2019 Traffic Incident Management Capability Maturity Self-Assessment National Analysis Report

November 2019

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16. Abstract

This report presents a summary of the 2019 Traffic Incident Management Capability Maturity Self-Assessments (TIM CM SA) completed by transportation personnel from 94 locations across the country between June and September, 2019. There are 55 scored questions in the TIM CM SA that are grouped into three sections: Strategic, Tactical, and Support. The initial assessments completed in 2003, 2004, and 2005 (78 in total) continue to be used as the Baseline scores, although it should be noted that the Baseline scores are recalibrated each year that a major revision to the TIM CM SA is completed (2007, 2011, and 2015).

The 2019 overall TIM CM SA score was 73.3 percent (out of a possible 100 percent), representing a 44.6 percent increase over the Baseline.

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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS				
SYMBOL	**WHEN YOU KNOW**	**MULTIPLY BY**	**TO FIND**	**SYMBOL**
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
		NOTE: volumes greater than 1000 L shall be shown in m^3		
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
		TEMPERATURE (exact degrees)		
ºF	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	ºC
		ILLUMINATION		
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m^2	cd/m^2
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS				
SYMBOL	**WHEN YOU KNOW**	**MULTIPLY BY**	**TO FIND**	**SYMBOL**
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
		TEMPERATURE (exact degrees)		
ºC	Celsius	1.8C+32	Fahrenheit	ºF
		ILLUMINATION		
lx	lux	0.0929	foot-candles	fc
cd/m^2	candela/m^2	0.2919	foot-Lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

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EXECUTIVE SUMMARY

The Federal Highway Administration (FHWA) has used the Traffic Incident Management Capability Maturity Self-Assessment (TIM CM SA) for nearly two decades to evaluate the state of the practice in traffic incident management across the country. Originally developed by FHWA in 2002, State and local TIM program managers use the TIM CM SA annually to benchmark and evaluate TIM program success and identify where additional resources may be needed for program improvement.

In 2019, a total of 94 locations completed a TIM CM SA for inclusion in the national analysis, down slightly from the number of submittals in 2018 (98). The 55 scored questions in the TIM CM SA were grouped into three sections: Strategic, Tactical, and Support. The initial assessments completed in 2003, 2004, and 2005 (78 in total) continue to be used as the Baseline scores, although it should be noted that the Baseline scores are recalibrated each year that a major revision to the TIM CM SA is completed (2007, 2011, and 2015).

Table 1 shows the average score for each of the three TIM CM SA sections from the Baseline and 2019, along with the percentage change from the Baseline.

Table 1. Mean score for each section (Baseline and 2019).

Section	# of Questions	Mean Score (percent)		High Score 2019 (possible)	Percent Change in scores from Baseline	Section Weights (percent)
		Baseline	2019			
Strategic	28	42.4	68.5	36.9 (40)	61.6	40
Tactical	22	64.6	77.5	38.8 (40)	20.0	40
Support	5	39.7	74.0	19.0 (20)	86.4	20
Overall	**55**	**50.7**	**73.3**	**93.3 (100)**	**44.6**	**100 percent**

The 2019 overall TIM CM SA score was 73.3 percent (out of a possible 100 percent), representing a 44.6 percent increase over the Baseline. The TIM CM SA mean scores tended to be higher in larger metropolitan areas than in smaller areas. Specifically, mean scores were calculated for the top 40 metropolitan areas (by population), the top 75 metropolitan areas, and non-top 75 metropolitan areas:

- Top 40 metro areas: 77.5 percent.
- Top 75 metro areas: 75.5 percent.
- Non-top 75: 68.5 percent.
- **Overall: 73.3 percent.**

The significant revisions implemented in 2015 resulted in an overall decrease in the national score from 2014 to 2015 (down 9.5 percent). At 73.3 percent, the 2019 score is now the highest since that revision in 2015.

The TIM CM SA is intended to represent the consensus opinion of the TIM stakeholders completing an annual assessment in each TIM program area (city/region/State). Starting with the 2017 TIM CM SA, an optional question was added to identify which TIM stakeholders (by stakeholder type, not specific name or agency) were involved in completing the annual assessment. Nearly all (95 percent) of the locations submitting a TIM CM SA in 2019 provided information on the stakeholder groups involved in completing their respective assessments. Figure 1 shows the percentage involvement of TIM stakeholder groups in completing the assessments in 2019. Stakeholder groups included in Other are: Medical Examiners; Safety Service Patrol Providers; Local/Regional Governments; Public Works Departments; and Transit and School Transportation Providers.

