Analysis and Production of the Traffic Incident Management State Self-Assessments (TIM SA) National Report

National Analysis Report

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Federal Highway Administration
US Department of Transportation

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List of Abbreviations

ATRI	American Transportation Research Institute
CMS	Changeable Message Signs
DMS	Dynamic Message Signs
FFSP	Full-Function Service Patrols
FHWA	Federal Highway Administration
HAZMAT	Hazardous Materials
ICS	Incident Command System
ITS	Intelligent Transportation Systems
KMS	Knowledge Management System
MOU	Memoranda of Understanding
MUTCD	Manual on Uniform Traffic Control Devices
NCHRP	National Cooperative Highway Research Program
NIMS	National Incident Management System
NTIMC	National Traffic Incident Management Coalition
NUG	National Unified Goal
SHRP	Strategic Highway Research Program
SHSP	Strategic Highway Safety Plan
SQC	Safe Quick Clearance
TIM PM FSI	Traffic Incident Management Performance Measures Focus States Initiative
TIM SA	Traffic Incident Management Self-Assessment
TMC-CAD	Traffic Management Center Computer-Aided Dispatch
TMC	Traffic Management Center
TMS	Transportation Management System
TOC	Traffic Operations Center

Executive Summary

Background

The Traffic Incident Management Self-Assessment (TIM SA) is a benchmarking tool for evaluating TIM program components and overall TIM program success. The Federal Highway Administration (FHWA) initiated development of the TIM SA in 2002 and the first assessments were conducted in 2003. While the TIM SA is intended to provide local TIM program managers with a way to assess progress, analysis of the aggregated TIM SA results also allows FHWA to identify program gaps and better target TIM program resources.

There are 80 FHWA-defined operational areas (States, regions, localities) in the annual TIM SA process. The original plan for the TIM SA was to have 40 of the operational areas complete a re-assessment in 2004 and the remaining 40 to do so in 2005. In 2006, the decision was made to have all 80 areas conduct the TIM SA on an annual basis. Since the inaugural TIM SA in 2003, additional TIM programs beyond the original 80 have completed and submitted the TIM SA for inclusion in the national analysis. A total of 86 TIM SA were submitted for the 2009 national analysis, the largest number submitted to date. Table ES1 shows the total number of new and re-assessments each year.

Table ES1.
TIM SA Completed

Year	New Assessments	Re-Assessments	Total Completed
2003	70	--	70
2004	7	25	32
2005	1	41	42
2006	3	67	70
2007	5	62	67
2008	2	74	76
2009	6	80	86

The TIM SA underwent a review and revision in 2007 to more closely align the TIM SA with current TIM state of practice and to create synergy with a number of complementary federal initiatives. The TIM SA Revision was completed in 2008. Among other changes, the Revision included a reduction in the number of questions from 34 to 31 and a renaming of the three primary categories of questions as follows:

- Program and Institutional Issues was renamed Strategic.
- Operational Issues was renamed Tactical.
- Communications and Technology Issues was renamed Support.

In order to benchmark progress in the three sections, the initial assessments completed in 2003, 2004 and one in 2005 (78 in total) are used as the Baseline data against which subsequent years (2006 and beyond) are evaluated. Table ES2 shows the average score for each of the three TIM SA sections from the Baseline and 2009, along with the percentage change from the Baseline. The table also shows the high score achieved in each of the three program areas.

Table ES2.
Mean Score for Each Section (Baseline and 2009)

Section	# of Questions	Mean Score		High Score 2009 (possible)	% Change in scores from Baseline	Section Weights
		Baseline	2009			
Strategic	11	36.3%	51.1%	28.2 (30)	40.9%	30%
Tactical	13	57.6%	68.8%	39.2 (40)	19.5%	40%
Support	7	41.3%	59.0%	30.0 (30)	42.8%	30%
Overall Total	**31**	**45.9%**	**60.6%**	**96.6 (100)**	**31.9%**	**100%**

Strategic

The questions in the Strategic section ask respondents to rate progress in how the TIM program is organized, resourced, supported and sustained. The Strategic questions also cover TIM performance measures. The Strategic questions have realized a 40.9 percent increase over the Baseline.

Despite progress in the Strategic area, the five questions receiving the lowest mean score in the TIM SA are in this section, with four of the five coming from the subsection on TIM Performance Measurement (Table ES3). The lowest scoring question on tracking performance in reducing secondary incidents was added as part of the TIM SA Revision and therefore does not have a Baseline against which to measure progress. In 2010 and subsequent TIM SA analyses, the 2009 mean score of 1.03 will become the Baseline for this question.

Table ES3.
Lowest Mean Scores (2009)

Mean Score Rank in 2009/ Baseline	Question Number	Question	2009 Mean Score (n=86)	% Scoring 3 or Higher (2009)	% Change in 2009/ Baseline Mean Scores
31/- -	4.1.3.5 Strategic	Track performance in reducing secondary incidents?	**1.03**	8%	- -

Mean Score Rank in 2009/ Baseline	Question Number	Question	2009 Mean Score (n=86)	% Scoring 3 or Higher (2009)	% Change in 2009/ Baseline Mean Scores
30/23	4.1.3.4 Strategic	Routinely review whether progress is made in achieving the targets?	1.63	26%	120.0%
29/24	4.1.3.1 Strategic	Have multi-agency agreement on the two performance measures being tracked (roadway clearance time and incident clearance time)?	1.66	26%	159.8%
28/19	4.1.1.2 Strategic	Is there a process in place to ensure the continuity of these agreements / memoranda of understanding through integrated planning and budgeting across and among participating agencies?	1.79	28%	32.6%
27/21	4.1.3.3 Strategic	Have targets (i.e. time goals) for performance of the two measures?	1.84	33%	58.4%

The questions in TIM Performance Measurement are also among the questions that achieved the largest increase from the Baseline. Table ES4 shows that scores for three of the TIM Performance Measurement questions have more than doubled since the Baseline.

Table ES4.
Largest Changes in Mean Score (2009 from Baseline)

Mean Score Rank in 2009/ Baseline	Question Number	Question	2009 Mean Score (n=86)	% Scoring 3 or Higher (2009)	% Change in 2009 Mean Scores from Baseline
24/24	4.1.3.2 Strategic	Has the TIM program established methods to collect and analyze the data necessary to measure performance in reduced roadway clearance time and reduced incident clearance time?	**1.97**	33%	207.0%
29/24	4.1.3.1 Strategic	Have multi-agency agreement on the two performance measures being tracked?	**1.66**	26%	159.8%
30/23	4.1.3.4 Strategic	Routinely review whether progress is made in achieving the targets?	**1.63**	26%	120.0%
22/22	4.3.2.2 Support	Are motorists provided with travel time estimates for route segments?	**2.13**	42%	114.9%
20/20	4.1.2.2 Strategic	Conduct training? • NIMS training? • Training on the NTIMC National Unified Goal? • Other training?	**2.16**	49%	71.7%

Tactical

The questions in Tactical focus on the policies and procedures used by field personnel when responding to incidents. This includes the policies and procedures specifically targeting motorist and responder safety. Collectively, these questions consistently score among the highest in the TIM SA and in 2009 this section achieved an overall score of 68.8 percent. Four of the five questions achieving the highest mean score are in the Tactical section (Table ES5).

The highest scoring question in the 2009 TIM SA on "move over" laws was added as part of the 2008 TIM SA Revision and therefore does not have a Baseline score. With 85 percent of the assessments scoring this question 3 or higher and with 47 states with "move over" laws already in place, the expectation is that this question will remain in the top five scoring questions in subsequent analyses.

Table ES5.
Highest Mean Scores (2009)

Mean Score Rank in 2009/ Baseline	Question Number	Question	2009 Mean Score (n=86)	% Scoring 3 or Higher (2009)	% Change in 2009/ Baseline Mean Scores
1/--	4.2.2.1 Tactical	Have "move over" laws which require drivers to slow down and if possible move over to the adjacent lane when approaching workers or responders and equipment in the roadway?	**3.20**	85%	--
2/2	4.2.1.3 Tactical	Use a safety service patrol for incident and emergency response?	**3.10**	83%	13.7%
3/5	4.1.2.4 Strategic	Conduct planning for special events?	**3.09**	88%	25.0%
4/4	4.2.1.4 Tactical	Utilize the Incident Command System?	**3.08**	76%	20.8%
4/1	4.2.1.6 Tactical	Identify and type resources so that a list of towing, recovery and hazardous materials response operators (including operator capabilities and special equipment) is available for incident response and clearance?	**3.08**	74%	7.7%

In part due to the already high scores in the Tactical section, it is also the TIM SA section with the questions achieving the smallest increases in mean score from the Baseline. However, as shown in Table ES6, two of the three questions with little change over Baseline point to a need for additional guidance in hazardous materials incident response.

Table ES6.
Smallest Changes in Mean Score (2009 from Baseline)

Mean Score Rank in 2009/ Baseline	Question Number	Question	2009 Mean Score (n=86)	% Scoring 3 or Higher (2009)	% Change in 2008 Mean Scores from Baseline
15/3	4.2.1.7 Tactical	Have specific policies and procedures for hazmat and fatal accident response that also address maintaining traffic flow around the incident?	2.50	56%	-7.7%
4/1	4.2.1.6 Tactical	Identify and type resources so that a list of towing, recovery and hazardous materials response operators (including operator capabilities and special equipment) is available for incident response and clearance?	3.08	74%	7.7%
2/2	4.2.1.3 Tactical	Use a safety service patrol for incident and emergency response?	3.10	83%	13.7%

Support

The questions in Support focus on the tools and technologies enabling improved incident detection, response and clearance. The questions in Support collectively continue to experience the largest increase over the Baseline, up 42.8 percent. However, in 2009 the overall mean score declined slightly from the 2008 score of 59.4 to 59.0.

In the Data subsection, the highest scoring question is 4.3.1.1 on the use of a Traffic Management Center/Traffic Operations Center (TMC/TOC) to coordinate incident detection, notification and response. However, lower scores throughout this subsection indicate that the potential of TMCs/TOCs is not yet being fully realized due to several factors including limited co-location of public safety and transportation in the centers.

Summary

The 2009 TIM SA is the first completed following an extensive review and revision completed in 2008. As a result of the revision, several key changes were made to the TIM SA:

- The three subsections were renamed.

- The total number of questions was reduced from 34 to 31.
- A new scoring approach was instituted which asked respondents to rate progress using High, Medium and Low rather than the numeric scoring of 0-4.
- An online TIM SA was introduced to make it easier for participants to respond to the questions.

With a total of 86 TIM SA completed in 2009, it appears that the revisions had a positive impact on participation. The 86 assessments represent 80 re-assessments and six new locations submitting an assessment for the first time. An overall score of 60.6 percent was achieved, representing a 31.9 percent increase over the Baseline. The highest scores continue to be in the Tactical section and the largest percentage increase over Baseline was once again in the Support section.

Low scoring questions and those with the least improvement over Baseline indicate specific program areas where additional guidance from FHWA is warranted. This includes TIM Performance Measurement and in particular, additional guidance on secondary incident definitions and technical direction on tracking reductions in the occurrence of secondary incidents.

2009 Traffic Incident Management Self-Assessment National Analysis Report

Background and Methodology

The TIM SA was developed by the American Transportation Research Institute (ATRI) under contract to the Federal Highway Administration (FHWA) in 2002. It was designed as a tool by which state, regional and local TIM practitioners could assess progress in achieving successful multi-agency programs to manage traffic incidents safely and effectively. As originally designed, the TIM SA provided TIM program managers a way to identify areas where additional resources (human, financial, technical) could be deployed to improve program performance. Additionally, the TIM SA was intended to provide FHWA with a national picture of broader program areas on which to focus national program initiatives.

The TIM SA was launched in 2003 in the nation's top 75 urban areas. Those 75 census areas were subsequently redefined by FHWA Division Offices into 80 operational areas for the TIM SA. Initially intended to be completed on a biennial basis, in 2006 the TIM SA process was modified so that all 80 areas were requested to complete the assessment on an annual basis. In 2006, a total of 70 assessments were conducted and in 2007 that number dropped to 67.

