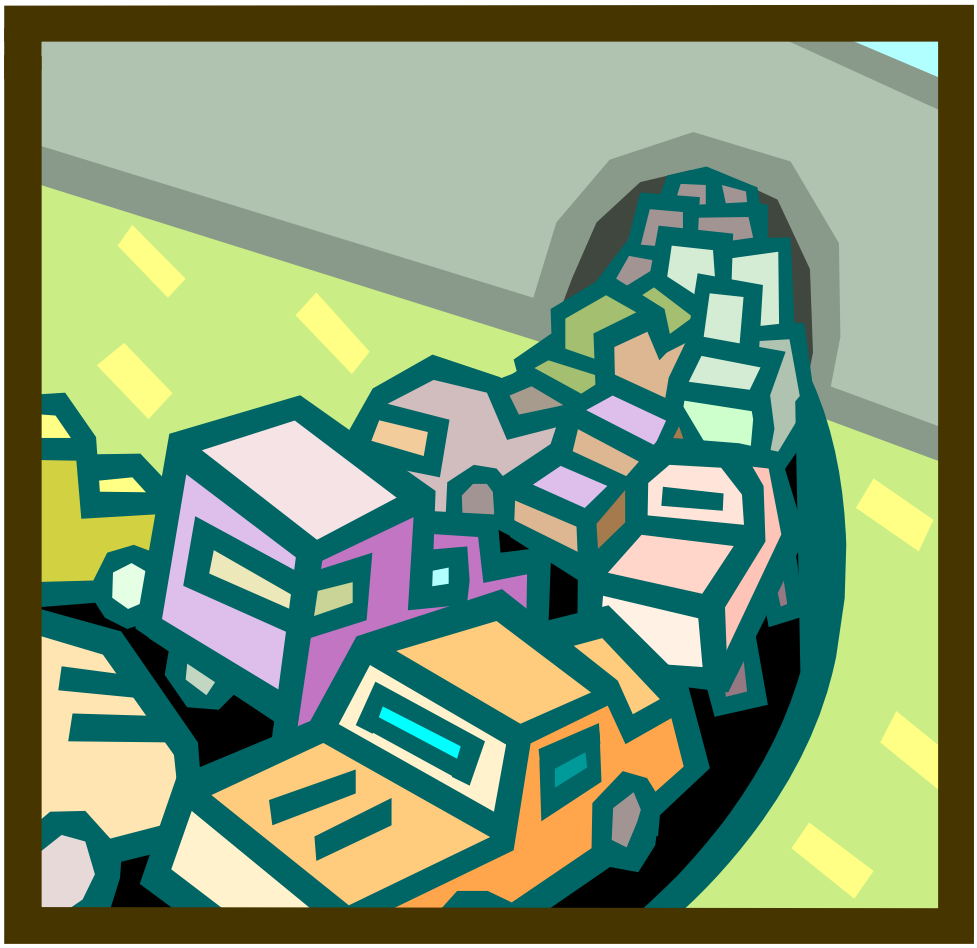
WORK ZONE MOBILITY AND SAFETY SELF ASSESSMENT

2007 NATIONAL REPORT



FEDERAL HIGHWAY ADMINISTRATION

OFFICE OF OPERATIONS

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To help States evaluate their work zone practices, and to help assess work zone practices nationally, the Federal Highway Administration (FHWA) developed the Work Zone Mobility and Safety Self Assessment (WZ SA) tool. The WZ SA tool consists of a set of 46 questions designed to assist those with work zone management responsibilities in assessing their programs, policies, and procedures against many of the good work zone practices in use today. The policies, strategies, processes, and tools identified in the WZ SA were gathered from the best practices currently in place in State departments of transportation (DOTs), Metropolitan Planning Organizations, and local municipalities. Many of the items can be found in the *Work Zone Best Practices Guidebook* (available at http://www.fhwa.dot.gov/workzones).

The WZ SA helps FHWA Division Offices work with their State partners to:

- Assess their past work zone activities
- Identify actions and priority areas for improvement as appropriate for a given State
- Establish a baseline of their state of the practice and monitor changes over time
- Gain useful information that States can use as part of their inputs when they perform the process reviews that are required by the Work Zone Safety and Mobility Rule (http://www.ops.fhwa.dot.gov/wz/resources/final_rule.htm).

On a National level, the WZ SA serves several important roles. It:

- Helps raise the level of awareness of practices and strategies used in mitigating work zone congestion and crashes
- Facilitates communication and sharing of best practices among transportation professionals
- Provides an opportunity to benchmark progress in work zone management at the National level
- Helps FHWA identify work zone congestion and safety management strategies that need more investigation and performance evaluation
- Helps FHWA identify areas where there is a need for additional training and guidance
- Assists in identifying States that are on the “leading edge” in a particular area and may be well-suited to share their experiences through case studies, as part of scanning tours or workshops, or as peers in the WZ Peer-to-Peer Program (http://www.ops.fhwa.dot.gov/wz/p2p/index.htm).

OVERVIEW OF RESULTS

This section presents an overview of the results of the 2007 WZ SA. Results from the 2006 WZ SA are also included for comparative purposes. Table 1 shows the average ratings for each of the six sections in the WZ SA and compares the 2007 results with the 2006 average ratings.

The data from Table 1 show that the highest average ratings were assigned to Section 5 (Communications and Education), followed by Section 4 (Project Construction and Operation) and Section 3 (Project Design). The lowest average rating was assigned to

Section 6 (Program Evaluation). This is consistent with the results of the 2006 WZ SA and the resulting trends from previous years.

Table 1. National Average Scores

Section	# of Questions	2006	2007	Change	% Change
1. Leadership and Policy	10	7.6	8.3	0.7	10%
2. Project Planning and Programming	6	6.9	7.6	0.7	10%
3. Project Design	12	8.5	9.1	0.6	7%
4. Project Construction and Operation	9	9.0	9.5	0.5	6%
5. Communications and Education	5	11.1	11.3	0.2	2%
6. Program Evaluation	4	5.5	6.2	0.7	13%
Overall	**46**	**8.4**	**9.0**	**0.6**	**7%**

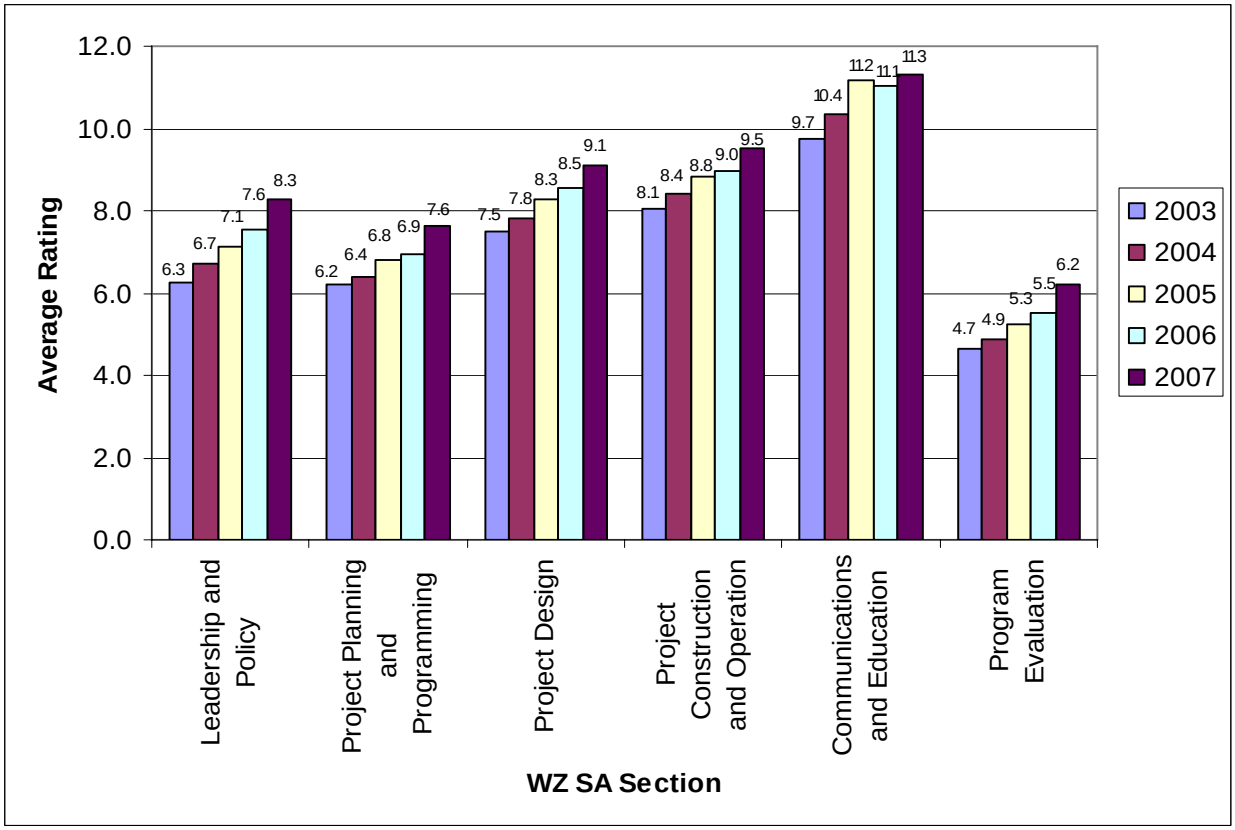
Between 2006 and 2007, Section 6 (Program Evaluation), Section 1 (Leadership and Policy), and Section 2 (Project Planning and Programming) had the highest average rating increase (13%, 10%, and 10%, respectively).

