

CTDOT: REPORT ON SAFETY ROLES WITHIN THE AGENCY

April 2016

Prepared by CTDOT Enterprise Function Safety Committee

Quick Acronym Reference

AA	Affirmative Action
AAA	American Automobile Association
AARP	American Association of Retired Persons
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ARNOLD	All Roads Network of Linear Reference Data
BS&E	Bridge Safety and Evaluation
CEUI	Connecticut Employees Union Independent
CFR	Code of Federal Regulations
CGS	Connecticut General Statutes
CMF	Crash Modification Factor
CRCOG	Capitol Regional Council of Governments
CT	Connecticut
CTDOT	Connecticut Department of Transportation
DAS	Department of Administrative Services
DEEP	Department of Energy and Environmental Protection
DOT	Department of Transportation
EEO	Equal Employment Opportunity
EPA	Environmental Protection Agency
FAST	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FMIS	Financial Management Information System
FRA	Federal Railroad Administration
HPMS	Highway Performance Monitoring System
HRRR	High Risk Rural Road
HSIP	Highway Safety Improvement Program
HSO	Highway Safety Office
HSP	Highway Safety Plan
HVAC	Heating, Ventilation, and Air Conditioning
HVE	High Visibility Enforcement
IT	Information Technology
ITS	Intelligent Transportation System
LRS	Linear Referencing System
M&PT	Maintenance and Protection of Traffic
MAP-21	Moving Ahead for Progress in the 21st Century Act
MDC	Metropolitan District Company
MIRE	Model Inventory Roadway Elements
MPO	Metropolitan Planning Organization
NBIS	National Bridge Inspection Standards
NCHRP	National Cooperative Highway Research Program
NHI	National Highway Institute
OSHA	Occupational Safety and Health Administration
P&FS	Property and Facilities Services
QCW	Qualified Craft Worker
RR	Railroad
SHSP	Strategic Highway Safety Plan
SRTS	Safe Routes to School
USC	United States Code
USCG	United States Coast Guard

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EXECUTIVE SUMMARY

The Connecticut Department of Transportation (CTDOT) is committed to providing a safe, efficient, and best in class intermodal transportation system to serve the needs of the state, its citizens and its many visitors. Each Bureau's employees treat safety as an essential component in their respective roles, including the documentation and coordination of specific safety functions; however, CTDOT does not have a centralized safety office. In order to better keep track of the various safety roles within the agency, CTDOT's executive management team formed an Enterprise Safety Function Committee with the initial responsibility of cataloging all safety functions across all Bureaus. The table on the following page is a summary of the primary safety functions, including statutory authority, and challenges within each Bureau. This information could be used to perform a gap analysis and/or evaluate enterprise wide coordination.

Leading up to the formation of the Committee, all members of the Executive Team were asked to submit the names of all of the agency's employees with a role in safety to join the Committee. Once the Bureau Chiefs selected their employees who have relevant safety roles to serve on the Committee a first meeting was held at which the group discussed the goals/objectives of the Committee, the individual roles of the members and the Committee's work schedule going forward. The Committee members were tasked with identifying their primary safety-related functions, best practices and possible oversights within their agency units to compile within this report.

Bureau/Office	Primary Safety Function	Statutory Authority	Challenges
<i>Office of the Commissioner</i>			
Training and Staff Development	Provide safety training & staff development	FHWA, FRA, OSHA, DEEP, CTDOT	record keeping, advertising, coordination
<i>Highway Operations</i>			
Highway Operations	improve transportation safety via ITS	FHWA	Staffing, technology, integration & data collection
Maintenance Operations	Maintain the state highway system in a safe manner	CGS	Reduce all work and motor vehicle injuries
<i>Public Transportation</i>			
Rail - Infrastructure and Safety	improve safety of railroad network	FHWA, FRA, CGS	Staffing, funding & data
Transit and Ridesharing	Investigate vehicle & insurance safety regulations for Taxi, Livery, Motor Bus & Motor Carriers	CGS	Staffing, data
Maritime (Ferries)	Provide safe ferry service	CGS	staffing, automated fare collection
<i>Policy and Planning</i>			
Coordination, Modeling, and Crash Data	Collect, process, store & distribute crash data on all public roadways	FHWA & CGS	staffing & data issues
Strategic Planning and Projects - Intermodal Planning	Perform & oversee multimodal transportation studies, including safe routes to school program	FHWA & CGS	data/inventory gaps & complete streets implementation
Roadway Inventory Systems	Collect, process, store & distribute traffic volume & roadway inventory data	FHWA	staffing & unclear FHWA guidance
Highway Safety	Identify & address transportation safety issues regarding driver behavior	FHWA & NHTSA	Funding & data
<i>Finance and Administration</i>			
Occupational Health and Safety	Promote & support a safe workplace for all CTDOT employees & contractors	OSHA	staffing, technology, funding
Human Resources-Drug and Alcohol	Administration of CTDOT's alcohol & drug testing program	FHWA, US Coast Guard Regs, CGS	staffing
Human Resources-Workman's Comp	Administration of CTDOT's WC program	OSHA, CGS	training
Property and Facilities - Code Enforcement	Provide code compliance for all CTDOT buildings	CT building & fire codes, OSHA, DEEP, CGS	staffing, technology, funding
Property and Facilities - Building Operations	Building safety	OSHA, CT building codes	automated tracking for inspections & compliance
Property and Facilities - Concessions	Provide safe public facilities for travelers on the state system	CGS, DEEP	Staffing, funding
<i>Engineering & Construction</i>			
Bridge Safety and Evaluation	Manage, direct & coordinate inspection of State & Local bridges, tunnels, sign & signal supports	FHWA & CGS	staffing, need to update manual
Facilities Design	Identify & pursue safety at highway support & transit facilities for all users	CGS & Insurance Regs	staffing, funding, incomplete asset info
Engineering Services	review & approve roadside safety hardware systems & develop standards for CTDOT's use	FHWA	staffing, training, implementation
Traffic Engineering-RR section	Identify & pursue safety improvements at public RR grade Xing's	FHWA	training, coordination, incomplete asset info
Traffic Engineering-Safety Section	identify & pursue safety improvements on all public rds; admin of HSIP & SHSP	FHWA	training, data
Traffic Engineering-Operations	identify & pursue safety improvements at specific locations on state hwys	FHWA	staffing, training
Traffic Engineering-Project Design	Provide plans & specs for safe work zones for construction projects	FHWA & CGS	data
Construction	Identify & pursue systemic safety concerns within CTDOT work zones	FHWA	training, data, compliance

OFFICE OF THE COMMISSIONER
Office of Training and Staff Development

Mission:

Provide training and staff development opportunities that prepare CTDOT employees to meet the evolving needs of CTDOT.

Purpose:

Provide mandatory training that complies with federal, state and local regulatory requirements, provide discretionary training to develop the workforce, and comply with internal policies and procedures.

Goal:

CTDOT strives to provide education and training opportunities for its employees to improve their employment related skills, keep them current in their chosen fields of endeavor, and assist them in achieving their career development goals.

Organization Structure:

Staffing consists of 1-Management Analyst, 2-Curriculum Managers, and 1-Secretary. Approximately 90% of the training is funded with a yearly grant from FHWA, and broken down into categories by bureau, unit and/or job function.

Training Requirements:

CTDOT must meet several requirements in order to fully comply with various safety regulations. The 2016 training schedule currently includes 9 mandatory courses. The courses include federally mandated training for bridge inspectors (FHWA), railroad workers (FRA), highway maintainers/roadside workers (OSHA), environmental compliance (EPA, DEEP, OSHA), Commercial Driver's License requirements (federal DOT drug testing rules), and diversity training (AA/EEO).

National Highway Institute Courses

FHWA, through the National Highway Institute (NHI), provides transportation specific training for DOT's and other partners on request. Mandatory courses for the Bridge Safety and Evaluation units, such as Safety Inspection of In-Service Bridges and Bridge Inspection Refresher (required for bridge inspectors) are held yearly (or every other year, depending on the need). NHI is the sole provider of this mandatory training for the CTDOT and many of our consultants. Other required courses offered by NHI are Right-of-way courses such as Basic Relocation under the Uniform Act.

UCONN's Technology Transfer Center Custom Courses

The Technology Transfer Center (T2 Center) provides CTDOT maintenance and construction units with safety training through their Road Master and Road Scholar Programs, Leadership Program, and over 22 custom courses on the 2016 schedule. The 2016 schedule includes 6

OSHA 10-hour courses, 4 Competent Person Trenching courses, 4 Competent Person Confined Space courses, 1 Qualified Signal/Rigger course, 3 After-the-Storm Chainsaw Demo courses, 2 Blueprint Reading courses, 3 Invasive Plant Identification courses, and 3 separate Train the Trainer courses (Forklift, Bucket truck, and Fall Protection).

Non-mandatory Courses

Non-mandatory training classes provided by NHI are requested annually and scheduled throughout the year. They include unit specific courses such as National Environmental Policy Act and the Transportation Decision Making Process, Engineering for Structural stability in Bridge Construction, Rock Slopes, Intersection Safety, Micropile Design and Construction, and Work Zone Traffic Control, to name a few. The 2016 schedule includes 37 non-mandatory courses or programs.

CEUI/Technical Courses for NP-2 Bargaining Unit Members

Safety related courses offered by the Spring 2016 CEUI/Technical Courses for NP-2 bargaining unit employees include: Safety: Be More Secure in an Insecure World, Basic Electricity, E1 and E2 Continuing Education for Electricians, General Building Trades, General Building Trades, Green Construction Materials, Heartsaver First Aid CPR AED, HVAC 1 Maintenance and Repair, HVAC 2 Heating I Steam and Hydronics, HVAC 3 Air Conditioning and Maintenance, HVAC 4 Commercial Refrigeration, Identifying and Eradicating Invasive Vines and Plants, OSHA 10, Welding I, Welding II, Welding Processes I, and Welding Processes II. These courses are generally open to employees who perform the associated tasks, such as welding, or have a need for the training, such as E1 and E2 Continuing Education for Electricians to maintain a license.

In-Service Training

The Department of Administrative Services and Connecticut's Community College System are partners in providing a wide variety of cost-effective training opportunities to Connecticut State employees. The 2016 catalog includes courses that help employees enhance their skills to meet and support agency goals efficiently and with a high level of customer service. These are fee based courses and offered at various locations across Connecticut.

In-House Training

Safety related courses offered in-house through the training center include Metro North Roadway Worker training (required by FRA to access railroad property), and New Employee Orientation Workplace Violence, and Safety Overview modules (DAS and DOT policy requirements).

Gaps, Threats, and Opportunities for Improvement:

- Incomplete/inconsistent recording of employees' training
- No advertising of offered courses
- Lack of coordination among units requesting courses
- Inconsistent maintenance training among the 4 Districts

- No one monitoring or maintaining training for *all* of the Construction and Engineering units, and many units in other bureaus
- Inability to delegate experienced trainers to conduct mandatory training

BUREAU OF HIGHWAY OPERATIONS
Office of Highway Operations

Mission:

Provide timely and accurate roadway information to improve transportation safety, mobility, environment, and enhance economic productivity by integrating advanced communication technologies into vehicles and infrastructure.

Purpose:

Ensure the safe and efficient movement of traffic over the State's highway and road network, through monitoring and reporting roadway maintenance, construction, snow and ice control, traffic incident management, Amber Alert, operations of Connecticut Highway Assistance Program and computerized traffic signal systems.

