FUSS & O'NEILL

Proposal For

Design Services for Safe Routes to Schools and Public Transit Facilities

Submitted to

City of Stamford, Connecticut

October 7, 2021

FUSS & O'NEILL

October 7, 2021

Frank Petise, PE
Acting Bureau Chief
Transportation, Traffic, and Parking
888 Washington Boulevard
Stamford, CT 06901

RE: RFP No. 846. Design Services for Safe Routes to Schools and Public Transit Facilities

Dear Mr. Petise:

Connectivity is at the heart of the Safe Routes to School project. Connecting schools to students provides a safe, alternate mode of transportation while encouraging outdoor activity, improving the overall health and well-being of students. This important project will help to transform the City's schools into safe, connected, and welcoming destinations.

Fuss & O'Neill has been a proud partner in transportation and traffic engineering projects throughout the City for nearly two decades. For the past several years, we have been providing these services on an on-call basis, creating traffic and transportation safety improvements throughout the City, including many sidewalk design projects within the limits of this project. We also provided the concept plans for sidewalk improvements in support of the TAP Safe Routes to School grant application for this project.

John Guzze, PE will serve as your Project Manager and works out of our Manchester office. He was the Project Manager for Long Ridge Road Sidewalk Design and the redesign of Boxer Square, a 2020 AASHTO America's Transportation award-winning project that provided pedestrian safety improvements to the intersection among other improvements. John has managed and designed a number of pedestrian and bicycle safety projects throughout the City, including Hope Street and Tom's Road improvements, Strawberry Hill Avenue extension and Glenbrook Road at Scofield Avenue improvements, all of which had pedestrian safety access to schools within the project limits.

Our project team is made up of specialists and experts with decades of experience and specialized insight in transportation safety projects. To complete our team, we have partnered with Pereira Engineering, LLC to provide land survey and right-of-way services. They are located at 1 Enterprise Drive, Suite 312, Shelton, CT 06484.

We are excited about partnering with the City of Stamford to fulfill your vision for safe and effective pedestrian access and connectivity to the City's schools. This proposal will remain in effect for ninety (90) days after acceptance of the proposal by the City. Mark Vertucci, Vice President, is authorized to commit the company to this contract. The City may contact Mark Vertucci or John Guzze regarding any questions and clarifications to this proposal. They can be reached at 860.646.2469 ext. 5381 and ext. 5207 respectively.

Sincerely,

John Guzze, PE
Project Manager

Mark Vertucci, PE, PTOE
Principal-in-Charge

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Maine
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Vermont

Table of Contents

Summary

Section 1: Summary

Fuss & O'Neill has been providing transportation and traffic engineering consulting services to the City of Stamford for decades. Our work in Stamford is important to our firm and we value our relationship with the City and the work that we've done together over the years. We would like to continue to provide the responsive and quality services you have come to rely upon from our firm for the Design Services for Safe Routes to Schools and Public Transit Facilities. We offer the following proposal in this regard. The following section provides a brief overview of the materials included in this submission.

Project Staff

As a multidiscipline engineering firm with more than 90 years of experience, and 250+ highly qualified professionals throughout New England, we can be responsive to your needs for this project. Our organizational chart, which is contained in Section 3, lists all of the talented individuals that make up our comprehensive team. But individual talents alone are not what will make this project ultimately successful. It is how those individual talents come together, how they work together, that will make all the difference. As part of our local support, we have partnered with Pereira Engineering, LLC to provide land survey and right-of-way services. Our internal team and our external teaming partners have all worked together many times. There are countless benefits to these established relationships, but here we would like to focus on one, the one we think is most important - collaboration. An established team does not worry about "stepping on toes" - it works efficiently and respectively, knowing that everyone shares the unified goal of producing the best product. We invite you to learn more about each of the individuals that makeup this team in Section 3.

Experience and Capabilities

Many of the designs we have been working on for the City have been within the limits of this project, and many within the schools zones or on CT Transit bus routes including: Dolan Middle School, CT Transit's bus route (line 336), Stamford High School, and Julia A. Stark Elementary School.

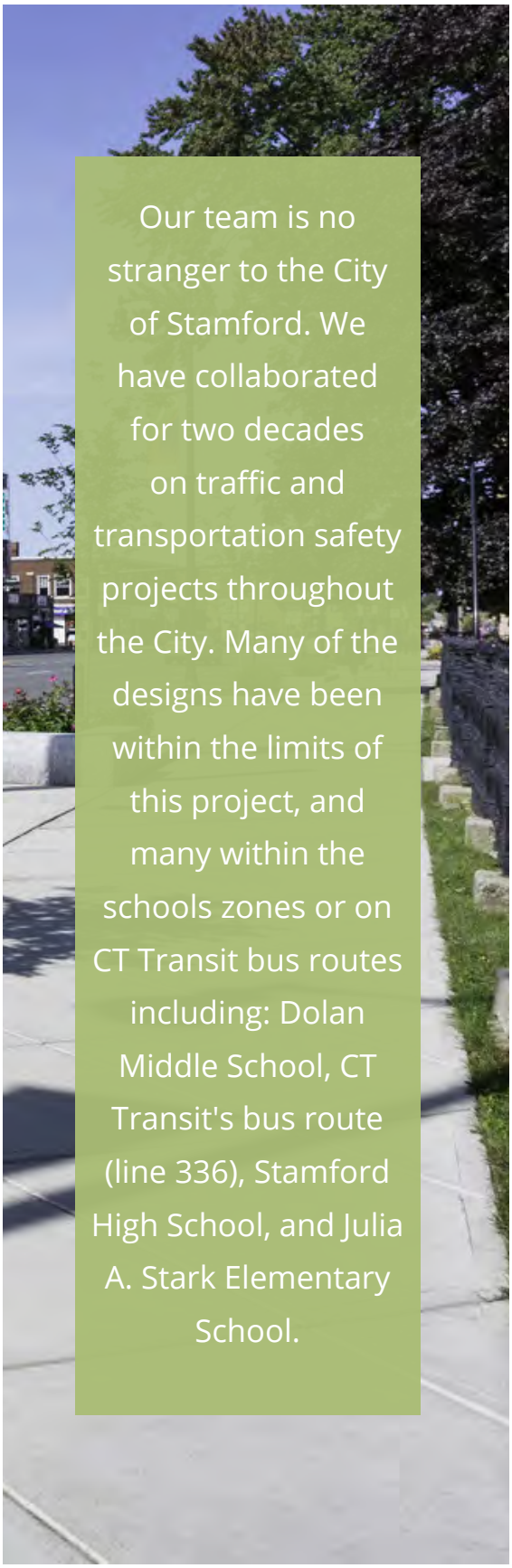
For this project, the safety of non-vehicular users is at the core. Our traffic engineers are well versed in evaluating traffic operations to ensure that safety and efficiency are balanced. As a display of our experience and commitment to safety, for many years we have served as CTDOT's Task-based Traffic and Safety On-call Consultant providing traffic and pedestrian operations reviews, signal analysis, interpreting crash data, and providing safety evaluations.

More detailed information regarding our experience and qualifications is highlighted in Section 4.

Project Understanding

The City of Stamford is seeking a consultant to provide design services for sidewalk and access improvements within proximity of several public schools and transit facilities in the City. Our team understands the purpose of this project is to improve pedestrian safety, as well as traffic operation and flow. A successful project starts with understanding the City's vision of being a place where people of all ages and abilities can safely and conveniently walk and bicycle to all destinations. Addressing the physical elements while creating an inviting, safe and efficient design for all users will be our focus.

Based on our knowledge of the City and research of the City's information, including the Stamford Bicycle and Pedestrian Plan (2019) and the Neighborhood Traffic Calming Master Plan (2011), we understand there are numerous schools that can be made better accessible by pedestrians, including young children, within one mile of the school, if safe and comfortable facilities existed. There have been a number of locations identified where there are gaps in the City-wide sidewalk system, as well as traffic calming improvements that can help slow speeding vehicles, reduce cut-through traffic, and better manage traffic on non-residential streets. Walking is an essential means of transportation for students in Stamford that



Our team is no stranger to the City of Stamford. We have collaborated for two decades on traffic and transportation safety projects throughout the City. Many of the designs have been within the limits of this project, and many within the schools zones or on CT Transit bus routes including: Dolan Middle School, CT Transit's bus route (line 336), Stamford High School, and Julia A. Stark Elementary School.

reside within the one mile range, therefore it is imperative that students have safe and comfortable access while walking to school. We understand that the two studies have received significant support from the surrounding community through an extensive series of public/stakeholder outreach, design charrettes, and neighborhood meetings. Section 6 of this proposal outlines in greater detail our understanding of the project as well as outlines potential challenges that the City may face when implementing these improvements. Through our on-going projects and close relationships within the City, we know this project is important to you.

