic information is routinely made available throughout the construction project on all high visibility and/or controversial projects to inform the public about the status of the project; the steps the State is taking to minimize their inconvenience; and to encourage the use of alternative travel times, ridesharing, alternate routes and alternate modes to minimize motorist inconveniences and delay.</p>	<p>General traveler and traffic information programs are conducted to inform the public about the status of construction projects; the steps the State is taking to minimize inconvenience; and to encourage the use of alternative travel times, ridesharing, alternate routes and alternate modes to minimize motorist inconveniences and delay.</p>	<p>FHWA senior management is proactively involved promoting the need for traveler and traffic information during construction phase to inform the public about the status of the project; the steps the State is taking to minimize their inconvenience; and to encourage the use of alternate transportation..</p>

Category V - Leadership Actions Taken to Continuously Improve and Evaluate the Agency's Traffic Management Program
[Maximum 15 points]

12 - 15 Points	8 - 11 Points	4 - 7 Points	0 - 3 Points
<p>All work zone crashes are evaluated by trained personnel to determine the cause of the crash. Results of these evaluations are summarized in annual statewide/area-wide reports which are distributed to all stakeholders. Individual project evaluations are distributed to project personnel and the appropriate correction action taken in a timely manner.</p>	<p>All fatal work zone crashes are evaluated by trained personnel to determine the cause of the crash. Results of these evaluations are summarized in annual statewide/area-wide reports which are distributed to all stakeholders. Individual project evaluations are distributed to project personnel and the appropriate correction action taken in a timely manner.</p>	<p>All fatal work zone crashes are evaluated by trained personnel to determine the cause of the crash. Individual project evaluations are distributed to project personnel and the appropriate correction action taken in a timely manner.</p>	<p>FHWA senior management is proactively promoting analysis of all work zone crashes by trained personnel to determine the cause of the crashes and annual statewide/area-wide reports.</p>
<p>The State DOT and FHWA are proactive in quality improvement activities that routinely reevaluate work zone traffic management policies and practices on a statewide/area-wide basis.</p>	<p>The State DOT routinely reevaluates work zone traffic management policies and practices on a statewide/area-wide basis.</p>	<p>The State DOT occasionally reevaluates work zone traffic management policies and practices on a statewide/area-wide basis.</p>	<p>FHWA senior management is proactively promoting quality improvement activities to reevaluate work zone traffic management policies and practices.</p>
<p>The State routinely conducts project specific and statewide/area-wide customer surveys to evaluate the effectiveness of their efforts to minimize delays and enhance the safety of work zones.</p>	<p>The State routinely conducts project specific customer surveys to evaluate the effectiveness of their efforts to minimize delays and enhance the safety of work zones.</p>	<p>The State occasionally conducts project specific and statewide/area-wide customer surveys to evaluate the effectiveness of their efforts to minimize delays and enhance the safety of work zones.</p>	<p>FHWA senior management is proactively promoting the use of project specific and statewide/area-wide customer surveys to evaluate the effectiveness of the State's efforts to minimize delays and enhance the safety of work zones.</p>
<p>The division office is proactive in identifying, disseminating, promoting, and implementing best practices to minimize motorist delay and enhance work zone safety.</p>	<p>The division office is proactive in identifying, disseminating, and promoting best practices to minimize motorist delay and enhance work zone safety.</p>	<p>The division office is proactive in disseminating, and promoting best practices to minimize motorist delay and enhance work zone safety.</p>	<p>The division office is proactive in disseminating best practices to minimize motorist delay and enhance work zone safety.</p>

SELF EVALUATION GUIDE SCORE SHEET

Category I	Category II	Category III	Category IV	Category V

Average Number of Points for Category I = _____ (Maximum = 25 points)
Average Number of Points for Category II = _____ (Maximum = 20 points)
Average Number of Points for Category III = _____ (Maximum = 20 points)
Average Number of Points for Category IV = _____ (Maximum = 20 points)
Average Number of Points for Category V = _____ (Maximum = 15 points)

GRAND TOTAL = _____ (Maximum = 100 points)