Goal:

To improve the safety, mobility and productivity on Connecticut Limited Access Highways and arterials through the use of ITS. Below are a few goals listed in the 2015 CRCOG ITS Plan:

Goal 1: Reduce Congestion and Stimulate Economic Growth by Moving Traffic More Safely and Efficiently

- Replace Aged ITS Investments
- Improve Incident Identification and Verification Capabilities
- Expand Traveler Information Accessibility
- Integrate Third Party Detection Data

Goal 2: Stimulate Growth of Public Transportation Ridership by Enhancing the Users' Experience

- Build on the Success of CTfastrak
- Enhance the Seamlessness of the Public Transportation Network
- Increase User Friendliness of the Public Transportation System

Goal 3: Improve Traffic Signal Management, Operations and Maintenance by Developing a Sustainable Computerized Traffic Signal System Program

- Strengthen Existing Practices (Stage 1)
- Create Collaborative Regional Group for Computerized Signal Systems (Stage 2)
- Leverage Advanced Signal Systems to Benefit the Region (Stage 3)

Goal 4: Achieve Sustainable Transportation Operations through the Use of Technology

- Implement Technology to Reduce Impacts of the Roadway Network on the Environment
- Enhance the Sustainability of ITS Deployments

Goal 5: Enhance Roadway Safety through the Use of Technology

- Expand Roadway Weather Situational Awareness Capabilities
- Enhance Coordination of and Access to Roadway Incident, Emergency, and Weather Event Information Among First Response Stakeholders
- Reduce Secondary Incidents and Increase the Safety of First Responders in the Field

Organization Structure:

Operations

Newington - 1-Maintenance Crew Leader, 6-Maintainer 4

Bridgeport - 10-Contracted Staff

Engineering

Newington - 1-Principal Engineer, 1-Transportation Supervising Engineer, 2-Transportation Engineer 3, 1-Transportation Engineer 2, 1-Transportation Engineer 1, 1-Telecommunications Engineer 1, 2-Transportation Engineer Trainees.

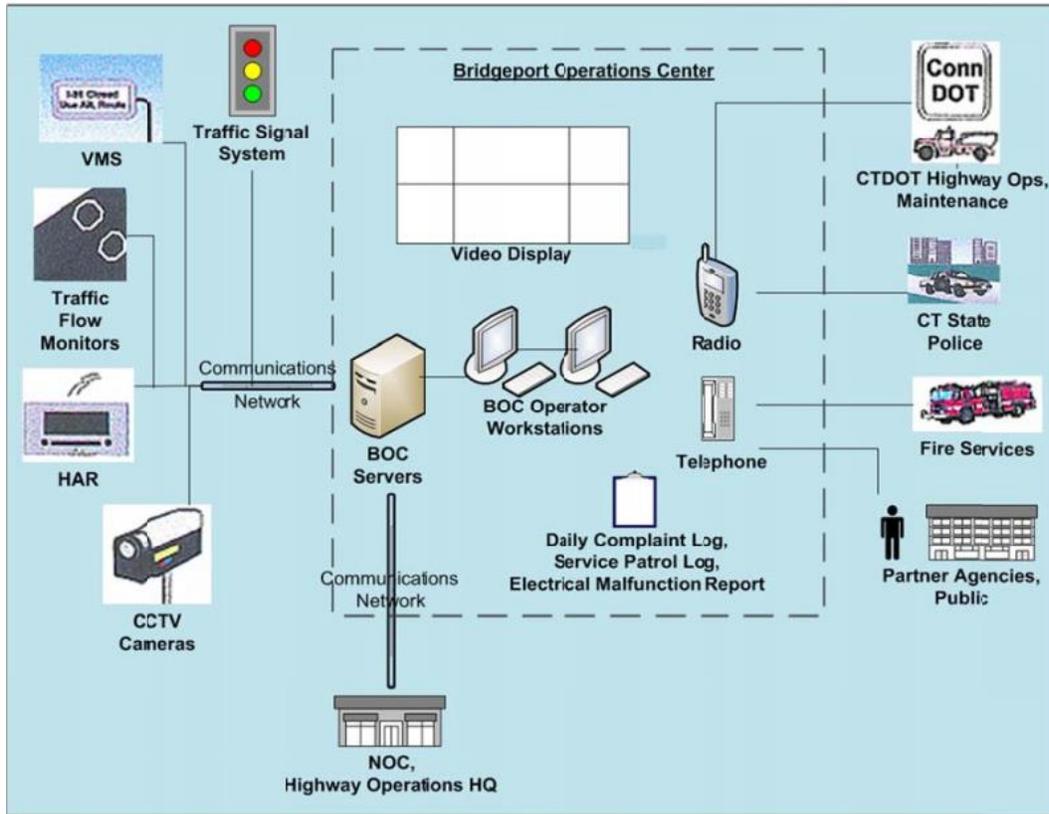
Traffic Signal Lab

Rocky Hill - 2-Transportation Engineer 3, 2-Design Engineer, 4-Electrical Technician 2

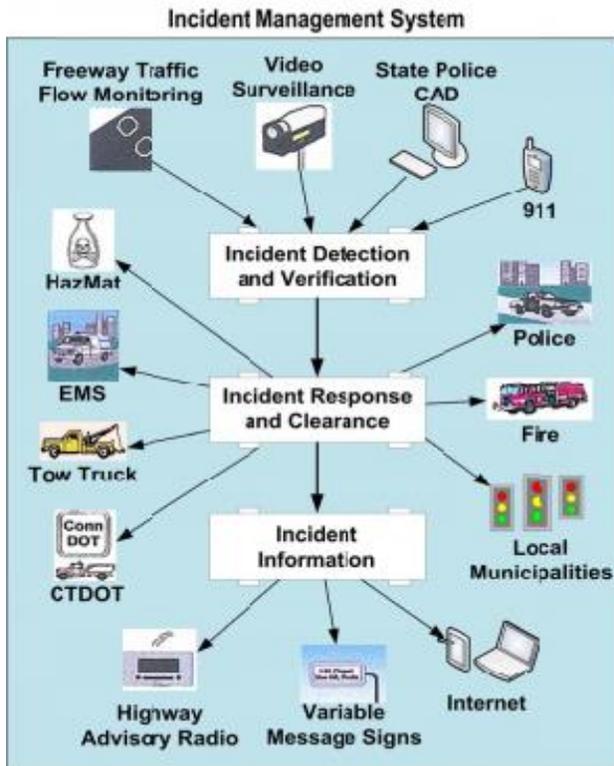
Functional Requirements:

In order to fulfill Highway Operations Operator responsibilities effectively, the ITS Engineering and Support Section plan, design, implement, and monitor a multitude of ITS equipment and subsystems, including:

Highway Operations Control Facility Centers – Highway Operations operates two ITS Control Centers across the state to monitor traffic conditions through the use of ITS technologies and processes. The control center is the focal point of Highway Operations activity. Below is a diagram outlining the processes of the Control Center for Bridgeport CT.



Traffic Incident Management (TIM) - TIM consists of a planned and coordinated multi-disciplinary process to detect, respond to, and clear traffic incidents so that traffic flow may be restored as safely and quickly as possible. Effective TIM reduces the duration and impacts of traffic incidents and improves the safety of motorists, crash victims and emergency responders. Below is a diagram outlining the processes for TIM.



Closed Circuit Television (CCTV) Traffic Monitoring System – This system is the primary tool used by the operators who actively and continuously monitor the video feeds from this system. The CCTV Traffic Monitoring System includes a system of cameras spread across segments of the highway network in Connecticut, and connected through fiber optic and telephone communications networks to a central system housed and operated at the Operations Center.

CRESCENT Traffic Management System – This system is an automated, map-based traffic management system that is used by the operators to capture the details of congestion, incidents and planned events on the highway network. The CRESCENT Traffic Management System consists of central software that is connected to and controls a network of ITS devices installed along the highway network. The connected ITS devices include Traffic Flow Monitors which detect traffic speed information, Variable Message Signs which display traffic information, and Highway Advisory Radios which disseminate traffic information over localized radio channels. The CRESCENT Traffic Management System provides a Graphical User Interface that features an interactive map. The CRESCENT Traffic Management System also makes traveler information available to CTDOT websites, E-Alert system, and via an Extensible Markup Language (XML) feed.

CTDOT Radio System – This system is a multi-channel radio system hosted by CTDOT and used by the operators as their primary means of communications with field staff. The radio system consists of a central communications console at the Operations Center, radio base stations installed across Connecticut, and mobile radio units.

Highway Advisory Radio (HAR) System – This system is used by Operators to provide traffic information to the highway motorists over AM radio. The HAR system consists of a state-wide low-power radio network transmitters broadcasting on the AM band and is primarily controlled by the CRESCENT system, with a dial-up telephone backup system available to control each HAR site.

Variable Message Sign (VMS) System – This system is used by Operators to provide traffic information to motorists. The VMS System consists of permanent and permanent-portable VMS installed or stationed on state-owned roadways, and primarily controlled by the CRESCENT system, with the capability to be put under manual control.

State Police Computer Aided Dispatch (CAD) – This system is used by the operators to view the current incident information to look for incidents that may affect traffic. The State Police CAD System is used by the State Police to record details of traffic related calls and dispatch of troopers to incident sites with a feed from the CAD is made available to the Operations Center for the operators to view the current incident information.

Weather Monitoring Systems – This system is used by the Operators to monitor weather and road conditions along the highway network. This system comprises of a network of roadside weather stations (Road Weather Information System) that monitor and collect information about various weather (surface temperature, air temperature) and pavement conditions (wet, dry, ice, snow, amount of de-icing chemicals present on the surface, etc.) at various points on the highway network. This system is available to the Operations Center operators on the CTDOT network.

Computerized Traffic Signal Systems – These systems are used by Operators to implement pre-scheduled signal timing plans, monitor traffic signals, make changes to signal timing, collect traffic data such as vehicle counts and average travel speeds, implement diversion route timing plans for highway closures, and monitor the system and intersection operation. The Computerized Traffic Signal Systems are operated by the State of Connecticut and consists of a centrally located computerized system which monitors and controls the various closed-loop traffic signal systems within Connecticut.

Connected Vehicle – Connected Vehicle program uses vehicle and device makers, and the public to test and evaluate technology that will enable cars, buses, trucks, trains, roads and other infrastructure, and our smartphones and other devices to “talk” to one another. Cars on the highway, for example, would use short-range radio signals to communicate with each other so every vehicle on the road would be aware of where other nearby vehicles are. Drivers would receive notifications and alerts of dangerous situations, such as someone about to run a red light as they’re nearing an intersection or an oncoming car, out of sight beyond a curve, swerving into their lane to avoid an object on the road. 1,083 lives... That is the approximate number of lives that could be saved by deploying just two of the many connected vehicle safety applications being developed by the USDOT. More Connected vehicles could dramatically reduce the number of fatalities and serious injuries caused by accidents on our roads and highways. While the number of people surviving crashes has increased significantly thanks to

airbags, anti-lock brakes, and other technology, the USDOT is shifting its focus from helping people survive crashes to preventing crashes from happening in the first place. –

Third-Party Information Access System – Operators monitor a variety of third-party information sources for weather and traffic related information. These systems are typically accessed over the internet.

CTDOT Daily Complaint Log – This system is used by Operators to capture all the notifications received from the police, maintenance crews, service patrols and other sources regarding problems (excluding incidents) on the highway network. The Daily Complaint Log is an electronic database maintained by CTDOT and accessible from the Operations Center over the CTDOT LAN.

CTDOT Service Patrol Log – This system is used by Operators to keep track of the start and end times of each service patrol shift, as well as noting the details of each motorist assist. The Service Patrol log is an electronic database maintained by CTDOT and accessible from the Bridgeport Operations Center over the CTDOT LAN.

CTDOT Equipment Malfunction Report – This system is used by Operators to send out the CTDOT electrical contractor to repair faulty roadside ITS equipment (CCTV, VMS, HAR, speed sensors) and is intended to also be used for asset management purposes in the future. The Equipment Malfunction Report is a database of reports generated by CTDOT's Equipment Malfunction Report generation tool and accessible from the Operations Center over the CTDOT LAN.

Gaps, Threats, and Opportunities for Improvement:

- FHWA defines Intelligent Transportation System (ITS) as electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system. If Connecticut does not make significant progress in infrastructure, ITS Technology and integration will be limited.
- Agency Relations will prove important in implementation of ITS statewide.
- Additional staff training on “new” Intelligent Transportation Systems.
- Existing communication method from field to Operations Center will need to be upgraded accordingly in Connecticut to keep up with advancements of ITS and performance data collection to report to FHWA.
- Connected vehicles are currently one of the main areas of focus of the U.S. Department of Transportation's Intelligent Transportation Systems Joint Program Office. Connected vehicle safety applications will enable drivers to have 360-degree awareness of hazards and situations they cannot even see. Through in-car warnings, drivers will be alerted to imminent crash situations, such as merging trucks, cars in the driver's blind side, or when a vehicle ahead brakes suddenly.
- Limited staffing poses a problem with advancements in ITS.