Last, but certainly not least, we believe that frequent and clear communication with our clients is vitally important to the success of any project. Not only does it ensure that everyone is on the same page and apprised of the latest developments, but it also ensures that any unforeseen obstacles are dealt with promptly in order to prevent any undue delays or cost overages. We understand that the success of any project is measured in terms of meeting budget constraints and schedule deadlines, as well as providing effective, long-term solutions, and we remain committed to that goal.

Project Approach

This project is about safety. Safety will influence all our design decisions. Sidewalk design will consider all users; traffic calming measures will be thoughtfully designed so they control speeds and fit in aesthetically; urban design challenges will consider their impact on the traveling public; and streetscape improvements will integrate pedestrian safety and may address site safety needs. Our traffic and transportation engineers have already begun to think about how all these concerns will factor into the final design. Section 6 provides a comprehensive outline of our approach to this project.

Project Management Plan

SECTION 2

Section 2: Project Management Plan

Coordination with City Staff

Point-of-Service

Our direct local and state experience gives us in-depth knowledge of Connecticut conditions, regulations, and regulators. This level of combined knowledge and ability has earned us respect from regulators. To maximize this advantage, this project will be conducted and led from our Manchester office. This local presence will allow us to respond to issues quickly and make our managers and staff more accessible to you, especially to respond to immediate needs.

Our service to you begins with the project manager assigned to this project. Our Project Manager will be your primary point-of-contact. This provides the City with a single point-of-contact to coordinate the project and reach to resolve issues as they arise.

Client Communications

Client communications range from keeping our clients up-to-date on the status of the ongoing project, to actively engaging key client staff in critical project decisions. These communications are critical to ensuring that we ultimately meet your overall needs, and will include emails, telephone conversations, and meetings. These will include planned activities and responding to urgent issues as they arise.

Work Plan

Developing a work plan is a key initial task. Work tasks by scope, duration, effort, cost, and level of assigned staff will be developed and the project team will be identified. This will:

- define deliverables and due dates
- estimate the effort involved to complete tasks to meet deliverable due dates
- coordinate the project schedule with the calendar

If changes occur, we can identify them quickly and early enough in the process to allow for course corrections. If the goals of the project change, we will work with you to redefine the scope and deliverables to achieve the new goals and to establish revised budgets and schedules.

Developing a Work Plan

A small amount of time invested in a well thought-out work plan results in a better product delivered to our clients, including its quality, budget, and schedule.

Under our project management policy, developing a work plan is a key initial task. Work tasks defined by duration, effort, cost, and level of assigned staff will be developed.

The plan will determine deliverables and due dates, estimate the effort involved to complete tasks to meet deliverable due dates, and coordinate the project schedule with the calendar.

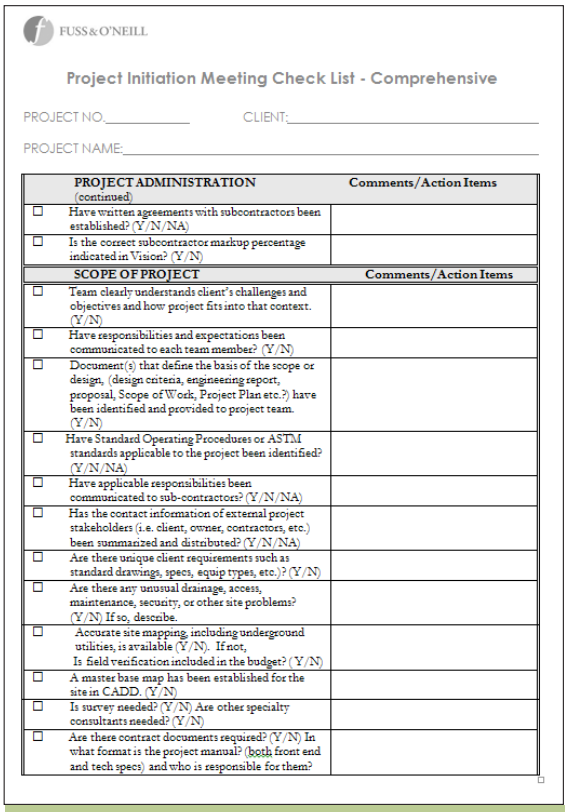
Essentially, this plan coordinates our staffs' effort and places them on a single path to achieve your objectives.

Quality Control

It is Fuss & O'Neill's policy to develop and monitor a formal QA/QC program for each project/assignment. The goal of the QA/QC program is to produce projects that maximize client satisfaction and minimize costs, by building into each project consistency, completeness, constructability, clarity, and cost-effectiveness. In addition to common QA/QC steps such as reviews by project leaders, key elements of our QA/QC programs include third-party reviews and the use of checklists.

We use in-house technical experts to review designs and reports, while they are in draft form and prior to being forwarded to our clients. This allows a fresh set of experienced eyes to review a project closely and see potential issues not seen by the project team. Depending on the size of the project, this third-party can participate in reviews at various critical steps of the project. Task leaders are responsible for developing QA/QC plans as part of their work plans.

These quality control measures are applicable to any work produced by subconsultants as well. They are held to the same internal review as any of our in-house staff.



FUSS & O'NEILL

Project Initiation Meeting Check List - Comprehensive

PROJECT NO._____ CLIENT:_____

PROJECT NAME:_____

	PROJECT ADMINISTRATION (continued)	Comments/Action Items
☐	Have written agreements with subcontractors been established? (Y/N/NA)	
☐	Is the correct subcontractor markup percentage indicated in Vision? (Y/N)	
	SCOPE OF PROJECT	**Comments/Action Items**
☐	Team clearly understands client's challenges and objectives and how project fits into that context. (Y/N)	
☐	Have responsibilities and expectations been communicated to each team member? (Y/N)	
☐	Document(s) that define the basis of the scope or design, (design criteria, engineering report, proposal, Scope of Work, Project Plan etc.?) have been identified and provided to project team. (Y/N)	
☐	Have Standard Operating Procedures or ASTM standards applicable to the project been identified? (Y/N/NA)	
☐	Have applicable responsibilities been communicated to sub-contractors? (Y/N/NA)	
☐	Has the contact information of external project stakeholders (i.e. client, owner, contractors, etc.) been summarized and distributed? (Y/N/NA)	
☐	Are there unique client requirements such as standard drawings, specs, equip types, etc.)? (Y/N)	
☐	Are there any unusual drainage, access, maintenance, security, or other site problems? (Y/N) If so, describe.	
☐	Accurate site mapping, including underground utilities, is available (Y/N). If not, Is field verification included in the budget? (Y/N)	
☐	A master base map has been established for the site in CADD. (Y/N)	
☐	Is survey needed? (Y/N) Are other specialty consultants needed? (Y/N)	
☐	Are there contract documents required? (Y/N) In what format is the project manual? (both front end and tech specs) and who is responsible for them?	

Project Initiation Check List

Subconsultant Performance

Fuss & O'Neill partners with respected subconsultants who serve as an integral part of our team. As a result, we hold our subconsultants to the same Project Management Plan and QA/QC standards that we hold for our own internal team as outlined above.

Corporate Resources and Staffing Availability

Fuss & O'Neill is not your typical engineering firm. We focus on open communication, responsiveness, listening to your needs, high quality deliverables and feasible solutions that are on schedule and budget. We are a proactive firm that strives for perfection on project performance and client satisfaction. It is for these reasons that Fuss & O'Neill has been in business in for nearly a century, with 80% of our work coming from repeat business. We intend to bring our energy, passion, and core values to the City of Stamford. Fuss & O'Neill is a large, multidisciplinary consulting firm. With more than 300 employees, we work on more than 1,000 projects a year. Utilizing scheduling software and strong project management, we ensure that our projects are appropriately staffed and can provide backup personnel from our deep bench of professionals throughout New England. Each team member and teaming partner proposed in Section 3 has allocated appropriate time to work on this project; from start to finish, ensuring timely milestones deliverables and "on-time" construction.

Project Staff

SECTION 3

Section 3: Project Staff

We have assembled a team of highly qualified engineers from our Manchester, CT office. Together have extensive experience designing transportation safety projects. Our team of seasoned professionals have worked together on numerous projects and is adept at coordinating tasks seamlessly into the framework of the overall project and achieving or exceeding project goals. The narrative below summarizes the qualifications our proposed leadership team. An Organizational Chart and Resumes for the full team follow.