A number of challenges with the TIM SA were identified since its inception and in 2007, FHWA initiated a process to review and revise the annual TIM SA. Among the challenges/issues associated with the TIM SA which this revision process was designed to address are the following:

- Lack of multi-agency participation in the annual assessment;

- Lack of consistent participation by the individuals completing the TIM SA;

- Missing or incomplete data and supporting documentation submitted with each individual TIM SA, making analysis of the results difficult; and

- Confusion over the meaning/intent of some of the TIM SA questions.

Additionally, since the initial TIM SA, a number of federal initiatives had advanced to the point where it was appropriate to examine where synergies between those initiatives and the TIM SA existed. Among the initiatives evaluated in the TIM SA revision process were:

- U.S. Department of Homeland Security National Incident Management System (NIMS);

- Requirements for state Departments of Transportation to develop and implement Strategic Highway Safety Plans (SHSP);

- National Traffic Incident Management Coalition (NTIMC) and its National Unified Goal (NUG);

- FHWA Traffic Incident Management Performance Measures Focus States Initiative (TIM PM FSI).

The TIM SA Revision process included a review of current TIM initiatives, case studies with select TIM SA participants and a thorough review of the TIM SA questions and scoring approach.

The TIM SA Revision completed in 2008 resulted in several key changes, implemented for the first time in the 2009 TIM SA. The program area categories were renamed to more closely align with current NIMS and TIM state of practice. Program and Institutional Issues was renamed Strategic; Operational Issues was renamed Tactical; and Communications and Technology Issues was renamed Support.

The 34 questions were reduced to 31 questions in seven subcategories as follows:

- Strategic
    - Formal TIM Programs (2 questions)
    - Multi-Agency TIM Teams (4 questions)
    - Performance Measurement (5 questions)

- Tactical
    - Policies and Procedures for Incident Response and Clearance (8 questions)
    - Responder and Motorist Safety (5 questions)

- Support
    - Data Collection/Integration/Sharing (5 questions)
    - Traveler Information (2 questions)

The scoring was also revised from numeric (0-4) to Low/Medium/High per the descriptions below (Table 1). Supplemental scores were added to clarify specific program progress based on an initial score of Low or Medium. The supplemental scores are described in Table 2.

Table 1.
Scoring Scheme

Score	Description
LOW	**Little to no progress in this area.** • Has never been discussed or discussed informally with no or minimal action taken
MEDIUM	**Progress in this area is moderate to good.** • Has been put into practice with some multi-agency agreement and cooperation
HIGH	**Progress in this area is strong to outstanding.** • Efforts in this area are well coordinated with a high level of cooperation among agencies

Table 2.
Supplemental Scoring Scheme

Score	Description	
LOW	**No Activity**	
	• No activity or discussion of this issue	
	Some Activity	
	• Issue has been acknowledged and there has been some single agency activity	
MEDIUM	**Fair Level of Activity**	
	• Some good processes exist, but they may not be well integrated or coordinated	
	Good Level of Activity	
	• Efforts in this area are strong and results are promising, though there is still room for improvement	

The Annual TIM SA National Analysis Report provides progress in each program area over the Baseline score. The TIM SA Revision reduced the number of questions overall, through the elimination of some questions, the combining of others and the inclusion of several new questions. To ensure the fidelity of the analysis after the revision, a question-to-question map was created (Appendix A). Where two questions were combined into one, the Baseline for each was averaged to create a new Baseline score for that question. Questions that are new as a result of the revision will not have a Baseline score and the 2009 mean score for that question will become its Baseline. Examples of the question and subsequent scoring conversion are shown in Table 3.

Table 3.
Examples of the 2008 and 2009 Question Conversion Map

Programmatic Area	2009 Question #	2008 Question #	Baseline
Multi-agency agreements/MOUs	4.1.1.1	4.1.1.2	1.71
Formalized TIM Team meets regularly	4.1.2.1	4.1.2.1	1.90
Measure secondary accidents	4.1.3.5	--	--
Traffic flow around hazmat or fatal accidents	4.2.1.7	4.2.3.2 and 4.2.3.3	2.71

The TIM SA Revision also included development of an online portal through which participants could provide answers to each of the questions. Also new in 2009 is the identification of high-scoring locations in each of the three program areas. The TIM SA Revision process noted the value of the TIM SA as a peer networking tool. However, prior to the revision, those locations achieving a high degree of success in specific program areas went unnamed. By noting the success of specific TIM programs, other TIM program managers can communicate with their peers to identify ways to advance program performance and subsequently improve TIM SA scores.

Results – Overall

A total of 86 assessments were completed in 2009 with an overall score of 60.6 percent, representing a 31.9 percent increase over the Baseline (Table 4). Scores for the questions in Support show the greatest percentage change (42.8 percent) over the Baseline and the highest section score was achieved in Tactical (68.8 percent).

Table 4.
Mean Score for Each Section (Baseline and 2009)

Section	# of Questions	Mean Score		% Change in scores from Baseline	Section Weights
		Baseline	2009		
Strategic	11	36.3%	51.1%	40.9%	30%
Tactical	13	57.6%	68.8%	19.5%	40%
Support	7	41.3%	59.0%	42.8%	30%
Overall Total	**31**	**45.9%**	**60.6%**	**31.9%**	**100%**

The 31 TIM SA questions are further divided into category-specific subsections. The revised TIM SA has seven subsections, down from the original eight. Integrated Interagency Communications (4.3.1) and Transportation Management Systems (4.3.2) were combined into one section entitled Data Collection/Integration/Sharing (4.3.1) as part of the TIM SA Revision process. Table 5 shows the overall scores by subsection for the 2009 TIM SA and the Baseline, along with the percentage change from the Baseline.

In the Strategic section, the five questions in TIM Performance Measurement (4.1.3) continue to achieve the highest percentage change from the Baseline (104.5 percent). In 2008, TIM Performance Measurement experienced an 84.5 percent increase over Baseline.

Traveler Information (4.3.2), a subsection of Support, had the second largest increase over the Baseline (74.2 percent). The remaining subsections of questions show significant increases over the Baseline, though Policies and Procedures (4.2.1) had the smallest percentage increase (10.8 percent) of the subsections. Policies and Procedures had the highest score in the Baseline (2.61) and the only Baseline score over 2. This high baseline affords less opportunity for substantial percentage increases in the score year to year.

Table 5.
Mean Score for Each Subsection (Baseline and 2009)

Sections and Subsections	No.	Mean Score Range = 0 to 4		% Change in 2009 from Baseline
		Baseline (n=78)	2009 (n=86)	
Strategic	4.1			
Formal TIM Programs	4.1.1	1.53	1.98	29.6%
Multi-agency TIM Teams	4.1.2	1.81	2.60	43.6%
TIM Performance Measurement	4.1.3	0.80	1.63	104.5%
Tactical	4.2			
Policies and Procedures	4.2.1	2.61	2.89	10.8%
Responder and Motorist Safety	4.2.2	1.71	2.53	47.7%
Support	4.3			
Data Collection/Integration/Sharing	4.3.1	1.80	2.30	39.7%
Traveler Information	4.3.2	1.52	2.52	74.2%

Scores for all 31 questions for both the Baseline and the 2009 re-assessments are shown in Figure 1. Following Figure 1 is a section-by-section analysis of the change in TIM SA scores from the Baseline to 2009.

Questions appearing for the first time in the 2009 TIM SA (as a result of the 2008 TIM SA Revision) will not show a Baseline score. In the 2010 and subsequent TIM SA National Analysis Reports, the 2009 score for these questions will become the Baseline.

Figure 1.
Mean Scores for All Questions
Baseline – 2009
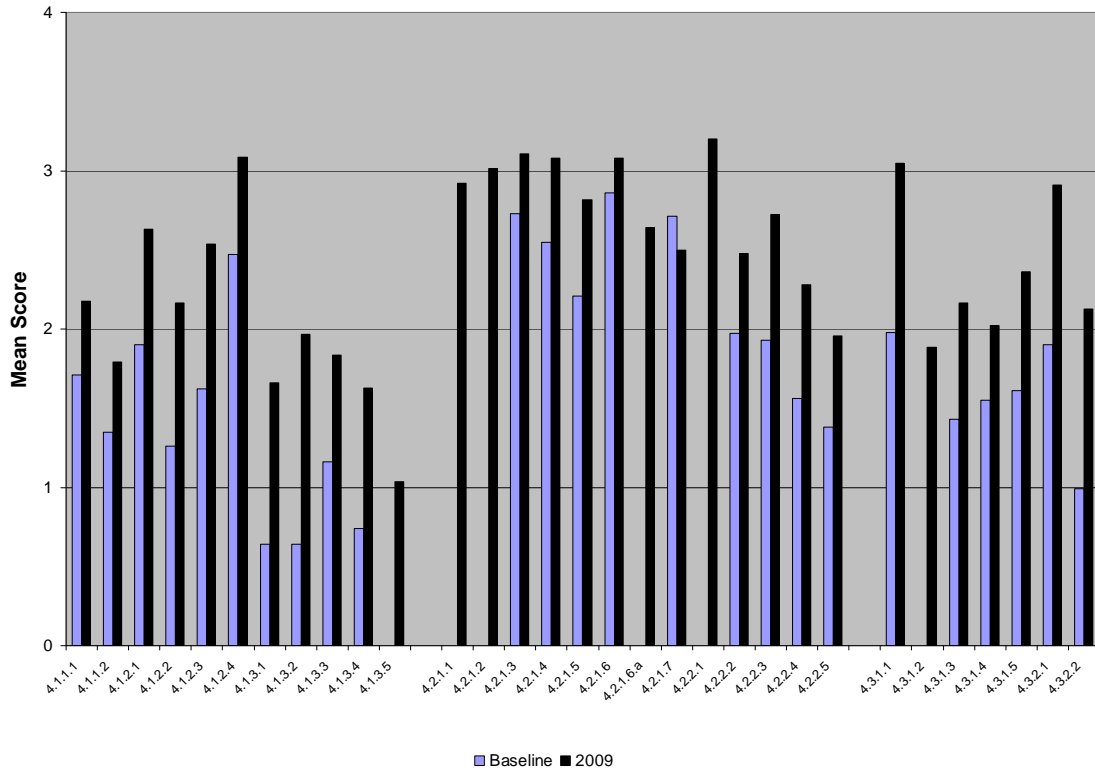
Results – Strategic

Mean Score: 51.1% (15.3 of 30 points)

Strategic program elements provide the basis for organizing and sustaining TIM programs. The continued climb in scores in this section since 2003 (Table 6) illustrates the evolution of TIM programs from ad hoc operations to more formalized and sustained programs.

Table 6.
Strategic

Year	Mean Score
Baseline	36.3
2006	48.5
2007	48.8
2008	51.0
2009	51.1

The 2008 TIM SA Revision maintained the three sections of questions in the Strategic program area:

- Formal Traffic Incident Management Programs
- Multi-Agency TIM Teams (formerly TIM Administrative Teams)
- TIM Performance Measures

The Formal Traffic Incident Management Programs subsection focuses on the underlying support mechanisms for TIM programs including multi-agency agreements or Memoranda of Understanding (MOU). The TIM SA Revision shifted the focus of this subsection from inter-agency agreements and the identification of budget and personnel needs to explicit resource sharing and integrated, budget processes that facilitate TIM program continuity and sustainability.

The Multi-Agency TIM Teams subsection targets TIM team formal meetings, training, post-incident debriefings and planning for special events. The TIM SA Revision removes the distinction between administrative teams and on-scene responders by emphasizing multi-agency TIM teams. Questions on specific types of training have been added to reflect current state of TIM practice, including NIMS training and training on the National Traffic Incident Management Coalition's (NTIMC's) National Unified Goal.

Questions in the subsection on TIM Performance Measurement target the two measures identified in FHWA's TIM Performance Measures Focus States Initiative (TIM PM FSI). The TIM PM FSI resulted in two consensus program performance measures; Roadway Clearance Time and Incident Clearance Time. The TIM PM FSI also added a third measure, which is now part of the TIM SA; tracking performance in reducing secondary accidents is queried in question 4.1.3.5.

Figure 2 shows the change from the Baseline for each of the three subsections in Strategic.