BUREAU OF HIGHWAY OPERATIONS
Office of Maintenance Operations

Mission:

Maintain the state highway and bridge systems in a safe, efficient manner balancing the needs of the motoring public and the CTDOT employees maintaining the highway system.

Purpose:

Utilize best practices and federal safety guidelines to achieve an optimal level of service to the highway and bridge systems, which includes road and bridge maintenance, snow and ice control, incident management and oversize/overweight vehicle permitting.

Goal:

Keep all public roads safe and free of all hazards that can impair the safety of the motoring public. We are concerned with the safety of all employees playing a role in maintaining our structures and the motorists who use our systems. Employee training is provided by CTDOT, as well as, a public awareness campaign to inform motorists of the dangers of traveling through work areas.

Organization Structure:

Staffing within the Office of Maintenance Operations consists of 1-Bureau Chief, 1-Maintenance Administrator, 5- Directors, 17-Managers, and 81-General Supervisors.

Funding:

Funding is received from the General State fund, Special Transportation fund, and grants from FHWA.

Safety Involvement:

The Bureau of Highway Operations provides training to all its employees for proper display of traffic control plans (Work Zone Safety Guidelines) as guided by the Manual on Uniform Traffic Control Devices (MUTCD). Employees are trained in incident management procedures regulated by the FHWA National Incident Management System. All employees are provided with Personal Protective Equipment consisting of hard and soft caps, reflective vest, gloves, respirators, hearing and eye protecting. Employees are also trained in the safe and proper use of heavy equipment. This training is directed by a trainer within each district, who conveys safety directives developed in the Occupational Health and Safety Office.

There are quarterly district safety meetings and staff safety meetings to discuss all issues that arise from all aspects of Maintenance, including but not limited to auto accidents, personal injuries and traffic pattern inconsistencies.

This office also works with the Connecticut Work Zone Awareness campaign. This is a FHWA awareness program that works through advertising and outreach events to heighten the motoring public's awareness of how to properly interact with highway maintenance or

construction works zones. This all helps to keep our employees safe and provide the motoring public safe passage through our work zones.

Improvements:

The hope is to reduce all injuries related to our work, everything from personal injuries to motor vehicle involved crashes, and create an environment where employees can work, motorists can travel and everyone can go home safely.

BUREAU OF PUBLIC TRANSPORTATION
Office of Rail – Infrastructure and Safety Section

Mission:

Preserve and promote enhancements to the safety and efficiency of Connecticut’s railroad network.

Purpose:

To provide oversight and guidance to railroads regarding compliance with Federal regulations, State statutes and State maintenance agreements concerning safety and infrastructure maintenance; work with the CTDOT’s Highway Engineering section regarding the Federal Crossing Improvement Program. Advance public safety through the Operation Life Saver program that educates the public on the dangers and risk associated with railroad crossings and illegal trespass of railroad properties, trains law enforcement professionals on how to safely investigate railroad accidents at crossings, and coordinate with law enforcement regarding trespass concerns.

Goal:

Work with railroads, Federal, State and local government agencies, and the general public to prevent fatalities and injuries to railroad maintenance-of-way employees, passengers, emergency responders and general public in railroad related incidents including at highway/railroad at-grade crossings.

Organization Structure:

Staffing within the Infrastructure/Safety Section consists of 1-Supervising Rail Officer; 2-Transportation Rail Officer 2, and 1-Transportation Rail Officer 1. The Office of Rail Infrastructure/Safety units plan to fill 3 current vacancies, two positions will be added to the Rail Regulatory/Operation Life Saver units and one will be added to the Maintenance of Way unit.

The Office of Rail is currently increasing staff resources by adding positions to the newly formed Infrastructure/Safety section to provide more safety oversight and guidance for railroad safety issues and public safety needs pertaining to railroad crossings, railroad rights of way, railroad bridges and any railroad issues that may become a public safety concern.

Federal Railroad Administration Requirements:

Rail Regulatory

The Office of Rail Regulatory unit participates with the FRA, Railroads and Municipalities on all Crossing Diagnostic reviews as needed, assure that applicable State Statutes (Chapter 245, 245a and 245b) are followed as intended, assist the FRA with maintaining the Federal Crossing Inventory Database, respond to public complaints and work with the CT Legislature regarding public needs and safety.

Maintenance of Way

The Maintenance of Way Unit (MOW) provides railroad track inspection oversight, railroad inspections record reviews and follow up, oversight of the FRA and Railroad Operator safety standards, assist with planning maintenance work on CT rail properties and investigate serious railroad incidents on a timely basis to determine what happened and what safety practices can be applied if needed. The MOW Unit in conjunction with the Regulatory Unit also implements the Office of Rail “Shared Crossing Maintenance Program” (SCMP)

Shared Crossing Maintenance Program

The SCMP was developed to provide quick responses to perform emergency repair work on State roads. This typically happens when complaints are received from the public or municipalities when a crossing condition becomes a public safety concern. This program was designed to provide financing to the State Highway Districts when they are needed to help with traffic control, pavement procurement and roadway spot surface improvements.

Operation Life Saver Program

The Operation Life Saver Program (OLSP) reaches out to the public to educate them regarding the dangers and risks that result from poor decisions at highway/railroad crossings and railroad property trespassing. OLSP also provides accident investigation courses for emergency responders and law enforcement professionals. OLSP operates on the three EEE’s principal, Education, Engineering and Enforcement. This is a national program that is mainly funded by the State and to a lesser extent the OLSP grant program when approved on the national level.

BUREAU OF PUBLIC TRANSPORTATION
Office of Maritime (Ferries)

Mission:

Maintain a “customer first” service strategy focusing on frontline customer interaction, appearance and communication. Ensure ferry operations are properly staffed to eliminate any interruption of service while providing service for both AM and PM rush hours.

Purpose:

To be open and operational for the times posted as the Ferry Schedule. The Ferries currently operate from April 1st – November 30th. On weekdays, the ferries operate from 7:00 am – 6:45 pm.

Goal:

The goal of the ferry program is to safely carry all vehicles and passengers on a day to day basis during the operating season, collect all fares and accurately reconcile and deposit all monies collected. During the maintenance period, use the ferry crew and contracted vendors to optimize vessel maintenance and ensure vessel safety requirements are achieved.

Organization Structure:

Staffing for the Connecticut River Ferries consists of: 6-USCG licensed captains; 4-ferry first mates, and during the peak summer months, 4-summer worker deckhands. Each ferry location has one of the licensed captains designated as a Master Captain to serve as the crew leader for the employees, and as the contact person for CTDOT.

Operational Authority:

Connecticut General Statutes (CGS) state that the Commissioner of Transportation shall operate the Connecticut River Ferries and report any deviations to the Office of Policy and Management. The monies collected are to be deposited into an account as directed and controlled by the Treasurer.

Reporting Requirements:

On a form provided by the Army Corps of Engineers, the ferry service must report the number of crossings, vehicles and passengers carried on an annual basis.

Funding Source and Program:

FHWA – Ferry Boat Discretionary
CTDOT operating budget
CTDOT capital budget

Gaps, Threats, Opportunities for Improvement:

- Implementation of an automatic (electronic) fare collection system.
- Improve security around the ferry slips to protect all assets
- Cost to replace ferries with new or slightly used vessels

- Optimize vessel maintenance procedures and processes to ensure safety, reliability and effective use of resources.
- Invest in slip improvements to improve safety and efficiency
- Modernize mechanical equipment currently being utilized by ferries
- Improve existing training and orientation processes to ensure staff is up-to-date on all safety procedures as required by federal and state boating safety regulations.

BUREAU OF POLICY AND PLANNING
Office of Coordination, Modeling and Crash Data
Crash Data and Analysis Section

Mission:

Crash Data and Analysis staff collects, processes, stores and distributes Connecticut roadway crash data associated with state and local public roadways.

Purpose:

Statistics are used for program and project development, input to federal, state, municipal and other public and private-sector reports, and form the basis for developing a comprehensive safety plan.

Goal:

To collect, process, and make available to the public all crash data within 30 days of notification of the crash. This data is available at the UConn Transportation Safety Research Center's repository and can be accessed through the internet.

Organization Structure:

Staffing within the Crash Data and Analysis office consists of 1- Transportation Assistant Planning Director; 1-Transportation Supervising Planner, 1-Transportation Planner 2, 1-Transportation Planner 1, 1-Transportation Planning Assistant 2, 5-Transportation Planning Assistant 1, and 2- Office Assistants. This office also has a partnership with UConn for crash data assistance and a consultant that provides software development and IT services.

HSIP Requirement:

To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

Gaps, Threats, and Opportunities for Improvement:

- In the past, the 16 month backlog was an issue for all crash data users. Currently, there is only a 2 month backlog. All crash data is transmitted to UConn on a nightly basis after it is geo-located and reviewed.
- Having 20 years of "old" data and only 1 year of new Model Minimum Uniform Crash Criteria data, it will be difficult to perform historical analysis or find trends.
- Collecting Fatal Analysis Reporting System (FARS) data is always a challenge in obtaining all required fields.
- No longer performing a comprehensive review of each crash, which may result in inadequate data for analysis.

BUREAU OF POLICY AND PLANNING
Office of Strategic Planning and Projects – Intermodal Planning Unit

Mission:

Performs, manages and oversees studies on all modes of transportation, including Bicycle/Pedestrian planning and oversight, and the Safe Routes to School Program (SRTS). The transportation modes include transit, highway, aviation, maritime, freight, and bicycle/pedestrian (non-motorized transportation).

Purpose:

Produce corridor-wide needs assessments and alternatives analyses for all modes of transportation, and develops near and long term implementation plans that can guide Connecticut's transportation infrastructure improvements over the next 20 years.

Goal:

The goals of the Intermodal Planning Unit are:

- to produce studies that contain a set of context sensitive solutions to meet the deficiencies and needs identified in the assessment to ensure that projects are sensitive to the needs of the transportation system as well as the communities that they are part of
- to promote and facilitate the increased use of non-motorized transportation, including developing facilities for the use by bicyclists and pedestrians, along with public education, promotional, and safety programs for using such facilities

Organization Structure:

Staffing within the Intermodal Planning Unit consists of 1-Transportation Planning Director; 1-Assistant Transportation Planning Director, 1-Transportation Supervising Planner, 3-Transportation Planner 2, and 2-Transportation Planner 1. In addition, three task-based consulting firms, which provide planning/engineering services and assist the Intermodal Planning Unit in the delivery of capital projects are being utilized.

Safety-related Programs and Projects:

Strategic Highway Safety Plan (SHSP)

The Intermodal Planning unit supervisor chairs the non-motorized emphasis area team, and manages the non-motorized portion of Connecticut's current SHSP, dated May 2013. A new MAP-21 and Fast Act complaint SHSP is currently being prepared and the Intermodal Planning unit is overseeing the effort for the Non-motorized Emphasis Area. Quarterly meetings are currently being held. The Intermodal Planning unit is also a member of the SHSP Steering Committee.

Safe Routes to School Program

The Intermodal Planning unit manages the SRTS Program via a Coordinator. The SRTS objectives are:

- To enable and encourage children, including those with disabilities, to walk and bicycle to school

- To make bicycling and walking to school a safer and more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age
- To facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools

The Program is divided into two tasks, **Program Administration** and the **Non-Infrastructure Program**.

Task 1: Program Administration

The State Coordinator performs necessary administrative functions involving the budgetary control, implementation oversight, program evaluation, and program coordination to meet the objectives for the federal SRTS program, as per federal requirements contained in SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Act-A Legacy for Users) and any Federal legislation that supersedes it. Other duties include, but are not limited to:

- contracting out and managing services at the program level to carry out statewide initiatives;
- Establishment of policies, procedures, necessary for the preparation, development and monitoring of tasks related to Safe Routes to School program.
- Assisting elementary and middle schools with SRTS program development, including the 5 E's, Engineering, Education, Encouragement, Enforcement, and Evaluation.

