



2013 WORK ZONE SAFETY REVIEWS



State of Connecticut

Prepared By:

Connecticut Department of Transportation

Office of Construction

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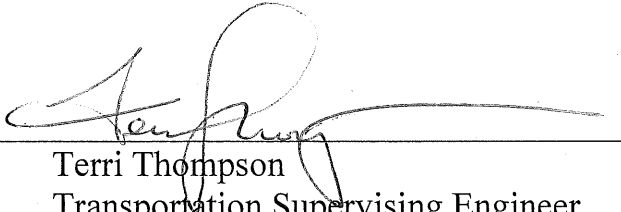
CONNECTICUT 2013 WORK ZONE SAFETY REVIEW REPORT

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.

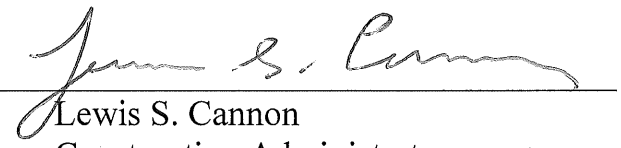
The Plan was developed in response to the recommendations in the 2011 Connecticut Work Zone Safety and Mobility Process Review Report and is evidence of Connecticut's compliance with 23 CFR 630.1008.

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Submitted By: _____


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Approved By: _____


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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.

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

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Project Action Items
2013 Work Zone Review Issues

2013 Work Zone Review Issues

Proj.ID	Comments
81-88	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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
<u>Project 81-88</u> Seth Burgess – Project Manager Joseph Grasso – Office of Traffic Bonney Whitaker – Office of Construction	<u>Project 88-178</u> 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
<u>Project 102-278</u> 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	<u>Project 151-296</u> 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.
- What is the clear zone for this project? Thirty feet off traveled way.
 - Where are materials stored for the project? Due to wetland areas, materials are brought in as needed. Minimal storage behind concrete barrier.
 - Where is equipment stored when construction is not in progress? Behind concrete barrier.
- 10) Have accommodations been made to account for
- Emergency Services – The First Selectman has been the contact/liaison. Temporary signalization has emergency vehicle pre-emption installed.
 - 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
- 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.
 - Are there conflicting markings? No
 - Are the temporary markings legible? Yes. If night review, comment on visibility
 - 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 3 rd 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 3 rd 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 3 rd 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.
- What is the clear zone for this project?
 - Where are materials stored for the project? Either at the field office location or onsite in a closed off area.
 - Where is equipment stored when construction is not in progress? Same as “b” above.
- 10) Have accommodations been made to account for
- 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 CTfastrack Construction News.
 - 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
- 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.
 - Are there conflicting markings?
 - Are the temporary markings legible? If night review, comment on visibility
 - 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 3 rd 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 3 rd 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 3 rd 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.
- What is the clear zone for this project? 30 feet
 - Where are materials stored for the project? Gore area at Exit 14; behind barriers; access road reviewed by the Office of Traffic
 - Where is equipment stored when construction is not in progress? Route 7 off-ramp
- 10) Have accommodations been made to account for
- Emergency Services – Coordinating with Norwalk; flyers; website
 - 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
- Is there an item for removal of pavement markings? If yes, indicate removal method being used. Yes. Grinding.
 - Are there conflicting markings?
 - Are the temporary markings legible? If night review, comment on visibility
 - 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 3 rd 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 3 rd 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 3 rd 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
Date: June 26, 2013