Figure 2.
Strategic
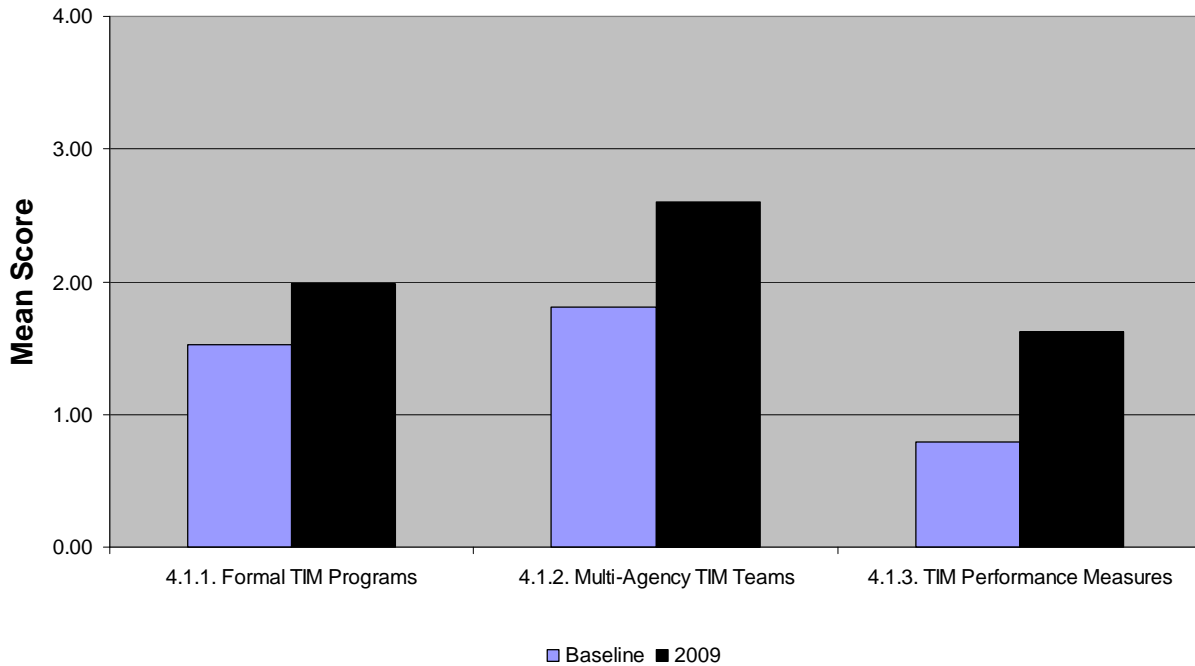
Baseline ■ 2009

Table 7 shows the mean score (Baseline and 2009) for each of the 11 questions in Strategic, the percentage of assessments rating this question three or higher (indicating success) and the percentage increase in the mean score in 2009 from the Baseline.

Table 7.
Comparison of Strategic between Baseline and 2009 Scores

Question Number	Question	Mean Score Range = 0 to 4		% of Assessments Scoring 3 or Higher		% Change in 2009 Mean Scores from Baseline
		Baseline	2009	Baseline	2009	
4.1.1.1	Is the TIM program supported by multi-agency agreements/memoranda of understanding detailing resource sharing (facilities, services, personnel and budget)?	1.71	**2.17**	18%	37%	27.2%

| Question Number	Question	Mean Score Range = 0 to 4		% of Assessments Scoring 3 or Higher		% Change in 2009 Mean Scores from Baseline
		Baseline	2009	Baseline	2009	
4.1.1.2	Is there a process in place to ensure the continuity of these agreements/memoranda of understanding through integrated planning and budgeting across and among participating agencies?	1.35	**1.79**	12%	28%	32.6%
4.1.2.1	Have a formalized TIM multi-agency team which meets regularly to discuss and plan for TIM activities?	1.90	**2.63**	28%	57%	38.3%
4.1.2.2	Conduct training? • NIMS training? • Training on the NTIMC National Unified Goal? • Other training?	1.26	**2.16**	9%	49%	71.7%
4.1.2.3	Conduct post-incident debriefings?	1.62	**2.53**	18%	52%	56.5%
4.1.2.4	Conduct planning for special events? • Construction and maintenance? • Sporting events, concerts, conventions, etc? • Weather-related events? • Catastrophic events?	2.47	**3.09**	35%	88%	25.0%
4.1.3.1	Have multi-agency agreement on the two performance measures being tracked? • Roadway clearance time? • Incident clearance time?	0.64	**1.66**	3%	26%	159.8%

Question Number	Question	Mean Score Range = 0 to 4		% of Assessments Scoring 3 or Higher		% Change in 2009 Mean Scores from Baseline
		Baseline	2009	Baseline	2009	
4.1.3.2	Has the TIM program established methods to collect and analyze the data necessary to measure performance in reduced roadway clearance time and reduced incident clearance time?	0.64	**1.97**	3%	33%	207.0%
4.1.3.3	Have targets (i.e. time goals) for performance of the two measures?	1.16	**1.84**	4%	33%	58.4%
4.1.3.4	Routinely review whether progress is made in achieving the targets?	0.74	**1.63**	3%	26%	120.0%
4.1.3.5	Track performance in reducing secondary incidents?	--	**1.03**	--	8%	--

The online TIM SA developed as part of the TIM SA Revision prompted respondents to submit comments on each of the 31 questions. This information was designed to provide additional insight into TIM program details, challenges and trends. While the number of comments submitted varied somewhat by question, in general about a third of TIM SA respondents provided comments for each question.

Comments submitted on Formal Traffic Incident Management Programs (Figure 3) reveal that while significant work has gone into the development of interagency agreements and MOUs, processes to ensure the continuity of the agreements remain somewhat informal, relying in many cases on ad hoc meetings to review the status of the agreements.

Figure 3
Formal Traffic Incident Management Programs
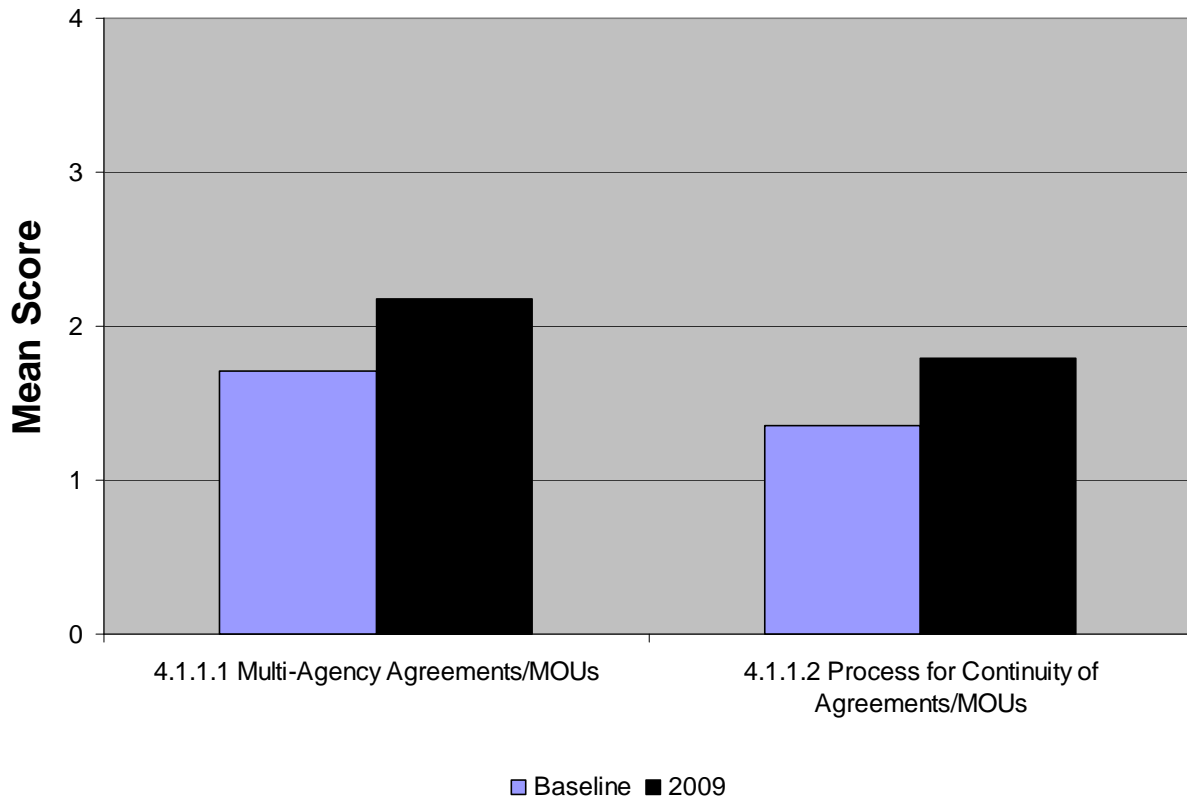
Average scores for the second subsection, Multi-Agency TIM Teams (4.1.2), have increased 43.6 percent over the Baseline. The highest mean score was achieved in planning for special events (4.1.2.4) with a mean score of 3.09. Planning for special events was the third highest scoring question overall in the 2009 TIM SA and is the question with the highest percentage (88 percent) of scores 3 or higher.

The score for this question is the aggregated average of individual scores in planning for the following types of events: Construction and Maintenance; Sporting Events, Concerts, Conventions; Weather-related Events and Catastrophic Events. Among those categories, Sporting Events, Concerts, Conventions (4.1.2.4.b) and Construction and Maintenance (4.1.2.4.a) achieved the highest mean scores of 3.27 and 3.15, respectively. The advanced notice of these events affords opportunities for planning, resulting in higher scores. However, planning for Weather-related Events and Catastrophic Events continues to lag, even though these events pose greater safety risks and have a higher likelihood of impacting larger segments of the general population. The relative infrequency of these events in most jurisdictions likely results in less advance planning.

The presence of a formalized TIM multi-agency team (Figure 4) which regularly meets (4.1.2.1) received a mean score of 2.63. Though "regularly" is not defined, the comments provided point to meetings held on a monthly or quarterly basis.

The training conducted by the TIM teams (4.1.1.2) is primarily NIMS training, with very few respondents indicating training on the NTIMC National Unified Goal (NUG). Scores in NUG training can be expected to increase in 2010 and subsequent years when the TIM Responder Training being developed as part of the Strategic Highway Research Program (SHRP II) is deployed. The Emergency Responder Safety Institute and the I-95 Corridor Coalition are also developing training based on key NUG objectives. Other types of training referenced in the comments included defensive driving, use of photogrammetry and responder safety.

Post-incident debriefing scores (4.1.2.3) continue to increase, achieving a mean score of 2.53 in 2009. The comments indicate that the debriefings typically occur after large incidents only and in many cases, are conducted by individual agencies and not as a multi-agency initiative.

Figure 4.
Multi-agency TIM Teams
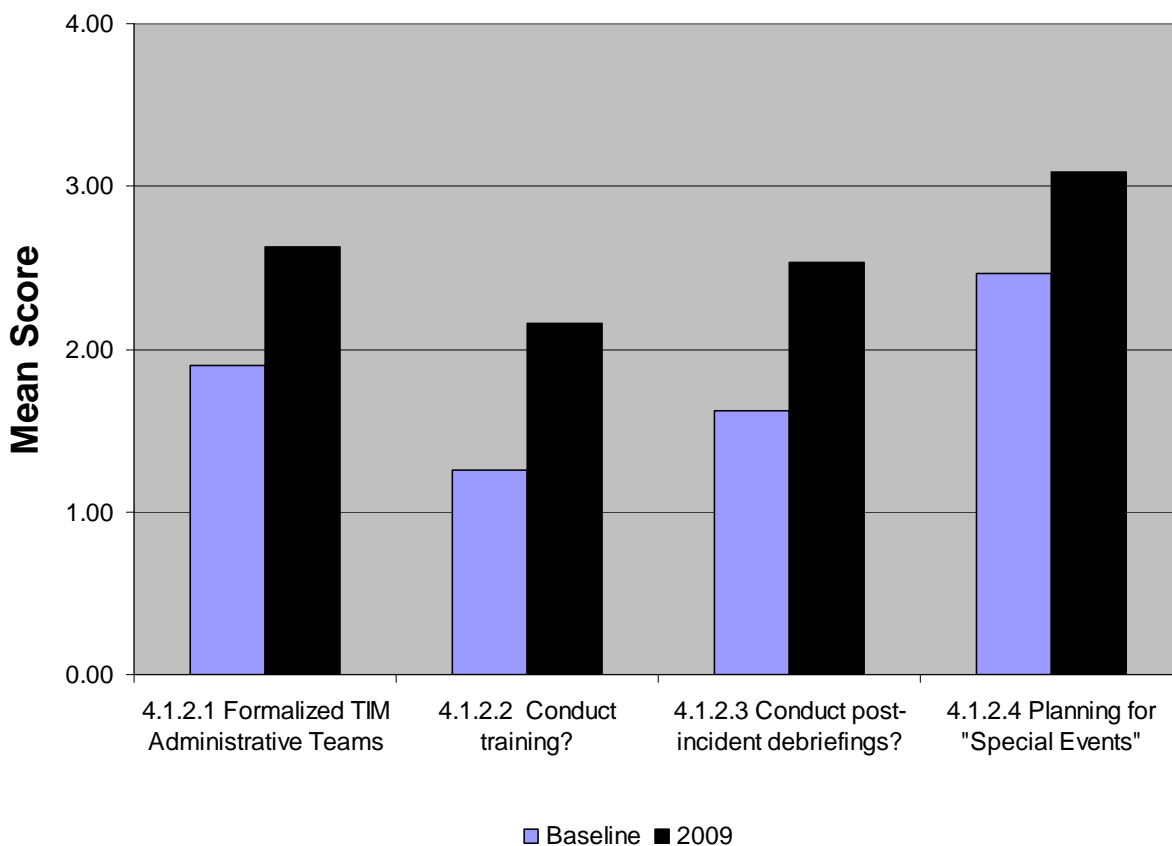
TIM Performance Measurement (4.1.3) scores continue to be the lowest in the TIM SA. None of the five questions in this subsection has yet to score above 2. However, the questions in this subsection also continue to achieve the greatest percentage increase over the Baseline (Figure 5). Of the two measures, multi-agency agreement on tracking Incident Clearance Time scored higher (1.70) than multi-agency agreement on tracking Roadway Clearance Time (1.63). The

