



# DCHC Traffic Incident Management Program Baseline Evaluation Report



## THE WAY FORWARD

To Enhancing Safety, Mobility,  
and Economic Vitality



An assessment of Traffic Incident Management in the  
Durham - Chapel Hill - Carrboro MPO

## ▶ INTRODUCTION/OVERVIEW

The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC) seeks to improve safety, mobility and economic vitality of the region by enhancing traffic incident management (TIM) practices.

TIM is a term used to define efforts by multiple agencies to clear crashes off the road as safely and quickly as possible. According to the Federal Highway Administration (FHWA):

*TIM Consists of a planned and coordinated multi-disciplinary process to detect, respond to, and clear traffic incidents so that traffic flow may be restored as safely and quickly as possible. Effective TIM reduces the duration and impacts of traffic incidents and improves the safety of motorists, crash victims and emergency responders<sup>1</sup>.*

TIM is an effective Transportation System Management and Operations (TSMO) strategy.

As one of eight key TSMO service layers in a TSMO strategic and program plan, TIM serves as a foundational element of TSMO. All TSMO strategies intend to help manage existing capacity to the greatest extent. TIM practices help establish the necessary relationships with emergency

response organizations that make TSMO possible.

Crashes compromise the safety of everyone. Every minute that passes is more dangerous to those in the crash, those responding to the crash, and those delayed or rerouted during and/or after the crash. The potential for secondary incidents in the queue, in the opposing direction, or on alternate routes, increases with every minute. According to the FHWA, 25% of all traffic congestion is a result of unforeseen incidents (crashes, spills, breakdowns), and that one in five crashes is actually a secondary crash to another incident.

*Motorist safety, mobility, economy and quality of life issues are impacted when crashes are not cleared in a timely manner.*

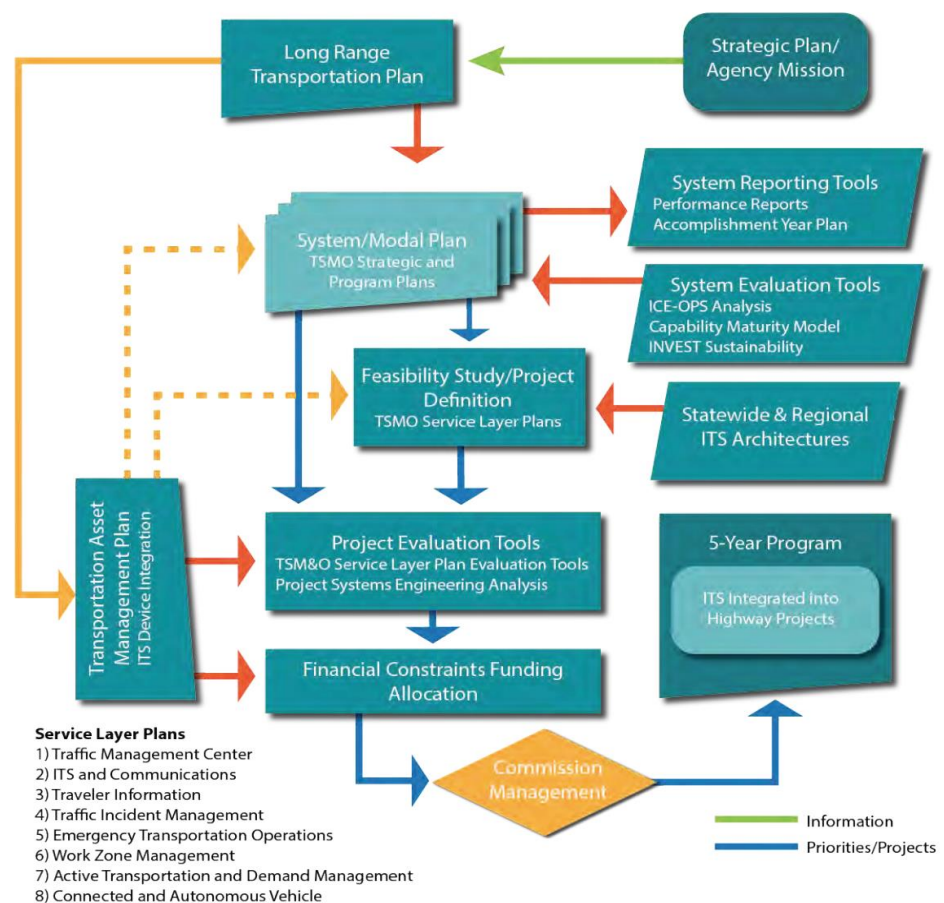


Figure 1: TIM and TSMO Integration into the Transportation Planning Process

<sup>1</sup> [http://ops.fhwa.dot.gov/eto\\_tim\\_pse/about/tim.htm](http://ops.fhwa.dot.gov/eto_tim_pse/about/tim.htm)

Additionally:

- *The economic supply chain is impacted because just-in-time deliveries arrive late*
- *Health care is impacted because ambulances and other life-saving services cannot follow an optimum route*
- *Local cities and town infrastructure life spans are shortened because traffic is diverted onto roadways that may not be suited for heavy volumes*
- *The public image of transportation agencies and planning organizations are impacted because there is a reduced level of confidence in the ability to deliver quality traveling experiences.*

A gauge of current regional observations and thoughts are included in the responder and stakeholder web survey results, later in this report.

In this program baseline report, the Task 2 deliverables include Web-Survey results, partner opinions and incident impact analysis.

Due to the lack of first hand response to our inquiries the consultant team did not conduct one-on-one interviews with area responders, the web survey responses were used to determine their TIM involvement.

