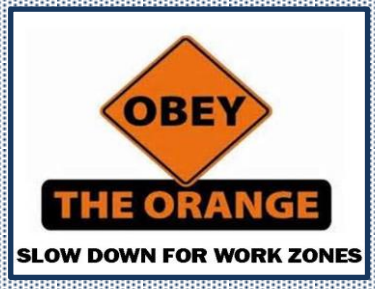
Work Zone Safety and Mobility

PROCESS REVIEW

2015 FINAL REPORT



WORK ZONE SAFETY and MOBILITY
PROCESS REVIEW FINAL REPORT

December 2015

This Work Zone Safety and Mobility Process Review Report was jointly prepared by the Connecticut Department of Transportation and the Federal Highway Administration, and is evidence of Connecticut's compliance with 23 CFR 630.1008(e).

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU of ENGINEERING and CONSTRUCTION

By: _____ Digitally signed by Harley, Thomas A. DN: E=Thomas.Harley@ct.gov, CN="Harley, Thomas A.", OU=AD_Migration_Processing, DC=DOT, DC=CT, DC=GOV Date: 2015.12.30 08:55:54-05'00' Date: 12/30/2015

Thomas A. Harley, P.E.
Bureau Chief and Chief Engineer

FEDERAL HIGHWAY ADMINISTRATION

By: DAVID W NARDONE Digitally signed by DAVID W NARDONE DN: c=US, o=U.S. Government, ou=DOT FHWAGlastonburyCT, ou=FHWA FHWAGlastonburyCT, cn=DAVID W NARDONE Date: 2015.12.30 09:46:43 -05'00' Date: 12/30/2015

Amy D. Jackson-Grove
Division Administrator

TABLE OF CONTENTS

EXECUTIVE SUMMARY **1**
BACKGROUND **3**
Regulations 3
Moving Ahead for Progress in the 21st Century Act (MAP-21) 3
PURPOSE and OBJECTIVE **4**
SCOPE and METHODOLOGY **5**
Scope of Review 5
CTDOT Work Zone Policies 5
2013-2014 Work Zone Safety Field Reviews 5
Connecticut Work Zone Improvement Plan (WZIP) 7
Work Zone Program Performance Measures 8
PROCESS REVIEW TEAM MEMBERS **9**
OBSERVATIONS and RECOMMENDATIONS **10**
CTDOT Work Zone Policies 10
2013-2014 Work Zone Safety Field Reviews 12
Connecticut Work Zone Improvement Plan (WZIP) 13
Work Zone Program Performance Measures 14
BEST PRACTICES **15**
CONCLUSIONS **16**
APPENDIX 1: ACTION ITEMS
APPENDIX 2: DEPARTMENT POLICES AND MEMORANDUMS
Policy No. E&C-5: Municipal Roads and Street Affected by Construction
Policy No. E&C-6: Policy on Trafficpersons on Construction Projects
Policy No. E&C-25: Policy on Dissemination of Construction Information to Local Officials
Policy No. E&C-32A: Protective Headgear
Policy No. E&C-32B: Protective Footwear (Steel Toe Shoes)
Policy No. E&C-40: Work Zone Safety and Accessibility
Policy No. E&C-46: Systematic Consideration and Management of Work Zone Impacts
Policy No. HO-11: Wheel Chocks

Work Zone Safety and Mobility Policy and Implementation Plan Memorandum

General Memorandum 07-09: Work Zone Safety and Mobility Policy and Implementation Plan

APPENDIX 3: 2013 & 2014 WORK ZONE SAFETY REVIEW ANNUAL REPORTS

2013 Work Zone Safety Reviews

2014 Work Zone Safety Reviews

APPENDIX 4: CTDOT WORK ZONE IMPROVEMENT PLAN

EXECUTIVE SUMMARY

This Process Review was conducted jointly by the Connecticut Department of Transportation (CTDOT or Department) and the Federal Highway Administration (FHWA) Connecticut Division to comply with the requirements of 23 CFR Part 630, Subpart J – *Work Zone Safety and Mobility*. It is the third such process review conducted for this program area since this regulation became effective on October 12, 2007.

Four (4) observations were documented with corresponding recommendations for improvements (see Observations and Recommendations). The key areas which need attention are summarized as follows:

- **Policies** – CTDOT needs to continuously update its policy statements concerning Work Zone Safety and Mobility, and include references to current federal regulations when applicable.
- **Annual Field Reviews** – CTDOT's goal is to conduct a minimum of ten (10) reviews a year, which includes four (4) in-depth reviews.
- **Program Evaluation** – Establish a process to systematically evaluate CTDOT's work zone program.
- **Performance Measures** – CTDOT needs to review the opportunities to establish and implement performance measures for work zone congestion, delays, and crashes.

To satisfy the biennial process review requirement, this review addresses implemented or required changes needed to accommodate these observations.

All Department policies related to Work Zone Safety and Mobility were compiled and are currently under review.

Work Zone field reviews of active construction projects have been conducted annually by CTDOT since the 2010 Work Zone Self-Assessment. Observations and recommendations resulting from these field reviews were provided by the CTDOT Office of Construction directly to the project personnel for action subsequent to each site visit.

Several best practices for CTDOT's implementation of the Work Zone Safety and Mobility program were found through the work zone field reviews. These best practices are going to be evaluated to see if they can be implemented on a broader scale.

The Connecticut Work Zone Improvement Plan (WZIP) was developed by CTDOT and accepted by FHWA in May 2013 and was the formal action plan developed to address the recommendations in the 2011 Process Review. The issues identified through WZIP in the previous (2013) Process Review Report have been included in the Action Item List of this Process Review Report. Furthermore, to streamline the parallel initiatives,

the original function of WZIP is being integrated into the Work Zone Process Review reporting.

For 2013 and 2014, no work zone performance measures were established, but going forward the Department can collect data specific to work zones. This will provide the framework to establish work zone performance measures in the future.

The next required Work Zone Process Review must be completed by December 31, 2017.

BACKGROUND

Federal Regulations

23 CFR Part 630, Subpart J – *Work Zone Safety and Mobility*, contains the requirements and guidance for systematically addressing and managing work zone safety and mobility impacts on Federal-aid highway projects. This Process Review was prepared to comply with 23 CFR Part 630.1008, paragraph (e), *State-level processes and procedures*, that requires States to perform a process review every two years in order to assess the effectiveness of work zone safety and mobility procedures.

To help States evaluate their work zone practices, and to assess work zone practices nationally, FHWA developed the Work Zone Safety and Mobility Self-Assessment (WZ SA) tool. The WZ SA tool consists of 46 questions designed to assist those with work zone management responsibilities in assessing their programs, policies, and procedures against many of the good work zone practices in use today. The policies, strategies, processes, and tools identified in the WZ SA were gathered from the best practices currently in place in State departments of transportation (DOTs), metropolitan planning organizations, and local municipalities. Many of the items can be found in the *Work Zone Best Practices Guidebook*.

The last WZ SA for Connecticut was conducted in 2012 and has since been discontinued by FHWA. However, the program areas that were found to need improvement have laid the foundation of the Work Zone Safety and Mobility Process Review. Some of the action items from the Self-Assessment are still included with the Process Review.

Moving Ahead for Progress in the 21st Century Act (MAP-21)

MAP-21 as amended became effective on October 1, 2012. Section 1405 *Highway Worker Safety* requires the Secretary of Transportation to modify 23 CFR Part 630.1108, paragraph (a) *Work zone safety management measures and strategies,* concerning the use of positive protective measures to separate workers on highway construction projects from motorized traffic. New rulemaking by FHWA is still pending.

PURPOSE and OBJECTIVE

The purpose and objective of this Process Review is to comply with the requirements contained in 23 CFR Part 630.1008, paragraph (e) and to determine whether the CTDOT is adequately and programmatically identifying, addressing, and managing work zone safety and mobility impacts on its highway projects.

The results and follow-up actions in this Process Review are intended to produce systematic improvements to work zone processes and procedures with the objective of improving safety and mobility on current and future highway projects in Connecticut.

SCOPE and METHODOLOGY

Scope of Review

The scope of this Process Review included four (4) areas to provide a statewide and programmatic perspective regarding the current status of work zone safety and mobility in Connecticut. The scope of each task is discussed below.

CTDOT Work Zone Policies

Eight (8) work zone policies and two (2) memoranda referencing work zone procedures (Appendix 2) were identified. These policies and memoranda are currently being reviewed and any revisions will be included in the 2017 Process Review Report.

2013-2014 Work Zone Safety Field Reviews

Work zone field reviews were conducted for randomly selected active highway construction projects administered by CTDOT. These field reviews were performed in order to assess current field practices relative to applying work zone safety and mobility processes and procedures on these projects.

During a regular work zone safety field review, personnel from the CTDOT Office of Construction and Division of Traffic Engineering were accompanied by project staff from the Construction District to tour selected projects during active construction operations.

An in-depth field review typically includes staff from the Office of Construction, the Division of Traffic Engineering, the Construction District, the Division of Safety, and the FHWA. Reports were created to document both successes and areas of improvement for the individual projects reviewed, as well as for Department policies or procedures in general.

The reviews included an overview of traffic control devices, sign installation and removal methods, sign recognition and visibility, and a survey of project personnel to determine strengths and weaknesses in work zone procedures. The goal was to identify best practices and needed improvements with the consensus among the various disciplines involved with work zone design and implementation.

Projects were chosen from each of the four (4) districts in the state:

- District 1 – Central Connecticut
- District 2 – Eastern Connecticut
- District 3 – Southwestern Connecticut
- District 4 – Western Connecticut

There was an attempt to review projects that had some unique features to focus on during the review and correlate with other projects with similar features. Once a project was selected, the review team was notified, and a date for the field review was scheduled. The field review team typically met with project personnel at the field office for an initial meeting and questionnaire, and then proceeded to conduct a field review to observe all aspects of the work zone. Upon completion of the field review, a report was generated detailing the observations and findings. These reports were circulated to the review team and project personnel for comments before being finalized.

The 2013-2014 Work Zone Safety and Mobility field reviews were conducted using the same Work Zone Review Form and Checklist developed in 2010. Projects were selected with the objective of conducting reviews during both daytime and nighttime hours. For the two (2) construction seasons covered, a total of fourteen (14) field reviews were conducted, three (3) of which were in-depth. Five (5) areas of focus were selected for the 2013-2014 field reviews:

- Detour operations
- Night reviews
- Pedestrian access
- Stage construction
- Temporary signalization

Tables 1a & 1b below summarizes the number of reviews conducted for each review type on active construction projects in each of the CTDOT Districts.

Table 1a – Summary of 2013 Work Zone Field Reviews

Review Type	District 1	District 2	District 3	District 4	**TOTAL**
Detour	1				**1**
Night			1		**1**
Stage Construction				1	**1**
Temporary Signalization	1				**1**
TOTAL PROJECTS	**2**		**1**	**1**	**4**

Table 1b – Summary of 2014 Work Zone Field Reviews

Review Type	District 1	District 2	District 3	District 4	**TOTAL**
Detour	1	1			**2**
Night		1	1		**2**
Pedestrian Access				1	**1**
Stage Construction	1	1	1	1	**4**
Temporary Signalization				1	**1**
TOTAL PROJECTS	**2**	**3**	**2**	**3**	**10**

The 2013 and 2014 Work Zone Safety Review Annual Reports contain an executive summary, a table of action items, and copies of the work zone review reports. The database created in 2010 was expanded to include the 2013 and 2014 project information. CTDOT has continued to conduct annual work zone field reviews every construction season since 2010 in order to continually improve work zone safety for construction crews and the traveling public.

Connecticut Work Zone Improvement Plan (WZIP)

The Connecticut Work Zone Improvement Plan (WZIP) document was accepted by FHWA on May 29, 2013. WZIP had proposed to address many of the identified action items listed in the 2011 Work Zone Process Review. The scope of the 2013 Process Review focused on the status of these action items. However, there was minimal progress in resolving the action items since 2013. The action items of WZIP have been incorporated into the 2015 Work Zone Process Review Action Items as well as the function of WZIP in general.

Work Zone Program Performance Measures

Work Zone Performance Measures have not been developed in the areas related to safety and congestion in 2013 and 2014, however, the Bureau of Policy and Planning Performance Measures Unit is working to incorporate performance measures in the future.

Work Zone Safety Performance Measures

Accurate crash data is necessary to develop Work Zone safety performance measures. Such data would include but is not limited to:

- Number of crashes
- Types of crashes
- Severity of crash
- Location in relation to the work zone

The last piece of data in the list above has usually been the hardest to come by and is the key to tracking incidents in work zones. Crash data is readily available in Connecticut but typically incidents were not easily identified as work zone related. Beginning January 1, 2015, a new crash reporting form was implemented that identifies crashes within work zones. Now that this key element is in place, CTODT can begin tracking and reporting work zone related incidents. For purposes of identifying trends and measuring performance, historical data is essential. Therefore, it will take a few years of compiling reported information to have enough data to adequately create performance measures.

Work Zone Congestion Performance Measures

Accurate data is also necessary to develop Work Zone congestion related performance measures. This data is more difficult to acquire and includes, but is not limited to:

- Historical and real time speed
- Travel time and delay
- Queue length
- Incident clearance time

Congestion related data is produced in a variety of ways. Collecting some of this data in-house can be labor and time intensive and requires specialized equipment. However, purchasing data such as real time speed and travel time from a third party can be extremely costly. This data will most likely come from a combination of sources and is fundamental to developing congestion related performance measures. Determining how this will be accomplished will be evaluated proceeding forward.

PROCESS REVIEW TEAM MEMBERS

The members of the Process Review team that conducted and analyzed the 2013-2014 work zone field reviews or compiled the final process review report were:

Robert W. Turner, *Safety / Area Engineer* (**FHWA**)
James P. Connery, *Construction Division Chief* (**CTDOT Construction**)
Anthony O. Kwentoh, *Transportation Supervising Engineer* (**CTDOT Construction**)
Jeffrey H. Hunter, *Transportation Engineer 3* (**CTDOT Construction**)
Bonney S. Whitaker, *Transportation Engineer 3* (**CTDOT Construction**)
Kiah A. Patten, *Transportation Engineer 2* (**CTDOT Construction**)
John S. DeCastro, *Maintenance Manager* (**CTDOT Highway Operations**)
Joseph P. Ouellette, *Transportation Supervising Engineer* (**CTDOT Traffic**)
Michael A. Chachakis, *Transportation Engineer 3* (**CTDOT Traffic**)
Oddler Fils, *Transportation Engineer 2* (**CTDOT Traffic**)
Colleen A. Kissane, *Assistant Planning Director* (**CTDOT Policy & Planning**)
Maribeth C. Wojenski, *Assistant Planning Director* (**CTDOT Policy & Planning**)
Joseph T. Cristalli, *Program Coordinator* (**CTDOT Policy & Planning**)
Craig J. Babowicz, *Transportation Engineer 3* (**CTDOT Policy & Planning**)

OBSERVATIONS and RECOMMENDATIONS

CTDOT Work Zone Policies

- Observation No. 1-1:

  Eight (8) Department polices and two (2) internal memoranda that can be applied to work zones were identified and are being reviewed for potential updates (See Appendix 2).

  Two (2) of the eight (8) policies were identified in the 2013 Process Review Report: E&C-40 – *Work Zone Safety and Accessibility* and E&C-46 – *Systematic Consideration and Management of Work Zone Impacts* are still being reviewed. The policies do not reference the applicable federal regulations. The policy on *Work Zone Safety and Accessibility* does reference the Manual of Uniform Traffic Control Devices (MUTCD) but does not cite 23 CFR 655 *Traffic Operations*. The policy on *Systematic Consideration and Management of Work Zone Impacts* defines what constitutes a significant project which is the basis of requiring Transportation Management Plans, but does not cite either 23 CFR 630.1010 *Significant Projects* or 23 CFR 630.1012 *Project-level procedures*.

  The two (2) memoranda were also identified in the 2013 Process Review Report. The 2007 CTDOT internal memorandum which transmitted the initial version of the *Systematic Consideration and Management of Work Zone Impacts* policy did reference the applicable federal regulations, and included a separate *Work Zone Safety and Mobility Implementation Plan Guidance* with further details for implementation of the policy. The subsequent 2007 CTDOT Consulting Engineers General Memorandum is still in effect, and provides general guidance regarding when Transportation Management Plans (TMPs) are required. The highlights from these memos will be considered to be incorporated into Policy No. E&C-46 as mentioned before.

  The other six (6) policies identified will be reviewed for accuracy and relevancy. The results of the review will be noted in the 2017 Process Review Report. The policies include:
  - E&C-5: Municipal Roads and Streets Affected by Construction
  - E&C-6: Policy on Trafficpersons on Construction Projects
  - E&C-25: Policy on Dissemination of Construction Information to Local Officials
  - E&C-32A: Protective Headgear
  - E&C-32B: Protective Footwear (Steel Toe Shoes)
  - HO-11: Wheel Chocks

Recommendation:

Future policy statements should include references to the applicable portions of 23 CFR 630 Subpart J - Work Zone Safety and Mobility and Subpart K - Temporary Traffic Control Devices, and 23 CFR 655 *Traffic Operations*.

All CTDOT's policies and memoranda related to work zones should be reviewed for relevancy and accuracy every two (2) years.

Compliance: No new policies were created at this time.

Resolution: Not applicable.

- Observation No. 1-2:

  On May 30, 2013, the Connecticut legislature passed Public Act No. 13-92 *An Act Concerning The Safety Of Workers In Roadway Work Zones* that includes a provision in Section 7 for CTDOT to study the implementation of a pilot program concerning the use of alternative colored lights in highway work zones.

  Recommendation:

  Determine if CTDOT should use alternative colored lights on vehicles in work zones based on research of current practices of other states.

  Compliance: None.

  Resolution:

  The findings from the study that was performed indicate that in order to improve motorist and worker safety, the solution is far more complex than revising the color of the warning lights. Many parameters must be considered that include flash pattern, intensity, position, and motorist awareness and responsiveness to these lights. There were not any reports or studies found that have measured the specific success of using colored lights in work zones.

  The studies and surveys performed by the Texas Transportation Institute as well as the work completed under NCHRP Project 13-02 and Report 924 indicate that amber and white warning lights provide increased detectability and are less confusing with other on-road activities such as law enforcement and emergency response. The amber and white colored lights are currently being used by some

of CTDOT Maintenance vehicles so this is a more likely choice to study further for application on CTDOT construction projects.

A pilot program to further study the use of different colored lights is not recommended since there is enough information available from other studies and resources to determine appropriate colored lights in highway work zones.

Since the Department is not recommending the use of alternative colored lights, it was determined that the report to the Legislature's Transportation Committee would be provided upon request.

2013-2014 Work Zone Safety Field Reviews

- Observation No. 2-1:

  The work zone review team completed only four (4) reviews for the 2013 season. This fell short of the goal of completing ten (10) reviews including four (4) in-depth reviews per year as noted in the 2013 annual work zone safety review report.

  Recommendation:

  CTDOT should continue to strive to meet its goal by selecting potential projects to be reviewed at the start of the construction season and diligently schedule them with project personnel.

  Compliance:

  Failure to meet the goal hinders proper evaluation of work zones within the predetermined focus areas.

  Resolution:

  In 2014, the work zone safety review team met the ten (10) reviews per year goal. However, only two in-depth construction reviews were conducted. It should be noted that with a revised streamlined work zone safety focus, CTDOT exceeded the goal for 2015. This will be documented in the 2017 Process Review Report.

- Observation No. 2-2:

  Issues were identified in eight (8) categories: Detours, Signing, Maintenance and Protection of Traffic (M&PT), Traffic Control Devices, Staging, Transportation Management Plans (TMPs), Queues, and Pedestrian Issues. The issues are listed within the Action Items section in this report.
  Recommendation:

  The issues will be assigned to the appropriate office for resolution. The progress of the items will be noted in the 2017 process review report.

  Compliance:

  Some of the issues identified during the field reviews include compliance with project's Maintenance and Protection of Traffic specifications while others concerned the completeness of the project plans.

  Resolution:

  Construction project inspection personnel were immediately notified by the CTDOT Office of Construction of non-compliant issues identified during these field reviews and then again within a report documenting the review.

  CTDOT will include a follow-up procedure after future reviews to verify that corrective actions were taken. If necessary, any reoccurring issues can be addressed programmatically via the annual construction inspection training sessions.

Connecticut Work Zone Improvement Plan (WZIP)

- Observation No. 3-1:

  The WZIP was a very ambitious plan intended to be implemented incrementally over a number of years. The plan was to resolve both action items that are required by regulation as well as observations. However, staffing issues and overly broad goals rendered it unrealistic.

  Recommendation:

  CTDOT needs to streamline its focus, reduce the number of outlying participants, and reduce the duplicity of the tasks to be addressed in order to successfully accomplish initiatives.

  Compliance: None.

Resolution:

The Work Zone Process Review has adopted the role of WZIP in the Department. The team is smaller and more focused than that of WZIP and will primarily concentrate on analyzing the work zone field review observations in the 2013 and 2014 reports for the 2015 Process Review. Those involved can gather information from their unit and for the Process Review. Tasks that will be undertaken will be issues that can be directly and immediately resolved.

Work Zone Program Performance Measures

- Observation No. 4-1:

  There are currently no performance measures for work zone safety and mobility and no goals established for improving work zone safety impacts on traffic. Performance measures need to be developed and tracked to efficiently evaluate and improve safety and mobility in work zones.

  Recommendation:

  Find the means to track work zone safety data with regards to congestion, delays, and crashes, and set appropriate measures and goals to improve the impacts.

  Compliance:

  Starting January 1, 2015, state police incident reports (PR1) now document work zone criteria relating to the crash being reported. This information will be stored in the State's crash data repository at the University of Connecticut which can be queried to find work zone related crashes and tracked to establish patterns for types of crashes.

  Resolution: Not applicable.

BEST PRACTICES

FHWA and CTDOT identified the following noteworthy practices during the 2013-2014 Work Zone Field Reviews:

- Traffic Control Devices: Replacement of shorter traffic cones with 42-inch traffic cones will provide better visibility for motorists driving on high-speed roadways and at night. Subsequently, this has been incorporated in the Maintenance and Protection Special Provisions.
- Detours: Producing detour maps to hand out to the public who stop at the field office to ask for directions have proven helpful for mobility.
- Signing: Providing extra signage for additional guidance and safety.
- Maintenance and Protection of Traffic: Being proactive to install a speed radar trailer for nighttime operations to deter motorists from speeding through the work zone.
- Traffic Control Devices: Having contractor personnel dedicated to checking traffic patterns with follow-ups performed by an inspector two to three times a shift.
- Pedestrian Access: Adding a marked crosswalk from a temporary pedestrian bridge to an existing walkway as a safety measure. It provided guidance across a gas station driveway for pedestrians along with bringing awareness to motorists for pedestrian safety.
- Pavement Markings: Speed limit pavement markings have shown to help raise awareness of and motorist compliance towards legally reduced work zone speed limits.

Another noteworthy practice is public outreach. Informing the public in advance of stage changes or the start of new construction has helped to increase work zone awareness. The public will either alter travel plans to avoid the area altogether or will anticipate approaching work zone, which increases safety due to positive changes in driver behavior before the work zone is even approached (if approached at all).

A best practice that will be considered going forward for the work zone review process is to follow up with reviewed projects to confirm if observations have been addressed. To ensure that procedural changes are effective, follow ups are needed to finalize the evaluation process.

Evaluation of internal processes was not fully executed in 2013 and 2014. Currently there are no best practices for Department policies and procedures for this 2015 process review.

CONCLUSIONS

The main issue identified during the field reviews concerns compliance with the project's Maintenance and Protection of Traffic specifications and plans. As previously noted, construction project inspection personnel were informed by the Work Zone Safety Review Team of non-compliant issues to be corrected. Some of these issues will be addressed programmatically via the construction inspection training sessions and others will be addressed through delegation of action items (Appendix 1) from the Work Zone Process Review. The Office of Construction will periodically hold meetings with the Process Review team members to check the status of the action items and if necessary reallocate resources to bring them to completion.

Ensuring that the goal of conducting a minimum of ten (10) reviews including four (4) in-depth reviews a year is met will help to identify systemic work zone safety issues in a more expeditious manner.

The successful practices that were identified during field reviews will continue to be incorporated into construction project development and administration. Research on improving traffic control devices and public outreach can further supplement the best practices found during the field reviews. Also, the practice of following up on the status of observations with their assigned unit will ensure the best practices and action items as listed in Appendix 1 are addressed and their resolutions incorporated into project designs.

In summary, the findings identified in this Process Review are as follows:

- Use of the 42-inch traffic cones will provide increased visibility to motorists. Compliance with the contractual requirement will continue to be monitored and reinforced during Work Zone Safety meetings.
- Monitoring the traffic control devices installed in a work zone should be conducted periodically by a dedicated contractor staff member during shifts for proper delineation.
- Use of speed radar trailers in work zones is an effective tool in mitigating speeding issues. The inclusion of this item on future projects will be determined by the Division of Traffic Engineering.
- Adequate signage and detour maps are essential for proper guidance to motorists. Compliance will continue to be monitored in the field.
- Ensuring pedestrian access and safety is an emphasis area that will continue to be addressed both in the project design phases and construction field operations.

A future improvement that will transform the review process will be the ability to analyze crash data specifically within work zones. Beginning January 1, 2015, work zone related crash criteria will be available through the use of a new crash report (PR-1) for analysis to set performance metrics. The PR-1 report will help to improve the accuracy of crash reporting. Specifically, it will allow those reporting a crash to describe a work

zone as a possible cause. This information will help engineers design safer work zones.

With the participation of diverse Department personnel in the Work Zone Process Review Team, the recommendations can go directly to the appropriate units for faster response and implementation. Through peer collaboration, Department coordination, and public outreach, CTDOT will continuously emphasize improving safety and mobility on current and future highway projects in the State of Connecticut.

APPENDIX 1: ACTION ITEMS

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Leadership and Policy	Establish strategic goals specifically to reduce congestion, delays, and crashes in work zones.	A. Develop strategic goals for work zone safety (CTDOT and stakeholders) to provide safe and efficient roadway systems. B. Prepare recommendations for comment by SHSP. C. Act on recommendations to implement or return for further action	Construction, Planning	Completed Result: Work Zone Safety being removed as an emphasis area; Rewriting of SHSP in progress
Leadership and Policy	Compile performance measures to track work zone congestion and delay (e.g. vehicle throughput or queue length).	Define metrics for performance measures for queue lengths, speed volume, and delay time.	Construction, Planning	Pending until 2017
Leadership and Policy	Establish performance measures to track work zone congestion and delay (e.g. vehicle throughput or queue length).	Develop criteria to define the limits of work zones and related queues.	Construction, Planning	Pending until 2017

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Leadership and Policy	Establish performance measures to track work zone congestion and delay (e.g. vehicle throughput or queue length).	Establish means to display real time traffic data (Low vehicle throughput and long queue lengths causing congestion and delays in work zones). a. Systems Engineering Analysis. b. Develop RPM Technical Design document for RFP. c. RFP document to be sent to Purchasing/Specification Committee to DAS to Advertising to Award. d. Begin travel time messaging.	Highway Operations	Completed a. Completed b. Completed c. Closed – not being approved as of 11/19/13 d. Completed – 10/14 Result: Highway Ops displays travel time on VMS using another source.
Leadership and Policy	Implement performance measures to track work zone crashes (e.g. crash rates).	Define metrics to be used for performance measure (e.g. type, frequency, location) and develop baseline to determine threshold values for measuring crashes.	Construction, Planning	Pending

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Program Evaluation	Collect work zone congestion and delay performance data for evaluation.	Research equipment to track work zone information such as speed, volume, and delay (i.e. length of queues) in order to establish some performance parameters that can be used in the design of work zones. a. Develop specification and add portable radar speed trailer to a pilot project. b. Obtain and evaluate data collected. c. Revise specification and add to additional projects. d. Establish some performance parameters that can be used in design.	Highway Operations, Planning	Ongoing a. Completed Result: Used on Project 82-299, Arrigoni Bridge, Middletown b. Pending c. Completed Result: Project 60-152/153 d. Pending – Reviewing to develop for more projects.

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Program Evaluation	Collect work zone congestion and delay performance data for evaluation.	Develop reporting system for incident- related delays using IMS. a. Develop database to log incident reports and structure queries. b. Produce monthly reports for analysis. c. Evaluate and develop delay performance measure.	Highway Operations	Pending

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Program Evaluation	Collect data to track, analyze and evaluate work zone safety performance.	Obtain reliable Crash Data in Work Zones. a. Include work zone as representation on crash reports. b. Decrease crash data receipt time. c. Categorize crash data d. Establish criteria addressing crash frequency for design.	Planning, Traffic Engineering	a. Completed Result: Starting January 1, 2015, work zone related criteria can be collected while documenting crashes b. Pending c. Pending d. Pending
Program Evaluation	Conduct customer surveys to evaluate work zone traffic management practices and policies on a statewide/area-wide basis.	Develop a web-based survey questionnaire.	Communications Webmaster, Construction, Maintenance	Pending Note: The Department has a public comments page on the Department's website.

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Program Evaluation	Develop strategies to improve work zone program performance based on work zone performance data and customer surveys.	Work Zone Safety Field Reviews. a. Develop review form and database to log reviews. b. Conduct field reviews. c. Prepare Annual Report.	Construction	Ongoing a. Completed b. Ongoing c. Ongoing - Biannual
Program Evaluation	Develop strategies to improve work zone program performance based on work zone performance data and customer surveys.	Maintain Work Zone Operations Action Item List in Process Review.	Work Zone Process Review Team	Ongoing

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Construction Sign Retro-Reflective Issues	Plastic substrate does not appear to be rigid enough to utilize the reflective properties of the sheeting so that the sign can be read properly by the traveling public during night time hours. Also, condensation found to reduce retro-reflectivity of construction signs.	A. Send Memo requesting removal of signs using plastic substrate. B. Revise specification to exclude plastic substrates. C. Monitor use of new sign provision on new projects. D. Propose research studies - Testing different types of sheeting and substrates to find qualities that provide optimum visibility and durability. E. Conduct additional in-depth reviews regarding condensation. F. Review results and, if necessary, revise specification so that condensation is removed from construction signs.	Construction, Traffic, Planning - Research	A. Completed B. Completed C. Ongoing D. Pending E. Completed – conducted by Project 0044-0151 personnel F. Pending

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Pedestrian/ Bicycle Access Issues	Incomplete sidewalks, pedestrian buttons inaccessible or inoperable, lack of crosswalks at intersections, and lack of handicap ramps.	A. Notify and discuss the review teams' concerns with chief inspectors. B. Review contract documents for specific language, or lack thereof, regarding this type of access. C. Investigate if utility delays are the reason why sidewalks are incomplete. D. Conduct training if necessary. E. Conduct more of these types of reviews to see if these pedestrian/bicycle issues are more widespread. F. Review plans and specifications and revise if necessary.	Traffic, Highway Design, Construction, Maintenance	A. Completed B. Completed C. Completed D. Completed E. Ongoing F. Ongoing

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Project Lighting for Night Construction	Glare from portable light plants affecting motorists traveling through the work zone.	A. Develop a Daily Site Review checklist to be used by project field personnel. B. Develop and distribute work zone safety reminders (i.e. issues memo) for field personnel. C. Review specification requirements.	Construction, Traffic, Safety	A. Completed B. Completed C. Completed
Lighting for Nighttime Inspection	Inspectors working on night projects do not have sufficient lighting to inspect work. This could be previously completed work or areas requested by contractor prior to placement of material.	A. Review specification requirements and found that contractor not required to supply any lighting either hand held or portable light plants. B. Request Specification Committee to include wording that for any night work, portable and hand held lighting is to be supplied by contractor for inspection staff.	Construction, Traffic, Maintenance, Safety	A. Completed B. Ongoing

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Barricade Warning Lights – High Intensity	High-intensity, solar powered warning lights are not effective in rural areas with significant canopy surroundings.	A. Review specification. B. Review specifications of solar powered warning lights in wooded areas. C. Projects should require and monitor battery-operated lights in areas where this may be an issue. D. Add as an item on a Daily Site Review checklist for project personnel.	Construction, Traffic, Safety	A. Completed B. Ongoing C. Ongoing D. Ongoing

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Traffic Control in Work Zones	Experience with and understanding of work zone safety. Establishing levels of enforcement effectiveness (i.e. presence versus enforcement).	A. Continue training at the local and state level. Look at grant resources to provide monies for training. B. Draft an Executive Policy Statement for "Policy on Effective Use of Traffic Persons in Work Zones" for Chief Engineer's approval. C. Work with Bureau of Policy and Planning to include work zones as a required field in crash report. D. Review policies and procedures and guidance documents and revise to meet current MUTCD, new policy and other standards in place at state and federal level. E. Add new section in Division I of Form 816 – Best practices for work zone safety operations.	Construction, Traffic, Maintenance, Safety, State Police	A. Closed Result: No further action by the Department B. Completed Result: Document submitted to Chief Engineer for review and approval. C. Completed D. Pending E. Closed Result: No further action by the Department

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Variable Message Signs	Defining proper placement (i.e. distance from the anticipated queue), proper messaging, and message legibility.	A. Continue to verify proper messaging during reviews. B. Research different types of portable/variable message signs and capabilities to find best approach. C. Develop guidebook for proper use of portable signs and distribute and reference in specifications.	Construction, Traffic, Maintenance, Highway Design, Highway Operations	A. Ongoing B. Ongoing C. Completed
Moveable Barrier Systems	Currently only one system available for use – proprietary – therefore difficult to use on federal participating projects.	A. Need to work with Design to develop a specification and design guidance on positive separation equipment and materials for work zones that are not proprietary and has potential for use on other projects. B. Investigate if other systems have been developed. If so, compare the systems.	Construction, Traffic, FHWA, Highway Design	A. Ongoing B. Ongoing

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Visibility of Signs and Markings	Visibility of retro-reflective properties of construction signs.	Reviewing new MUTCD requirements and incorporating changes into contracts.	Traffic, Construction, Maintenance, FHWA	Ongoing
Visibility of Signs and Markings	Visibility of pavement markings.	Add recessed pavement marking detail and items into contracts to enhance retro-reflective qualities.	Traffic, Construction, Maintenance, FHWA	Completed
Work Zone Safety Review	Improve and enhance the work zone safety review inspection process.	A. Include more photographs/videos of projects. B. Expand the number of field visits. C. Inform project staff of internet sites and pamphlets/documents.	Construction	Completed Note: Enhancements and improvements to the process will continue.