third measure identified in the FHWA TIM PM FSI is tracking reductions in secondary incidents (4.1.3.5). The score of 1.03 for this question will serve as its Baseline as previous assessments have not queried the existence of this measure. The inability to link incidents to one another was cited in the comments as one reason for the low Baseline score. The issue of responder liability was also mentioned as a potential impediment to tracking secondary incidents.

The addition of the secondary incident question in 2009 and its low baseline score had an impact on the overall score for this subsection. Nonetheless, the mean score for TIM Performance Measurement (1.63) has more than doubled since the Baseline (0.80).

Figure 5.
Traffic Incident Management Performance Measurement
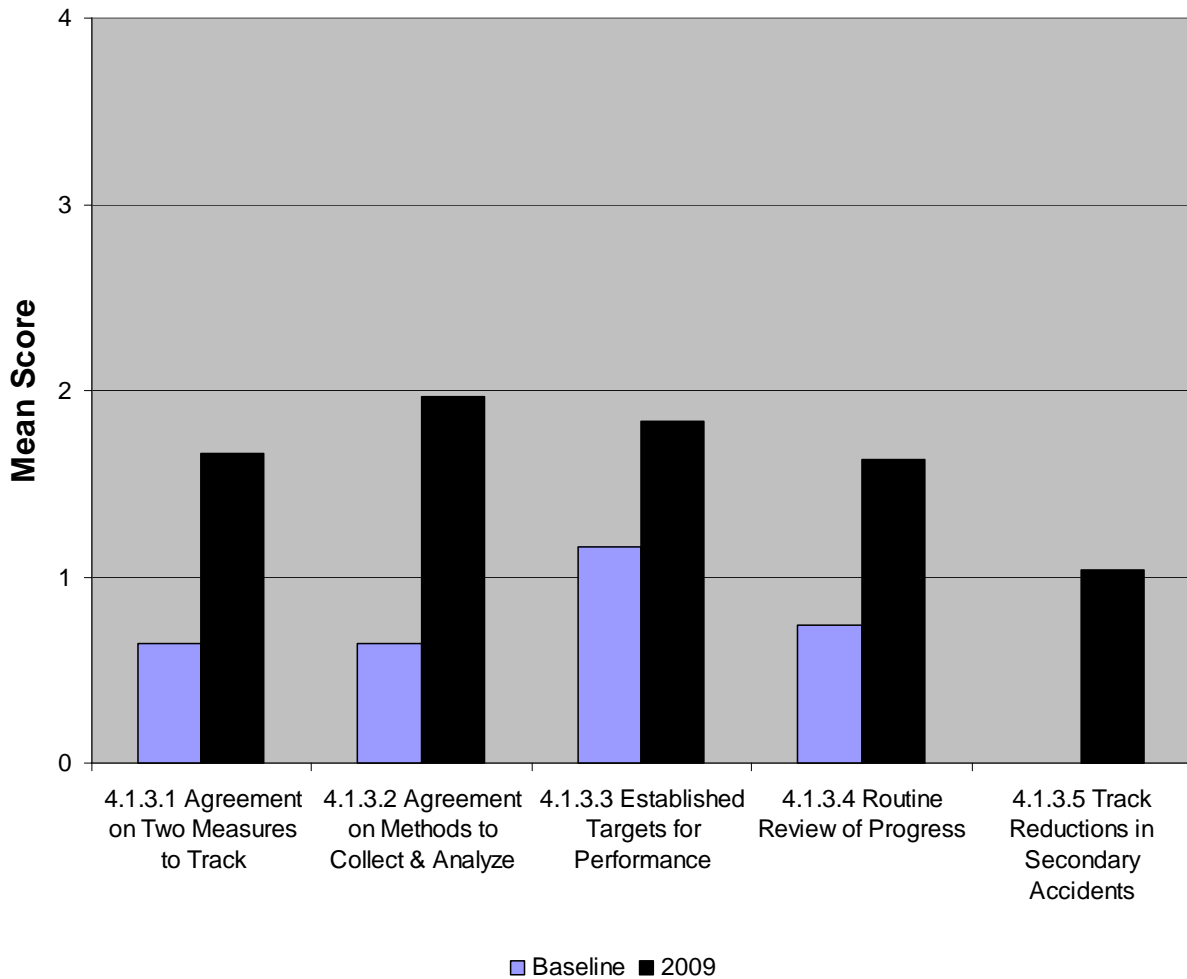
The TIM programs achieving the highest scores in Strategic program areas are listed alphabetically in Table 8.

Table 8.
Highest Scoring – Strategic

TIM Program
Jacksonville, Florida
Hampton Roads, Virginia
Orlando, Florida
St. Petersburg-Clearwater, Florida
Suburban DC (Virginia)
Tampa, Florida

Results – Tactical

Mean Score: 68.8% (27.5 of 40 points)

The questions in Tactical focus on operational or on-scene activities and policies. Prior to the TIM SA Revision, Tactical issues were grouped into three subsections, including one on Procedures for Major Incidents and another on Response and Clearance Policies and Procedures. Recognizing that NIMS and ICS do not make the distinction between incident response actions, policies or procedures based on incident severity level, incident response policies and procedures are now queried in one subsection. The third subsection, Responder and Motorist Safety, was retained in the TIM SA Revision.

As a group, the questions in Tactical continue to score the highest in the TIM SA, achieving a 68.8 percent in 2009, more than 19 percent over the Baseline (Table 9).

Table 9.
Tactical

Year	Mean Score
Baseline	57.6
2006	65.0
2007	66.0
2008	66.2
2009	68.8

Figure 6 shows the change from the Baseline for the two subsections in Tactical. Though the questions in Policies and Procedures (4.2.1) have the highest average score (2.89) of the two subsections, Responder and Motorist Safety (4.2.2) achieved a higher percentage (47.7) increase over the Baseline.

Figure 6.
Tactical
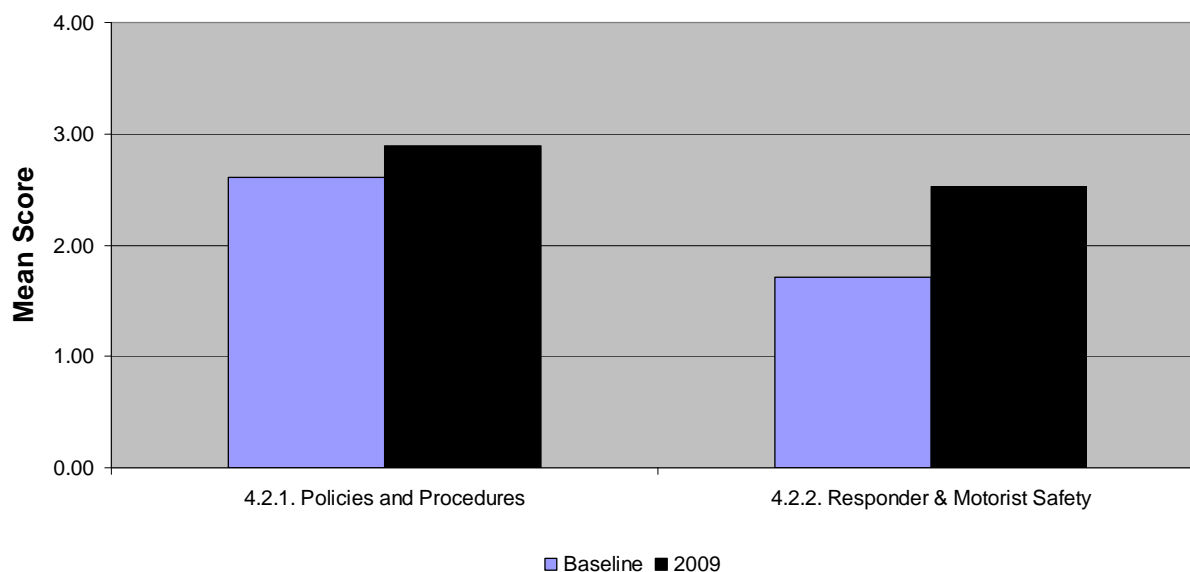
Prior to the TIM SA Revision, quick clearance laws and polices were queried in one question in the subsection on Response and Clearance Policies and Procedures. The comments appended to that question often indicated confusion on the part of respondents as to the question's intent; Move Over laws, which provide responder safety, were typically referenced rather than the quick clearance laws allowing driver removal or authority removal.

A total of four new questions were added to the Tactical section as part of the TIM SA Revision. Three of the new questions ask about specific safe, quick clearance (SQC) laws:

- Authority Removal (4.2.1.1);
- Driver Removal (4.2.1.2);
- Move Over (4.2.2.1).

By specifically asking which laws are in place in each responding location, the revised TIM SA eliminates confusion on the part of respondents and provides ongoing direction for FHWA's SQC Outreach and Education. Question 4.2.2.1 on Move Over laws received the highest mean score (3.20) in the 2009 TIM SA, indicating a high degree of success in promulgating Move Over laws. Therefore, the SQC Outreach and Education can instead focus on greater awareness of and compliance with Move Over laws rather than the rationale for Move Over legislation. In the case of authority removal and driver removal, the lower scores indicate a need for the outreach effort to highlight the rationale for deployment as well as awareness and compliance.