District No. 4
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.
- What is the clear zone for this project? Fourteen feet from edge line.
 - Where are materials stored for the project? Staging area or behind barrier.
 - Where is equipment stored when construction is not in progress? Same as b above.
- 10) Have accommodations been made to account for
- Emergency Services – Waterbury's traffic engineer notifies appropriate sources.
 - 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
- 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.
 - Are there conflicting markings? No.
 - Are the temporary markings legible? Yes. If a night review, comment on visibility.
 - 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 3 rd 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 3 rd 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 3 rd 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. Section 1.08 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
<i>Work Zone Self-Assessment Elements</i>						
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. <ul style="list-style-type: none"> 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
<i>Work Zone Self-Assessment Elements</i>						
3	Leadership and Policy	Establish performance measures (e.g. vehicle throughput or queue length) to track work zone congestion and delay	<ol style="list-style-type: none"> 1. Define metrics for performance measures considering <ul style="list-style-type: none"> - 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 <ol style="list-style-type: none"> 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
<i>Work Zone Self-Assessment Elements</i>						
4	Leadership and Policy	Implement performance measures (e.g., crash rates) to track work zone crashes	<ol style="list-style-type: none"> 1. Define metrics to be used for performance measure <ul style="list-style-type: none"> - Type - Frequency - Location 2. Develop baseline to determine threshold values to be used a basis of measuring crashes 3. Approval of metrics and baseline 	<ol style="list-style-type: none"> 1. WZPM 2. WZO / WZPM SHSP Champion 3. SHSP Champion and SHSP steering committee 	<ol style="list-style-type: none"> 1. Pending. Refer to Table 5 2. Pending. Refer to Table 5 3. Committee meetings to decide 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 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. <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> a) Develop database to log incident reports and structure queries b) produce monthly reports for analysis c) Evaluate and develop delay performance measure. 	<ol style="list-style-type: none"> 1. Highway Operations <ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Ongoing <ol style="list-style-type: none"> 1a) Implemented on Project No. 0082-0299, Arrigoni Bridge Middletown 1b) Received data 1c) Project No. 0060-0152/0153. 1d) Pending 2. Pending 	<ol style="list-style-type: none"> 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
<i>Work Zone Self-Assessment Elements</i>						
			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 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
<p>1 Construction Sign Retro-Reflective Issues</p>	<p>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.</p>	<p>Improved visibility of signs by the traveling public.</p>	<p>A)* B)*</p>	<p>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.</p>	<p>A)* B)* C) Ongoing D) Pending E) Pending further review</p>	<p>A) * B)*</p>	<p>Office of Construction Traffic Engineering</p>
<p>2 Pedestrian /Bicycle Access Issues</p>	<p>Incomplete sidewalks, pedestrian buttons inaccessible or inoperable, lack of crosswalks at intersections, and lack of handicap ramps.</p>	<p>Improved pedestrian and bicycle awareness and accessibility through design and construction</p>	<p>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) *</p>	<p>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.</p>	<p>C) Ongoing D) * E,F) Continue reviewing plans and monitoring projects for conformance</p>	<p>D)* E,F) Ongoing</p>	<p>Traffic Engineering Highway Design Office of Construction Office of Maintenance Mon-motorized Transportation Coordinator</p>

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
<p>6 Traffic Control in Work Zones</p>	<p>Experience with and understanding of work zone safety. Establishing levels of effectiveness (i.e. presence versus enforcement).</p>	<p>Consistent practices and implementation of use of traffic persons. Better educated traffic control persons who will provide effective direction in work zones.</p>	<p>“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/</p>	<p>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</p>	<p>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</p>	<p>A) Ongoing B) Pending Awaiting Commissioner signature C)* D) TBD E) 4 months</p>	<p>Office of Construction Traffic Engineering Office of Maintenance State Police Safety Division</p>
<p>7 Variable Message Signs</p>	<p>Defining proper placement (i.e. distance from the anticipated queue), proper messaging, and message legibility.</p>	<p>Maximize the best visibility and reading capability for the traveling public.</p>	<p>Continue to verify proper messaging during reviews.</p>	<p>A) Research different types of portable/variable message signs and capabilities to find best approach.</p>	<p>A) Pending</p>	<p>TBD</p>	<p>Office of Construction Traffic Engineering Office of Maintenance Highway Design</p>

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
<p>1 Construction Sign Retro-Reflective Issues</p>	<p>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.</p>	<p>Improved visibility of signs by the traveling public.</p>	<p>A)* B)*</p>	<p>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.</p>	<p>A)* B)* C) Ongoing D) Pending E) Pending further review</p>	<p>A) * B)*</p>	<p>Office of Construction Traffic Engineering</p>
<p>2 Pedestrian /Bicycle Access Issues</p>	<p>Incomplete sidewalks, pedestrian buttons inaccessible or inoperable, lack of crosswalks at intersections, and lack of handicap ramps.</p>	<p>Improved pedestrian and bicycle awareness and accessibility through design and construction</p>	<p>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) *</p>	<p>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.</p>	<p>C) Ongoing D) * E,F) Continue reviewing plans and monitoring projects for conformance</p>	<p>D)* E,F) Ongoing</p>	<p>Traffic Engineering Highway Design Office of Construction Office of Maintenance Mon-motorized Transportation Coordinator</p>

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
<p>6 Traffic Control in Work Zones</p>	<p>Experience with and understanding of work zone safety. Establishing levels of effectiveness (i.e. presence versus enforcement).</p>	<p>Consistent practices and implementation of use of traffic persons. Better educated traffic control persons who will provide effective direction in work zones.</p>	<p>“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/</p>	<p>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</p>	<p>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</p>	<p>A) Ongoing B) Pending Awaiting Commissioner signature C)* D) TBD E) 4 months</p>	<p>Office of Construction Traffic Engineering Office of Maintenance State Police Safety Division</p>
<p>7 Variable Message Signs</p>	<p>Defining proper placement (i.e. distance from the anticipated queue), proper messaging, and message legibility.</p>	<p>Maximize the best visibility and reading capability for the traveling public.</p>	<p>Continue to verify proper messaging during reviews.</p>	<p>A) Research different types of portable/variable message signs and capabilities to find best approach.</p>	<p>A) Pending</p>	<p>TBD</p>	<p>Office of Construction Traffic Engineering Office of Maintenance Highway Design</p>