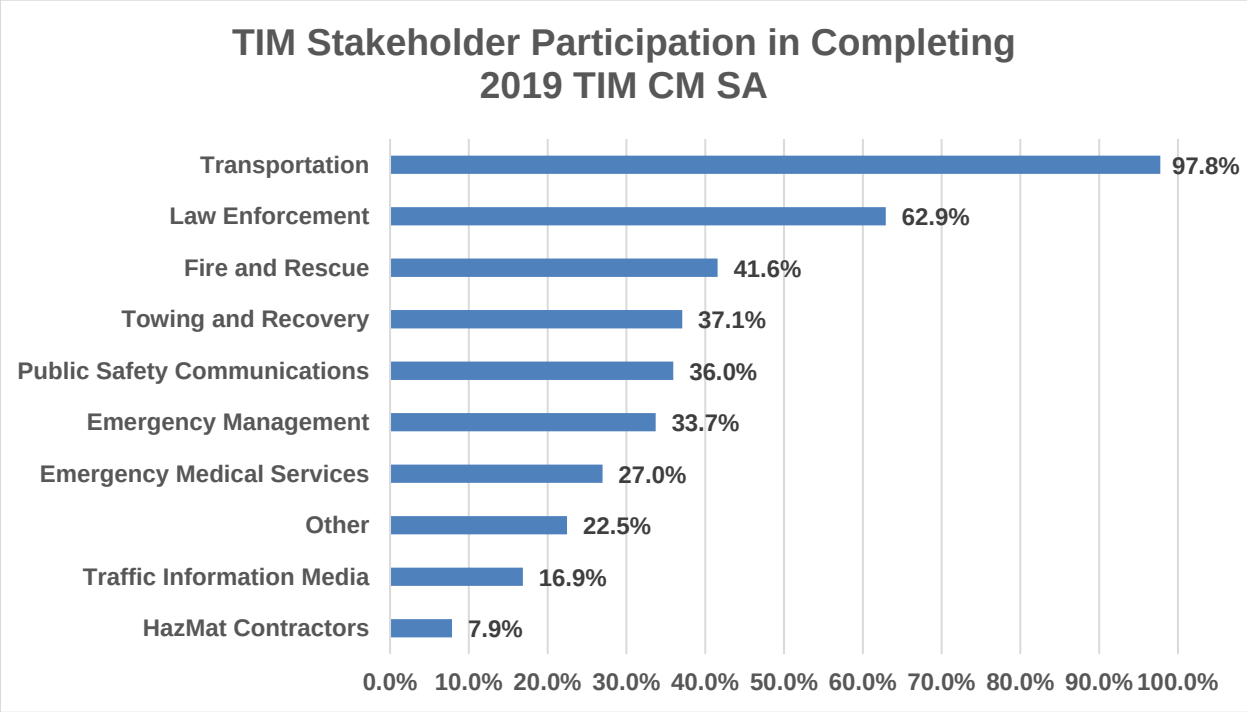

Figure 1. Graph. Traffic incident management stakeholder participation in completing 2019 Traffic Incident Management Capability Maturity Self-Assessment.

A listing of all 55 TIM CM SA questions, their respective Baseline and 2019 scores, and the percentage of programs scoring each question 3 or higher[1] can be found in the appendix.

[1] Scores of 3 and 4 indicate the highest levels of progress for a particular question.

CHAPTER 1. INTRODUCTION

The TIM CM SA has undergone several revisions over the years to reflect changes in TIM practices. The most significant and recent of these revisions occurred in 2015 to align the TIM CM SA with the Capability Maturity Framework (CMF).[2] Due to the nature of the revisions completed in 2015, a recalibration of the Baseline scores was necessary that year to protect the value of the TIM CM SA as a tool to measure national TIM progress over time.

The combined impact of the numerous changes implemented in 2015 resulted in a slight decrease in the 2015 national TIM CM SA score from the 2014 score, but some of that decrease reversed in 2016. Figure 2 shows the overall national scores for the past decade, which include major revisions in 2011 and 2015.