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Project-Level Work Zone Reviews	Inconsistent applications of work zone principles at the project level.	A. Continue reviewing plans and monitor projects for conformance. B. Have project personnel use a Daily Site Review checklist. C. Present Work Zone Policy & Procedure at winter training sessions.	Construction, Maintenance, Safety	A. Ongoing B. Ongoing C. Completed
Traffic Control Device Quality	Inconsistency in accepting devices of acceptable quality.	A. Obtain quality standard field guides. B. Distribute guides on accepting traffic control devices to field staff to use in daily reviews.	Construction, Maintenance, Safety	A. Completed B. Completed
Signing	Breakaway post anchor height does not conform to plans.	A. Review sign mounting detail with project inspector. B. Continue monitoring projects during work zone reviews for compliance.	Construction	A. Completed B. Ongoing

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Signing	Signs appear scuffed and dirty, making them difficult to read.	A. Request project have the signs cleaned. B. Continue monitoring projects during work zone reviews for compliance.	Construction	A. Completed B. Ongoing
Pavement Markings	Existing pavement markings are not eradicated, covered, missing, or worn.	A. Notify project staff of deficiencies. B. Hold a Lessons Learned meeting on recessed markings. C. Use winter training session to remind projects of the importance of maintaining consistent pavement markings. D. Add recessed pavement marking detail and items into contracts to enhance retro-reflective qualities.	Construction, Traffic	A. Completed B. Completed – 9/25/13 C. Completed – Winter 2014 D. Completed – 2/14
Detours	Traffic and detour plans were not included in the plans; project staff has to produce plans as needed.	Address in plan review process	Construction, Traffic Engineering	Ongoing

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Detours	Detours, not included in project plans were requested and granted.	Noted here as a finding.	Not applicable	Completed
Detours	The project installed detour signs per plan, but received complaints that there was not enough signage. Additional signage was added on two separate occasions.	Detour plans need completeness and accuracy.	Engineering	Completed
Maintenance and Protection of Traffic	There were missing delineators on the TPCBC.	Enforce contract specification and plans.	Construction	Ongoing
Maintenance and Protection of Traffic	Pavement drop offs were greater than 3 inches.	Construction should enforce the less than 3 inch drop off requirement or use safety edge.	Construction	Ongoing
Maintenance and Protection of Traffic	Raised manholes need better delineation.	Apply visibility paint on manholes.	Construction	Ongoing

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Maintenance and Protection of Traffic	The DE-7C delineators installed on the TPCBC are not all showing the correct color.	Enforce contract specifications and plans.	Construction	Ongoing
Maintenance and Protection of Traffic	The high intensity barricade warning lights provided in the Contract have not been used. (The reviewer did not locate any notes in the plans indicating the use of these lights.)	Plan notes need completeness and accuracy.	Engineering	Completed – Engineering was advised of issue.
Pedestrian Issues	Crosswalk markings and signage needed to be added for guidance to the temporary pedestrian walkway.	Address specific field conditions as needed.	Construction	Ongoing
Queues	Stopped traffic queue extended in advance of the Series 16 construction sign.	Move state police vehicle to back of queue to improve advance warning and additional Changeable Message Signs.	Engineering, Construction	Pending

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Queues	State police vehicle with flashing lights was not positioned in advance of stopped traffic queue.	Move state police vehicle to back of queue to improve advance warning.	Construction	Construction will initiate a dialogue with CSP on issue
Signing	Uncoordinated lane closures and construction signs between adjacent projects.	Adjust TMP to include coordination of lane closures of both projects.	Engineering	Pending
Signing	Signs need to be installed according to plans.	Enforce contract specifications and plans.	Construction	Ongoing
Signing	Inadequate advance warning signing for temporary lane closure.	Enforce contract specifications and plans.	Construction	Ongoing
Signing	In certain areas it was difficult to install warning signs due to limited space.	Creative plan design for limited access and sign placement.	Engineering	Ongoing

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Signing	Signs that were to be mounted on an inside barrier were relocated because the subsequent stage would not provide enough height clearance for pedestrians.	Consider pedestrian access and use when mounting signs on barrier in all stages.	Engineering	Ongoing
Staging	There was not a stage construction plan for maintaining two lanes of traffic as directed in the Notice to Contractor.	Ensure completeness and accuracy of plans in design reviews.	Engineering, Construction	Ongoing
Traffic Control Devices	Marginal or unacceptable quality of drums, cones and barricades that should be replaced or do not meet standard.	Refer to ATSSA/MUTCD guidelines for quality of traffic devices; Systemic problem since found in 2013 and 2014, training personnel may be needed.	Construction	Ongoing
Traffic Control Devices	Due to an oversight, traffic cones, traffic drums and Type III Barricades were not included in the contract.	Plan review to ensure completeness of contract specifications.	Construction, Engineering	Ongoing

ACTION ITEMS LIST

Category Key		
WZIP Performance Measures Action Items	WZIP Operations Action Items	2013 & 2014 Field Review Findings

Category	Observation	Recommendation	Assigned Office	Status
Traffic Control Devices	The contract quantity for traffic cones was insufficient.	Improve estimating.	Engineering	Ongoing
Traffic Control Devices	There has been an issue with traffic cones being knocked down.	Have a dedicated person to check traffic patterns a few times a night.	Construction	Ongoing
Transportation Management Plan	A copy of the TMP was not readily available for reference in the project field office.	Project Engineer responsible to advise project staff that TMPs are available on ProjectWise.	Construction	Ongoing
Transportation Management Plan	Project staff and Contractor were not aware a TMP was developed for the project.	A. Hold a Lessons Learned meeting on TMPs. B. Develop NTC to include plans in contract documents. C. Include NTC into contract documents. D. Work with Design to get the TMPs into ProjectWise.	Construction, Traffic, Design, Contract Development	A. Completed – 4/10/14 B. Completed – 9/10/14 C. Reviewing, if necessary D. Completed

APPENDIX 2: DEPARTMENT POLICES AND MEMORANDUMS

CONNECTICUT DEPARTMENT OF TRANSPORTATION

POLICY STATEMENT

POLICY NO. E&C - 5
April 8, 2011

SUBJECT: Municipal Roads and Streets Affected by Construction

The following policy shall be used in meetings with municipal officials relative to the treatment of municipal roads and streets affected by proposed highway construction using federal and/or State funding. Municipal roads or streets as defined in this policy are all roads or streets which are not State-maintained.

When a municipal road or street is to be disturbed by proposed construction, the Department's Highway Design Manual (HDM) shall apply, except when the municipality has design criteria or standards which require something greater. State and federal procedures for granting a design exception will be followed for any controlling criteria in the HDM which cannot be met. If existing municipal criteria cannot be met, written approval from the responsible municipal official will be required.

The designer should consider all criteria in the HDM or any town standards and develop solutions that meet the operational and safety requirements, while preserving the aesthetic, historic, or cultural resources of an area. Designers must exercise good judgement on individual projects and, frequently, they must be imaginative, innovative, and flexible in their approach to highway design.

When a municipal road or street is dead-ended by proposed highway construction, a turnaround or hammerhead is to be constructed, if required by municipal standards. If municipal standards do not exist, a determination of an acceptable treatment will be made in conjunction with municipal officials.

(This Policy Statement abolishes Policy Statement No. E&H.O -5 dated January 1, 1999)

James P. Redeker
Acting Commissioner

CONNECTICUT DEPARTMENT OF TRANSPORTATION

POLICY STATEMENT

POLICY NO. E&C -6
March 31, 2004

SUBJECT: Policy on Trafficpersons on Construction Projects

Trafficpersons should be utilized where appropriate to provide for the safe and efficient flow of traffic through a construction project.

The Department of Transportation is responsible for determining when Tafficpersons are necessary. In administering the Trafficperson item, the following will be adhered to:

- On a weekly basis, the Contractor shall inform the Engineer of their scheduled operation for the following week and the number of Trafficperson requested. The Engineer shall review this schedule and approve the type and number of Trafficpersons required.

- State Police Officers shall be uniformed off-duty sworn Connecticut State Police Officers. State Police (Troopers) are to be utilized only on limited access highways and secondary roadways under their primary jurisdiction.

- Uniformed Municipal Police Officers shall be sworn Municipal Police Officers or Uniformed Constables who perform criminal law enforcement duties from the Municipality in which the project is located. Uniformed Municipal Police Officers will be used on all non-limited access highways.

- Uniformed Flaggers shall be persons who have successfully completed flagger training by the ATSSA, National Safety Council, or other programs approved by the Engineer. Uniformed Flaggers will only be used on non-limited access highways to stop or slow traffic.

- A contractor who orders a Trafficperson for his own convenience is not to be reimbursed in the payment estimate. Those charges will be his obligation.

(This Policy Statement supersedes Policy Statement No. HWYS-6 dated April 15, 1988)

CONNECTICUT DEPARTMENT OF TRANSPORTATION

POLICY STATEMENT

POLICY NO. E&C -25
April 15, 1988

SUBJECT: Policy on Dissemination of Construction Information to Local Officials

Area Legislators and Town Officials receive numerous inquires from their constituents concerning our construction projects. It is important that these officials be aware of our projects and have a basic knowledge of the undertaking and anticipated schedule. To effectively accomplish this, it may be necessary to vary procedures depending on the type of projects and its impact upon the community. However, these officials will all be notified of and invited to attend all preconstruction meetings. If additional meetings are warranted, the District Engineer will be responsible for arranging them.

CONNECTICUT DEPARTMENT OF TRANSPORTATION

POLICY STATEMENT

POLICY NO. E&C - 32A
April 8, 2011

SUBJECT: Protective Headgear

Department employees performing certain tasks are required to wear protective, high-visibility headgear for personal safety in accordance with the following:

- Department-issued hard hats are required to be worn in compliance with OSHA Safety Standards and during Department-selected work activities as specified and directed by unit supervisors. During all other fieldwork activities, Department-issued soft caps are required to be worn.

- Employees may remove headgear when they are within fully enclosed vehicles normally driven over the road, such as passenger cars and pickup/dump trucks. Headgear must be worn when employees are stationed on vehicular equipment such as tractors, mowers, and payloaders, even if fully enclosed.

- Headgear will be worn in accordance with guidelines as noted in Safety Topic #35 and based on the type of work activities each unit performs. These guidelines must be utilized for this Policy to be effective.

- In areas not addressed by unit guidelines, the responsibility to wear the proper headgear lies with the individual employee. As with any safety-related policy, common sense and good judgement must rule.

Department supervisors will strictly enforce this Policy with noncompliance resulting in progressive disciplinary action.

(This Policy Statement abolishes Policy Statement No. E&H.O -35A dated October 1, 1999)

James P. Redeker
Acting Commissioner

CONNECTICUT DEPARTMENT OF TRANSPORTATION

POLICY STATEMENT

POLICY NO. E&C - 32B
April 8, 2011

SUBJECT: Protective Footwear (Steel Toe Shoes)

The Department, in order to insure the safety of all personnel under its jurisdiction, requires that those persons engaged in construction, surveys, bridge/field inspections, or general maintenance field activities wear protective footwear at all times when on the job (refer to Safety Training Topic #35).

Whenever it becomes necessary for other Department personnel to go into an area where protective footwear is required, such personnel shall also comply with this Policy.

Department supervisors will strictly enforce this Policy with noncompliance resulting in progressive disciplinary action.

(This Policy Statement abolishes Policy Statement No. E&H.O -35B dated March 31, 2004)

James P. Redeker
Acting Commissioner

CONNECTICUT DEPARTMENT OF TRANSPORTATION

POLICY STATEMENT

POLICY NO. E&C - 40
April 8, 2011

SUBJECT: Work Zone Safety and Accessibility

The Department is committed to ensure a safe and accessible highway environment for all users of the roadway (motorist, pedestrian, and bicyclist) traveling through a work zone and to establish a safe and secure area for those who must construct and maintain the highway system.

In order to achieve a safe and accessible highway environment during construction and maintenance periods, a uniform set of vehicular traffic control plans have been developed to establish a consistent application of traffic control patterns. These plans were developed using the principles set forth in the Manual of Uniform Traffic Control Devices (MUTCD), published by the Federal Highway Administration in cooperation with the American Association of State Highway and Transportation Officials. When applicable, these plans shall be utilized by all Department units, contractors, and permittees working within the highway right-of-way.

It is recognized that the development of detailed standards that would be adequate to cover all construction and maintenance applications is not practical. There will be occasions when the typical set of signs or other traffic control devices will not adequately address the field conditions impacting vehicles, pedestrians, or bicyclists for a given project. Such conditions should be anticipated and special traffic control plans, specifications, and/or transportation management plans reflecting the principles set forth in the MUTCD should be developed for the particular project or activity to address the identified concerns. All mobility modes should be considered in the development of project-specific plans. In particular, the level of accessibility for disabled individuals that was experienced prior to the project should be provided during construction and maintenance operations.

(This Policy Statement abolishes Policy Statement No. E&H.O -46 dated February 19, 2009)

James P. Redeker
Acting Commissioner

CONNECTICUT DEPARTMENT OF TRANSPORTATION

POLICY STATEMENT

POLICY NO. E&C - 46
April 8, 2011

SUBJECT: Systematic Consideration and Management of Work Zone Impacts

It is the policy of the Department to systematically consider and manage work zone impacts of significant projects.

In establishing this Work Zone policy, the Department's objectives are to:

1. Provide a high level of safety for both workers and the public.
2. Minimize congestion and community impacts.
3. Provide both maintenance forces and contractors adequate access to the highway to efficiently conduct their work.

In order to meet these objectives, appropriate planning, design, construction, maintenance, and public awareness strategies shall be employed on all significant projects. For the purposes of this policy, a significant project is defined as:

> A stationary highway construction or maintenance activity which causes sustained mobility impacts on I-84, I-91, I-95, I-291, I-384, or I-691 for more than three (3) days with either intermittent or continuous lane closures. In addition, any highway construction or maintenance activity that alone or in combination with other concurrent activities nearby, which is expected based on engineering judgment, to cause sustained mobility impacts that are considered greater than what is considered tolerable relative to typical traffic operations experienced in the area of the work zone, may be declared a significant project.

It is recognized that the Department's emergency operations may not always allow a systematic consideration of work zone impacts. In such situations, the objectives of this policy will be honored as much as practicable.

(This Policy Statement abolishes Policy Statement No. E&H.O -57 dated August 10, 2007)

James P. Redeker
Acting Commissioner

CONNECTICUT DEPARTMENT OF TRANSPORTATION

POLICY STATEMENT

POLICY NO. HO - 11
April 8, 2011

SUBJECT: Wheel Chocks

The Department shall, in order to maximize the safety of all personnel under its jurisdiction as well as the public, require all Department employees responsible for vehicles or equipment operation to deploy wheel chocks anytime the vehicle or equipment is not under the direct control of the operator.

This Policy shall apply to the following vehicles, equipment, and conditions:

- All vehicles with a gross vehicle weight of 10,000 pounds or greater.
- All towed-behind equipment including, but not limited to, compressors, wood chippers, and mixers.
- Any other State vehicles used to transport materials, equipment, or personnel except for pickup trucks, passenger and cargo vans, passenger vehicles, loaders, loader backhoes, rollers, graders, roadside tractor mowers, or other similar types of motorized equipment.
- Wheel chocks shall be of a type and design appropriate for the type of vehicle or equipment being secured.
- Wheel chocks shall be deployed in front of and behind the rear wheel of the vehicle at all times it is not under the direct control of the operator. This includes, but is not limited to, when vehicles are parked at job sites, staging areas, compound areas, parking lots, while inside garages, or at other times when the vehicle must be left and secured.
- Towed equipment must be chocked anytime it is not secured to the tow vehicle.

Violation of this Policy will result in progressive discipline for the operator of the vehicle or the individual responsible for the equipment being used and, in the case of field operations, the on-site supervisor or individual in charge of the operation.

Discipline for a violation of this Policy shall be a minimum of a written warning for an initial violation. More severe discipline shall be issued for repeated violations and/or those involving property, vehicle damage, or personal injury. Such increased discipline may include suspensions, demotions, unsatisfactory service ratings, or termination of employment.

Department supervisors shall strictly enforce this Policy with noncompliance resulting in progressive disciplinary action. Compliance with this Policy will result in a safer operation for Department employees as well as the public.

(This Policy Statement abolishes Policy Statement No. E&H.O -52 dated March 21, 2005)

James P. Redeker
Acting Commissioner

Draft

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

memorandum

subject Work Zone Safety and Mobility Policy and Implementation Plan

date: August 6, 2007

To Mr. Charles Barone
Mr. James H. Norman
Mr. Robert P. Mongillo
Mr. Lewis Cannon

from Michael W. Lonergan
Acting Bureau Chief
Bureau of Engineering
and Highway Operations

In September 2004, the Federal Highway Administration (FHWA) published updates to the Work Zone regulations contained in 23 CFR 630 Subpart J. The updated rule is referred to as the Work Zone Safety and Mobility Rule (Rule) and applies to all State and local governments that received Federal-aid highway funding. Transportation agencies are required to comply with the provisions of the Rule by October 12, 2007.

The Rule requires agencies to develop and implement an agency-level Work Zone Safety and Mobility policy to support systematic consideration and management of work zone impacts across all stages of project development. In order to develop this required policy, as well as prepare an associated implementation plan, a Rule Steering Committee was established by the Department. Members of this multi-disciplinary committee included representatives from the FHWA and Offices of Construction, Maintenance, Engineering, and Intermodal Planning.

The attached draft Department policy entitled "Policy on Systematic Consideration and Management of Work Zone Impacts" is in conformance with the Rule and by copy of this memorandum is being forwarded to Commissioner Carpenter's Office for approval. The policy defines which Department projects are subject to the Rule and allows an exception for unplanned emergency operations.

The attached implementation plan has been developed to provide guidance to your offices in complying with the Rule. The plan identifies several assignments and ongoing responsibilities for the units under your supervision which will be necessary for compliance. It should be noted that your Offices will need to develop more specific project and program level procedures to institutionalize the letter and spirit of the Rule. Your representatives to the Rule Steering Committee should be utilized as resources in this effort.

It has been determined that in Connecticut all "significant" projects, as defined by the policy, that begin their planning, preliminary engineering or preliminary design phase on or after October 1, 2007, or whose design completion date (DCD) is on or after October 1, 2008, shall be in accordance with the Rule. For those "significant" projects with a DCD during Federal Fiscal Year 2008 (October 1, 2007 to September 30, 2008), the FHWA, in coordination with the Department, will approve PS&E following confirmation that the appropriate TMP components have been incorporated in compliance with the Rule. Please take the steps necessary to ensure the Department's compliance with the Rule by these dates.

Attachment(s)
cc: Bradley Keazer (FHWA)
Robert Ramirez (FHWA)

TAN
JFC
JJO
TMW
CC

FROM THE DESK OF
TIMOTHY M. WILSON

AUG 0 8 2007

	F.Y.I.	PLS. DO	PLS. SEE ME
W. BRITNELL			
T. GAFFEY			
H. HAYWARD			
R. ZBROZEK			

John F. Carey:jyk

cc: Comr. Carpenter – Dep. Comr. Boice – Dep. Comr. Curtis – Dep. Comr. Martin
David Crowther – Please process the attached Policy for Commissioner Carpenter's approval.
Arthur W. Gruhn – Michael W. Lonergan - Richard T. Jankovich
James H. Norman, Acting Engineering Administrator
Timothy Wilson
Carmine Trotta
Robert P. Mongillo-Charles A. Drda-Ronald Cormier-David A. Sawicki-John Carey (Maintenance)
Mark Rolfe
John F. Carey

CONSULTING ENGINEERS
GENERAL MEMORANDUM 07-09

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING AHIGHWAY OPERATIONS
OFFICE OF ENGINEERING

Work Zone Safety and Mobility Policy and
Implementation Plan

September 18, 2007

To: CONSULTING ENGINEERS

Enclosed is guidance concerning the Department of Transportation's (Department) Work Zone Safety and Mobility (WZS&M) Implementation Plan in keeping with SAFETEA-LU legislation. In particular, your attention is directed to the implementation date of the WZS&M Plan requirements.

A primary goal of adopting this Plan is to ensure a broad assessment of work zone safety and mobility issues on a statewide or regional level, in addition to the project specific contract controls historically included in project design. Responsibility for documenting that assessment on a project-by-project basis will fall to the Designer with substantial input from the Department.

Much of the specifics for implementing this WZS&M Plan are going to evolve over a period of time, but the initial framework is summarized below.

A determination of "significance" will be made for each project and that determination will be revisited periodically during the life of the project. A project determined to be "significant" for work zone concerns will need a Transportation Management Plan (TMP) consisting of Temporary Traffic Control (TTC) Plan(s), a Transportation Operations (TO) Plan, and a Public Involvement/Outreach (PI or PO) Plan. Documentation of the overall TMP will take place in the Design Report which is required with the standard milestone submission (Preliminary, Semi Final, Final Plans for Review, and Final Plans).

Some elements of the TMP will be presented in the contracts plans (such as the TTC Plan(s)) and specifications (Prosecution and Progress, Maintenance and Protection of Traffic). Other elements of the TMP might involve procedures and functions the Department will provide such as outreach efforts, diversionary route signing and other regional traffic control initiatives outside the realm of the Construction Contract.

One particular element of the legislation that you should be aware of is the mandated training (and potential certification). This issue has not been fully resolved; but at a minimum, designers with responsibility for the TMPs will need to be appropriately trained.

Department staff will discuss implementation of this directive with each consulting firm on a project-by-project basis.

Very truly yours,

Thomas A. Harley, P.E.
Manager of Consultant Design
Bureau of Engineering and Highway Operations

Enclosure

APPENDIX 3: 2013 & 2014 WORK ZONE SAFETY REVIEW ANNUAL REPORTS

2013 WORK ZONE SAFETY REVIEWS

State of Connecticut

Prepared By:

Connecticut Department of Transportation

Office of Construction

Terri Thompson
Bonney Whitaker
Kiah Patten

2800 Berlin Turnpike

Newington CT, 06131

CONNECTICUT
2013 WORK ZONE SAFETY REVIEW REPORT

The report was prepared by the Connecticut Department of Transportation and the reviews have been completed to conform to the requirements of the Department's Work Zone Safety Improvement Plan, specifically Table 3, Work Zone Self-Assessment Element No. 8, Program Evaluation.

The Plan was developed in response to the recommendations in the 2011 Connecticut Work Zone Safety and Mobility Process Review Report and is evidence of Connecticut's compliance with 23 CFR 630.1008.

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Submitted By: _____

Terri Thompson
Transportation Supervising Engineer
Bureau of Engineering and Highway Operations

Approved By: _____

Lewis S. Cannon
Construction Administrator
Bureau of Engineering and Highway Operations

INTRODUCTION

The Connecticut Department of Transportation (CTDOT) with the assistance of the Federal Highway Administration (FHWA) conducts work zone field reviews (audits) as a means to assess current field practices relative to applying work zone safety and mobility processes and procedures on these projects. These field reviews are an important tool to promote better understanding of the operational and design characteristics of a work zone. They help CTDOT develop improvements in the area of design, construction and operations.

The reviews are conducted annually to help evaluate varying aspects of work zones paying particular attention to the current practices and designs being used in the Connecticut Department of Transportation's (CTDOT) work zones.

The reviews began in 2010 as a means to better understand and evaluate different characteristics of a work zone and the strategies and procedures that could be improved upon or used as a "best practices" example. In-depth field reviews include key personnel from the project, Office of Construction, Division of Traffic, Division of Safety and the Federal Highway Administration (FHWA). Reports are created to document both successes and needed areas of improvement, not only within the project limits but also within Department policies or procedures. The goal is to take the "Lessons Learned" and improve upon the various disciplines that are involved in work zone engineering, design and implementation.

The issues that arise as a result of these reviews are considered for incorporation into the Work Zone Improvement Plan and added to working group action item issues. Refer to Table 3, 4, 4a and 5 in Appendix A of this report.

Projects are chosen from each of the four districts in the state: District 1- Central Connecticut; District 2- Eastern Connecticut; District 3- Southwestern Connecticut and District 4- Western Connecticut. Priority is given to project reviews that have unique features, challenges or innovative practices.

WORK ZONE SAFETY REVIEW EXECUTIVE SUMMARY

The projects were selected with the objective of conducting reviews with various types of activities, challenges and also look at projects during daytime and nighttime hours since operations do differ based on light conditions. The field reviews are scheduled to include various types of projects in construction and maintenance. The Reviews can range from a full audit of all work zone aspects to a selected audit of particular work zone elements such as pedestrian accessibility, pattern deployment, quality of traffic control devices and innovative techniques.

The review team was unable to complete more than 4 reviews for the 2013 season. CTDOT will continue to strive for at least 10 reviews per year which includes four in-depth reviews.

The areas for the reviews in 2013 were: 1) Temporary Signalization 2) Detour 3) Night and 4) Stage Construction. Five (7) issue areas were identified: detours, signing, maintenance and protection of traffic, traffic control devices, traffic queues, transportation management plans, and staging. The report contains an executive summary, copies of work zone reviews, project action items generated from reviews, and updated tables that are also included in the Work Zone Improvement Plan. It should be noted that this is an evolving evaluation process. It is the intent that these reviews will continue every construction season, in order to continually improve work zone safety for construction crews and the traveling public.

The 2013 Work Zone Safety and Mobility field reviews were conducted using the same Work Zone Review Form and Checklist developed in 2010. The information is then entered into an Access database that can be used to analyze and identify possible design issues, material defects, specification problems, training needs for inspectors, policy and procedural issues, and best practices.

The primary user group for the information will be the Work Zone Operations Working Group under the Work Zone Improvement Plan recently signed by the FHWA and CTDOT. The Plan was developed in response to the Work Zone Safety and Mobility Process Review (Process Review) completed during the 2010 calendar year to comply with the requirements of 23 CFR Part 630, Preconstruction Procedures, Subpart J—Work Zone Safety and Mobility.

The Working Group will focus on elements related to work zone traffic management practices and policies on a statewide/area-wide basis. Many of the tasks for the working group are derived from information obtained during the work zone reviews. This group will evaluate and make recommendations for changes or improvements to the various elements that are a part of work zone traffic management practices and policies. This may include: improvements to traffic control devices; creating, updating, and revising specifications; development of guidance documents; and the use of innovative practices for the safety of the highway workers and the traveling public.

Some of the issues and good practices from the 2013 reviews are as follows:

1. Detours
   - Traffic and detour plans were not included in the plans; project staff has to produce plans as needed.
   - Detours, not included in project plans were requested and granted.

2. Signing
   - Uncoordinated Lane Closures and Construction Signs between adjacent projects.
   - Additional signs need to be installed according to plans.
   - Inadequate advance warning signing for temporary lane closure.

3. Maintenance and Protection of Traffic
   - There were missing delineators on the TPCBC,
   - Pavement drop offs were greater than 3 inches.
   - Raised manholes need better delineation.

4. Traffic Control Devices
   - Marginal or unacceptable quality of drums, cones and barricades that should be replaced or do not meet standard.
   - Replacement of smaller traffic cones with 42” traffic cones as good practice.

5. Staging
   - There was not a stage construction plan for maintaining two lanes of traffic as directed in the Notice to Contractor.

6. Transportation Management Plans (TMPs)
   - A copy of this document was not readily available for reference in the project field office.

7. Queues
   - Stopped traffic queue extended in advance of the Series 16 construction sign.
   - State police vehicle with flashing lights was not positioned in advance of stopped traffic queue.

Table of Contents

• **Introduction**

• **Executive Summary**

• **Project Action Items**

• **Temporary Signalization**

0081-0088	Route 147, Middlefield	2013

• **Detour Reviews**

0088-0178	Route 174, New Britain	2013

• **Night Reviews**

0102-0278*	I-95 & Route 1, Norwalk	2013

• **Stage Construction**

0151-0296	Chase Avenue, Waterbury	2013

***** ***Indicates project had an in-depth review performed***

• **Appendix A**

Table 3
Table 4
Table 4A
Table 5

• **Review Participants and Distribution List**

Project Action Items

2013 Work Zone Review Issues

2013 Work Zone Review Issues

Proj.ID	Comments
81-88	1. The project did not contain a stage construction plan for maintaining two lanes of traffic as directed in the Notice to Contractor – Durham Fair.
88-178	1. Traffic & detour plans were not included in the plans; therefore project staff has to produce plans as needed. 2. Traffic detour was to use Dewey Street, however the police has changed detour due to the narrow size of Dewey. 3. Project needs to have signs that indicate if side streets do not allow access to East Main St. 4. A "Bump" sign needs to be installed on Smalley Street. 5. There is an inappropriate "End Road Work" sign posted on the detour route in the middle of Smalley St. 6. Raised manholes need to have better delineation. 7. Project has good use of Municipal Police Officers for detour route.
102-278	1. Transportation Management Plan (TMP) – a copy of this document was not readily available for reference in the project field office. This is intended to be a living document, and should be reviewed and revised as appropriate throughout the life of the construction project (which for this project is approximately 3 years). 2. Uncoordinated Lane Closures and Construction Signs between adjacent projects – a permanent message sign on I-95 northbound (MP 13.8) located in advance of this project only displayed lane closure information for the project immediately east (north) of this project between Exits 16 and 18. At the request of Terri Thompson during this inspection, the message was changed to encompass the lane closures for both projects (i.e., between Exits 14 and 18). 3. Double Lane Closure Operation - a delayed start of the lane closure activities (due to the work zone review meeting from 8 pm to 10:30 pm) resulted in the single lane closure for I-95 southbound to be conducted between approximately 10:45 pm and 11 pm. This was immediately followed by a simultaneous left and center lane closure for I-95 northbound in one operation beginning around 11 pm. The I-95 northbound lane closures resulted in a stopped traffic queue which extended to a location in advance of the Series 16 construction sign for this project (see additional comments under State Police).

4. State Police – during the lane closure activities on I-95, the location of the state police vehicle with flashing lights should have been positioned in advance of the stopped traffic queue. For I-95 northbound, this (temporary) queue extended along a curve in advance of the Series 16 construction sign for this project at MP 13.84 located east (north) of Exit 13. On this night, only 2 of the 3 requested state police officers reported to the construction project, and since one was already stationed in the I-95 southbound construction work zone, two officers were not available to facilitate the I-95 northbound lane closures.

5. Portable Message Sign**:** There was an activated portable message sign located in the gore area of Exit 13 for I-95 northbound. Should the Series 16 construction sign at MP 13.84 be re-located in advance of Exit 13?

6. We have verified that the Speed Limit change from 55 to 45mph through the project was not approved by OSTA (former STC) due to the proposed short distance of the zone change request. It was determined that the length of approximately one mile was not a sufficient zone length. Please note that; Page MPT-05 of the project plans was revised during Design to reflect this determination. This plan sheet shows mapping of the project location and the lead-in signing prior to the project construction limits. However, the signing revision as reflected in this plan sheet was not incorporated into the field as the original lead-in signing layout was observed. The change to this lead-in signing sheet is noted in signs "D" and "G". Sign "D" which reads: 45 MPH Speed Zone Ahead; was to be changed from 41-5509 to 80- 5509. The only difference in these two signs is the background color change from yellow to orange. Sign "G" was changed from 31-5507: Speed Limit 45; to 80-9508; Reduce Speed to 45 MPH. Also, the subsequent MPT sheets were not revised. They show the regulatory (black/white) 55 mph signs being replaced with regulatory 45 mph signs. It is suggested that the Regulatory 45 MPH signs be changed to orange signs. However there is no identical replacement for a black/white to an orange/black speed limit sign. In accordance with the MUTCD, our choice for posting a construction speed limit is the use of an advisory speed plaque in combination with a warning sign. Therefore, we could add 80-9569 (45MPH) plaques below the "Lanes Narrow" and Shoulder Closed" advance construction signs. The existing Speed Limit 45 MPH signs should be removed and the 55 MPH signs reinstalled. Also as stated in the MUTCD, these regulatory signs may be covered during construction operations involving lane closures, where the lower advisory speed limit is recommended.

7. During the review it was noted that the 48 inch Orange Diamond "45 MPH Speed Zone Ahead" signs were difficult to read due to the small and narrow font letter size used on these signs. To improve the effectiveness of this sign, a larger (72 in x 24 in) "Construction Area 45 MPH" (80-9518) could be used.

	8. It was observed that the post mounted advance construction signs were only installed on the right side of the roadway in both directions. As I-95 normally provides three lanes in each direction, it is recommended that all advance signs be installed on both the left and right sides of the road. In accordance with the contract specifications, Item 971001A, "On multi- lane divided highways, advance warning signs shall be installed on both sides of the highway". The only exception to this condition should be where there is not adequate median width to accommodate the width of the left side sign assembly. Where possible, comply. 9. On I-95 southbound, there was a mixture of yellow and white and missing delineators on the TPCBC. Please install DE-7 delineators as shown on Standard Sheet TR-1205-01. 10. On U.S. Route 1 N.B., there was inadequate advance warning signing for the temporary lane closure. Refer to Traffic Control Plan no.10 included in the project M&PT special provisions. 11. Temporary pavement marking should be installed on U.S. Route 1 between Taylor Ave. and southern project limit. 12. Install "Road Closed" and "Stop" signs on Cedar Street at the intersection of U.S. Route 1 and Cedar St. 13. There were some blue arrow signs guiding motorists out of the work zone from Cedar Street and Summit Avenue. Were those arrows intended to guide motorists to U.S. Route 1? If so, add signs black and white "To Route 1" with black and white arrows instead. 14. Please install sidewalk closed sign nos. 80-9075 and 80-9076 on the eastside of U.S. Route 1 from Fairfield Avenue to Taylor Avenue. 15. Some of the traffic cones and drums were in unacceptable condition. Please replace the traffic cones and drums that are no longer reflective. 16. On U.S. Route 1 N.B., the "End Road Work" sign should be installed prior to Stuart Avenue.

Proj.ID	Comments
151-296	1. Pavement drop offs were significantly greater than 3 inches. 2. Some utility poles were too close to the edge of travel way. As a temporary measure, use Traffic Cones to delineate those utility poles that were too close to the edge of travel way. 3. Project requested 42” traffic cones to replace smaller ones. Also requested lane dividers. 4. Project plans were not clear as to how job was to be constructed without detour on Cooke Street. The Contractor requested and was granted the right to detour. 5. Section 1.08 Prosecution & Progress needed to be added in the Addendum. 6. Chief inspector’s safety vest needed replaced.

2013 Work Zone Safety Review Participants

District 1	District 1
Project 81-88 Seth Burgess – Project Manager Joseph Grasso – Office of Traffic Bonney Whitaker – Office of Construction	Project 88-178 Stephen Bombero – Project Manager, STV Inc. David Ferraro – Project Engineer Brien Smith – Office of Traffic Terri Thompson – Office of Construction Bonney Whitaker – Office of Construction
District 3	**District 4**
Project 102-278 William Slade – HAKS Eugene Fuks – HAKS Aldo Tartaglino – O&G Industries Robert Turner – FHWA Robert Nowak – Project Engineer Anthony Kwentoh – Office of Construction Terri Thompson – Office of Construction Philip Cohen – Office of Traffic Oddler Fils – Office of Traffic Bonney Whitaker – Office of Construction Jeffery Hunter – Office of Construction	Project 151-296 Stephen Zappone – Project Manager Oddler Fils – Office of Traffic Bonney Whitaker – Office of Construction

WORK ZONE REVIEW FORM

Project Number: 0081-0088 **District No. 1**
Date: September 5, 2013 **Weather: Pt. Cloudy, 75°F**

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☐ Limited Access ☒ Secondary ☐ Local / Town
Inspection Forces: ☒ State ☐ Maintenance ☐ Consultant

Location (Route & Town): Bridge No. 01398 Route 147 over Coginchaug River, Middlefield

Focus of Review: Lane Closure: ☐ Temporary ☒ Permanent; ☐ Stage Construction
☐ Detour; ☐ Pedestrian/ Bike issues; ☒ Temporary Signalization; ☐ Night Work

Prime Contractor: New England Road, Inc.

Project Engineer: James Ruitto **Chief Inspector:** Seth Burgess

Project Amount: $1,694,522.40 **Percent Complete:** 25%

Calendar Days completed: 122 **Calendar Days Allotted:** 512

Review Participants

Name	Representing
Seth Burgess	District 1 Construction
Joseph Grasso	Office of Traffic
Bonney Whitaker	Office of Construction

Q&A:

1) Is there clear, positive, understandable guidance through the work zone? Yes. All signs and pavement markings installed according to plans.

2) What is the overall condition of traffic flow through the work zone? (Include queue length and speed limit, roadway condition). May have a queue of 8 to 10 vehicles during rush hour that clears after one signal cycle. Roadway condition is deteriorated.

3) Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs). No. Blunt ends protected by temporary impact attenuation systems. Precast concrete barrier curb installed according to plans.

4) Are there any horizontal/vertical clearance issues? No.

5) Are there any permitted load issues? No.

6) Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements? Yes.

7) Are all cones, drums, barricades, or other channelization devices acceptable? Yes.

8) Are warning lights and devices used for Maintenance and Protection of Traffic? All advance construction warning signs have barricade warning lights – high intensity.

9) Clear Zone issues: (Y / N) Respond to questions below.

   a. What is the clear zone for this project? Thirty feet off traveled way.

   b. Where are materials stored for the project? Due to wetland areas, materials are brought in as needed. Minimal storage behind concrete barrier.

   c. Where is equipment stored when construction is not in progress? Behind concrete barrier.

10) Have accommodations been made to account for
   a. Emergency Services – The First Selectman has been the contact/liaison. Temporary signalization has emergency vehicle pre-emption installed.
   b. Pedestrian/ Bike/ ADA issues? N/A

11) Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain. No. The contractor has been quick to address any issues.

12) Pavement Markings- Temporary
   a. Is there an item for removal of pavement markings? If yes, indicate removal method being used. Experimental item added by CO: 6" Black Aggregate Cover-Up Resin Pavement Markings.
   b. Are there conflicting markings? No
   c. Are the temporary markings legible? Yes. If night review, comment on visibility
   d. Type of marking material being used. ☐ Tape ☒ Paint (non-epoxy) ☐ Epoxy (See question 12a)

13) Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? If no, explain. Yes

14) Type of Traffic Control Personnel being used on project? Indicate type of training or certification for each and position within the work zone area.