The questions showing the largest increases in score between 2006 and 2007 are:

- **Does the agency collect data to track WZ congestion and delay in accord with agency-established measures? (21% increase)**
  - *Only 15 agencies (29%) currently collect data to track WZ congestion and delay performance against agency measures.*
  - *This question had the lowest average score in the WZ SA, but the largest percent increase.*
- **Does the agency provide training to uniformed law enforcement personnel on WZ devices and layouts? (21% increase)**
  - *More than one-third (38%) of agencies provide training to law enforcement.*
  - *The requirement in the updated Work Zone Safety and Mobility Rule (Work Zone Rule) likely contributed to increased development of agency plans and guidance for training law enforcement, moving the average score from 4.5 to 5.5, and closer to the implementation stage.*
- **Has the agency established a policy for the development of Transportation Management Plans to reduce WZ congestion and crashes? (20% increase)**
  - *Two-thirds (67%) of agencies are implementing a policy for developing TMPs.*
  - *The average score for this item increased by 14% in 2006 and by 20% in 2007 - likely due to the Work Zone Rule.*
  - *The significant overall increase for this item is due to increased ratings from 27 agencies, with several agencies showing large increases.*

Figure 1 shows the National average section ratings for each of the five years the WZ SA has been conducted.

Figure 1. National Average Section Ratings by Year: 2003 to 2007



Most agencies reported an increase in their overall WZ SA score between 2006 and 2007. The average score increased for 42 of 51 agencies (82%), decreased for 4 of 51 agencies (8%), and remained the same for 5 of 51 agencies (10%).[1] Table 2 shows the changes in average agency scores from 2006 to 2007.

Table 2. Percent Change in Weighted Score by Agency[2]

Score Change	Agencies	% of Agencies
Increased by more than 10%	13	25%
Increased 6% to 10%	11	22%
Increased 1% to 5%	18	35%
No Change	5	10%
Decreased	4	8%
Total	51	100%

[1] The 2006 sample size was 51 reporting out of 52 total Divisions, and the 2007 sample size was 52 of 52. The sample size for comparison between 2006 and 2007 is 51 of 52, as results for one agency were not available for direct comparison over the two year period.

[2] Numbers in this table and other tables in this report may not calculate exactly due to rounding. Non-rounded values were used in the calculations.

BACKGROUND AND PURPOSE

FHWA began the WZ SA in 2003 and conducts the assessment annually. In 2007, each FHWA Division Office was asked to re-examine and update the results of its 2006 WZ SA, working with transportation agency staff from its State partner. Each Division Office had the option of performing a simple update or a more in-depth re-assessment. A simple update would focus on revising past scores to reflect current practices based on observations and an ongoing knowledge of work zone practices. For a more in-depth re-assessment, the WZ SA is conducted as a group exercise and involves a structured discussion among stakeholders to develop consensus ratings for each of the questions.

While the WZ SA score provides a metric for measurement, the most important information is derived from the discussions conducted among the participants. The interchange among stakeholders provides an opportunity for an agency to identify specific areas for improvement and provides the basis for structuring approaches to improve work zone policies, programs, and practices.

The WZ SA is intended to help agencies identify areas of strength and areas for improvement and to then use that information to identify needs and gaps in practices that could benefit from additional focus. Techniques and strategies that will lead to filling those gaps in the project development process are key to improving work zone operations. While a goal of the WZ SA is to identify opportunities for improvement, the "next step" in making use of the information is to identify techniques and actions that can improve upon current operations.

The WZ SA consists of six primary assessment areas:

- Section 1: Leadership and Policy
- Section 2: Project Planning and Programming
- Section 3: Project Design
- Section 4: Project Construction and Operation
- Section 5: Communications and Education
- Section 6: Program Evaluation

Each assessment area contains a set of questions about a particular work zone related policy, strategy, process, or tool. For each question, respondents were asked to evaluate the extent to which a particular practice has been incorporated into an agency's way of doing business. The questions in each section were rated according to the level of adoption phase, a scale of 0 to 15 broken into a set of five progressive levels based on the quality improvement process model used by industry. Definitions and characteristics for these ratings are listed in Table 3. A score of 7 or more on a question signifies that a State is implementing and executing the item in that question.

Table 3. WZ SA Rating/Scoring Scale

Adoption Phase	Scoring Range	Description
Initiation	(0-3)	• Does agency management acknowledge the need for a particular item? • Has exploratory research taken place to assess the benefits of this item? • Does management support further development of this item's requirements?
Development	(4-6)	• Has the agency developed a plan or approach to address the item's requirements? Has the agency started to investigate the feasibility of implementation? • Does the agency have standards and guidance to enable the item's implementation? • Does the agency have the approvals necessary for implementation? • Are resources in place to support the adoption of this item?
Execution	(7-9)	• Is the agency implementing/carrying out the requirements of this item? • Has the agency allocated financial or staff resources necessary for the item's execution? • Have appropriate personnel been trained to execute the item's requirements? • Has a process owner been established?
Assessment	(10-12)	• Has the agency assessed how well this item reduces work zone congestion and crashes? • Has the agency assessed the process for carrying out this item? • Has the agency implemented appropriate changes to the requirements of this item based on performance assessments?
Integration	(13-15)	• Has the agency integrated the requirements of this item into quality improvement processes? • Are the requirements of this item integrated into agency culture? • Are the requirements of this item included as part of the employee performance rating system?

Several questions in the WZ SA are based on the magnitude of impact that a project may have on a particular area. These project types are described in Table 4.

Table 4. Project Types Used in the WZ SA

Type	Characteristics	Examples
Type I	• Affects the traveling public at the metropolitan, regional, intrastate, and possibly interstate level • Very high level of public interest • Directly affects a very large number of travelers • Significant user cost impacts • Very long duration	• Central Artery/Tunnel in Boston, Massachusetts • Woodrow Wilson Bridge in District of Columbia/Maryland/Virginia • Springfield Interchange "Mixing Bowl" in Springfield, Virginia • I-15 reconstruction in Salt Lake City, Utah
Type II	• Affects the traveling public predominantly at the metropolitan and regional level • Moderate to high level of public impact. • Directly affects a moderate to high number of travelers • Moderate to high user cost impacts • Duration is moderate to long	• Major corridor reconstruction • High-impact interchange improvements • Full closures on high-volume facilities • Major bridge repair • Repaving projects that require long term lane closures
Type III	• Affects the traveling public at the metropolitan or regional level • Low to moderate level of public impact • Directly affects a low to moderate level of travelers • Low to moderate user cost impacts • May include lane closures for a moderate duration	• Repaving work on roadways and the National Highway System (NHS) with moderate Average Daily Traffic (ADT) • Minor bridge repair • Shoulder repair and construction • Minor interchange repairs
Type IV	• Affects the traveling public to a small degree • Low public impact • Duration is short to moderate • Work zones are usually mobile and typically recurring	• Certain low-impact striping work • Guardrail repair • Minor shoulder repair • Pothole patching • Very minor joint sealing • Minor bridge painting • Sign repair • Mowing

NOTE: These levels may not encompass all possible combinations or degrees of work zone categories. Some terms are general to allow flexibility in categorizing borderline project types.

DETAILED RESULTS

This section presents the results of the 2007 WZ SA at a more detailed level. For each section of the WZ SA, the information includes:

- An explanation of the intent of the section,
- The questions asked in that section,
- National average ratings for each question and comparative data from the 2006 WZ SA, and
- A question-by-question discussion of the scores, including the percentage of agencies implementing the practice asked about in the question (meaning they rated themselves at 7 or higher) and a summary of comments included by respondents in the results they submitted.

Many responders provided comments for some questions, while some did not submit any comments. The responders that provided comments offer helpful examples of some of the specific practices and efforts being done to make work zones work better.

Another rich source of examples is the series of implementation guides published by FHWA to provide guidance to transportation agencies as they implement the Work Zone Rule (23 CFR 630 Subpart J). The Guides contain many good examples of State DOT practices in use and provide references to helpful informational resources. The first guide in the series is the overall implementation guide, "Implementing the Rule on Work Zone Safety and Mobility." Three companion technical guides address specific related topics: "Work Zone Public Information and Outreach Strategies," "Developing and Implementing Transportation Management Plans for Work Zones," and "Work Zone Impacts Assessment: An Approach to Assess and Manage Work Zone Safety and Mobility Impacts of Road Projects." The Guides, as well as other information on the Rule, are available from the FHWA Work Zone Program website at http://www.ops.fhwa.dot.gov/wz/resources/final_rule.htm. The website also contains a list of work zone publications, studies, links, training resources, and examples of what agencies are doing to support Rule implementation. Hard copies of the Guides can be obtained by sending an email with the title(s), number of copies requested, and shipping information to workzonepubs@fhwa.dot.gov.

In 2007, the WZ SA included linkages, as applicable by question, to the appropriate sections of the Work Zone Rule. Between 2006 and 2007, many agencies moved toward implementation of the Work Zone Rule which likely affected the WZ SA ratings in a positive way. As agencies further implement the provisions of the Work Zone Rule by the October 12, 2007 deadline and use their revised practices in 2007, the ratings for next year will also likely increase, especially for agencies currently below the implementation threshold on directly linked questions.

LEADERSHIP AND POLICY

Agency leadership support should drive overall policy making for the agency. This support fosters an environment conducive to developing an effective work zone program. Project planning, design, and construction and maintenance activities should all incorporate consideration of work zone mobility and safety impacts and mitigation strategies. Agency management should facilitate and encourage a multidisciplinary approach to traffic management throughout all phases in the life of a project. Senior managers should be personally, visibly, and proactively involved in efforts to minimize work zone delays and enhance the safety of motorists and workers in work zones.

Goals provide high-level direction and establish expectations for agency staff. Clear and specific goal statements such as "Reduce congestion and delay in work zones by 10% in 5 years" establish a basis on which to develop strategies and actions. Use of performance measures helps to assess progress toward fulfillment of a goal. For example, to track progress toward reduction of work zone delays, an agency may gather information regarding the total vehicle hours of delay for a sample of work zones and track these values over time.

Figure 2 shows the average rating by question for 2006 and 2007 for the Leadership and Policy section. Table 5 shows the numeric ratings along with the percent change from 2006 to 2007 for each question. The average ratings increased for all of the questions in this section. For 2007, all but two of the questions had a national average score of 7.0 or greater, indicating that, on average, agencies are implementing the practices covered in this section. The questions with an average score below 7.0 (questions 4 and 10) had two of the highest percentage increases in this section (13% and 17%, respectively) from 2006 to 2007.