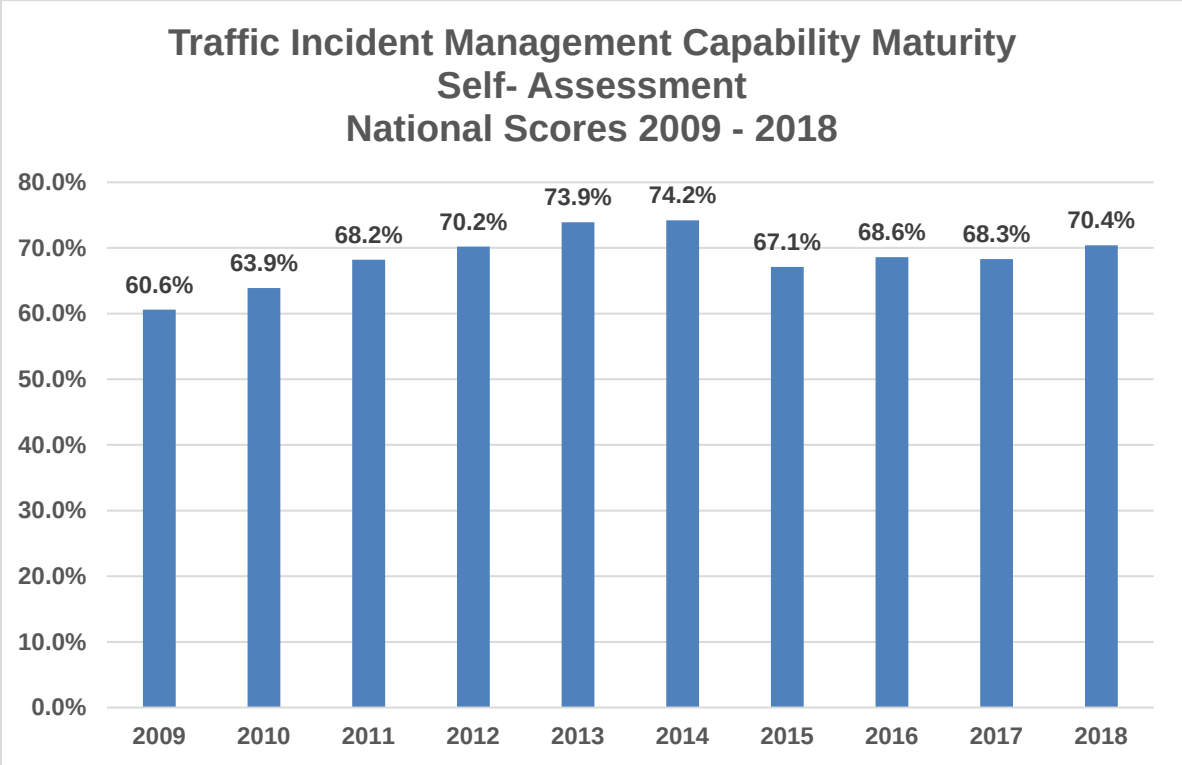

Figure 2. Graph. Traffic Incident Management Capability Maturity Self-Assessment national scores 2009 – 2018.

[2] This revision included a renaming of the annual assessment to the TIM Capability Maturity Self-Assessment or TIM CM SA as referred to throughout this report.

CHAPTER 2. OVERVIEW

Ninety-four locations completed a Traffic Incident Management Capability Maturity Self-Assessment (TIM CM SA) in 2019 for inclusion in the national analysis, slightly down from the 98 submitted in 2018. The 55 scored questions in the TIM CM SA were grouped into 3 sections: Strategic, Tactical, and Support. The initial assessments completed in 2003, 2004, and 2005 (78 in total) continue to be used as the Baseline scores, although it should be noted that the Baseline scores are recalibrated each year that a major revision to the TIM CM SA is completed (2007, 2011, and 2015).

The 2019 overall TIM CM SA score was 73.3 percent (out of a possible 100 percent), representing a 44.6 percent increase over the Baseline. The TIM CM SA mean scores tended to be higher in larger metropolitan areas than in smaller areas. Specifically, mean scores were calculated for the top 40 metropolitan areas (by population), the top 75 metropolitan areas, and all other metropolitan areas that responded but were not in either of these groups:

- Top 40 metro areas: 77.5 percent.
- Top 75 metro areas: 75.5 percent.
- Non-top 75: 68.5 percent.
- **Overall: 73.3 percent.**

As indicated above, the significant revisions implemented in 2015 resulted in an overall decrease in the national score from 2014 to 2015 (down 9.5 percent). At 73.3 percent, the 2019 score is now the highest since that revision in 2015.

CHAPTER 3. STRATEGIC

The 28 questions in the Strategic section are grouped into three subsections:

1. Formal Traffic Incident Management (TIM) Programs.
2. TIM Training and After-Action Reports.
3. TIM Performance Measures.

The Strategic section typically receives the lowest score of the three sections; this has traditionally been the result of low scores on the TIM Performance Measures subsection. The 2019 Traffic Incident Management Capability Maturity Self-Assessment (TIM CM SA) is no exception, with the Strategic section achieving a score of 68.5 percent compared to 77.5 percent in Tactical and 74.0 percent in Support. This year's Strategic score represents a 5.4 percent increase from the 2018 score of 65.0 percent.

Across the three subsections in the Strategic section, the highest average score was in Formal TIM Programs, indicating a strong framework for advancing TIM. The average score for the Formal TIM Program questions (#1-11) was 3.16, compared to 2.82 for TIM Training and After-Action Reports (Questions #12-16) and 2.32 for TIM Performance Measures (Questions #17-28). Key to the success of a Formal TIM program is regularly meeting and among 2019 TIM CM SA participants, 50 percent indicate that their TIM program meets as least four times per year if not more frequently.

Question 13 in the TIM Training and After-Action Reports subsection asks about the percentage of TIM responders completing the 4-Hour TIM Responder Training provided through the second Strategic Highway Research Program (SHRP2). The scoring guidance for this question, shown in table 2, has been updated since 2015 to reflect the increasing numbers of responders completing the training nationally. According to Federal Highway Administration (FHWA) data, as of September 25, 2019, over 431,000 individuals have received the training, which represents 37.3 percent of the total responders to be trained.[3]

Table 2. Scoring guidance for traffic incident management training question #13.

Scoring Guidance	2015	2019
Score 1 if:	Less than 5%	Less than 15%
Score 2 if:	Between 6-7%	Between 16-30%
Score 3 if:	Between 8-9%	Between 31-45 %
Score 4 if:	Over 10%	Over 45%

[3] Federal Highway Administration. National TIM Responder Training Program Update. September 25, 2019. Talking TIM Webinar. Available online: https://transops.s3.amazonaws.com/uploaded_files/Talking%20TIM%20Training%20updates%20September%202019.pdf

As shown in table 3, despite the increased thresholds in the scoring guidance for Question #13, the 2019 average score is now just 1.4 percent below the baseline established in 2015.[4] More than 30 percent of the 2019 TIM CM SA locations scored Question #13 a 4 – indicating that 45 percent or more of their responders have received the training.