   ☒ State Police

   ☒ Local Police Minimum Hourly Requirement: 4 hours

   ☐ Uniformed Flagger

   Comments from Traffic Control Personnel (indicate type of traffic person): not asked.

15) Chief Inspector Comments: The project did not contain a stage construction plan for maintaining two lanes of traffic as directed in the Notice to Contractor – Durham Fair.

16) Project Engineer Comments: Not available for review.

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	Construction
Location	Throughout project
Mounting Height	Acceptable
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	Signs are clean and visible.
Reflectorized/Sheeting Type	Bright fluorescent sheeting
Project Consistency	Very good
Need to be covered	No
Temp./Permanent	Permanent

Table B – Traffic control Devices

Requirement	Comment
Type & Placement	Traffic drums
Quantity	6 each
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized	Yes
Anchored	Rubber base
Consistent throughout project	Yes

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	Temporary precast concrete barrier curb.
Quantity	Eighteen (18) each.
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	N/A
Reflectorized	DE-7C delineators
Anchored	Pinned to each other.
Consistent throughout project	Yes.
Crash Trucks (TMA) in use? If yes how many and type	N/A

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	Barricade warning lights installed on advance construction warning signs. One light was not functioning. Inspector was notified. High intensity.
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	N/A
Location of portable devices – Indicate if in clear zone and how protected.	N/A
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	N/A

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. No

What special provisions are there in contract related to work zone (list item no, description and date of provision)?
0970006 Trafficperson (Municipal Police Officer), Rev. 1/2008
0970007 Trafficperson (Uniformed Flagger), Rev. 1/2008
0971001 Maintenance & Protection of Traffic, Rev. 21/21/11
0979003 Construction Barricade Type III, Rev. 1/17/01
0981101 Opposing Traffic Lane Divider, Rev. 10/15/10
1118101 Temporary Signalization, date not posted
1220013 Construction Signs – Bright Fluorescent Sheeting, Rev. 1/5/12
1803064 Type B Impact Attenuation System (Tangential) Replacement Parts, Rev. 4/12/07
1803071 Type B Impact Attenuation System (Tangential), Rev. 4/12/07

Is the project being completed in stage construction? If yes, explain. Stage 1A and 1B will shift traffic to south portion of existing bridge in order to remove the north portion of the existing structure, abutments and pier. The north portion of the proposed structure and abutments will be constructed. Stage 2A and 2B will shift traffic to the north portion of the proposed bridge in order to remove the remaining portion of the existing bridge, abutments and pier. The remaining portion of the proposed bridge, abutments and pier will be constructed.

Is there temporary signalization? If yes, explain. Temporary signalization is installed at approach roadway to maintain an alternating one-way traffic operation during stage construction.

Is a detour required or being used? If yes, explain. A detour plan was not part of the contract. However, the project has been working with the town to put an alternate route in place to accommodate traffic during the Durham Fair.

What guides, tools including manuals, pocket guides, books etc. do you reference?
The contract, the Form 816 and the project plans.

What work zone traffic plans are included in the project? Maintenance & Protection of Traffic and Temporary Signal Plan.

Has the project had any incident reports filed? No How many? N/A

Temporary signalization installed with stop bar, sign and new edge line.

Advance construction warning sign.

Temporary impact attenuation system protects blunt end of TPCBC.

Good covering of existing pavement markings with experimental resin pavement marking

WORK ZONE REVIEW FORM

Project Number: 88-178 **District No. 4**
Date: October 3, 2013 **Weather: Mostly Sunny, 78°**

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☐ Limited Access ☒ Secondary ☐ Local / Town
Inspection Forces: ☐ State ☐ Maintenance ☒ Consultant

Location (Route & Town): Route 174, New Britain (New Britain-Hartford Busway Contract 2)

Focus of Review: Lane Closure: ☒ Temporary ☐ Permanent; ☐ Stage Construction
☒ Detour; ☐ Pedestrian/ Bike issues; ☐ Temporary Signalization; ☐ Night Work

Prime Contractor: E & S Joint Venture II

Project Engineer: Dave Ferraro **Chief Inspector: Stephen Bombero**

Project Amount: $39,427,150.00 **Percent Complete: 63%**

Calendar Days completed: 469 **Calendar Days Allotted: 766**

Review Participants

Name	Representing
Stephen Bombero	STV Inc.
Dave Ferraro	District 4 Construction
Brien Smith	Office of Traffic
Terri Thompson	Office of Construction
Bonney Whitaker	Office of Construction

Q&A:

1) Is there clear, positive, understandable guidance through the work zone? Detour signs were in place; however several side streets were closed off at E. Main Street, but advance notice was not in place at Smalley Street to note there wasn't access to East Main St. (Rte. 174). Several drivers were observed having to turn around to get back on the detour.

2) What is the overall condition of traffic flow through the work zone? (Include queue length and speed limit, roadway condition). A queue will form at Smalley & East Street at rush hour. During this time the police officer is transferred from East Main St. to direct traffic at the intersection.

3) Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs). No

4) Are there any horizontal/vertical clearance issues? No

5) Are there any permitted load issues? No

6) Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements? Noted two "Bump" signs that were spray-painted on the back of other signs.

7) Are all cones, drums, barricades, or other channelization devices acceptable? There were some cones and drums that require replacement.

8) Are warning lights and devices used for Maintenance and Protection of Traffic? No

9) Clear Zone issues: (Y / N) Respond to questions below.

   a. What is the clear zone for this project?

   b. Where are materials stored for the project? Either at the field office location or onsite in a closed off area.

   c. Where is equipment stored when construction is not in progress? Same as "b" above.

10) Have accommodations been made to account for
   a. Emergency Services – The Contractor contacts the city & emergency services. The Project has the services of a Program Manager. The project publishes weekly updates online with CT*fastrack* Construction News.
   b. Pedestrian/ Bike/ ADA issues? The sidewalks were closed. A pedestrian detour was not designed, so pedestrians had to use the closed roadway.

11) Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain.

12) Pavement Markings- Temporary
   a. Is there an item for removal of pavement markings? If yes, indicate removal method being used. Area was a full depth reconstruction which removed any pavement markings.
   b. Are there conflicting markings?
   c. Are the temporary markings legible? If night review, comment on visibility
   d. Type of marking material being used. ☐ Tape ☐ Paint (non-epoxy) ☐ Epoxy

13) Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? If no, explain. Yes.

14) Type of Traffic Control Personnel being used on project? Indicate type of training or certification for each and position within the work zone area.

   ☒ Local Police Minimum Hourly Requirement: New Britain (4 hours)
   Newington (4/8 hours)

   ☐ Uniformed Flagger

15) Chief Inspector Comments: Traffic plans were not included in project plans.

16) Project Engineer Comments: Office of Traffic needed to be more involved in this project. The Contract did not provide proper quantities for signs, drums, cones & trafficpersons.

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	Construction
Location	Throughout project
Mounting Height	Acceptable
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	Signs were clean and visible
Reflectorized/Sheeting Type	Type III Reflective Sheeting
Project Consistency	Good
Need to be covered	Detour signs removed or covered at night
Temp./Permanent	Temporary

Table B – Traffic control Devices

Requirement	Comment
Type & Placement	Traffic drums
Quantity	Not counted
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	The majority of the drums were clean and visible with few exceptions
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	Not reviewed
Quantity	
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	
Reflectorized	
Anchored	
Consistent throughout project	
Crash Trucks (TMA) in use? If yes how many and type	

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	N/A
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	N/A
Location of portable devices – Indicate if in clear zone and how protected.	Changeable message sign located on the median island of the bridge over Route 9.
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	Portable with one frame displayed. Sign is turned off at night since only the closure dates are displayed and not the time of closure.

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. No

What special provisions are there in contract related to work zone (list item no, description and date of provision)?
0821189A Concrete Barrier Transition Section, rev. date not posted
0822010A Remove Temporary Precast Concrete Barrier Curb, rev. date not posted
0970006A Trafficperson (Municipal Police Officer), Rev. 1/2008
0970007A Trafficperson (Uniformed Flagger), Rev. 1/2008
0971001A Maintenance & Protection of Traffic, Rev. Date not posted
0979003A Construction Barricade Type III, Rev. 1/17/01
0981101A Opposing Traffic Lane Divider, rev. date not posted
1803060A Type B Impact Attenuation System (Non-Gating), Rev. 07/31/08
1803062A Type B Impact Attenuation System (Non-Gating) Replacement Parts, Rev. 07/31/08
1807104A (05A)(06A)(08A) Relocation of Temporary Impact Attenuation System A Module (700 LB)(1400 LB)(2100 LB)(400 LB), Rev. Date not posted

Is the project being completed in stage construction? If yes, explain. No.

Is there temporary signalization? If yes, explain. No

Is a detour required or being used? If yes, explain. Yes. Project activity includes full depth reconstruction of Route 174. Traffic is detoured off of Route 174 and onto East Street, Smalley Street, Dewey Street and Stanley Street. Detour is in place from 9 a.m. to 3 p.m.

What guides, tools including manuals, pocket guides, books etc. do you reference?

What work zone traffic plans are included in the project? Project specific plans were not included.

Has the project had any incident reports filed? No How many? N/A

Comments:
1. Traffic & detour plans were not included in the plans; therefore project staff has to produce plans as needed.
2. Traffic detour was to use Dewey Street, however the police has changed detour due to the narrow size of Dewey.
3. Project needs to have signs that indicate if side streets do not allow access to East Main St.
4. A “Bump” sign needs to be installed on Smalley Street.
5. There is an inappropriate “End Road Work” sign posted on the detour route in the middle of Smalley St.
6. Raised manholes need to have better delineation.
7. Project has good use of Municipal Police Officers for detour route.

Side street blocked at East Main Street. There was not notification at beginning of side streets that there was not access to East Main Street (Rte. 174).

Two "Bump" signs were spray painted on the back of other signs due to theft of signs

Detour arrow

East Main Street closed to traffic

WORK ZONE REVIEW FORM

IN DEPTH

Project Number: 0102-0278 **District No. 3**
Date: August 21, 2013 **Weather: Clear night, 67°F**

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☒ Limited Access ☐ Secondary ☐ Local / Town
Inspection Forces: ☐ State ☐ Maintenance ☒ Consultant

Location (Route & Town): Reconstruction of I-95 & Route 1, Norwalk

Focus of Review: Lane Closure: ☒ Temporary ☐ Permanent; ☒ Stage Construction
☐ Detour; ☐ Pedestrian/ Bike issues; ☐ Temporary Signalization; ☒ Night Work

Prime Contractor: O & G Industries

Project Engineer: Bob Nowak **Chief Inspector:** Bill Slade

Project Amount: $42,776,974.00 **Percent Complete:** 34%

Calendar Days completed: 419 **Calendar Days Allotted:** 975

Review Participants

Name	Representing
William Slade	HAKS-Consultant
Eugene Fuks	HAKS-Consultant
Aldo Tartaglino	O&G Industries
Robert Turner	FHWA
Robert Nowak	Construction-District 3
Anthony Kwentoh	Office of Construction
Terri Thompson	Office of Construction

(Continued on page 7)

Q&A:

1) Is there clear, positive, understandable guidance through the work zone? Yes

2) What is the overall condition of traffic flow through the work zone? (Include queue length and speed limit, roadway condition). Refer to Comment 3 on page 5.

3) Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs). No.

4) Are there any horizontal/vertical clearance issues? No

5) Are there any permitted load issues? No

6) Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements? Yes

7) Are all cones, drums, barricades, or other channelization devices acceptable? The majority of devices were acceptable. Many cones were marginal and some devices should be replaced.

8) Are warning lights and devices used for Maintenance and Protection of Traffic? Signs have warning lights attached – all working

9) Clear Zone issues: (Y / N) Respond to questions below.

   a. What is the clear zone for this project? 30 feet

   b. Where are materials stored for the project? Gore area at Exit 14; behind barriers; access road reviewed by the Office of Traffic

   c. Where is equipment stored when construction is not in progress? Route 7 off-ramp

10) Have accommodations been made to account for
   a. Emergency Services – Coordinating with Norwalk; flyers; website
   b. Pedestrian/ Bike/ ADA issues? Norwalk asked to minimize pedestrian detour signs & sidewalk closed. Pedestrians still have access.

11) Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain. No.

12) Pavement Markings- Temporary
   a. Is there an item for removal of pavement markings? If yes, indicate removal method being used. Yes. Grinding.
   b. Are there conflicting markings?
   c. Are the temporary markings legible? If night review, comment on visibility
   d. Type of marking material being used. ☐ Tape ☒ Paint (non-epoxy) ☐ Epoxy

13) Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? Class 2 vests at night, no pants. Consultant wears Class 3.

14) Type of Traffic Control Personnel being used on project? Indicate type of training or certification for each and position within the work zone area.

   ☒ State Police

   ☒ Local Police Minimum Hourly Requirement: 4 hours

   ☐ Uniformed Flagger; (In contract. It has not being used)

15) Chief Inspector Comments: O&G took initiative to install protective screen to reduce rubbernecking. Contractor adds additional arrow signs for lane closures.

16) Project Engineer Comments: Suggested that the police run radar every night to get drivers to slow down. There have been a few accidents with drums in median. It is a narrow area which forms a queue. Requested 45 MPH signs. Project should not be responsible for ordering State Police.

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	Construction
Location	Throughout project on I-95
Mounting Height	Acceptable
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	Yes
Reflectorized/Sheeting Type	Type III Reflective sheeting
Project Consistency	Good
Need to be covered	No
Temp./Permanent	Permanent

Table B – Traffic control Devices

Requirement	Comment
Type & Placement	
Quantity	
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	
Reflectorized	
Anchored	
Consistent throughout project	

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	Traffic cones
Quantity	Not counted
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Many cones were marginal.
Reflectorized	Some reflective bands were dull.
Anchored	
Consistent throughout project	Yes
Crash Trucks (TMA) in use? If yes how many and type	Three crash trucks

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	Warning lights used on advanced warning signs. All lights were functioning. High intensity.
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	Portable arrow. One light out.
Location of portable devices – Indicate if in clear zone and how protected.	In shoulder.
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	Permanent and portable signs in use. Highway Operations was notified to change the message on the permanent sign to provide a clearer understanding of upcoming lane closures. Refer to comment No. 2.

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. Yes. Project 102-278 requires intermittent, but not continuous, Route I-95 lane closures. Therefore, it meets the definition of a significant project.

What special provisions are there in contract related to work zone (list item no, description and date of provision)?
Item #0970006 Trafficperson (Municipal Police Officer), Rev. 1/2008
Item #0970007 Trafficperson (Uniformed Flagger), Rev. 1/2008
Item #0971001 Maintenance & Protection of Traffic, Rev. 10/07/2011
Item #0979003 Construction Barricade Type III, Rev. 1/17/01
Item #1131002 Remote Control Changeable Message Sign, Rev. 10/06/2011
Item #1220013 Construction Signs - Bright Fluorescent Sheeting, Rev. 1/17/01
Item #1803071 Type B Impact Attenuation System (Tangential), Rev. 4/12/07
Item #1803072 Type B Impact Attenuation System (Median/Gore), Rev. 4/12/07

Is the project being completed in stage construction? If yes, explain. Stages I95-1 and I95-2 include I-95 widening & bridge construction, Stages US1-1 – US1-3B include reconstruction of US Route 1.

Is there temporary signalization? If yes, explain. Temporary signalization installed at four sites when the Contractor revises or relocates the existing signal or installs temporary traffic signal equipment.

Is a detour required or being used? If yes, explain. Detour for Cedar Street bridge closure. Project detour plans provided for Cedar St., Taylor Ave. and Fairfield Ave., I95 SB on-ramp and I-95 SB Exit 14.

What guides, tools including manuals, pocket guides, books etc. do you reference?

What work zone traffic plans are included in the project? Maintenance & Protection of Traffic for various stages of construction.

Has the project had any incident reports filed? Yes How many? 11
Not using wrecker service. According to project staff, practice has shown it is not necessary.

Comments:

Provided by Robert Turner (FHWA):

1. Transportation Management Plan (TMP) – a copy of this document was not readily available for reference in the project field office. This is intended to be a living document, and should be reviewed and revised as appropriate throughout the life of the construction project (which for this project is approximately 3 years).

2. Uncoordinated Lane Closures and Construction Signs between adjacent projects – a permanent message sign on I-95 northbound (MP 13.8) located in advance of this project only displayed lane closure information for the project immediately east (north) of this project between Exits 16 and 18. At the request of Terri Thompson during this inspection, the message was changed to encompass the lane closures for both projects (i.e., between Exits 14 and 18).

3. Double Lane Closure Operation – a delayed start of the lane closure activities (due to the work zone review meeting from 8 pm to 10:30 pm) resulted in the single lane closure for I-95 southbound to be conducted between approximately 10:45 pm and 11 pm. This was immediately followed by a simultaneous left and center lane closure for I-95 northbound in one operation beginning around 11 pm. The I-95 northbound lane closures resulted in a stopped traffic queue which extended to a location in advance of the Series 16 construction sign for this project (see additional comments under State Police).

4. State Police – during the lane closure activities on I-95, the location of the state police vehicle with flashing lights should have been positioned in advance of the stopped traffic queue. For I-95 northbound, this (temporary) queue extended along a curve in advance of the Series 16 construction sign for this project at MP 13.84 located east (north) of Exit 13. On this night, only 2 of the 3 requested state police officers reported to the construction project, and since one was already stationed in the I-95 southbound construction work zone, two officers were not available to facilitate the I-95 northbound lane closures.

5. Portable Message Sign**:** There was an activated portable message sign located in the gore area of Exit 13 for I-95 northbound. Should the Series 16 construction sign at MP 13.84 be re-located in advance of Exit 13?

Provided by Phil Cohn (Traffic Engineering)

6. We have verified that the Speed Limit change from 55 to 45mph through the project was not approved by OSTA (former STC) due to the proposed short distance of the zone change request. It was determined that the length of approximately one mile was not a sufficient zone length. Please note that; Page MPT-05 of the project plans was revised during Design to reflect this determination. This plan sheet shows mapping of the project location and the lead-in signing prior to the project construction limits. However, the signing revision as reflected in this plan sheet was not incorporated into the field as the original lead-in signing layout was observed. The change to this lead-in signing sheet is noted in signs "D" and "G". Sign "D" which reads: 45 MPH Speed Zone Ahead; was to be changed from 41-5509 to 80-5509. The only difference in these two signs is the background color change from yellow to orange. Sign "G" was changed from 31-5507: Speed Limit 45; to 80-9508; Reduce Speed to 45 MPH.

   Also, the subsequent MPT sheets were not revised. They show the regulatory (black/white) 55 mph signs being replaced with regulatory 45 mph signs.
   It is suggested that the Regulatory 45 MPH signs be changed to orange signs. However there is no identical replacement for a black/white to an orange/black speed limit sign. In accordance with the MUTCD, our choice for posting a construction speed limit is the use of an advisory speed plaque in combination with a warning sign. Therefore, we could add 80-9569 (45MPH) plaques below the "Lanes Narrow" and Shoulder Closed" advance

construction signs. The existing Speed Limit 45 MPH signs should be removed and the 55 MPH signs reinstalled. Also as stated in the MUTCD, these regulatory signs may be covered during construction operations involving lane closures, where the lower advisory speed limit is recommended.

7. During the review it was noted that the 48 inch Orange Diamond "45 MPH Speed Zone Ahead" signs were difficult to read due to the small and narrow font letter size used on these signs. To improve the effectiveness of this sign, a larger (72 in x 24 in) "Construction Area 45 MPH" (80-9518) could be used.

8. It was observed that the post mounted advance construction signs were only installed on the right side of the roadway in both directions. As I-95 normally provides three lanes in each direction, it is recommended that all advance signs be installed on both the left and right sides of the road. In accordance with the contract specifications, Item 971001A, "On multi-lane divided highways, advance warning signs shall be installed on both sides of the highway". The only exception to this condition should be where there is not adequate median width to accommodate the width of the left side sign assembly. Where possible, comply.

Additional comments provided by Oddler Fils (Traffic Engineering) as a result of daytime review on 9/5/13:

9. On I-95 southbound, there was a mixture of yellow and white and missing delineators on the TPCBC. Please install DE-7 delineators as shown on Standard Sheet TR-1205-01.

10. On U.S. Route 1 N.B., there was inadequate advance warning signing for the temporary lane closure. Refer to Traffic Control Plan no.10 included in the project M&PT special provisions.

11. Temporary pavement marking should be installed on U.S. Route 1 between Taylor Ave. and southern project limit.

12. Install "Road Closed" and "Stop" signs on Cedar Street at the intersection of U.S. Route 1 and Cedar St.

13. There were some blue arrow signs guiding motorists out of the work zone from Cedar Street and Summit Avenue. Were those arrows intended to guide motorists to U.S. Route 1? If so, add signs black and white "To Route 1" with black and white arrows instead.

14. Please install sidewalk closed sign nos. 80-9075 and 80-9076 on the eastside of U.S. Route 1 from Fairfield Avenue to Taylor Avenue.

15. Some of the traffic cones and drums were in unacceptable condition. Please replace the traffic cones and drums that are no longer reflective.

16. On U.S. Route 1 N.B., the "End Road Work" sign should be installed prior to Stuart Avenue.

Review Participants (continued from page 1)

Name	Representing
Philip Cohn	Office of Traffic
Oddler Fils	Office of Traffic
Bonney Whitaker	Office of Construction
Jeff Hunter	Office of Construction

WORK ZONE REVIEW FORM

Project Number: 151-296 **District No. 4**
Date: June 26, 2013 **Weather: Humid, 90°**

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☐ Limited Access ☐ Secondary ☒ Local / Town
Inspection Forces: ☒ State ☐ Maintenance ☐ Consultant

Location (Route & Town): Chase Avenue, Waterbury

Focus of Review: Lane Closure: ☐ Temporary ☐ Permanent; ☒ Stage Construction
☐ Detour; ☐ Pedestrian/ Bike issues; ☐ Temporary Signalization; ☐ Night Work

Prime Contractor: Dayton Construction Company

Project Engineer: James Zaharevich **Chief Inspector: Stephen Zappone**

Project Amount: $5,589,848.50 **Percent Complete: 41%**

Calendar Days completed: 288 **Calendar Days Allotted: 392**

Review Participants

Name	Representing
Stephen Zappone	District 4
Oddler Fils	Office of Traffic
Bonney Whitaker	Office of Construction

Q&A:

1) Is there clear, positive, understandable guidance through the work zone? Yes

2) What is the overall condition of traffic flow through the work zone? (Include queue length, speed limit and roadway condition). Traffic flow was good. Police officers were directing at side streets to allow for equipment to safely maneuver in & out.

3) Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs). There were areas where the pavement drop off along the edge of travel way was greater than 3 inches; however the travel way was delineated with traffic drums.

4) Are there any horizontal/vertical clearance issues? No

5) Are there any permitted load issues? No

6) Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements? Yes

7) Are all cones, drums, barricades, or other channelization devices acceptable? The majority were acceptable. There were some traffic drums that should be replaced.

8) Are warning lights and devices used for Maintenance and Protection of Traffic? The contractor requested that the use of barricade warning lights be waived.

9) Clear Zone issues: (Y / N) Respond to questions below.

   a. What is the clear zone for this project? Fourteen feet from edge line.

   b. Where are materials stored for the project? Staging area or behind barrier.

   c. Where is equipment stored when construction is not in progress? Same as b above.

10) Have accommodations been made to account for
   a. Emergency Services – Waterbury's traffic engineer notifies appropriate sources.
   b. Pedestrian/ Bike/ ADA issues? No issues. North side sidewalk is open.

11) Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain. No.

12) Pavement Markings- Temporary
   a. Is there an item for removal of pavement markings? If yes, indicate removal method being used. Yes. Grinding is performed in the project limits and black tape is installed beyond the project limits.
   b. Are there conflicting markings? No.
   c. Are the temporary markings legible? Yes. If a night review, comment on visibility.
   d. Type of marking material being used. ☒ Tape ☒Paint (non-epoxy) ☐ Epoxy

13) Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? If no, explain. Yes.

14) Type of Traffic Control Personnel being used on project? Indicate type of training or certification for each and position within the work zone area.

   ☐State Police

   ☒Local Police Minimum Hourly Requirement: 4 Hours

   ☒Uniformed Flagger

   Comments from Traffic Control Personnel (indicate type of traffic person): not asked.

15) Chief Inspector Comments: Stage construction needs to be clearly stated, especially for side streets. He would like cross sections for stage construction. Also, traffic plans should mention synchronizing of lights.

16) Project Engineer Comments: Not available.

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	Construction
Location	Throughout project
Mounting Height	Acceptable
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	Yes
Reflectorized/Sheeting Type	Type III Reflective Sheeting
Project Consistency	Good
Need to be covered	No
Temp./Permanent	Permanent

Table B – Traffic control Devices

Requirement	Comment
Type & Placement	Not reviewed
Quantity	
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	
Reflectorized	
Anchored	
Consistent throughout project	

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	Traffic drums
Quantity	Not counted
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	The majority of drums were acceptable. There were a few drums that should be replaced.
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes
Crash Trucks (TMA) in use? If yes how many and type	N/A

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	Contractor request to have warning lights waived was granted.
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	N/A
Location of portable devices – Indicate if in clear zone and how protected.	Portable message sign at beginning of project protected by three Type 3 barricades.
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	Portable message sign. Two frames displayed. Frame timing is acceptable.

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. No

What special provisions are there in contract related to work zone (list item no, description and date of provision)?
0970006 Trafficperson (Municipal Police Officer), Rev. 1/2008
0970007 Trafficperson (Uniformed Flagger), Rev. 1/2008
0971001 Maintenance and Protection of Traffic, Rev. 3/19/07
0979003 Construction Barricade Type III, Rev.1/17/01
1118051 Temporary Signalization (Site No. 1), Rev. 1-09
1118052 Temporary Signalization (Site No. 2), Rev. 1-09
1118301 Relocate Pre-emption System (Site No. 1), Rev. 1-09
1220011 Construction Signs - Type III Reflective Sheeting, Rev.1/17/01

Is the project being completed in stage construction? If yes, explain. Yes. Stage 1 reconstructs the south side of the road and Stage 2 reconstructs the north side of the road.

Is there temporary signalization? If yes, explain. Yes. Two sites have temporary signalization installed.

Is a detour required or being used? If yes, explain. The contract plans did not include a detour. The Contractor requested a detour for Cooke Street and received permission to detour traffic during the day.

What guides, tools including manuals, pocket guides, books etc. do you reference? Manual on Uniform Traffic Control Devices (MUTCD on-line).

What work zone traffic plans are included in the project? Stage construction plans

Has the project had any incident reports filed? No. How many? N/A

Comments:
1. Pavement drop offs were significantly greater than 3 inches.
2. Some utility poles were too close to the edge of travel way. As a temporary measure, use Traffic Cones to delineate those utility poles that were too close to the edge of the travel way.
3. Project requested 42” Traffic Cones to replace smaller cones. Also requested lane dividers.
4. Project plans were not clear as to how job was to be constructed without detour on Cooke Street. The Contractor requested and was granted the right to detour.
5. Section1.08 Prosecution & Progress needed to be added in the Addendum.
6. Chief inspector’s safety vest needed replaced.

Good spacing of traffic drums.

Detour Signs

Utility pole at edge of road could benefit from additional delineation.

Variable Message Sign
Type 3 Barricade stripes need to all slope downward in the direction road users are to pass.

Appendix A

Connecticut Work Zone Improvement Plan (WZIP) Tables

- *Table 3 –Action Areas*
- *Table 4* - Work Zone Operations (WZO) Action Item Issues
- *Table 4A* – Completed Issues
- *Table 5* - Work Zone Performance Measures (WZPM) Action Item Issues

TABLE 3 – Connecticut Work Zone Improvement Plan (WZIP) Action Areas

Updated 11/1/13

	Critical Issue Area	Recommendations for Improvement	Actions and/or Products, including Major Steps, if any, and Resources Needed	Responsible Office/ Position/ Person	Status	Target Completion Date
	Work Zone Self-Assessment Elements					
1	**Leadership and Policy**	A) Establish strategic goals specifically to reduce congestion and delays in work zones. B) Reduce crashes in work zones. (Added October 18, 2013 WZIP Meeting)	1. Form working groups comprised of various stakeholders that can assist in improvement. a) Establish Work Zone Operations (WZO) Working Group and Work Zone Performance Measures (WZPM) Working Group. b) Schedule meeting for both groups to go over action plan and issues list from work zone reviews 2. Define other safety plans and programs that include Work Zone Safety elements 3. Develop strategic goals for work zone safety (CTDOT and stakeholders) to provide safe and efficient roadway systems. 4. Prepare recommendation(s) for implementation of strategic goals for review and comment by the SHSP Champion. 5. Act on recommendations to implement or return for further action 6. Approve strategic goals and incorporate into SHSP	1a. T. Thompson 1b. Chairpersons - currently T. Thompson and C. Kissane 2. WZO and WZPM Chairpersons 3. WZO and WZPM Chairpersons 4. WZO and WZPM Chairpersons and SHSP Champion 5. SHSP Champion 6. SHSP Champion and SHSP steering committee	1a. Completed 1b. Completed- May 29, 2013 2. Completed 3. Ongoing 4. Pending 5. Pending 6. Pending	1a. Completed 1b. Completed 2. Completed 3.To Be Determined 4.To Be Determined 5.To Be Determined 6.To Be Determined
2	**Leadership and Policy**	Implement strategic goals specifically to reduce crashes in work zones.	1. Establish a Work Zone Safety Advocate/Liaison that reports to upper management and coordinates with various offices, agencies and organizations to brainstorm and identify reasonable strategic goals to improve mobility in work zones and handle delays more effectively.	Office of Commissioner	Pending	To Be Determined

TABLE 3 – Connecticut Work Zone Improvement Plan (WZIP) Action Areas

Updated 11/1/13

	Critical Issue Area	Recommendations for Improvement	Actions and/or Products, including Major Steps, if any, and Resources Needed	Responsible Office/ Position/ Person	Status	Target Completion Date
	Work Zone Self-Assessment Elements					
3	**Leadership and Policy**	Establish performance measures (e.g. vehicle throughput or queue length) to track work zone congestion and delay	1. Define metrics for performance measures considering - Queue lengths - Speed - Volume - Delay time 2. Development of criteria to define the limits of work zones and related queues 3. Establish means to capture real time traffic data.- Low vehicle throughput and long queue lengths causing congestion and delays in work zones a) Systems Engineering Analysis - Needs Assessment and Functional Requirements b) Develop RPM Technical Design document for RFP c) RFP Document to be sent to Purchasing / Specification Committee d) RFP Document to be sent to DAS e) RFP Advertising to Award f) Begin Travel Time messaging.	1-2. WZPM 3. Highway Operations 3a-b) Consultant with input from stakeholders including WZO and WZPM 3c) Highway Operations 3d) Highway Operations 3e) DAS/Purchasing 3f) Highway Operations	1-2 Pending. Refer to Table 5 3. Ongoing 3a-b) Completed 3c-e) As of November 19, 2013 RFP is not being approved. 3f) In progress	1-2. To Be Determined 3a) Completed 3b) Completed 3c-e) Tabled 3f) TBD

TABLE 3 – Connecticut Work Zone Improvement Plan (WZIP) Action Areas

Updated 11/1/13

	Critical Issue Area	Recommendations for Improvement	Actions and/or Products, including Major Steps, if any, and Resources Needed	Responsible Office/ Position/ Person	Status	Target Completion Date
	Work Zone Self-Assessment Elements					
4	**Leadership and Policy**	Implement performance measures (e.g., crash rates) to track work zone crashes	1. Define metrics to be used for performance measure - Type - Frequency - Location 2. Develop baseline to determine threshold values to be used a basis of measuring crashes 3. Approval of metrics and baseline	1. WZPM 2. WZO / WZPM SHSP Champion 3. SHSP Champion and SHSP steering committee	1. Pending. Refer to Table 5 2. Pending. Refer to Table 5 3. Committee meetings to decide	1. To Be Determined 2. Coincides with data collection effort 3. Pending
5	**Program Evaluation**	Collect data to track, analyze and evaluate work zone congestion and delay performance.	1. Research equipment to track work zone information such as speed, volume, and delay (length of queues) in order to establish some performance parameters that can be used in the design of work zones. a) Develop specification and add to project as pilot b) Obtain and evaluate data collected c) Revise specification and add to additional projects d) Establish some performance parameters that can be used in the design of work zones 2. Develop reporting system to output incident related delays utilizing current in place system to obtain data a) Develop database to log incident reports and structure queries b) produce monthly reports for analysis c) Evaluate and develop delay performance measure.	1. Highway Operations 1a) Terri Thompson and John Korte 1b) PDP Associates – company furnishing system 1c) Terri Thompson and John Korte 1d) Bureau of Engineering & Construction- Offices of Traffic Engineering Design Services, Construction 2. WZO with OIS	1. Ongoing 1a) Implemented on Project No. 0082-0299, Arrigoni Bridge Middletown 1b) Received data 1c) Project No. 0060-0152/0153. 1d) Pending 2. Pending	1a) 2011 1b) January 2014 1c) March 2014 1d) To Be Determined 2. Pending

TABLE 3 – Connecticut Work Zone Improvement Plan (WZIP) Action Areas

Updated 11/1/13

	Critical Issue Area	Recommendations for Improvement	Actions and/or Products, including Major Steps, if any, and Resources Needed	Responsible Office/ Position/ Person	Status	Target Completion Date
	Work Zone Self-Assessment Elements					
			and message legibility. c) Approve recommendations and incorporate into specifications, policies and practices for Department	and Engineering & Construction		
8	**Program Evaluation**	1. Develop strategies to improve work zone performance based on work zone performance data and customer surveys.	1. Work Zone Traffic Control Reviews a) Develop review form and database to document evaluations. Review sections include - Q&A - Traffic Control Devices - Plans and specifications b) Perform Field Reviews c) Prepare Annual Report 2. Maintain Action List for Working Groups (WZO/WZPM) a) Define issue and problem statement, with expected outcome b) Review issues and develop or revise as needed - Actions Required, Status, Time Frame and Responsible parties c) Update action list and report out on activities to SHSP Champion.	1. Bureau of Engineering & Construction- Office of Construction 1a) Jeff Hunter 1b) Work Zone Review Group – includes personnel from FHWA, Office of Construction, Traffic, Safety, and Highway Operations 1c) Office of Construction 2. Work Zone Review Group	1. Ongoing 1a) Completed 1b) 2010 through 2013 completed 1c) Completed 2. Revisions for Tables 3, 4 and 5 under review Refer to Table 4 and Table 5	1. Ongoing 1a) Completed 1b) Min. 10 per year 1c) 2011 and 2012 combined in one report November 1, 2013 2. N/A 2c) Present revisions as part of WZIP Annual Meeting

TABLE 3 – Connecticut Work Zone Improvement Plan (WZIP) Action Areas

Updated 11/1/13

	Critical Issue Area	Recommendations for Improvement	Actions and/or Products, including Major Steps, if any, and Resources Needed	Responsible Office/ Position/ Person	Status	Target Completion Date
	Work Zone Self-Assessment Elements					
6	**Program Evaluation**	1. Collect data to track, analyze and evaluate work zone safety performance	1. Obtain reliable Crash Data in Work Zones a) Accurate representation on accident reports and include work zone as primary element on crash report b) Decrease time to get crash data c) Categorize crash types d) Incorporate crash frequency in the design of future projects in the area.	1a-b) Bureau of Policy & Planning 1c) Bureau of Policy and Planning 1d) Bureau of Engineering and Construction Engineering –Design and Traffic	1. a-c) Dependent on CTDOT Vehicle Crash Reporting System www.ct.gov/dot/crashinitiative	1a-c) Adopt new motor vehicle crash reporting January 1, 2015
7	**Program Evaluation**	Conduct customer surveys to evaluate work zone traffic management practices and policies on a statewide/area-wide basis	1. Customer Surveys a) Develop questionnaire for survey for web based application b) Info System setup for webpage c) Conduct Survey d) Compile information and develop needs list based on customer feedback e) Recommend new practices and polices based on needs list f) Submit for approval and implementation g) Approve recommendations and incorporate into specifications, and practices for Department 2. Maximize the best visibility and reading capability for the traveling public a) Research different types of portable/variable message signs and capabilities to find best approach. b) Recommend changes to specifications, policies and practices based on research (i.e. distance from the anticipated queue), proper messaging,	1. WZO 1a) Work Zone Safety Awareness Working Group 1b) OIS 1c) WZO / WZPM 1d) Chairpersons WZO / WZPM 1e-g) SHSP Champion and Bureau Chief 2a) WZO Highway Operations 2b) SHSP Champion 2c) Bureau Chiefs for Highway Operations	1. Pending 2. Pending	1a) January 2014 1b) January 2014 1c) March 2014 1d) June 2014 1e) TBD – Present at WZIP Annual Meeting 1f-g) To Be Determined 2. To Be Determined