Task 2: Non-Infrastructure Program

These activities encourage walking and bicycling to school, including, but are not limited to:

- Traffic education and enforcement in the vicinity of schools, student sessions on bicycle and pedestrian safety, health, and environment, and funding for training (in-state and out-of-state) volunteers.
- Consultant to serve as local managers of Safe Routes to School programs. The program is targeting 35 schools to provide site assessments and assistance with SRTS program development. Other proposed tasks include promotion of International Walk and Bike to School Days and other SRTS events, providing bicycle and pedestrian educational classes, and public outreach efforts to promote safe walking and bicycling.
- Statewide development of school-based SRTS Plans, including budget plans for schools events.
- Statewide implementation of Bicycle and Pedestrian education classes for elementary and middle schools.
- Coordinator's continued partnership with outside agencies, i.e. Coordinated School Health, Department of Health and Department of Education, etc. including public outreach when attend outside agency functions.

Future initiatives include: packaging fundamental program information into a toolkit; developing a timeless website and articles; and providing training. We will assist in the state-wide expansion and development of local SRTS programs to act as models for other school communities to follow, with the overall expectation that this will provide local communities, community members, and school systems with the resources to continue development of local SRTS programs after this program has ended. The State Coordinator will perform necessary administrative functions involving the budgetary control, implementation oversight, program evaluation, and program coordination to meet the objectives for the federal SRTS program, as

per federal requirements contained in MAP- 21 (Moving Ahead for Progress in the 21st Century). Under MAP-21 and the FAST Act, the emphasis of this program is on the non-infrastructure program.

Community Connectivity Program

The Community Connectivity Program is a new program that is intended to improve conditions for walking and bicycling to and within Connecticut's community centers. Community Centers are defined as places where people from a particular town/city can meet for social, educational, employment or recreational activities. This pilot program is one of the outputs from Governor Dannel Malloy's newly authorized Let'sGoCT! transportation program which addresses short-term and long-term transportation needs across the State. Under Let'sGoCT!, the Community Connectivity Program is intended to improve accommodations for bicyclists and pedestrians (bike/ped) in urban, suburban and rural community centers. The first step in this pilot program was for Towns and Cities to complete and submit an application for a Road Safety Audit (RSA). A RSA is a process that identifies safety issues and counter-measures to help improve safety and reduce vehicle crashes.

An RSA is an innovative tool that documents factors that can help or hinder safe bike/ped travel. Some of these factors include, but are not limited to: shoulder width; sidewalk width/condition; pavement markings; traffic volume; on-road parking locations; presence of bicycle lanes; traffic signalization; topography; drainage; and sightlines.

This program is providing consultant assistance to cities and towns to conduct road safety audits for important bike and pedestrian corridors/intersections. Roadway safety audits identify bike/ped needs, and develop recommendations to improve conditions. Typically there are low-cost recommendations that can be implemented in the short term, and higher-cost recommendations that can be done over the longer term.

Bicycle and Pedestrian Planning and Oversight

The Intermodal Planning unit oversees the Bicycle and Pedestrian Planning and Oversight for CTDOT. The Intermodal Surface Transportation Efficiency Act Section 1033 legislation required the creation of a bicycle and pedestrian (non-motorized) coordinator position within each State Department of Transportation.

Safety-related objectives of Bicycle and Pedestrian Planning and Oversight include:

- To promote the traveling safety of cyclists and pedestrians in Connecticut.
- To manage, develop, or assist in the development of programs which encourage the use of bicycles and walking as a means of mobility.
- To expand and extend bicycle facilities and pedestrian walkways.
- Review highway design plans to determine their suitability for bicyclists and pedestrians.
- Assist towns and advocacy organizations with planning of new shared use paths for cyclists and pedestrians including identification of potential funding sources.
- Provide safety materials for bicycle rodeos and to other groups promoting bike/ped safety.
- Work toward the goals outlined in the State Bicycle and Pedestrian Plan.

- Research and respond to design-related questions on multi-use trails and bike routes to those within the CTDOT, as well as for outside agencies (i.e. MPO's, towns, etc.);
- Attend various events and represent CTDOT, speaking on policies and efforts regarding bicycling and pedestrian issues.
- Research and respond to inquiries from the public regarding route selection for cycling in and/or through the state. Such inquiries often require the preparation of maps or other aids, including information regarding bicycle access to state highways and bridges.
- Assist with and act as DOT liaison to the Connecticut Bicycle and Pedestrian Advisory Board and work toward accomplishing goals set forth in the Board's Plan.
- Identify and promote opportunities to expand and enhance the statewide network of shared-use paths and on-road routes to better accommodate the needs of non-motorized transportation users.
- Update the Bicycle and Pedestrian Plan Map to reflect changes to existing facilities.
- Update and Revise the Highway Design Manual to better reflect bike/ped design elements.
- Promote Complete Streets policy adoption and implementation at all levels of government.
- Chair the Complete Streets Standing Committee.
- Facilitate signage for the East Coast Greenway through the state.
- Facilitate the establishment of the U.S. Bike Route System through the state.
- Coordinate with and provide technical assistance to the CTDOT's operating and support bureaus, federal agencies, other State agencies, project advocates and project sponsors on transportation alternative (TA) projects and initiatives.
- Provide technical assistance to staff and project sponsors for maintaining compliance with related federal laws, guidance and requirements and aiding in the adherence to obligation schedules, including procedures involved in the selection and development of projects.
- Consultant Services will be utilized, when necessary, to supplement staff by providing technical support, liaison services and expertise in a variety of areas as well as to facilitate process improvement where needed

Gaps, Threats, and Opportunities for Improvement:

Gaps

- Inaccuracy of data reporting (ex. bike/pedestrian use - leisure vs. necessity, etc.)
- Inability to track "near" collisions
- Incomplete roadway inventory and traffic volume data on locally owned roads limits the Intermodal Planning unit's ability to conduct network screening for potential traffic safety issues.
- Difficulty in enforcing bike laws (ex. 3 ft. separation when overtaking and passing cyclists)
- Ability to measure success of existing programs
- No statewide consistency, or guidelines for cities and towns to reference
- Sidewalks to nowhere and non-continuous sidewalks; bike trails that cannot be used for commuting purposes
- Reaching bicyclists that may never have driven, resulting in no access to the driving training

manual (as it pertains to bike safety)

- State of Connecticut's inability to necessitate repair, maintenance, and snow removal on sidewalks in cities and towns; lack of municipal support for sidewalk maintenance
- Lack of awareness of traffic laws that pertain to bicyclists
- Lack of information regarding safety program effectiveness
- Limited funding to support implementation of bike/ped accommodations
- No clearinghouse for bike/ped exposure data
- Lack of sidewalk maintenance/snow removal inventories

Threats

- Persistent fear from parents concerning the safety of their children walking/biking to school
- Lighting along scenic routes and crosswalks
- Lack of cooperation and general opposition from the general public regarding installation, repair, and maintenance on town and city sidewalks
- Developers may avoid installing sidewalks based on economics
- The mindset of motorists and how it relates to non-motorized vehicles
- Motor vehicle speed
- An inability to reach the public with the message of bicycle/pedestrian safety
- Pedestrians and bicyclists not taking personal responsibility
- Rumble strips

Opportunities

- The use of data as a key component in receiving Federal funding (Vermont's Bike/Ped Safety Plan is a good example)
- Incorporate bike/pedestrian info into the driver refresher course given through AAA and AARP
- Implement Complete Streets policy
- Use social media, posting surveys, or pop quizzes that incorporate bike/pedestrian safety
- Provide technical assistance to towns and municipalities
- Offer cities and towns help with sidewalk repair
- Study University bicycle/pedestrian safety plans (UCONN as an example)
- Change culture/perception with regard to bicyclists and pedestrians (ex. "roads are for cars", "children aren't safe walking or biking to school")
- Enforce snow removal on sidewalks, thus eliminating the need for pedestrians and school children to walk in the street
- Encourage adoption of municipal master plans for sidewalks
- Initiate media campaigns geared to both motorists and bicyclists
- Install or replace traffic signals with audible buzzers and check signal timing
- Insure that bike/pedestrian safety is part of the Physical Education Curriculum in schools (South Windsor, Simsbury already incorporate this into their PE classes)
- Enlist volunteers and Police bike patrols to educate the public through community based programs
- Continue to educate crossing guards (refresher classes) on the proper way to cross the street (no diagonal crossing)
- Use the presence of law enforcement officers as a threat to deter speeding (a major

contributor to bike/pedestrian accidents and fatalities)

- Encourage the use of bike patrol officers
- Use cellular phone Applications as a monitoring tool for bike/pedestrian traffic
- Tap into existing CTDOT monitoring devices to track bike traffic
- Use local Boards' of Education as an educational tool to highlight the benefits and safety of walking and biking to school
- Create a "Hotline" for motorists, bicyclists, and pedestrians as a quick reference to changes in laws and overall safety tips
- Offer Emergency Medical Technician classes to organized Cycling groups and clubs
- Pursue opportunities for Road Diets; apply for FHWA tech assistance for implementing road diets
- Use SHSP EA Committee to leverage information and action
- Work with nonprofits on outreach opportunities (e.g., Center for Latino Progress; Head Start)
- FHWA offers links to bike/ped videos developed for specific age groups
- Private developers funding offsite improvements (e.g., rather than fund sidewalk construction in a small cul-de-sac, use the same funds for sidewalk construction on connecting streets)

BUREAU OF POLICY AND PLANNING
Office of Roadway Inventory Systems

Mission:

Collects, processes, stores and distributes Connecticut roadway traffic volume data, inventory data, digital highway data, Public Roadway Linear Referencing System (LRS) development, enterprise data integration, web based mapping and research administration.

Purpose:

Mandatory Highway Performance Monitoring (HPMS) Reporting to FHWA, ARNOLD, FMIS, MIRE, Asset Management, Geospatial Data Sharing, Town Road Map Updates, Official Roadway Mileage Declaration reporting. Provide critical roadway inventory data across enterprise for analysis essential for CTDOT business functions. Ensure data is of high quality, disseminated in a timely manner and is easily accessible for spatial and other types of analysis.

Goal:

Improve efficiency of outdated workflows, update technology, assign appropriate data stewardship roles, and enhance data quality, dissemination and maintenance. LRS Development provides the foundation upon which critical Enterprise transportation data can be easily maintained, visualized, consumed and analyzed for countless CTDOT functions, including Safety.

Organization Structure:

1- Transportation Planning Director; 1-Transportation Assistant Director and 35 Transportation Planners and Engineers total. 3-Transportation Supervising Planners, 3-Transportation Engineer 3, 3-Transportation Engineer 2, 6-Transportation Planner 2, 13-Transportation Planner 1, 4-Transportation Planning Assistant. Consultant engineering firms are used for specific tasks focused on replacing outdated legacy systems. Three IT Bodyshop contractual Software Developers are critical to this mission as they provide technical expertise critical to success of this mission. Several summer interns, unpaid IT interns, UConn grad students have also been instrumental in assisting in expediting completion of the LRS. In addition, it is important to note that for the last several years close coordination with Engineering Applications and IT Staff has provided us with a far better understanding of the technological hurdles we are likely to face.

RIS Reporting Requirements:

Under MAP-21 and the FAST ACT, CTDOT must meet several requirements in order to fully obligate State Planning and Research funds. These include reports such as The Annual Highway Log, Traffic Log, Official Statewide Mileage Declaration, Town Road Updates, Congestion Management System Reporting, Digital Highway (Photolog) Software/data accessibility, HPMS, ARNOLD, MIRE, FMIS Linear Referencing System Mandates.