Table 3. Traffic incident management training question #13.

Question	2015 Average Score	2019 Average Score
13. What percentage (estimated) of TIM responders in the region identified as needing training have received the 4-Hour SHRP2 TIM Responder Training (in-person or via web-based training), or equivalent?	2.82	2.78

TIM = Traffic Incident Management. SHRP2 = Second Strategic Highway Research Program.

In addition to the SHRP2 training, other specific types of training cited by respondents include mock disaster drills, Incident Command System (ICS)/National Incident Management System (NIMS), livestock handling, Severe Incident Response Vehicle (SIRV), Rapid Incident Scene Clearance (RISC), and Towing and Recovery Incentive Program (TRIP).

In 2017, the TIM Performance Measures (TIM PM) questions were changed to query respondents on the three TIM PM—Roadway Clearance Time (RCT), Incident Clearance Time (ICT) and Secondary Crashes—in individual questions that only asked about one of the three TIM PM per question rather than combining the TIM PM in one question as had been done previously.

This was implemented to provide a more granular analysis on how TIM programs are addressing each of the three TIM PM individually. In 2019, all of the questions in the TIM PM subsection experienced an increase in average score from the 2018 TIM CM SA. However, two of the TIM PM questions remain below their Baseline score as shown in table 4.

Table 4. Traffic incident management performance measures (PM) questions with average scores below Baseline.

Question	2019 Average Score	2019 Change from Baseline
24. How does your agency use ICT performance data to influence your operations?	2.20	-0.5 percent
28. How does your agency use Secondary Crash performance data to influence your TIM operations?	1.94	-12.2 percent

ICT = Incident Clearance Time. TIM = Traffic Incident Management.

[4] Prior to the 2015 TIM CM SA revision, the question on percentage of responders trained was a non-scored supplemental question.

As shown in table 5, where TIM programs are generally more advanced and have resources available for TIM PM collection and analysis, scores across those questions are, for the most part, higher.

Table 5. Top 40 major metropolitan area scores versus top 75 and non-top 75.

Question	Top 40 Metropolitan Area Average Score	To 75 Metropolitan Area Average Score	Non-Top 75 Average Score
20. How does your agency use RCT performance data to influence your operations?	2.8	2.6	2.0
24. How does your agency use ICT performance data to influence your operations?	2.5	2.3	1.9
28. How does your agency use Secondary Crash performance data to influence your TIM operations?	2.0	2.0	1.8

ICT = Incident Clearance Time. RCT = Roadway Clearance Time. TIM = Traffic Incident Management.

Scores for Question #8 in the Strategic section corroborate that the top 40 metropolitan areas typically have better resourced TIM programs capable of collecting and analyzing TIM PM data (table 6).

Table 6. Traffic incident management program funding.

Question	Top 40 Metropolitan Area Average Score	To 75 Metropolitan Area Average Score	Non-Top 75 Average Score
8. Are funds available for TIM activities?	3.2	3.1	2.7

TIM = Traffic Incident Management.

Scores on the TIM PM questions have traditionally been among the lowest in each year's TIM CM SA, and 2019 is no exception. As shown in table 7, the five lowest scoring questions in the 2019 TIM CM SA are all in the TIM PM subsection.

Table 7. Lowest scoring questions on 2019 Traffic Incident Management Capability Maturity Self-Assessment.

Question	Baseline	2019 Average Score	Percent Change from Baseline
27. Has the TIM program established performance targets for a reduction in the number of Secondary Crashes?	1.16	1.55	33.6
28. How does your agency use Secondary Crash performance data to influence your TIM operations?	2.21	1.94	-12.2
23. Has the TIM program established performance targets for ICT?	1.16	2.07	78.4
24. How does your agency use ICT performance data to influence your TIM operations?	2.21	2.20	-0.5
26. How is data for the number of Secondary Crashes collected?	1.88	2.37	26.1

ICT = Incident Clearance Time. TIM = Traffic Incident Management.

Given the low Baseline scores overall in the TIM PM subsection combined with FHWA's 10+ year focus on advancing TIM PM, this is also where the largest percentage change from Baseline has occurred in the TIM CM SA. Six of the 12 TIM PM questions have more than doubled their score over Baseline (see the Appendix).

The TIM CM SA analysis identifies the percentage of programs that score each question a 3 or 4, indicating high levels of success in achieving that program element. In the Strategic section, the range of percentages is 90.4 (Question #6: Are the TIM response roles and responsibilities of public and private sector TIM stakeholders mutually understood?) on the high end to 12.8 percent (Question #27: Has the TIM program established performance targets for a reduction in the number of Secondary Crashes?) on the low end. See the Appendix for the complete listing of questions and their corresponding percent scoring 3 or higher.

Table 8 lists alphabetically the TIM programs that achieved the highest scores in the Strategic section.

Table 8. Highest scoring – Strategic.

Traffic Incident Management Program
Atlanta, GA
Cincinnati, OH
Columbus, OH
Louisville, KY
Miami – Dade, FL

CHAPTER 4. TACTICAL

The 22 questions in the Tactical section are focused on the following three areas:

- Traffic Incident Management (TIM) Laws.
- Policies and Procedures for Incident Response and Clearance.
- Responder and Motorist Safety.