TABLE 4- Work Zone Operations (WZO) Working Group Action Item Issues

* Refer to Table 4a for completed actions

Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
1	**Construction Sign Retro-Reflective Issues**	Plastic Substrate does not appear to be rigid enough to utilize the reflective properties of the sheeting so that the sign can be read properly by the traveling public during night time hours. Condensation found to reduce retro-reflectivity of construction signs.	Improved visibility of signs by the traveling public.	A)* B)*	C) Monitor use of new sign provision on new projects. D) Propose research studies - Testing different types of sheeting and substrates to find qualities that provide optimum visibility and durability. E) Additional in-depth reviews regarding condensation conducted by Project 0044-0151 personnel. Review and, if necessary, revise specification so that condensation is removed from construction signs.	A)* B)* C) Ongoing D) Pending E) Pending further review	A) * B)*	Office of Construction Traffic Engineering
2	**Pedestrian /Bicycle Access Issues**	Incomplete sidewalks, pedestrian buttons inaccessible or inoperable, lack of crosswalks at intersections, and lack of handicap ramps.	Improved pedestrian and bicycle awareness and accessibility through design and construction	A) Notified and discussed the review teams' concerns with chief inspectors. B) Reviewed contract documents for specific language, or lack thereof, regarding this type of access. C) Investigate if utility delays are the reason why sidewalks are incomplete. D) *	E) Conduct more of these types of reviews to see if these pedestrian/bicycle issues are more widespread. F) Review plans and specifications and revise if necessary.	C) Ongoing D) * E,F) Continue reviewing plans and monitoring projects for conformance	D)* E,F) Ongoing	Traffic Engineering Highway Design Office of Construction Office of Maintenance Mon-motorized Transportation Coordinator

TABLE 4- Work Zone Operations (WZO) Working Group Action Item Issues

* Refer to Table 4a for completed actions

Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
3	**Project Lighting for Night Inspection**	Refer to Table 4a Completed Issues						
4	**Lighting for Night-Time Inspection**	Inspectors working on night projects do not have sufficient lighting to inspect work. This could be previously completed work or areas requested by contractor prior to placement of material.	Increase visibility for inspecting night time and improve overall visibility of work area.	A) Reviewed specification requirements and found that contractor not required to supply any lighting either hand held or portable light plants.	B) Place request to specification committee to include wording that for any night work, portable and hand held lighting is to be supplied by contractor for inspection staff.	B) In the process of reviewing current M&PT and work zone requirements included in special provisions and standard specifications.	Ongoing	Office of Construction Traffic Engineering Office of Maintenance Safety Division
5	**Barricade Warning Lights - High intensity**	High-intensity, solar powered warning lights are not effective in rural areas with significant canopy surroundings.	Ensure that lights are operational under all conditions.	Reviewed specification.	Revise current provision to state exclusion of solar powered warning lights in rural areas. Projects should require and monitor battery-operated lights in areas where this may be an issue. Add as an item on the Daily Site Review checklist referenced is Issue No. 3.	Discussing with the Office of Traffic about possibly changing the plans or revising the specification to allow either solar or battery-operated.	Ongoing	Office of Construction Traffic Engineering Safety Division

TABLE 4- Work Zone Operations (WZO) Working Group Action Item Issues

* Refer to Table 4a for completed actions

Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
6	**Traffic Control in Work Zones**	Experience with and understanding of work zone safety. Establishing levels of effectiveness (i.e. presence versus enforcement).	Consistent practices and implementation of use of traffic persons. Better educated traffic control persons who will provide effective direction in work zones.	"Safe and Effective Use of Connecticut Law Enforcement Personnel in Work Zones" training curriculum now available online. Visit University of Connecticut Technology Transfer (T2) Center at http://www.t2center.uconn.edu/	A) Continue training at the local and state level. Look at grant resources to provide monies for training. B) Executive Policy Statement for "Policy on Effective Use of Traffic Persons in Work Zones". C) Work with Bureau of Policy and Planning to include work zones as a required field in accident report* D) Review policies and procedures and guidance documents and revise to meet current MUTCD, new policy and other standards in place at state and federal level E) Add new section in Division I of Form 816 – Best practices for work zone safety operations	A) T2 continues to provide training but funding is an issue since many local towns and municipalities, as well as, Police Standards Training Academy do not have funds available to pay for this course. Limited to a Train-the-Trainer scenario so they can teach their own. B) Final Draft completed C) * D) Ongoing E) Pending	A) Ongoing B) Pending Awaiting Commissioner signature C)* D) TBD E) 4 months	Office of Construction Traffic Engineering Office of Maintenance State Police Safety Division
7	**Variable Message Signs**	Defining proper placement (i.e. distance from the anticipated queue), proper messaging, and message legibility.	Maximize the best visibility and reading capability for the traveling public.	Continue to verify proper messaging during reviews.	A) Research different types of portable/variable message signs and capabilities to find best approach.	A) Pending	TBD	Office of Construction Traffic Engineering Office of Maintenance Highway Design

TABLE 4- Work Zone Operations (WZO) Working Group Action Item Issues

* Refer to Table 4a for completed actions

Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
8	**Movable Barrier Systems**	Currently only one system available for use – proprietary – therefore difficult to use on federal participating projects.	Having barrier systems that can be utilized on more than one project.	None to date.	A) Need to work with Design to develop a specification and design guidance on positive separation equipment and materials for work zones that are not proprietary and has potential for use on other projects. B) Investigate if other systems have been developed. If so, compare the systems.	A) Positive feedback from Project 0044-0151, I95 Old Lyme that is completed. Project 53-175 Putnam Bridge active Use is limited to certain project types. Need to look at other alternatives.	Ongoing	Office of Construction Traffic Engineering FHWA Highway Design
9	**Environmental Conditions**	Visibility of work zone warning equipment during inclement weather. Rain affecting retro-reflective properties of construction signs and pavement markings.	Improved visibility of signs and markings even during inclement weather.	Continued investigation in construction signs and their lack of reflective properties.	Use the Daily Site Review checklist referenced in Issue No. 3.	1. Reviewing new MUTCD requirements and incorporating changes into contracts. 2. Add recessed pavement marking detail and items into contracts to enhance retro-reflective qualities	1. Ongoing 2. Moved to Issue 14	Traffic Engineering FHWA Office of Construction Office of Maintenance
10	**Work Zone Safety Review**	Improve and enhance the work zone safety review inspection process.	Improve awareness and documentation of work zone reviews.	Improved questionnaire form and created a database to store information.	A) Include more photographs/videos of projects. Expand the number of field visits. Inform project staff of internet sites and pamphlets/documents. Are issues based on road, material, or project type?	A) Review 8-10 projects per year 2010-Ten projects reviewed 2011-Six projects reviewed 2012-Nine projects reviewed 2013 – Four projects reviewed	Ongoing	Traffic Engineering FHWA Office of Construction Office of Maintenance

TABLE 4- Work Zone Operations (WZO) Working Group Action Item Issues

* Refer to Table 4a for completed actions

Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
1	**Construction Sign Retro-Reflective Issues**	Plastic Substrate does not appear to be rigid enough to utilize the reflective properties of the sheeting so that the sign can be read properly by the traveling public during night time hours. Condensation found to reduce retro-reflectivity of construction signs.	Improved visibility of signs by the traveling public.	A)* B)*	C) Monitor use of new sign provision on new projects. D) Propose research studies - Testing different types of sheeting and substrates to find qualities that provide optimum visibility and durability. E) Additional in-depth reviews regarding condensation conducted by Project 0044-0151 personnel. Review and, if necessary, revise specification so that condensation is removed from construction signs.	A)* B)* C) Ongoing D) Pending E) Pending further review	A) * B)*	Office of Construction Traffic Engineering
2	**Pedestrian /Bicycle Access Issues**	Incomplete sidewalks, pedestrian buttons inaccessible or inoperable, lack of crosswalks at intersections, and lack of handicap ramps.	Improved pedestrian and bicycle awareness and accessibility through design and construction	A) Notified and discussed the review teams' concerns with chief inspectors. B) Reviewed contract documents for specific language, or lack thereof, regarding this type of access. C) Investigate if utility delays are the reason why sidewalks are incomplete. D) *	E) Conduct more of these types of reviews to see if these pedestrian/bicycle issues are more widespread. F) Review plans and specifications and revise if necessary.	C) Ongoing D) * E,F) Continue reviewing plans and monitoring projects for conformance	D)* E,F) Ongoing	Traffic Engineering Highway Design Office of Construction Office of Maintenance Mon-motorized Transportation Coordinator

TABLE 4- Work Zone Operations (WZO) Working Group Action Item Issues

* Refer to Table 4a for completed actions

Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
3	**Project Lighting for Night Inspection**	Refer to Table 4a Completed Issues						
4	**Lighting for Night-Time Inspection**	Inspectors working on night projects do not have sufficient lighting to inspect work. This could be previously completed work or areas requested by contractor prior to placement of material.	Increase visibility for inspecting night time and improve overall visibility of work area.	A) Reviewed specification requirements and found that contractor not required to supply any lighting either hand held or portable light plants.	B) Place request to specification committee to include wording that for any night work, portable and hand held lighting is to be supplied by contractor for inspection staff.	B) In the process of reviewing current M&PT and work zone requirements included in special provisions and standard specifications.	Ongoing	Office of Construction Traffic Engineering Office of Maintenance Safety Division
5	**Barricade Warning Lights - High intensity**	High-intensity, solar powered warning lights are not effective in rural areas with significant canopy surroundings.	Ensure that lights are operational under all conditions.	Reviewed specification.	Revise current provision to state exclusion of solar powered warning lights in rural areas. Projects should require and monitor battery-operated lights in areas where this may be an issue. Add as an item on the Daily Site Review checklist referenced is Issue No. 3.	Discussing with the Office of Traffic about possibly changing the plans or revising the specification to allow either solar or battery-operated.	Ongoing	Office of Construction Traffic Engineering Safety Division

TABLE 4- Work Zone Operations (WZO) Working Group Action Item Issues

* Refer to Table 4a for completed actions

Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
6	**Traffic Control in Work Zones**	Experience with and understanding of work zone safety. Establishing levels of effectiveness (i.e. presence versus enforcement).	Consistent practices and implementation of use of traffic persons. Better educated traffic control persons who will provide effective direction in work zones.	"Safe and Effective Use of Connecticut Law Enforcement Personnel in Work Zones" training curriculum now available online. Visit University of Connecticut Technology Transfer (T2) Center at http://www.t2center.uconn.edu/	A) Continue training at the local and state level. Look at grant resources to provide monies for training. B) Executive Policy Statement for "Policy on Effective Use of Traffic Persons in Work Zones". C) Work with Bureau of Policy and Planning to include work zones as a required field in accident report* D) Review policies and procedures and guidance documents and revise to meet current MUTCD, new policy and other standards in place at state and federal level E) Add new section in Division I of Form 816 – Best practices for work zone safety operations	A) T2 continues to provide training but funding is an issue since many local towns and municipalities, as well as, Police Standards Training Academy do not have funds available to pay for this course. Limited to a Train-the-Trainer scenario so they can teach their own. B) Final Draft completed C) * D) Ongoing E) Pending	A) Ongoing B) Pending Awaiting Commissioner signature C)* D) TBD E) 4 months	Office of Construction Traffic Engineering Office of Maintenance State Police Safety Division
7	**Variable Message Signs**	Defining proper placement (i.e. distance from the anticipated queue), proper messaging, and message legibility.	Maximize the best visibility and reading capability for the traveling public.	Continue to verify proper messaging during reviews.	A) Research different types of portable/variable message signs and capabilities to find best approach.	A) Pending	TBD	Office of Construction Traffic Engineering Office of Maintenance Highway Design

TABLE 4- Work Zone Operations (WZO) Working Group Action Item Issues

* Refer to Table 4a for completed actions

Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
8	**Movable Barrier Systems**	Currently only one system available for use – proprietary – therefore difficult to use on federal participating projects.	Having barrier systems that can be utilized on more than one project.	None to date.	A) Need to work with Design to develop a specification and design guidance on positive separation equipment and materials for work zones that are not proprietary and has potential for use on other projects. B) Investigate if other systems have been developed. If so, compare the systems.	A) Positive feedback from Project 0044-0151, I95 Old Lyme that is completed. Project 53-175 Putnam Bridge active Use is limited to certain project types. Need to look at other alternatives.	Ongoing	Office of Construction Traffic Engineering FHWA Highway Design
9	**Environmental Conditions**	Visibility of work zone warning equipment during inclement weather. Rain affecting retro-reflective properties of construction signs and pavement markings.	Improved visibility of signs and markings even during inclement weather.	Continued investigation in construction signs and their lack of reflective properties.	Use the Daily Site Review checklist referenced in Issue No. 3.	1. Reviewing new MUTCD requirements and incorporating changes into contracts. 2. Add recessed pavement marking detail and items into contracts to enhance retro-reflective qualities	1. Ongoing 2. Moved to Issue 14	Traffic Engineering FHWA Office of Construction Office of Maintenance
10	**Work Zone Safety Review**	Improve and enhance the work zone safety review inspection process.	Improve awareness and documentation of work zone reviews.	Improved questionnaire form and created a database to store information.	A) Include more photographs/videos of projects. Expand the number of field visits. Inform project staff of internet sites and pamphlets/documents. Are issues based on road, material, or project type?	A) Review 8-10 projects per year 2010-Ten projects reviewed 2011-Six projects reviewed 2012-Nine projects reviewed 2013 – Four projects reviewed	Ongoing	Traffic Engineering FHWA Office of Construction Office of Maintenance

TABLE 4- Work Zone Operations (WZO) Working Group Action Item Issues

* Refer to Table 4a for completed actions

Updated 11/1/13

Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
11 Project-Level Work Zone Reviews	Inconsistent applications of work zone principles at the project level.	Consistent practices of work zone reviews for each project.	Included this item in the Winter training session for supervisors and inspectors occurs in February and March 2012.	A) Continue reviewing plans and monitor projects for conformance. B) Use the Daily Site Review checklist referenced in Issue 3. C) Include this item in upcoming winter training session to include Work Zone Policy & Procedure presentation.	A) Ongoing process B) Ongoing Process C) Completed for 2011 & 2012.	Implemented Topic of discussion since 2011 training classes.	Office of Construction Office of Maintenance Safety Division
12 Traffic Control Device Quality	A) Inconsistency in accepting devices of similar quality. B) Marginal or unacceptable quality of drums, cones and barricades that should be replaced or do not meet standard	Understanding acceptable qualities for traffic control devices and maintaining consistency in which devices are accepted.	Obtained quality standard field guides.	A) Distribute guides on accepting traffic control devices to field staff to use in daily reviews.	A) Ongoing process – provided at preconstruction meetings wz reviews and upon request Continue to monitor device quality B) Additional issues with devices in 2013 reviews	Ongoing	Office of Construction Office of Maintenance Safety Division
13 Signing	A) Breakaway post height does not conform to plans. B) Uncoordinated Lane Closures and Construction Signs between adjacent projects	A) Conformity to requirements posted in the project plans. B) Closer coordination between projects	A) Reviewed sign mounting detail with project inspector. B) Reinforce MP&T drive-thru to review signing and remove potential conflicts, promote pre-sign installation meetings at wz project meetings.	Continue monitoring projects during work zone reviews for compliance.	A) New issue in 2011 and 2012 reviews. Ongoing with work zone reviews. B) Additional issues with signing in 2013 reviews	Ongoing	Office of Construction

TABLE 5- Work Zone Performance Measures (WZPM) Working Group Action Item Issues

Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
1	**Mobility in Work Zones**	Low vehicle throughput and long queue lengths causing congestion and delays in work zones.	Improve mobility in work zones or handle delays more effectively.	Systems Engineering Analysis Review initiated by Highway Operations	A) Establish means to capture real time traffic data.	A) Ongoing- See Table 3, Item 3	3 years	Bureau of Policy and Planning, Office of Coordination, Modeling and Crash Data and TRCC August 30, 2014 data available
2	**Reliable Crash data in Work Zones**	Crash data for work zones must be accurately represented on accident reports	Gaining more data in a timely manner to incorporate crash frequency in the design of future projects in the area.	Members of WZO and WZPM became stakeholders in the Traffic Records Coordinating Committee (TRCC)	A) Working with Bureau of Policy & Planning to get more motor vehicle crash reports.	A) Ongoing- See Table 3 Items 4 & 6	Dependent on CTDOT Vehicle Crash Reporting System 100% electronic January 2015	A) Bureau of Policy and Planning, Office of Coordination, Modeling and Crash Data and TRCC
3	**Work Zone Safety Performance**	Safety concerns for highway workers and the traveling public in work zones	Improved safety in work zones.		A) Collect data to track, analyze and evaluate work zone safety performance. B) Establish work zone safety practices and monitoring that they are applied consistently throughout the duration of the project.	A) Ongoing- See Table 3 Items 6 & 8. Current backlog is 7 months B) See Table 3 Item 8 See WZO Action List Items 10-12	A) Dependent on CT Vehicle Crash Reporting. New Crash report (PR-1) Jan. 2015 Backlog schedule: 6 mo. - Dec 2013 3 mo. - Aug 2014. B) Implemented	A) Bureau of Policy and Planning, Office of Coordination, Modeling and Crash Data and TRCC B) Offices of Safety, Construction and Maintenance
4	**Traveler Feedback**	Not knowing if the performance measures taken are most useful for the traveling public	Implement practices that are more conscientious of the public and assure them that they're contributing to the process		A) Conduct traveler surveys to evaluate work zone traffic management practices and policies on a state-wide and area region-wide basis	A) Ongoing- See Table 3 Item 7	2013	Office of Construction Office of Maintenance
5	**Develop Strategies from Performance Data and Traveler Surveys**	Not utilizing information obtained to continuously improve practices	Establishing effective performance measures		A) Evaluate data and surveys to determine where improvements can be made	A) Ongoing- Table 3 Items 1 & 7	Ongoing	Offices of Strategic Planning & Projects, Construction and Maintenance

Table 4a- Work Zone Operations (WZO) Working Group Action Item Issues Completed Updated 11/1/13							
	Issue	**Problem**	**Expected Outcomes**	**Actions Taken**	**Actions to be Taken**	**Current Status**	**Time Frame**	**Responsible Parties**
3	**Project Lighting for Night Construction**	Glare from portable light plants affecting motorists traveling through the work zone.	Reduce glare for motorists in work zone areas.	A) Develop a Daily Site Review checklist to be used by project field personnel.	B) Develop and distribute work zone safety reminders (i.e. issues memo) for field personnel. C) Review specification requirements.	A) Completed B) Completed C) Completed- no change	A) Implemented Aug. 15, 2012	Office of Construction Traffic Engineering Safety Division
6	**Traffic Control in Work Zones**	Experience with and understanding of work zone safety. Establishing levels of effectiveness (i.e. presence versus enforcement).	Consistent practices and implementation of use of traffic persons. Better educated traffic control persons who will provide effective direction in work zones.	"Safe and Effective Use of Connecticut Law Enforcement Personnel in Work Zones" training curriculum now available online. Visit University of Connecticut Technology Transfer (T2) Center at http://www.t2center.uconn.edu/	C) Work with Bureau of Policy and Planning to include work zones as a required field in accident report.	C) Completed – Model Minimum Uniform Crash Criteria Fourth Edition (2012) Data Element C18	C) Completed through PR-1 crash report.	Bureau of Policy and Planning

Table 4a- Work Zone Operations (WZO) Working Group Action Item Issues Completed Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
1	**Construction Sign Retro-Reflective Issues**	Plastic Substrate does not appear to be rigid enough to utilize the reflective properties of the sheeting so that the sign can be read properly by the traveling public during night time hours. Condensation found to reduce retro-reflectivity of construction signs.	Improved visibility of signs by the traveling public.	A) Send Memo requesting removal of signs using plastic substrate. B) Revise specification to exclude plastic substrates.		Sent out October 15, 2011 Memo from Construction to Division of Traffic recommending two changes A) Discontinued the use of Type III sheeting and require bright fluorescent sheeting for all construction signs. B) Revised specification Item No. 1220013A Construction Signs - Bright Fluorescent Sheeting to not allow use of corrugated or waffle board types of plastic substrate, foam core, and composite aluminum sign substrates.	A) Completed 5/30/12 B) Completed revision date 1/5/12	Office of Construction Traffic Engineering
2	**Pedestrian /Bicycle Access Issues**	Incomplete sidewalks, pedestrian buttons inaccessible or inoperable, lack of crosswalks at intersections, and lack of handicap ramps.	Improved pedestrian and bicycle awareness and accessibility through design and construction	D) Conduct training if necessary. Lessons Learned Session on WZS and Ped Access 12/4/13 with Design, Traffic, FHWA and Construction District offices		D) Included in winter training session- Work Zone Policy & Procedure presentation. Training session for supervisors and inspectors occurs in February and March.	D) Completed as of April 2012	Traffic Engineering Highway Design Office of Construction Office of Maintenance Mon-motorized Transportation Coordinator

TABLE 4- Work Zone Operations (WZO) Working Group Action Item Issues

* Refer to Table 4a for completed actions

Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
14	**Pavement Markings***	Existing pavement markings not eradicated or covered. Missing or worn pavement markings need to be addressed.	Provide a clearly defined path for the traveling public through the work area.	1. Notified project staff of deficiencies. 2. Lessons Learned 9/25/13 on recessed markings	1. Use winter training session to remind projects of the importance of maintaining consistent pavement markings. 2. recessed pavement marking detail and items into contracts to enhance retro-reflective qualities	1. Scheduled New issue in 2011 and 2012 reviews. 2. Specification in development- trial projects in progress	1. Winter Training 2014 2. 2014	Office of Construction Traffic Engineering
15	**Transportation Management Plan (TMP)**	A) Not being included into projects B) or projects not aware of plan being part of project	Projects provided plan and make updates as needed to keep it current with project.	Put on the Lessons Learned agenda	Work with Design to get the TMP's into Projectwise	Pending	2014	Office of Construction Design Traffic Engineering

TABLE 4- Work Zone Operations (WZO) Working Group Action Item Issues

* Refer to Table 4a for completed actions

Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
14	**Pavement Markings***	Existing pavement markings not eradicated or covered. Missing or worn pavement markings need to be addressed.	Provide a clearly defined path for the traveling public through the work area.	1. Notified project staff of deficiencies. 2. Lessons Learned 9/25/13 on recessed markings	1. Use winter training session to remind projects of the importance of maintaining consistent pavement markings. 2. recessed pavement marking detail and items into contracts to enhance retro-reflective qualities	1. Scheduled New issue in 2011 and 2012 reviews. 2. Specification in development- trial projects in progress	1. Winter Training 2014 2. 2014	Office of Construction Traffic Engineering
15	**Transportation Management Plan (TMP)**	A) Not being included into projects B) or projects not aware of plan being part of project	Projects provided plan and make updates as needed to keep it current with project.	Put on the Lessons Learned agenda	Work with Design to get the TMP's into Projectwise	Pending	2014	Office of Construction Design Traffic Engineering

Table 4a- Work Zone Operations (WZO) Working Group Action Item Issues Completed Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
1	**Construction Sign Retro-Reflective Issues**	Plastic Substrate does not appear to be rigid enough to utilize the reflective properties of the sheeting so that the sign can be read properly by the traveling public during night time hours. Condensation found to reduce retro-reflectivity of construction signs.	Improved visibility of signs by the traveling public.	A) Send Memo requesting removal of signs using plastic substrate. B) Revise specification to exclude plastic substrates.		Sent out October 15, 2011 Memo from Construction to Division of Traffic recommending two changes A) Discontinued the use of Type III sheeting and require bright fluorescent sheeting for all construction signs. B) Revised specification Item No. 1220013A Construction Signs - Bright Fluorescent Sheeting to not allow use of corrugated or waffle board types of plastic substrate, foam core, and composite aluminum sign substrates.	A) Completed 5/30/12 B) Completed revision date 1/5/12	Office of Construction Traffic Engineering
2	**Pedestrian /Bicycle Access Issues**	Incomplete sidewalks, pedestrian buttons inaccessible or inoperable, lack of crosswalks at intersections, and lack of handicap ramps.	Improved pedestrian and bicycle awareness and accessibility through design and construction	D) Conduct training if necessary. Lessons Learned Session on WZS and Ped Access 12/4/13 with Design, Traffic, FHWA and Construction District offices		D) Included in winter training session- Work Zone Policy & Procedure presentation. Training session for supervisors and inspectors occurs in February and March.	D) Completed as of April 2012	Traffic Engineering Highway Design Office of Construction Office of Maintenance Mon-motorized Transportation Coordinator

Table 4a- Work Zone Operations (WZO) Working Group Action Item Issues Completed Updated 11/1/13							
	Issue	**Problem**	**Expected Outcomes**	**Actions Taken**	**Actions to be Taken**	**Current Status**	**Time Frame**	**Responsible Parties**
3	**Project Lighting for Night Construction**	Glare from portable light plants affecting motorists traveling through the work zone.	Reduce glare for motorists in work zone areas.	A) Develop a Daily Site Review checklist to be used by project field personnel.	B) Develop and distribute work zone safety reminders (i.e. issues memo) for field personnel. C) Review specification requirements.	A) Completed B) Completed C) Completed- no change	A) Implemented Aug. 15, 2012	Office of Construction Traffic Engineering Safety Division
6	**Traffic Control in Work Zones**	Experience with and understanding of work zone safety. Establishing levels of effectiveness (i.e. presence versus enforcement).	Consistent practices and implementation of use of traffic persons. Better educated traffic control persons who will provide effective direction in work zones.	"Safe and Effective Use of Connecticut Law Enforcement Personnel in Work Zones" training curriculum now available online. Visit University of Connecticut Technology Transfer (T2) Center at http://www.t2center.uconn.edu/	C) Work with Bureau of Policy and Planning to include work zones as a required field in accident report.	C) Completed – Model Minimum Uniform Crash Criteria Fourth Edition (2012) Data Element C18	C) Completed through PR-1 crash report.	Bureau of Policy and Planning

TABLE 5- Work Zone Performance Measures (WZPM) Working Group Action Item Issues

Updated 11/1/13

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
1	**Mobility in Work Zones**	Low vehicle throughput and long queue lengths causing congestion and delays in work zones.	Improve mobility in work zones or handle delays more effectively.	Systems Engineering Analysis Review initiated by Highway Operations	A) Establish means to capture real time traffic data.	A) Ongoing- See Table 3, Item 3	3 years	Bureau of Policy and Planning, Office of Coordination, Modeling and Crash Data and TRCC August 30, 2014 data available
2	**Reliable Crash data in Work Zones**	Crash data for work zones must be accurately represented on accident reports	Gaining more data in a timely manner to incorporate crash frequency in the design of future projects in the area.	Members of WZO and WZPM became stakeholders in the Traffic Records Coordinating Committee (TRCC)	A) Working with Bureau of Policy & Planning to get more motor vehicle crash reports.	A) Ongoing- See Table 3 Items 4 & 6	Dependent on CTDOT Vehicle Crash Reporting System 100% electronic January 2015	A) Bureau of Policy and Planning, Office of Coordination, Modeling and Crash Data and TRCC
3	**Work Zone Safety Performance**	Safety concerns for highway workers and the traveling public in work zones	Improved safety in work zones.		A) Collect data to track, analyze and evaluate work zone safety performance. B) Establish work zone safety practices and monitoring that they are applied consistently throughout the duration of the project.	A) Ongoing- See Table 3 Items 6 & 8. Current backlog is 7 months B) See Table 3 Item 8 See WZO Action List Items 10-12	A) Dependent on CT Vehicle Crash Reporting. New Crash report (PR-1) Jan. 2015 Backlog schedule: 6 mo. - Dec 2013 3 mo. - Aug 2014. B) Implemented	A) Bureau of Policy and Planning, Office of Coordination, Modeling and Crash Data and TRCC B) Offices of Safety, Construction and Maintenance
4	**Traveler Feedback**	Not knowing if the performance measures taken are most useful for the traveling public	Implement practices that are more conscientious of the public and assure them that they're contributing to the process		A) Conduct traveler surveys to evaluate work zone traffic management practices and policies on a state-wide and area region-wide basis	A) Ongoing- See Table 3 Item 7	2013	Office of Construction Office of Maintenance
5	**Develop Strategies from Performance Data and Traveler Surveys**	Not utilizing information obtained to continuously improve practices	Establishing effective performance measures		A) Evaluate data and surveys to determine where improvements can be made	A) Ongoing- Table 3 Items 1 & 7	Ongoing	Offices of Strategic Planning & Projects, Construction and Maintenance

2014 WORK ZONE SAFETY REVIEWS

State of Connecticut

Prepared By:

Connecticut Department of Transportation

Office of Construction

Terri Thompson
Bonney Whitaker

2800 Berlin Turnpike

Newington CT, 06131

CONNECTICUT
2014 WORK ZONE SAFETY REVIEW REPORT

The report was prepared by the Connecticut Department of Transportation and the reviews have been completed to conform to the requirements of the Department's Work Zone Safety Improvement Plan, specifically Table 3, Work Zone Self-Assessment Element No. 8, Program Evaluation.

The Plan was developed in response to the recommendations in the 2011 Connecticut Work Zone Safety and Mobility Process Review Report and is evidence of Connecticut's compliance with 23 CFR 630.1008.

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Submitted By: _____

Terri Thompson
Transportation Supervising Engineer
Bureau of Engineering and Construction

Approved By: _____

Lewis S. Cannon
Construction Administrator
Bureau of Engineering and Construction

INTRODUCTION

The Connecticut Department of Transportation (CTDOT) conducts field reviews annually to help evaluate varying aspects of work zones paying particular attention to the current practices and designs being used in the Connecticut Department of Transportation's (CTDOT) work zones.

The reviews began in 2010 as a means to better understand and evaluate different characteristics of a work zone and the strategies and procedures that could be improved upon or used as a "best practices" example. In-depth field reviews include key personnel from the project, Office of Construction, Division of Traffic, Division of Safety and the Federal Highway Administration (FHWA). Reports are created to document both successes and opportunities for improvement, not only within the project limits but also within Department policies or procedures. The goal is to take the "Lessons Learned" and improve upon the various disciplines that are involved in work zone engineering, design and implementation.

The issues that arise as a result of these reviews are considered for incorporation into the Work Zone Improvement Plan and added to working group action item issues.

Projects are chosen from each of the four districts in the state: District 1- Central Connecticut; District 2- Eastern Connecticut; District 3- Southwestern Connecticut and District 4- Western Connecticut. There is an attempt to review projects that have some unique features, challenges or innovative practices.

NEW APPROACH

CTDOT is currently looking to conduct field reviews differently than has been done in the past 4 years. The intent is to form a more diverse team of review participants comprising personnel from all of the Bureaus: Engineering & Construction, Maintenance and Highway Operations; Policy & Planning, and Finance and Administration Safety Division along with FHWA.

The team would schedule several work zone reviews during a week(s) long period. Outside of the concentrated effort during this review schedule will be the addition of night time reviews since most work on limited access roadways occurs during this time. Night reviews are more of a challenge for a variety of reasons, including scheduling and availability of team members.

The Work Zone review team concept will include personnel that range in expertise. The knowledge and experience will range from personnel with expertise in project design, traffic engineering, construction and highway operations and maintenance to those that represent the common road user who for the most part have only come in contact with work zones during their daily travels.

The report itself will be streamlined as well and will no longer include an Executive Summary section but will have an issues/best practices section, copies of the reviews completed and also an updated report on entries in the work zone review database. The Work Zone Improvement Plan Tables will be updated and retained within the plan and not included in the report.

Table of Contents

• **Introduction**

• **Work Zone Review Summary**

• **Temporary Signalization**

0031-0127	Route 4, Cornwall	2014

• **Detour Reviews**

0070-0116	Route 616, Lebanon	2014
0082-0298	Route 17, Middletown	2014

• **Night Reviews**

0058-0329*	I-95, Groton	2014
0135-0270*	Route 15, Stamford/New Canaan	2014

• **Stage Construction**

0036-0182	Route 34, Derby	2014
0053-0186	Route 2, Glastonbury	2014
0060-0152	Route 9, Haddam	2014
0138-0221	I-95, Milford/Stratford	2014

• **Pedestrian Review**

0051-0258	Route 4, Farmington	2014

***** ***Indicates project had an in-depth review performed***

• **Review Participants and Distribution List**

• **Appendix A**
Database Report - Work Zone Reviews To Date

Project Action Items

2014 Work Zone Review Issues

2014 Work Zone Review Summary

Some of the issues and good practices from the 2014 reviews are as follows:

1. Detours
   - The project installed detour signs per plan, but received complaints that there was not enough signage. Additional signage was added on two separate occasions.
   - Best Practice - The project has produced detour maps to hand out to the public who stop at the field office to ask directions.

2. Signing
   - Good Practice: The Contractor provided extra signage for additional safety.
   - Pre-Stage 1A traffic was difficult due to inadequate areas to install warning signs. Traffic has improved with stage construction.
   - Signs that were to be mounted on an inside barrier were relocated because Stage 1B would not provide enough height clearance for pedestrians.

3. Maintenance and Protection of Traffic
   - The DE-7C delineators installed on the TPCBC are not all showing the correct color.
   - The high intensity barricade warning lights provided in the Contract have not been used. (The reviewer did not locate any notes in the plans indicating the use of these lights.)
   - Good Practice: The Contractor has been proactive by installing a speed radar trailer for nighttime operations.

4. Traffic Control Devices
   - Marginal or unacceptable quality of drums, cones and barricades that should be replaced or do not meet standard.
   - Due to an oversight, Traffic Cones, Traffic Drums and Type III Barricades were not included in the Contract. Good Practice: The Contractor was proactive and placed traffic drums out before a price was approved.
   - The contract quantity for traffic cones was insufficient.
   - There has been an issue with traffic cones being knocked down. Good Practice: The Contractor has a dedicated person to check traffic patterns and the Consultant checks patterns 2 or 3 times a night.

5. Transportation Management Plans (TMPs)
   - Project personnel were not aware a TMP was developed for the project.

6. Pedestrian Issues
   - Good Practice: The Project added a painted crosswalk from the temporary pedestrian bridge as a safety measure. It provides delineated guidance across a gas station driveway for pedestrians along with awareness for drivers.
   - Crosswalk markings and signage needed to be added for guidance to the temporary pedestrian walkway.

2014 Work Zone Review Issues

Proj.ID	Comments
31-127	1. Due to an oversight, Traffic Cones, Traffic Drums and Type III Barricades were not included in the Contract. Traffic Drums, 42" and 28" Traffic Cones, and Type III Construction Barricades were added by Construction Order. The Contractor was proactive and placed traffic drums out before a price was approved. Note: Traffic cones less than 42 inches in height shall not be used on limited-access roadways or on non-limited access roadways with a posted speed limit of 45 mph and above. 2. The Contractor provided extra signage for additional safety. 3. The Contractor questioned the temporary impact attenuation system that was designed for an impact velocity of 55 mph or less, since the posted speed limit is 45 mph. A change in the array system was approved to set up for an impact velocity of 45 mph or less. 4. The DE-7C delineators installed on the TPCBC are not all showing the correct color. The yellow side should show on the left side of traffic and silver show on the right side of traffic. 5. The high intensity barricade warning lights provided in the Contract have not been used. (The reviewer did not locate any notes in the plans indicating the use of these lights.)
36-182	1. The Project continues to monitor traffic flow and work with the Office of Traffic to help alleviate traffic backup on Route 34 & Route 8 off-ramps. The following measures have been taken: • The right lane was changed to have a permanent green arrow to allow a continuous traffic flow onto Route 34 East. • Additional pavement markings were added for lane indicators. • "Do Not Block Intersection" signs were added. • The northbound Route 8 off-ramp force-off detector was disconnected. • Signal timing changes were made. • Municipal police were placed at intersections to direct traffic, but this did not improve the traffic issues. 2. Crosswalk markings and signage needed to be added for guidance to the temporary pedestrian walkway. 3. During the field review, a car was observed entering the northbound Route 8 on-ramp through the red arrow. The red arrow is activated by the pedestrian crossing button. 4. Signs that were to be mounted on an inside barrier were relocated because Stage 1B would not provide enough height clearance for pedestrians.