## ► PROJECT ORGANIZATION

The final assessment report will include first an analysis of the current baseline of activities (this report), and then will set a strategic direction, including actions/strategies, recommendations and suggested performance targets and measures.

The baseline report includes the following:

- Background information on the MPO area and linkage of TIM to 2040 Long Range Transportation Plan (LRTP) goals

- An assessment of stakeholder involvement and satisfaction with the current TIM practice
- Assessment of the DCHC region's TIM practice as evidenced by the most recent Federal Highway Administration TIM Self-Assessment compared to similar regions
- An incident analysis using NCDOT data tables and other available data sets to identify general areas of concern

The strategic plan will address:

- Program Vision & Mission
- Gaps in the current program compared to best practices
- Objectives to address the gaps
- Strategies to achieve objectives
- Tactics/actions within the strategies to be considered for implementation
- Measurement recommendations

For each of these areas, this report will present the current baseline assessment, a set of goals, objectives, strategies, and tactics that might be useful in advancing the program in the MPO and driving success elsewhere in North Carolina and beyond.

## ► ROADMAP FOR SUCCESS

A 2012 U.S. DOT-sponsored gathering of transportation and public safety officials from around the country produced a "Roadmap for Success" that organized activities under the four pillar categories, and suggested that successful programs in the future could link their activities to those subject areas.

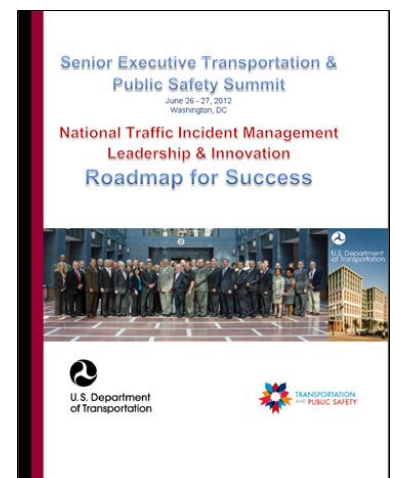
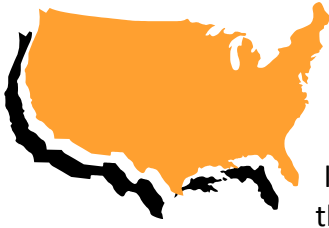


Figure 2- Roadmap for TIM Success

## ► STRATEGIC PLANNING BASED ON THE FOUR PILLARS CONCEPT



**LEGISLATIVE & LEADERSHIP:** pertains to activities that set clear direction and support effective TIM in policies and legislation. In North Carolina, there appears to be no

legislative shortcoming, so agency TIM leadership should be a focus area moving forward.

**INSTITUTIONAL & SUSTAINABILITY:** pertains to the integration of TIM principles and procedures into all disciplines, including a programmatic approach that stresses long-term viability, including staffing and appropriate time and financial resources. This could result in specific agreements, cooperative policies, and procedures. A major goal of this project is to establish a simple, yet responsive memorandum of understanding (MOU), acknowledging basic common goals in incident response and clearance activities. A more robust local to regional to statewide program structure might be a start. The absence of a regional or Statewide TIM committee was also identified during this process. As a later recommendation this strategy could play an important role in program success.

**PRACTITIONER CAPACITY BUILDING:** goes beyond training, to resourcing and the application of technology as appropriate in tactical activities and support activities. This is most clearly evidenced by cooperative training, education, exercise, and a continuous learning environment that embraces performance measurement and reviews for the purpose of improvement. The lack of knowledge and or attendance in the FHWA sanctioned SHRP2 First Responder training program was evidenced by responses of not knowing about the program during our stakeholder meeting. North Carolina

lags in trained responders compared to neighboring states.

**EDUCATION AND OUTREACH:** is an area that stresses a whole community approach that was summed up by one DCHC practitioner, who defined success as “trained responders; aware community.” There is a national need for a more informed public, from the basic driver education skills learned by new drivers to continuing public attention to citizens who act in their own best interest, and those of responders. This category also speaks to outreach to decision makers, continuously championing the advancement of more effective TIM. The public education component of this program is lacking as well.

North Carolina law enforcement agencies are emphasizing the “Move Over” law, *NC G.S. 20-157 (f)*, enacted in January 2002.

*The law “requires motorists slow down and approach cautiously when an emergency vehicle is stopped on the shoulder of the roadway with its lights flashing. Motorists are required to move over to another lane away from the emergency vehicle on a multi-lane highway or slow down on a two lane highway and can do so safely. Motorists must slow down while maintaining a safe speed.”*