The Tactical section continues as the highest scoring of the three Traffic Incident Management Capability Maturity Self-Assessment (TIM CM SA) sections, achieving an overall score of 77.5 percent. Three of the five highest scoring questions on the 2019 TIM CM SA are in the Tactical section, as part of the Policies and Procedures subsection (table 9).

Table 9. Traffic incident management policies and procedures – highest scoring in 2019.

Question	2019 Average Score	Percent of TIM CM SA Scoring 3 or Higher
44. Is there a procedure in place for removal of abandoned vehicles?	3.45	83.0
40. Does at least one responding agency have the authority to override the decision to utilize the responsible party's Hazmat contractor and call in other resources?	3.40	91.5
36. Do towing and recovery procedures/rotation list policies deploy resources based on type/severity of incident?	3.33	89.4

TIM CM SA = Traffic Incident Management Capability Maturity Self-Assessment.

High scores in this area can be attributed, in part, to the National TIM Responder Training that emphasizes the need for policies and procedures that provide for responder and motorist safety and quick clearance. Given the increasing numbers of responders trained in the course curricula, it is not surprising that there are now three questions in the Policies and Procedures subsection that have 90 percent or more of the programs scoring questions 3 or higher as shown in table 10.

Table 10. Traffic incident management policies and procedures – 90 percent or more scoring each question 3 or higher.

Question	2019 Average Score	Percent of TIM CM SA Scoring 3 or Higher
34. Do TIM responders routinely utilize the Incident Command System (ICS), specifically Unified Command (UC), while on scene?	3.24	90.4
39. Is there a policy in place that clearly identifies reportable types and quantities, and appropriate Hazmat response?	3.30	90.4
40. Does at least one responding agency have the authority to override the decision to utilize the responsible party's Hazmat contractor and call in other resources?	3.40	91.5

Two questions in the TIM CM SA query respondents on Safety Service Patrols (questions 32 and 33). The first asks about the existence of a Safety Service Patrol and the second asks respondents to score the Safety Service Patrol's level of coverage.

Over 80 percent of respondents scored both questions 3 or 4 (with 41.5 percent scoring both questions 4), meaning a large number of Safety Service Patrols across the country range from mid-level to full-functionality.

Services provided by these Safety Service Patrols include motorist assistance, incident response and clearance, emergency traffic control, and scene management. Furthermore, these Safety Service Patrols range from medium-sized fleets providing service on most major roadways to fleets large enough to provide ample coverage on all major roadways. For those that provided operating hours for their programs, the majority operate during morning and afternoon peak periods Monday through Friday, although some operate 24/7 on a year-round basis.

Seventy-eight percent of the 2019 TIM CM SA respondents provided information on levels of coverage, with the combined Safety Service Patrol coverage extending over 4,600 centerline miles and 13,468 lane miles (some programs reported centerline, others lane miles). The median centerline miles coverage reported by 2019 TIM CM SA respondents was 131 miles and the median lane miles coverage was 290 miles.

The continued high scores in the Tactical section of the TIM CM SA indicate that TIM programs have successfully institutionalized Driver Removal and Authority Removal laws, policies and procedures for incident response and clearance and have put into place the processes necessary for responder and motorist safety. With initially high Baseline scores, the Tactical questions have only experienced a combined 20.0 percent increase over Baseline, and the average percentage of programs scoring these questions a 3 or higher is 79.0 percent.

However, two questions in the Tactical section (#42 and #44) remain below their Baseline, and Question 42 on procedures for removal of the deceased prior to arrival of the Medical Examiner is four percent below Baseline and realized a 12.3 percent decrease from the average score in 2018. Among locations that submitted a TIM CM SA in 2018 and 2019, the average score is up 4.2 percent, so this year-over-year decrease is the result of high-scoring locations that submitted in 2018 but not in 2019, and the addition of some new locations in 2019 with lower scores on Question 42. Nonetheless, with one of the lower average scores overall on the 2019 TIM CM SA, procedures for removal of the deceased prior to the arrival of the Medical Examiner should be a continued focus area for TIM training and best practices development.

Table 11 lists alphabetically the TIM programs that achieved the highest scores in the Tactical section.

Table 11. Highest scoring – Tactical.

Traffic Incident Management Program
Atlanta, GA
Cincinnati, OH
Miami – Dade, FL
Milwaukee, WI
San Francisco, CA
Seattle, WA
Tucson, AZ

CHAPTER 5. SUPPORT

The Support section had the second highest overall score of 74.0 percent and the largest increase over Baseline of the three sections (86.4 percent).

The questions in the Support section focused on the tools and technologies enabling improved incident detection, response and clearance. The major revision completed in 2015 removed questions on traveler information, returning the emphasis to the infrastructure and activities that enable incident information exchange between Traffic Incident Management (TIM) program stakeholders. This allows programs to rate their progress on items over which their TIM program has control.

The five questions in the Support section all address TIM data sharing and integration among TIM stakeholders. The highest scoring question in the Support section was question 51 (below), which scored an average of 3.53, the highest scoring question on the 2019 TIM CM SA.

51. Are TIM stakeholders aware of and actively utilizing Traffic Management Center/Traffic Operations Center (TMC/TOC) resources to coordinate incident detection, notification, and response?