Table 10.
Comparison of Tactical between Baseline and 2009 Scores

Question Number	Question	Mean Score Range = 0 to 4		% of Assessments Scoring 3 or Higher		% Change in 2009 from Baseline Scores
		Baseline	2009	Baseline	2009	
4.2.1.1.	Have "authority removal" laws allowing pre-designated responders to remove disabled or wrecked vehicles and spilled cargo?	--	**2.92**	--	67%	--
4.2.1.2.	Have "driver removal" laws which require drivers involved in minor crashes (not involving injuries) to move vehicles out of the travel lanes?	--	**3.01**	--	71%	--
4.2.1.3.	Use a safety service patrol for incident and emergency response?	2.73	**3.10**	67%	83%	13.7%
4.2.1.4.	Utilize the Incident Command System?	2.55	**3.08**	58%	76%	20.8%
4.2.1.5	Have response equipment pre-staged for timely response?	2.21	**2.81**	41%	62%	27.3%
4.2.1.6	Identify and type resources so that a list of towing, recovery and hazardous materials response operators (including operator capabilities and special equipment) is available for incident response and clearance?	2.86	**3.08**	67%	74%	7.7%
4.2.1.6.a	a. Is that list organized so that resources are identified and deployed based on incident type and severity?	--	**2.64**	--	58%	--
4.2.1.7	Have specific policies and procedures for hazmat and fatal accident response that also address maintaining traffic flow around the incident?	2.71	**2.50**	62%	56%	-7.7%
4.2.2.1	Have "move over" laws which require drivers to slow down and if possible move over to the adjacent lane when approaching workers or responders and equipment in the roadway?	--	**3.20**	--	85%	--
4.2.2.2.	Train all responders in traffic control procedures?	1.97	**2.48**	28%	51%	25.7%
4.2.2.3.	Utilize transportation resources to conduct traffic control procedures in compliance with the MUTCD?	1.93	**2.72**	27%	57%	41.0%

Question Number	Question	Mean Score Range = 0 to 4		% of Assessments Scoring 3 or Higher		% Change in 2009 from Baseline Scores
		Baseline	2009	Baseline	2009	
4.2.2.4	Utilize traffic control procedures for the end of the incident traffic queue?	1.56	**2.28**	17%	49%	46.1%
4.2.2.5	Have mutually understood equipment staging and emergency lighting procedures on-site to maximize traffic flow past an incident while providing responder safety?	1.38	**1.95**	14%	33%	41.6%

The only question in the 2009 TIM SA to experience a lower mean score than its Baseline score was question 4.2.1.7 on specific policies and procedures for hazmat and fatal accident response (Figure 7). This continues a trend evident over the past several years of the TIM SA. Despite high scores in the identification and typing of resources for incident and hazardous materials response (4.2.1.6), the effective deployment of those resources through specific hazardous materials and fatal incident response policies and procedures is not as prevalent. Increased dissemination and use of FHWA's 2009 *Traffic Incident Management in Hazardous Materials Spills in Incident Clearance* primer containing specific best practices and procedures should result in increased scores for 4.2.1.7.[1]

With a mean score of 3.10, the use of safety service patrols for incident and emergency response (4.2.1.3), ranked second highest of all questions in the 2009 TIM SA. This reverses a trend noted in the 2008 National Analysis Report when nearly 10 percent of TIM SA respondents scored this question 0, indicating little, if any, progress toward the use of safety service patrols by those locations. This year, the percentage of TIM SA respondents scoring this question 0 is less than five percent.

The use of safety service patrols for incident response has numerous benefits including:

- Expedited response and clearance by operators trained in incident response, clearance and traffic control;
- Improved resource utilization as first responders are freed to focus on more traditional activities for which they are uniquely trained (law enforcement, fire/rescue, etc.).

The comments submitted with this question indicate that safety service patrols are generally operating during peak travel times only and are not yet operating 24/7. These service patrols would meet the definition of Baseline or Mid-Level Service Patrols, as described in FHWA's 2008 *Service Patrol Handbook.*[2] The move to Full-Function Service Patrols (FFSP) is a key metric for FHWA and one that can be tracked through subsequent year TIM SA scores for

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[1] U.S. Department of Transportation, Federal Highway Administration. *Traffic Incident Management in Hazardous Materials Spills in Incident Clearance.* January, 2009. http://www.ops.fhwa.dot.gov/publications/fhwahop08058/default.htm
[2] U.S. Department of Transportation, Federal Highway Administration. *Service Patrol Handbook.* November, 2008. http://www.ops.fhwa.dot.gov/publications/fhwahop08031/ffsp_handbook.pdf.

question 4.2.1.3. The *Service Patrol Handbook* provides guidance on migrating service patrols to full-function. Additionally, FHWA's SQC Outreach and Education will populate the messages and outreach materials necessary to convince decision-makers to dedicate resources to FFSP deployment.

Figure 7.
Policies and Procedures
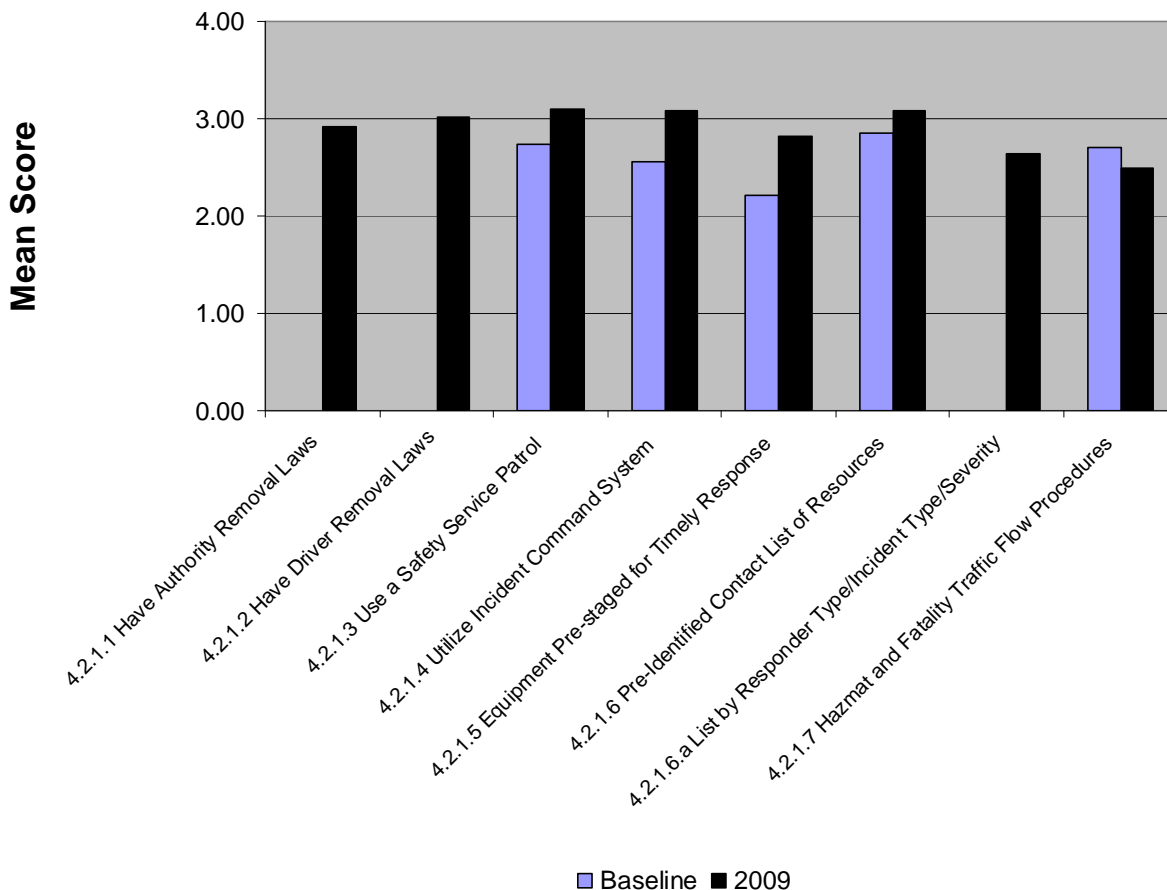
Figure 8 shows the increases in scores from the Baseline for the five questions in Responder and Motorist Safety. The question on Move Over laws (4.2.2.1) is new in 2009 and therefore does not have a Baseline score. The comments appended to the question on Move Over laws do point to a need for increased awareness of the laws where Move Over laws already exist. Specifically, there is a need for increased outreach and education to the driving public to ensure that motorists do move over when they can safely do so and if not, that they at least slow down when driving through an incident scene to protect those working the scene. However, the comments indicate that in one state the Move Over law is in direct conflict with the instructions given new drivers in the state's driver handbook, which notes that drivers are not to slow down when approaching an incident scene but rather to keep driving through the scene (presumably to prevent "rubbernecking" effects).

Figure 8.
Responder and Motorist Safety

| Baseline | 2009 |
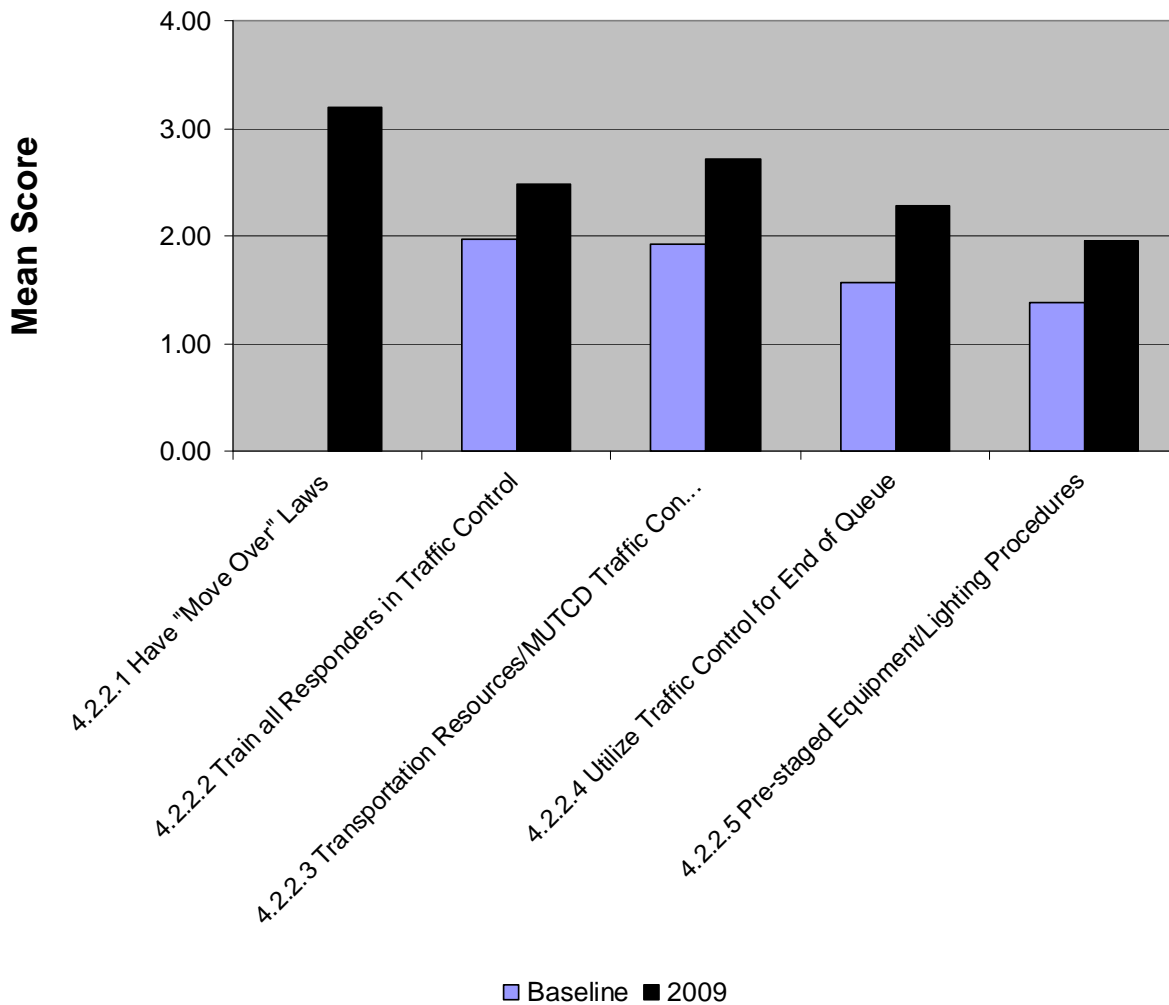
Safely moving traffic past an incident scene is key to protecting the safety of responders and motorists. Traffic control is the subject of the remaining four questions in this subsection. Question 4.2.2.2 asks about training responders in traffic control procedures. With a mean score of 2.48, just over half (51 percent) of the TIM SA respondents scored this question 3 or higher. The comments indicate that training, when conducted, is done by individual agencies and not coordinated across agencies. In some cases, the training provided is nothing more than on-the-job experience, creating increased risks for responders and motorists alike.

The use of MUTCD-compliant traffic control procedures (4.2.2.3) received a mean score of 2.72, representing a 41 percent increase over Baseline. However, the comments point to greater adherence by transportation responders than by other agency responders. This is an area where additional multi-agency training (like the SHRP II TIM Responder Training) may fill a void.

The TIM programs achieving the highest scores in Tactical program areas are listed alphabetically in Table 11.