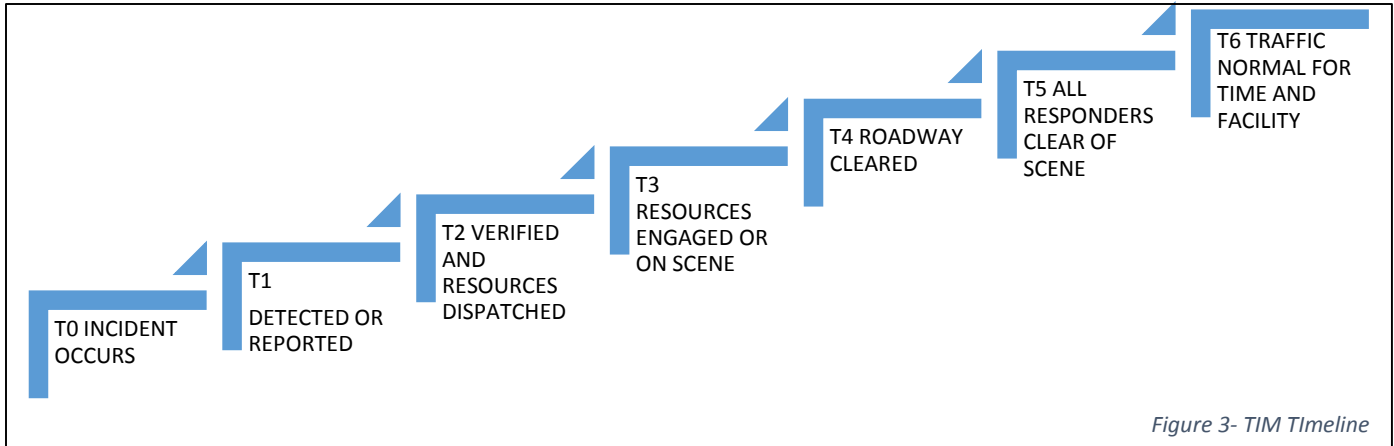
## ► COMMON CHARACTERISTICS OF SUCCESSFUL TIM PROGRAMS

- Focus on safety and mobility as a united goal from leadership
- Passion for multi-agency cooperation and direction setting
- Emphasis on learning from past practices
- Effective communications and outreach to partners and the public
- Strategically focused on support of tactical operations

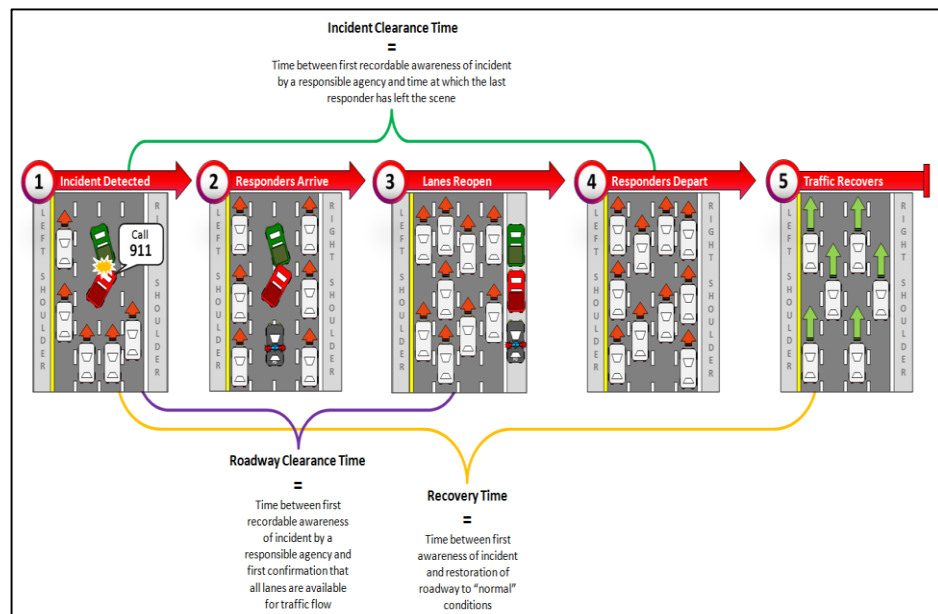
## ▶ WHAT IS THE TRAFFIC INCIDENT MANAGEMENT TIMELINE?

These points are the measurable times in the life cycle of an incident, from the incident occurrence through restoration of capacity and mobility. Making each segment smaller, in terms

of time between points, pays dividends. We attack each time segment as a team, in a successful program. The Incident Timeline is now a national standard and part of the Federal Highway Administration's SHRP 2 Responder Safety training program.



- **INCIDENT OCCURS Point 0** is the incident itself. This is uncontrollable, and random.
- **INCIDENT REPORTED/DETECTED Point 1** is the time it is detected. This means someone saw the incident and/or shared the information with an authority, and it becomes the point of measurement of response.
- **VERIFIED AND RESOURCES DISPATCHED Point 2** is the time that the incident is verified and understood and resources dispatched. That can be by a dispatcher or other appropriate agent or agency.
- **RESOURCES ENGAGED OR ON SCENE Point 3** is arrival on scene of responders or the time that ITS devices such as a Dynamic Message Sign (DMS) might be engaged.
- **ROADWAY CLEARED Point 4** is the road clearance/opening time, when all lanes are open to traffic.
- **ALL RESPONDERS LEAVE SCENE Point 5** is when all responders and debris are no longer present and influencing traffic.
- **TRAFFIC NORMAL FOR TIME AND FACILITY Point 6** is the time when normal conditions for that time and place are achieved.



*Figure 4- NCDOT Timeline Version*

*Above- A simplified version used by the NCDOT is shown here. It goes beyond measurement of the roadway clearance time and incident clearance time to measure recovery time.*



## ▶ THE DCHC BASELINE

### ▶ MPO GOALS 2040 LRTP / TIM LINKAGE

The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization's goals and objectives included in the 2040 Long Range Transportation Plan include:

#### 1. Overall Transportation System

**Goal:** A safe, sustainable, efficient, attractive, multi-modal transportation system that: supports local land use; accommodates trip-making choices; maintains mobility and access; protects the environment and neighborhoods; and improves the quality of life for urban area residents.

#### 2. Multi-Modal Street and Highway System

**Goal:** An attractive multi-modal street and highway system that allows people and goods to be moved safely, conveniently, and efficiently.

#### 3. Public Transportation System

**Goal:** A convenient, accessible, and affordable public transportation system, provided by public and private operators, that enhances mobility and economic development.