John Guzze, PE

Project Manager

John is an experienced transportation engineer who understands how to incorporate safety design for pedestrian and bicycles. John is no stranger to the City of Stamford. He was integral to the design of Boxer Square and has worked on numerous bicycle and pedestrian safety projects throughout the City. As Project Manager, John will be your primary point of contact. **John works in our Manchester office, he will be accessible to you on a daily basis and can respond quickly to any urgent issues.**

Mark Vertucci, PE, PTOE

Principal-in-Charge

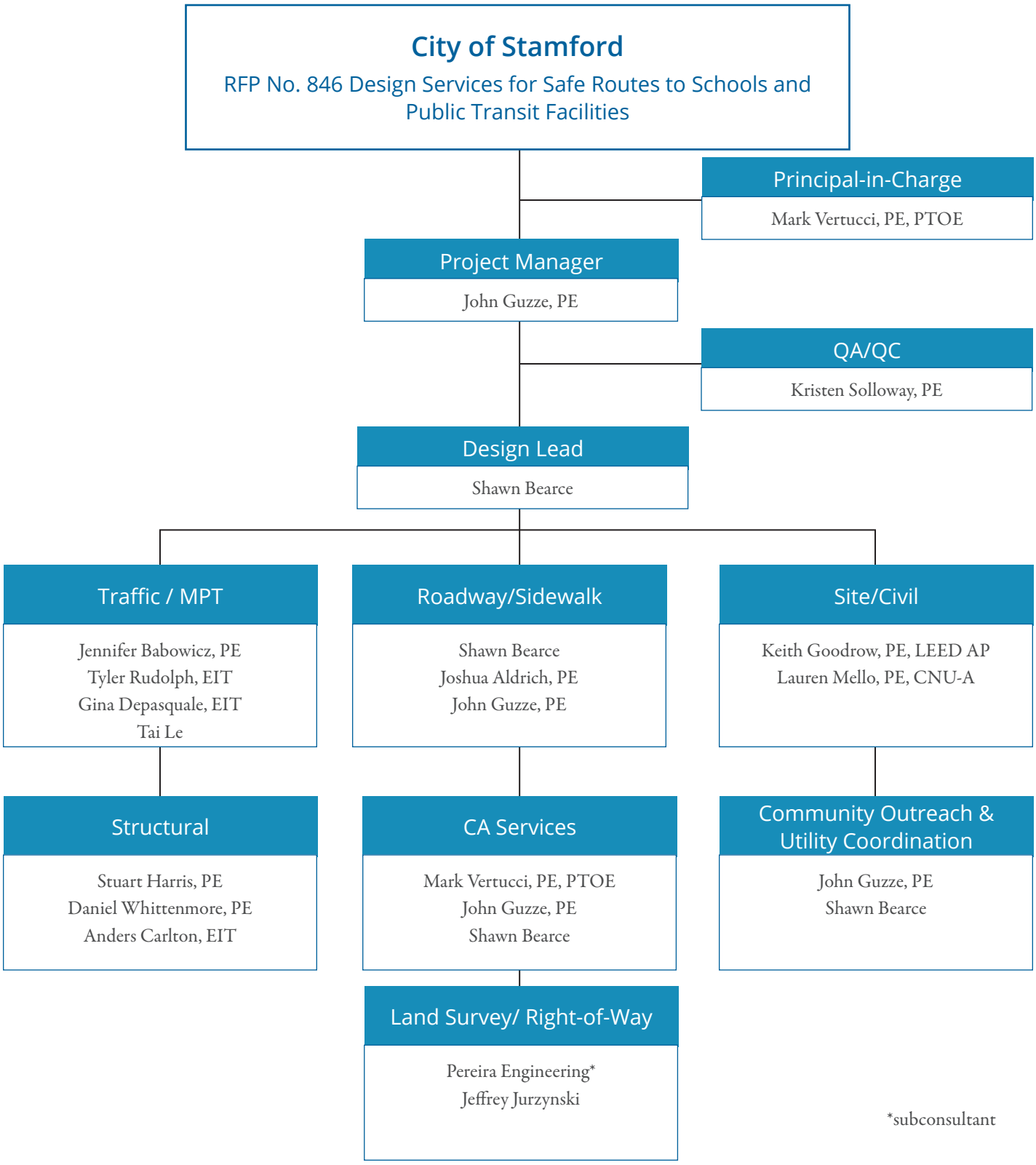
Mark is a Vice President in our Transportation Business Line and has led some of our firm's largest transportation projects. His commitment to integrity defines the shortest path to success and sets the stage for getting the project done. Mark is invested in the development of a safety-centric City of Stamford that serves the needs of its residents. Furthermore, Mark has been involved in a number of bicycle and pedestrian safety projects throughout the City including Hope Street, Stillwater Avenue, and Strawberry Hill/Newfield Streets.

Kristen Solloway, PE

QA/QC

Kristen is a Vice President and Department Manager of our Transportation Business Line. Throughout her career, she has completed a wide range of projects in various technical disciplines. Kristen is currently the Senior Reviewer for the Connecticut roadway and land development projects. She is responsible for ensuring that Fuss & O'Neill's quality control policies are met and promoting high quality work products that meet client's expectations.

Organizational Chart



*subconsultant

Mark Vertucci, PE, PTOE

Principal-in-Charge

"As a child, I drew chalk roads on my driveway and installed paper road signs around my house. I coerced my mother to take me on long day trips just to drive along roads I had never been on before. Transportation has always been a passion of mine. To me, it is not all about the destination. Getting there is half the fun."

mvertucci@fando.com 800.286.2469 x5381

EDUCATION
BS, Civil Engineering - 1998
Rensselaer Polytechnic Institute

LICENSES & REGISTRATIONS
Professional Engineer CT, RI, NY, MA
Professional Traffic Operations Engineer

PROFESSIONAL AFFILIATIONS
Inst Transportation Engineers

EXPERIENCE
24 Years with Fuss & O'Neill
25 Years Professional Experience

Mark is a Vice President in our Transportation Business Line. He has many years of experience in traffic engineering, transportation planning, site development, and roadway improvement projects. Throughout his career, he has prepared numerous traffic impact studies, planning studies, corridor studies, parking studies, and traffic management plans.

Mark has extensive experience with traffic signal design projects, roadway design projects, and intelligent transportation systems. Mark is certified by the Institute of Transportation Engineers (ITE) as a Professional Traffic Operations Engineer (PTOE), and the current President of the Connecticut Chapter of ITE.

Mark works full-time in the Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

City-wide Bicycle and Pedestrian Safety and Connectivity Improvements, Stamford, CT: Senior Transportation Engineer for bicycle and pedestrian safety projects through the City that have included proven measures to reduce crashes and improve safety, such as high visibility retroreflective thermoplastic crosswalks, curb extensions at corners, "turning vehicles yield to pedestrians" signs, "no turn on red signs" and other signage, implementation of bike lanes, road diets, pavement marking and parking improvements. Some of these projects have included the implementation of leading pedestrian intervals (LPI) at traffic signals and Rectangular Rapid Flashing Beacons (RRFB's). These "quick hit" projects have been done in conjunction with programmed capital improvement projects on City roadways.

Greenwich Avenue Corridor Improvements, Stamford, CT: Project Director for conceptual plan alternatives to

improve traffic safety and flow, pedestrian circulation, and the streetscape throughout the corridor limits. This project included review of operations, safety, and capacity at 13 intersections and assessment of existing conditions parking demand and turnover on the study corridors. Traffic capacity analysis and a simulation model were developed for the study area. Three conceptual alignment alternatives, intersection improvement options, and cost estimates were prepared. This project included a public involvement process, including workshops with stakeholders to achieve input during the concept planning stage. Following selection of the preferred alternative, this project culminated with the design and permitting of a new roundabout at the Greenwich Avenue/Pulaski Street/O&G Industries Drive intersection.

Atlantic Street Complete Streets Improvements, Stamford, CT: Principal-in-Charge for the preliminary design of the widening and Complete Streets Improvements along Atlantic Street for approximately 1,600 feet between Washington Boulevard and the Urban Transitway. This urban roadway design includes a comprehensive field survey, property acquisitions, geotechnical program, streetscape enhancements, new traffic signals, and extensive public involvement process.