Gaps, Threats, and Opportunities for Improvement:

- Roadway information Systems currently collects and disseminates full extent transportation data for over 4,000 miles of state maintained roads and 17,000 miles of locally maintained roads. The Inventory Unit maintains the EXOR LRS which contains the majority of what is

required for MIRE Fundamental Data Elements. In addition to basic roadway network data EXOR will contain ownership, Functional Class, National Highway System, Median Type, number of lanes etc. and several other vital assets. Assets not maintained in EXOR will be periodically loaded into EXOR for annual HPMS reporting purposes (project, pavement condition, signal, sign, guiderail, speed limits, curve/grade, Annual Average Daily Traffic, truck percentages etc.) All the previously listed databases are in various states of readiness for integration. The desired state of future architecture is being conceptualized in conjunction with the Asset Management Plan Template currently being developed. There is a great deal of work to be done to properly assign, validate and construct a mechanism to easily maintain, update and make these data accessible for safety analysis purposes.

- The Photolog Unit currently collects pavement condition (Rutting, Cracking, Faulting, Curve/Grade) all critical inputs to proper safety analysis for the State Maintained roads. To extend this effort to the remaining 15,000 miles of publicly maintained roads could require either a doubling or tripling of staff and equipment or outsourcing data collection for all required elements. We have not developed cost estimates for outsourcing because we do not have enough specifics about the expected cycle for collection, as well as the extent and content of what will be required. It is obvious however; that the cost associated with either option will be significant.
- The Traffic Monitoring Unit currently collects full extent traffic volume, partial extent classification and weigh-in-motion data for the State Maintained roads on an annual basis. To extend this effort to the remaining 15,000 miles of publicly maintained roads could require either a doubling or tripling of staff and equipment or outsourcing data collection for all required elements. We have not developed cost estimates for outsourcing because we do not have enough specifics about the expected cycle for collection, as well as the extent and content of what will be required. It is possible that a research project currently in progress could provide an alternative estimation process which could greatly reduce cost and scale of effort. Whether this study will prove to be implementable has not yet been determined. Also, previous studies investigating the potential use of outside resources for traffic data collection have been resisted due to cost benefit ratio analysis. In any event, it is highly likely that a significant increase in staffing and equipment would be required.
- Certain MIRE data elements such as bicycle/pedestrian counts, rumble strips, striping, shoulder widths on local roads etc. are non-existent or fragmented with no assigned steward or method planned for future maintenance.
- The ability to track financial project data has taken a giant leap forward due to progress made with development of the LRS and coordination with Engineering Applications. The LRS maintained by our Inventory Unit, is basically complete for project location on state roads. Data attribution and location integration with Core-CT and the Obligation Plan exists. Other competing needs have paved the way already for improved tracking of financial projects.

BUREAU OF POLICY AND PLANNING
Office of Highway Safety

Mission:

Investigate and pursue opportunities to improve transportation safety issues regarding driver behavior on Connecticut's roadways.

Purpose:

To plan, coordinate, and implement effective highway safety programs and to provide technical leadership, support, and policy direction to highway safety partners.

Goal:

Prevent roadway fatalities and injuries as a result of crashes related to driver behavior.

Organization Structure:

Staffing within the Connecticut Highway Safety Office (HSO) consists of: 1-Transportation Planning Director, 1-Transportation Principal Safety Program Coordinator, 1-Highway Safety Office Supervisor, 7-Transportation Safety Program Managers, 2 task-based consulting firms, which provide traffic records program services and assists the HSO with data reporting, grant and reimbursement development, one Traffic Safety Resource Prosecutor located in the Judicial Department, and one behavioral analyst located at the Connecticut Transportation Safety Research Center.

HSP Requirements:

Under the Highway Safety Act of 1966 (U.S. 23 USC - Chapter4) the Governor is required to implement a highway safety program through a designated State agency suitably equipped and organized to carry out the program. An appointed Governor's Highway Safety Representative oversees the program and supporting Section 402 and 405 highway safety grant funds made available to the States to carry out their annual Highway Safety Plans. The Connecticut Highway Safety program is an extension of this Federal requirement.

Highway Safety Plan (HSP)

The HSP is a planning document that provides historic, trend, and most current crash data available, in addition to other State-provided data, detailing highway safety in Connecticut. The identified problem areas dictate the State's highway safety goals, objectives, and planned countermeasures. The basis for examination in Connecticut's motor vehicle crash experience is based on a five-year moving average along with a four-year projection. The Highway Safety Plan also serves as Connecticut's application to the National Highway Traffic Safety Administration (NHTSA) for federal funds under Sections 402 and 405 within MAP-21 and the Fast Act and as planning tool for the current Federal Fiscal Year.

The HSO focuses on NHTSA program areas under the Federal 402 and 405 programs including Impaired Driving, Occupant Protection, Child Passenger Safety, Distracted Driving Police Traffic Services, Speed, Motorcycle Safety, Traffic Records, Driver Groups, Bicycle and Pedestrian Safety and Work Zone Safety. These program areas provide funding for countermeasures to combat key problems identified in each section. Key priority areas

include; percentage of alcohol-related fatalities and injuries, percentage of unbelted fatalities, speed related fatalities and injuries, motorcycle fatalities and injuries, pedestrians fatalities and injuries and improving crash data collection and availability.

Impaired Driving

Countermeasures for this program area are directly correlated to problem identification data. These measures are based on proven programs and NHTSA mobilizations. They are also selected from NHTSA's *Countermeasures That Work* and in the sharing of best practices at national safety conferences such as the Governor's Highway Safety Association and Lifesavers as well as Transportation Safety Institute training courses.

Enforcement objectives will be accomplished through the Comprehensive Driving Under the Influence (DUI) Enforcement Program which will include funding sobriety checkpoints and/or roving patrols and associated equipment purchases.

Paid advertising and earned media will be part of a comprehensive program designed to address specific highway safety goals identified in this section. Public education will be aimed at specific target groups who are most over-represented in alcohol-related crashes in relation to the number of licensed drivers in those age groups.

Standardized Field Sobriety Testing (SFST) training for police officers will be offered for the purpose of increasing the pool of SFST trainers and to ensure that field officer practitioners making DUI arrests are properly trained in the detection and apprehension of drunk drivers, and follow standardized arrest procedures that will hold up in court.

The Highway Safety Office will continue to support the passage of legislation that discourages impaired driving through enforcement, sanctions aimed at reduction of recidivism, passage of an open container statute, and work with other State agencies to increase current Interlock Ignition Device (IID) installation rates and increased penalties for first time and repeat DUI offenders.

Occupant Protection

Countermeasures for this program area are directly correlated to problem identification data. These measures are based on proven programs which are selected from NHTSA's *Countermeasures That Work* and also from the sharing of best practices at national safety conferences such as the Governor's Highway Safety Association, Lifesavers, and Transportation Safety Institute training courses.

CTDOT serves as the lead agency for the coordination of occupant protection programs in Connecticut. Participation in the national high visibility safety belt and child safety seat enforcement mobilization: "Click It or Ticket" (CIOT) will continue to be the core component of the program.

Speeding

Speeding related crashes, injuries and fatalities are addressed through funding High Visibility Enforcement (HVE) projects. Speed Problem ID data is paired with FHWA's High Risk Rural

Road data to encourage agencies to participate in speed-related enforcement through various methods including dedicated high visibility speed enforcement grants to achieve the goals listed above. Funding has been used for comprehensive speed grants as well as the purchase of speed measuring devices for law enforcement agencies to use during speed enforcement.

Distracted Driving

The goal of the distracted driving program is to decrease fatalities and injuries as a result of crashes caused by driver distraction, especially those caused by hand held mobile phone use by:

- Increasing enforcement, especially HVE of Connecticut's hand held mobile phone ban for drivers.
- Increased education of the driving public of the dangers of distracted driving through media campaigns, public awareness campaigns, grassroots outreach and public information campaigns and educational programs.

There are three distinct countermeasures for this program area including:

- An HVE campaign to coincide with NHTSA's April "Distracted Driving month". This enforcement mobilization will pair an enforcement mobilization with a media campaign using the NHTSA slogan "U Drive. U Text. U Pay."
- Public outreach and education campaigns.
- Educational programming for High Schools and younger drivers.

Annual Safety Report

MAP-21 (and the FAST Act) requires that the HSO coordinate safety efforts shared by the Department's Highway Safety Improvement Plan (HSIP) and the Strategic Highway Safety Plan (SHSP) as stated in 23CFR 1200.11(a)(b)(c). The annual safety report is prepared by the HSO detailing all of the program areas performance goals, noteworthy practices and crash data trends. The document is submitted by the HSO to NHTSA for review and approval.

Gaps (G), Threats (T), and Opportunities for Improvement (O):

- Supportive Legislation for safety program initiatives (G and T)
- Funding limitations based on the passage of the recent FAST ACT including funding restrictions based on performance measures. (G and T)
- Application of the new Crash Data Repository to use more current crash data in problem identification and program evaluation. (O)
- Support for inclusion of additional databases to be added to the repository to expand and allow for effective data analysis for problem ID and identification of appropriate counter measures. (O)

BUREAU OF FINANCE AND ADMINISTRATION
Division of Occupational Health and Safety

Mission:

Act in the best interests of the CTDOT, employees, contractors and the public by identifying hazards within CTDOT operations and to promote and support a safe and healthy workplace for all CTDOT employees through regulatory compliance, policy development, health and safety training and by striving to develop and foster a safety culture and continuous improvement throughout the organization.

Purpose:

To support CTDOT's overall Transportation Mission, by implementing CTDOT's Occupational Health, Safety and Wellness objectives; to protect CTDOT employees and interests by striving for Zero workplace injuries and Zero workplace accidents.

To develop and implement such safety programs, policies, directives, guidelines and procedures as required by CTDOT or that will assist CTDOT in complying with applicable Federal and State health and safety regulations.

To develop such CTDOT specific safety related training programs so that all CTDOT operations are conducted in a manner that will continually improve overall employee safety as well as the safety of the motoring public.

To investigate and analyze safety related incidents that involve or potentially involve CTDOT employees, contractors, CTDOT property, CTDOT holdings or CTDOT interests in order to prevent future occurrences.

To conduct routine safety inspections of CTDOT properties, holdings, facilities and job sites, for review and evaluation for compliance with CTDOT, Federal and State health and safety requirements.

Goal:

The fundamental goal is to evaluate the safety risk within CTDOT operations, identify areas for correction or improvement and then take such action as is necessary to implement an appropriate Action Plan to protect the health and safety of CTDOT workers and the best interest of the CTDOT.

BUREAU OF FINANCE AND ADMINISTRATION
Division of Property and Facilities Services – Code Enforcement

Mission:

Administer the Connecticut State Building and Fire Safety Codes for CTDOT for all Agency non-threshold new-building and related construction and the renovation for all facilities, which include Administration, Highway Maintenance, Railroad, Bus (including CTFastrak), Highway Rest Areas, the 23 Highway Service Plazas, and signalization related to State facilities and roads.

Purpose:

Provide code compliance for access to and within all of our buildings for Agency and Tenant employees and the traveling Public for all levels of ability.

Goal:

Ensure code compliance, quality assurance, insurance conformance, and minimizing life-safety risk and the exposure for liability.

Organization Structure:

Staffing within the Division of Property and Facilities Building Code Enforcement Unit falls under the Transportation Director of Property and Facilities Services and is comprised of 1-Design Engineer 3 (Structural), 1-Architectural Plan Reviewer 2, 1-Design Engineer 1 (Electrical), 1-Building Construction Specialist 1 (Mechanical), 1-Building Construction Specialist 1 (full-time), 1-Building Construction Specialist 1 (shared with Concessions Unit), and 1-Drafter 2 (Architectural).

Authority/Policy Statement/Regulation/Law:

The following Connecticut General Statutes provide the authority to carry out these functions:

- 13b
- 29-252a
- 29-261

All applicable Codes/Regulations that govern the following operations that occur at Agency-owned facilities and apply:

- CT State Building Code
- CT State Fire Safety Code
- Americans with Disabilities Act (the physical attributes)
- CT DEEP 22a
- OSHA (where overlap occurs with the Building Code in non-public areas)
- Federal Railroad Administration Standards (Federal Standards that supersede the building code)
- FM Global (not regulatory, but maintains insurability)
- CT Health Code
- Utility Company Proprietary Requirements (Eversource, United Illuminating, Local Utilities, MDC, CT Water, Aquarian, Etc.)