Figure 2. Results for Leadership and Policy Section

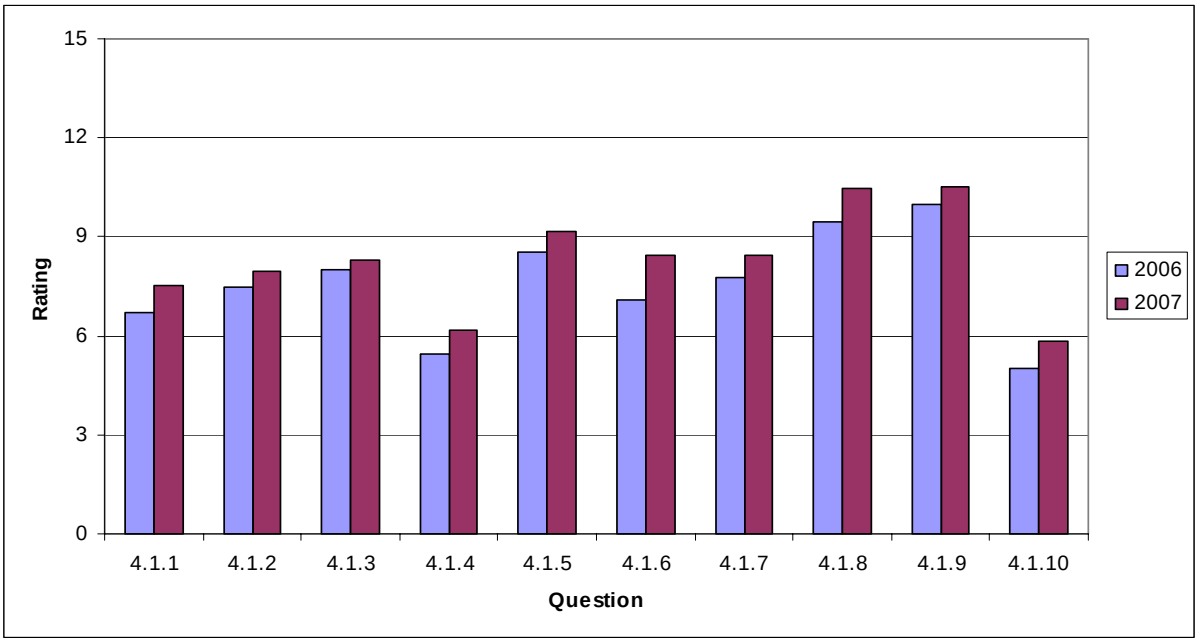


Table 5. Ratings for Leadership and Policy Section, 2006-2007

Section	2007	2006	Change	% Change
4.1.1	7.5	6.7	0.8	12%
4.1.2	7.9	7.5	0.4	6%
4.1.3	8.3	8.0	0.3	4%
4.1.4	6.2	5.4	0.7	13%
4.1.5	9.2	8.6	0.6	7%
4.1.6	8.5	7.1	1.4	20%
4.1.7	8.4	7.8	0.6	8%
4.1.8	10.4	9.4	1.0	11%
4.1.9	10.5	10.0	0.6	6%
4.1.10	5.8	5.0	0.8	17%

Questions 6, 10, 4, and 1 in this section increased substantially (20%, 17%, 13%, and 12% respectively) from 2006 to 2007. The ratings for some questions likely increased due to the impending deadline for compliance with the Work Zone Rule. This is particularly likely for Question 1, which relates to the Work Zone Rule requirement to define and identify "significant projects", and Question 6, which relates directly to the Work Zone Rule requirement to develop Transportation Management Plans (TMPs) to reduce the work zone impacts of projects. Questions 4 and 10 had a larger percentage increase partly due to the overall lower 2006 value compared with other questions. The increasing trend in the ratings for this section favors more focus on work zone issues by policy makers and decision makers.

4.1.1 Has the agency developed a process to determine whether a project is impact type I, II, III, or IV? Fifty-four percent of the agencies have developed a process to determine the impact type of projects. These processes are located in a standard policy or sometimes done as an informal process during the construction phase. One agency noted informal identification of high profile projects as opposed to a formal process to classify every project. This process includes rating projects similar to the impact type categories listed in this question but based on low, medium, or high impact ratings. Another agency cited use of a consistent process across all projects to assign a designation of "significant" or "not significant" based on project size, complexity, construction time, and traffic volume levels. Some agencies have developed a policy that addresses project classification, largely due to the requirements of the Work Zone Rule. One agency noted that its decentralized structure allows project classification activities to occur at the regional level and such activities could likely vary across regions. The 12% increase in score for this question was due to small increases by many agencies and larger increases by a few agencies.

4.1.2 Has the agency established strategic goals specifically to reduce congestion and delays in work zones? Nearly two-thirds (65%) of the responding agencies indicated that they have strategic goals to reduce work zone congestion and delays. Goals to reduce congestion and delays in work zones are supported by practices such as the use of QuickZone (a queue analysis spreadsheet tool for work

zones), ITS technologies, and lane closure policies that minimize closures during peak periods. Several agencies noted that draft policies are in place to help them focus on reducing congestion and delay. Some agencies focus on reducing congestion and delay but have not developed specific strategic goals. One agency reported that they have established a goal of no more than 20 minutes of stopped delay and 30 minutes of total delay through certain projects. Another agency reported development of a Strategic Highway Safety Plan (SHSP) that addresses strategies to reduce congestion and delay in work zones, thereby increasing safety performance by reducing stop-and-go conditions that contribute to crashes. The same agency reported inclusion of congestion and delay goals in their project level Transportation Management Plans (TMPs). One agency noted the need to develop performance measures prior to establishing goals. Another agency has regional mobility coordinators that implement practices to meet the formal mobility goals for the region.

4.1.3 Has the agency established strategic goals specifically to reduce crashes in work zones? Out of 52 reporting agencies, nearly two-thirds of them (62%) have strategic goals specifically to reduce crashes in work zones. Several agencies noted the use of strategic goals within their Strategic Highway Safety Plan (SHSP). A similar number of agencies cited use of strategies designed to reduce crashes in work zones but without a formal strategic goal. One agency noted the use of an annual safety action plan that includes goals and techniques and strategies to meet the goals. Another agency cited a goal for a reduction in all work zone crashes of 10%, and an SHSP goal to reduce fatal work zone crashes as part of an overall goal to reduce statewide fatal crashes by 100 by 2010.

4.1.4 Has the agency established measures (e.g., vehicle throughput or queue length) to track work zone congestion and delay? Nearly half (44%) of the states are implementing measures to track work zone congestion and delay. The average score for this item increased from 5.4 to 6.1 (13%) between 2006 and 2007. The increase continues a trend from the previous two years. The number of agencies that have reached the implementation threshold for establishing congestion and delay performance measures increased from 17 to 23 (a 35% increase). This result indicates that a number of agencies are placing more emphasis on this area and several have moved closer to the implementation threshold. Queue length and travel time variability are the most common measures used to track work zone delay, and some agencies use real-time data collection to measure conditions and provide traveler information on selected projects. Four agencies noted that policies are in place that define a performance measure based on delay. Several agencies cited that use of the measures is mainly at the project level compared with a system or network level. One agency noted a recent shift from tracking delay and congestion at the project level to tracking measures at the system level. Several agencies noted the need to develop specific performance measures and share information on practices in use. One agency noted that their policy for maintaining traffic has almost eliminated delays and that queues above the allowable threshold are rarely reported.

4.1.5 Has the agency established measures (e.g., crash rates) to track work zone crashes? Forty agencies (77%) have established measures to track work zone crashes. Several agencies reported use of crash databases and crash reporting and archiving systems. One agency extracts information from crash records when a site-specific issue is observed. Some agencies compare crash rates with data from previous years. Several agencies mentioned having difficulty in determining whether crashes were in the work zone or caused by the presence of the work zone or by the traffic control setup. To alleviate this issue, one agency added a work zone field to the State crash report forms so that officers can highlight if the crash occurred in a work zone. One agency stated that measures are addressed in the design stage, allowing the agency to be proactive with potential safety issues. Generally, respondents cited use of the number of crashes to measure the potential problem more than crash rates. This practice is likely due to limited volume information and construction timelines that are too short in duration to establish a meaningful rate for comparison.

4.1.6 Has the agency established a policy for the development of Transportation Management Plans to reduce work zone congestion and crashes? Two-thirds (67%) of the agencies are implementing a policy for the development of Transportation Management Plans (TMPs) to reduce work zone congestion and crashes. The average score for this item increased by 14% in 2006 and by 20% in 2007, which is likely due to the approaching October 2007 compliance date of the Work Zone Rule, which requires TMPs for all projects. The significant overall increase in the score for this question is due to increased ratings from 27 agencies, with several of these agencies showing large increases. Two agencies decreased their scores. One agency cited that, while they perform this function of reviewing project plans to determine what methods and procedures would have the least impact to the public, they do not yet officially refer to it as a TMP. The same agency noted that a draft TMP policy is under development, including procedures for implementing TMPs. Several other agencies also noted that a policy for use of TMPs is under development. One agency cited use of draft TMP guidelines for upcoming projects.

4.1.7 Has the agency established work zone performance guidance that addresses maximum queue lengths, the number of open lanes, maximum traveler delay, etc.? Standards for work zone performance guidance have been established in 38 agencies (73%). Some agencies noted that performance measures are used at the project level to help determine times when lane closures are permitted. One agency noted that once a project is let, no changes can be made – the project can only be temporarily stopped due to longer than acceptable queues (4 miles). Several agencies reported use of delay thresholds within a permitted lane closure analysis tool, and one cited 30 minute delays as the maximum overall traveler delay allowed for significant projects. One agency cited use of QuickZone as a tool for estimating overall delay.