Boxer Square, CCGP Program, Stamford, CT: John served as Project Manager and Lead Designer for this intersection improvement and community enhancement project. John worked with engineering and landscape architect professionals to create a realigned intersection that incorporated a plaza area adjacent to the roadway centered around an important community monument. Design considerations included bicycle lanes, grading constraints, streetscape and landscape elements, pedestrian lighting, drainage relocations, and traffic analyses. This project was funded through CTDOT's Community Connectivity Grant Program (CCGP).

Long Ridge Road Sidewalks and Pedestrian Improvements, Stamford, CT: Principal-in-Charge for the design for sidewalks and pedestrian improvements on Long Ridge Road from Cold Spring Road to Stamford Health Medical Group complex to provide a safe connection from Bull's Head intersection to the complex. This complex is a major traffic generator and located on CT Transit's bus route (line 336), but lacked pedestrian access. The project installed ADA compliant sidewalks and ramps, traffic signal modifications, new or relocated crosswalks, and mid-block pedestrian HAWK signals.

Campus-wide Pedestrian Safety Study, Connecticut College, New London, CT: Senior Transportation Engineer for coordination efforts with the College and the CTDOT to provide recommendations for the improvement of pedestrian safety on campus. Recommendations were based on a survey of students, faculty, and staff as well as on site observations. He continued to assist the College with grant applications and interfacing with CTDOT to help ensure the construction of recommendations.

Citywide Traffic Management Plan, Norwalk, CT: Senior Transportation Engineer for the development of a Citywide Traffic Management Plan that will serve as a blueprint for meeting the City's long-term transportation goals. The Plan included new traffic impact study guidelines, access management guidelines, a traffic calming toolbox, a Travel Demand Management (TDM) toolbox, and new standards and details for roadway design and construction. Extensive public outreach was conducted to include businesses and residents in the decision-making process.

John Guzze, PE

Project Manager | Roadway/Sidewalk | CA Services | Community Outreach/Utility Coordination

"Projects we have completed demonstrate what we know; future projects decide what we will learn. Soaking in all the knowledge from coworkers who can make any project become a reality is something I look forward to each week."

jguzze@fando.com 800.286.2469 x5207

EDUCATION
BS, Civil Engineering - 2012
UMass at Amherst

MS, Transportation Engineering - 2013 UMass at Amherst

LICENSES & REGISTRATIONS
Professional Engineer CT

PROFESSIONAL AFFILIATIONS
Inst Transportation Engineers
CT Institute of Trans Eng

EXPERIENCE
7 Years with Fuss & O'Neill
7 Years Professional Experience

John is a Senior Transportation Engineer in Fuss & O'Neill's Transportation Department in Manchester, Connecticut. John has been leading roadway, streetscape, and safety improvements projects throughout Connecticut for several years. Drawing on his practical background designing parking solutions, bikeway facilities, intersection improvements, and streetscape enhancements, John leads and creates practical and constructable solutions for Connecticut municipalities. John works closely with his clients, listening to their concerns and making sure he understands their needs – both current and future needs. He then leads teams to design context-sensitive improvements that create safer passageways for all roadway users.

John works full-time in the Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

City-wide Bicycle and Pedestrian Safety and Connectivity Improvements, Stamford, CT: Senior Transportation Engineer for bicycle and pedestrian safety projects through the City that have included proven measures to reduce crashes and improve safety, such as high visibility retroreflective thermoplastic crosswalks, curb extensions at corners, "turning vehicles yield to pedestrians" signs, "no turn on red signs" and other signage, implementation of bike lanes, road diets, pavement marking and parking improvements. Some of these projects have included the implementation of leading pedestrian intervals (LPI) at traffic signals and Rectangular Rapid Flashing Beacons (RRFB's). These "quick hit" projects have been done in conjunction with programmed capital improvement projects on City roadways.

Long Ridge Road Sidewalks and Pedestrian Improvements, Stamford, CT: Project Manager for the

design for sidewalks and pedestrian improvements on Long Ridge Road from Cold Spring Road to Stamford Health Medical Group complex to provide a safe connection from Bull's Head intersection to the complex. This complex is a major traffic generator and located on CT Transit's bus route (line 336), but lacked pedestrian access. The project installed ADA compliant sidewalks and ramps, traffic signal modifications, new or relocated crosswalks, and mid-block pedestrian HAWK signals.

Boxer Square, CCGP Program, Stamford, CT: John served as Project Manager and Lead Designer for this intersection improvement and community enhancement project. John worked with engineering and landscape architect professionals to create a realigned intersection that incorporated a plaza area adjacent to the roadway centered around an important community monument. Design considerations included bicycle lanes, grading constraints, streetscape and landscape elements, pedestrian lighting, drainage relocations, and traffic analyses. This project was funded through CTDOT's Community Connectivity Grant Program (CCGP).

Greenwich Avenue Roundabout Design, LOTCIP Program, Stamford, CT: As Lead Engineer, John advanced the preliminary design alternative of a roundabout through remaining design submissions as part of CTDOT's LOTCIP. Planned improvements included the design of new sidewalks and RRFB actuated crosswalks, replacement of the stop-controlled intersection with a roundabout and revisions to the approaching roadway alignments. The roundabout design considerations consisted of geometric constraints, grading, drainage, lighting, coordination with overhead and underground utilities, property impacts, and enhanced erosion and sedimentation control elements due to CTDEEP coastal permits.

Atlantic at Henry Street Intersection Design, Stamford, CT: John served as Project Engineer for the realignment of the east leg of Henry Street. This project included concept design plans, public presentation plans, and construction documents (which consisted of Local Roads Projects review and submission process through CTDOT. John progressed construction document plans and the contract project manual from Semi-Final to Final Design. Design tasks included updating existing drainage lines and structures, relocating utility poles, replacing the existing signal mast arms and equipment, incorporating on-street parking spaces, and improving the pavement structure. All construction improvements were coordinated with the utility companies. Test pits were conducted to identify potential utility conflicts, and the design mitigated major utility underground relocations.

Jefferson Avenue Improvements, LOTCIP Program, New London, CT: As Project Manager, John is leading intersection improvements and roadway restoration on Jefferson Avenue and Chester Street. The project seeks to increase both vehicular and pedestrian safety, redefine and redistribute the wide travel lanes, incorporate bicycles facilities, reconstruct a signalized intersection into a mini-roundabout, revitalize the outlived roadway pavement sections, and improve vehicular flow. John is managing: topographic survey, a geotechnical boring program, establishing public outreach and utility field meetings, generating an updated traffic analysis narrative, and leading corridor and roundabout design efforts. Other project tasks include coordinating with CTDOT, SCCOG, and the City to ensure all permits and environmental policies are satisfied and in compliance.

Kristen Solloway, PE

QA/QC

"Like a road, this job has its twists and turns. But if it wasn't challenging, it wouldn't be fun!"

ksolloway@fando.com 800.286.2469 x5344

EDUCATION
BS, Civil Engineering - 1996
Clarkson University

LICENSES & REGISTRATIONS
Professional Engineer CT

PROFESSIONAL AFFILIATIONS
CT Women's Council
Inst Transportation Engineers
CT Institute of Trans Eng

EXPERIENCE
24 Years with Fuss & O'Neill
26 Years Professional Experience

Kristen is a Vice President and Department Manager of our Transportation Business Line. Throughout her career, she has completed a wide range of projects in various technical disciplines. These projects include roadway design, traffic signal design, traffic impact studies, rights of way coordination, intelligent transportation systems, utility infrastructure, regulatory permitting, and construction administration and inspection. Kristen is currently the Senior Reviewer for the Connecticut roadway and land development projects. She is responsible for ensuring that Fuss & O'Neill's quality control policies are met and promoting high quality work products that meet client's expectations.

Kristen works full-time in the Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

Greenwich Avenue Corridor Improvements and Roundabout Design, Stamford, CT: Project Manager for conceptual plan alternatives to improve traffic safety and flow, pedestrian circulation, and the streetscape throughout the corridor limits. This project included review of operations, safety, and capacity at 13 intersections and assessment of existing conditions parking demand and turnover on the study corridors. Traffic capacity analysis and a simulation model were developed for the study area. Three conceptual alignment alternatives, intersection improvement options, and cost estimates were prepared. This project included a public involvement process, including workshops with stakeholders to achieve input during the concept planning stage. Following selection of the preferred alternative, this project culminated with the design and permitting of a new roundabout at the Greenwich Avenue/Pulaski Street/O&G Industries Drive intersection.