P&FS works closely with the Office of State Building Inspector as liaison for Threshold Building projects, code interpretation and code modifications and the Office of State Fire Marshal for enforcement issues and evaluations.

DOT Safety Division works closely with P&FS to resolve matters in which OSHA and the Building Code overlap.

DOT Environmental Compliance works with P&FS during the construction or re-construction of fueling facilities to ensure compliance with DEEP regulations.

Reporting Requirements:

While 29-252a provides authority for internally carrying out building code inspection, permitting and occupancy correspondence is copied and submitted to the Office of State Building Inspector and the Office of State Fire Marshal for their records.

- Notice of Intent to Construct (Building Permit)
- Certificate of Code Compliance / Occupancy
- Record and maintain inspection reports through course of project (Internal)
- Utility Release (Approval submitted to respective utility company for service activation - Internal)

Funding source and program:

In general, the DOT operating budget funds DOT Code Enforcement staff. Inspection funding is also arranged by project when large-scale new-building (non-threshold) or renovation projects are constructed.

Gaps, Threats, and Opportunities for Improvement:

- Insufficient technology for mobile email retrieval and office plan review (some employees have access, but not all).
- Potentially insufficient staffing to properly handle projected workload of future projects, mainly in electrical.
- “Building Department” software is now available for tracking projects, permits, inspections, issues, and so on.
- PDF scanning for documents will help organize and reduce the amount of physical paperwork. This is currently done through the copy machine, but is very time consuming.
- Blanket funding for electrical inspection (traffic signals) should be accessible.

BUREAU OF FINANCE AND ADMINISTRATION
Division of Property and Facilities Services – Building Operations

Mission:

Our safety function is to ensure CTDOT facilities are maintained in a safe and healthy environment.

Purpose:

The Division of Property and Facilities Services/Building Operations safety function is to ensure ongoing maintenance of Building Life Safety Systems; such as fire alarms and sprinklers, as well as responding to Building Safety issues.

Goal:

The safety goal is to ensure protection of staff and assets, as well as employee safety.

Organization Structure:

Staffing within the Building Operations consists of 9-Regional Supervisors, 1-Maintenance Supervisor (General 2), 1-Building Superintendent 2, 2-Office Assistants, 1-Transportation Planner 2, 1-Electronics Technician 2, 1-QCW Locksmith, 3-QCW Carpenters, 4-QCW HVACR, 4-QCW Plumber/Steamfitters, 6-QCW Electricians, 4-Maintainer 2, 2-Maintainer 3, and 1-General Trades Worker.

Gaps, Threats, and Opportunities for Improvement:

No automated way to track inspections at present.

BUREAU OF FINANCE AND ADMINISTRATION
Division of Property and Facilities Services – Concessions

Mission:

Administer the Concession Agreement that is in place between the CTDOT and the Concessionaire - Project Service LLC for the operation of the 23 service plazas that are located along Connecticut's highways (I-95, I-395, and the Merritt and Wilbur Cross Parkways) in a manner that will ensure the health and safety of the traveling public.

Purpose:

Fulfill CTDOT's commitment to provide safe and clean service plaza rest facilities for the traveling public to use when traveling along the state's highways.

Goal:

Perform physical inspections of the 23 service plaza facilities frequently enough as to properly monitor the day to day operations and procedures that impact public health and safety - which include:

- Food handling procedures,

- Snow removal operations,
- Fuel storage and dispensing procedures
- General building and site maintenance and repair

Organization Structure:

Staffing within the Division of Property and Facilities Concession Section falls under the Transportation Director of Property and Facilities Services and is comprised of Transportation Director of Concessions Operations and Revenue, 2-Transportation Public Concessions Inspectors, and 1-Building Construction Specialist 1 (shared with Code Enforcement Section).

Authority/Policy Statement/Regulation/Law:

The following Connecticut General Statutes provide the authority to operate the service plazas:

- 13a-20
- 13a-23
- 13a-33
- 13a-80a
- 13a-143
- 13b-23

All applicable Codes/Regulations that govern the following operations that occur at the service plazas apply:

- Food handling / safety
- Building (codes / regulations)
- Fire (codes / regulations)
- Fuel storage / dispensing
- Storm water run-off
- Potable well system
- Septic system discharges

DOT Environmental Compliance also works closely with P&FS to test/monitor the service plaza sites for potential fuel related contamination issues (DEEP regulations apply)

Reporting Requirements:

No statutory or regulatory requirement for reporting of Concession Inspector reports/inspections exists. A process has been developed to convey and track deficient issues that have been identified with the service plaza operator for repair/correction.

Various regulatory reporting requirements do exist that the service plaza operator must comply with. The DOT Concession unit does the best that it can to monitor for compliance with these requirements based on staff levels:

- Fuel UST issues
- Potable well testing
- Septic system testing
- Storm water system monitoring
- Numerous building and fire life safety system checks/inspections

Funding source and program:

The DOT operating budget funds the DOT Concession staff/inspectors.

Private capital from Project Service LLC and the tenant revenues fund all operations at the service plazas - which includes all maintenance, repair, reinvestment, testing costs. Revenues also partially fund investment debt service payments.

Gaps, Threats, and Opportunities for Improvement:

- Insufficient Concession section staffing to properly monitor the various record keeping and reporting obligations of the service plaza operator and tenants.
- Insufficient staffing to properly monitor the number of food venues that now exist at the 23 service plazas as often as we would like to ensure proper food handling procedures.
- Potential concern about viability of tenants to remain solvent. More tenants divide the revenue "pie" up - so - if tenants close - there is less revenue to fund maintenance, repair, and operating costs. There have been quite a few tenant closures so far."

BUREAU OF ENGINEERING AND CONSTRUCTION
Division of Bridges – Bridge Safety and Evaluation

Mission:

To ensure the safety of the traveling public and protect the State of Connecticut’s multi-billion-dollar capital investment in bridges by managing, directing, and coordinating the inspection of State and Local highway bridges, tunnels, overhead sign support structures, traffic signal supports, and high mast lighting supports.

Purpose:

Bridge Safety and Evaluation (BS&E)’s primary function is to carry out the FHWA National Bridge Inspection Program (NBIP) utilizing the National Bridge Inspection Standards (NBIS) in the Code of Federal Regulations, 23 CFR 650 Subpart C, and to meet the FHWA’s NBIS oversight requirements – Metrics for the Oversight of the NBIP (Metrics).

Goals:

- To fulfill the requirements of the NBIS
- To ensure prompt discovery of any deterioration, defect, or structural deficiency that could be hazardous to the traveling public
- To maintain an up-to-date inventory that records the condition and load capacity of all qualifying structures on certified public roads in Connecticut
- To establish and maintain the information required by the Bridge Management System
- To determine the extent of minor deterioration and initiate routine maintenance and repair work
- To determine the extent of major deterioration and select rehabilitation or replacement candidates

Organization Structure:

BS&E utilizes in-house inspection staff and consultant engineering firms to meet its commitment to the NBIS and compliance with the Metrics. Staffing within BS&E as of January 1, 2016, consists of one Manager of Bridge Operations, 1-Secretary 2, 4-Transportation Supervising Engineer, 14-Transportation Engineer 3, 2-Bridge Inspector 3, 14-Bridge Inspector 2, 5-Task-based Consulting Engineering Inspection Firms, 1-Task-Based On-Call Consulting Engineering Inspection Firm, 4-Task-Based Consulting Engineering Inspection Firms – Town Owned Bridges Under 20 feet only, and 2-Task-Based Consultant Engineering Underwater Inspection Firms

National Bridge Inspection Standards and Companion Documents

Every aspect of bridge inspection is highly regulated. As stated by the FHWA, “The NBIS sets the national standards for the proper safety inspection and evaluation of all highway bridges in accordance with 23 U.S.C. 151.”

The NBIS is very specific in the requirements for bridge inspection and sets the national policies regarding inspection frequency, inspector qualifications, report formats, and inspection and rating procedures. Two manuals developed by the FHWA as companion documents to the NBIS

are the *Bridge Inspector Training Manual* and the *Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges (Coding Guide)*. The American Association of State Highway and Transportation Officials (AASHTO) have companion documents for bridge inspection. AASHTO's *Manual for Bridge Element Inspection, published in 2013* is currently being used by BS&E for the collection and reporting of inspection data to the FHWA.

BS&E developed a companion document, the Bridge Inspection Manual (BIM). The purpose of the BIM is to define the procedures and practices of CTDOT for determining the physical condition, load capacity, and maintenance needs of highway bridges in Connecticut. The NBIS and all its companion documents are referenced in the BIM.

Bridge Inspections:

In general, all bridges must be inspected every 24 months. There are approved exceptions, such as certain bridge types in good condition which can be inspected every 48 months. Bridges in a deteriorated condition must be inspected more frequently, usually on a 12-month or 6-month inspection schedule. Bridge inspections are also performed for semi-final construction projects and emergency situations such as vehicle collisions or flood events. All inspections follow the NBIS.

Condition Evaluation and Discovery of Deterioration During Inspections:

One of the main objectives of the inspection is to determine the condition of the bridge and to promptly discover deficiencies. The condition evaluation establishes the physical and functional condition of the bridge components including the extent of deterioration and other defects. The evaluation forms the basis for the load rating of the bridge, maintenance actions, and repair/rehabilitation programs.

The condition of each bridge member is to be evaluated in accordance with the 0-9 numeric coding system described in the FHWA Coding Guide. CTDOT guidelines for interpreting defects and deterioration and assigning a numeric rating to the structural element are contained in the BIM.

The biennial inspection cycle provides a continuous record of bridge condition and rate of deterioration. Unless struck by a vehicle or damaged by flooding, bridge deterioration happens over time, usually as steel corrosion or concrete deterioration. There are limited special cases where cracks in steel can cause sudden failures. These Fracture Critical bridge members are given special attention in the NBIS and elevated inspection criteria are used during all inspections.

All significant deficiencies discovered during the inspection are documented and issued a Priority for repair. This includes everything from an immediate repair, to programming a rehabilitation project or replacement, which can take in excess of five years depending on the complexity of the project.

Repairs that can be performed by Bridge Maintenance will be sent using the recently acquired Inspectech inspection database program. If emergency repairs are required, Bridge Maintenance will be notified immediately. If the required emergency work is beyond their

scope, the Commissioner will issue an Emergency Declaration for the bridge repair and The Office of Construction will hire a contractor to stabilize the bridge and perform the repair. The Inspectech program will also be used to send project rehabilitation or replacement candidates directly to Bridge Management.

After the inspection is completed, a determination will be made whether the bridge requires an updated load rating analysis. If required, a request is made to Bridge Design to perform a load rating based on the current bridge condition. Based on the completed load rating, the bridge may be required to have signs posted for a reduced live load carrying capacity and if so, posting signs would be installed.

As required by the FHWA, all inspection data for the previous year's inspections is sent by April 1st. This includes the NBI and the NBE data for bridges on the National Highway System. The FHWA uses this information to compile the National Bridge Inventory (NBI). The NBI data is then used to assess the condition of the nation's bridges.

Gaps, Threats, and Opportunities for Improvement:

- BS&E's Bridge Inspection Manual is currently being updated in sections. Until the manual is completed and disseminated to all State and Consultant Engineering inspection teams, there may be inconsistencies with certain aspects of the inspections and reports. These will not affect the overall evaluation of the condition of the bridge, however it may reduce the efficiency and interpretation of the presented data.
- The database software for writing and storing the inspection reports, Inspectech, was adapted by BS&E in the spring of 2015. Integrating it into our inspection program is still incomplete. Until full integration is complete, the efficiencies hoped to be gained by using the program will be delayed.
- Sharing of all pertinent information for CTDOT infrastructure using easily accessible databases continues to be a challenge. CTDOT has made great strides for information access and management but full integration into workflows for all units has not yet been achieved. Overall efficiency will suffer until this has been completed. This is especially important for bridge information since many units rely on each other's information.
- BS&E currently has 16 State bridge inspectors. Close to half the inspectors are eligible for retirement now or within 5 years. A succession plan needs to be implemented in order to maintain the same number of inspectors. The NBIS requires five years of inspection experience in order to obtain certification as a lead inspector. To date, all inspectors have a maintenance background and no technical education is required. Our preference is to obtain more technically qualified inspectors at the Technician and/or Engineering level.