4.1.8 Has the agency established criteria to support the use of project execution strategies (e.g., nightwork, full closures) to reduce public exposure to work zones and reduce the duration of work zones? Forty-seven agencies (90%) have established criteria to support the use of project execution strategies. Many agencies

reported wide use of nighttime construction, especially on the Interstate system and in high traffic volume locations. One agency reported that full road closure is only used on Interstates and typically only during blasting work. One agency cited the use of strategies such as nighttime construction and off-peak lane closures that avoid work during the peak hours. Agencies also cited the use of alternative contracting techniques to reduce public exposure to work zones. One agency noted use of performance measures (e.g., measuring queues) for assessment of strategies.

4.1.9 Has the agency developed policies to support the use of innovative contracting strategies to reduce contract performance periods? Of 52 reporting agencies, 47 of them (90%) have developed policies to support the use of innovative contracting strategies to reduce contract performance periods. Strategies used include A+B bidding, design-build, incentives/disincentives, and lane rental (cited to a lesser extent) on major projects. Two agencies noted legislative and contracting regulation limitations in the use of certain strategies. One agency said that, while it may not be a primary goal, contract performance periods are generally reduced as a result of these strategies. Another agency cited common use of fixed completion dates in all contracts.

4.1.10 Has the agency established Memoranda of Understanding (MOU) between utility suppliers to promote the proactive coordination of long-range transportation plans with long-range utility plans, with the goal of reducing project delays and minimizing the number of work zones on the highway? Only 18 agencies (35%) have established an MOU between utility suppliers to promote the proactive coordination of long range transportation plans with long-range utility plans. One agency noted coordination between utility suppliers and the DOT based on long range transportation plans, while another noted coordination at the Statewide Transportation Improvement Program (STIP) level. Another agency uses a checklist for coordination that includes an "Issue Notice" action that notifies the utility provider (often years in advance) of the need to coordinate with the construction schedule. One agency said that an MOU is in place but legislative action is needed to affect current practices. Some agencies work informally to coordinate between the transportation agency and the utility companies, such as through monthly coordination meetings. Four agencies reached the implementation threshold in 2007, contributing to the large percentage increase in score.

PROJECT PLANNING AND PROGRAMMING

While transportation planning and implementation processes differ significantly from State to State, they all focus on developing increased capacity and efficiency in the transportation system. They do this by developing long-range transportation plans (LRTPs), transportation improvement program plans (TIPs), unified planning work programs (UPWPs), and in some cases congestion management system (CMS) plans.

Transportation management and operations (M&O) processes are increasingly important to the planning professional. Metropolitan areas account for 75% of the nation's population and 83% of its economic output. They are centers for social as well as economic activity and are the hubs of the national transportation system. In addition,

they are portals for people and freight moving between the United States and other countries. To meet the challenge of continued mobility, the planning community needs to take an active role in the development and implementation of transportation system M&O strategies.

The complexity of our transportation systems and the impact of congestion on our nation necessitates input from planners during the project development process in order to better assess and manage work zone impacts. The following are some example roles for planners:

- Using analytical traffic models to assess the system-wide impacts of specific project requirements.
- Evaluating programming estimates to ensure that the proper level of funding is included to mitigate traffic congestion and improve safety through work zones.
- Providing the critical "bridge" of knowledge between the planning world and the design world to reduce the impacts of work zones on the traveling public.

Figure 3 shows the average rating by question for 2006 and 2007 for the Project Planning and Programming section. Table 6 shows the numeric ratings along with the percent change in average rating from 2006 to 2007 for each question. The average ratings increased for all six questions, with double-digit percentage increases for four of the six questions. While the national average score for the question regarding the use of analytical modeling tools remained lower than the other questions in this section and below the implementation threshold, this item showed a large increase (10%) in average rating.

Figure 3. Results for Project Planning and Programming Section

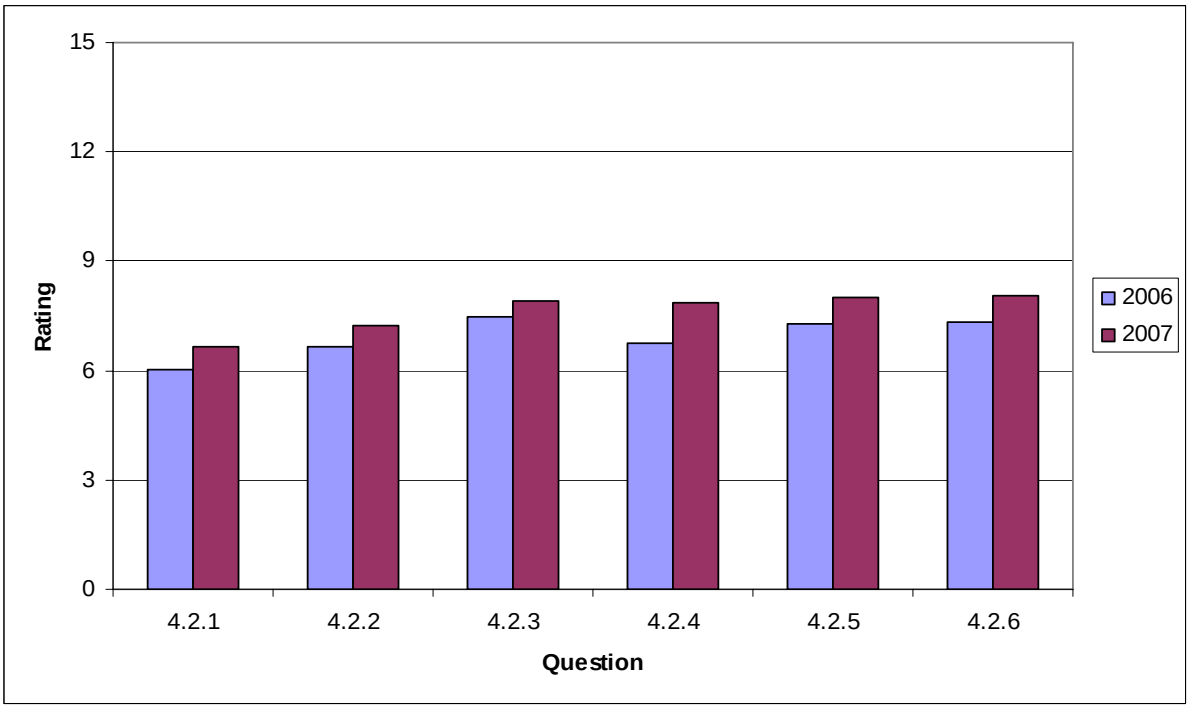


Table 6. Ratings for Project Planning and Programming Section, 2006-2007

Section	2007	2006	Change	% Change
4.2.1	6.7	6.0	0.7	10%
4.2.2	7.2	6.7	0.5	8%
4.2.3	7.9	7.5	0.4	6%
4.2.4	7.9	6.8	1.1	16%
4.2.5	8.0	7.3	0.7	10%
4.2.6	8.1	7.3	0.8	10%

4.2.1 Does the agency's planning process actively use analytical traffic modeling programs to determine the impact of future type I and II road construction and maintenance activities on network performance? More than half of the agencies (60%) actively use analytical traffic modeling programs to determine the impact of future type I and II project activities. The average rating for this question in 2007 increased by 10% due the increase in rating by 19 agencies. Two agency ratings decreased for this question. One agency cited use of travel demand models to predict future traffic levels using 20 and 25 year horizons. The same agency also cited use of microscopic traffic models to estimate the impacts during a construction year. Several agencies noted use of modeling on a project by project basis and for the localized project area as opposed to the system-wide/network level. Agencies cited use of a fairly broad range of proprietary software applications, including Paramics, VSIM, NETSIM, and Synchro, for modeling construction impacts.

4.2.2 Does the agency's planning process include developing alternative network options (e.g., frontage roads, increased capacity on parallel arterials, beltways, or strategically placed connectors) to maintain traffic volumes during future road construction and maintenance? Sixty percent of the agencies reported using tools to determine alternate network options for traffic volumes that could be delayed due to road construction. Corridor-level analysis is a technique that can identify alternative network options. One agency said that they use existing spare capacity on their network of frontage roads and consider spare capacity in future roadway systems to help reduce construction impacts. Several agencies cited processes for improving alternate routes and alleviating choke points prior to significant mainline construction projects.

4.2.3 Does the agency's planning process manage the transportation improvement program to eliminate network congestion caused by poorly prioritized and uncoordinated execution of projects? Thirty-four agencies (65%) indicated they make efforts during the planning process to manage the transportation improvement program to eliminate network congestion caused by poorly prioritized and uncoordinated execution of projects. One agency noted that project letting is staggered to avoid impacts from multiple projects along the same corridor. One agency noted that its TMP guidance encourages greater coordination among projects. Another agency noted that the planning and programming process is designed to mitigate potential issues with poorly prioritized and uncoordinated execution of projects. One agency

noted that the planning process allows for input on future performance issues from all stakeholder groups when developing projects.

4.2.4 Does the agency's transportation planning process include a planning cost estimate review for work types I, II, and III that accounts for traffic management costs (e.g., incident management, public information campaigns, positive separation elements, uniformed law enforcement, and intelligent transportation systems [ITS])? Thirty-three agencies (63%) have a process for estimating traffic management costs during the transportation planning process. Some agencies do this on type I and II projects, but not on type III projects. One agency noted that a cost estimate review is performed in the scoping phase and is generally a percentage of the total project cost (0.5% to 1%). Another agency said that a planning cost estimate review is performed on some projects, but that no formal process exists. One agency incorporates traffic management costs and public information costs early on in the process. Another agency noted that strategies such as ITS applications are line items earlier in the process (compared with the start of construction) for some projects.

4.2.5 Does the agency's transportation planning process include the active involvement of planners during the project design stage to assist in the development of congestion mitigation strategies for type I and II projects? Planners assist in developing congestion mitigation strategies in 67% of reporting agencies. Strategies can be developed from the early design phase, with designers, field personnel, and other partners working with planners. Agencies also involve local planners (MPO representatives) in the process for State projects. One agency noted that planners analyze traffic patterns to ensure adequate levels of service can be maintained and provide input into mitigation strategies that can be designed into the project.