#### 4. Pedestrian and Bicycle System

**Goal:** A pedestrian and bicycle system that: provides a safe alternative means of transportation; allows greater access to public transit; supports recreational opportunities; and includes off-road trails

#### 5. Integration of Land Use and Transportation

**Goal:** A Transportation Plan that is integrated with local land use plans and development policies.

#### 6. Protection of Natural Environment and Social Systems

**Goal:** A multi-modal transportation system which provides access and mobility to all

residents, while protecting the public health, natural environment, cultural resources, and social systems.

#### 7. Public Involvement

**Goal:** An ongoing program to inform and involve citizens throughout all stages of the development, update, and implementation of the Transportation Plan.

#### 8. Safety and Security

**Goal:** Continue to improve transportation safety and ensure the security of the transportation system.

Objectives directly tied to TIM:

- *Reduce economic losses due to transportation crashes and incidents.*
- *Improve the ability to identify high accident locations, and evaluate their impacts in TIP project prioritization.*

#### 9. Freight Transportation and Urban Goods Movement

**Goal:** Improve mobility and accessibility of freight and urban goods movement.

**FINDING:** While the area of Safety and Security is most closely associated with effective TIM, there is also a link to Goal 1 in maintaining mobility and access, to Goal 2 in allowing safe, convenient, and efficient movement of people and goods, Goal 3 in enhancing mobility in public transportation, Goal 7 involving the public as partners in effective TIM, and Goal 9 in addressing the need for movement of good in urban and interstate settings.



Figure 5- DCHC Members Map

► WHAT WE KNOW ABOUT DCHC TRAVEL, INCIDENTS

Population and vehicle miles traveled are consistent from county to county in the MPO, as evidenced in the graphic depictions.

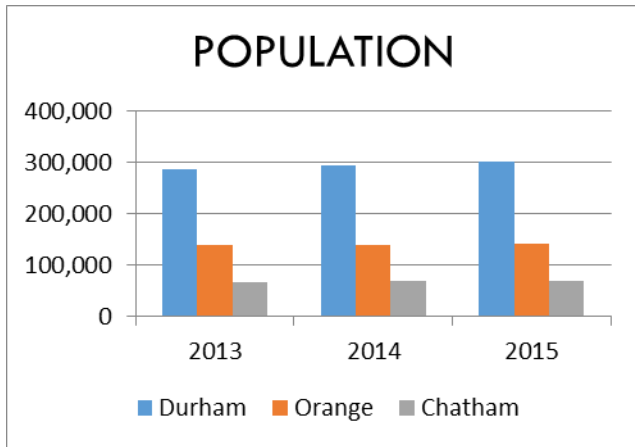


Figure 6- DCHC Population

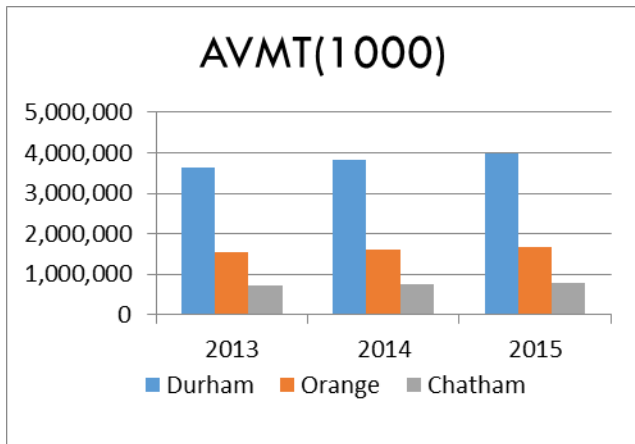


Figure 7- DCHC AVMT

Fatal injury statistics show an alarming spike in the number in Orange County, disproportionate to any of the earlier comparisons as shown in this bar graph.

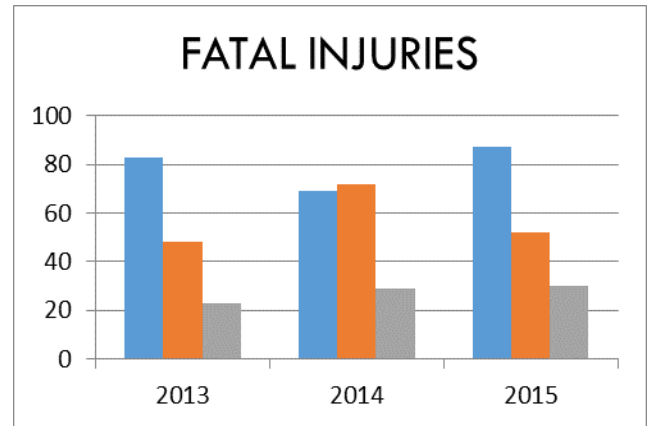


Figure 8- DCHC Fatalities

While the number of incidents are disproportionately greater in Durham County each year, the number of fatal injuries are disproportionately high in Orange counties.

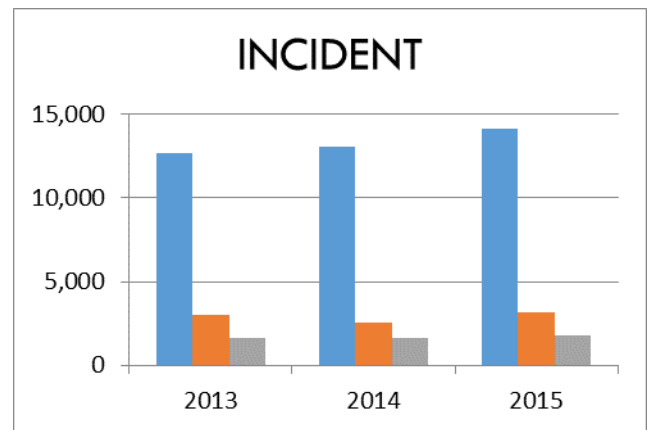


Figure 9- DCHC Incidents

A responsible and effective TIM program would address the similarities and differences in each area and through the program, address the needs based on data, measure the effectiveness of each partner in the TIM Timeline, and craft specific approaches that stress interdependence on each partner.