BUREAU OF ENGINEERING AND CONSTRUCTION
Division of Facilities and Transit – Facilities Design

Mission:

Investigate and pursue opportunities to improve safety at Connecticut’s highway support and transit facilities for all public and employee users.

Purpose:

To construct new facilities and to renovate existing facilities to comply with the following:

- State Building Code as adopted pursuant to CGS 29-252, as amended.
- State Fire Prevention Code as adopted pursuant to CGS 29-291a, as amended.
- Fire Safety Code as adopted pursuant to CGS 29-292, as amended.
- Department of Justice “ADA Standards for Accessible Design.”
- FM Global Property Loss Prevention Data Sheets.
- National Fire Protection Association Standards.

Goal:

Promote the health and safety of the people of Connecticut that use the highway support and transit facilities.

Organization Structure:

Staffing within the Division of Facilities and Transit Office of Facilities Design consists of (36) engineers; 1-Transportation Principal Engineer, 6-Transportation Supervising Engineer, 16-Transportation Engineer 3, 6-Transportation Engineer 2, 1-Transportation Engineer 1, 6-Transportation Engineer Trainees. On-call and task-based consulting engineering firms provide engineering services to assist in the delivery of capital projects.

Design Requirements:

State Building Code

The State Building Code is used to ensure that the design of capital projects complies with the building, electrical, mechanical, plumbing, and energy code requirements necessary to promote the health and safety of the people of Connecticut.

State Fire Prevention Code and State Fire Safety Code

The State Fire Prevention Code and the State Fire Safety Code are used to ensure that the design of capital projects complies with the codes, standards, and regulations to reduce the harm associated with fires, explosions, and mechanical failures.

Department of Justice “ADA Standards for Accessible Design”

The Department of Justice “ADA Standards for Accessible Design” sets minimum requirements, both scoping and technical, for newly designed and constructed or altered State facilities to be readily accessible to and usable by individuals with disabilities.

FM Global Property Loss Prevention Data Sheets

FM Global is the property insurance carrier for the State of Connecticut. FM Global publishes engineering guidelines to help reduce the risk of property loss due to fire, weather, and/or equipment failure.

NFPA Standards

National Fire Protection Association (NFPA) develops and publishes consensus codes and standards intended to minimize the possibility of fire and other risks.

Gaps, Threats, and Opportunities for Improvement:

- Division of Facilities and Transit Office of Facilities Design provides design-relates services for multiple bureaus, resulting in competing priorities. These bureaus are: the Bureau of Engineering (such as movable bridges and vertical projects in conjunction with roadway and rails-to-trails projects), the Bureau of Public Transportation (such as ports, ferries, bus facilities, parking garages, railroad stations, railroad maintenance facilities, railroad track and catenary work), and the Bureau of Finance and Administration (such as maintenance and repair facilities, salt storage facilities, office buildings, rest areas, weigh stations).
- Incomplete asset management information on existing facilities impacts the decision making process related to the need for new facilities or the need to renovate existing facilities; which ones are next?
- Funding constraints delay the ability to construct new facilities and to renovate existing facilities as quickly as necessary.
- Staffing level may delays the ability to construct new facilities and to renovate existing facilities as quickly as necessary unless consultants are used.

BUREAU OF ENGINEERING AND CONSTRUCTION ***Division of Highway Design – Engineering Services***

Mission:

Review and approve roadside safety hardware systems and to develop standard drawings and specifications for their use.

Purpose:

Develop standards and specifications to insure crashworthy, federally eligible, roadside safety hardware is installed and maintained properly on our roadway network.

Goal:

To insure the CTDOT is specify/installing crashworthy systems that are federally eligible. Maintain inventory of roadside safety hardware and track progress on the removal of existing obsolete systems.

Organization Structure:

Staffing within the Engineering Services-Special Project Section consists of 3-engineers; 1-Transportation Supervising Engineer, 1-Transportation Engineer 3, and 1-Transportation Engineer 2. The staff is assigned other tasks and works only part-time on this activity.

FHWA Requirements:

The FHWA has issued letters of eligibility for roadside hardware systems that have passed NCHRP-350 or AASHTO Manual for Assessing Safety Hardware (MASH) testing protocols; only systems with these letters are eligible for federal-aid reimbursement. Recently the AASHTO/FHWA Joint MASH Implementation Agreement was successfully balloted by AASHTO's Standing Committee on Highways and approved by the FHWA. The agreement sets timetables for full implementation on the use of MASH approved roadside safety hardware by state Agencies. By December 31, 2017, only MASH approved w-beam and cast-in-place concrete barriers will be eligible for federal aid reimbursement. Later deadlines have been established for other types of roadside safety hardware systems.

Gaps, Threats, and Opportunities for Improvement:

Gap and Threats

- Outdated network information on existing roadside safety hardware systems with limited ability to maintain the database that contains this information.
- Challenges in meeting deadlines for full MASH implementation. Testing protocols have not yet been published. MASH approved systems are limited at this time. New standard details and specifications need to be developed when MASH approved systems become available in the marketplace.

Opportunities for Improvement

- Develop training programs to improve installation, inspection and maintenance of roadside safety hardware.
- Update guidelines for the proper selection and layout of crashworthy roadside safety hardware.
- Develop maintenance guidelines for the repair and upgrading of existing roadside safety hardware.
- Develop a process for the in-service evaluation of roadside safety hardware after crashes.
- Develop guidelines and standards for use of new, innovative crashworthy roadside hardware systems.
- Develop a program for the systematic removal/upgrading of obsolete roadside safety hardware on our network.

BUREAU OF ENGINEERING AND CONSTRUCTION
Division of Traffic Engineering – Railroad Section

Mission:

Investigate and pursue opportunities to improve transportation safety at Connecticut’s public railway-highway grade crossings for all road users.

Purpose:

To carry out the Railway-Highway Crossing Program (23 USC 130), commonly referred to as the Section 130 Program, of the FHWA HSIP, as amended under MAP-21 and the FAST Act.

Goal:

Eliminate hazards at public railway-highway grade crossings. This is achieved by the closure of crossings, the installation of protective devices at crossings, and the installation of warning devices, such as signs and pavement markings on the approaches to the crossings.

Organization Structure:

Staffing within the Railway-Highway Grade Crossing Section consists of seven (7) engineers; 1-Transportation Supervising Engineer, 2-Transportation Engineer 3, 1-Transportation Engineer 2, and 3-Transportation Engineer Trainees. Also, two task-based consulting engineering firms, which provide engineering services, and assist the Railway-Highway Grade Crossing Section in the delivery of capital projects.

Railway-Highway Crossing (Section 130) Program Requirements:

In accordance with 23 USC 130(d), each State is required to conduct and systematically maintain a survey of all highways to identify those railroad crossings that may require separation, relocation, or protective devices, and establish and implement a schedule of projects for this purpose. At a minimum this schedule is to provide warning devices, such as signs and pavement markings, for all railway-highway grade crossings.

Annual Railway-Highway Crossings Program Report

In accordance with 23 USC 130(g), each State is required to submit annual reports on the progress being made to implement this program, the effectiveness of such improvements, an assessment of the costs of the various treatments employed, and subsequent crash experience at improved locations. In addition, States are required to submit a report that describes how improvements contributed to reducing fatalities and serious injuries at railway-highway grade crossings. The FHWA recommends that this information be included in the Railway-Highway Crossings Report, rather than in a separate report. The annual report is prepared by the Railway-Highway Grade Crossing Section and submitted by the Safety Section along with the HSIP annual report.

Gaps, Threats, and Opportunities for Improvement:

- Lack of staff experience
- Staff training on design of Railway-Highway Crossings
- An internal railway-highway crossing database does not exist for use of tracking all documentation relating to each particular crossing. Railway-highway crossings should be viewed as an asset similar to traffic signals, bridges, etc. Documentation should include detour plans, RR device plans, pre-emption timing calculations, signing and pavement marking plans, and inventory sheets.
- Coordination between the Bureau of Engineering and Construction and the Bureau of Public Transportation. The Division of Traffic Engineering administers the Section 130 Program and designs the Traffic related portions of the rail crossing (signs, pavement markings, and traffic signals). Traffic Engineering then works with the individual RR companies to design the RR devices (gates and flashers). The Bureau of Public Transportation houses the Office of Rail, which includes Rail Design, Rail Operations, and Rail Regulatory. Currently there is very little coordination between the two Bureaus. Some of the projects that the Office of Rail works on could utilize Section 130 Program funding but currently don't due to the lack of coordination.
- Not meeting funding targets.

BUREAU OF ENGINEERING AND CONSTRUCTION *Division of Traffic Engineering – Safety Section*

Mission:

Investigate and pursue opportunities to improve transportation safety on Connecticut's public roads for all road users.

Purpose:

To implement sections of the FHWA HSIP, as established under 23 USC 148 and amended by MAP-21 and the FAST Act. The Railway-Highway Crossing Program (23 USC 130) is also part of the HSIP, but is administered by another section within the Division of Traffic Engineering.

Goal:

Achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

Organization Structure:

Staffing within the Safety Section consists of nine (9) engineers; 1-Transportation Supervising Engineer, 3-Transportation Engineer 3, 2-Transportation Engineer 2, 1-Transportation Engineer 1, and 2-Transportation Engineer Trainees. Also, two task-based consulting engineering firms, which provide engineering services, assist the Safety Section in the delivery of capital projects.

HSIP Requirements:

CTDOT must meet several requirements in order to fully obligate HSIP funds. These include develop, implement, and update a Strategic Highway Safety Plan, produce a program of projects or strategies to reduce identified safety problems, evaluate the SHSP on a regular basis, and submit an annual report to FHWA regarding HSIP activities.

Strategic Highway Safety Plan

The SHSP is a statewide-coordinated safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads. The SHSP is developed in a cooperative process with Local, State, Federal, Tribal and private sector safety stakeholders. It is a data-driven, multi-year comprehensive plan that establishes statewide goals, objectives, and key emphasis areas and integrates the four E's of highway safety – engineering, education, enforcement and emergency medical services. The SHSP allows highway safety programs and partners in the State to work together in an effort to align goals, leverage resources and collectively address the State's safety challenges. The Safety Section managed the update of Connecticut's current SHSP, dated May 2013. A new MAP-21 and FAST ACT compliant SHSP is currently being prepared and the Safety Section is overseeing the effort.

Spot Safety Improvement Program (State Roads)

The spot safety improvement program addresses specific traffic safety concerns on state owned and maintained roads. Locations that exhibit higher than expected crash rates are identified on a network screening tool called the Suggested List of Surveillance Study Sites (SLOSSS) which is produced annually by the Bureau of Policy and Planning. Investigations are conducted from the SLOSSS and reports are prepared documenting conditions and any recommended countermeasure. Depending on the cost and scope of the countermeasure, CTDOT's Office of Maintenance may be requested to make low-cost improvements such as traffic signal timing changes, installation of signs and pavement markings. In those situations where the scope of work is beyond the resources of maintenance, the Safety Section recommends a project for inclusion in CTDOT's capital improvement plan.

Systemic Safety Improvement Program

The systemic approach to safety involves widely implemented improvements based on high-risk roadway features correlated with specific severe crash types. The approach provides a more comprehensive method for safety planning and implementation that supplements and compliments the spot safety improvement program. It helps CTDOT broaden their traffic safety efforts and consider risk as well as crash history when identifying where to make low cost safety improvement. The Safety Section initiates and designs systemic safety projects identified on the CTDOT's capital improvement plan.