4.2.6 Does the agency's transportation planning process engage planners as part of a multi-disciplinary/multi-agency team in the development of Transportation Management Plans involving major corridor improvements? For 63% of the responding agencies, the transportation planning process engages planners as a part of a team in the development of Transportation Management Plans (TMPs). Planners and designers often meet during the development of the TMP. One agency noted that multidisciplinary/multi-agency teams perform reviews throughout all phases of project development including TMP development. Another agency cited use of this practice on type I projects.

PROJECT DESIGN

Project designers, working in concert with other functional experts, should consider work zone maintenance of traffic issues early in the design process. Designers should examine the use of different project execution strategies that can accelerate construction, thereby reducing construction time and minimizing the exposure of travelers to work zones. In addition, designers should actively lead the preparation of Transportation Management Plans, including Traffic Control Plans, that will mitigate the impact of work zone activities.

Figure 4 shows the average rating by question for 2006 and 2007 for the Project Design section. Table 7 shows the numeric ratings along with the percent change in average rating from 2006 to 2007 for each question. The average ratings increased from 2006 to 2007 for all of the questions, and items 1, 5, 7, and 12 in this section experienced double-digit percentage increases. These increases are likely due to the Work Zone Rule, especially Questions 7 and 12.

Figure 4. Results for Project Design Section

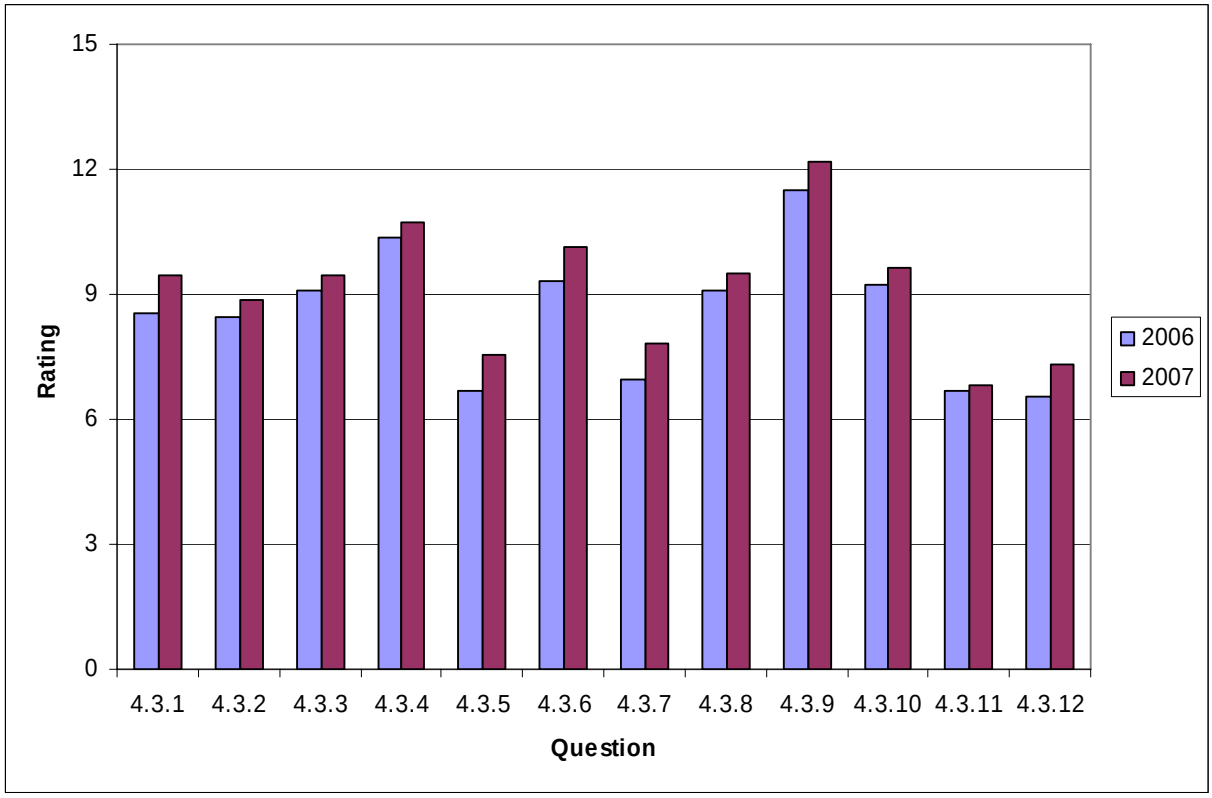


Table 7. Ratings for Project Design Section, 2006-2007

Section	2007	2006	Change	% Change
4.3.1	9.5	8.6	0.9	11%
4.3.2	8.8	8.4	0.4	5%
4.3.3	9.4	9.1	0.3	4%
4.3.4	10.7	10.4	0.3	3%
4.3.5	7.5	6.7	0.8	13%
4.3.6	10.1	9.3	0.8	9%
4.3.7	7.8	7.0	0.8	12%
4.3.8	9.5	9.1	0.4	4%
4.3.9	12.2	11.5	0.7	6%
4.3.10	9.6	9.2	0.4	4%
4.3.11	6.8	6.7	0.1	2%
4.3.12	7.3	6.6	0.7	12%

4.3.1 Does the agency have a process to estimate road user costs and use them to evaluate and select project strategies (full closure, night work, traffic management alternatives, detours, etc.) for type I and II projects?
Forty-one agencies (79%) have a process to estimate road user costs. Several agencies cited use of software, such as QUEWZ, QuickZone, and other agency-developed applications, to analyze potential project strategies. One agency noted that they also incorporate past experience, engineering judgment, and historical knowledge in concert with software tools to make decisions on the appropriate strategies such as night work and detour routes around the project. Another agency takes into account road user costs when determining liquidated damages and contract times. One agency focuses on delay instead of road user costs due to large user costs that likely cannot be mitigated.

4.3.2 Does the agency develop a Transportation Management Plan that addresses all operational impacts focused on project congestion for type I and II projects? Thirty-eight agencies (73%) develop a transportation management plan that addresses all operational impacts focused on project congestion for type I and II projects. Some agencies rated this question based on a formal TMP, while others rated it based on a plan very similar to the formal TMP and its elements (while not specifically called a TMP). One agency noted that communications and public outreach were a large focus of the TMP. Implemented strategies are often evaluated during construction and modified as needed. Since the Work Zone Rule requires TMPs, results from the 2008 WZ SA are expected to show the number implementing the practice to be all 52 agencies. A large increase was not present this year since many early adopters of the Work Zone Rule were likely among the agencies already implementing this practice.

4.3.3 Does the agency use multi-disciplinary teams consisting of agency staff to develop Transportation Management Plans for type I and II projects? Thirty-nine of the reporting agencies (75%) use multidisciplinary teams. These teams may consist of staff from planning, design, construction, operations, and other external stakeholders such as the public. In some cases, multidisciplinary teams are used primarily on high priority projects. One agency noted that they include key stakeholders, including local citizens, depending on the requirements of the project. Another agency said that they use these types of teams for value engineering and constructability reviews.

4.3.4 Does the agency perform constructability reviews that include project strategies to reduce congestion and traveler delays during construction and maintenance for type I and II projects? Out of the 52 responding agencies, 49 of them (94%) use constructability reviews on projects. This practice has one of the highest implementation rates in the WZ SA. Agencies may only require constructability reviews for complex projects, or may decide to use them on a project-by-project basis. One agency performs constructability reviews on high profile projects but does not have a formal policy. One agency noted using the reviews to identify traffic management strategies, especially when incentives are included in the contract.

4.3.5 Does the agency use independent contractors or contractor associations to provide construction process input to expedite project contract time for type I and II projects? Two-thirds of the agencies (67%) use contractor associations to provide construction process input. This practice is often executed primarily on complex projects and also on design-build projects. One agency cited use of contractor association representatives for input to help reduce congestion and delay caused by the work zone. Workshop forums are also used to gain input from contractors. One agency solicited contractor input through an Accelerated Construction Technology Transfer (ACTT) Workshop. One agency noted that construction process input is mainly done at the program level instead of the project level.

4.3.6 Does the agency use scheduling techniques that are based on time and performance, such as the critical path method or parametric models, to determine contract performance times for type I and II projects? Forty-four agencies (85%) are using a technique to determine contract performance times for type I and II projects. Several agencies noted use of the critical path method during the construction phase to determine performance times and also noted use of Gantt charts for project scheduling. Some agencies use various project and program management tools to establish contract performance times. One agency cited using proprietary software tools on projects that exceed five million dollars in total cost.

4.3.7 Does the agency have a process to evaluate the appropriate use of intelligent transportation system (ITS) technologies to minimize congestion in and around work zones for type I, II, and III projects? Nearly two-thirds of the agencies (65%) consider ITS technologies to minimize work zone congestion. Agencies use stand-alone work zone ITS systems and also use existing, permanent ITS for monitoring and management. Some agencies may evaluate whether to implement ITS technologies on a project-by-project basis, while other agencies only consider ITS use for major projects. One agency noted that some ITS deployments are stand alone while others are part of a corridor ITS plan. One agency has guidelines in place for determining the appropriate ITS components for work zone traffic management. Some examples cited include using speed sensors, variable speed limit systems, highway advisory radio, and changeable message signs. Some agencies noted that feedback from field personnel and the public is used to evaluate the effectiveness of ITS. One agency has a policy to submit design plans to TMC personnel so that they may evaluate the appropriate use of permanent ITS for traffic monitoring and management.

4.3.8 Does the agency use life-cycle costing when selecting materials to reduce the frequency and duration of work zones for type I, II, and III projects? To reduce the frequency and duration of work zones, life-cycle costing is used by 41 agencies (79%). One agency cited the use of longer lasting pavements and pre-cast materials to reduce the frequency of work zones and the duration of work. Another agency noted that life cycle cost analysis is used in pavement design and bridge design.