Stamford Urban Transitway, Stamford, CT: Senior Engineer for reconstruction and widening of five city streets and a

creation of a new roadway. The purpose of this project was to create an important east-west connection from the city's transportation hub to the interstate highway system. Key design features included widening of existing roadways in an urban environment, a new storm drainage system, 5 new traffic signals and the inclusion of a bus/HOV dedicated lane and associated transit appurtenances. In addition to design, Kristen assisted with the coordination of over 70 property acquisitions. Kristen also assisted in project coordination with the City of Stamford, CT Transit and the Federal Transit Administration as well as the major utility relocation of all overhead and underground utilities.

Discovery Drive (State Project 77-215), University of Connecticut, Mansfield, CT: Principal-in-Charge and Resident Engineer for the design and construction of 3,500 feet of new roadway on the University's Storrs Campus. This project provides a new entrance to the University and its new Technology Park, as well as a more direct route to Gample Pavilion. Key design elements include roadway, structural, drainage, utility, traffic engineering, and landscape architecture, as well as environmental studies, analysis, and CTDEEP and Army Corps of Engineers permitting. As this work was completed on a college campus, multimodal safety was a component and the project included dedicated bike lanes. Sustainable design measures were incorporated, including creative drainage measures and protective fencing to maintain existing hydrology, and wildlife crossing corridors. This project included master planning and landscape architectural services, focusing on creating an artful expression of each of the unique environments throughout the corridor. Paying homage to the site's agricultural heritage and forested wetlands, native fieldstone wall demarcate significant nodes with complementary roadside vegetation creating distinguishable experiences throughout the corridor. Kristen served as the resident engineer and managed construction inspection team to ensure that this federally-funded project met the construction inspection requirements of the CTDOT.

Hartford Riverwalk, Hartford, CT: Project Manager for the Hartford-Windsor Riverwalk North Extension project (State Project No. 63-721). Fuss & O'Neill has provided design, permitting and construction documents for multiple phases of the waterfront park and multi-use path system on Connecticut River. Including Bulkeley Bridge Walkabout, Riverwalk North, Riverwalk Downtown, Riverwalk South/ Gateway, and renovation of Charter Oak Landing and Riverside Park including boat ramp. Total project area approximately 14 acres with a 1.5 mile trail system. Challenges such as environmental contamination, State and Federal regulatory issues (EPA, DEEP, ACOE), property ownership issues, and limited development and maintenance costs have been met successfully.

Windsor Locks Downtown Complete Streets Improvements, Town of Windsor Locks, CT: Principal-in-Charge for the LOTCIP program. Kristen led the design team to utilize existing roadway cross section to redistribute the wide travel lanes into a Complete Street. The Complete Street design connected the station to regional bike systems, incorporated on-street parking and wide multi-use sidewalks as well as public gathering spaces throughout the streetscape improvements. Coordination amongst the town and state authorities was vital to accomplish the goals for the project.

Shawn K. Bearce

Roadway Engineering, Bridge Engineering, and Permitting

"Getting people home safely is what I do."

sbearce@fando.com 800.286.2469 x5699

EDUCATION
BS, Civil Engineering - 1998
University of Hartford

PROFESSIONAL AFFILIATIONS
Connecticut Society of Civil Engineers
ATSSA Certified Traffic Control Supervisor

EXPERIENCE
<1 Year with Fuss & O'Neill
24 Years Professional Experience

Shawn recently joined Fuss & O'Neill's Manchester, Connecticut Transportation Department. Bringing more than 20 years of experience to his role, Shawn excels at preparing project plans, specifications, schedules and cost estimates for new construction and major reconstruction/rehabilitation for both urban and rural interstate/local roadways, as well as commercial/residential land development projects. He is proficient in roadway geometrics and design of stormwater drainage systems, pavement, maintenance and protection of traffic, and temporary construction staging. Shawn has strong project documentation skills focused on adherence to contract requirements including design standards and construction materials testing.

Shawn works full-time in the Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

All projects shown here were completed prior to joining Fuss & O'Neill:

Pawcatuck Sidewalk Improvements, Stonington, CT: Senior Transportation Engineer for sidewalk enhancements along South Broad Street (U.S. Route 1) between Spellman Avenue and Mayflower Avenue in the Pawcatuck neighborhood of Stonington. The purpose of this project was to identify and address gaps within the existing sidewalk system, as well as accessibility issues. As part of the project, a mobility analysis and traffic study was performed to identify and investigate potential improvements for pedestrians and cyclists, as well as the feasibility of removing a left-turn lane to facilitate construction of the improvements. Project responsibilities include providing senior technical oversight and quality control and assurance.

State Project No. 118-112, Silas Deane Highway Pedestrian Improvements Phase III, Rocky Hill, CT: Served as Senior Transportation Engineer for this streetscape en-

hancement project along the Silas Deane Highway (Route 99). Scope of work included replacement of approximately 6,000 linear feet of sidewalk, installation of new pedestrian level lighting, street trees, shrubs, and plantings, and the addition of pedestrian amenities including bus shelters and benches. Project responsibilities included design lead and oversight of preparation of contract documents (plans, specifications, and cost estimate), and utility coordination. Construction completed in July 2021 with an estimated construction cost of $2.6 million dollars.

State Project No. 118-112, Silas Deane Highway Pedestrian Improvements Phase III, Rocky Hill, CT: Senior Transportation Engineer for a streetscape enhancement project along the Silas Deane Highway (Route 99), which included replacement of approximately 6,000 linear feet of sidewalk, installation of new pedestrian level lighting, street trees, shrubs, and plantings, and the addition of pedestrian amenities including bus shelters and benches. Project responsibilities included design lead and oversight of preparation of contract documents (plans, specifications, and cost estimate), and utility coordination.

Harbor Brook Channel Improvements and Trail Design, Meriden, CT: Served as Senior Transportation Engineer for the design and development of construction documents and specifications for flood channel improvements along a portion of Harbor Brook. These improvements included lowering and widening the Harbor Brook channel for approximately 6400 linear feet, installing scour countermeasures, restorative native landscaping, constructing passive recreational spaces, and 4,900 linear feet of multi-use trail. The project also included trail signage, traffic signal design, subsurface investigations, parking lot designs, and Environmental Assessments of the contaminated soil, groundwater, surface water and channel bed sediment. The restoration of this floodway is occurring in phases, this is the second phase and includes work between Bradley/ Coe Avenue Bridge to the Cooper Street Bridge. Project responsibilities of this multi-discipline project included design lead; Coordination with OSTA and District DOT regarding an encroachment permit for traffic signal improvements that are part of the project; Managing the development of multiple property maps required for the project; Maintaining the project schedule and budget; supporting scope development and fee proposals for additional services.

State Project No. 108-189, Moosup Valley Multi-Use Trail, Sterling and Plainfield, CT: Served as Senior Transportation Engineer for the trail design of a 6-mile segment of multi-use trail within the towns of Sterling and Plainfield. Working for the Connecticut Department of Transportation, the project will be constructed on land owned and managed by DEEP and is a key link in connecting the off-road portions of Connecticut's segment of the East Coast Greenway to the state of Rhode Island. Responsibilities included trail design, and preparation of plans, specs, and estimate conforming to CTDOT requirements.

State Project No. L138-0001, Stratford Avenue/Honeyspot Road Intersection and Streetscape Improvements, Stratford, CT: Senior Transportation Engineer for the design of a roundabout, intersection, and traffic signal improvements, as well as streetscape improvements along Honeyspot Road and Stratford Avenue (Route 130) in Stratford. A Complete Streets approach was implemented to address the needs of multiple users including motor vehicles, cyclists, and pedestrians. The proposed design provides safe and efficient traffic flow by replacing the intersection of Stratford Avenue (Route 130), South Avenue, and Honeyspot Road with a roundabout.

Jennifer Babowicz, PE

Traffic / MPT

"When I was young I loved to build things and figure out how things worked. It wasn't until I was preparing for college that I realized that was engineering. Now I hear my daughter and her friends talk about being engineers, and I'm excited that our industry is reaching kids at a young age...and inspiring them to the possibility that they can change the world!"

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EDUCATION
BS, Civil Engineering - 1994
University of Hartford

LICENSES & REGISTRATIONS
Professional Engineer CT

PROFESSIONAL AFFILIATIONS
Inst Transportation Engineers
CT Institute of Trans Eng

EXPERIENCE
7 Years with Fuss & O'Neill
27 Years Professional Experience

Jennifer joined Fuss & O'Neill after working 19 years at the Connecticut Department of Transportation (CTDOT), where she specialized in traffic engineering projects and studies. Much of her experience involved conducting reviews and preparing reports for the Office of the State Traffic Administration (OSTA).