Local Road Accident Reduction Program

The Local Road Accident Reduction Program provides HSIP funding for safety-related improvements for locations not on the state's system. The Regional Planning Organizations submit candidate projects on behalf of their member towns to address traffic safety issues. The Safety Section, in consultation with the Division of Highway Design-Local Roads Unit, reviews submittals to ensure compliance with the program guidelines. Projects that meet the program requirements are recommended by the Safety Section for inclusion in the CTDOT's capital improvement plan.

High Risk Rural Road Program

23 USC 148(g)(l) established a High Risk Rural Road (HRRR) Special rule, which requires States where the fatality rate on rural roads increased over the most recent two year period to obligate a specific amount of funds toward HRRR safety projects in the next fiscal year. The special rule applies to Connecticut and the Safety Section is responsible for initiating projects towards HRRR safety.

Penalty Funds

23 USC 154 requires states to enact and enforce an open container law that prohibits the possession of any open alcohol beverage container and the consumption of any alcohol beverage, in the driver or passenger area of any motor vehicle located on a public highway or right-of-way of a public highway. Connecticut is non-compliant and 2.5 percent of Federal-Aid funds are withheld from either National Highway Performance Program and/or Surface Transportation Program. A portion of these funds are transferred to CT's Highway Safety Office for the administration of alcohol-impaired driving programs. The balance of the penalty funds are managed by the Safety Section and are used on HSIP eligible activities. Penalty funds released for HSIP eligible activities must be obligated by the end of the fiscal year or be returned to FHWA as part of the August redistribution process.

Annual Safety Report

MAP-21 and FAST Act requires each State to submit a Highway Safety Improvement report that describes the progress being made to implement highway safety improvement projects; assesses the effectiveness of those improvements; and describes the extent to which the improvements have contributed to reducing fatalities and serious injuries on all public roads. The annual report is prepared by the Safety Section.

Gaps, Threats, and Opportunities for Improvement:

- Incomplete roadway inventory and traffic volume data on locally owned roads limits the Safety Section's ability to conduct network screening for potential traffic safety issues.
- Existing network screening analysis methods for the state system and the methodology for evaluation of safety projects are not at the level recommended in the Highway Safety Manual.
- Inconsistent use of the FHWA's CMF Clearinghouse for countermeasure selection by designers. The creation of Connecticut-specific and roadway type-specific CMFs will further improve the State's countermeasure selection process.
- The Safety Section has limited ability to track financial project data. This has a direct and negative impact on project evaluation, program evaluation, and HSIP reporting. The primary limitation is that Core-CT cannot track project types. In particular, if a project has a safety impact, but it was not at least partially paid for with safety funds, the Core-CT reports will not be helpful in identifying them. In addition, others within CTDOT can circumvent the Safety Section to use safety funds. This is an issue because all projects funded with HSIP funds need to be tracked for HSIP reporting.
- Safety is one of seven National Goals established in 23 USC 150 as part of a comprehensive performance management program. FHWA defines Transportation Performance Management as a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals. The Safety goal is to achieve a

significant reduction in traffic fatalities and serious injuries on all public roads. If Connecticut does not make significant progress toward achieving its targets, CTDOT's obligation authority could be affected in certain programs.

- Additional staff training on state of the practice safety analytic methods.

BUREAU OF ENGINEERING AND CONSTRUCTION
Division of Traffic Engineering – Operations Section

Mission:

Investigate and pursue opportunities to improve transportation safety on Connecticut's state-owned and maintained roadways for all road users.

Purpose:

To review specific locations on the state highway system for possible highway safety improvements. The study locations typically originate from internal databases, such Suggested List of Study Surveillance Sites (SLOSSS), or via appointed and elected officials, town officials, or the public. The SLOSSS, which is a network screening tool, is a requirement of FHWA's HSIP, under 23 USC 148 as amended by MAP-21 and the FAST Act.

Goal:

Achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

Organization Structure:

There are two Operations Sections within Traffic Engineering. One section handles District 1 and 2 and the other Districts 3 and 4. Current staffing within both sections consists of 2 - Transportation Principals Engineers; 4 - Transportation Supervising Engineers and 16 - Transportation Engineers (1, 2, or trainees). There are numerous vacant positions.

HSIP Requirements:

Spot Safety Improvement Program (State Roads)

The spot safety improvement program addresses specific traffic safety concerns on state owned and maintained roads. Locations that exhibit higher than expected crash rates are identified on a network screening tool called the SLOSSS which is produced annually by the Bureau of Policy and Planning. Investigations are conducted from the SLOSSS and reports are prepared documenting conditions and any recommended countermeasure. Depending on the cost and scope of the countermeasure, the CTDOT's Office of Maintenance may be requested to make low-cost improvements such as traffic signal timing changes, installation of signs and pavement markings. In those situations where the scope of work is beyond the resources of maintenance, the Operations' Section recommends a project for inclusion in the CTDOT's capital improvement plan.

Gaps, Threats, and Opportunities for Improvement:

- Existing network screening analysis methods for the state system and the methodology for evaluation of safety projects are not at the level recommended in the Highway Safety Manual.

- Inconsistent use of the FHWA’s CMF Clearinghouse for countermeasure selection by designers. The creation of Connecticut-specific and roadway type-specific CMFs will further improve the State’s countermeasure selection process.
- Although CTDOT has developed and continuously updates its network screening tool (SLOSSS), there is no FHWA requirement that it be used. Due to other functions within the Operations Section, such as OSTA reviews, traffic signal designs and non-safety related investigations, not many SLOSSS investigations are conducted annually due to staffing constraints.

BUREAU OF ENGINEERING AND CONSTRUCTION
Division of Traffic Engineering – Project Design

Mission:

Increase worker and public safety surrounding construction work zones through more intelligent design.

Purpose:

Manage the designs of various construction activities, including State, Federal, and Town projects, maintenance operations, and permit projects, with an emphasis on the effects of work zones on the worker and the traveling public. These operations vary from sign and traffic control signal replacements and installations, to bridge rehabilitations and replacements, to highway repaving projects. The Unit reviews Consultant designed projects, as well as provides designs for State designed projects.

Goal:

Provide a work zone that is as safe as possible for both the worker and the travelling public, while also limiting impacts to the motorist.

Organization Structure:

The Unit consists of twenty-four engineers. The structuring consists of one Transportation Principal Engineer, three Transportation Supervising Engineers, seven Transportation Engineer 3, six Transportation Engineer 2, four Transportation Engineer 1, and three Transportation Engineer Trainee. There are also two task-based consulting engineering firms that are available to provide engineering services and assist in the delivery of capital projects.

Implementation Methods:

In projects, work zone safety is implemented through a project’s specifications and special provisions, as well as the project plans and the FHWA *Manual on Uniform Traffic Control Devices*.

The project specifications, which consist of the *State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges, and Incidental Construction Form 816* (Form 816) and the amending supplemental specifications (bi-annually) and special provisions (project basis), provide required direction to the Contractor. The specifications contractually limit the Contractor to specific methods for setting up and taking down work

zones, as well as rules for the actual designs of the work zones. Specifically, Section 1.08.04: Prosecution and Progress – Limitation of Operations and Section 9.71: Maintenance and Protection of Traffic provide these restrictions. The special provisions for these sections (Section 1.08.04 and Item No. 0971001A) provide any additional project specific restrictions. Section 1.08.04: Prosecution and Progress – Limitation of Operations provides the Contractor with time restrictions. The restrictions include various holiday periods where the Contractor is prohibited from working entirely, to hourly time of day restrictions. The intent is to limit work hours to those hours when traffic is lightest and when the public will be least affected. This lowers the risk of an incident between the travelling public and the Contractor, such as a vehicle crash.

Section 9.71: Maintenance and Protection of Traffic and the associated special provision (Item No. 0971001A) limit how the Contractor's work, which only occurs within the time restrictions set in Section 1.08.04, will affect the travelling public. Such limits include, but are not limited to:

- Detours
- Driveway access
- Lane closures
- Minimum lane and shoulder widths

The special provision for Item No. 0971001A also provides details depicting minimum requirements for lane closure patterns and temporary signs, as well as language detailing the use of State Police officers and various construction equipment, including, but not limited to, traffic drums and cones, portable changeable message signs, and truck mounted impact attenuators. This section of the Contract leads to work zones that are expected, orderly, and command respect from the travelling public. The temporary, short-term work zone needs to provide appropriate guidance and notification to safely alert the motorist of the temporary road conditions and direct traffic around the work area. This is especially the case with short-term, since workers are not positively protected.

Maintenance and protection of traffic (M&PT) project plans are added when long-term stage construction is proposed, which typically involves temporary precast concrete barrier curb (TPCBC). The M&PT plans provide visual direction to the Contractor and show how the work zone should be arranged. The plans show placement of TPCBC, lane shifts, temporary pavement markings and signs, as well as any other temporary modification to the existing roadway condition. The plans show work zones that should provide the highest level of safety while also minimizing impacts to the travelling public.

The above standards and limitations are developed by referencing the FHWA's MUTCD. The MUTCD is a manual that provides accepted minimum national standards, practices, and guidelines for roadway construction. The MUTCD is used as a basis for the establishment of State standards, which are developed to meet or exceed the standards set within the MUTCD. The MUTCD is revised and rewritten by the FHWA as needed and is in use in some capacity nationwide. Nationwide acceptance allows motorists to be familiar with work zones no matter where they are travelling, which increases safety by reducing confusion and the potential for an incident.

Gaps, Threats, and Opportunities for Improvement:

- Additional traffic volume data on State and locally owned roadways would increase the ability to provide accurate project specific limitations within Section 1.08.04.
- Additional and updated 85th percentile speed data would increase the ability to accurately locate and design project specific construction equipment, including, but not limited to, temporary sign placement, lane merge and shift taper lengths, and temporary traffic control signal design.
- Insufficient knowledge of the MUTCD and CTDOT design standards and practices leads to the development of inadequate work zones, such as short taper lengths and the inappropriate use of traffic drums and cones and temporary signs.
- Insufficient staffing levels can lead to overburdened engineers, which may lead to subpar reviews and designs. Inadequate staffing also leads to less frequent field visits and less time for supervisors to properly train new engineers in work zone design.
- Increasing project site visits during design allows engineers to gain an understanding of the existing conditions, which benefits work zone development.
- Increasing the frequency of work zone inspections during construction allows engineers to gain field experience and knowledge on effective and ineffective design practices, policies, standards, and guidelines.

BUREAU OF ENGINEERING AND CONSTRUCTION

Office of Construction

Mission:

Observe and identify systemic problems with the implementation of construction work zone procedures in the field and develop action plans for the CTDOT work zone safety improvements in design and construction phases.

Purpose:

Focuses on fulfilling the requirements of the 23 CFR 630, Subpart J – *Work Zone Safety and Mobility* by addressing and managing work zone safety and mobility impacts to the traveling public on Connecticut highway projects.

Goal:

The goal of the work zone field reviews is to identify emphasis areas of needed improvements and best practices for work zone safety. The goal of the work zone process reviews are intended to produce programmatic improvements to work zone processes and procedures with the objective of improving safety and mobility on current and future highway projects.

Federal Requirement:

Work Zone Safety Field Reviews

To manage work zone safety and mobility impacts, the Office of Construction randomly selects active construction projects to identify compliance issues, systemic problems, and best practices. The field reviews were performed in order to assess current field practices relative to applying work zone safety and mobility processes and procedures. The Office of Construction is accompanied by personnel from the Construction Districts, Division of Traffic Engineering, and

Federal Highway to bring a multi-discipline perspective in collaboratively conducting the work zone reviews.

Work Zone Safety and Mobility Process Review

To comply with 23 CFR Part 630.1008, paragraph (e), *State-level processes*, the CTDOT Work Zone Operations task group performs a biannual process review to adequately and programmatically identify, address, and manage work zone safety and mobility impacts on its highway construction projects. The review team is a multi-disciplined group of CTDOT and Federal Highway personnel who analyze the CTDOT's work zone program as a whole and keeps track of action items for improving the program.

Gaps, Threats and Opportunities for Improvement:

- No data for queue lengths, delays, and congestion within work zones
- Lack of performance metrics for crashes and delays within work zones
- Ensure field personnel are complying with the contract specifications and plans
- Develop systematic procedures to address inconsistent practice