Over 61 percent of respondents scored question 51 a 4, indicating widespread understanding and use of TMC/TOC resources for traffic incident management. The comments submitted in the Support section corroborate this, with a number pointing to co-location of public safety and transportation personnel in the TMC/TOC. The locations that scored this question the lowest are in more rural States where traffic management/traffic operation centers are not in place or are not as advanced.

The lowest scoring question in the Support section is question 54 on policies and procedures for signal timing changes to support traffic management during incident response. Question 54 received an average score of 2.37 in 2019 and only 45.7 percent of programs scored this question 3 or 4. The locations that scored question 51 low also tended to score question 54 low, indicating less access to the tools and technologies to support traffic incident management in more rural areas.

Table 12 lists alphabetically the TIM programs that achieved the highest scores in the Support section.

Table 12. Highest scoring – Support.

Traffic Incident Management Program
Alachua – Bradford, FL
Louisville, KY
Philadelphia, PA
San Bernardino, CA
San Diego, CA

CHAPTER 6. RESULTS SUMMARY

A total of 94 locations completed a Traffic Incident Management Capability Maturity Self-Assessment (TIM CM SA) in 2019, with an average overall score of 73.3 percent (out of a possible 100 percent). The TIM CM SA mean scores tended to be higher in larger metropolitan areas than in smaller areas. Specifically, mean scores were calculated for the top 40 metropolitan areas (by population), the top 75 metropolitan areas, and all other metropolitan areas that responded but were not in either of these groups:

- Top 40 metro areas: 77.5 percent.
- Top 75 metro areas: 75.5 percent.
- Non-top 75: 68.5 percent.
- **Overall: 73.3 percent.**

The highest scores were achieved in Tactical (77.5 percent) and the largest percentage increase in scores from the Baseline was in Support (86.4 percent). Low-scoring questions and those with the least improvement over Baseline indicate specific program areas where additional guidance from FHWA may be warranted.

Among the lowest scoring questions on this year's TIM CM SA, five were in the TIM Performance Measures (TIM PM) subsection and one was in the Support section (table 13). Despite low average scores, these questions experienced an increase from the 2018 TIM CM SA.

Table 13. Lowest scoring questions on 2019 TIM CM SA.

Question	2019 Average Score	Percent Change from 2018 Average Score
27. Has the TIM program established performance targets for a reduction in the number of Secondary Crashes?	1.55	9.9
28. How does your agency use Secondary Crash performance data to influence your TIM operations?	1.94	4.9
23. Has the TIM program established performance targets for ICT?	2.07	11.3
24. How does your agency use ICT performance data to influence your TIM operations?	2.20	2.8
26. How is data for the number of Secondary Crashes collected?	2.37	11.8
54. Are there policies or procedures in place for signal timing changes to support traffic management during incident response?	2.37	1.3

ICT = Incident Clearance Time. TIM = Traffic Incident Management.

Another indicator of where resources should be focused is what a question scores relative to its Baseline score. Five questions in the 2019 TIM CM SA have average scores below their respective Baseline scores (table 14).

Table 14. Scores below Baseline.

Question	2019 Average Score	Percent Change from 2018 Average Score	2019 Percent Change from Baseline
28. How does your agency use Secondary Crash performance data to influence your TIM operations?	1.94	4.9	-12.2
42. For incidents involving a fatality, is there a procedure for the removal of the deceased prior to Medical Examiner arrival?	2.43	-12.3	-4.0
13. What percentage (estimated) of TIM responders in the region identified as needing training have received the 4-hour SHRP 2 TIM Responder Training (in-person or via web-based training), or equivalent?	2.78	6.5	-1.4
44. Is there a procedure in place for removal of abandoned vehicles?	3.45	0.3	-0.6
24. How does your agency use ICT performance data to influence your TIM operations?	2.20	2.8	-0.5

TIM = Traffic Incident Management. SHRP2 = second Strategic Highway Research Program. ICT = Incident Clearance Time.

Lastly, there are six questions in the 2019 TIM CM SA where over 90 percent of respondents scored the question 3 or higher, indicating success (table 15). These are program areas where success has been institutionalized, and represent questions that potentially could be removed in future iterations of the TIM CM SA.

Table 15. Program areas of success as indicated by 90 percent or more scoring each question 3 or higher.

Question	2019 Average Score	Percent of TIM CM SA Scoring 3 or Higher
51. Are TIM stakeholders aware of and actively utilizing TMC/TOC resources to coordinate incident detection, notification and response?	3.53	94.7
40. Does at least one responding agency have the authority to override the decision to utilize the responsible party's Hazmat contractor and call in other resources?	3.40	91.5
39. Is there a policy in place that clearly identifies reportable types and quantities, and appropriate Hazmat response?	3.30	91.5

Table 15. Program areas of success as indicated by 90 percent or more scoring each question 3 or higher. (continued)

Question	2019 Average Score	Percent of TIM CM SA Scoring 3 or Higher
34. Do TIM responders routinely utilize the Incident Command System (ICS), specifically Unified Command (UC), while on scene?	3.24	90.4
6. Are the TIM response roles and responsibilities of public and private sector TIM stakeholders mutually understood?	3.23	90.4
52. What TIM data (i.e., number of involved vehicles, number of lanes blocked, length of queue, etc.) is captured via TMC's and/or public safety computer-aided dispatch (CAD) systems and is it shared with other disciplines for real-time operational purposes?	3.14	90.4

APPENDIX. SUMMARY OF 2019 TRAFFIC INCIDENT MANAGEMENT CAPABILITY MATURITY SELF-ASSESSMENT RESULTS

Table 16. 2019 Traffic Incident Management Capability Maturity Self-Assessment scores.