4.3.9 Does the agency have a process to assess projects for the use of positive separation devices for type I and II projects? Fifty agencies (96%) have a process to assess projects for the use of positive separation devices for type I and II projects. This was the third highest scoring question on the WZ SA, and the practice with the second highest implementation rate. Some agencies set standards and specify that certain project types require positive separation devices. An agency may require the use of temporary concrete median barriers for major projects and on high speed facilities. Agencies may also use shadow vehicles, moveable concrete barriers, and arrestor nets to provide positive protection. One agency noted that positive separation is always used on type I and II projects. Another agency cited a policy to always use temporary barriers on Interstate projects and high speed facilities. One agency stated that use of positive protection should be driven by design as opposed to project type.

4.3.10 Does the agency anticipate and design projects to mitigate future congestion impacts of repair and maintenance for type I, II, and III projects? Forty-six agencies (88%) incorporate features into their project designs that accommodate the need for future repair and/or maintenance activities. One agency noted that wider shoulders are considered for projects where use as a pull off area may be needed. The same agency cited the design of a wider inside shoulder for less traffic impact during maintenance operations. Full depth shoulders, tied shoulders, guardrail attachment points, snowplow-designed markers, and frontage roads were also cited by agencies as tools to mitigate future congestion during maintenance. One agency noted that often these design considerations are removed from projects due to cost.

4.3.11 When developing the Traffic Control Plan for a project, does the agency involve contractors on type I and II projects? Contractors are involved with the development of traffic control plans in 28 agencies (54%). The average rating for this question experienced a small increase (2%) from 2006 to 2007 compared with a 14% increase over the previous two years. Often, contractors are used informally during constructability reviews or may be consulted during the design stage if needed. Additionally, agencies allow contractors to submit ideas for or revisions to the traffic control plan. One agency noted that contractor involvement occurs mainly for high impact design-build projects.

4.3.12 When developing the Traffic Control Plan for a project, does the agency use computer modeling to assess Traffic Control Plan impacts on traffic flow characteristics such as speed, delay, and capacity for type I and II projects? Thirty-three of the 52 responding agencies (63%) implement computer modeling in the development of traffic control plans. This question showed a 12% increase in the average score from the previous year. This does not appear to be a widespread national trend, but rather is due primarily to a subset of agencies with increased ratings (16 agencies), with two agencies increasing their score from zero noting initial attention being given to the topic. Some agencies use this computer modeling on a project-by-project basis (potentially for larger projects when higher impacts are anticipated) or on occasion to evaluate the potential impacts. Agencies reported using QuickZone, QUEWZ, and agency-developed spreadsheet tools for analyzing impacts. Simple

capacity calculations are often used in conjunction with traffic volume data to estimate impacts for a project, network, or corridor. Several agencies cited use of modeling on primarily type I projects.

PROJECT CONSTRUCTION AND OPERATION

A roadway construction or maintenance site can be a very complex orchestration of activities affecting the public in many ways. There are many pieces to the project delivery process and everyone has a critical role, but what the public mostly sees and experiences is the construction end of the process. The use of letting strategies, quality-based contractor selection, time-sensitive bidding, efficient operations, traffic management, aggressive contract management, and good public information, can help agencies improve the execution and public perception of transportation improvements.

Complaints from the traveling public often focus on the proper use and maintenance of traffic control devices such as cones, drums, signs, barricades, barriers, striping, and changeable message signs. Some common problems include signs that inform travelers of conditions that do not exist, striping that is misleading, changeable signs that show the wrong message, and cones and drums that are improperly spaced. These inconsistencies have an impact on agency credibility with the traveling public. Drivers develop work zone habits that are based on past observations. Agencies can require and provide incentives for work zone contractor personnel to be trained in the proper application and maintenance of traffic control devices in work zones.

Figure 5 shows the average rating by question for 2006 and 2007 for the Project Construction and Operation section. Table 8 shows the numeric ratings along with the percent change in average rating from 2006 to 2007 for each question. Overall, this section had the second highest average rating of the six sections. The average ratings increased for all of the questions in this section. All the questions except question 9 have reached the implementation stage (score of 7 or higher), meaning on average agencies are generally implementing the practices addressed in this section. The average rating for question 4 crossed the implementation threshold between 2006 and 2007.

The average score for question 9 continues to be significantly lower than the scores for other questions in this section; however, question 9 showed a 21% increase since last year – the greatest percentage increase of any question in the WZ SA. Question 9 addresses training for law enforcement. Two likely reasons for the 21% increase are the publication by FHWA of a work zone law enforcement course in 2006 that can be used by DOTs to train law enforcement, and the Work Zone Rule provision that specifies that DOTs require that personnel in work zone enforcement be adequately trained.

Figure 5. Results for Project Construction and Operation Section

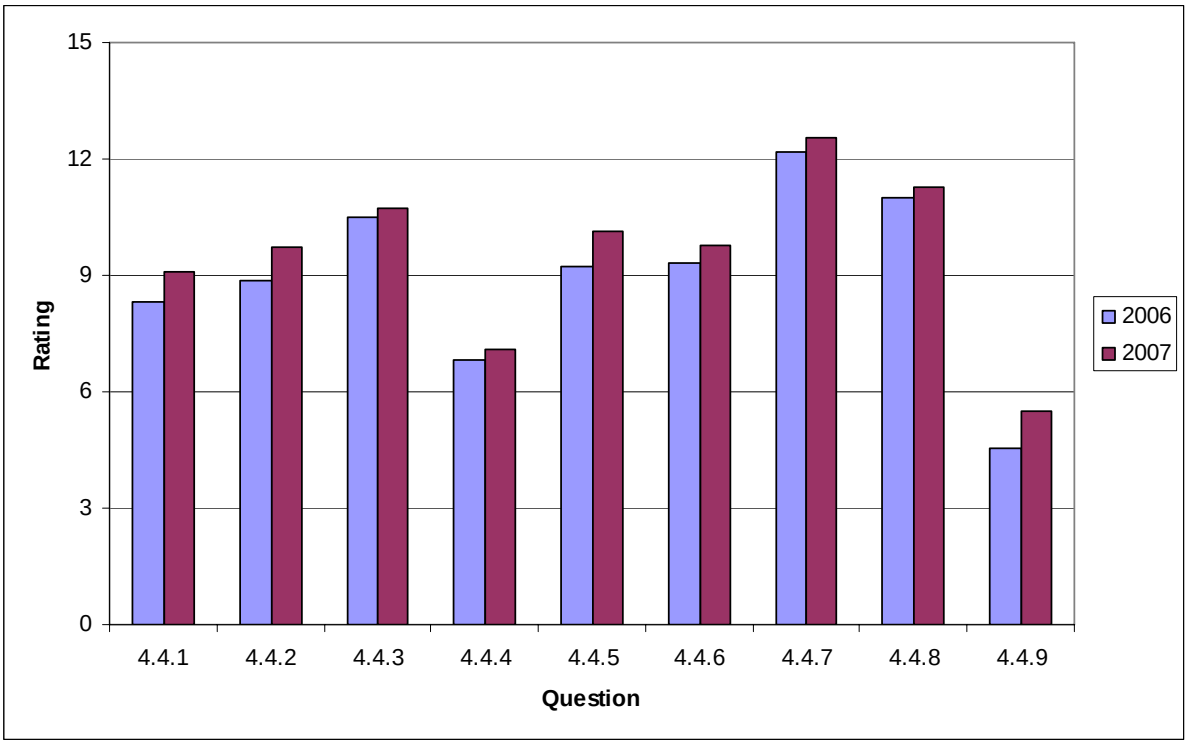


Table 8. Ratings for Project Construction and Operation Section, 2006-2007

Section	2007	2006	Change	% Change
4.4.1	9.1	8.3	0.8	9%
4.4.2	9.8	8.9	0.9	10%
4.4.3	10.7	10.5	0.2	2%
4.4.4	7.1	6.8	0.3	4%
4.4.5	10.1	9.2	0.9	10%
4.4.6	9.8	9.3	0.5	5%
4.4.7	12.6	12.2	0.4	3%
4.4.8	11.3	11.0	0.3	2%
4.4.9	5.5	4.5	0.9	21%

4.4.1 Is the letting schedule altered or optimized to reflect the available resources and capabilities of the construction industry? Thirty-eight agencies (73%) use this practice. Some agencies consult with the budgeting section of the DOT to schedule times in order to get better bids. Letting schedules are often driven by fiscal process constraints. One agency alters letting schedules if competition is limited or contractor resources are committed to other projects. One agency noted that very large projects are contracted by phase to allow for greater competition by activity. One agency places emphasis in this area at the district level.

4.4.2 Is the letting schedule altered or optimized to minimize disruptions to major traffic corridors? Eighty-eight percent of the agencies are minimizing disruptions on major traffic corridors by optimizing the letting schedule. Projects are reviewed to make sure that multiple projects do not adversely impact traffic along certain corridors. Several agencies review major jobs and other construction activity on a case-by-case basis and adjust the letting schedule to reduce conflicts. Agencies often consider special events along a corridor in addition to multiple projects to mitigate traffic impacts. One agency noted that schedules are often driven by funding and availability of funds as opposed to the potential for impacts.

4.4.3 When bidding type I and II projects, does the agency include road user costs in establishing incentives or disincentives (e.g., I/D, A+B, or lane rental) to minimize road user delay caused by work zones? Eighty-eight percent of the agencies include road user costs in establishing incentives/disincentives to minimize road user delay in work zones. Some examples of the strategies used by agencies include A+B bidding, lane rental, incentives, disincentives, and the use of modeling to determine the effects of construction on traffic. One agency noted that road user costs are used to determine incentives and disincentives. Another agency noted that A+B bidding and lane rental have not been as widely used as incentive/disincentive contracting.

4.4.4 When bidding type I, II, and III projects, does the agency use performance-based selection to eliminate contractors who consistently demonstrate their inability to complete a quality job within the contract time? Twenty-nine of the responding agencies (56%) use performance-based selection to eliminate contractors that regularly have difficulty completing quality jobs on-time. Some examples cited by agencies include having joint reviews to identify poor performing contractors, using field feedback, pre-qualifying contractors, grading contractors, and analyzing past experience with the contractor. One agency noted that State law does not allow elimination based on these factors alone, and another noted that prequalification disqualifies contractors earlier in the process than the contract award phase.