Proj.ID	Comments
51-258	1. The Project added a painted crosswalk from the temporary pedestrian bridge as a safety measure. It provides delineated guidance across a gas station driveway for pedestrians along with awareness for drivers. 2. A safety inspection was also performed by Kiah Patten on this project and report submitted.
53-186	1. The Contractor requested and was granted an extension on the time restrictions posted in the contract to allow for shoulder and lane closures. 2. The Contractor utilized the contract provision to close ramps when unable to maintain a 12 foot travel path to perform rubblization. 3. The merging taper for the right lane closure (Traffic Control Plan #1) was not the required length of 800'. The taper length measured in the field was approximately 400'. The inspector was instructing the contractor to comply with the specifications. Also, by visible inspection the shoulder closure taper length in front of the flashing arrow was not the required length. 4. The project had an incident where a State Police vehicle was hit when parked in front of the crash truck. 5. The project had an issue with a State Trooper who shut down night operations due to rain. 6. The Contractor has been proactive by installing a speed radar trailer for nighttime operations.
58-329	1. The contract quantity for 42" traffic cones of 100 each was insufficient. The project has used 395 traffic cones. The Project Engineer noted that paving and tack coat are rough on traffic cones and they are being replaced as needed. 2. There has been an issue with traffic cones being knocked down. The Contractor has a dedicated person to check traffic patterns and the Consultant checks patterns 2 or 3 times a night. 3. The Contractor questioned why Reduced Speed signs were eliminated from the Traffic Control plans. He feels they are needed to help slow traffic down. The sign is not required per MUTCD and therefore was removed from traffic plans. Another solution may be to use the CMS as advance warning of upcoming work zone and indicate to reduce speed. 4. The Contractor feels that using the optional 1000' buffer slows traffic down. 5. The Consultant questioned whether State Police are allowed to shut a project down due to an event such as Sailfest. Terri Thompson informed him that State Police do not have that authority. 6. There was an incident where the crash truck mirror was hit at an exit, but the driver did not stop. 7. There had been issues with high speed truckers late at night. The Project personnel feel this has improved with time and increased awareness of ongoing

	work being performed. A subcontractor trucker was removed from the project due to excessive speed. Field Review Concerns: 1. There was a safety concern with the traffic pattern when entering from the left onto I-95 SB from Route 12 and Route 184. The traffic pattern closed the left side of the entrance ramp, forcing vehicles through the painted gore and into the high speed lane of I-95 SB without enough time to safely merge. It is recommended to close the left lane of I-95 SB upstream of the entrance ramp to allow ramp traffic adequate travel lane width and acceleration length to merge into mainline stream of traffic. *(Note: Project has taken corrective action).* 2. A Changeable Message Sign located in the median before the Gold Star Bridge on I-95 NB was partially obscured by a permanent bridge and river information sign. The CMS needs to be relocated to a location where the visibility is unrestricted. 3. A Changeable Message Sign display format of "Road Closed 10/8-9", indicating dates, was confusing. It is suggested that two frames be used to display "Road Closed" for frame 1 and "10/8 to 10/9" for frame 2. 4. A sweeper truck was observed driving, lights on, the wrong way in a right shoulder closure. Best Practice 1. The Contractor conducts a review of traffic control with the work crew and police ½ hour prior to setting up patterns. 2. Project requires contractor to set up pattern at beginning of job and staff assesses the quality of traffic control devices and has contractor remove from service any devices that are considered unacceptable. 3. Frequent nightly reviews to ensure all traffic control devices are in place and acceptable. Any found unacceptable or marginal are noted and contractor is notified via speed memo. 4. Project personnel kept in contact with an adjacent project to be aware of any coordination that would be required to maintain proper traffic flow. Recommended Practice 1. Put Project No. and date on construction signs to document how many times signs have been put in service. New signs coming into project are also marked when they arrive 2. Provide means to accurately check the retro-reflectivity and sheeting type of signs. Add a measuring device into contract specification and provide a sheeting identification chart. **Project Action Item:** Project was requested to get signs from contractor; one that they feel is acceptable and one that may be marginal. They will be brought to DOT Sign Department for

	testing of retro-reflectivity and condition. **Note:** FHWA Construction Inspection Report No. 2 was prepared and submitted by Robert Turner for this project.
60-152	1. The Project staff suggested that protection for the Portable Work Zone Management System be included in the contract. The PWZMS had to be recalibrated after being relocated for protection. At time of review the PWZMS was no longer in use. 2. A Changeable Message Sign was added to the project in order to give motorists an additional opportunity to get off of Route 9 and find an alternate route. 3. The Project staff would like to have had the plans suggest alternate routes. The Office of Traffic had to reset signals to maximum time in two locations on Route 154 to accommodate increased traffic. 4. The plans did not shut down the NB climbing lane, which would result in three lanes approaching the work zone. The Project ended up closing the climbing lane to keep all traffic in two lanes in the approach to the work zone. The intent was to improve traffic flow through the work zone and reduce queues approaching work area.
82-298	1. Long Hill Road transitions into Wesleyan Hills Road without any street sign to signify the change. After turning a bend in the road where the name changes, the road intersects with another street named Long Hill Road. Driving through the detour, I turned onto Long Hill Road thinking I was continuing on the road indicated for the detour but I immediately realized that it was a different road. I would suggest that at that intersection there be another Detour sign with a straight arrow placed to give clarity about which road to stay on. I did see there was a Detour sign placed at the Daniel Street intersection to notify drivers they were entering a detour route; something similar at the other Long Hill Road will be sufficient. 2. When I approached the police officer, the Chief Inspector was telling him to place an extra detour sign they had at the Long Hill Road #1 intersection that I had concern with. The police officer told me that earlier in the evening he went out and placed paper detour signs with arrows throughout detour to further clarify detour route to drivers. He was told at a progress meeting with DOT and the Contractor that the Contractor would provide all the detour signs and barricades for road closure needed. At the time for the closure they weren't provided. The officer asked the Contractor that night to get some cones to help with the road closure. They were able to obtain 24-inch cones to close the road and they took it upon themselves to block the left turn lane on Randolph Road. There was, however, one barricade with a road closed sign that was further back beyond the road closure. He said there was no sign stating "Business Open" at Cypress Hill to notify motorists that they can access the business.

Proj.ID	Comments
135-270	1. At northbound on ramp 36, there were construction equipment hanging over the right shoulder. Also construction workers were moving in and out of the right shoulder. The right shoulder was not safe for motorists. Therefore, it should have been closed to protect construction equipment and construction workers. Refer to the M&PT special provision for typical shoulder closure plans. 2. During the review, it was unclear if the work zones were too closely spaced. Except when a 3-mile work zone has been reviewed and allowed by Construction, the following language is included in the Prosecution & Progress special provision: "The Contractor will not be allowed to have more than 2 work zones on Route 15 in each direction at a time. Each work zone shall be 1.5 miles or less with a minimum of one mile of open roadway between the work zones. The one mile clear area length shall be measured from the end of the first work area to the beginning of the signing pattern for the next work area". 3. On the southbound, there was a section of Temporary Precast Concrete Barrier Curb (TPCBC) on the right of the travelway with yellow delineators. Those delineators should be changed to white delineators.
138-221	1. Due to Pre-stage 1 accidents, the speed of vehicles became a concern on this project. The Contractor tried to slow traffic one day with the use of crash trucks, but State Police had a concern about this practice and suggested 6" solid white lines be installed. Changes that were put in place include a reduced speed limit of 45 mph and marking the speed limit on the travel lanes. Operation Big Orange for police enforcement of speed has been used which the Project personnel feels has been effective. 2. Stage 3 accesses the median work zone from below for I-95 for daytime operations, while nighttime operations allow a lane closure to gain access. Project personnel would have liked to have a plan provided that would have provided daytime access from the travel lanes of I-95. 3. The Project has had requests approved for a change of hours in the Limitation of Operations to allow an earlier start to the second lane closure. 4. According to project personnel, some signs are difficult to maintain due to narrow areas.

WORK ZONE REVIEW FORM

Project Number: 138-221 **District No. 3**
Date: September 16, 2014 **Weather: Cloudy 68°**

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☒ Limited Access ☐ Secondary ☐ Local / Town
Inspection Forces: ☐ State ☐ Maintenance ☒ Consultant

Location (Route & Town): Reconstruction of Bridge No. 00135 (Moses Wheeler Bridge) I-95 over Housatonic River & Naugatuck Avenue in Towns of Milford and Stratford

Focus of Review: Lane Closure: ☐ Temporary ☐ Permanent; ☒ Stage Construction ☐ Detour; ☐ Pedestrian/ Bike issues; ☐ Temporary Signalization; ☐ Night Work

Prime Contractor: Walsh Construction Co. /PCL J.V. II

Project Engineer: Steven Hebert **Project Manager:** Leon Wolochuk

Project Amount: $185,253,956.39 **Percent Complete:** 82%

Calendar Days completed: 367 **Calendar Days Allotted:** 320

Review Participants

Name	Representing
Jack Ploski	HNTB Consultant (Chief Inspector)
Bonney Whitaker	Office of Construction
Kiah Patten	Office of Construction

Q&A:

1) Is there clear, positive, understandable guidance through the work zone? Yes

2) What is the overall condition of traffic flow through the work zone? (include queue length and speed limit, roadway condition). Traffic was flowing smoothly at time of review. Morning and evening rush hour has the normal amount of slow down.

3) Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs). No.

4) Are there any horizontal/vertical clearance issues? No.

5) Are there any permitted load issues? No.

6) Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements? Yes.

7) Are all cones, drums, barricades, or other channelization devices acceptable? Yes.

8) Are warning lights and devices used for Maintenance and Protection of Traffic? Yes

9) Clear Zone issues: (Y / N) No. Respond to questions below.

   a. What is the clear zone for this project? Work site is behind TPCBC.

   b. Where are materials stored for the project? Under I-95

   c. Where is equipment stored when construction is not in progress? Behind barrier

10) Have accommodations been made to account for
   a. Emergency Services – Yes
   b. Pedestrian/ Bike/ ADA issues? Yes.

11) Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain. No.

12) Pavement Markings- Temporary
   a. Is there an item for removal of pavement markings? If yes, indicate removal method being used. Grinding
   b. Are there conflicting markings? No.
   c. Are the temporary markings legible? If night review, comment on visibility
   d. Type of marking material being used. ☐ Tape ☐ Paint (non-epoxy) ☒ Epoxy
      Per contract plans, epoxy resin pavement markings are used for all temporary pavement markings exposed throughout the winter.

13) Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? If no, explain. Yes. Class 3 pants are worn at night, although not a requirement.

14) Type of Traffic Control Personnel being used on project? Indicate type of training or certification for each and position within the work zone area.

   ☒ State Police

   ☒ Local Police Minimum Hourly Requirement:

   ☐ Uniformed Flagger

   Comments from Traffic Control Personnel (indicate type of traffic person): not available

15) Chief Inspector Comments: See comments on Pages 4 and 5.

16) Project Engineer Comments: Not available

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	Construction
Location	Throughout project
Mounting Height	Acceptable
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized/Sheeting Type	Bright fluorescent
Project Consistency	Yes
Need to be covered	No
Temp./Permanent	Post mounted (Temporary)

Table B – Traffic control Devices

Requirement	Comment
Type & Placement	Traffic cones and drums
Quantity	Not counted
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Majority are acceptable. A few were marginal.
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	Temporary Precast Concrete Barrier Curb
Quantity	Not counted
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	N/A
Reflectorized	Delineators installed on top of the barrier.
Anchored	Yes
Consistent throughout project	Yes
Crash Trucks (TMA) in use? If yes how many and type	One crash truck being used on local road in work zone where work underneath I-95 is being accomplished.

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	High intensity warning lights are attached to post mounted diamond shaped construction signs.
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	N/A
Location of portable devices – Indicate if in clear zone and how protected.	Changeable message signs located behind metal beam rail.
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	Two portable message signs, one northbound & one southbound, displaying “45 MPH ENFORCED”

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. Yes. This construction activity causes sustained mobility on I-95 for more than three (3) days with intermittent lane closures, therefore meeting the definition of a significant project. TMP needs to be updated.

What special provisions are there in contract related to work zone (list item no, description and date of provision)?
0821022A Remove & Reset Precast Concrete Barrier Curb,
0822005A Temporary Precast Concrete Barrier Curb (Structure)
0822006A Relocated Temporary Precast Concrete Barrier Curb (Structure)
0822042(3)A Temporary Glare Screen Modular Units (Relocated), Rev. 11/99,
0970006(7)A Trafficperson (Municipal police officer)(Uniformed flagger), Rev. 1/2008,
0971001A Maintenance and Protection of Traffic
0973725A Worksite Traffic Supervisor, Rev. 3/15/10
0979003A Construction Barricade Type III, Rev. 1/17/01
1131002A Remote Control Changeable Message Sign, Rev. 12/02/02
1220013A Construction Signs-Bright Fluorescent Sheeting, Rev. 1/17/01

Is the project being completed in stage construction? If yes, explain. Yes, Stage 1 erects the north section of the new bridge & shifts southbound traffic to the north section of the new bridge. Stage 2 demolishes the south half of the existing bridge and constructs the south 1/3rd of the new bridge. Stage 3 demolishes the remaining north section of the existing bridge.

Is there temporary signalization? If yes, explain. Yes. Temporary signalization is in the contract for local roads, but is not extensive.

Is a detour required or being used? If yes, explain. Yes. There are temporary detours on local roads only.

What guides, tools including manuals, pocket guides, books etc. do you reference?
The Chief Inspector references the Special Provisions.

What work zone traffic plans are included in the project? Plan Nos. MPT-1 through MPT-22.

Has the project had any incident reports filed? Yes How many? Count not provided.
Majority of incidents occur during rush hour and involve rear end collisions.

Comments:
1. Due to Pre-stage 1 accidents, the speed of vehicles became a concern on this project. The Contractor tried to slow traffic one day with the use of crash trucks, but State Police had a concern about this practice and suggested 6" solid white lines be installed. Changes that were put in place include a reduced speed limit of 45 mph and marking the speed limit on the travel lanes. Operation Big Orange for police enforcement of speed has been used which the Project personnel feels has been effective.
2. Stage 3 accesses the median work zone from below for I-95 for daytime operations, while nighttime operations allow a lane closure to gain access. Project personnel would have liked

to have a plan provided that would have provided daytime access from the travel lanes of I-95.

3. The Project has had requests approved for a change of hours in the Limitation of Operations to allow an earlier start to the second lane closure.
4. According to project personnel, some signs are difficult to maintain due to narrow areas.

Efforts to reduce speed through work zone include message signs for northbound and south-bound traffic, solid white lines and 45 MPH speed limit painted directly on all travel lanes.

Two work sites underneath I-95.

Completed By: _____

Approved By: _____

WORK ZONE REVIEW FORM

Project Number: 135-270 **District No. 3**
Date: 9/24/2014 **Weather: Pt. Cloudy, 58°**

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☒ Limited Access ☐ Secondary ☐ Local / Town
Inspection Forces: ☐ State ☐ Maintenance ☒ Consultant

Location (Route & Town): CT Route 15 in the Towns of Stamford to New Canaan

Focus of Review: Lane Closure: ☒ Temporary ☐ Permanent; ☐ Stage Construction
☐ Detour; ☐ Pedestrian/ Bike issues; ☐ Temporary Signalization; ☒ Night Work

Prime Contractor: O & G Industries, Inc.

Project Engineer: Joe Sorcinelli **Project Manager: Michael Martin**

Project Amount: $57,864,272.43 **Percent Complete: 52%**

Calendar Days completed: 257 **Calendar Days Allotted: 535**

Review Participants

Name	Representing
Joseph Becker	URS Consulting
Aldo Tartaglino	O&G Industries
Robert Turner	FHWA
Anthony Kwentoh	Office of Construction
Dan Stafko	District 3 Construction
Bonney Whitaker	Office of Construction
Kiah Patten	Office of Construction
Jeff Hunter	District 2 Construction
Oddler Fils	Office of Traffic

Q&A:

1) Is there clear, positive, understandable guidance through the work zone? Yes.

2) What is the overall condition of traffic flow through the work zone? (include queue length and speed limit, roadway condition). Good. Moving continuously after set up.

3) Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs). No

4) Are there any horizontal/vertical clearance issues? No. The contract Special Provisions for Maintenance & Protection addresses Route 15 vertical clearance at Bridge No. 00710R.

5) Are there any permitted load issues? No. Route 15 is already restricted and does not allow commercial vehicles.

6) Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements? Yes, although visually some appeared scuffed and dirty. (Refer to Page 5 pictures).

7) Are all cones, drums, barricades, or other channelization devices acceptable? The majority were acceptable. Some cones need to be replaced.

8) Are warning lights and devices used for Maintenance and Protection of Traffic? Yes on required signs.

9) Clear Zone issues: N (Y / N) Respond to questions below.
   a. What is the clear zone for this project? Traffic is maintained adjacent to work zone using lane closure signing patterns, crash trucks and State Police to protect the workers.
   b. Where are materials stored for the project? Yard off of Exit 37.
   c. Where is equipment stored when construction is not in progress? Behind concrete barrier.

10) Have accommodations been made to account for
   a. Emergency Services – Yes, in accordance with NTC to coordinate all lane closures with emergency services.
   b. Pedestrian/ Bike/ ADA issues? Yes, for local roads.

11) Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain. No.

12) Pavement Markings- Temporary
   a. Is there an item for removal of pavement markings? If yes, indicate removal method being used. Grinding
   b. Are there conflicting markings? No
   c. Are the temporary markings legible? If night review, comment on visibility Good
   d. Type of marking material being used. ☐ Tape ☒ Paint (non-epoxy) ☒ Epoxy (epoxy temporary for winter)

13) Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? If no, explain. Yes

14) Type of Traffic Control Personnel being used on project? Indicate type of training or certification for each and position within the work zone area.

   ☒ State Police

   ☒ Local Police Minimum Hourly Requirement: 4 hour minimum

   ☐ Uniformed Flagger

   Comments from Traffic Control Personnel: State Police Sgt. Lynch of Troop G stated that traffic control has not been a problem.

15) Chief Inspector Comments: Having two work zone patterns in the same direction causes a longer delay.

16) Project Engineer Comments: Future Merritt Parkway projects should consider extending work zone to a 3 mile maximum vs. a 1.5 mile for Mon-Wed nights.

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	Construction
Location	Throughout project
Mounting Height	Acceptable
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	Some were marginal (refer to pictures on page 5)
Reflectorized/Sheeting Type	Bright fluorescent
Project Consistency	Yes
Need to be covered	No
Temp./Permanent	Temporary

Table B – Traffic control Devices

Requirement	Comment
Type & Placement	42" traffic cones
Quantity	Not counted
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Overall, traffic cone were acceptable to marginal. A few were unacceptable and should be replaced.
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	No. Varying degrees of quality.

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	Traffic drums
Quantity	Not counted
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Acceptable to marginal
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	No. Varying degrees of quality.
Crash Trucks (TMA) in use? If yes how many and type	Three crash trucks

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	High intensity warning lights attached to construction signs as specified in the contract.
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	Truck mounted arrows functioning properly.
Location of portable devices – Indicate if in clear zone and how protected.	In lane closure, protected by traffic drums.
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	Changeable message signs were in use. One northbound & one southbound. Reviewers did not note message or timing.

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. No. Policy No. E&C-46 does not include Route 15 for significant projects. Existing lanes are maintained throughout the day and peak hours, so the sustained mobility impacts are not greater than typical traffic operations.

What special provisions are there in contract related to work zone (list item no, description and date of provision)?
0970006 Trafficperson (Municipal Police Officer), Rev. 1/2008;
0971001 Maintenance & Protection of Traffic, Rev. 2/2013;
0979003 Construction Barricade Type III, Rev. 1/17/01
1118051 (2)(3) Temporary Signalization (Site No. 1)(No. 2)(No. 3), Rev. 1/13;
1131002 Remote Control Changeable Message Sign, Rev, 12/2012;
1220013 Construction Signs-Bright Fluorescent Sheeting, Rev. 1/17/01

Is the project being completed in stage construction? If yes, explain. Yes. There are three stages of construction. Stage 1 shifts traffic to the left side of the roadway for right side operations, Stage 2 shifts traffic to the right side of the roadway for left side & median work and Stage 3 is final drainage, pavement, pavement markings and landscaping operations.

Is there temporary signalization? If yes, explain. Yes. Temporary signalization used on local roads to allow for alternating one-way traffic for bridge operations.

Is a detour required or being used? If yes, explain. Yes. A detour plan is provided for Guinea Road for work on bridge over Route 15. The Contractor provided a ramp detour plan to close NB Exit 33 on-ramp, as allowed for Maintenance & Protection of Traffic in the Special Provisions.

What guides, tools including manuals, pocket guides, books etc. do you reference?
This project is a pilot program for the use of tablets in the field. Inspections have PDFs for plans and specifications.

What work zone traffic plans are included in the project? MPT plans are a subset. The inspector stated a preference for MPT plans to be included within appropriate construction section.

Has the project had any incident reports filed? Yes. How many? Approximately 12

Comments:

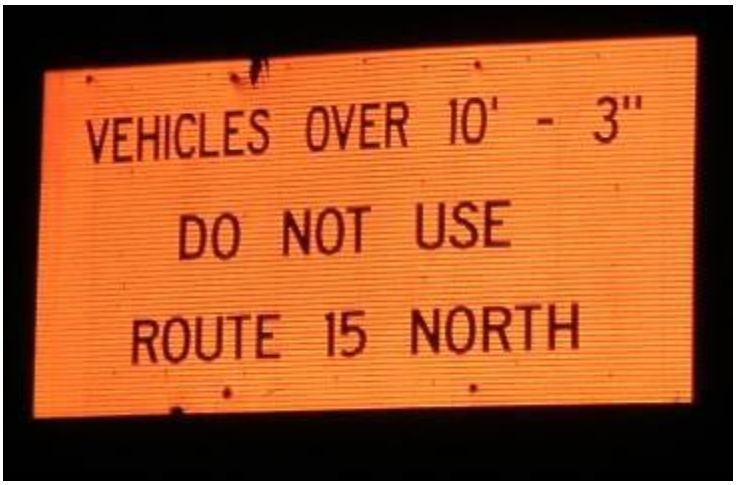
1. At northbound on ramp 36, there were construction equipment hanging over the right shoulder. Also construction workers were moving in and out of the right shoulder. The right shoulder was not safe for motorists. Therefore, it should have been closed to protect construction equipment and construction workers. Refer to the M&PT special provision for typical shoulder closure plans.

2. During the review, it was unclear if the work zones were too closely spaced. Except when a 3-mile work zone has been reviewed and allowed by Construction, the following language is included in the Prosecution & Progress special provision: “The Contractor will not be allowed to have more than 2 work zones on Route 15 in each direction at a time. Each work

zone shall be 1.5 miles or less with a minimum of one mile of open roadway between the work zones. The one mile clear area length shall be measured from the end of the first work area to the beginning of the signing pattern for the next work area".

3. On the southbound, there was a section of Temporary Precast Concrete Barrier Curb (TPCBC) on the right of the travelway with yellow delineators. Those delineators should be changed to white delineators

Some temporary signs installed on this night were scuffed and appeared to be dirty.



Warning sign for Route 15 entrance ramp.

Traffic drums are placed for lane closure.

Completed By: _____

Approved By: _____

WORK ZONE REVIEW FORM

Project Number: 0082-0298 **District No.** 1
Date: September 5, 2014 **Weather:** clear, 70°

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☐ Limited Access ☒ Secondary ☐ Local / Town
Inspection Forces: ☒ State ☐ Maintenance ☐ Consultant

Location (Route & Town): Route 17 (South Main Street), Middletown

Focus of Review: Lane Closure: ☒ Temporary ☐ Permanent; ☐ Stage Construction
☒ Detour; ☐ Pedestrian/ Bike issues; ☐ Temporary Signalization; ☐ Night Work

Prime Contractor: J. Iappaluccio, Inc.

Project Engineer: Juan Ruiz **Chief Inspector:** Michael Burch

Project Amount: $1,652,051.35 **Percent Complete:** 10%

Calendar Days completed: 102 **Calendar Days Allotted:** 168

Review Participants

Name	Representing
Mohammed Bishtawi	District 1 Construction
Michael Burch	District 1 Construction
Kiah Patten	Office of Construction

Q&A:

1) Is there clear, positive, understandable guidance through the work zone? ***Yes, see note in comments section.***

2) What is the overall condition of traffic flow through the work zone? (include queue length and speed limit, roadway condition). ***No queue length, motorists were going the normal speed limit, roads used for the detour were in good condition,***

3) Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs). ***No.***

4) Are there any horizontal/vertical clearance issues? ***No.***

5) Are there any permitted load issues? ***No.***

6) Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements? ***Yes.***

7) Are all cones, drums, barricades, or other channelization devices acceptable? ***Yes.***

8) Are warning lights and devices used for Maintenance and Protection of Traffic? ***Yes.***

9) Clear Zone issues: (Y / N) Respond to questions below. ***No.***

   a. What is the clear zone for this project? ***N/A***

   b. Where are materials stored for the project? ***In Stonegate Apartment parking lot outside DOT field office.***

   c. Where is equipment stored when construction is not in progress? ***In Stonegate Apartment parking lot outside DOT field office.***

10) Have accommodations been made to account for
   a. Emergency Services – ***Met with Middletown Fire Department – South District and Middletown Police Department – Traffic Division***
   b. Pedestrian/ Bike/ ADA issues? ***N/A, no sidewalks or pedestrian signals.***

11) Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain. ***No.***

12) Pavement Markings- Temporary
   a. Is there an item for removal of pavement markings? If yes, indicate removal method being used. ***No.***
   b. Are there conflicting markings? ***N/A***
   c. Are the temporary markings legible? If a night review, comment on visibility. ***N/A***
   d. Type of marking material being used. ☐ Tape ☐ Paint (non-epoxy) ☐ Epoxy

13) Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? If no, explain. ***Yes.***

14) Type of Traffic Control Personnel being used on project? Indicate type of training or certification for each and position within the work zone area. ***Stationed at road closure at either end of project site – Randolph Road and Wesleyan Hills Road, and at Brown Street (off of Randolph Road).***

   ☐ State Police

   ☒ Local Police Minimum Hourly Requirement: ***4 hours***

   ☐ Uniformed Flagger

   Comments from Traffic Control Personnel (indicate type of traffic person): not asked.

15) Chief Inspector Comments: ***No.***

16) Project Engineer Comments: ***Not present.***

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	*Construction*
Location	*Throughout detour*
Mounting Height	*6 feet*
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	*Yes*
Reflectorized/Sheeting Type	*Bright Fluorescent Sheeting*
Project Consistency	*Yes*
Need to be covered	*No*
Temp./Permanent	*Permanent*

Table B – Traffic control Devices

Requirement	Comment
Type & Placement	*Cones/Drums*
Quantity	*30/15*
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	*Yes*
Reflectorized	*Yes*
Anchored	*No*
Consistent throughout project	*Yes*

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	*Type III*
Quantity	*7*
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	*Yes*
Reflectorized	*Yes*
Anchored	*No*
Consistent throughout project	*Yes*
Crash Trucks (TMA) in use? If yes how many and type	*No*

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	*Yes* *Barricade warning lights on advanced warning* *Yes* *High intensity*
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	*N/A*
Location of portable devices – Indicate if in clear zone and how protected.	*Construction Message Signs 500 feet north of Randolph Road and 1000 feet north of Round Hill Road*
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	*Portable, message is understandable, 2 frames, 2 seconds between frames*

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. ***No.***

What special provisions are there in contract related to work zone (list item no, description and date of provision)? ***0970006 – Trafficperson (Municipal Police Officer), 0970007 – Trafficperson (Uniformed Flagger), 0979003 – Construction Barricade Type III, 1131001 – Changeable Message Sign, 1220013 – Construction Signs – Bright Fluorescent Sheeting***

Is the project being completed in stage construction? If yes, explain. ***Yes, two stages will be done after the bridge is replaced to install parapets.***

Is there temporary signalization? If yes, explain. ***No.***

Is a detour required or being used? If yes, explain. ***Yes, Route 17 closed from 7 pm Friday to 3pm Monday between Randolph Road and Wesleyan Hills Road, and at Coleman Road intersection due to rapid bridge construction.***

What guides, tools including manuals, pocket guides, books etc. do you reference? ***OSHA Construction Industry Digest and ATSSA Quality Guidelines for Temporary Traffic Control Devices and Features***

What work zone traffic plans are included in the project? ***Detour, Stage 1 & 2 Construction***

Has the project had any incident reports filed? ***No.*** How many? ***N/A***

Comments:

1. Long Hill Road transitions into Wesleyan Hills Road without any street sign to signify the change. After turning a bend in the road where the name changes, the road intersects with another street named Long Hill Road. Driving through the detour, I turned onto Long Hill Road thinking I was continuing on the road indicated for the detour but I immediately realized that it was a different road. I would suggest that at that intersection there be another Detour sign with a straight arrow placed to give clarity about which road to stay on. I did see there was a Detour sign placed at the Daniel Street intersection to notify drivers they were entering a detour route; something similar at the other Long Hill Road will be sufficient.
2. When I approached the police officer, the Chief Inspector was telling him to place an extra detour sign they had at the Long Hill Road #1 intersection that I had concern with. The police officer told me that earlier in the evening he went out and placed paper detour signs with arrows throughout detour to further clarify detour route to drivers. He was told at a progress meeting with DOT and the Contractor that the Contractor would provide all the detour signs and barricades for road closure needed. At the time for the closure they weren't provided. The officer asked the Contractor that night to get some cones to help with the road closure. They were able to obtain 24-inch cones to close the road and they took it upon themselves to block the left turn lane on Randolph Road. There was, however, one barricade with a road closed sign that was further back beyond the road closure. He said there was no sign stating "Business Open" at Cypress Hill to notify motorists that they can access the business.

Advanced warning sign and CMS – Frame 1, 500 feet north of Randolph Road

Advanced warning sign and CMS, 1000 feet north of Round Hill Road

Barricade with road closure sign described in comments section.

Detour sign stating road open only to local traffic on Coleman Road

WORK ZONE REVIEW FORM

Project Number: 70-116 **District No. 2**
Date: July 25, 2014 **Weather: Sunny, 75°**

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☐ Limited Access ☒ Secondary ☐ Local / Town
Inspection Forces: ☒ State ☐ Maintenance ☐ Consultant

Location (Route & Town): S.R. 616 (Norwich Avenue) over Bartlett Brook, Lebanon

Focus of Review: Lane Closure: ☐ Temporary ☒ Permanent; ☐ Stage Construction
☒ Detour; ☐ Pedestrian/ Bike issues; ☐ Temporary Signalization; ☐ Night Work

Prime Contractor: McCarthy Concrete, Inc.

Project Engineer: Patrick Warzecha **Chief Inspector: Joseph Taylor**

Project Amount: $1,629,655.53 **Percent Complete: 52%**

Calendar Days completed: 294 **Calendar Days Allotted: 208**

Review Participants

Name	Representing
Joseph Taylor	Construction – District 2
Bonney Whitaker	Office of Construction
Kiah Patten	Office of Construction
Joseph Grasso	Office of Traffic

Q&A:

1) Is there clear, positive, understandable guidance through the work zone? Yes, however the project added extra detour signs after receiving complaints that there was insufficient signage.

2) What is the overall condition of traffic flow through the work zone? (include queue length and speed limit, roadway condition). Detour is in place to direct traffic around work site. The local residents are better at adhering to the posted speed limit.

3) Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs). No.

4) Are there any horizontal/vertical clearance issues? No.

5) Are there any permitted load issues? No. Existing bridge was posted for a 34 ton live load restriction however the bridge is being replaced while detour is in place.

6) Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements? Yes. Signs are new.

7) Are all cones, drums, barricades, or other channelization devices acceptable? Yes

8) Are warning lights and devices used for Maintenance and Protection of Traffic? Yes

9) Clear Zone issues: (Y / N) Respond to questions below.

   a. What is the clear zone for this project? Road is closed. All activity is behind barricades.

   b. Where are materials stored for the project? Behind barricade at the work site.

   c. Where is equipment stored when construction is not in progress? Behind barricade.

10) Have accommodations been made to account for
   a. Emergency Services – Chief inspector contacted police & fire departments, schools & town halls.
   b. Pedestrian/ Bike/ ADA issues? N/A

11) Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain. No.

12) Pavement Markings- Temporary
   a. Is there an item for removal of pavement markings? If yes, indicate removal method being used. No item. Total road closure for full depth excavation.
   b. Are there conflicting markings? N/A
   c. Are the temporary markings legible? If night review, comment on visibility
   d. Type of marking material being used. ☐ Tape ☐Paint (non-epoxy) ☐ Epoxy

13) Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? If no, explain. Yes

14) Type of Traffic Control Personnel being used on project? Indicate type of training or certification for each and position within the work zone area.

   ☒State Police

   ☒Local Police Minimum Hourly Requirement: Four & eight hours.
   Road closure resulted in minimal use of police.

   ☐Uniformed Flagger

   Comments from Traffic Control Personnel (indicate type of traffic person): not asked.

15) Chief Inspector Comments: People are inattentive and are not following installed signs. (See additional comments on Page 4). The inspector commented that white signs may not stand out to get the attention of the motorists.

16) Project Engineer Comments: Not Available

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	Construction
Location	Throughout project
Mounting Height	Acceptable
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized/Sheeting Type	Bright fluorescent
Project Consistency	Yes
Need to be covered	No
Temp./Post mounted	Post mounted

Table B – Traffic Control Devices

Requirement	Comment
Type & Placement	Traffic Drums
Quantity	Not counted
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	Construction Barricades Type III
Quantity	4 each
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes
Crash Trucks (TMA) in use? If yes how many and type	N/A

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	Flashing lights on post mounted diamond shaped signs All functioning High intensity
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	N/A
Location of portable devices – Indicate if in clear zone and how protected.	N/A
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	N/A

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. No.

What special provisions are there in contract related to work zone (list item no, description and date of provision)?
0970007 Trafficperson (Uniformed Flagger), Rev. Date 01/08
0971001 Maintenance & Protection of Traffic, Rev. Date 6/29/12
0979003 Construction Barricade Type III, Rev. Date 1/17/01
1220013 Construction Signs-Bright Fluorescent Sheeting, Rev. Date 1/5/12
1803070 Type B Impact Attenuation System (Flared), Rev. Date 9/21/11
1803071 Type B Impact Attenuation System (Tangential), Rev. Date 9/21/11

Is the project being completed in stage construction? If yes, explain. No.

Is there temporary signalization? If yes, explain. No.

Is a detour required or being used? If yes, explain. Yes. The bridge is being replaced in one stage, so traffic is being detoured

What guides, tools including manuals, pocket guides, books etc. do you reference?
Form 816 and the Contract Specifications & Special Provisions

What work zone traffic plans are included in the project? Detour plan.

Has the project had any incident reports filed? No. How many? N/A

Comments:

1. The project installed detour signs per plan, but received complaints that there was not enough signage. Additional signage, noted in Table 1 at end of report, was added on two separate occasions. While at the work site, there were three occasions where motorists ignored warning signs that the road was closed and preceded to the work site where they had to turn around.

2. Best Practice - The project has produced detour maps to hand out to the public who stop at the trailer to ask directions.

3. It was discovered that GPS directions will detour vehicles that end up at the closed bridge onto a local road that becomes a narrow dirt road with a 90° turn. A “NO TRUCKS” sign had to be installed at the entrance to this road after trucks were unable to negotiate the 90° turn.

Detour signs on CT 2 and at bottom of exit.

Advance warning to motorists installed on State Road 616.

Vehicles were observed having to turn around at this work site sign.