As part of Fuss & O'Neill's Transportation Business Line, Jennifer's project experience includes traffic signal design, traffic impact studies, Maintenance & Protection of Traffic plans, traffic signal system design, transportation planning and analysis, and complete streets design. Jennifer has considerable knowledge in the processes and procedures of the CTDOT, including production of digital contract plans, specifications, and supplemental contract documents.

Jennifer works part-time in our Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

Signal Design, Selleck Street at Greenwich Avenue, Stamford, CT: Project Engineer for a signal redesign as a result of an additional turn lane being added to help accommodate a new residential development in Stamford's south end. Initial efforts included traffic impact analysis at the intersection and recommendation of a new turn lane, followed by the design of a new signal and completion of signal plan updates.

Traffic Signal Design for Downtown Streetscape Improvements City of New Britain, CT: Senior Engineer responsible for the design of two traffic signals replaced as a part of the City's roadway diet design on the Main Street overpass. The traffic signals are located on either side of the overpass, which was given a new aesthetic treatment making it an iconic structure and more pedestrian friendly. The roadway diet included wider sidewalks, attention to

streetscape features, and bicycle lanes. The traffic signal designs focused on replacement of existing mast arms and providing pedestrian ramps, crosswalks, push buttons, and pedestrian signals to meet current ADA standards.

Traffic Control Signal Replacement, CTDOT, District 3, CT: Senior Transportation Engineer for State Project No. 173-486/487. Under Fuss & O'Neill's Task-Based Traffic and Safety Engineering Services contract, 12 traffic signals were selected for equipment replacement. The project included the upgrade of the existing infrastructure to the latest standards (e.g., span poles/mast arms, signal heads, signage, and vehicle detection). Pedestrian control features were also upgraded to include accessible pedestrian signals (APS) with pushbuttons and countdown signal heads. The project included construction/reconstruction of pedestrian ramps, sidewalk extensions, landing areas, detectable warning surfaces, and realignment of skewed crosswalks. Capacity analysis using Synchro software was conducted at each location to determine recommended changes to the signal phasing and/or timings. Several intersections are located within existing computerized traffic signal systems, which required updated progression analysis.

Travel Demand Management Plan, 100 College Street, New Haven CT: As part of a transit-oriented development (TOD) plan to unite neighborhoods with the downtown while preserving corridor mobility, enhancing safety, and improving economic conditions, Jen prepared a Travel Demand Management (TDM) Plan report for a large office building in downtown New Haven for a tenant moving their operations from a suburban campus. The purposes of the TDM plan were to encourage occupants to seek alternate commuting arrangements, reduce their number of trips during the peak hours, and forgo parking in the on-site parking garage. Preparation of the document included conducting an employee survey and analyzing the results. The document included an inventory of available multi-modal transportation infrastructure, services, and facilities in the immediate vicinity of the development and identified the overall TDM goal of the development and the ways in which the developer would support the tenants' efforts through infrastructure improvements and amenities. This project tackled the complex interrelationships of land use, traffic, economic conditions, and the environment, allowing the district to grow as a biomedical center of global significance.

Maintenance and Protection of Traffic for Route 2A (Poquetanuck Road) over Poquetanuck Cove, CTDOT, Preston, CT: Senior Transportation Engineer responsible for extensive traffic analysis to determine the feasibility of implementing alternating one-way traffic through temporary signalization of two spans located a 1/2 mile apart. Developed maintenance and protection of traffic plans and temporary signalization plans based on results of the traffic analysis, for multiple stages of construction.

Maintenance and Protection of Traffic for Route 2 WB/EB over West Road, CTDOT, Marlborough, CT: Senior Transportation Engineer responsible for providing maintenance and protection of traffic plans for two stages of construction on West Road while maintaining the existing one lane of travel in each direction through lane shifts and maintaining one sidewalk at all times. The lane shifts required the relocation of bus stops and revising the transit route through an existing park and ride lot adjacent to the project area.

Tyler Rudolph, EIT

Traffic/MPT

"One of the most exciting aspects of transportation engineering is that it provides unique opportunities to work on challenging, community-enhancing projects."

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EDUCATION
BS, Civil Engineering - 2018
University of Connecticut

LICENSES & REGISTRATIONS
Engineer In Training CT

PROFESSIONAL AFFILIATIONS
Inst Transportation Engineers

EXPERIENCE
3 Years with Fuss & O'Neill
3 Years Professional Experience

Tyler is a Transportation Engineer in Fuss & O'Neill's Transportation Team in Manchester, Connecticut. He has an in-depth understanding of roadway design, signal design, and intersection improvements. He has experience in signing for horizontal curves and traffic impact analysis. Computer application experience includes AutoCAD, Microstation Connect, AutoTurn, and Synchro.

Tyler works full-time in the Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

HAWK Signal Design, City of Stamford, CT:
Transportation Engineer for traffic engineering services for the design of a High Intensity Activated Crosswalk (HAWK) signal on state-owned Route 1. To facilitate safe pedestrian crossing of Route 1, Fuss & O'Neill designed a HAWK system in compliance with City standards and the current CTDOT Traffic Signal Design Manual. In addition to the HAWK signal mast arm design, the plan included ADA compliant sidewalk ramps and a painted crosswalk.

Bridge Street and Roxbury Road Roadway Improvement Plans, City of Stamford, CT:
Transportation Engineer for the implementation of new pavement markings, reduction in lane widths, improved lane definition, the addition of bike lanes, and the addition of parallel parking spaces. Tyler created the PVT plans for this project.

Munson Road Medical Building Traffic Impact Study, Metro Realty Group, Ltd., Farmington, CT: For a proposed medical building development, Tyler assisted with preparation of a traffic impact study. The study involved compiling turning movement traffic counts, review of traffic operations via a site visit, reviewing crash data, and determination of queue lengths for critical lanes within the study area.

New Middle School Traffic Impact Study, Town of Oxford, CT: For a proposed middle school, Tyler assisted with a traffic impact study. The study involved a site visit to observe existing traffic conditions, conducting new turning movement counts, determining site generated traffic anticipated by the new school, preparation of capacity and queue analyses, and review of crash data.

Horizontal Curve Signing, CTDOT, District 1, CT: Transportation Engineer for the development of systematic countermeasures to reduce the instances of roadway departure crashes along curves on state-owned and maintained roads and ramps in District 1. This project includes field reviews of each identified horizontal curve, review of existing conditions, and use of a ball-bank indicator to determine appropriate advisory speeds. The existing signs are being upgraded and new installations are being pursued based on the determined safe speeds. Signs are being designed in accordance with the Manual on Uniform Traffic Control Devices. We are developing construction plans for installing horizontal curve warning signs and advisory ramp speed signs at project locations.

Traffic Control Signal Replacement Project on State Roads, CTDOT, District 3, CT: Transportation Engineer for an ongoing project for the redesign and replacement of 13 traffic control signals on state roads in south central Connecticut. The project entails the gathering of all the crash and traffic volume data for each intersection. The analysis of this data to determine if any revisions are needed to increase the safety and operations of the intersections. Design of the traffic control signals in conformance with state and federal rules and guidelines. The preparation of contract plans, specifications and estimate for bid on a state construction project.

Traffic/Transportation Services for Replacement of Bridge No. 02932, Route 2A (Poquetanuck Road) over Dickerman's Brook, CTDOT, Preston, CT: Transportation Engineer for roadway services in support of replacement of this single-span concrete slab built in 1928. Traffic and transportation support included: maintenance and protection of traffic (completed using two stages of alternating one-way traffic controlled by a temporary traffic signal), revised traffic capacity and queue analysis, traffic plans, and right-of-way impacts.

Transportation Planning Effort, The Hartford Insurance Group, Hartford, CT: Transportation Engineer for The Hartford transportation planning effort involving guiding The Hartford's team through the CTDOT I-84 Project design process. Work included creating viable roadway layout concepts that balanced the requirements of The Hartford with sound traffic engineering and community development principles, and facilitating positive communication among The Hartford, CTDOT, and the City of Hartford.

Gina DePasquale, EIT

Traffic / MPT

"I have always loved working with and for people. As a traffic engineer, it's very rewarding that my work helps so many people - and in ways in which I will never even know about!"

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EDUCATION
BS, Civil Engineering - 2021
University of Hartford

LICENSES & REGISTRATIONS
Engineer-in-Training CT

EXPERIENCE
4 Years with Fuss & O'Neill
4 Years Professional Experience

Gina is a Traffic Engineer in our Manchester, Connecticut Transportation Department. Gina has experience performing traffic counts, evaluating curve safety, signal analysis, performing traffic impact studies, modeling, and developing maintenance and protection of traffic plans. Gina has worked on major CTDOT projects, which has given her a complete understanding of their policies, procedures, and expectations.