Table 11.
Highest Scoring – Tactical

TIM Program
Hampton Roads, Virginia
Knoxville, Tennessee
Louisville, Kentucky
Orlando, Florida
Suburban DC (Virginia)

Results – Support

Mean Score: 59.0% (17.7 of 30 points)

The questions in Support focus on the tools and technologies enabling improved incident detection, response and clearance. The 2009 TIM SA groups the questions into the following subsections:

- **Data Collection/Integration/Sharing:** These questions focus on how responders and support personnel (TMCs/TOCs) use transportation management systems (TMS) to collect, integrate and exchange incident information.
- **Traveler Information:** These questions focus on providing motorists with accurate and timely incident information to influence traveler behavior.

Previously, the TIM SA had three subsections in Support: Integrated Interagency Communications; Transportation Management Systems; and Traveler Information. The first two were combined in the 2008 TIM SA Revision to reflect the increasing interdependence between interagency communications and the technologies to support those communications.

The questions in Support collectively continue to experience the largest increase over the Baseline, up 42.8 percent (Table 12). In the 2008 National Analysis Report it was noted that scores in this section would likely level off or possibly decline due to the significant resource needs of these technologies coupled with dwindling state budgets. In 2009, the overall average scores for this group of questions did decline slightly from 59.4 to 59.0. When the six first-time TIM SA locations are removed from the analysis, the decline is even more pronounced. For the 80 re-assessments in 2009, the overall Support score declined to 57.7.

Table 12.
Support

Year	Mean Score
Baseline	41.3
2006	57.1
2007	57.5
2008	59.4
2009	59.0

Figure 9 shows that of the two subsections, Traveler Information (4.3.2) had the higher score (2.52) and experienced the highest increase over Baseline (74.2 percent).

Figure 9.
Support
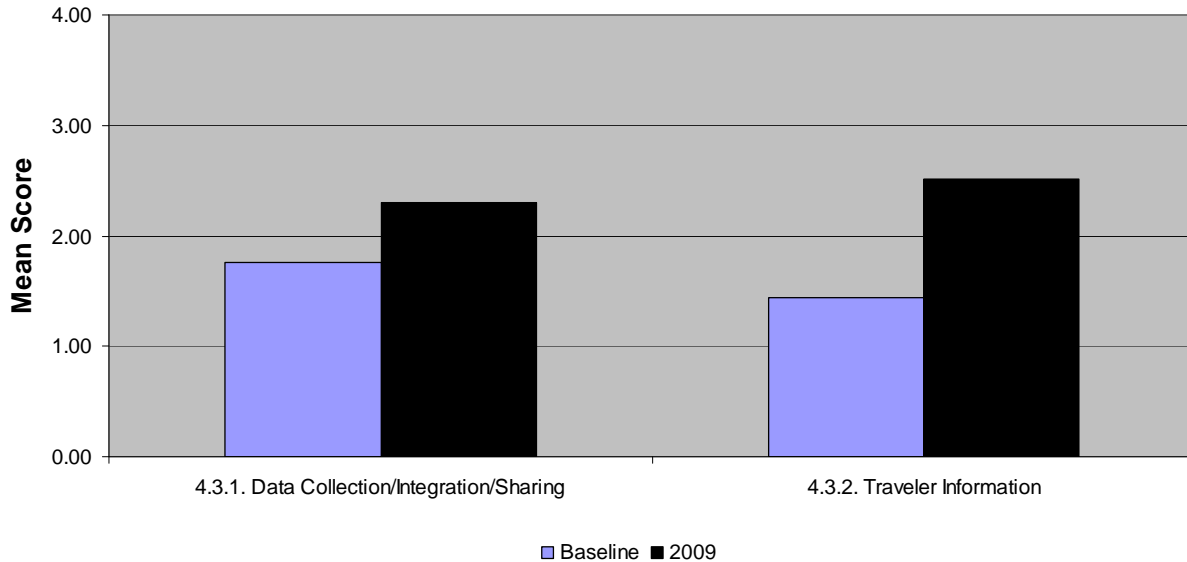
Each of the questions in Support is listed in Table 13, with the Baseline mean score, the 2009 mean score, the percentage change and the percentage of assessments scoring each question 3 or higher. There is one new Support question (4.3.1.2) in 2009, which asks if public safety is co-located with transportation in the Traffic Management Center/Traffic Operations Center (TMC/TOC). As with all new questions in the 2009 TIM SA, there is no baseline score for this question. The 2009 average score 1.88 will be used as the Baseline score in subsequent TIM SA analyses.

Table 13.
Comparison of Support between Baseline and 2009

Question Number	Question	Mean Score		% of Assessments Scoring 3 or Higher		% Change in 2009 from Baseline Scores
		Baseline	2009	Baseline	2009	
4.3.1.1.	Does the TIM program use a Traffic Management Center/Traffic Operations Center (TMC/TOC) to coordinate incident detection, notification and response?	1.98	**3.05**	41%	72%	53.9%

Question Number	Question	Mean Score		% of Assessments Scoring 3 or Higher		% Change in 2009 from Baseline Scores
		Baseline	2009	Baseline	2009	
4.3.1.2.	Is public safety co-located with transportation in the TMC/TOC?	--	**1.88**	--	41%	--
4.3.1.3	Has the TIM program achieved TMC-CAD integration so that incident data and video information is transferred between agencies and applications?	1.43	**2.16**	10%	43%	51.2%
4.3.1.4	Does the TIM program have specific policies and procedures for traffic management during incident response (i.e. signal timing changes, opening/closing of HOV lanes/ramp metering)?	1.55	**2.02**	18%	29%	30.5%
4.3.1.5	Does the TIM program provide for interoperable, interagency communications on-site between incident responders?	1.61	**2.36**	17%	47%	46.6%
4.3.2.1.	Have a real-time motorist information system providing incident-specific information? a. Traveler information delivered via 511? b. Traveler information delivered via website? c. Traveler information delivered through traffic media access to TMC/TOC data/information?	1.90	**2.91**	27%	78%	53.0%
4.3.2.2.	Are motorists provided with travel time estimates for route segments?	0.99	**2.13**	12%	42%	114.9%

In the Data subsection, the highest scoring question is 4.3.1.1 on the use of a TMC/TOC to coordinate incident detection, notification and response. The average score in 2009 is 3.05 and nearly three-quarters (72 percent) of respondents scored this question 3 or higher. Additionally, the score represents a 53.9 percent increase over the Baseline.

However, lower scores throughout this section indicate that the potential of TMCs/TOCs is not yet being fully realized (Figure 10). Of the locations scoring the TMC/TOC question 3 or higher, over a third (37 percent) do not yet have public safety co-located in the center. This co-location of transportation and public safety resources is a key indicator of success in data sharing and improved incident response. Another key indicator of success, TMC-CAD integration (4.3.1.3) is also lagging behind. Of the locations scoring the TMC/TOC question 3 or higher, nearly 13 percent do not yet have TMC-CAD integration.

Figure 10.
Data Collection/Integration/Sharing
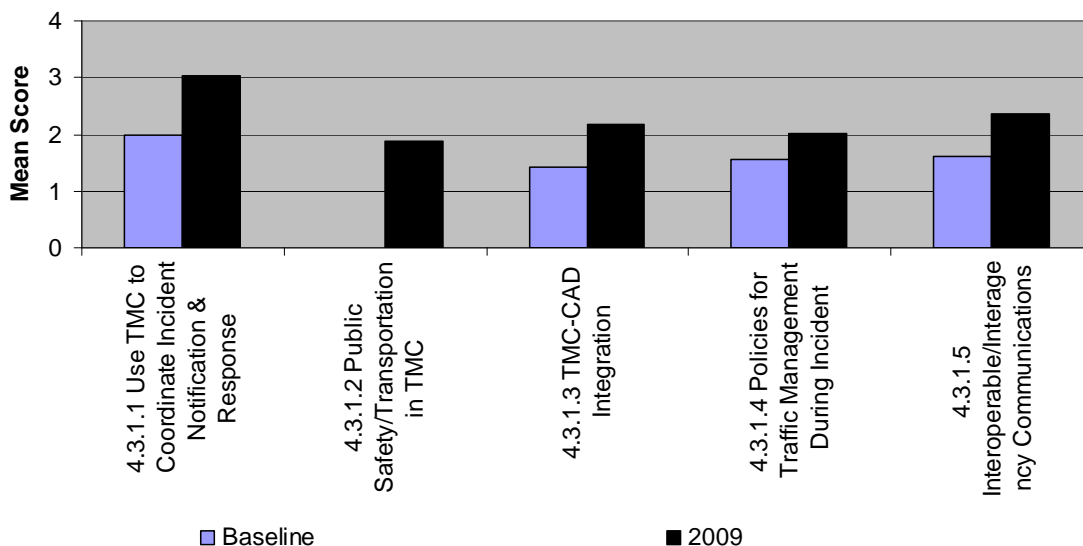
Figure 11 below shows the changes in scores from the Baseline for the two questions in Traveler Information (4.3.2). The average score for question 4.3.2.1 is a composite score of three sub-questions regarding traveler information delivered via 511 (4.3.2.1.a), traveler information website (4.3.2.1.b) or through traffic media access to TMC/TOC data/information (4.3.2.1.c). Of the three types, 511 is the least utilized; 27.9 percent indicate little to no activity in 511 deployment/utilization.

The provision of travel time estimates to motorists (4.3.2.2) achieved one of the highest percentage increases in 2009 from the Baseline (114.9 percent). However, the mean score still remains in the lower range (2.13) and 36 percent of the TIM SA respondents indicated little to no activity in this area. Where travel time estimates are being provided to motorists, changeable message signs (CMS)/dynamic message signs (DMS) are the primary means for delivering that information based on the comments.

Figure 11.
Traveler Information
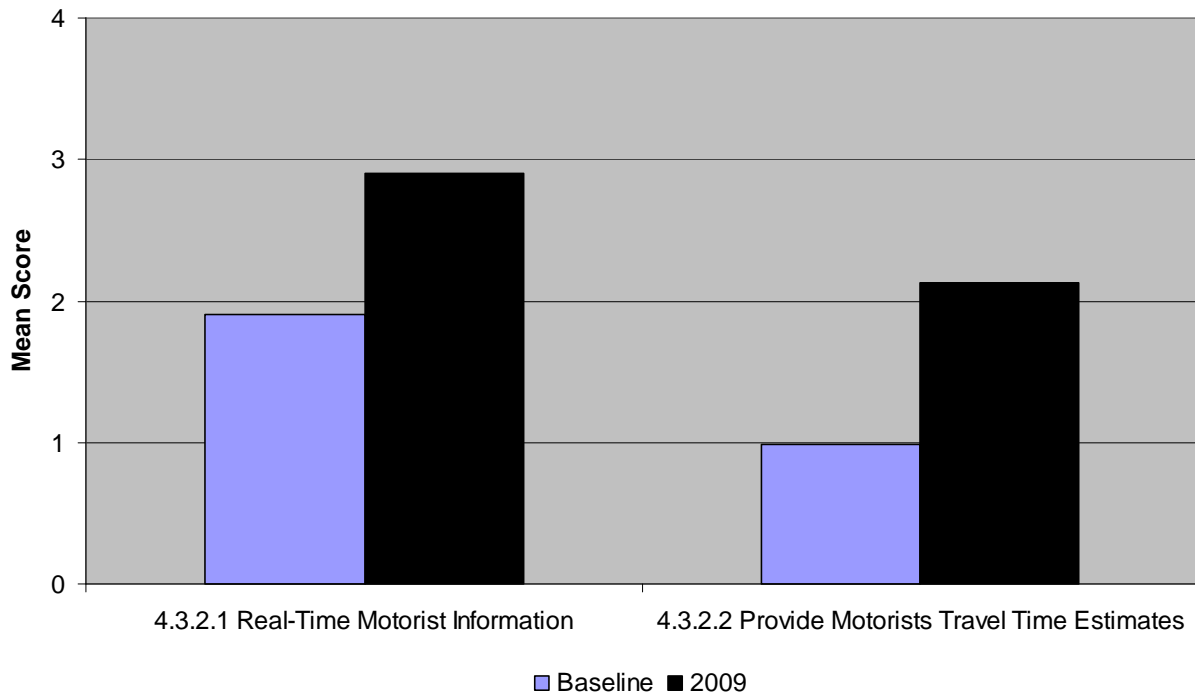
The TIM programs achieving the highest scores in Support program areas are listed alphabetically in Table 14.