Table 1

Signs added for Project 70-116		
DOT No.	Qty.	Sign Description
31-0553	1	STOP
51-6612	2	EAST
51-6614	1	WEST
80-1608	1	CONSTRUCTION AHEAD
80-1613	1	CONSTRUCTION AHEAD
80-9078	1	BRIDGE CLOSED X MILES AHEAD LOCAL TRAFFIC ONLY
80-9082	1	BRIDGE OUT
80-9701R	1	DETOUR
80-9702L	1	DETOUR
80-9708	2	END DETOUR
80-9710	1	DETOUR (Insert right, left or straight arrow)
80-9913	1	NORWICH AVE (with arrows)
80-9916	2	NORWICH AVENUE
80-9928	1	NORWICH AVE. DETOUR
80-9929	1	NORWICH AVE. EAST CLOSED
80-9933	2	ROAD CLOSED AHEAD

Completed By: _____

Approved By: _____

WORK ZONE REVIEW FORM

Project Number: 60-152 **District No. 1**
Date: July 24, 2014 **Weather: Cloudy, 77°**

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☒ Limited Access ☐ Secondary ☐ Local / Town
Inspection Forces: ☒ State ☐ Maintenance ☐ Consultant

Location (Route & Town): Route 9 over Nedobity Road, Haddam

Focus of Review: Lane Closure: ☐ Temporary ☒ Permanent; ☒ Stage Construction
☐ Detour; ☐ Pedestrian/ Bike issues; ☐ Temporary Signalization; ☐ Night Work

Prime Contractor: Mohawk Northeast, Inc.

Project Engineer: Brian Gustafson **Chief Inspector: Brent Church**

Project Amount: $2,528,821.57 **Percent Complete: 43%**

Calendar Days completed: 120 **Calendar Days Allotted: 265**

Review Participants

Name	Representing
Brent Church	Construction – Dist. 1
Brian Gustafson	Construction – Dist. 1
Rich Brooks	Construction – Dist. 1
Bonney Whitaker	Office of Construction
Kiah Patten	Office of Construction

Q&A:

1) Is there clear, positive, understandable guidance through the work zone? Yes. Pavement markings with solid lane lines provide good guidance through work zone.

2) What is the overall condition of traffic flow through the work zone? Traffic is steady for this stage. According to project staff, Stage 2 had significant back-up due to reducing travel to one lane.

3) Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs). No. Blunt ends from concrete barriers are protected by impact attenuation systems

4) Are there any horizontal/vertical clearance issues? No

5) Are there any permitted load issues? No.

6) Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements? Yes. All signs are new.

7) Are all cones, drums, barricades, or other channelization devices acceptable? Yes. Traffic drums are new. Traffic cones have not been used.

8) Are warning lights and devices used for Maintenance and Protection of Traffic? Yes

9) Clear Zone issues: (Y / N) Respond to questions below.

   a. What is the clear zone for this project? 30' off traveled way

   b. Where are materials stored for the project? On Nedobity Rd, away from traffic

   c. Where is equipment stored when construction is not in progress? Behind concrete barrier

10) Have accommodations been made to account for
   a. Emergency Services – N/A
   b. Pedestrian/ Bike/ ADA issues? N/A

11) Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain. No

12) Pavement Markings- Temporary
   a. Is there an item for removal of pavement markings? If yes, indicate removal method being used? Grinding & water blasting.
   b. Are there conflicting markings? No
   c. Are the temporary markings legible? If night review, comment on visibility
   d. Type of marking material being used. ☐ Tape ☒ Paint (non-epoxy) ☐ Epoxy

13) Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? If no, explain. Yes.

14) Type of Traffic Control Personnel being used on project? Indicate type of training or certification for each and position within the work zone area.

   ☒ State Police

   ☐ Local Police Minimum Hourly Requirement:

   ☒ Uniformed Flagger (on local roads)

   Comments from Traffic Control Personnel (indicate type of traffic person): not available.

15) Chief Inspector Comments: See comments on page 4.

16) Project Engineer Comments: See comments on page 4.

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	Construction
Location	Throughout project
Mounting Height	Acceptable
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized/Sheeting Type	Bright fluorescent
Project Consistency	Yes
Need to be covered	No
Temp./Post mounted	Post mounted

Table B – Traffic Control Devices

Requirement	Comment
Type & Placement	Traffic Drums
Quantity	Not Counted
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	TPCBC
Quantity	Not counted
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized	Delineators attached on top of TPCBC
Anchored	Yes – One section not pinned.
Consistent throughout project	Yes
Crash Trucks (TMA) in use? If yes how many and type	No

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	High intensity warning lights attached to post mounted diamond shaped construction signs.
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	N/A
Location of portable devices – Indicate if in clear zone and how protected.	N/A
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	N/A

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. No.

What special provisions are there in contract related to work zone (list item no, description and date of provision)?
0970007 Trafficperson (Uniformed Flagger), Rev. Date 1/2008
0971101(2) Maintenance & Protection of Traffic (Site No. 1) (Site No. 2), Rev. Date 7/24/13
1131002 Remote Control Changeable Message Sign, Rev. Date 12/02/02
1131007 Portable Work Zone Management System Deployment, Rev Date 07/24/13
1131008 Portable Work Zone Management System Operations, Rev. Date 07/24/13
1131009 Portable Work Zone Management System Queue Trailer/Sensor, Rev. Date 07/24/13
1131010 Portable Work Zone Management System Changeable Message Sign, Rev. 07/24/13
1131011 Portable Work Zone Management System Mobile Video Trailer with Pan Tilt Zoom (PTZ), Rev. Date 07/24/13
1220013 Construction Signs-Bright Fluorescent Sheeting, Rev. Date 1/5/12

Is the project being completed in stage construction? If yes, explain. This project has three stages. The first stage was used to lay out Stage 2 which provided one lane of traffic. The current Stage 3 provides for two lanes of continuous traffic.

Is there temporary signalization? If yes, explain. No.

Is a detour required or being used? If yes, explain. No.

What guides, tools including manuals, pocket guides, books etc. do you reference?
Form 816, Special Provisions, Construction Manual

What work zone traffic plans are included in the project? M&PT Stage 2 & Stage 3

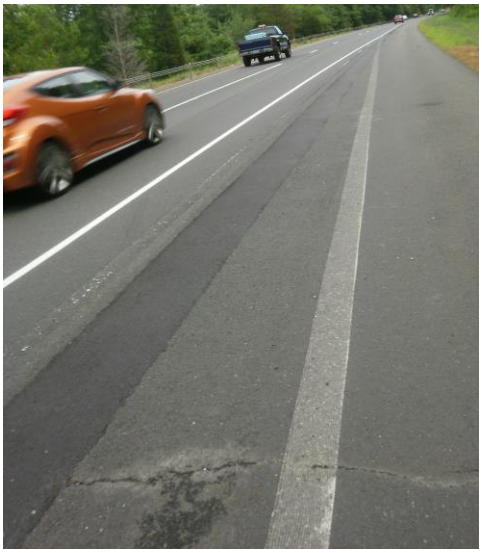
Has the project had any incident reports filed? Yes. How many? 1

Comments:
1. The Project staff suggested that protection for the Portable Work Zone Management System be included in the contract. The PWZMS had to be recalibrated after being relocated for protection. At time of review the PWZMS was no longer in use.
2. A Changeable Message Sign was added to the project in order to give motorists an additional opportunity to get off of Route 9 and find an alternate route.
3. The Project staff would like to have had the plans suggest alternate routes. The Office of Traffic had to reset signals to maximum time in two locations on Route 154 to accommodate increased traffic.
4. The plans did not shut down the NB climbing lane, which would result in three lanes approaching the work zone. The Project ended up closing the climbing lane to keep all traffic in two lanes in the approach to the work zone. The intent was to improve traffic flow through the work zone and reduce queues approaching work area.

Start of lane closure on NB Route 9

Temporary impact attenuation system is protecting blunt end of TPCBC. End delineator needs to be reattached.

Traffic drums are weighted with two rubber rings for additional stability from passing traffic.



Existing edge line was removed for placement of temporary edge line.

Completed By: _____

Approved By: _____

WORK ZONE REVIEW FORM

Project Number: 58-329 **District No. 2**
Date: October 8, 2014 **Weather: Pt. Cloudy, 69°**

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☒ Limited Access ☐ Secondary ☐ Local / Town
Inspection Forces: ☐ State ☐ Maintenance ☒ Consultant

Location (Route & Town): Pavement Preservation on I-95, Groton

Focus of Review: Lane Closure: ☒ Temporary ☐ Permanent; ☐ Stage Construction
☒ Detour; ☐ Pedestrian/ Bike issues; ☐ Temporary Signalization; ☒ Night Work

Prime Contractor: American Industries, Inc.

Project Engineer: Keith Schoppe **Resident Engineer: Bret Kaczka**

Project Amount: $9,037,320.00 **Percent Complete: 95%**

Calendar Days completed: 140 **Calendar Days Allotted: 175**

Review Participants

Name	Representing
Bret Kaczka	Tectonic
Terry McAuliffe	Tectonic Office Engineer
Cale Carnot	American Industries, Inc.
Keith Schoppe	Construction – District 2
Robert Turner	FHWA
Terri Thompson	Office of Construction
Anthony Kwentoh	Office of Construction
Bonney Whitaker	Office of Construction
Kiah Patten	Office of Construction
Michael Chachakis	Office of Traffic
Jeff Hunter	Construction – District 2

Q&A:

1) Is there clear, positive, understandable guidance through the work zone? Yes. Traffic control is checked several times a night.

2) What is the overall condition of traffic flow through the work zone? (include queue length and speed limit, roadway condition). May have ¼ mile queue during set-up. Usually have 2 lanes open, so traffic flow is normal.

3) Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs). No. Wedge joint is being used & there is not any TPCBC.

4) Are there any horizontal/vertical clearance issues? No

5) Are there any permitted load issues? Paving material delivered to the project is routed around the Gold Star Bridge.

6) Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements? Signs are bright fluorescent sheeting, but visually some were scuffed and dirty, making them difficult to read.

7) Are all cones, drums, barricades, or other channelization devices acceptable? Yes. Project does request for devices to be replaced when unacceptable.

8) Are warning lights and devices used for Maintenance and Protection of Traffic? No. The project does not have permanent diamond shaped construction signs.

9) Clear Zone issues: (Y / N) Respond to questions below.

   a. What is the clear zone for this project? Project has staked out a 30' offset.

   b. Where are materials stored for the project? Exit 88 NB off-ramp gore area.

   c. Where is equipment stored when construction is not in progress? Same as b above.

10) Have accommodations been made to account for
   a. Emergency Services – Contact list is used.
   b. Pedestrian/ Bike/ ADA issues? N/A

11) Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain. Contractor is compliant

12) Pavement Markings- Temporary
   a. Is there an item for removal of pavement markings? If yes, indicate removal method being used. Milling roadway
   b. Are there conflicting markings?
   c. Are the temporary markings legible? If night review, comment on visibility
   d. Type of marking material being used. ☐ Tape ☒ Paint (non-epoxy) ☐ Epoxy
      Hot applied

13) Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? If no, explain. Yes

14) Type of Traffic Control Personnel being used on project?

   ☒ State Police

   ☐ Local Police Minimum Hourly Requirement:

   ☐ Uniformed Flagger

15) Chief Inspector Comments: It would be a good idea to have detour plans included in contract plans in order to omit contractor submittal process.

16) Project Engineer Comments: Believes that plywood used for construction signs contributes to sign dullness and because they are heavier, scratching during handling, transporting and storing.

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	Construction
Location	Throughout project
Mounting Height	Acceptable
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	Some were unacceptable. They were dull, scratched and difficult to read. Requested contractor to clean them.
Reflectorized/Sheeting Type	Bright fluorescent sheeting
Project Consistency	See comment above
Need to be covered	No
Temp./Permanent	Temporary

Table B – Traffic control Devices

Requirement	Comment
Type & Placement	42" Traffic Cones and traffic drums
Quantity	Not counted
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Yes - Acceptable
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	N/A
Quantity	
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	
Reflectorized	
Anchored	
Consistent throughout project	
Crash Trucks (TMA) in use? If yes how many and type	Crash trucks in use.

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	No. Project does not have diamond shaped post mounted signs..
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	Truck-mounted. Lights functioning and in correct mode.
Location of portable devices – Indicate if in clear zone and how protected.	Various locations in closed lanes and gore area at exit.
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	Three of four portable message signs being used tonight. One message sign is confusing. Refer to comments at end of report. One to two frames being used. Timing is acceptable.

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. Yes. Due to high traffic volumes, the potential for traffic disruption on I-95, and in order to serve the safety and mobility needs of the traveling public, a TMP was developed. The project staff was not aware of the TMP.

What special provisions are there in contract related to work zone (list item no, description and date of provision)?
0970006 (7) Trafficperson (Municipal Police Officer) (Uniformed Flagger), Rev. 1/2008
0971001 Maintenance and Protection of Traffic, Rev. 9/16/13
1131002 Remote Control Changeable Message Sign, Rev. 12/02/02
1220013 Construction Signs - Bright Fluorescent Sheeting, Rev. 1/5/12

Is the project being completed in stage construction? If yes, explain. No.

Is there temporary signalization? If yes, explain. No.

Is a detour required or being used? If yes, explain. Detour plans were not included in the contract. The Contractor had concerns about working safely on the ramps due to the widths and radii of the ramps. The Contractor submitted detour plans which have been reviewed and approved by the District.

What guides, tools including manuals, pocket guides, books etc. do you reference?
Standard Specifications Form 816 and Special Provisions.

What work zone traffic plans are included in the project? All of the temporary lane closures are handled with the temporary traffic control plans within the special provision for Item No. 0971001A: Maintenance and Protection of Traffic.

Has the project had any incident reports filed? No. How many? N/A

Discussion Comments:

- The contract quantity for 42" traffic cones of 100 each was insufficient. The project has used 395 traffic cones. The Project Engineer noted that paving and tack coat are rough on traffic cones and they are being replaced as needed.
- There has been an issue with traffic cones being knocked down. The Contractor has a dedicated person to check traffic patterns and the Consultant checks patterns 2 or 3 times a night
- The Contractor questioned why Reduced Speed signs were eliminated from the Traffic Control plans. He feels they are needed to help slow traffic down. The sign is not required per MUTCD and therefore was removed from traffic plans. Another solution may be to use the CMS as advance warning of upcoming work zone and indicate to reduce speed.
- The Contractor feels that using the optional 1000' buffer slows traffic down.

- The Consultant questioned whether State Police are allowed to shut a project down due to an event such as Sailfest. Terri Thompson informed him that State Police do not have that authority.
- There was an incident where the crash truck mirror was hit at an exit, but the driver did not stop.
- There had been issues with high speed truckers late at night. The Project personnel feel this has improved with time and increased awareness of ongoing work being performed. A subcontractor trucker was removed from the project due to excessive speed.

Field Review Concerns:

- There was a safety concern with the traffic pattern when entering from the left onto I-95 SB from Route 12 and Route 184. The traffic pattern closed the left side of the entrance ramp, forcing vehicles through the painted gore and into the high speed lane of I-95 SB without enough time to safely merge. It is recommended to close the left lane of I-95 SB upstream of the entrance ramp to allow ramp traffic adequate travel lane width and acceleration length to merge into mainline stream of traffic. *(Note: Project has taken corrective action).*
- A Changeable Message Sign located in the median before the Gold Star Bridge on I-95 NB was partially obscured by a permanent bridge and river information sign. The CMS needs to be relocated to a location where the visibility is unrestricted.
- A Changeable Message Sign display format of "Road Closed 10/8-9", indicating dates, was confusing. It is suggested that two frames be used to display "Road Closed" for frame 1 and "10/8 to 10/9" for frame 2.
- A sweeper truck was observed driving, lights on, the wrong way in a right shoulder closure.

Best Practice

- The Contractor conducts a review of traffic control with the work crew and police ½ hour prior to setting up patterns.
- Project requires contractor to set up pattern at beginning of job and staff assesses the quality of traffic control devices and has contractor remove from service any devices that are considered unacceptable.
- Frequent nightly reviews to ensure all traffic control devices are in place and acceptable. Any found unacceptable or marginal are noted and contractor is notified via speed memo.
- Project personnel kept in contact with an adjacent project to be aware of any coordination that would be required to maintain proper traffic flow.

Recommended Practice

- Put Project No. and date on construction signs to document how many times signs have been put in service. New signs coming into project are also marked when they arrive
- Provide means to accurately check the retro-reflectivity and sheeting type of signs. Add a measuring device into contract specification and provide a sheeting identification chart.

Project Action Item:

Project was requested to get signs from contractor; one that they feel is acceptable and one that may be marginal. They will be brought to DOT Sign Department for testing of retro-reflectivity and condition.

WORK ZONE REVIEW FORM

Project Number: 53-186 **District No. 1**
Date: June 16, 2014 **Weather: Clear, 82°**

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☒ Limited Access ☐ Secondary ☐ Local / Town
Inspection Forces: ☐ State ☐ Maintenance ☒ Consultant

Location (Route & Town): Route 2, Glastonbury

Focus of Review: Lane Closure: ☒ Temporary ☐ Permanent; ☐ Stage Construction
☐ Detour; ☐ Pedestrian/ Bike issues; ☐ Temporary Signalization; ☐ Night Work

Prime Contractor: Tilcon Connecticut, Inc.

Project Engineer: Paul Carl **Chief Inspector: John O'Dierna**

Project Amount: $21,808,646.00 **Percent Complete: 15%**

Calendar Days completed: 83 **Calendar Days Allotted: 360**

Review Participants

Name	Representing
Paul Carl	Construction – Dist. 1
John O'Dierna	Dewberry-Consultant
Khaled Abu-Sitteh	Dewberry-Consultant
Joseph Grasso	Office of Traffic
Bonney Whitaker	Office of Construction
Kiah Patten	Office of Construction

Q&A:

1) Is there clear, positive, understandable guidance through the work zone? Yes.

2) What is the overall condition of traffic flow through the work zone? (include queue length and speed limit, roadway condition). There are no significant issues. There is a slight back-up around 3pm to 4 pm, but less than 5 minutes.

3) Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs). There is a drop-off next to the travel lane at the work site where there is full depth excavation of the existing road.

4) Are there any horizontal/vertical clearance issues? No

5) Are there any permitted load issues? No.

6) Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements? Yes

7) Are all cones, drums, barricades, or other channelization devices acceptable? Traffic drums are showing some wear, but have maintained their shape and reflectivity.

8) Are warning lights and devices used for Maintenance and Protection of Traffic? There are not any diamond shaped signs that require warning lights, but there will be in the future.

9) Clear Zone issues: (Y / N) Respond to questions below.

   a. What is the clear zone for this project? Thirty feet off traveled way.

   b. Where are materials stored for the project? In gore areas at Exits 10 & 17.

   c. Where is equipment stored when construction is not in progress? In gore areas and Exit 10 commuter parking lot at field office.

10) Have accommodations been made to account for
   a. Emergency Services – Highway operations are notified of lane closure.
   b. Pedestrian/ Bike/ ADA issues? N/A

11) Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain. No.

12) Pavement Markings- Temporary
   a. Is there an item for removal of pavement markings? If yes, indicate removal method being used. Full depth removal
   b. Are there conflicting markings? No.
   c. Are the temporary markings legible? If night review, comment on visibility
   d. Type of marking material being used. ☐ Tape ☒Paint (non-epoxy) ☒ Epoxy (Winter)

13) Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? If no, explain. Yes. Safety pants worn at night.

14) Type of Traffic Control Personnel being used on project? Indicate type of training or certification for each and position within the work zone area.

   ☒State Police

   ☐Local Police Minimum Hourly Requirement: Four (4) hour minimum

   ☐Uniformed Flagger

   Comments from Traffic Control Personnel (indicate type of traffic person): not asked.

15) Chief Inspector Comments: Project plans did not provide MPT sheets.

16) Project Engineer Comments: N/A

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	Construction
Location	Throughout project
Mounting Height	Acceptable
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized/Sheeting Type	Type III reflective sheeting
Project Consistency	Good
Need to be covered	No
Temp./Permanent	Temporary

Table B – Traffic control Devices

Requirement	Comment
Type & Placement	N/A
Quantity	
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	
Reflectorized	
Anchored	
Consistent throughout project	

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	Traffic drums
Quantity	Not counted
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Marginal
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes
Crash Trucks (TMA) in use? If yes how many and type	Two crash trucks are being used by the project

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	High intensity warning lights will be used, but are not required at this time.
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	Two portable
Location of portable devices – Indicate if in clear zone and how protected.	Right side of road behind guardrail
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	Portable message sign – two frames- 3 seconds between screens reading: Right lane closed Merge left

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. No.

What special provisions are there in contract related to work zone (list item no, description and date of provision)?
0822005(6) (Relocated) Temporary Precast Concrete Barrier Curb (Structure), date not posted
0970006 (7) Trafficperson(Municipal)(Uniformed Flagger), Rev. date 1/2008
0971001 Maintenance and Protection of Traffic, date not posted
1130002 Remote Control Changeable Message Sign, Rev. date 12/02/02
1220013 Construction Signs-Bright Fluorescent Sheeting, Rev date 1/5/12
1803071 Type B Impact Attenuation System (Tangential), Rev. date 9/21/11

Is the project being completed in stage construction? If yes, explain. No.

Is there temporary signalization? If yes, explain. No.

Is a detour required or being used? If yes, explain. No.

What guides, tools including manuals, pocket guides, books etc. do you reference?
MUTCD & ATSSA Supervisor Training Course Manual

What work zone traffic plans are included in the project? No MPT plans.

Has the project had any incident reports filed? Yes How many? 3

Comments:

1. The Contractor requested and was granted an extension on the time restrictions posted in the contract to allow for shoulder and lane closures.
2. The Contractor utilized the contract provision to close ramps when unable to maintain a 12 foot travel path to perform rubblization.
3. The merging taper for the right lane closure (Traffic Control Plan #1) was not the required length of 800'. The taper length measured in the field was approximately 400'. The inspector was instructing the contractor to comply with the specifications. Also, by visible inspection the shoulder closure taper length in front of the flashing arrow was not the required length.
4. The project had an incident where a State Police vehicle was hit when parked in front of the crash truck.
5. The project had an issue with a State Trooper who shut down night operations due to rain.
6. The Contractor has been proactive by installing a speed radar trailer for nighttime operations.

One lane traffic traveling through work site

Merging taper length is incorrect length as noted in comments on page 4.

State Police gave a warning to an aggressive driver

Contractor took initiative to install speed radar that operates during nighttime operations

WORK ZONE REVIEW FORM

Project Number: 51-258 **District No. 1**
Date: June 9, 2014 **Weather: Cloudy, 68°**

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☐ Limited Access ☒ Secondary ☐ Local / Town
Inspection Forces: ☒ State ☐ Maintenance ☐ Consultant

Location (Route & Town): **Replacement of Bridge No. 01951, Route 4, Farmington**

Focus of Review: Lane Closure: ☐ Temporary ☐ Permanent; ☒ Stage Construction
☐ Detour; ☒ Pedestrian/ Bike issues; ☐ Temporary Signalization; ☐ Night Work

Prime Contractor: **The Brunalli Construction Company**

Project Engineer: Juan Ruiz **Chief Inspector: Jon Leblanc**

Project Amount: $4,043,380 **Percent Complete: 27%**

Calendar Days completed: 175 **Calendar Days Allotted: 625**

Review Participants

Name	Representing
Juan Ruiz	Construction – Dist. 1
Jon Leblanc	Construction – Dist. 1
Claudel Meronnis	Office of Traffic
Bonney Whitaker	Office of Construction
Kiah Patten	Office of Construction
Robert Whittaker	CDR Maguire

Q&A:

1) Is there clear, positive, understandable guidance through the work zone? Yes

2) What is the overall condition of traffic flow through the work zone? (include queue length and speed limit, roadway condition). Traffic has been shifted while maintaining existing number of travel lanes and flow of traffic. Traffic flow is good with short queue lengths at the signalized intersection.

3) Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs). No. Temporary impact attenuation systems are installed to protect blunt ends.

4) Are there any horizontal/vertical clearance issues? No

5) Are there any permitted load issues? No

6) Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements? Yes. Signs are new.

7) Are all cones, drums, barricades, or other channelization devices acceptable? Overall, devices were acceptable. There were some drums and cones that required replacement. Inspector will notify contractor.

8) Are warning lights and devices used for Maintenance and Protection of Traffic? High intensity barricade warning lights are mounted on appropriate signs.

9) Clear Zone issues: (Y / N) Respond to questions below.

   a. What is the clear zone for this project? Work zone area protected by barriers.

   b. Where are materials stored for the project? In work area, behind temporary precast concrete barrier curb.

   c. Where is equipment stored when construction is not in progress? Same as "b" above.

10) Have accommodations been made to account for
   a. Emergency Services – Yes, through calls and email to the Farmington Police Department.
   b. Pedestrian/ Bike/ ADA issues? Temporary sidewalk and pedestrian bridges are constructed in Stage 2 and Stage 4.

11) Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain. No.

12) Pavement Markings- Temporary
   a. Is there an item for removal of pavement markings? If yes, indicate removal method being used. Grinding has been used for removal.
   b. Are there conflicting markings? No
   c. Are the temporary markings legible? If night review, comment on visibility
   d. Type of marking material being used. ☐ Tape ☒ Paint (non-epoxy) ☐ Epoxy

13) Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? If no, explain. Yes

14) Type of Traffic Control Personnel being used on project? Indicate type of training or certification for each and position within the work zone area.

   ☐ State Police

   ☒ Local Police Minimum Hourly Requirement: Four (4) & eight (8) hours

   ☐ Uniformed Flagger

   Comments from Traffic Control Personnel (indicate type of traffic person): N/A.

15) Chief Inspector Comments: Project installed additional pavement markings for pedestrian walkway from temporary pedestrian bridge across gas station driveway.

16) Project Engineer Comments: None

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	Construction
Location	Throughout project
Mounting Height	Acceptable
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized/Sheeting Type	Bright fluorescent
Project Consistency	Good
Need to be covered	No
Temp./Permanent	Permanent

Table B – Traffic control Devices

Requirement	Comment
Type & Placement	Traffic drums
Quantity	Approximately 20 each
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Most are acceptable or marginal. A few were unacceptable which the inspector will get replaced.
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	Construction Barricade Type III
Quantity	4 each
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes
Crash Trucks (TMA) in use? If yes how many and type	N/A

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	Barricade warning lights mounted on diamond shaped post mounted construction signs. All lights are functioning High intensity
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	N/A
Location of portable devices – Indicate if in clear zone and how protected.	N/A
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	N/A

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. No.

What special provisions are there in contract related to work zone (list item no, description and date of provision)?
0503018 Maintaining Pedestrian Traffic, Rev. date not posted
0970006(7) Trafficperson (Municipal Police Officer)(Uniformed Flagger), Rev. 1/2008
0971001 Maintenance & Protection of Traffic, Rev. 1/10/2013
0979003 Construction Barricade Type III, Rev. 1/17/01
1118051 Temporary Signalization (Site 1), Rev. 1/13
1803060(2) Type B Impact Attenuation System -Non-gating (Replacement parts), Rev. 9/21/11

Is the project being completed in stage construction? If yes, explain. There are five stages to allow for one lane of traffic in each direction and maintain an existing left turn lane during each stage. Temporary bridges are erected to accommodate pedestrians during Stages 2 & 4.

Is there temporary signalization? If yes, explain. Traffic signal had a sensor installed when project work involved removing the existing loop detectors.

Is a detour required or being used? If yes, explain. No.

What guides, tools including manuals, pocket guides, books etc. do you reference? The contract, project plans, the Form 816 and Temporary Traffic Control pocket guide.

What work zone traffic plans are included in the project? Maintenance & Protection of Traffic plans for stages 1 through 5.

Has the project had any incident reports filed? No How many? N/A

Comments:

1. The Project added a painted crosswalk from the temporary pedestrian bridge as a safety measure. It provides delineated guidance across a gas station driveway for pedestrians along with awareness for drivers.

2. A safety inspection was also performed by Kiah Patten on this project and report submitted.

The left photo shows the temporary pedestrian bridge constructed per plan. As an added safety measure, the project took the extra step to delineate a walkway across a gas station driveway from the pedestrian bridge, as shown in the right photo.

The Double Reverse Curve sign, left photo, installed prior to the lane shift pictured above. Existing pavement markings were removed by grinding. Temporary pavement markings provide clear guidance for motorists to travel through the work zone.

Completed By: _____ Date: 11/03/14

Approved By: _____ Date: 11/6/14

WORK ZONE REVIEW FORM

Project Number: 0036-0182 **District No.** 4
Date: October 14, 2014 **Weather:** Cloudy, 73°

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☐ Limited Access ☒ Secondary ☐ Local / Town
Inspection Forces: ☒ State ☐ Maintenance ☐ Consultant

Location (Route & Town): Route 34 over Naugatuck River, City of Derby

Focus of Review: Lane Closure: ☐ Temporary ☒ Permanent; ☒ Stage Construction
☐ Detour; ☐ Pedestrian/ Bike issues; ☐ Temporary Signalization; ☐ Night Work

Prime Contractor: Baier Construction Company, Inc.

Project Engineer: Thomas Weldon **Chief Inspector:** Richard Rudaitis

Project Amount: $8,952,986.59 **Percent Complete:** 19%

Calendar Days completed: 183 **Calendar Days Allotted:** 732

Review Participants

Name	Representing
Thomas Weldon	District 4 Construction
Bonney Whitaker	Office of Construction
Claudel Meronnis	Office of Traffic
Kiah Patten	Office of Construction

Q&A:

1) **Is there clear, positive, understandable guidance through the work zone?** Yes.

2) **What is the overall condition of traffic flow through the work zone? (Include queue length, speed limit, and roadway condition.)** Traffic flow has improved as project progresses. Traffic queues are being monitored and discussed with the Office of Traffic to make changes for improvement. Traffic will back up when drivers ignore a green arrow.

3) **Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs.)** No. Impact attenuation systems are in place.

4) **Are there any horizontal/vertical clearance issues?** No

5) **Are there any permitted load issues?** No

6) **Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements?** Yes

7) **Are all cones, drums, barricades, or other channelization devices acceptable?** Reflectivity is good. Some drums and cones are dented or misshapen and should be replaced.

8) **Are warning lights and devices used for Maintenance and Protection of Traffic?** Yes.

9) **Clear Zone issues: (Y / N) Respond to questions below.**

   a. **What is the clear zone for this project?**

   b. **Where are materials stored for the project?** Storage yard by field office & town access road

   c. **Where is equipment stored when construction is not in progress?** Behind barrier & town access road

10) **Have accommodations been made to account for:**
   a. **Emergency Services?** Existing Emergency Vehicle Pre-emption System is operational.
   b. **Pedestrian/ Bike/ ADA issues?** Temporary pedestrian walkway is installed with temporary ramp. It is regularly used by two individuals in motorized wheelchairs.

11) **Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain.** No. Contractor is compliant.

12) **Pavement Markings- Temporary**
   a. **Is there an item for removal of pavement markings? If yes, indicate removal method being used.** Grinding
   b. **Are there conflicting markings?**
   c. **Are the temporary markings legible? If night review, comment on visibility**
   d. **Type of marking material being used.** ☐ **Tape** ☒ **Paint (hot applied)** ☒ **Epoxy**
      Epoxy for winter (temporary)

13) **Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? If no, explain.** Yes

14) **Type of Traffic Control Personnel being used on project? Indicate type of training or certification for each and position within the work zone area.**

   ☒ **State Police:** Only for installation of advance warning signs on Route 8.

   ☒ **Local Police** **Minimum Hourly Requirement:** Four (4) hours minimum

   ☐ **Uniformed Flagger**

Comments from Traffic Control Personnel (indicate type of traffic person): Not available

15) **Chief Inspector Comments:** Not available.

16) **Project Engineer Comments:** Pre-Stage 1A traffic was difficult due to inadequate areas to install warning signs. Traffic has improved with stage construction. The Office of Traffic has been responsive in helping to alleviate traffic and signage issues, building a good working relationship with the Project.

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	Construction
Location	Throughout project
Mounting Height	Acceptable
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized/Sheeting Type	Bright fluorescent sheeting
Project Consistency	Acceptable
Need to be covered	Right Lane Closed Ahead signs are folded down-see pg. 5
Temp./Permanent	Permanent

Table B – Traffic Control Devices

Requirement	Comment
Type & Placement	42" Traffic cones
Quantity	Not counted
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Acceptable – some are dented.
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	Type III barricade @ temp. pedestrian crosswalk
Quantity	5 each
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes
Crash Trucks (TMA) in use? If yes how many and type	N/A

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	High intensity warning lights mounted on all diamond shaped post mounted construction signs. All are functioning.
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	N/A
Location of portable devices – Indicate if in clear zone and how protected.	N/A
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	N/A

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. Yes, Route 34 is a major highway between the towns of Newtown and New Haven. The project site is located on the route where there is high traffic volumes and potential to disrupt mobility for both Route 34 and Route 8 during construction.

What special provisions are there in contract related to work zone (list item no, description and date of provision)?

#0822005A - Temporary Precast Concrete Barrier Curb (Structure), #0822052A - Temporary Precast Concrete Half-Section Barrier Curb (Structure) (10/10/13), #0970006(7)A - Trafficperson (Municipal Police Officer)(Uniformed Flagger) (01/08), #0971001A – Maintenance & Protection of Traffic (02/25/13), #0979003A - Construction Barricade Type III (01/17/01), #1111201(2)A – Temporary Detection (Site No. 1) (Site No. 2)(01/13), #1118051(2)(3)A – Temporary Signalization (Site No. 1) (Site No. 2) (Site No. 3) (01/13), #1131002A - Remote Control Changeable Message Sign (01/09), #1220013A – Construction Signs – Bright Fluorescent Sheeting (01/05/12), #1807200A – Temporary Impact Attenuation System Type B (01/08/10)

Is the project being completed in stage construction? If yes, explain. There is Pre-Stage 1, Stage 1, Stage 2 and Stage 3.

Is there temporary signalization? If yes, explain. Traffic signals were relocated, realigned and timing modified.

Is a detour required or being used? If yes, explain. The detour plan provided in the contract has yet to be used. Route 34 may be closed on a maximum of six (6) occasions during off-peak night time periods for the purpose of steel erection, installation of drainage structures and full depth pavement reconstruction on Route 8 NB on-ramp.

What guides, tools including manuals, pocket guides, books etc. do you reference?

The MUTCD and M&PT sheets in the project plans are referenced.

What work zone traffic plans are included in the project? MPT Stage 1A, MPT Stage 1B, MPT Stage 2, MPT Stage 3, Maintenance and Protection Details, Detour Plan.

Has the project had any incident reports filed? No. **How many?** N/A

Comments:

1. The Project continues to monitor traffic flow and work with the Office of Traffic to help alleviate traffic backup on Route 34 & Route 8 off-ramps. The following measures have been taken:

- The right lane was changed to have a permanent green arrow to allow a continuous traffic flow onto Route 34 East.
- Additional pavement markings were added for lane indicators.
- "Do Not Block Intersection" signs were added.
- The northbound Route 8 off-ramp force-off detector was disconnected.

- Signal timing changes were made.
- Municipal police were placed at intersections to direct traffic, but this did not improve the traffic issues.

2. Crosswalk markings and signage needed to be added for guidance to the temporary pedestrian walkway.

3. During the field review, a car was observed entering the northbound Route 8 on-ramp through the red arrow. The red arrow is activated by the pedestrian crossing button.

4. Signs that were to be mounted on an inside barrier were relocated because Stage 1B would not provide enough height clearance for pedestrians.

The "Right Lane Closed Ahead" sign is hinged to fold down when not in use.

New traffic island allows continuous right turn from Main St.

Crosswalk markings added for pedestrian guidance. A field decision was made to use traffic cones & drums, on left, in place of Type III Construction Barricades.

The end of the impact attenuation system in the temporary pedestrian walkway was framed out for protection.

WORK ZONE REVIEW FORM

Project Number: 31-127 **District No. 4**
Date: September 19, 2014 **Weather: Sunny, 60°**

Project Type: ☒ Construction ☐ Maintenance ☐ Bridge Safety
Road Type: ☐ Limited Access ☒ Secondary ☐ Local / Town
Inspection Forces: ☒ State ☐ Maintenance ☐ Consultant

Location (Route & Town): **Replacement of Bridge No. 01933, Route 4 over Bloody Brook in the Town of Cornwall**

Focus of Review: Lane Closure: ☐ Temporary ☒ Permanent; ☐ Stage Construction ☐ Detour; ☐ Pedestrian/ Bike issues; ☒ Temporary Signalization; ☐ Night Work

Prime Contractor: Dayton Construction Company, Inc.

Project Engineer: Ali Farzan **Chief Inspector: Donald Lamb**

Project Amount: $693,689.50 **Percent Complete: 34%**

Calendar Days completed: 80 **Calendar Days Allotted: 154**

Review Participants

Name	Representing
Donald Lamb	Office of Construction-District 4
Bonney Whitaker	Office of Construction
Kiah Patten	Office of Construction

Q&A:

1) Is there clear, positive, understandable guidance through the work zone? Yes.