4.4.5 When bidding type I and II project contracts, does the agency use incident management services (e.g., wreckers, push vehicles, and service patrols)? Incident management services such as wreckers, courtesy patrols, and off-duty highway patrol officers are used by 44 agencies (85%). While more than three fourths of agencies use incident management services, some agencies commented that they do not include it as a bid item in the construction contract. One agency notes that these services are used for type I and II projects. One agency evaluated use of incident management services and determined that they are generally not cost effective.

4.4.6 When bidding contracts, does the agency use flexible starting provisions after the Notice to Proceed is issued? Most agencies (83%) routinely use flexible starting provisions after the Notice to Proceed is issued. Agencies reported that the start date may be up to the contractor, or the completion date may control the start date. One example cited by an agency involves using milestone completion dates that allow

the contractor to begin at flexible times when they have resources available. Another agency stated that all types of projects have some flexibility between award and notice to proceed, but that notice to proceed general followed award within 45 days. One agency noted that they only use this practice for resurfacing and bridge replacement projects.

4.4.7 During type I, II, and III projects, does the agency use uniformed law enforcement? Ninety-two percent of the reporting agencies indicated that they use uniformed law enforcement on projects. As was the case in 2006, this question has the highest overall rating of any question in the WZ SA, indicating that the use of law enforcement in work zones is a well-established and assessed practice in many agencies. Several agencies have formal agreements set up with the highway patrol to provide these services. One agency noted use of enforcement personnel on a project by project basis, and another noted use on every project but that no formal assessment has occurred. Another agency noted that law enforcement personnel are used on all nighttime construction projects on limited access highways. Agencies may include the reimbursement of these services in the project costs.

4.4.8 Does the agency provide/require training of contractor staff on the proper layout and use of traffic control devices? Most agencies (85%) indicated that they provide and/or require training of contractor staff on proper use of traffic control devices. Some agencies list training and certification requirements in their specifications. Some agencies require or are in the process of requiring the contractor to take courses dealing with traffic control device training. Sometimes certification is required, although the requirement may not be enforced. States rely on training opportunities from a variety of sources such as unions, OSHA, DOTs, ATSSA, and universities. Some agencies use specification language to require the contractor to comply with OSHA, MUTCD, and ASTM standards. Several agencies cited focus in this area because of the provisions of the Work Zone Rule.

4.4.9 Does the agency provide training to uniformed law enforcement personnel on work zone devices and layouts? More than one-third (38%) of responding agencies provide training to uniformed law enforcement. This question had the highest percentage increase (21%) of any question in the WZ SA between 2006 and 2007. Several agencies have conducted traffic safety seminars and traffic control supervisor training, and make these courses available to uniformed law enforcement personnel. In some cases, courses specifically geared toward emergency responders and law enforcement personnel are available. In some cases, a one-on-one short training session is conducted with law enforcement officers working on DOT projects. Some law enforcement agencies take advantage of the LTAP centers that provide training to local police agencies. Several agencies noted that they use the FHWA Law Enforcement Training Course or developed a State-specific course based on the principles in the FHWA course. The Work Zone Rule includes a requirement that enforcement personnel be trained. This new requirement likely contributed to the increased development of agency plans and guidance for training law enforcement, moving the average score from 4.5 to 5.5, and closer to the implementation stage.

COMMUNICATIONS AND EDUCATION

To reduce public anxiety and frustration regarding work zones, it is important to sustain effective communications and outreach with the public about road construction and maintenance activity, and the potential impacts of the activities. This also increases the public's awareness of such activity. Lack of information is often cited as a key cause of frustration for the traveling public; therefore, the agency should identify and consider key issues from a public outreach and information perspective.

Figure 6 shows the average rating by question for 2006 and 2007 for the Communications and Education section. Table 9 shows the numeric ratings along with the percent change in average rating from 2006 to 2007 for each question. The average ratings increased for all of the questions in this section. The scores in this section have consistently been the highest in the WZ SA and remain so this year.

Figure 6. Results for Communications and Education Section

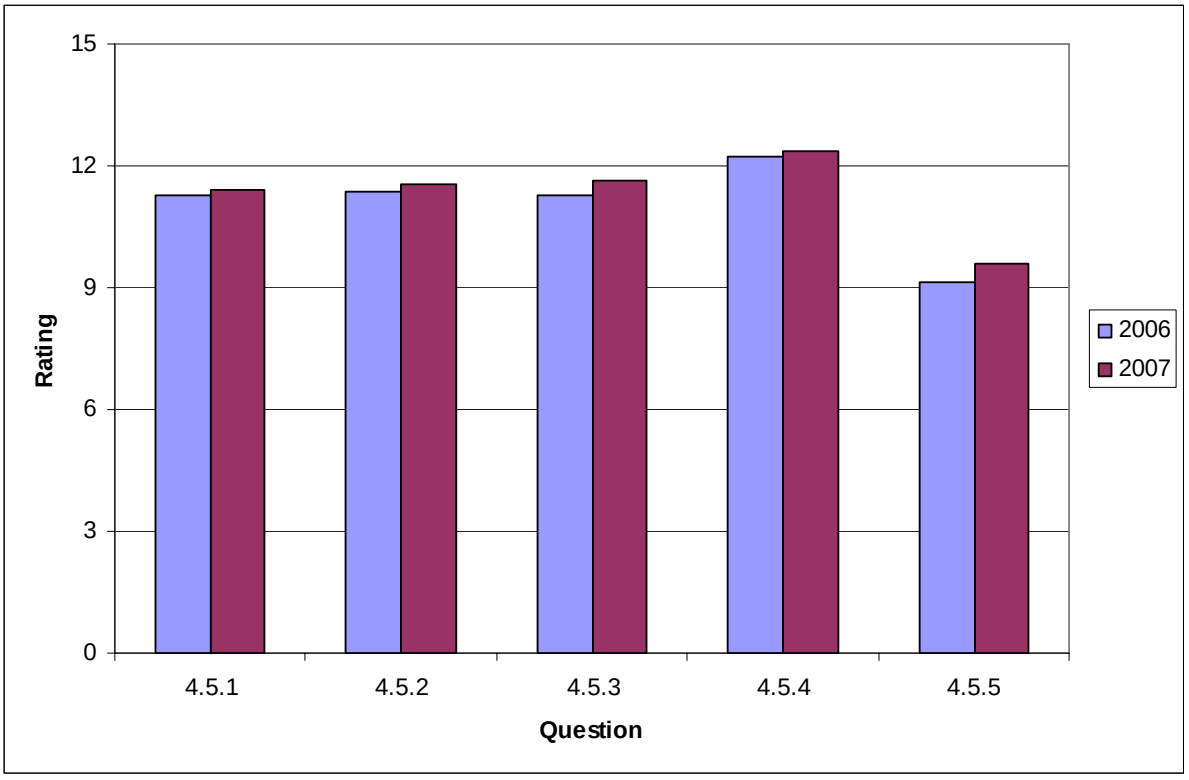


Table 9. Ratings for Communications and Education Section, 2006-2007

Section	2007	2006	Change	% Change
4.5.1	11.4	11.3	0.1	1%
4.5.2	11.6	11.4	0.2	2%
4.5.3	11.6	11.3	0.3	3%
4.5.4	12.4	12.2	0.2	1%
4.5.5	9.6	9.1	0.5	5%

4.5.1 Does the agency maintain and update a work zone web site providing timely and relevant traveler impact information for type I, II, and III projects to allow travelers to make effective travel plans? Forty-eight agencies (92%) implement a web site to provide traveler impact information on projects to allow travelers to make more effective travel plans. This was one of the highest rated questions on the WZ SA. Several agencies noted that they provide some sort of web site for travelers and commented that it could range from project specific information on separate websites to one website with statewide information on construction activities. One agency noted the use of hourly and daily updates to the information, while another agency noted use of a subscription-based electronic alert system to provide proactive information. Some agencies cited use of dedicated project websites that are updated daily.

4.5.2 Does the agency sponsor National Work Zone Awareness week? This was one of the highest scoring questions on the WZ SA. Most agencies (88%) sponsor National Work Zone Awareness week. Some agencies have no formal campaign but still support the program. One agency noted collaboration with FHWA, utility suppliers, contractor associations, and others to support NWZAW. Examples of other activities include local memorials, national memorial displays, and work zone safety awareness conferences. One agency referenced a national media kickoff event for a major bridge project.

4.5.3 Does the agency assume a proactive role in work zone educational efforts? Most agencies (92%) are developing educational materials to inform and educate the public on work zone safety. This question was one of the highest scoring on the WZ SA, with many agencies not only implementing this strategy but also performing assessment of their work zone educational efforts. Most agencies that provided comments cited the use of educational efforts from public service announcements to high school driver's education programs. One agency noted use of educational strategies at the project level.

4.5.4 During type I, II, and III project construction, does the agency use a public information plan that provides specific and timely project information to the traveling public through a variety of outreach techniques (e.g., agency website, newsletters, public meetings, radio, and other media outlets)? This practice is being implemented by 51 of 52 agencies, giving it the highest implementation rate in the WZ SA. Almost all agencies (98%) use a public information plan to provide specific and timely project information to the traveling public through a variety of outreach techniques. Some of these techniques include publishing information on the agency's web site and providing information to media outlets. Other techniques include work zone maps, public relations managers, radio, TV, newspaper ads, telephone hotlines, and public information centers. One agency noted use of camera images of work zones on public websites, especially along major freeway corridors. This question was the second highest scoring question on the WZ SA, indicating that the use of public information plans is widespread and is a well-established practice in most agencies.

4.5.5 During type I, II, and III projects, does the agency use intelligent transportation system (ITS) technologies to collect and disseminate information to motorists and agency personnel on work zone conditions? Forty-five agencies (87%) use ITS technologies to collect and disseminate work zone information. Many agencies use dynamic message signs and portable changeable message signs to give the traveling public specific and timely project information. Some agencies may incorporate ITS into the work zone plan. Several agencies cited implementation of technologies such as those mentioned. Some other agencies have more experience with implementation and are in the assessment phase to help enhance future deployments.