Table 14.
Highest Scoring – Support

TIM Program
Cincinnati, Ohio
Jacksonville, Florida
Oregon (Statewide)
Orlando, Florida
St. Petersburg-Clearwater, Florida
Tampa, Florida

Opportunities for FHWA

A primary objective of the TIM SA is to identify those program areas where resources can be deployed to address TIM program gaps, both at the local level and nationally. First and foremost in the gap analysis is a review of the questions achieving the lowest mean scores. However, additional opportunities for FHWA are apparent in a review of program areas achieving little change in mean score from year to year and in those where the mean score may be declining.

TIM Performance Measures
Four of the five questions achieving the lowest mean scores in 2009 are in TIM Performance Measurement. The lowest score overall was achieved in secondary incident tracking (4.1.3.5). The lack of technical capabilities to link incidents was cited as one of the primary drivers for the lower scores. The lack of a consistent definition of "secondary incident" and the liability concerns that arise from quantification of secondary incidents are also cited as challenges in the ability to track performance in this area.

FHWA has already accomplished much in the area of TIM Performance Measurement. The TIM PM Focus States Initiative led to the identification of the two consensus measures queried in the post-revision TIM SA; incident clearance time and roadway clearance time. The TIM PM FSI also resulted in the tracking of secondary incident performance as a third metric.

The planned launch of the TIM PM Knowledge Management System (KMS) later this year should facilitate greater awareness of TIM PM and how it is accomplished. FHWA should capitalize on the TIM PM KMS and its Listserv function to further disseminate TIM PM best practices and technical guidance. The TIM PM KMS may also facilitate consensus building on secondary incident definitions.

Safety Service Patrols
The use of safety service patrols received one of the highest scores in the 2009 TIM SA, reversing a trend noted in the 2008 National Analysis Report. While the majority of TIM SA respondents indicate use of (or progress toward the use of) safety service patrols, limitations on the functionality of those patrols continue. Based on the comments submitted, resources are not available to migrate the service patrols to full-function. FHWA should utilize the SQC Outreach and Education initiative to build greater understanding among decision-makers of the critical role of FFSP and of the quantifiable return-on-investment provided by FFSP.

HAZMAT Response Policies and Procedures
The 2008 National Analysis Report recommended dissemination of HAZMAT response best practices as a means for increasing the scores on question 4.2.1.7. FHWA has since released its primer on TIM in Hazardous Materials Spills[3] and should focus now on increased dissemination of the primer. Additionally, this topic would be appropriate for an educational webinar hosted by FHWA and potentially coordinated through the NTIMC.

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[3] U.S. Department of Transportation, Federal Highway Administration. *Traffic Incident Management in Hazardous Materials Spills in Incident Clearance.* January, 2009.
http://www.ops.fhwa.dot.gov/publications/fhwahop08058/default.htm

Leveraging Other Programs

There are a number of concurrent efforts underway that can and should be leveraged to improve TIM performance, and therefore, increase TIM SA scores.

National Traffic Incident Management Coalition

The NTIMC, representing the broad range of TIM stakeholders, should be utilized to build greater awareness of the TIM SA and to actively engage in the development and dissemination of outreach, education and training to address issues identified in the gap analysis. As noted above, the NTIMC can partner with FHWA in a webinar focused on HAZMAT response best practices.

Similarly, the NTIMC membership should be engaged in the development and vetting of outreach messages on safety service patrols. As has been done previously with FHWA products like the TIM Handbook, NTIMC members can review and provide comment on products coming out of the SQC Outreach initiative.

NCHRP 20-7 (282) Research Needs Assessment for Roadside Worker and Vehicle Visibility

This research initiative, to launch in late 2009, is designed to develop a comprehensive, multiyear research program roadmap to improve visibility and conspicuity within work zones and at incident scenes; improve highway user response to the presence of first responder and roadway personnel and vehicles; and contribute to more effective multidisciplinary solutions for responder safety in keeping with the goals of the TIM National Unified Goal (NUG). The first task will be a gap analysis of existing research in this area. The TIM SA results will be reviewed as part of that gap analysis.

The research program roadmap developed will include collection and dissemination of best practices for improving responder and motorist safety. This will include best practices targeting incident scene traffic control procedures (questions 4.2.2.2 – 4.2.2.5).

Traffic Incident Management Responder Training

Several new TIM responder training courses are under development which could be leveraged for improving TIM program performance and subsequently TIM SA scores. The Strategic Highway Research Program (SHRP II) Traffic Incident Responder Training will be ready for deployment in 2010. Likewise, the I-95 Corridor Coalition is finalizing a three-dimensional, multi-player computer gaming simulation technology to train incident responders on best practices. These training efforts can be utilized to improve the knowledgebase and performance in specific TIM program areas where the TIM SA identifies a need through lower and/or decreasing scores. Additionally, as a result of both training initiatives focusing on the National Unified Goal objectives of safe, quick clearance, responder safety and prompt, reliable, interoperable communications, increased deployment of the training should raise scores on Question 4.1.2.2 on NUG training.

What to Expect in 2010

The 2010 TIM SA process will include several improvements resulting from the use of the online portal. Participants in the 2009 TIM SA were sent a summary report of their responses to each question, allowing for review and revision prior to the start of the analysis. When the 2010 TIM SA is initiated, the 2009 summary reports will be resent as a reference to the TIM SA point of contact (POC) for each location. Knowing how each question was scored previously, along with reviewing any comments submitted the year prior should allow for more objective evaluation of progress year over year.

Additionally, upon completion of the 2010 online TIM SA, participants will be sent a 2010 summary report to review and provide any revisions or additional comments prior to the 2010 analysis.

Based on feedback from the 2009 TIM SA training webinars and to more closely align the TIM SA questions with the actual performance measures being tracked by FHWA and the states, a review of the questions will be conducted prior to the 2010 TIM SA launch. It is probable that this review will result in minor revisions to the TIM SA questions, though the overall structure of the TIM SA will not change.

Summary

A total of 86 TIM SA were completed in 2009, with an average overall score of 60.6 percent (out of a possible 100 percent). Overall scores are up 31.9 percent over the Baseline scores. The highest scores were achieved in Operational Issues (68.8 percent) and the largest percentage increase in scores from the Baseline was in Support (42.8 percent).

Tables 15 and 16 show the highest and lowest mean scores, respectively. Both sets of questions, along with the largest change in mean score (Table 17) and smallest change in mean score (Table 18) present both challenges and opportunities for FHWA. Specifically, the 2009 TIM SA scores highlight a need for additional guidance in the following areas:

- Safety Service Patrols
- Hazardous Materials Response Policies and Procedures
- TMC-CAD Integration

The 2009 TIM SA is the first to identify top performing locations in each of the three program areas in order to facilitate peer-to-peer networking among all TIM SA respondents. Other opportunities for advancing TIM program success and improving TIM SA scores are available through the NTIMC, the TIM Responder Training in development as part of the Strategic Highway Research Program (SHRP II) and the upcoming NCHRP 20-7 (282) Research Needs Assessment for Roadside Worker and Vehicle Visibility.

Additionally, FHWA programs and publications which target specific issue areas in the TIM SA should be leveraged, including:

- TIM Performance Measures Knowledge Management System and Listserv

- Safe, Quick Clearance Outreach and Education
- *Traffic Incident Management Quick Clearance Laws: A National Review of Best Practices*
- Safe, Quick Clearance Primer Series
    - *Traffic Incident Management in Hazardous Materials Spills in Incident Clearance*
    - *Traffic Control Concepts for Incident Clearance*
- Service Patrol Handbook

Table 15.
Highest Mean Score (2009)

Mean Score Rank in 2009/ Baseline	Question Number	Question	2009 Mean Score (n=86)	% Scoring 3 or Higher (2009)	% Change in 2009/ Baseline Mean Scores
1/--	4.2.2.1 Tactical	Have "move over" laws which require drivers to slow down and if possible move over to the adjacent lane when approaching workers or responders and equipment in the roadway?	**3.20**	85%	--
2/2	4.2.1.3 Tactical	Use a safety service patrol for incident and emergency response?	**3.10**	83%	13.7%
3/5	4.1.2.4 Strategic	Conduct planning for special events?	**3.09**	88%	25.0%
4/4	4.2.1.4 Tactical	Utilize the Incident Command System?	**3.08**	76%	20.8%
4/1	4.2.1.6 Tactical	Identify and type resources so that a list of towing, recovery and hazardous materials response operators (including operator capabilities and special equipment) is available for incident response and clearance?	**3.08**	74%	7.7%

Table 16.
Lowest Mean Score (2009)

Mean Score Rank in 2009/ Baseline	Question Number	Question	2009 Mean Score (n=86)	% Scoring 3 or Higher (2009)	% Change in 2009/ Baseline Mean Scores
31/--	4.1.3.5 Strategic	Track performance in reducing secondary incidents?	**1.03**	8%	--
30/23	4.1.3.4 Strategic	Routinely review whether progress is made in achieving the targets?	**1.63**	26%	120.0%
29/24	4.1.3.1 Strategic	Have multi-agency agreement on the two performance measures being tracked (roadway clearance time and incident clearance time)?	**1.66**	26%	159.8%
28/19	4.1.1.2 Strategic	Is there a process in place to ensure the continuity of these agreements / memoranda of understanding through integrated planning and budgeting across and among participating agencies?	**1.79**	28%	32.6%
27/21	4.1.3.3 Strategic	Have targets (i.e. time goals) for performance of the two measures?	**1.84**	33%	58.4%

Table 17.
Largest Changes in Mean Score (2009 from Baseline)

Mean Score Rank in 2009/ Baseline	Question Number	Question	2009 Mean Score (n=86)	% Scoring 3 or Higher (2009)	% Change in 2009 Mean Scores from Baseline
24/24	4.1.3.2 Strategic	Has the TIM program established methods to collect and analyze the data necessary to measure performance in reduced roadway clearance time and reduced incident clearance time?	1.97	33%	207.0%
29/24	4.1.3.1 Strategic	Have multi-agency agreement on the two performance measures being tracked?	1.66	26%	159.8%
30/23	4.1.3.4 Strategic	Routinely review whether progress is made in achieving the targets?	1.63	26%	120.0%
22/22	4.3.2.2 Support	Are motorists provided with travel time estimates for route segments?	2.13	42%	114.9%
20/20	4.1.2.2 Strategic	Conduct training? • NIMS training? • Training on the NTIMC National Unified Goal? • Other training?	2.16	49%	71.7%

Table 18.
Smallest Changes in Mean Score (2009 from Baseline)

Mean Score Rank in 2009/ Baseline	Question Number	Question	2009 Mean Score (n=86)	% Scoring 3 or Higher (2009)	% Change in 2009 Mean Scores from Baseline
15/3	4.2.1.7 Tactical	Have specific policies and procedures for hazmat and fatal accident response that also address maintaining traffic flow around the incident?	2.50	56%	-7.7%
4/1	4.2.1.6 Tactical	Identify and type resources so that a list of towing, recovery and hazardous materials response operators (including operator capabilities and special equipment) is available for incident response and clearance?	3.08	74%	7.7%
2/2	4.2.1.3 Tactical	Use a safety service patrol for incident and emergency response?	3.10	83%	13.7%

Table 19 shows the urban areas completing the TIM SA each year since the Baseline assessments in 2003 and 2004.