2) What is the overall condition of traffic flow through the work zone? (include queue length and speed limit, roadway condition). Rural road does not experience queues. Microwave detectors are installed on temporary signalization.

3) Are there any hazards to the traveling public or construction personnel? (Blunt ends, Drop-offs). No. Impact attenuation systems are in place.

4) Are there any horizontal/vertical clearance issues? No. An 11' wide travel lane is provided.

5) Are there any permitted load issues? No.

6) Are all signs being used for Maintenance and Protection of Traffic acceptable in accordance with applicable requirements? Yes. Signs have bright fluorescent sheeting.

7) Are all cones, drums, barricades, or other channelization devices acceptable? Yes. A few traffic drums were marginal.

8) Are warning lights and devices used for Maintenance and Protection of Traffic? No. They are an item in the contract, but they have not been used.

9) Clear Zone issues: (Y / N) Respond to questions below.

   a. What is the clear zone for this project? Work zone is behind TPCBC

   b. Where are materials stored for the project? Behind TPCBC.

   c. Where is equipment stored when construction is not in progress? Behind TPCBC.

10) Have accommodations been made to account for
   a. Emergency Services – Notice in the paper for alternating one-way traffic.
   b. Pedestrian/ Bike/ ADA issues? Vehicles allow bikes to proceed first through work site.

11) Do you have a hard time ensuring Traffic Control Devices are in functioning condition and installed according to plan? If yes, explain. No

12) Pavement Markings- Temporary
   a. Is there an item for removal of pavement markings? If yes, indicate removal method being used. 6" preformed black line mask pavement marking tape.
   b. Are there conflicting markings? No
   c. Are the temporary markings legible? If night review, comment on visibility
   d. Type of marking material being used. ☒ Tape ☒ Paint (non-epoxy) ☐ Epoxy
      Extra 6' black tape required to cover double yellow lines.

13) Personnel Protective Equipment- Are all members of the work force wearing the proper reflective equipment? If no, explain. Yes

14) Type of Traffic Control Personnel being used on project? Indicate type of training or certification for each and position within the work zone area.

   ☐ State Police

   ☐ Local Police Minimum Hourly Requirement:

   ☒ Uniformed Flagger

   Comments from Traffic Control Personnel (indicate type of traffic person): N/A.

15) Chief Inspector Comments: Refer to comments 1-3 on page 4.

16) Project Engineer Comments: Not available.

Traffic Control Device Inspection- PART II

Table A – Signs

Requirement	Comment
Type: Construction/Regulatory	Construction
Location	Throughout project
Mounting Height	Acceptable
Clean, Visible, Legible (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized/Sheeting Type	Bright fluorescent sheeting
Project Consistency	Yes
Need to be covered	No
Temp./Post mounted	Post mounted

Table B – Traffic control Devices

Requirement	Comment
Type & Placement	Traffic drums
Quantity	15 each
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Overall acceptable; a few were marginal with numerous scratches on the sheeting.
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes

Table C - Barricades and other channelization devices

Requirement	Comment
Type & Placement	Type III Construction Barricades
Quantity	4 each
Clean, Visible, Functioning (rate using quality standards guide ATSSA 3rd edition)	Acceptable
Reflectorized	Yes
Anchored	Yes
Consistent throughout project	Yes
Crash Trucks (TMA) in use? If yes how many and type	N/A

Table D- Warning lights and devices

Requirement	Comment
Warning lights being used? Indicate type and location. Are all lights functioning? High or low intensity?	No.
Advance Flashing Warning arrows Portable or Truck-mounted Lights functioning and in correct mode?	N/A
Location of portable devices – Indicate if in clear zone and how protected.	N/A
Changeable Message Signs – indicate if Permanent or Portable, Message understandable, Number of frames displayed, Timing between screens acceptable?	N/A

Work Zone Traffic Control Review
Plans and Specifications Section – PART III

Is there a Transportation Management Plan? If yes, explain. No.

What special provisions are there in contract related to work zone (list item no, description and date of provision)?
0970007 Trafficperson (Uniformed Flagger), Rev. 01/08
0971001 Maintenance and Protection of Traffic, Rev. 2/25/13
1118101 Temporary Signalization, Rev. 2/21/01
1220013 Construction Signs-Bright Fluorescent Sheeting, Rev. 1/5/12

Is the project being completed in stage construction? If yes, explain. Stage I places TPCBC to shift traffic to the south side of the existing structure. Stage II relocates Stage I TPCBC to shift traffic to the north side of the new structure.

Is there temporary signalization? If yes, explain. Temporary signalization is utilized to maintain alternating one-way traffic during all stages of construction.

Is a detour required or being used? If yes, explain. No.

What guides, tools including manuals, pocket guides, books etc. do you reference?
Work experience

What work zone traffic plans are included in the project? MPT-1 & MPT-2

Has the project had any incident reports filed? No How many? N/A

Comments:

1. Due to an oversight, Traffic Cones, Traffic Drums and Type III Barricades were not included in the Contract. Traffic Drums, 42" and 28" Traffic Cones, and Type III Construction Barricades were added by Construction Order. The Contractor was proactive and placed traffic drums out before a price was approved. Note: Traffic cones less than 42 inches in height shall not be used on limited-access roadways or on non-limited access roadways with a posted speed limit of 45 mph and above.

2. The Contractor provided extra signage for additional safety. (Refer to picture on Page 5).

3. The Contractor questioned the temporary impact attenuation system that was designed for an impact velocity of 55 mph or less, since the posted speed limit is 45 mph. A change in the array system was approved to set up for an impact velocity of 45 mph or less.

4. The DE-7C delineators installed on the TPCBC are not all showing the correct color. The yellow side should show on the left side of traffic and silver show on the right side of traffic.

5. The high intensity barricade warning lights provided in the Contract have not been used. (The reviewer did not locate any notes in the plans indicating the use of these lights.)

Advanced signs for traffic light ahead.

Stop bar and signs at approach to one lane traffic.

Eradicated and new pavement markings at work site.

Additional signage provided by the contractor.

Completed By: _____

Approved By: _____

2014 Work Zone Safety Review Participants

District 1

Project 51-258
Juan Ruiz – Project Engineer
Job LeBlanc – Project Manager
Robert Whittaker – CDR Maguire
Claudel Meronnis – Office of Traffic
Bonney Whitaker – Office of Construction
Kiah Patten – Office of Construction

Project 53-186
Paul Carl – Project Engineer
John O'Dierna –Dewberry
Khaled Abu-Sitteh – Dewberry
Joseph Grasso – Office of Traffic
Bonney Whitaker – Office of Construction
Kiah Patten – Office of Construction

Project 82-298
Mohammed Bishtawi – Supervising Engineer
Michael Birch – Project Manager
Kiah Patten – Office of Construction

District 2

Project 58-329
Keith Schoppe – Project Engineer
Bret Kaczka – Tectonic
Terry MacAuliffe – Tectonic
Cale Carnot – American Industries, Inc.
Robert Turner – FHWA
Michael Chachakis – Office of Traffic
Terri Thompson – Office of Construction
Anthony Kwentoh – Office of Construction
Bonney Whitaker – Office of Construction
Kiah Patten – Office of Construction
Jeff Hunter – District 2 Construction

Project 58-329
Brian Gustafson – Project Engineer
Brent Church – Project Manager
Rich Brooks – District 1 Construction
Bonney Whitaker – Office of Construction
Kiah Patten – Office of Construction

Project 70-116
Joseph Taylor – Project Engineer
Joseph Grasso – Office of Traffic
Bonney Whitaker – Office of Construction
Kiah Patten – Office of Construction

District 3

Project 135-270
Dan Stafko – Supervising Engineer
Joseph Becker – URS Consulting
Aldo Tartaglino – O&G Industries
Robert Turner – FHWA
Oddler Fils – Office of Traffic
Anthony Kwentoh – Office of Construction
Bonney Whitaker – Office of Construction
Kiah Patten – Office of Construction
Jeff Hunter – District 2 Construction

Project 138-221
Jack Ploski – HNTB
Bonney Whitaker – Office of Construction
Kiah Patten – Office of Construction

District 4

Project 31-127
Donald Lamb – Project Manager
Bonney Whitaker – Office of Construction
Kiah Patten – Office of Construction

Project 36-182
Thomas Weldon – Project Engineer
Claudel Meronnis – Office of Traffic
Bonney Whitaker – Office of Construction
Kiah Patten – Office of Construction

APPENDIX A - WORK ZONE REVIEWS TO DATE DATABASE REPORT

Date	Project Number	Dist	Location (Route Town)	Prime Contractor	Project Engineer	Detours	Stage Const	Temp. SIgnal	Night Work	Ped and Bicycle	Limited	Temp. Lane Closure	Perm. Lane Closure
8/3/2010	0050-0204/0206	3	Route 15 Fairfield / Trumbull	O & G Industries	Anil Sehgal	☐	☑	☐	☑	☐	☑	☑	☑
8/25/2010	76-205	1	Intersection of Route 6 & Route 44 in the Town of Manchester	Spazzarini Construction Company	Jaspal Jutla	☐	☑	☐	☐	☑	☐	☑	☐
8/25/2010	42-297	1	Intersection of Silver Lane & Forbes St. East Hartford	Spazzarini Construction Company	Jaspal Jutla	☐	☐	☐	☐	☑	☐	☑	☐
10/6/2010	0044-0151	2	Interstate 95 Exits 72 to 83 in East Lyme / Waterford	Tilcon CT	Michael Wilson	☐	☐	☐	☑	☐	☑	☑	☐
11/2/2010	0015-0296 & 0301-0070A, B, C	1A	Various RR Bridges, Fairfield, Bridgeport, Westport	Ducci Electrical Contractors	Basel Hashem	☐	☑	☐	☐	☑	☐	☑	☐
11/3/2010	83-255	3	Interstate 95 North and Southbound in Milford and Orange	Manafort Brothers	Jeff Mordino	☐	☑	☐	☑	☐	☑	☑	☐
11/9/2010	140-164	4	Route 8 NB, Thomaston, Rehab Bridge # 00604	NJR Construction	Dave Ferraro	☐	☑	☐	☐	☐	☑	☐	☑
11/10/2010	0143-0177	4	Pinewoods Road, Torrington, CT	Spazzarini Construction	Dave Ferraro	☑	☐	☐	☐	☐	☐	☐	☑
12/8/2010	142-144	1	Route 74 west of I-84 Overpass, Tolland	Northern Construction Services	Dilraj Josen	☐	☑	☑	☐	☐	☐	☐	☑
12/8/2010	0111-0118	2	Route 97 Pomfret	New England Infrastructure	Mark Elliott	☐	☑	☑	☐	☐	☐	☐	☑
6/25/2011	0126-0167	3	Route 8 - Shelton	Rotha Contracting Co.	Joseph Sorcinelli	☐	☑	☐	☐	☐	☑	☑	☐
6/29/2011	0067-0115	4	Route 341 Kent	Dayton Construction Co.	Matthew Cleary	☐	☐	☑	☐	☐	☐	☐	☑
7/21/2011	59-155	2	Route 77 (Durham Road) Guilford, CT	Brunalli Construction Company	Paul Andruskiewicz	☐	☑	☑	☐	☐	☐	☐	☑
9/12/2011	173-414	3	Route 15 S.B. Hamden	New England Road Inc.	Jeffrey Knapp	☐	☐	☐	☑	☐	☑	☑	☐

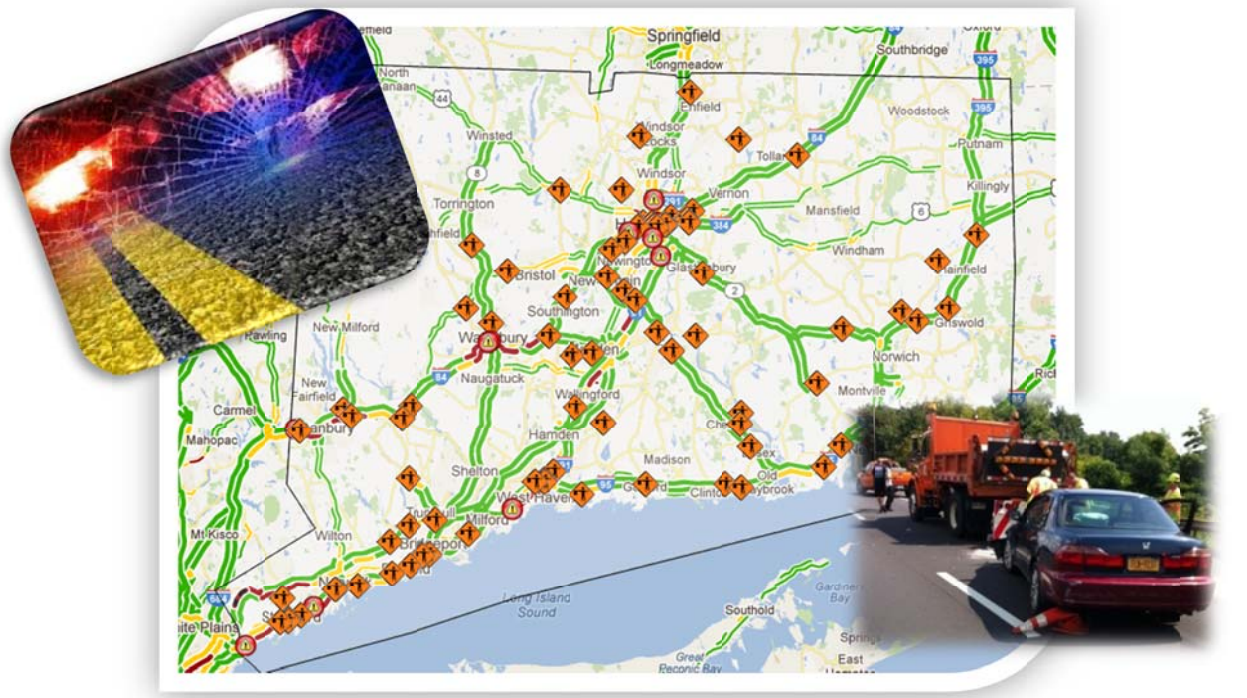
APPENDIX A - WORK ZONE REVIEWS TO DATE DATABASE REPORT

Date	Project Number	Dist	Location (Route Town)	Prime Contractor	Project Engineer	Detours	Stage Const	Temp. SIgnal	Night Work	Ped and Bicycle	Limited	Temp. Lane Closure	Perm. Lane Closure
10/25/2011	0092-0531/0619	3A	I-95, I-91 & Route 34 Interchange (Q Corridor) New Haven	92-531 E O&G/Tutor Perini 92-619 E2 Walsh	92-531 Dan Stafko 92-619 Bob Savage	☑	☑	☐	☑	☐	☑	☑	☐
11/8/2011	0084-0102	4	Route 25 Monroe, CT	Dayton Construction Company Inc.	Charles Murad	☑	☐	☑	☐	☐	☐	☐	☐
6/12/2012	0144-0179	3	Route 25, Trumbull	Manafort Brothers, Inc	Steven Hebert	☐	☐	☐	☐	☐	☑	☑	☐
6/19/2012	0103-0256	2	Route 97, Norwich	Pondview Construction, Inc.	Patrick Warzecha	☐	☑	☑	☐	☐	☐	☐	☑
7/26/2012	0098-0100	3	Route 17, North Branford	D & V Morin Constructio Co., Inc.	Roger Thomas	☐	☑	☑	☐	☐	☐	☐	☑
8/8/2012	0082-0299	1	Arrigoni Bridge, Cromwell/Middletown	The Middlesex Corp.	James J. Ruitto	☐	☑	☐	☐	☑	☐	☐	☑
8/23/2012	0042-0312	1	I-84 East Hartford, Manchester	Tilcon Connecticut, Inc	Paul Carl	☐	☑	☐	☑	☐	☑	☑	☐
8/29/2012	0096-0199	4	Route I-84, Newtown, Southbury and Middlebury	Tilcon Connecticut, Inc.	Dave Neelands	☐	☐	☐	☑	☐	☑	☑	☐
9/11/2012	0171-0351	1	Various	Arborio Corp.	Joe Sullivan	☐	☑	☐	☑	☐	☑	☑	☐
10/16/2012	0137-0143 & 0137-0144	2	Route 1 over Stony Brook & over Quanaduck Cove, Stonington	Hemlock Construction Co., Inc.	Keith Schoppe	☐	☑	☐	☐	☐	☐	☐	☑
11/30/2012	0079-0215	4	Route 71 (Cook Ave) over Harbor Brook, Meriden	Dayton Construction Co., Inc.	Ali Farzan	☑	☐	☐	☐	☑	☐	☐	☐
6/26/2013	0151-0296	4	Chase Avenue, Waterbury	Dayton Construction Co.	James Zaharevich	☐	☐	☐	☐	☐	☐	☐	☐
8/21/2013	0102-0278	3	Reconstruction of I-95 & Route 1, Norwalk	O & G Industries	Bob Nowak	☐	☑	☐	☑	☐	☑	☑	☐
9/5/2013	0081-0088	1	Route 147, Middlefield	New England Road, Inc	James Ruitto	☐	☐	☑	☐	☐	☐	☐	☑
10/3/2013	0088-0178	4	Route 174, New Britain (New Britain-Hartford Busway Contract 2)	E & S Joint Venture II	Dave Ferraro	☑	☐	☐	☐	☐	☐	☑	☐

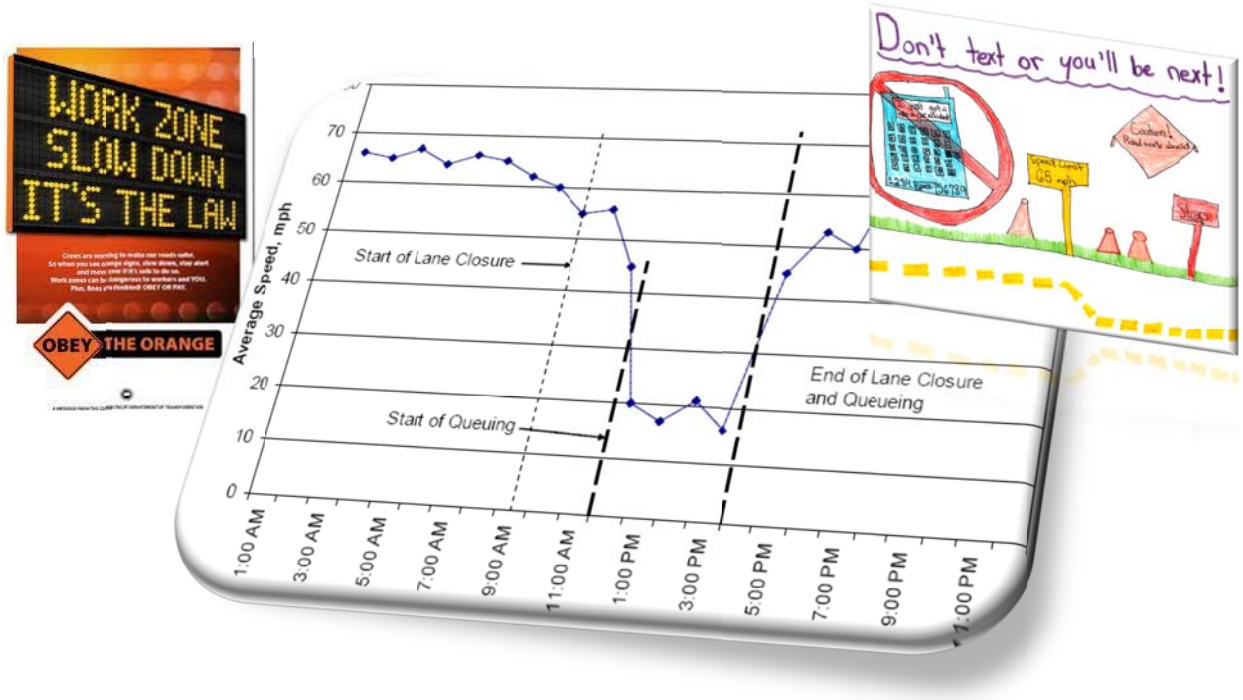
APPENDIX A - WORK ZONE REVIEWS TO DATE DATABASE REPORT

Date	Project Number	Dist	Location (Route Town)	Prime Contractor	Project Engineer	Detours	Stage Const	Temp. SIgnal	Night Work	Ped and Bicycle	Limited	Temp. Lane Closure	Perm. Lane Closure
6/9/2014	0051-0258	1	Replacement of Bridge No. 01951, Route 4, Farmington	The Brunalli Construction Company	Juan Ruiz	☐	☑	☐	☐	☑	☐	☐	☐
6/16/2014	0053-0186	1	Route 2, Glastonbury	Tilcon Connecticut, Inc	Paul Carl	☐	☐	☐	☐	☐	☑	☑	☐
7/24/2014	0060-0152	1	Route 9 over Nedobity Road, Haddam	Mohawk Northeast, Inc.	Brian Gustafson	☐	☑	☐	☐	☐	☑	☐	☑
7/25/2014	0070-0116	2	S.R. 616 (Norwich Avenue) over Bartlett Brook, Lebanon	McCarthy Concrete, Inc	Patrick Warzecha	☑	☐	☐	☐	☐	☐	☐	☑
9/5/2014	0082-0298	1	Route 17 (South Main Street), Middletown	J. Iappaluccio, Inc.	Juan Ruiz	☑	☐	☐	☐	☐	☐	☑	☐
9/16/2014	0138-0221	3	Reconstruction of Bridge No. 00135 (Moses Wheeler Bridge) I-95 over Housatonic River & Naugatuck Avenue in Towns of Milford and Stratford	Walsh Construction Co. /PCL J.V. II	Steven Hebert	☐	☑	☐	☐	☐	☑	☐	☐
9/19/2014	0031-0127	4	Replacement of Bridge No. 01933, Route 4 o/Bloody Brook, Cornwall	Dayton Construction Company, Inc.	Ali Farzan	☐	☐	☑	☐	☐	☐	☐	☑
9/24/2014	0135-0270	3	CT Route 15 in the Towns of Stamford to New Canaan	O & G Industries, Inc.	Joe Sorcinelli	☐	☐	☐	☑	☐	☑	☑	☐
10/8/2014	0058-0329	2	Pavement Preservation on I-95, Groton	American Industries, Inc.	Keith Schoppe	☑	☐	☐	☑	☐	☑	☑	☐
10/14/2014	0036-0182	4	Route 34 over Naugatuck River, City of Derby	Baier Construction Company, Inc.	Thomas Weldon	☐	☑	☐	☐	☐	☐	☐	☑

APPENDIX 4: CTDOT WORK ZONE IMPROVEMENT PLAN



Connecticut Work Zone Improvement Plan



CONNECTICUT
WORK ZONE IMPROVEMENT PLAN

This Work Zone Improvement Plan was prepared by the Connecticut Department of Transportation in response the recommendations in the 2011 Connecticut Work Zone Safety and Mobility Process Review Report and is evidence of Connecticut's compliance with 23 CFR 630.1008.

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

By: _____ Date: 5/22/13
James P. Redeker
Commissioner

FEDERAL HIGHWAY ADMINISTRATION

By: _____ Date: 5/29/13
Amy Jackson-Grove
Division Administrator

Executive Summary

A Work Zone Safety and Mobility Process Review (Process Review) was completed during the 2010 calendar year by the Connecticut Department of Transportation (CTDOT) and the Federal Highway Administration Connecticut Division (FHWA) to comply with the requirements of 23 CFR Part 630, Preconstruction Procedures, Subpart J—Work Zone Safety and Mobility.

The Process Review was the first such review conducted for the Work Zone Safety Program since this regulation became effective in 2007. The report is entitled *2011 Work Zone Safety and Mobility Process Review* and was signed by CTDOT and the FHWA on July 11, 2011. The report includes several recommendations for improvement and also a commitment by CTDOT to develop a formal action plan to pursue opportunities for additional improvement.

The 2010 and 2011 Work Zone Mobility and Safety Self-Assessments (Self-Assessment) and the 2010 Work Zone Field Reviews (Field Reviews) were the primary means by which the Process Review was developed.

The Self-Assessment is conducted annually by the FHWA Connecticut Division and CTDOT. It is used to evaluate the effectiveness of work zone management activities in Connecticut and to identify areas needing improvement.

The Field Reviews are scheduled to include various types of projects in construction and maintenance. The Reviews can range from a full audit of all work zone aspects to a selected audit of particular work zone elements such as pedestrian accessibility, pattern deployment, quality of traffic control devices and innovative techniques. These Field Reviews are an important tool to promote better understanding of the operational and design characteristics of a work zone. They help the DOT to develop improvements in the area of design, construction and operations.

This Work Zone Improvement Plan (WZIP) is the formal action plan to address the recommendations in the recent Process Review. The primary objective of the Plan is to minimize work zone congestion and delays, and enhance the safety of workers and motorists. This will be done through the establishment of policies, strategies, processes and tools to manage work zone mobility and safety impacts during project planning, design, and construction and maintenance activities.

A number of intermediate goals and actions are included in the WZIP to work towards the use of safety performance measures. Typical safety performance measures relate to the number and rate of fatalities and/or crashes and incidents, emergency response times, public perceptions of safety, etc., for the relevant transportation modes. Safety performance measures should be relevant to the safety issues and policy/strategy initiatives in a jurisdiction[1].

The most critical safety benefit is a decrease in the number of fatal and injury crashes that occur each year on streets and highways. Motor vehicle crashes are the sixth leading cause of death and the leading cause of injuries in the United States.

The Process Review identified several successful practices that are part of CTDOT's culture and continue to be refined and improved upon. They include:

- CTDOT Design Manual has been updated to provide for the consideration of positive separation devices for certain high speed/high volume facilities. Transportation Management Plans (TMPs) are being consistently developed to address the operational impacts of significant projects.
- A CTDOT work zone website has been developed to provide traveler information for its projects.
- Intelligent Transportation System (ITS) technologies are frequently used to collect and disseminate information to motorists and agency personnel on work zone conditions.
- CTDOT uses uniformed law enforcement personnel in work zones.
- CTDOT does an excellent job of sponsoring and promoting National Work Zone Awareness Week annually and of promoting awareness throughout each construction season.
- Incident Management services are utilized on Type I and II projects.

FHWA and CTDOT also identified the following noteworthy practices as a result of the Field Reviews:

- A temporary moveable concrete barrier system was utilized for median work on an interstate highway to protect construction workers, inspection personnel and motorists.
- Traffic queues were either nonexistent or minimal for all projects reviewed.
- Work zones were clearly identified and marked with appropriate construction signs and delineated with appropriate channelization devices and temporary pavement markings as warranted.
- Warning lights were in use on most of the projects reviewed.
- Equipment and materials storage areas were located either off-site, beyond a 30-foot clear zone, or protected by temporary concrete barrier.

The two areas identified in the Process Review that need improvement based on the Self-Assessments are:

Leadership and Policy- The report suggests CTDOT could strengthen its work zone program by establishing and/or implementing strategic goals to:

a) Reduce congestion and delays in work zones; and
b) Reduce crashes in work zones

[1] Cited from Cambridge Systematics, Inc. 2009, *A Primer on Safety Performance Measures for the Transportation Planning Process,* Report No. FHWA-HEP-09-043 http://safety.fhwa.dot.gov/hsip/tsp/fhwahep09043/fhwahep09043.pdf

Further, the report recommended that CTDOT establish and/or implement performance measures to:

a) Track work zone congestion and delay; and
b) Track work zone crashes

Program Evaluation - In order to accurately assess impacts from work zone operations, CTDOT needs to collect, track, and evaluate the following types of work zone data:

a) Work zone congestion and delay performance data and measures; and
b) Work zone safety performance data and measures

Customer surveys could also be conducted to evaluate work zone traffic management practices and policies on an area, corridor, or state-wide basis.

This WZIP establishes two working groups to progress the action items outlined in this plan. The first is the Work Zone *Performance Measures* Working Group under the Bureau of Policy and Planning and the second is the Work Zone *Operations* Working Group under the Bureau of Engineering and Construction. The Work Zone *Performance Measures* Working Group is responsible for developing strategic goals, performance measures, and the means to collect and analyze work zone congestion, delay, and safety performance. The Work Zone *Operations* Working Group is responsible for developing standards, practices, and policies that are consistent with national programs and meet Federal and State requirements. A Chairperson presides over each working group and decisions within the group are made by general consensus. These Working Groups will exist as an implementation tool for the Strategic Highway Safety Plan (SHSP) objectives and each Chairperson is responsible to the SHSP *Work Zones* safety emphasis area leader being referred to as the "Champion" in this WZIP.

The reader is reminded that CTDOT oversees the SHSP which is a broader, federally mandated plan covering a wide spectrum of physical and behavioral safety initiatives. The purpose of the SHSP is to clearly identify the State's critical safety needs and direct allocated resources to achieve significant reductions in fatalities and serious injuries on highways and all other public roads. The SHSP is a data-driven, multiyear comprehensive safety plan which integrates the 4E's – engineering, education, enforcement, and emergency medical services (EMS). To achieve the goal of the SHSP, the following safety emphasis areas have been identified:

- Traffic Records and Information Systems
- Roadway Departure and continued Spot and Systematic Safety Improvement
- Pedestrians and Bicycles
- Work Zones
- Driver Behavior (Occupant Protection, Child Passenger Safety, Speed Enforcement and Distracted Driving)
- Commercial Vehicles
- Incident Management

The SHSP *Work Zones* Champion is not only an active participant in the WZIP but is also a member of the SHSP Steering Committee. The Champion will steer the WZIP Chairpersons in a direction consistent with the policy objectives of the broader SHSP. The Champion provides the conduit for feedback for future SHSP updates, and manages changes to the emphasis area. The Champion and the Chairpersons will ensure that the recommendations of the WZIP are brought to the appropriate agency management levels for implementation.

Introduction

Since the Federal Highway Administration (FHWA) issued the 2004 Final Rule on Work Zone Safety and Mobility, several changes to the Code of Federal Regulations (CFR) have been adopted. Key elements of the Work Zone Safety and Mobility regulations require State Highway Agencies to implement the following:

- Policy – implement a policy to manage work zone impacts. The policy may be in the form of plans, processes, and procedures that will be developed in cooperation with FHWA.

- Assessment – develop and implement systematic procedures to assess work zone impacts, the scope of the assessment shall be based on project characteristics.

- Significant projects – identify significant projects based on agency policy and engineering judgment.

- Transportation Management Plan (TMP) – develop a TMP that consists of temporary traffic control plans; for significant projects, TMPs shall address the traffic control plans, operational strategies, and public information and outreach.

- Work Zone Data – use work zone crash data to improve work zone safety and mobility during project implementation and to improve agency procedures for future work zones.

- Training – train personnel involved in work zone design, implementation, operation, and inspection.

- Process Review – perform a work zone safety and mobility process review every 2 years with the FHWA.

- Pay Items – include appropriate pay items for implementing the TMP either through method or performance based specifications.

- Responsible persons – provide a qualified person responsible for work zone safety and mobility at the State and Contractor level.

- Implementation – work in partnership with the FHWA in the implementation of its policies and procedures to improve work zone safety and mobility. The FHWA will review the State's conformance with this regulation at appropriate intervals.

Requirements that were added to the CFR include revisions to standards, guidance, options, and supporting information relating to the traffic control devices, impacting virtually every section of

the Manual of Uniform Traffic Control Devices (MUTCD). These requirements resulted in the adoption of the 2009 Edition of the MUTCD as the national standard for all traffic control devices installed on any street, highway, or bicycle trail open to public travel. Some other final rules that have been incorporated into Title 23 CFR are:

- Final rule to supplement existing regulations to include conditions for the appropriate use of, and expenditure of funds for; uniformed law enforcement officers; positive protective measures between workers and motorized traffic; and installation and maintenance of temporary traffic control devices during construction, utility, and maintenance operations (Reference 23 CFR Part 630 Subpart K revised December 5, 2007).

- Final rule on maintaining traffic sign retro-reflectivity (Reference 23 CFR Part 655 Subpart F revised May 14, 2012).

- Final rule on high-visibility safety apparel in response to Section 1402 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act commonly referred to as SAFETEA-LU, which requires all workers to wear high-visibility safety apparel (Reference 23 CFR Part 655 Subpart F revised April 1, 2009).

A Work Zone Safety and Mobility Process Review was completed during the 2010 calendar year by the Connecticut Department of Transportation (CTDOT) and the Federal Highway Administration Connecticut Division (FHWA) to comply with the requirements of 23 CFR Part 630, Preconstruction Procedures, Subpart J—Work Zone Safety and Mobility.

The Process Review was the first such review conducted for the Work Zone Safety Program since this regulation became effective in 2007. The report is entitled *2011 Work Zone Safety and Mobility Process Review* and was signed by CTDOT and the FHWA on July 11, 2011. The report includes several recommendations for improvement and also a commitment by CTDOT to develop a formal action plan to pursue opportunities for additional improvement. The next work zone process review must be completed in 2013.

This Work Zone Improvement Plan (WZIP) is the formal action plan to address the recommendations in the recent Process Review. The primary objective as it relates the management of work zone safety and mobility for CTDOT is to minimize work zone congestion and delays, and enhance the safety of workers and motorists. This will be done through the establishment of policies, strategies, processes and tools to manage work zone mobility and safety impacts during project planning, design, and construction and maintenance activities.

Overview

Plan: a system for achieving objective

WZIP will evolve through updates, be expanded as needed, and address future changes in rules and regulations related to work zone safety initiatives:

1) National Highway Work Zone Safety Program
2) Final Rule on Work Zone Safety and Mobility
3) Public Law 112-141 Moving Ahead for Progress in the 21st Century Act (MAP-21).

WZIP will also integrate CTDOT's work zone policies, goals and objectives included in the SHSP, and results of the annual Self-Assessments and Field Reviews being performed annually by CTDOT in cooperation with the FHWA. Agency guidelines, policies, and practices will be reviewed and updated to meet the new laws and regulations that are enacted at the state and Federal levels and be documented in WZIP.

Administration

This WZIP establishes two working groups to progress the action items outlined in this plan. The first is the Work Zone *Performance Measures* Working Group under the Bureau of Policy and Planning and the second is the Work Zone *Operations* Working Group under the Bureau of Engineering and Construction. The Work Zone *Performance Measures* Working Group is responsible for developing strategic goals, performance measures, and the means to collect and analyze work zone congestion, delay, and safety performance. The Work Zone *Operations* Working Group is responsible for developing standards, practices, and policies that are consistent with national programs and meet Federal and State requirements. A Chairperson presides over each working group and decisions within the group are made by general consensus. These Working Groups will exist as an implementation tool for the Strategic Highway Safety Plan (SHSP) objectives and each Chairperson is responsible to the SHSP *Work Zones* safety emphasis area leader being referred to as the "Champion" in this WZIP. Refer to Figure 1 Organization Chart for additional information on participants and relationships between SHSP, WZIP and others.

The reader is reminded that CTDOT oversees the SHSP which is a broader, federally mandated plan covering a wide spectrum of physical and behavioral safety initiatives. The purpose of the SHSP is to clearly identify the State's critical safety needs and direct allocated resources to achieve significant reductions in fatalities and serious injuries on highways and all other public roads. The SHSP is a data-driven, multiyear comprehensive safety plan which integrates the 4E's – engineering, education, enforcement, and emergency medical services (EMS). To achieve the goal of the SHSP, the following safety emphasis areas have been identified:

- Traffic Records and Information Systems
- Roadway Departure and continued Spot and Systematic Safety Improvement
- Pedestrians and Bicycles
- Work Zones
- Driver Behavior (Occupant Protection, Child Passenger Safety, Speed Enforcement and Distracted Driving)
- Commercial Vehicles
- Incident Management

The SHSP *Work Zones* Champion is not only an active participant in the WZIP but is also a member of the SHSP Steering Committee. The Champion will guide the WZIP Chairpersons in a direction consistent with the policy objectives of the broader SHSP. The Champion provides the conduit for feedback for future SHSP updates, and manages changes to the emphasis area. The Champion and the Chairpersons will ensure that the recommendations of the WZIP are brought to the appropriate agency management levels for implementation.