Question	Mean Score		Percent Change from Baseline	Percent Scoring 3 or Higher	
Strategic	**Baseline**	**2019**		**Baseline**	**2019**
1. Is there a formal Traffic Incident Management (TIM) program that is supported by a multidiscipline, multi-agency team or task force, which meets regularly to discuss and plan for TIM activities?	1.90	3.18	67.4	28.0	83.5
2. Are all disciplines and agencies participating in on-going TIM enhancement activities/efforts?					
3. Is the importance of TIM understood by all TIM stakeholders and supported by multidiscipline, multi-agency agreements or memorandums of understanding (MOUs)?	1.71	2.85	66.7	18.0	71.3
4. Is agency leadership actively involved in program-level TIM decisions (i.e., policy establishment, training, funding, legislation, etc.)?	1.71	2.98	74.3	18.0	76.6
5. Is there a full-time position within at least one of the participating agencies with responsibility for coordinating the TIM program as their primary job function?	2.28	3.19	39.9	54.0	73.4
6. Are the TIM response roles and responsibilities of public and private sector TIM stakeholders mutually understood?	1.71	3.23	88.9	18.0	90.4
7. Is planning to support TIM activities, including regular needs assessments, done across and among participating agencies?	1.35	3.02	123.7	12.0	83.0

Table 16. 2019 Traffic Incident Management Capability Maturity Self-Assessment scores. (continued)

Question	Mean Score		Percent Change from Baseline	Percent Scoring 3 or Higher	
Strategic	**Baseline**	**2019**		**Baseline**	**2019**
8. Are funds available for TIM activities?	1.71	2.97	73.7	18.0	70.2
9. Is TIM considered and incorporated into planning efforts for construction and work zones?	2.47	3.37	36.4	35.0	87.9
10. Is TIM considered and incorporated into planning efforts for special events such as sporting events, concerts, conventions, etc.?					
11. Is TIM considered and incorporated into planning efforts for weather-related events?					
12. Have stakeholders in the region participated in a second Strategic Highway Research Program (SHRP2) National TIM Responder Training Program, or equivalent, Train-the-Trainer (TtT) session and are they actively training others?	1.26	2.88	128.6	9.0	72.3
13. What percentage (estimated) of TIM responders in the region identified as needing training have received the 4-Hour SHRP2 TIM Responder Training (in-person or via Web-Based Training), or equivalent?	2.82	2.78	-1.4	57.9	56.4
14. Is the SHRP2 TIM Responder Training being conducted in a multidiscipline setting?	2.97	3.21	8.1	66.3	74.5
15. Has the SHRP2 TIM Responder Training, or equivalent, been incorporated into the local academy and/or technical college curriculums?	1.77	2.41	36.2	10.5	41.5
16. Does the TIM program conduct multidiscipline, multi-agency after-action reviews (AARs)?	1.62	2.82	74.1	18.0	60.6

Table 16. 2019 Traffic Incident Management Capability Maturity Self-Assessment scores. (continued)

Question	Mean Score		Percent Change from Baseline	Percent Scoring 3 or Higher	
Strategic	**Baseline**	**2019**		**Baseline**	**2019**
17. Is Roadway Clearance Time (RCT) being measured utilizing the Federal Highway Administration (FHWA) standard definition time between first recordable awareness of an incident by a responsible agency and first confirmation that all lanes are available for traffic flow?	0.64	2.82	340.6	3.0	70.2
18. Which of the following data collection and analysis practices best align with your region for RCT?	0.64	2.51	292.2	3.0	53.2
19. Has the TIM program established performance targets for RCT?	1.16	2.48	113.8	4.0	45.7
20. How does your agency use RCT performance data to influence your TIM operations?	2.21	2.43	10.0	35.8	52.1
21. Is Incident Clearance Time (ICT) measured and used by your agency? FHWA defines ICT as the "time between the first recordable awareness of the incident and the time at which the last responder has left the scene."	0.64	2.65	314.1	3.0	62.8
22. Which of the following data collection and analysis practice best aligns with your region for ICT?	0.64	2.43	279.7	3.0	50.0
23. Has the TIM program established performance targets for ICT?	1.16	2.07	78.4	4.0	34.0
24. How does your agency use ICT performance data to influence your TIM operations?	2.21	2.20	-0.5	35.8	42.6

Table 16. 2019 Traffic Incident Management Capability Maturity Self-Assessment scores. (continued)