PROGRAM EVALUATION

Evaluation is necessary to identify successes and analyze failures. Work zone performance monitoring and reporting at a nationwide level can increase the knowledge base on work zones and help lead to the development of better tools to help agencies better plan, design, and implement road construction and maintenance projects. At the local level, performance monitoring and reporting provides an agency with valuable information on the effectiveness of congestion mitigation strategies, contractor performance, and work zone safety.

Figure 7 shows the average rating by question for 2006 and 2007 for the Program Evaluation section. Table 10 shows the numeric ratings along with the percent change in average rating from 2006 to 2007 for each question. The average ratings increased for all questions in this section. Question 1 (collecting data to track congestion and delay) and question 3 (evaluation using customer surveys) had large percentage increases from 2006 (20% and 17%, respectively).

Figure 7. Results for Program Evaluation Section

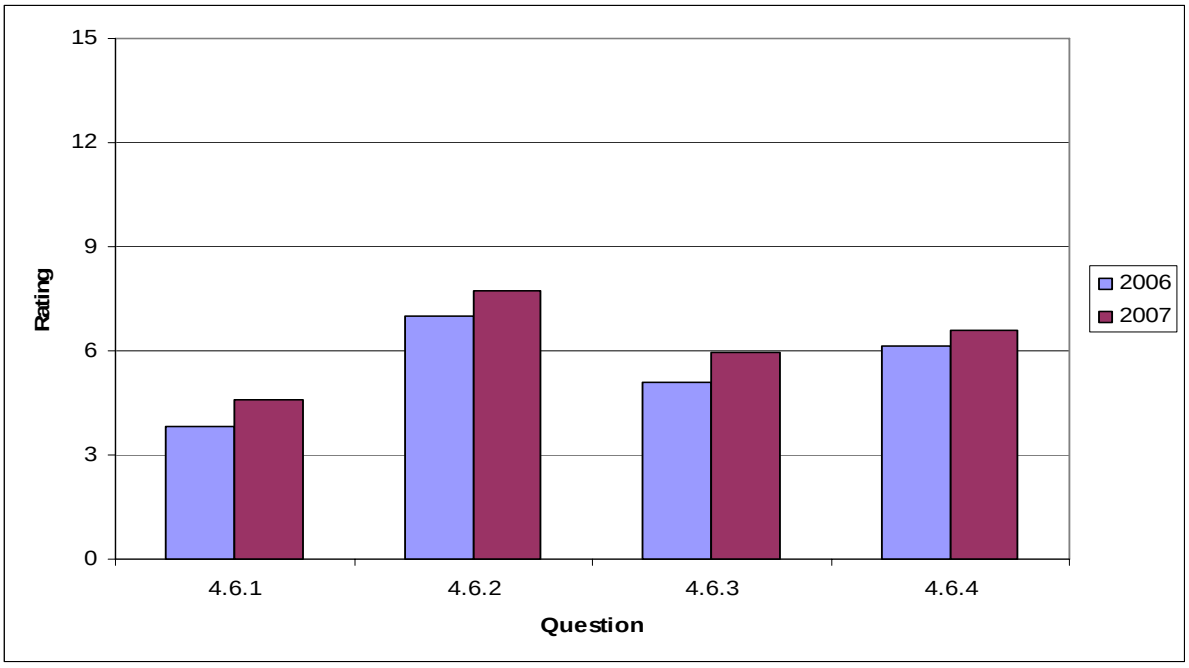


Table 10. Ratings for Program Evaluation Section, 2006-2007				
Section	**2007**	**2006**	**Change**	**% Change**
4.6.1	4.6	3.8	0.8	21%
4.6.2	7.7	7.0	0.7	10%
4.6.3	5.9	5.1	0.9	17%
4.6.4	6.6	6.1	0.5	8%

4.6.1 Does the agency collect data to track work zone congestion and delay in accord with agency-established measures? (See Section 1, item 4.1.4) Only 15 agencies (29%) collect data to track work zone congestion and delay performance against agency measures. Although this question had the lowest average score in the WZ SA, it had the largest percent increase in the WZ SA and had the highest percent increase for this section. Thus it appears that more agencies are moving toward using data to track work zone congestion and delay. One agency cited current efforts to procure equipment to track speed, volume, and delay in order to establish performance measures. Agencies cited use of ITS technologies and probe vehicles to collect information that can be used to analyze work zone performance for congestion. Some agencies cited lack of capability to collect the appropriate information. One agency developed a data collection template to provide consistency in quantifying delay. Another agency noted that performance measures are used during planning and design but are not monitored during construction.

4.6.2 Does the agency collect data to track work zone safety performance in accordance with agency-established measures? (See Section 1, item 4.1.5) More than half of the agencies (62%) are collecting data to track work zone safety performance. Some agencies cited collection of work zone fatality data, but also noted that crash data are often not detailed enough for work zone analysis. Several responses to this question show that agencies have difficulty in determining whether a crash can be directly attributed to the presence of the work zone. One agency noted that work zone crashes, injuries, and fatalities are tracked and used for the development of district and statewide changes to work zone safety policies and Strategic Highway Safety Plan strategies. Several agencies indicated that guidance on specific performance measures is needed to provide consistency across agencies.

4.6.3 Does the agency conduct customer surveys to evaluate work zone traffic management practices and polices on a statewide/area-wide basis? Twenty-three agencies (44%) are implementing this practice. Agencies provide opportunities for feedback on ways to improve work zones. Customer surveys are used in most cases. Customer surveys are often part of Context Sensitive Solutions practices in planning for and designing projects. Several agencies cited use of other feedback techniques such as easy access to public information officer contact information and dedicated project websites that accept comments. One agency noted that service patrol vehicles are equipped with mail-in motorist survey cards.

4.6.4 Does the agency develop strategies to improve work zone performance on the basis of work zone performance data and customer surveys? Over half of agencies (56%) develop strategies to improve work zone performance based on work zone data and customer surveys. One agency noted use of data after construction to assess potential changes in processes. One agency said it uses fatal crash reviews for work zones to improve safety and update procedures.

SUPPLEMENTAL QUESTION: WORK ZONE SAFETY AND MOBILITY RULE COMPLIANCE

In the 2007 WZ SA, agencies responded to a supplemental question that focused on compliance with the Work Zone Safety and Mobility Rule. The supplemental question was:

Is the agency in conformance with the provisions of the Work Zone Safety and Mobility Rule?

Figure 8 shows the number of agencies in compliance, and Figure 9 shows the percentages. In submitting their WZ SA results in early summer 2007, 12 agencies cited they were already in compliance with the Work Zone Rule. Other agencies indicated they were working on implementation efforts and were generally making good progress toward full compliance by the deadline. To the extent possible, a response of "No" was split into two separate categories based on whether the respondent commented that the agency would for sure be in compliance by the October 12, 2007 deadline.

For a response of "No", agencies were asked to describe what remains to be accomplished and when they expect to be in compliance. Twenty-two agencies stated that they had policies and procedures underway to assist with implementation of the Work Zone Rule. With respect to what remains to be accomplished, several agencies cited additional work on training, changes to manuals and specifications, and finalizing policies and procedures that have been under development.

Some agencies completed the survey early in 2007, well before the October 12, 2007 compliance date. Most agencies have made significant additional progress since they responded to this question.

Figure 8. Number of States in Compliance (as of Summer 2007)

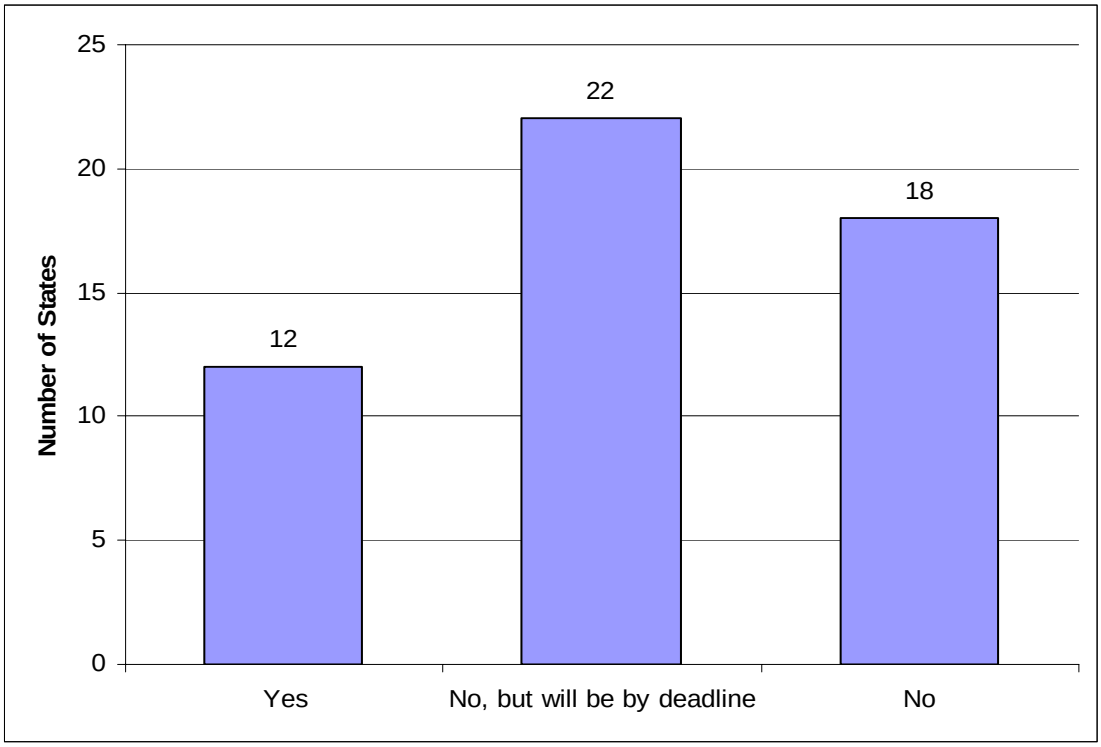


Figure 9. Percentage of States in Compliance (as of Summer 2007)