## ▶ WHAT DO DCHC STAKEHOLDERS BELIEVE?

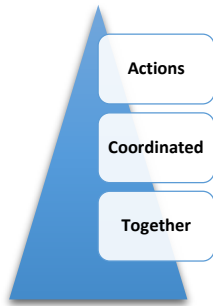


Figure 10- Three Main Descriptors

Stakeholders were identified by the MPO staff and several invitations were sent by email to engage the stakeholders on their opinions about the state of the TIM program in the region.

Respondents included representatives of law enforcement, fire service, traffic management, NCDOT leadership, emergency medical, and emergency management.

### They DEFINED Traffic Incident Management as:

- Guidelines for all responders to follow and utilize when responding
- To reduce the impact managing traffic and reducing secondary incidents
- Keep responders, victims, and travelers informed and safe while they are traveling or making travel plans
- Good multi-disciplinary management of TI scenes, to include good incident command, buffer zones, traffic control, safe and speedy conclusion
- Notification of road closures or issues
- The coordinated response and management of traffic incidents to maximize responder & patient safety while minimizing the impact on the flow of traffic
- All partners working together to complete a common objective of responding, investigating and clearing crashes quickly

### They defined SUCCESS as:

- To be efficient and all agencies have an understanding of what the other is doing and be able to work together to successfully complete task at hand
- Collaborative partnership between MPO, DOT, and emergency responders that produces tangible work products/outcome
- No fights on scene
- Trained responders, aware community
- Safe, coordinated, efficient and consistent in response
- That we become more understanding of what resources we have in the region and what quick clearance means



### They said the four things that are DONE BEST in the area include:

- Incidents detected, reported quickly
- 911 dispatches correct resources
- Safe ingress and vehicle positioning important (See NCDOT Reference Card)
- PPE important on scene

### The five areas SCORING LOWEST in their opinion were:



- Planners are not engaged in support
- Little pre-planning for all responders
- Incident Command/Unified Command spotty
- Traffic Management Center (TMC) not updated
- Towing/Recovery not included in the program



**MAJOR ISSUES included -**

**MINOR ISSUES included -**

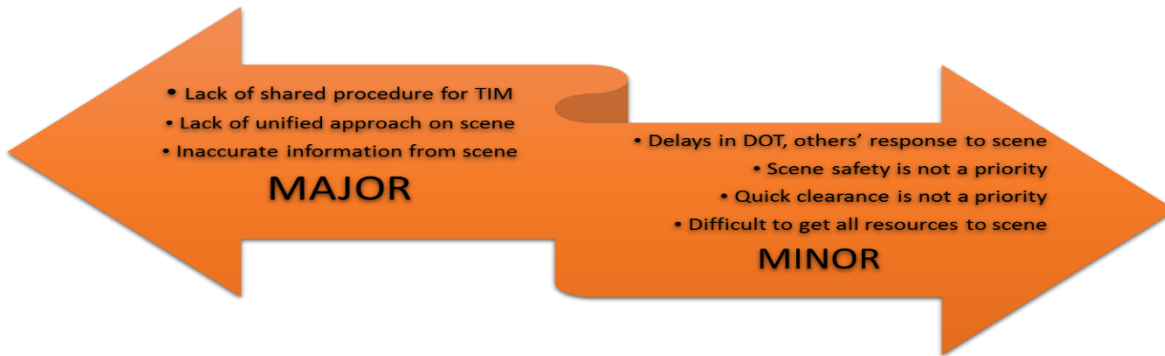


Figure 11- Major and Minor Issues as identified by DCHC responders

**TIM STAKEHOLDER KICK OFF MEETING**

On April 28, 2016 Gannett Fleming (GF) Staff along with MPO Staff held two stakeholder meetings at the DCHC Transportation office. This meeting was facilitated by GF staff and consisted of a power point presentation via WebEx to brief the attendees on the results of the TIM survey and to solicit additional participation from other regional responders.