Question	Mean Score		Percent Change from Baseline	Percent Scoring 3 or Higher	
Strategic	**Baseline**	**2019**		**Baseline**	**2019**
25. Is the number of Secondary Crashes being measured and used? FHWA defines Secondary Crashes as the number of unplanned crashes beginning with the time of detection of the primary crash where a collision occurs either a) within the incident scene or b) within the queue, including the opposite direction, resulting from the original incident?	1.03	2.39	132.0	8.0	57.4
26. How is data for the number of Secondary Crashes collected?	1.88	2.37	26.1	29.5	53.2
27. Has the TIM program established performance targets for a reduction in the number of Secondary Crashes?	1.16	1.55	33.6	4.0	12.8
28. How does your agency use Secondary Crash performance data to influence your TIM operations?	2.21	1.94	-12.2	35.8	28.7
Tactical					
29. Is an Authority Removal Law in place and understood by TIM stakeholders?	2.92	3.19	9.2	67.0	80.9
30. Is a Driver Removal Law in place and understood by TIM stakeholders?	3.01	3.02	0.3	71.0	81.9
31. What activities are in place to outreach to and educate the public and elected officials about TIM?	2.38	2.81	18.1	46.3	72.3
32. Is there a Safety Service Patrol program in place for incident and emergency response?	2.73	3.29	20.5	67.0	83.0
33. What level of coverage does the Safety Service Patrol program provide?					

Table 16. 2019 Traffic Incident Management Capability Maturity Self-Assessment scores. (continued)

Question	Mean Score		Percent Change from Baseline	Percent Scoring 3 or Higher	
Tactical	**Baseline**	**2019**		**Baseline**	**2019**
34. Do TIM responders routinely utilize the Incident Command System (ICS), specifically Unified Command (UC), while on scene?	2.55	3.24	27.1	58.0	90.4
35. Are temporary traffic control (TTC) devices (e.g., cones, advanced warning signs, etc.) pre-staged in the region to facilitate timely response?	2.21	2.97	34.4	41.0	76.6
36. Do towing and recovery procedures/rotation list policies deploy resources based on type/severity of incident?	3.14	3.33	6.1	74.7	89.4
37. Do towing and recovery procedures/rotation list policies include company/operator qualifications, equipment requirements, and/or training requirements?	2.86	3.09	8.0	67.0	78.7
38. Do towing and recovery procedures/rotation list policies include penalties for non-compliance of response criteria?	2.49	2.85	14.5	55.8	70.2
39. Is there a policy in place that clearly identifies reportable types and quantities, and appropriate Hazmat response?	2.89	3.30	14.2	69.0	90.4
40. Does at least one responding agency have the authority to override the decision to utilize the responsible party's Hazmat contractor and call in other resources?	3.22	3.40	5.6	89.0	91.5
41. For incidents involving a fatality, is there a procedure in place for early notification and timely response of the Medical Examiner?	2.53	3.18	25.7	55.0	78.7

Table 16. 2019 Traffic Incident Management Capability Maturity Self-Assessment scores. (continued)

Question	Mean Score		Percent Change from Baseline	Percent Scoring 3 or Higher	
Tactical	**Baseline**	**2019**		**Baseline**	**2019**
42. For incidents involving a fatality, is there a procedure for the removal of the deceased prior to Medical Examiner arrival?	2.53	2.43	-4.0	55.0	48.9
43. Are there procedures in place for expedited crash investigations?	2.59	2.90	12.0	72.0	64.9
44. Is there a procedure in place for removal of abandoned vehicles?	3.47	3.45	-0.6	91.0	83.0
45. Do standardized, documented TIM response procedures/guidelines exist?	2.73	2.83	3.7	61.1	72.3
46. Do TIM responders routinely utilize temporary traffic control devices to provide traffic control for the three incident classifications (minor, intermediate, major) in compliance with the *Manual on Uniform Traffic Control Devices* (MUTCD)?	1.93	3.18	64.8	27.0	81.9
47. Do TIM responders routinely utilize traffic control procedures to provide back of traffic queue warning to approaching motorists?	1.56	2.99	91.7	17.0	74.5
48. Is there a mutually understood procedure/guideline in place for safe vehicle positioning?	1.28	3.18	148.4	14.0	81.6
49. Are there mutually understood procedures/guidelines in place for use of emergency-vehicle lighting?					
50. Are TIM responders following high-visibility safety apparel requirements as outlined in the MUTCD?					

Table 16. 2019 Traffic Incident Management Capability Maturity Self-Assessment scores. (continued)

Question	Mean Score		Percent Change from Baseline	Percent Scoring 3 or Higher	
Support	**Baseline**	**2019**		**Baseline**	**2019**
51. Are TIM stakeholders aware of and actively utilizing Traffic Management Center/Traffic Operations Center resources to coordinate incident detection, notification and response?	1.98	3.53	78.3	41.0	94.7
52. What TIM data (i.e., number of involved vehicles, number of lanes blocked, length of queue, etc.) is captured via TMCs and/or public safety computer-aided dispatch (CAD) systems and is it shared with other disciplines for real-time operational purposes?	1.43	3.14	119.6	10.0	90.4
53. Is TIM video captured via TMCs and/or public safety CAD systems and is it shared with other disciplines for real-time operational purposes?	1.43	2.96	107.0	10.0	83.0
54. Are there policies or procedures in place for signal timing changes to support traffic management during incident response?	1.55	2.37	52.9	18.0	45.7
55. Are there pre-planned detour and/or alternate routes identified and shared between TIM stakeholders?	1.55	2.82	81.9	18.0	68.1

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