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
<p>11 Project-Level Work Zone Reviews</p>	<p>Inconsistent applications of work zone principles at the project level.</p>	<p>Consistent practices of work zone reviews for each project.</p>	<p>Included this item in the Winter training session for supervisors and inspectors occurs in February and March 2012.</p>	<p>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.</p>	<p>A) Ongoing process B) Ongoing Process C) Completed for 2011 & 2012.</p>	<p>Implemented Topic of discussion since 2011 training classes.</p>	<p>Office of Construction Office of Maintenance Safety Division</p>
<p>12 Traffic Control Device Quality</p>	<p>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</p>	<p>Understanding acceptable qualities for traffic control devices and maintaining consistency in which devices are accepted.</p>	<p>Obtained quality standard field guides.</p>	<p>A) Distribute guides on accepting traffic control devices to field staff to use in daily reviews.</p>	<p>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</p>	<p>Ongoing</p>	<p>Office of Construction Office of Maintenance Safety Division</p>
<p>13 Signing</p>	<p>A) Breakaway post height does not conform to plans. B) Uncoordinated Lane Closures and Construction Signs between adjacent projects</p>	<p>A) Conformity to requirements posted in the project plans. B) Closer coordination between projects</p>	<p>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.</p>	<p>Continue monitoring projects during work zone reviews for compliance.</p>	<p>A) New issue in 2011 and 2012 reviews. Ongoing with work zone reviews. B) Additional issues with signing in 2013 reviews</p>	<p>Ongoing</p>	<p>Office of Construction</p>

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
<p>1 Construction Sign Retro-Reflective Issues</p>	<p>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.</p>	<p>Improved visibility of signs by the traveling public.</p>	<p>A) Send Memo requesting removal of signs using plastic substrate. B) Revise specification to exclude plastic substrates.</p>		<p>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.</p>	<p>A) Completed 5/30/12 B) Completed revision date 1/5/12</p>	<p>Office of Construction Traffic Engineering</p>
<p>2 Pedestrian /Bicycle Access Issues</p>	<p>Incomplete sidewalks, pedestrian buttons inaccessible or inoperable, lack of crosswalks at intersections, and lack of handicap ramps.</p>	<p>Improved pedestrian and bicycle awareness and accessibility through design and construction</p>	<p>D) Conduct training if necessary. Lessons Learned Session on WZS and Ped Access 12/4/13 with Design, Traffic, FHWA and Construction District offices</p>		<p>D) Included in winter training session- Work Zone Policy & Procedure presentation. Training session for supervisors and inspectors occurs in February and March.</p>	<p>D) Completed as of April 2012</p>	<p>Traffic Engineering Highway Design Office of Construction Office of Maintenance Mon-motorized Transportation Coordinator</p>

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.	<ol style="list-style-type: none"> 1. Notified project staff of deficiencies. 2. Lessons Learned 9/25/13 on recessed markings 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Scheduled New issue in 2011 and 2012 reviews. 2. Specification in development- trial projects in progress 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Notified project staff of deficiencies. 2. Lessons Learned 9/25/13 on recessed markings 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Scheduled New issue in 2011 and 2012 reviews. 2. Specification in development- trial projects in progress 	<ol style="list-style-type: none"> 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
<p>1 Construction Sign Retro-Reflective Issues</p>	<p>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.</p>	<p>Improved visibility of signs by the traveling public.</p>	<p>A) Send Memo requesting removal of signs using plastic substrate. B) Revise specification to exclude plastic substrates.</p>		<p>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.</p>	<p>A) Completed 5/30/12 B) Completed revision date 1/5/12</p>	<p>Office of Construction Traffic Engineering</p>
<p>2 Pedestrian /Bicycle Access Issues</p>	<p>Incomplete sidewalks, pedestrian buttons inaccessible or inoperable, lack of crosswalks at intersections, and lack of handicap ramps.</p>	<p>Improved pedestrian and bicycle awareness and accessibility through design and construction</p>	<p>D) Conduct training if necessary. Lessons Learned Session on WZS and Ped Access 12/4/13 with Design, Traffic, FHWA and Construction District offices</p>		<p>D) Included in winter training session- Work Zone Policy & Procedure presentation. Training session for supervisors and inspectors occurs in February and March.</p>	<p>D) Completed as of April 2012</p>	<p>Traffic Engineering Highway Design Office of Construction Office of Maintenance Mon-motorized Transportation Coordinator</p>

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