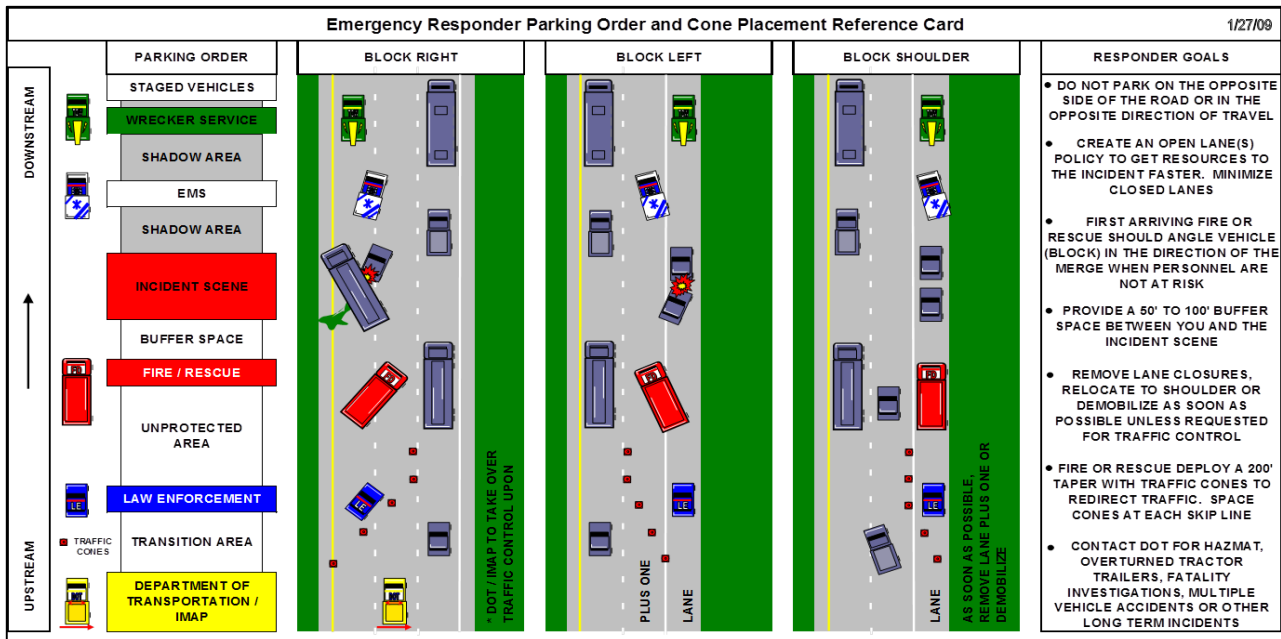


Figure 12- NCDOT On-Scene Vehicle Positioning

## ▶ STAKEHOLDERS DEFINE WHAT IS NEEDED MOST

What's missing? - In any baseline assessment of a program, gaps must be identified so that strategies can be developed and defined to address those deficiencies. In the DCHC region, as is true in other areas of the state and the nation responders have identified joint and multi-discipline training as their top priority.

Stakeholders were asked, from a set list of offerings, which actions would help most in advancing TIM. The top answer was common, shared training. That was followed, in order, shown clockwise.

The top five answers are a great starting point to a mature program, and are the most important takeaway from the stakeholder definition of the current program and short term needs.

## ▶ NORTH CAROLINA – QUICK CLEARANCE LEGISLATION

The state of North Carolina has a definitive and very comprehensive “No Harm” legislation to protect responders in clearing incidents in a safe and quick manner.

The NC Quick Clearance Law was enacted 12/01/11 – **NC General Statute § 20-161. “Stopping on highway prohibited; warning signals; removal of vehicles from public highway.”** This important legal protection is extended to all responders to immune them civilly from clearing lanes and incident scenes. However historically the NC responder community does not recognize or in some instances are not aware of this legislation when mitigating minor, intermediate or major incidents. Below is the section that should be emphasized in the DCHC region and in fact the remainder of the state:

**Subsection (f):** Any investigating law enforcement officer, with the concurrence of the Department of Transportation, may immediately remove or cause to be removed from the State highway system any

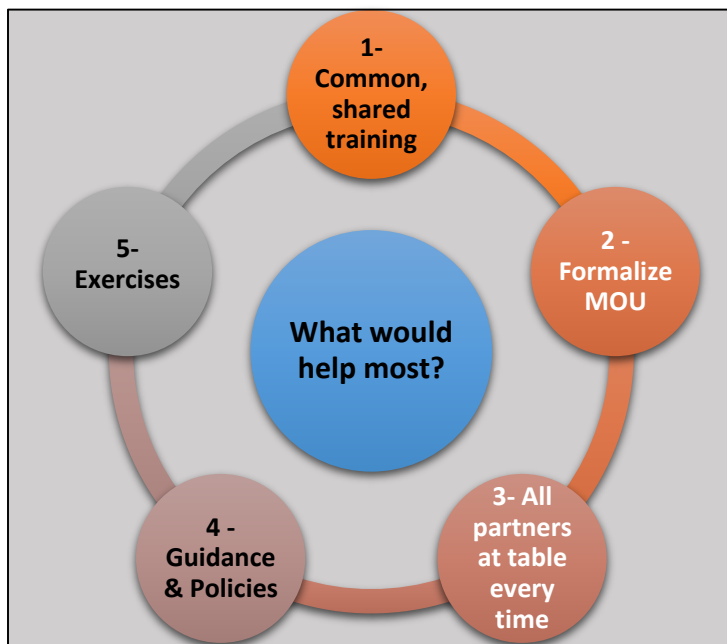


Figure 13- Top TIM Priorities

wrecked, abandoned, disabled, unattended, burned, or partially dismantled vehicle, cargo, or other personal property interfering with the regular flow of traffic or which otherwise constitutes a hazard. In the event of a motor vehicle crash involving serious personal injury or death, no removal shall occur until the investigating law enforcement officer determines that adequate information has been obtained for preparation of a crash report.

No state or local law enforcement officer, Department of Transportation employee, or person or firm contracting or assisting in the removal or disposition of any such vehicle, cargo, or other personal property shall be held criminally or civilly liable for any damage or economic injury related to carrying out or enforcing the provisions of this section.



Figure 14 - NC Crash Scene

## ► SELF ASSESSMENT: WHAT IS IT, AND WHY DOES IT MATTER?

The Federal Highway Administration (FHWA) offers a self-assessment tool, and has since 2004, with modifications made in 2008, 2011, and 2015.

For the purpose of this undertaking, the scores for the greater Raleigh-Durham region were done by the NCDOT for the region as a whole.

Those “scores” were compared, at the request of the MPO, with similar areas. The consultant study team chose the following areas, some slightly smaller and larger than the DCHC region, to include:

- Buffalo, NY
- Richmond, VA
- Rochester, NY
- Tucson, AZ

Scoring is subjective, but there is a rubric guiding answers. The self-assessments are not specifically designed to be compared to others, but instead are a kind of self-guided report card to assess progress in an area’s TIM programming.