The action item areas recommended for improvement based on the Self-Assessments are in the category for Leadership and Policy and the category for Program Evaluation and are listed in Table 3. The action item issues recommended and based upon the Field Reviews have been included in Table 4 and Table 5. The groups will work collaboratively with the Commissioner's Highway Work Zone Safety Advisory Council, the Work Zone Safety Awareness Working Group, the Highway Safety Office (HSO), and be responsible for integrating their efforts into Connecticut's Strategic Highway Safety Plan.

The Highway Work Zone Safety Advisory Council was established under Public Act 08-114 (Connecticut General Statute Section 14-212e).Its purpose is to make recommendations to improve safety for workers, public safety officers, and motor vehicle operators in a "highway work zone", as defined in Connecticut General Statute Section 14-212d.

The ongoing areas of study and review by the Council include: (1) Evaluation of current work design and safety protocols; (2) survey of effective highway work zone design and safety protocols in other states; (3) implementation of technology to improve highway work zone safety; (4) use of public safety officers to improve highway work zone safety; (5) availability of federal funding for highway work zone training and enforcement; and (6) other issues the Council deems appropriate for improving highway work zone safety.

The Work Zone Safety Awareness Working Group was formed in 2000, following the inception of the National Work Zone Awareness Campaign in 1999. The Working Group's primary objective is to increase public awareness of work zone safety and facilitate intradepartmental and interagency communication and support related to work zone safety awareness.

The HSO's primary objectives are to plan, coordinate, and implement effective highway safety programs and to provide technical leadership, support and policy direction to highway safety partners. The HSO focuses on NHTSA (National Highway Traffic Safety Administration) program areas under the Federal 402 program. These include Impaired Driving, Occupant Protection, Child Passenger Safety, Police Traffic Services, Motorcycle Safety, Traffic Records, Driver Groups, Bicycle and Pedestrian Safety and Work Zone Safety. The HSO is also publishes the Annual Highway Safety Plan and the Annual Highway Safety Report, which ensures compliance with CTDOT policies, National Highway Traffic Safety Administration guidelines, and relevant federal laws and regulations; establishes problem identification, and formulates goals and objectives for transportation safety.

The Strategic Highway Safety Plan clearly identifies the State's critical safety needs and directs allocated resources to achieve significant reductions in fatalities and serious injuries on highways and all other public roads. The SHSP is prepared in cooperation and collaboration with the Highway Safety Improvement Program. It is the mechanism for all highway safety programs in the State to work together in a coordinated effort to maximize its resources and positions the State and all its safety partners to address the State's traffic safety challenges. The Plan includes Work Zones as an emphasis area. The Champion is responsible for the oversight of the WZIP, and execution of any recommendations that originate from the WZIP that have been approved by the Department of Transportation or SHSP steering committee.

Work Zone Operations Working Group (WZO)

Terri L. Thompson - Chair
Transportation Supervising Engineer
Bureau of Engineering and Construction
Office of Construction
Telephone: (860) 594-2667
Email: Terri.Thompson@ct.gov

The Work Zone *Operations* Working Group is responsible for developing standards, practices, and policies that are consistent with national programs and meet Federal and State requirements. A Chairperson presides over each working group and decisions within the group are made by general consensus.

TABLE 1- WORK ZONE OPERATIONS WORKING GROUP

MEMBER	REPRESENTING
Terri Thompson	Office of Construction, Central Administration – Chairperson
Jeffrey Hunter	Office of Construction, Central Administration
Bonney Whitaker	Office of Construction, Central Administration
Kiah Patten	Office of Construction, Central Administration
Travis Woodward	Office of Construction, District
David Ferraro	Office of Construction, District
Charles Harlow	Office of Traffic Engineering
Michael Calabrese	Office of Highway Design
Steve Keedy	Office of Bridge Safety
Frederick DiNardi	Office of Maintenance, Central Administration
John Korte	Office of Highway Operations
David Shute	Office of Human Resources- Safety Division
Robert Turner	Federal Highway Administration
Robert Ramirez	Federal Highway Administration
Vacant	Department of Emergency Services & Public Protection State Police
Vacant	Connecticut Police Chiefs Association

The Working Group will focus on elements in Table 3 and Table 4 related to work zone traffic management practices and policies on a statewide/area-wide basis. The tasks will include development and execution of customer surveys to gauge the effectiveness of public outreach strategies, work zone design and management, and the level of recognition of the work zone traffic control devices and their functions. This group will also evaluate and make recommendations for changes or improvements to the various elements that are a part of work zone traffic management practices and policies. This will include: improvements to traffic control devices; creating, updating, and revising specifications; development of guidance documents; and the use of innovative practices for the safety of the highway workers and the traveling public.

Work Zone Performance Measures Working Group (WZPM)

Colleen A. Kissane - Chair
Transportation Assistant Planning Director
Bureau of Policy and Planning
Office of Strategic Planning and Projects
Telephone: (860) 594-2132
Email: Colleen.Kissane@ct.gov

The Work Zone *Performance Measures* Working Group is responsible for developing strategic goals, performance measures, and the means to collect and analyze work zone congestion, delay, and safety performance.

TABLE 2- WORK ZONE PERFORMANCE MEASURES WORKING GROUP

MEMBER	REPRESENTING
Colleen Kissane	Office of Strategic Planning and Projects - Chairperson
Craig Babowicz	Office of Strategic Planning and Projects- Policy & Performance Measures Unit
Michael Connors	Office of Roadway Information Systems
Maribeth Wojenski	Office of Coordination, Modeling and Crash Data
Harold Decker	Office of Highway Operations
Charles Harlow	Office of Traffic Engineering
Terri Thompson	Office of Construction, Central Administration
Jeffrey Hunter	Office of Construction, Central Administration
Bonney Whitaker	Office of Construction, Central Administration
John DeCastro	Office of Maintenance, Central Administration
Robert Turner	Federal Highway Administration
Robert Ramirez	Federal Highway Administration
Vacant	Department of Emergency Services & Public Protection State Police
Vacant	Connecticut Police Chiefs Association

The Working Group will focus on elements in Table 3 and Table 5 that are related to goals and performance measures in an attempt to reduce crashes and delays. This will include monitoring congestion impacts and identifying problems in real time that result in work zone delays and crashes.

Implementation

Action Items

The Process Review identified the following action item areas needing improvement based on the scores for the Self-Assessments. These areas are part of WZIP Action Areas (see Table 3).

1) Establish strategic goals specifically to reduce congestion and delays in work zones.

2) Implement strategic goals specifically to reduce crashes in work zones.
3) Establish performance measures (e.g., vehicle throughput or queue length) to track work zone congestion and delay.

4) Implement performance measures (e.g., crash rates) to track work zone crashes.

5) Collect data to track, analyze and evaluate work zone congestion and delay performance.

6) Collect data to track, analyze and evaluate work zone safety performance.

7) Conduct customer surveys to evaluate work zone traffic management practices and policies on a statewide/area-wide basis.

8) Develop strategies to improve work zone performance based on work zone performance data and customer surveys.

Performance Measures

Performance measures have been a topic of discussion at the Council, which has a responsibility to make recommendations to improve safety for workers, public safety officers, and motor vehicle operators in a "highway work zone," as defined in Connecticut General Statute Section 14-212d. The areas of study and review by the Council include: (1) evaluation of current work design and safety protocols; (2) survey of effective highway work zone design and safety protocols in other states; (3) implementation of technology to improve highway work zone safety; (4) use of public safety officers to improve highway work zone safety; (5) availability of federal funding for highway work zone training and enforcement; and (6) other issues the Council deems appropriate for improving highway work zone safety.

Ms. Colleen Kissane and Mr. Joseph Cristalli, who is the Transportation Principal Safety Program Coordinator in the Office of Highway Safety, provided an overview to the Council of their experience with implementing performance measures and provided a copy of the National Cooperative Highway Research Program (NCHRP) Domestic Scan 08-04 entitled "Best Practices in Work Zone Assessment, Data Collection, And Performance Measurement", which is available at the following website:
http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-68A_08-04.pdf

Areas that have been identified by CTDOT and the FHWA as opportunities for best practices are:
Tracking Long-Term Progress

- Monitoring progress system-wide over many years to determine trends
- Not assessing any individual project, but CTDOT as a whole
- Key interest items:
    - Traffic safety during construction
        - Be able to identify accident rates before, during, and after construction
        - Is construction activity increasing accidents?
        - Are accident rates better or worse after construction than before?
    - Congestion impacts of construction
        - How much delay is construction causing motorists?
        - How can delays be evaluated?
        - Should existing speed-flow monitors on I-91 be used?

- Need to capture data from existing and convenient sources, if possible.

- Scope may require narrowing the types of projects or roads to be included in data collection.
  - ✓ Example: Data on freeway system (freeway construction projects) may be readily available.
  - ✓ Single data source: State Police
  - ✓ Electronic data source: State Police System

Identifying Problems in Real Time on Individual Projects

- If problems occur during construction projects, are they being recognized and corrected appropriately?
- The FHWA cited tractor trailer rollovers during a past I-95 construction project in Bridgeport. The monitoring of traffic cameras in the area revealed that trucks were having trouble negotiating lane changing in the project limits. The contractor identified improper super elevation, repaved the area of concern, and corrected the problem.
- Tracking crashes in a work zone
  - ✓ The crash data element for work zones must be accurately represented on accident reports in order to obtain reliable crash data. Emphasis and understanding of the work zone element as defined in the Model Minimum Uniform Crash Criteria (MMUCC) and ANSI D16.1-2007 Manual on Classification of Motor Vehicle is critical in order for the performance measures to move forward.

  - ✓ The Traffic Records Coordinating Committee is a committee whose mission is to provide a timely, complete, uniform, accurate, accessible, and integrated motor vehicle crash reporting system for Connecticut. TRCC will provide major assistance to the WZIP Working Group in developing performance measures related to vehicle crash data.

Specific Items Requiring Further Discussion by WZIP Working Groups

1) Best Available Data – Look at internal, interagency and external sources for information.

2) Delay Measures – Innovative practices and devices to assist in getting data.

3) Public Information – Use of surveys, campaigns, website, and social media to get public feedback.

4) Determine what is considered construction-related effects on congestion and delay – Approaching work zones (i.e. queue areas).

5) Law Enforcement Training – Require all law enforcement personnel to complete a course in work zone traffic control, such as “Safe and Effective Use of Connecticut Law Enforcement Personnel in Work Zones,” that is available through the University of Connecticut Technology Transfer Center.

6) Incident Reporting – Develop project-based incident reporting database.

7) Establishment of work zone clear zone - The AASHTO Roadside Design Guide defines a clear zone as the total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a non-recoverable slope, and/or a clear run-out area. The clear zone needs to be established for each project to ensure the contractor's operations provide an appropriate clear area for items such as storage of equipment, vehicles, and stockpiling of project materials. The use of appropriate NCHRP 350 devices that provide positive protection must also be required.

Planned Measures and Strategies

WZIP will be the mechanism for:

- Documenting issues, defining problems, and establishing realistic outcomes, as a result of discussions with various work zone stakeholders that include local, state and private agencies and organizations, the traveling public, and contracting industry.

- Establishing tasks and timelines to implement goals and measures for reducing congestion and delays, and reduce crashes in work zones.

- Guiding the Working Groups in producing solutions in the areas of Engineering, Enforcement, Education and Outreach, Traffic Incident Management, and Programming and Planning.

WZIP has three task-based lists that will address the following:

1) Action Areas, Table 3.

2) The Work Zone Operations Working Group Action Item Issues, Table 4.

3) The Work Zone Performance Measures Working Group Action Item Issues, Table 5.

This WZIP includes recommendations and solutions that are achievable, valuable, manageable, constructive, and realistic. There are other activities that are not specifically addressed in the tables and are as follows:

1) Annual Meeting to report out on progress by Work Zone Operations and Work Zone Performance Measures Working Groups.

2) Member participation or affiliation with other committees, groups, and organizations that have work zone safety focus or emphasis areas that may have related work zone safety areas (i.e. Strategic Highway Safety Plan Committee, Traffic Records Coordinating

Committee, Connecticut Transportation Institute Technology Transfer Center, Office of Highway Safety, Commissioner's Highway Work Zone Safety Advisory Council, and the Work Zone Safety Awareness Working Group).

3) Joint meetings held quarterly with the Executive Steering Committee WZIP Working Groups to discuss progress and update the tables.

4) Annual Work Zone Mobility and Safety Self-Assessments.

5) Work Zone Safety Awareness Campaign initiatives, including the annual work zone safety press event and public outreach activities in support of the National Work Zone Awareness Campaign.

6) Work zone safety audits for night and day operations are conducted throughout the construction season and include the review of traffic control devices, sign installation and removal methods, and sign recognition and visibility. A survey of workers is also conducted to better understand what is working and what is not working. Through these audits, changes and improvements can be made to assist motorists and workers. Specific action items to be addressed by the Working Groups are included in the Work Zone Improvement Plan Table 4 and Table 5.

FIGURE 1- ORGANIZATIONAL CHART

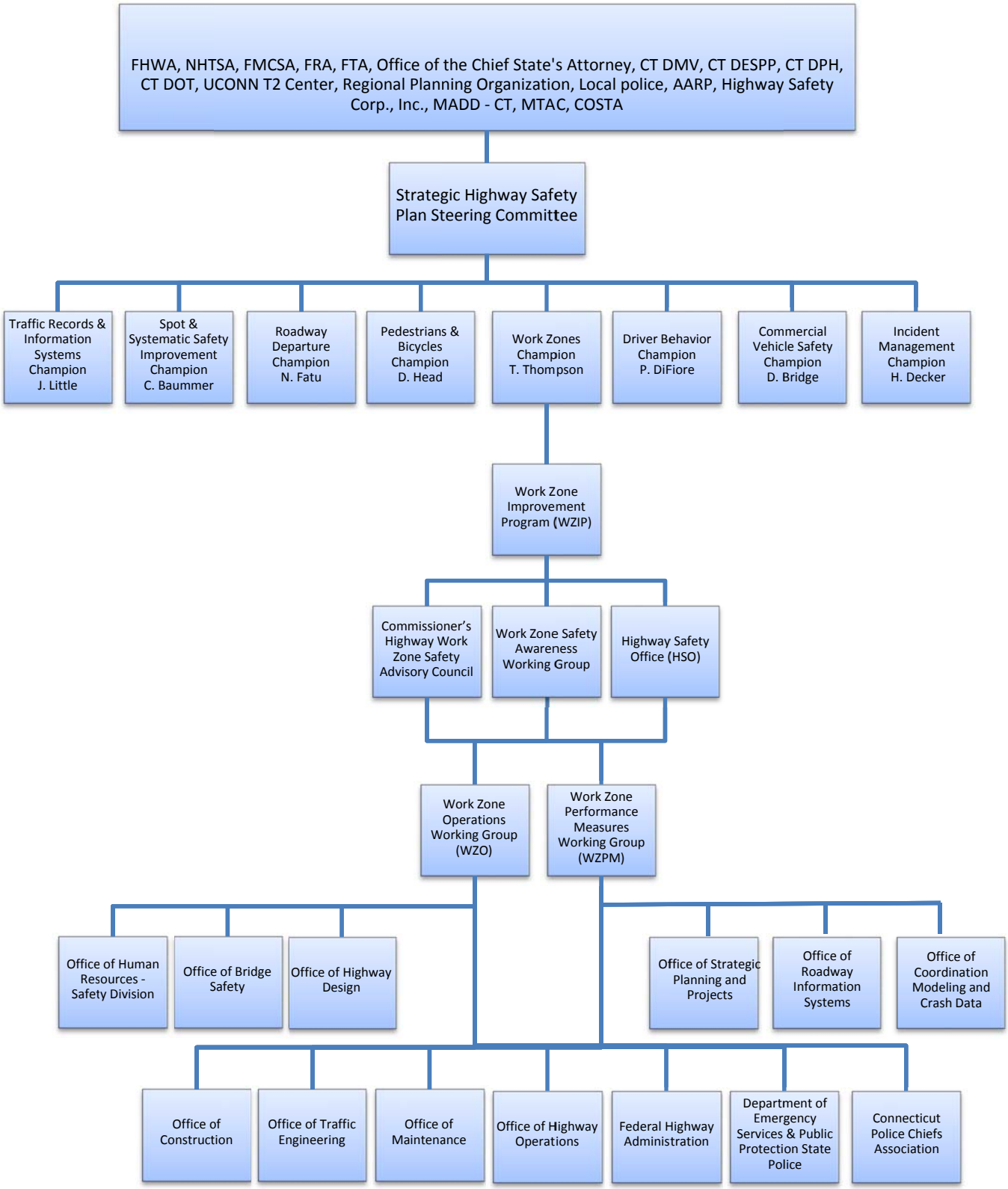


TABLE 3 – Connecticut Work Zone Improvement Plan (WZIP) Action Areas

Improvement Area: Work Zone Safety and Mobility
State: Connecticut
Process Review Report Date: July 11, 2011

	Critical Issue Area	Recommendations for Improvement	Actions and/or Products, including Major Steps, if any, and Resources Needed	Responsible Office/ Position/ Person	Status	Target Completion Date
	Work Zone Self-Assessment Elements					
1	**Leadership and Policy**	Establish strategic goals specifically to reduce congestion and delays in work zones.	1. Form working groups comprised of various stakeholders that can assist in improvement. a) Establish Work Zone Operations (WZO) Working Group and Work Zone Performance Measures (WZPM) Working Group. b) Schedule meeting for both groups to go over action plan and issues list from work zone reviews 2. Define other safety plans and programs that include Work Zone Safety elements 3. Develop strategic goals for work zone safety (CTDOT and stakeholders) to provide safe and efficient roadway systems. 4. Prepare recommendation(s) for implementation of strategic goals for review and comment by the SHSP Champion. 5. Act on recommendations to implement or return for further action 6. Approve strategic goals and incorporate into SHSP	1a. T. Thompson 1b. Chairpersons - currently T. Thompson and C. Kissane 2. WZO and WZPM Chairpersons 3. WZO and WZPM Chairpersons 4. WZO and WZPM Chairpersons and SHSP Champion 5. SHSP Champion 6. SHSP Champion and SHSP steering committee	1a. Completed 1b. Pending Approval of WZIP 2. Ongoing 3. Ongoing Refer to Table 4 & Table 5 4. Pending 5. Pending 6. Pending	1a. Completed 1b. May 2013 2. Ongoing 3. October 2013 4.To Be Determined 5.To Be Determined 6.To Be Determined

	Critical Issue Area	Recommendations for Improvement	Actions and/or Products, including Major Steps, if any, and Resources Needed	Responsible Office/ Position/ Person	Status	Target Completion Date
	Work Zone Self-Assessment Elements					
2	**Leadership and Policy**	Implement strategic goals specifically to reduce crashes in work zones.	1. Establish a Work Zone Safety Advocate/Liaison that reports to upper management and coordinates with various offices, agencies and organizations to brainstorm and identify reasonable strategic goals to improve mobility in work zones and handle delays more effectively.	Office of Commissioner	Pending	To Be Determined
3	**Leadership and Policy**	Establish performance measures (e.g. vehicle throughput or queue length) to track work zone congestion and delay	1. Define metrics for performance measures considering - Queue lengths - Speed - Volume - Delay time 2. Development of criteria to define the limits of work zones and related queues 3. Establish means to capture real time traffic data.- Low vehicle throughput and long queue lengths causing congestion and delays in work zones a) Systems Engineering Analysis - Needs Assessment and Functional Requirements b) Develop RPM Technical Design document for RFP c) RFP Document to be sent to Purchasing / Specification Committee d) RFP Document to be sent to DAS e) RFP Advertising to Award f) Begin Travel Time messaging.	1-2. WZPM 3. Highway Operations 3a-b) Consultant with input from stakeholders including WZO and WZPM 3c) Highway Operations 3d) Highway Operations 3e) DAS/Purchasing 3f) Highway Operations	1-2 Pending. Refer to Table 5 3. Ongoing 3a) Completed 3b-f) Pending	1-2. To Be Determined 3a) Completed 3b) April 30, 2013 3c) May 1, 2013 3d) May 30, 2013 3e) June 15 - Sept. 30, 2013 3f) Sept. 30, 2014

	Critical Issue Area	Recommendations for Improvement	Actions and/or Products, including Major Steps, if any, and Resources Needed	Responsible Office/ Position/ Person	Status	Target Completion Date
	Work Zone Self-Assessment Elements					
4	**Leadership and Policy**	Implement performance measures (e.g., crash rates) to track work zone crashes	1. Define metrics to be used for performance measure - Type - Frequency - Location 2. Develop baseline to determine threshold values to be used a basis of measuring crashes 3. Approval of metrics and baseline	1. WZPM 2. WZO / WZPM SHSP Champion 3. SHSP Champion and SHSP steering committee	1. Pending. Refer to Table 5 2. Pending. Refer to Table 5 3. Pending	1. To Be Determined 2. Coincides with data collection effort 3. Pending
5	**Program Evaluation**	Collect data to track, analyze and evaluate work zone congestion and delay performance	1. Research equipment to track work zone information such as speed, volume, and delay (length of queues) in order to establish some performance parameters that can be used in the design of work zones. a) Develop specification and add to project as pilot b) Obtain and evaluate data collected c) Revise specification and add to additional projects d) Establish some performance parameters that can be used in the design of work zones 2. Develop reporting system to output incident related delays utilizing current in place system to obtain data a) Develop database to log incident reports and structure queries b) produce monthly reports for analysis c) Evaluate and develop delay performance measure.	1. Highway Operations 1a) Terri Thompson and John Korte 1b) PDP Associates – company furnishing system 1c) Terri Thompson and John Korte 1d) Bureau of Engineering & Construction- Offices of Traffic Engineering Design Services, Construction 2. WZO with OIS	1. Ongoing 1a) Implemented on Project No. 0082-0299, Arrigoni Bridge Middletown 1b) Awaiting data 1c) Pending 1d) Pending 2. Pending	1a) 2011 1b) September 2013 1c) March 2014 1d) Undetermined 2. Pending

	Critical Issue Area	Recommendations for Improvement	Actions and/or Products, including Major Steps, if any, and Resources Needed	Responsible Office/ Position/ Person	Status	Target Completion Date
	Work Zone Self-Assessment Elements					
6	**Program Evaluation**	1. Collect data to track, analyze and evaluate work zone safety performance	1. Obtain reliable Crash Data in Work Zones a) Accurate representation on accident reports and include work zone as primary element on crash report b) Decrease time to get crash data c) Incorporate crash frequency in the design of future projects in the area. d) Categorize crash types	1. TRCC / Bureau of Policy & Planning 1a) Traffic Records TRCC 1b) UConn Repository 1c) Bureau of Engineering and Construction Engineering- Design and Traffic 1d) Bureau of Policy and Planning	1. Dependent on TRCC Vehicle Crash Reporting System	1) Adopt new motor vehicle crash reporting January 2015

	Critical Issue Area	Recommendations for Improvement	Actions and/or Products, including Major Steps, if any, and Resources Needed	Responsible Office/ Position/ Person	Status	Target Completion Date
	Work Zone Self-Assessment Elements					
7	**Program Evaluation**	Conduct customer surveys to evaluate work zone traffic management practices and policies on a statewide/area-wide basis	1. Customer Surveys a) Develop questionnaire for survey for web based application b) Info System setup for webpage c) Conduct Survey d) Compile information and develop needs list based on customer feedback e) Recommend new practices and polices based on needs list f) Submit for approval and implementation g) Approve recommendations and incorporate into specifications, and practices for Department 2. Maximize the best visibility and reading capability for the traveling public a) Research different types of portable/variable message signs and capabilities to find best approach. b) Recommend changes to specifications, policies and practices based on research (i.e. distance from the anticipated queue), proper messaging, and message legibility. c) Approve recommendations and incorporate into specifications, policies and practices for Department	1. WZO 1a) Work Zone Safety Awareness Working Group 1b) OIS 1c) WZO / WZPM 1d) Chairpersons WZO / WZPM 1e-g) SHSP Champion and Bureau Chief 2a) WZO Highway Operations 2b) SHSP Champion 2c) Bureau Chiefs for Highway Operations and Engineering & Construction	1. Pending	September 2013

	Critical Issue Area	Recommendations for Improvement	Actions and/or Products, including Major Steps, if any, and Resources Needed	Responsible Office/ Position/ Person	Status	Target Completion Date
	Work Zone Self-Assessment Elements					
8	**Program Evaluation**	1. Develop strategies to improve work zone performance based on work zone performance data and customer surveys.	1. Work Zone Traffic Control Reviews a) Develop review form and database to document evaluations. Review sections include - Q&A - Traffic Control Devices - Plans and specifications b) Perform Field Reviews c) Prepare Annual Report 2. Develop Action List for Working Groups (WZO/WZPM) a) Define issue and problem statement, with expected outcome b) Review issues and develop - Actions Required, Status, Time Frame and Responsible parties c) Update action list and report out on activities to SHSP Champion.	1. Bureau of Engineering & Construction- Office of Construction 1a) Jeff Hunter 1b) Work Zone Review Group – includes personnel from FHWA, Office of Construction, Traffic, Safety, and Highway Operations 1c) Office of Construction 2. Work Zone Review Group	1. Ongoing 1a) Completed 1b) 2010 and 2011 completed 2012 in progress 1c) 2011 and 2012 Pending 2. Ongoing Refer to Table 4 and Table 5	1. Ongoing 1a) Completed 1b) Min. 10 per year 1c) 2011 and 2012 to be combined in one report May 2013 2. N/A 2c) Present Progress as part of WZIP Annual Meeting – December of each year.

Table 4 and Table 5 include items from the 2010 Work Zone Action Items included in 2011 Process Review and have been updated for this report.

TABLE 4- Work Zone Operations (WZO) Working Group Action Item Issues

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
1	**Construction Sign Retro-Reflective Issues**	Plastic Substrate does not appear to be rigid enough to utilize the reflective properties of the sheeting so that the sign can be read properly by the traveling public during night time hours. Condensation found to reduce retro-reflectivity of construction signs.	Improved visibility of signs by the traveling public.	Ongoing discussion with the Office with Traffic Engineering concerning the issue. Inquired to other states if they encountered same issue. Email sent to Districts asking for review and to be ready for discussion at next managers meeting. Additional in-depth reviews regarding condensation conducted by Project 0044-0151 personnel. A) Send Memo requesting removal of signs using plastic substrate. B) Revise specification to exclude plastic substrates.	C) Monitor use of new sign provision on new projects. D) Propose research studies - Testing different types of sheeting and substrates to find qualities that provide optimum visibility and durability. E) Review and, if necessary, revise specification so that condensation is removed from construction signs.	Sent out October 15, 2011 Memo from Construction to Division of Traffic recommending two changes A) Discontinued the use of Type III sheeting and require bright fluorescent sheeting for all construction signs. B) Revised specification Item No. 1220013A Construction Signs - Bright Fluorescent Sheeting to not allow use of corrugated or waffle board types of plastic substrate, foam core, and composite aluminum sign substrates. C) Ongoing D) Pending E) Pending further review	A) Completed 5/30/12 B) Completed revision date 1/5/12	Office of Construction Traffic Engineering

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
2	**Pedestrian /Bicycle Access Issues**	Incomplete sidewalks, pedestrian buttons inaccessible or inoperable, lack of crosswalks at intersections, and lack of handicap ramps.	Improved pedestrian and bicycle awareness and accessibility through design and construction	A) Notified and discussed the review teams' concerns with chief inspectors. B) Reviewed contract documents for specific language, or lack thereof, regarding this type of access. C) Investigate if utility delays are the reason why sidewalks are incomplete. D) Conduct training if necessary.	E) Conduct more of these types of reviews to see if these pedestrian/bicycle issues are more widespread. F) Review plans and specifications and revise if necessary.	D) Included in winter training session- Work Zone Policy & Procedure presentation. Training session for supervisors and inspectors occurs in February and March. E, F) Continue reviewing plans and monitoring projects for conformance	D) Completed as of April 2012 E,F) Ongoing	Traffic Engineering Highway Design Office of Construction Office of Maintenance Mon-motorized Transportation Coordinator
3	**Project Lighting for Night Construction**	Glare from portable light plants affecting motorists traveling through the work zone.	Reduce glare for motorists in work zone areas.	A) Develop a Daily Site Review checklist to be used by project field personnel.	B) Develop and distribute work zone safety reminders (i.e. issues memo) for field personnel. C) Review specification requirements.	A) Completed B) Completed C) Completed- no change	A) Implemented Aug. 15, 2012	Office of Construction Traffic Engineering Safety Division
4	**Lighting for Night-Time Inspection**	Inspectors working on night projects do not have sufficient lighting to inspect work. This could be previously completed work or areas requested by contractor prior to placement of material.	Increase visibility for inspecting night time and improve overall visibility of work area.	A) Reviewed specification requirements and found that contractor not required to supply any lighting either hand held or portable light plants.	B) Place request to specification committee to include wording that for any night work, portable and hand held lighting is to be supplied by contractor for inspection staff.	B) In the process of reviewing current M&PT and work zone requirements included in special provisions and standard specifications.	Ongoing	Office of Construction Traffic Engineering Office of Maintenance Safety Division

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
5	**Barricade Warning Lights - High intensity**	High-intensity, solar powered warning lights are not effective in rural areas with significant canopy surroundings.	Ensure that lights are operational under all conditions.	Reviewed specification.	Revise current provision to state exclusion of solar powered warning lights in rural areas. Projects should require and monitor battery-operated lights in areas where this may be an issue. Add as an item on the Daily Site Review checklist referenced is Issue No. 3.	Discussing with the Office of Traffic about possibly changing the plans or revising the specification to allow either solar or battery-operated.		Office of Construction Traffic Engineering Safety Division
6	**Traffic Control in Work Zones**	Experience with and understanding of work zone safety. Establishing levels of effectiveness (i.e. presence versus enforcement).	Consistent practices and implementation of use of traffic persons. Better educated traffic control persons who will provide effective direction in work zones.	"Safe and Effective Use of Connecticut Law Enforcement Personnel in Work Zones" training curriculum now available online. Visit University of Connecticut Technology Transfer (T2) Center at http://www.t2center.uconn.edu/	A) Continue training at the local and state level. Look at grant resources to provide monies for training. B) Executive Policy Statement for "Policy on Effective Use of Traffic Persons in Work Zones". C) Work with Traffic Records Coordinating Committee (TRCC) to include work zones as a required field in accident report. D) Review policies and procedures and guidance documents and revise to meet current MUTCD, new policy and other standards in place at state and federal level E) Add new section in Division I of Form 816 – Best practices for work zone safety operations	A) T2 continues to provide training but funding is an issue since many local towns and municipalities, as well as, Police Standards Training Academy do not have funds available to pay for this course. Limited to a Train-the-Trainer scenario so they can teach their own. B) Final Draft completed C) Completed – Model Minimum Uniform Crash Criteria Fourth Edition (2012) Data Element C18 D) Ongoing E) Pending	A) Ongoing B) Completed 11/16/2012-awaiting Commissioner signature C) Completed D) TBD E) TBD	Office of Construction Traffic Engineering Office of Maintenance State Police Safety Division

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
7	**Variable Message Signs**	Defining proper placement (i.e. distance from the anticipated queue), proper messaging, and message legibility.	Maximize the best visibility and reading capability for the traveling public.	Continue to verify proper messaging during reviews.	A) Research different types of portable/variable message signs and capabilities to find best approach.	A) Pending	TBD	Office of Construction Traffic Engineering Office of Maintenance Highway Design
8	**Movable Barrier Systems**	Currently only one system available for use – proprietary – therefore difficult to use on federal participating projects.	Having barrier systems that can be utilized on more than one project.	None to date.	A) Need to work with Design to develop a specification and design guidance on positive separation equipment and materials for work zones that are not proprietary and has potential for use on other projects. B) Investigate if other systems have been developed. If so, compare the systems.	A) Positive feedback from Project 0044-0151, I95 Old Lyme that is completed. Project 53-175 Putnam Bridge scheduled to start April 1, 2013. Use is limited to certain project types. Need to look at other alternatives.	Ongoing	Office of Construction Traffic Engineering FHWA Highway Design
9	**Environmental Conditions**	Visibility of work zone warning equipment during inclement weather. Rain affecting retro-reflective properties of construction signs and pavement markings.	Improved visibility of signs and markings even during inclement weather.	Continued investigation in construction signs and their lack of reflective properties.	Use the Daily Site Review checklist referenced in Issue No. 3.	1. Reviewing new MUTCD requirements and incorporating changes into contracts. 2. Add recessed pavement marking detail and items into contracts to enhance retro-reflective qualities	Ongoing	Traffic Engineering FHWA Office of Construction Office of Maintenance

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
10	**Work Zone Safety Review**	Improve and enhance the work zone safety review inspection process.	Improve awareness and documentation of work zone reviews.	Improved questionnaire form and created a database to store information.	A) Include more photographs/videos of projects. Expand the number of field visits. Inform project staff of internet sites and pamphlets/documents. Are issues based on road, material, or project type?	A) Review 8-10 projects per year	Implemented	Traffic Engineering FHWA Office of Construction Office of Maintenance
11	**Project-Level Work Zone Reviews**	Inconsistent applications of work zone principles at the project level.	Consistent practices of work zone reviews for each project.	Included this item in the Winter training session for supervisors and inspectors occurs in February and March 2012.	A) Continue reviewing plans and monitor projects for conformance. B) Use the Daily Site Review checklist referenced in Issue 3. C) Include this item in upcoming winter training session to include Work Zone Policy & Procedure presentation.	A) Ongoing process B) Ongoing Process C) Ongoing	Implemented Topic of discussion since 2011 training classes.	Office of Construction Office of Maintenance Safety Division
12	**Traffic Control Device Quality**	Inconsistency in accepting devices of similar quality.	Understanding acceptable qualities for traffic control devices and maintaining consistency in which devices are accepted.	Obtained quality standard field guides.	A) Distribute guides on accepting traffic control devices to field staff to use in daily reviews.	A) Ongoing process	A) Complete by end of 2013	Office of Construction Office of Maintenance Safety Division

TABLE 5- Work Zone Performance Measures (WZPM) Working Group Action Item Issues

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
1	**Mobility in Work Zones**	Low vehicle throughput and long queue lengths causing congestion and delays in work zones.	Improve mobility in work zones or handle delays more effectively.	Systems Engineering Analysis Review initiated by Highway Operations	A) Establish means to capture real time traffic data.	A) Ongoing- See Table 3, Item 3	3 years	Bureau of Policy and Planning, Office of Coordination, Modeling and Crash Data and TRCC August 30, 2014 data available
2	**Reliable Crash data in Work Zones**	Crash data for work zones must be accurately represented on accident reports	Gaining more data in a timely manner to incorporate crash frequency in the design of future projects in the area.	Members of WZO and WZPM became stakeholders in the Traffic Records Coordinating Committee (TRCC)	A) Working with TRCC to get more motor vehicle crash reports.	A) Ongoing- See Table 3 Items 4 & 6	Dependent on TRCC Vehicle Crash Reporting System 100% electronic January 2015	A) Bureau of Policy and Planning, Office of Coordination, Modeling and Crash Data and TRCC
3	**Work Zone Safety Performance**	Safety concerns for highway workers and the traveling public in work zones	Improved safety in work zones.		A) Collect data to track, analyze and evaluate work zone safety performance. B) Establish work zone safety practices and monitoring that they are applied consistently throughout the duration of the project.	A) Ongoing- See Table 3 Items 6 & 8 B) See Table 3 Item 8 See WZO Action List Items 10-12	A) Dependent on TRCC Vehicle Crash Reporting August 30, 2014 data available and crash record January 2015 B) Implemented	A) Bureau of Policy and Planning, Office of Coordination, Modeling and Crash Data and TRCC B) Offices of Safety, Construction and Maintenance

	Issue	Problem	Expected Outcomes	Actions Taken	Actions to be Taken	Current Status	Time Frame	Responsible Parties
4	**Traveler Feedback**	Not knowing if the performance measures taken are most useful for the traveling public	Implement practices that are more conscientious of the public and assure them that they're contributing to the process		A) Conduct traveler surveys to evaluate work zone traffic management practices and policies on a state-wide and area region-wide basis	A) Ongoing- See Table 3 Item 7	2013	Office of Construction Office of Maintenance
5	**Develop Strategies from Performance Data and Traveler Surveys**	Not utilizing information obtained to continuously improve practices	Establishing effective performance measures		A) Evaluate data and surveys to determine where improvements can be made	A) Ongoing- Table 3 Items 1 & 7	Ongoing	Offices of Strategic Planning & Projects, Construction and Maintenance