Gina has experience using AutoCAD Civil 3D, MicroStation V8i, Microstation Connect, GIS, Bluebeam, Synchro, Torus, and CTDOT Trns*port Estimator. She routinely works on projects for municipalities, developers, and private corporations. Some of her recent, relevant project experience is shown here.

Gina works full-time in the Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

City-wide Safety Improvements, Stamford, CT: Gina is serving as Traffic Engineer for a number of safety improvement projects throughout the City of Stamford. Projects include: Elm Street/Cove Road corridor study application; Route 1 West Main Street pavement markings; Strawberry Hill Avenue extension; Long Ridge Road Pavement restriping; Oaklawn at Newfield Avenue intersection improvements; Waterford Lane park improvements; Long Ridge Road Sidewalk Design; and Hope Street analysis and concept plan.

Traffic Control Signal Replacement, CTDOT, District 3, CT: Traffic Engineer for State Project No. 173-486/487. Under Fuss & O'Neill's Task-Based Traffic and Safety Engineering Services contract, 12 traffic signals were selected for equipment replacement. The project included the upgrade of the existing infrastructure to the latest standards (e.g., span poles/mast arms, signal

heads, signage, and vehicle detection). Pedestrian control features were also upgraded to include accessible pedestrian signals (APS) with pushbuttons and countdown signal heads. The project included construction/reconstruction of pedestrian ramps, sidewalk extensions, landing areas, detectable warning surfaces, and realignment of skewed crosswalks. Capacity analysis using Synchro software was conducted at each location to determine recommended changes to the signal phasing and/or timings. Several intersections are located within existing computerized traffic signal systems, which required updated progression analysis.

Horizontal Curve Project, CTDOT, District 1, CT: Traffic Engineer for State Project No. 171-440. Under Fuss & O'Neill's Task-Based Traffic and Safety Engineering Services contract, curve warning signing was reviewed on approximately 1,750 curves throughout 36 towns in the central part of the state. Each curve was reviewed to determine if the existing signing was appropriate and should be removed or replaced with enhanced signing. The goal of the project is to reduce the instances of roadway departure crashes along horizontal curves on state-owned and maintained roads and ramps.

Jefferson Avenue Improvements, LOTCIP Program, New London, CT: Traffic Engineer for intersection improvements and roadway restoration on Jefferson Avenue and Chester Street. The project seeks to increase both vehicular and pedestrian safety, redefine and redistribute the wide travel lanes, incorporate bicycles facilities, reconstruct a signalized intersection into a mini-roundabout, revitalize the outlived roadway pavement sections, and improve vehicular flow.

Old Farms Road Design and Permitting, Avon, CT: Traffic Engineer for safety improvements to Old Farms Road. In recent years, traffic volume and speed have increased and this roadway needs alterations to better serve the public, students, and faculty that routinely traverse this area. This project seeks to address insufficient geometry, width, horizontal and vertical alignments, poor sight lines, and prevailing vehicle speeds. The selected treatments include innovative pedestrian safety and complete streets applications (such as rectangular rapid flashing beacons), as well as separated multi-use trails and connections to regional facilities.

Downtown Complete Streets Improvements and Roundabout Design, Windsor Locks, CT: Traffic Engineer for a public infrastructure investment that supports a relocated train station and provides safe, multi-modal connectivity to the station, to regional trail networks, and to historic/cultural sites. The project used existing roadway cross-section to redistribute wide travel lanes into a Complete Street, which created space for on-street parking and wide multi-use sidewalks, as well as the development of public gathering spaces. Pedestrian safety and streetscape features are major project components.

East Main Street Corridor Study, SCRCOG, Meriden, CT: Traffic Engineer for access management alternatives, safety improvements, and roadway configuration options for a segment of East Main Street extending from the I-91 northbound ramps in the east toPaddock Avenue in the west. This project included an existing conditions analysis, traffic volume analysis, review of crash data, analysis of traffic conditions using Synchro 10 and SimTraffic 10, analysis of existing site access and circulation, safety considerations, and a detailed public outreach campaign.

Tai Le

Traffic / MPT

"I became an engineer because it allows me to express myself through creative thinking and innovation. Engineering, with its variations of challenges, is a chance to create the future!"

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EDUCATION
BS, Civil Engineering - 2020
University of Connecticut

EXPERIENCE
1 Year with Fuss & O'Neill
1 Year Professional Experience

Tai is a recent graduate of the University of Connecticut who works in our Manchester, Connecticut Transportation Department. Focusing on traffic engineering, Tai has worked for both public and private clients to ensure the safety of the traveling public. The following is a selection of Tai's recent relevant projects.

Tai works full-time in the Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

City-wide Safety Improvements, Stamford, CT: Tai is serving as Transportation Engineer for a number of safety improvement projects throughout the City of Stamford. Projects include: Elm Street/Cove Road corridor study application; Oaklawn at Newfield Avenue intersection improvements; Newfield Avenue at Vine Road concept plan; Summer Street pavement markings; Myrtle Avenue restriping plans; and CMAQ traffic signal upgrade designs.

Traffic and Parking Impact Study, 25 Van Zant Acquisitions, LLC, Norwalk, CT: Tai served as the project Transportation Engineer for a Traffic and Parking Impact Study for a proposed building conversion to a workforce training center, office space, and a daycare. The Traffic and Parking Impact Study was performed in support of the development's

land use application. This project includes site visits to observe existing traffic conditions, traffic counts, coordination with both CTDOT and the Norwalk Planning Department, review of crash data, calculation of expected traffic, capacity analysis, queue length determination, analysis of parking needs, and parking lot layout review.

High Frequency Crash Locations, CTDOT, New Haven, CT: Transportation Engineer for State Project No. 170-3601. Under Fuss & O'Neill's Task-Based Traffic and Safety Engineering Services contract, Tai is helping to study and produce reports for high frequency crash locations. The goal of this project is to recommend improvements to reduce crashes and improve safety for specific spot locations in the City. This project currently includes data collection, review of currently planned or programmed roadway improvements, proposed pedestrian and bicycle plans, published corridor study reports, and traffic study reports for proposed and ongoing major traffic generators. Future work includes analysis of collected data, preparing recommendations, and presenting our findings and recommendations to the Department.

Old Farms Road Design and Permitting, Avon, CT: Transportation Engineer for safety improvements to Old Farms Road. In recent years, traffic volume and speed have increased and this roadway needs alterations to better serve the public, students, and faculty that routinely traverse this area. This project seeks to address insufficient geometry, width, horizontal and vertical alignments, poor sight lines, and prevailing vehicle speeds. The selected treatments include innovative pedestrian safety and complete streets applications (such as rectangular rapid flashing beacons), as well as separated multi-use trails and connections to regional facilities.

Traffic Signal Design for State Project 174-424, CTDOT, Various Locations, CT: Under Fuss & O'Neill's Task-based Traffic and Safety Engineering Services contract, Tai is part of a team designing 13 full equipment replacement traffic signals and one Rectangular Rapid-Flashing Beacon. The project includes upgrade of the existing infrastructure to the latest standards, such as span poles/mast arms, signal head placement, upgraded signage, and vehicle detection. Pedestrian control features to be upgraded include APS with pushbuttons and countdown signal heads. The project includes construction/ reconstruction of curb ramps, blended transitions, sidewalk extensions, landing areas, detectable warning surfaces, and realignment of skewed crosswalk pavement markings. Capacity analysis using Synchro software is being conducted at each location to determine recommended changes to signal phasing and/or timings, including clearance intervals and pedestrian timings. Several intersections are located within existing computerized traffic signal systems, which requires updated progression analysis.

845 Canal Street Traffic/OSTA Support, BLT Management, LLC, Stamford, CT: Transportation Engineer for a Traffic Impact Study and state traffic permitting for a mixed-used development. Project tasks include determination of the impact of traffic generated by the development, review of crash data, coordination with CTDOT and the City of Stamford, capacity analysis, queue length determination, and preparation of a submission to OSTA requesting an Administration Decision Review.