The scores help set a local baseline, and if done specifically for the DCHC MPO only, could be an effective measurement tool.

In summary, the self-assessment scores for the Raleigh-Durham region were lower than the five-region average in the following areas:

SELF ASSESSMENT AREA	Durham/Raleigh	Average
Funding availability	2	2.2
Work zone planning	3	3.4
Weather planning	3	3.4
SHRP 2 or TIM training	2	2.6
Multi-disciplinary training	2	3.2
Secondary crash data	2	2.4
Data improves ops?	2	2.2
Towing call severity	3	3.2
Body removal	1	2.4
Lighting	2	2.8
High visibility	3	3.4

Scores were higher than the average in the following areas:

SELF ASSESSMENT AREA	Durham/Raleigh	Average
Regular Team meetings	3	2.8
Are there MOUs	3	2.6
Leadership buy in present	3	2.6
Full time staff commitment	4	3.2
All players understand others roles	3	2.8
Shared planning is present	3	2.8
Percentage of trained responders	2	1.8
SHRP training in academy	2	1.6
Shared AARs are done	4	3
Incident clearance is tracked	4	3
How is it collected	4	2.8
Target times for clearance	3	2.4
Authority Removal laws	4	2.8
Driver Removal laws	4	2.6
Safety Patrol functions	4	3.2
Level of service for safety patrols	4	3
ICS use on incident scenes	4	3.4
Towing requirements clear	3	2.8
Towing penalties present	3	2.6
Override trucking hazmat call	4	3.4
Early notice of coroner/ME	4	3.2
Expedited crash investigation	3	2.8
Abandoned vehicles policy	4	2.6
Guidelines are in place	3	2.6
Back of queue protection	3	2.8
Safe positioning of vehicles	3	2.4
TMC use	4	3.4
Data sharing among partners	4	3
Video sharing among partners	3	2.4
Signal timing changes done	2	1.8
Detour routing known to all	3	2.8

In eight areas, the scores here were exactly the average.

SELF ASSESSMENT AREA	Durham/Raleigh	Average
All disciplines are involved	3	3
Special events planning	4	4
Roadway clearance targets	3	3
Reduction targets	2	2
Outreach to public	3	3
TTC pre-staged resources	3	3
Quantities of Hazmat defined	3	3
TTC utilization is evident	3	3

## ► INCIDENT IMPACT ANALYSIS

Key to any incident analysis is the adoption of the FHWA accepted categories of incident durations these categories re defined in this draft NCDOT table, obtained April 8, 2016:

### ► Incident Category Table:

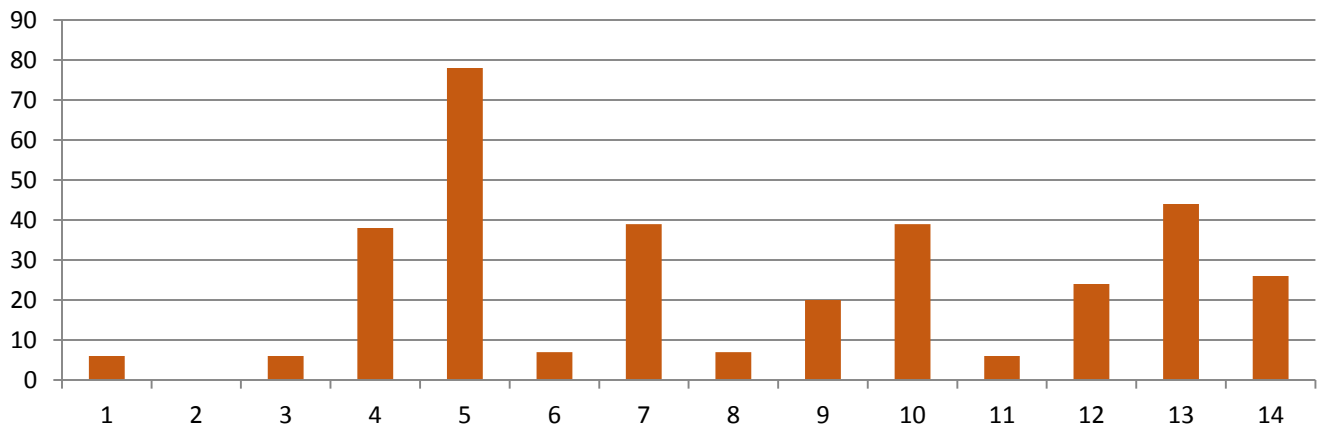
<b>Minor</b>	Expected duration <b>under 30 minutes</b>
	Minor traffic incidents are typically disabled vehicles and minor crashes with minimal disruption to the flow of traffic. On-scene responders are typically law enforcement, towing companies, and occasionally Incident Management Assistance Patrol (IMAP).
	<p><i>Examples:</i></p> <ul style="list-style-type: none"> <li>• Disabled vehicles</li> <li>• Roadway debris</li> <li>• Typically property damage only crashes</li> <li>• Incidents that fall under the “Fender Bender” law</li> </ul>
<b>Intermediate</b>	Expected duration of <b>30 minutes to 2 hours</b>
	Intermediate traffic incidents typically affect travel lanes for a time period of 30 minutes to 2 hours, and usually require traffic control on the scene to safely direct road users past the incident. Full roadway closures might be needed for short periods during traffic incident clearance to allow traffic incident responders to accomplish their tasks.
	<p><i>Examples:</i></p> <ul style="list-style-type: none"> <li>• Vehicle rollovers</li> <li>• Multi-vehicle crashes</li> <li>• Crashes involving personal injury</li> <li>• Truck or tractor-trailer crashes</li> </ul>
<b>Major</b>	Expected duration of <b>more than 2 hours</b>
	Major traffic incidents are typically traffic incidents involving hazardous materials, fatal traffic crashes, and other natural or man-made disasters. These traffic incidents typically involve closing all or part of a roadway facility for a period exceeding 2 hours.
	<p><i>Examples:</i></p> <ul style="list-style-type: none"> <li>• Overturn-turned tractor trailer</li> <li>• Full road closures in one direction on a multilane facility</li> <li>• Fatal or life-threatening injury crashes</li> <li>• Incidents that require crash investigations</li> <li>• HAZMAT (any placarded substance) situations that require evacuations, detours, or environmental issues (spillage into a waterway or drainage system)</li> <li>• Incidents that involve structural damage</li> </ul>
	Note: Recommend after incident reviews be required for all major incidents