Table 19.
Traffic Incident Management Self Assessments

Legend: ■ Baseline   ▨ Re-Assessment   ▤ New Assessment

State – Urban Area	2003	2004	2005	2006	2007	2008	2009
AK (Statewide)					New	Re	
AL – Birmingham	Baseline	Re		Re	Re	Re	Re (RA)
AR – Little Rock	Baseline	Re		Re	Re	Re	Re
AZ – Phoenix	Baseline		Re		Re	Re	Re
AZ – Tucson	Baseline		Re	Re	Re	Re	Re
CA – Bakersfield-Fresno		Baseline					Re
CA – Los Angeles	Baseline						Re
CA – Orange County							Re (NA)
CA – Sacramento	Baseline						Re
CA – San Bernardino-Riverside							Re (NA)
CA – San Diego	Baseline			Re			Re
CA – San Francisco	Baseline					Re	Re
CO – Denver	Baseline	Re		Re	Re	Re	Re
CT – Hartford	Baseline		Re	Re	Re	Re	Re
DC – Washington	Baseline	Re		Re	Re	Re	Re
FL – Ft. Lauderdale	Baseline		Re	Re			Re
FL – Miami-Dade	Baseline		Re	Re		Re	Re
FL – Jacksonville	Baseline		Re	Re		Re	Re
FL – Orlando	Baseline	Re			Re	Re	Re
FL – Sarasota-Bradenton		Baseline					Re
FL – St. Petersburg-Clearwater	Baseline		Re	Re			Re
FL – Tampa-Hillsborough	Baseline	Re		Re			Re
FL – West Palm Beach	Baseline		Re	Re			Re
GA – Atlanta	Baseline		Re	Re		Re	Re
HI (Statewide)	Baseline	Re		Re	Re		Re
IL – Chicago	Baseline	Re		Re	Re	Re	Re
IN – Indianapolis	Baseline		Re	Re	Re	Re	Re
KY – Lexington					New	Re	Re

State – Urban Area	2003	2004	2005	2006	2007	2008	2009
KY – Louisville							
LA – Baton Rouge							
LA – New Orleans							
MD – Baltimore							
MD – Suburban Wash DC							
MA – Boston							
MA – Springfield							
ME – I-95 Corridor							
MI – Detroit							
MI – Grand Rapids							
MN (Statewide)							NA
MO – Kansas City							
MO – St. Louis							
MS (Statewide)							
NE – Omaha							
NJ (Statewide)							NA
NV – Las Vegas							
NM – Albuquerque							
NY – Albany							
NY – Buffalo							
NY – New York							
NY – New York-North NJ							
NY – Rochester							
NY – Syracuse							
NC – Charlotte							
NC – Greensboro-WS-HP							
NC – Raleigh-Durham							
OH – Cincinnati							
OH – Cleveland							
OH – Columbus							
OH – Dayton							
OH – Toledo							
OH – Youngstown							

State – Urban Area	2003	2004	2005	2006	2007	2008	2009
OK – Oklahoma City							
OK – Tulsa							
OR – Portland							
PA – Allentown-Bethlehem							
PA – Harrisburg							
PA – Philadelphia							
PA – Pittsburgh							
PA – South New Jersey							
PA – Wilkes Barre-Scranton							
PR – San Juan							
RI – Providence							
SC (Statewide)							NA
SC – Greenville-Spartanburg							
SD (Statewide)							
TN – Chattanooga							
TN – Knoxville							
TN – Memphis							
TN – Nashville							
TX – Austin							
TX – Dallas-Ft. Worth							
TX – El Paso							
TX – McAllen (Pharr Dist)							
TX – Houston							
TX – San Antonio							
UT – Salt Lake City							
VA – Norfolk-Virginia Beach							
VA – No. VA-Sub. Wash DC							
VA – Richmond							
WA – Seattle							
WI – Milwaukee							
WV (Statewide)							NA
WY (Statewide)							

Appendix A. Question to Question Map

2008 Questions (Pre-Revision)	Located in 2009	2009 Questions (Post-Revision)
4.1 Program and Institutional Issues		4.1 Strategic
4.1.1 Formal Traffic Incident Management Programs		4.1.1 Formal Traffic Incident Management Programs
4.1.1.1. Have multi-agency, multi-year strategic plans detailing specific programmatic activities to be accomplished with appropriate budget and personnel needs identified?	4.1.1.2	4.1.1.1 Is the TIM program supported by multi-agency agreements/ memoranda of understanding detailing resource sharing (facilities, services, personnel and budget)?
4.1.1.2. Have formal inter-agency agreements on operational and administrative procedures and policies?	4.1.1.1	4.1.1.2. Is there a process in place to ensure the continuity of these agreements/memoranda of understanding through integrated planning and budgeting across and among participating agencies?
4.1.1.3. Have field-level input into the plans ensuring that the plans will be workable by those responsible for their implementation?	not in 2009	
4.1.2 TIM Administrative Teams		4.1.2 Multi-Agency TIM Teams
4.1.2.1. Have formalized TIM multi-agency administrative teams to meet and discuss administrative policy issues?	4.1.2.1	4.1.2.1. Have a formalized TIM multi-agency team which meets regularly to discuss and plan for TIM activities?
4.1.2.2. Hold regular meetings of the TIM administrative team?	not in 2009	
4.1.2.3. Conduct training through simulation or "in-field" exercises?	4.1.2.2	4.1.2.2. Conduct training? *(Composite score for 4.1.2.2.a thru 4.1.2.2.c below)*
4.1.2.4. Conduct multi-agency post-incident debriefings?	4.1.2.3	4.1.2.2.a. NIMS training?
4.1.2.5. Conduct planning for "special events": *(Composite score for 4.1.2.5.a thru 4.1.2.5.d below)*	4.1.2.4	4.1.2.2.b. Training on the NTIMC National Unified Goal?
4.1.2.5.a. Construction and maintenance?	4.1.2.4a	4.1.2.2.c. Other training?
4.1.2.5.b. Sporting events, concerts, conventions, etc.?	4.1.2.4b	4.1.2.3 Conduct post-incident debriefings?
4.1.2.5.c. Weather-related events?	4.1.2.4c	4.1.2.4 Conduct planning for special events? *(Composite score for 4.1.2.4.a thru 4.1.2.4.d below)*
4.1.2.5.d. Catastrophic events?	4.1.2.4d	4.1.2.4.a. Construction and maintenance?
		4.1.2.4.b. Sporting events, concerts, conventions, etc?
		4.1.2.4.c. Weather-related events?

2008 Questions (Pre-Revision)	Located in 2009	2009 Questions (Post-Revision)
		4.1.2.4.d. Catastrophic events?
4.1.3. Performance Measurement		4.1.3. TIM Performance Measures
4.1.3.1. Have multi-agency agreements on what measures will be tracked and used to measure program performance?	4.1.3.1	4.1.3.1. Have multi-agency agreement on the two performance measures being tracked? *(Composite score for 4.1.3.1.a and 4.1.3.1.b below)*
4.1.3.2. Have agreed upon methods to collect and analyze/track performance measures?	4.1.3.2	4.1.3.1.a. Roadway Clearance Time?
4.1.3.3. Have established targets for performance? *(Composite score for 4.1.3.3.a and 4.1.3.3.b below)*	4.1.3.3	4.1.3.1.b. Incident Clearance Time?
4.1.3.3.a. Response?	4.1.3.3	4.1.3.2. Has the TIM program established methods to collect and analyze the data necessary to measure performance in reduced roadway clearance time and reduced incident clearance time?
4.1.3.3.b. Clearance?	4.1.3.3	4.1.3.3. Have targets (i.e. time goals) for performance of the two measures?
4.1.3.4. Conduct periodic review of whether or not progress is being made to achieve targets?	4.1.3.4	4.1.3.4. Routinely review whether progress is made in achieving the targets?
		4.1.3.5 Track performance in reducing secondary incidents?
4.2 Operational Issues		4.2 Tactical
4.2.1. Procedures for Major Incidents		4.2.1. Policies and Procedures for Incident Response and Clearance
4.2.1.1. Have established criteria for what is a "major incident" – incident levels or codes?	not in 2009	4.2.1.1. Have "authority removal" laws allowing pre-designated responders to remove disabled or wrecked vehicles and spilled cargo?
4.2.1.2. Identify high ranking agency members available on 24/7 basis to respond to a major incident (Major Incident Response Team)?	not in 2009	4.2.1.2. Have "driver removal" laws which require drivers involved in minor crashes (not involving injuries) to move vehicles out of the travel lanes?
4.2.1.3. Have a pre-identified (approved) contact list of resources (including special equipment) for incident clearance and hazardous materials response?	4.2.1.6 and 4.2.1.6a	4.2.1.3. Use a motorist assist service patrol?
4.2.1.4. Have the response equipment pre-staged for timely response?	4.2.1.5	4.2.1.4. Utilize the Incident Command System?
		4.2.1.5. Have response equipment pre-staged for timely response?
		4.2.1.6. Identify and type resources so that a list of towing, recovery and

2008 Questions (Pre-Revision)	Located in 2009	2009 Questions (Post-Revision)
		hazardous materials response operators (including operator capabilities and special equipment) is available for incident response and clearance?
		4.2.1.6.a. Is that list organized so that resources are identified and deployed based on incident type and severity?
		4.2.1.7. Have specific policies and procedures for hazmat and fatal accident response that also address maintaining traffic flow around the incident?
4.2.2. Responder and Motorist Safety		4.2.2. Responder and Motorist Safety
4.2.2.1. Train all responders in traffic control procedures?	4.2.2.2	4.2.2.1. Have "move over" laws which require drivers to slow down and if possible move over to the adjacent lane when approaching workers or responders and equipment in the roadway?
4.2.2.2. Utilize on-scene traffic control procedures for various levels of incidents in compliance with MUTCD?	4.2.2.3	4.2.2.2. Train all responders in traffic control procedures?
4.2.2.3. Utilize traffic control procedures for the end of the incident traffic queue?	4.2.2.4	4.2.2.3. Utilize transportation resources to conduct traffic control procedures in compliance with the MUTCD?
4.2.2.4. Have mutually understood equipment staging and emergency lighting procedures on-site to maximize traffic flow past an incident while providing responder safety?	4.2.2.5	4.2.2.4. Utilize traffic control procedures for the end of the incident traffic queue?
		4.2.2.5. Have mutually understood equipment staging and emergency lighting procedures on-site to maximize traffic flow past an incident while providing responder safety?
4.2.3. Response and Clearance Policies and Procedures		
4.2.3.1. Utilize the Incident Command System?	4.2.1.4	
4.2.3.2. Have specific policies and procedures for fatal accident investigation that also address maintenance of traffic flow?	4.2.1.7	
4.2.3.3. Have specific policies and procedures for hazardous materials response that also address maintenance of traffic flow?	4.2.1.7	

2008 Questions (Pre-Revision)	Located in 2009	2009 Questions (Post-Revision)
4.2.3.4. Have quick clearance policies for major and minor incidents?	4.2.1.1 & 4.2.1.2	
4.2.3.5. Have a pre-qualified list of available and contracted towing and recovery operators (to include operators' capabilities)?	4.2.1.6	
4.2.3.6. Use motorist assist service patrols?	4.2.1.3	
4.3 Communication and Technology Issues		4.3 Support
4.3.1. Integrated Interagency Communications		4.3.1. Data Collection/ Integration/ Sharing
4.3.1.1. Have a two-way interagency voice communications system allowing for direct on-site communications between incident responders?	4.3.1.5	4.3.1.1. Does the TIM program use a Traffic Management Center/Traffic Operations Center to coordinate incident detection, notification and response?
4.3.1.2. Provide data and video information transfer between agencies and applications (TMC-CAD integration)?	4.3.1.3	4.3.1.2. Is public safety co-located with transportation in the TMC/TOC?
4.3.2. Transportation Management Systems		4.3.1.3. Has the TIM program achieved TMC-CAD integration so that incident data and video information is transferred between agencies and applications?
4.3.2.1. Use Traffic Management Center(s) to coordinate incident notification and response?	4.3.1.1	4.3.1.4. Does the TIM program have specific policies and procedures for traffic management during incident response (i.e. signal timing changes, opening/closing of HOV lanes/ramp metering)?
4.3.2.2. Have a developed technical infrastructure for surveillance and rapid detection of traffic incidents?	not in 2009	4.3.1.5. Does the TIM program provide for interoperable, interagency communications on-site between incident responders?
4.3.2.3. Have specific policies and procedures for traffic management during incident response (i.e. signal timing changes, opening/closing of HOV lanes/ramp metering)?	4.3.1.4	
4.3.3. Traveler Information		4.3.2. Traveler Information
4.3.3.1. Have the ability to merge/integrate and interpret information from multiple sources?	not in 2009	4.3.2.1. Have a real-time motorist information system providing incident-specific information? *(Composite score for 4.3.2.1.a thru 4.3.2.1.c below)*
4.3.3.2. Have a real-time motorist	4.3.2.1	4.3.2.1.a. Traveler information delivered

2008 Questions (Pre-Revision)	Located in 2009	2009 Questions (Post-Revision)
information system providing incident-specific information?		via 511?
4.3.3.3. Provide motorists with travel time estimates for route segments?	4.3.2.2	4.3.2.1.b. Traveler information delivered via website?
		4.3.2.1.c. Traveler information delivered through traffic media access to TMC/TOC data/information?
		4.3.2.2. Provide motorists with travel time estimates for route segments?