► Major Incident Analysis by DCHC/DOT overlapping Divisions and Jurisdictions

Major Incident Data represented for Sep 2012 - Feb 2016

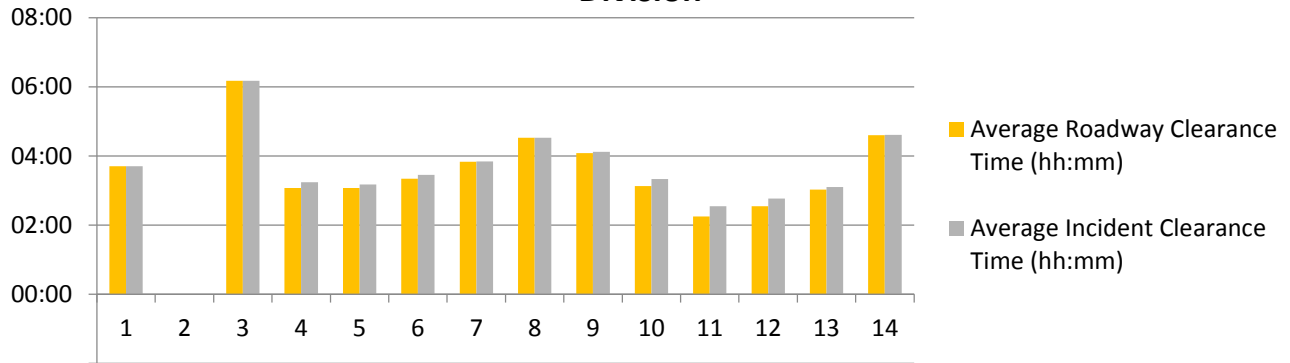
Division	All Routes				Interstate Routes		
	# Incidents	Average Roadway Clearance Time (HH:MM)	Average Incident Clearance Time (HH:MM)	# Incidents w/ Missing Info	# Incidents	Average Roadway Clearance Time (HH:MM)	Average Incident Clearance Time (HH:MM)
1	45	3:22	3:50	0	6	3:42	3:42
2	48	2:05	2:27	0	0	0:00	0:00
3	73	2:50	3:03	0	6	6:10	6:10
4	142	2:34	2:57	0	38	3:04	3:14
5	201	03:06	03:17	0	78	3:04	3:10
6	57	02:32	02:50	0	7	3:20	3:27
7	82	03:24	03:32	0	39	3:49	3:50
8	87	02:54	03:09	0	7	4:31	4:31
9	60	03:24	03:40	0	20	4:04	4:07
10	84	02:43	03:03	0	39	3:07	3:19
11	58	02:25	02:46	0	6	2:14	2:32
12	76	02:45	03:01	0	24	2:32	2:46
13	84	03:01	03:15	0	44	3:01	3:06
14	69	03:06	03:23	0	26	4:36	4:36
<b>Total</b>	<b>1166</b>	<b>02:53</b>	<b>03:10</b>	<b>0</b>	<b>340</b>	<b>03:31</b>	<b>03:36</b>

# of Major Incidents on Interstates by Division





**Average Clearance Times for Major Incidents on Interstates by Division**



<b>WHEN, WHERE AND HOW LONG Past 5 years 2011-2016</b>	<b>No. of Crashes</b>	<b>Avg. TIME to clear</b>	<b>AM Peak %</b>	<b>Noon %</b>	<b>PM Peak %</b>	<b>Other Hours %</b>
I-85 Durham County	419	0:63	21%	5%	26%	<b>40%</b>
I-40 Durham/Orange	2054	0:57	15%	6%	<b>44%</b>	35%
NC-147 Durham County	741	0:53	33%	5%	<b>36%</b>	26%
US 15-501 Chapel Hill	17	0:28	6%	0%	35%	<b>59%</b>

**► Baseline Summary**

The DCHC MPOs involvement with furthering the ideals of Traffic Incident Management in a leading and guiding role is commendable. The baseline report was built on document reviews, stakeholder identification, web based survey results and a stakeholder meeting that included representatives from the MPO, Law Enforcement, Fire and Emergency Services, Emergency Management and one local traffic planning staff member. An acknowledgment of areas for improvement were made to include communication issues, roles on scene and urgency in quick clearance strategies to

clear incident scenes. From this preliminary baseline the main areas of concern for the responders are:

- Training
- Formalized TIM Memorandum of understanding
- Partner Participation
- Standardized Response Policies
- Scenario Based Exercises

Therefore it will be the focus of the upcoming work to focus on these areas with the Strategic Plan and Recommendations for improving the TIM Program in the DCHC region.

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