Joshua Aldrich, PE

Roadway Engineering, Bridge Engineering, and Permitting

"Engineering for me is all about the challenge of taking a problem, no matter the size, and through clever application of mathematics, science, and experience, subdividing it into solvable parts. When the solution to a complex engineering problem comes together, I get a thrill that's impossible to replicate any other way. It's more than a job, it's a reason to jump out of bed every day."

jaldrich@fando.com 800.286.2469 x5582

EDUCATION
BS, Chemistry - 2007
UMass Amherst

BS, Civil Engineering - 2009
UMass Amherst

LICENSES & REGISTRATIONS
Professional Engineer CT
Professional Engineer MA

PROFESSIONAL AFFILIATIONS
Inst Transportation Engineers
CT Institute of Trans Eng

EXPERIENCE
1 Year with Fuss & O'Neill
10 Years Professional Experience

Joshua Aldrich is a Project Manager in our Transportation Business Line. He has been working in highway design and pavement engineering for 10 years. Through his career he's concentrated on practical "boots on the ground" engineering experience, construction phase services and flexible pavement design. Josh has also provided comprehensive design assistance for local roadway programs as well as field support and specification services.

Joshua works full-time in the Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

Old Farms Road Safety Improvements, Town of Avon, CT: Served as Project Manager as well as designer for a new, overland realignment of Old Farms Road, a collector serving Old Farms School. In recent years, traffic volume and speed have increased and this roadway needs alterations to better serve the public, students, and faculty that routinely traverse this area. This project seeks to address insufficient geometry, width, horizontal and vertical alignments, poor sight lines, and prevailing vehicle speeds. The selected treatments include innovative pedestrian safety and complete streets applications (such as rectangular rapid flashing beacons), as well as separated multi-use trails and connections to regional facilities. Pavement design here focused on longevity and minimal impacts to the surrounding area with

special consideration given to a new wetland crossing.

Alexander Road Road Diet and Traffic Calming, City of New Britain, CT: Worked closely with the City of New Britain on a Road Diet project that involved structural improvement of a pavement near the end of its service life. Multiple pavement preservation technologies (Ultra-Thin Bonded Overlay and microsurfacing) were explored as part of this project.

Pavement Structure Improvements, Town of Berlin, CT: As the project Pavement Engineer, evaluated project streets and developed flexible pavement designs for reconstruction, rehabilitation, and structural improvement of high volume (>4 million design ESALS) arterials in the Town of Berlin, CT. As Pavement Engineer for this project, Josh has championed the use of cold in-place recycling, a treatment that has never before been deployed on a LOTCIP project.

Beeline Trail Phase 2, City of New Britain, CT: Project Manager for the realization of a multi-use trail connection between the existing Farmington Canal Heritage Trail (FCHT) and New Britain's downtown CTfastrak station. Phase 2 includes design completion of approximately 35% in accordance with the CTDOT Consultant Design Manual, drainage design, development of cross-section plans, and estimation of preliminary construction costs. This project includes traffic signal revisions at three intersections where trail crossings are proposed.

Hartford-Windsor Riverwalk Extension, City of Hartford, CT: Designed frost resistant pavement sections that maintained the minimum disturbance demanded by a shared use path within the flood zone of the Connecticut River. This work involved re-evaluation of frost penetration models with respect to current and future climate change.

Lyman Street (Route 33) Smart Growth District Infrastructure Improvements, Town of South Hadley, MA: Project Manager for engineering and contract documents for the reconstruction of Lyman Street, as well as other critical public infrastructure upgrades for Dayton Street and Fulton Street. This project includes full-depth pavement reclamation on Lyman Street; replacement of the existing asphalt sidewalk with a 5-foot-wide concrete sidewalk; replacement of an existing cast iron water main; installation of a 10-foot-wide shared-use path and traffic signage; and upgrade of the stormwater drainage system to accommodate new curbing.

Moosehorn Road Bridge Highway Design, CTDOT, Granby, CT: Josh is leading the highway design portion of this project, which seeks to replace an existing 42-foot single-span bridge. This project includes design of a 10-foot-wide temporary pedestrian bridge crossing a brook during weekend construction. Maintenance and protection of traffic is alternating one-way traffic operation for the construction of the abutment extensions/wingwalls and a 56-hour weekend closure for the installation of the new superstructure. The highway design portion of this project includes calculating coordinate geometry for the horizontal layout; design of the guide railing, erosion control devices, pavement structure, and signing; and development of roadway cross-sections (50-foot intervals and at critical project locations. This project includes close coordination with the CTDOT, the CTDOT's Consultant Liaison Engineer, and the Town of Granby.

Keith Goodrow, PE, LEED AP

Site/Civil

"As an engineer, I find it very rewarding to be able to use my knowledge and experience to help our clients achieve their vision while being conscience of the environmental need to create sustainable low–impact solutions."

kgoodrow@fando.com 800.286.2469 x5208

EDUCATION
BS, Civil Engineering - 2002
University of Connecticut

LICENSES & REGISTRATIONS
Professional Engineer CT
LEED-AP

EXPERIENCE
6 Years with Fuss & O'Neill
18 Years Professional Experience

Keith is a Senior Engineer in our Site Planning and Design Group. With more than 15 years of engineering experience, Keith has contributed to a wide variety of projects, including municipal roadway design, commercial and residential site development, and large campus improvements.

Keith specializes in stormwater management and the design of detention systems, low-impact water quality measures, and hydraulic storm modeling.

Keith works full-time in the Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

Bank Street Drainage Improvements, New London, CT: Keith served as Project Engineer for the design of drainage improvements to reduce flooding during storm events. Services included evaluating the extent of the existing flooding and design improvements to alleviate or reduce flooding potential while working within several existing constraints.

Enfield ROADS 2010 Referendum and Stormwater Management, Town of Enfield, CT: Keith served as Project Engineer for the design of stormwater management systems and hydraulic modeling of several large roadway reconstruction projects in the Town of Enfield. This project included roadway and drainage design for full-depth reconstruction of 15 streets in Enfield. The roadway projects included

design, cost estimating, permitting (state and local), and construction administration.

Roadway Improvements, Town of Southington, CT: Keith was the Project Engineer for the design of water quality and low-impact measures for the removal of an overpass bridge and roadway intersection improvements. Services included quantifying the water quality requirements, modeling the design improvements, and writing a report to summarize the design.

Renovations, State Office Building, Hartford, CT: Keith served as Project Engineer/Lead Designer for site/civil engineering support for the complete renovation of the State Office Building and construction of a public square and supporting parking garage. Services included site engineering, utility design, stormwater management, and landscape architecture.

Mixed-use Complex, Forest Manor, West Haven, CT: As Project Engineer, Keith provided site/civil engineering support for construction of a mixed-use retail and residential complex supporting the University of New Haven. Services included site engineering, utility design, stormwater management, and landscape architecture.

Mixed-use Development and Construction, Winstanley, New Haven, CT: As Senior Engineer, Keith assisted with the development of a feasibility study for a six-story mixed-use development site in New Haven. He prepared a site plan, evaluating access, utilities, water supply, and site grading. As part of this project, the following plans were created: site clearing/site preparation; site grading; site utility; erosion and sedimentation control; landscaping; signage; and remedial action. This project included design development, permitting, preparation of construction documents, construction administration, and multiple meetings with project stakeholders. The site has a historic building that was integrated into the overall site plan design.

Windsor-Bloomfield Landfill, Windsor, CT: As Senior Engineer, Keith provided site/civil engineering support for closure of a municipal soil waste landfill. He implemented the closure plan and obtained CTDEEP permits. He prepared biannual surveys to monitor landfill capacity and conducted routing inspections as required by permits. He designed and modeled stormwater management and erosion control measures to be used during the implementation of the closure plan and conducted routine inspections as required by permits. He is designing mitigation measures for environmental impacts to nearby wetlands systems.

Student/Faculty Housing, Westminster School, Simsbury, CT: Keith served as Senior Engineer for the site design and permitting of three 65,000-square-foot student and faculty housing dormitories on the Westminster School campus. He provided site/civil engineering support for a new dining hall and for student and faculty residence halls. Services included the layout design of the stormwater management and drainage systems, site utilities, grading, as well as state and local permitting.

Dining Hall, Westminster School, Simsbury, CT: Keith served as Senior Engineer for the site design of a new 22,000-square-foot dining hall at Westminster School. Project responsibilities included the layout design of the borefield for the geothermal heating and cooling system, site utilities, grading and drainage, as well as state and local permitting.

Lauren Mello, PE, CNU-A

Site/Civil

Lauren's guiding principle is inspired by this quote from Ghandi - "the future depends on what we do in the present."

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EDUCATION
BS, Civil Engineering - 2013
Worcester Polytechnic Institute

MS, Civil Engineering - 2014
Worcester Polytechnic Institute

LICENSES & REGISTRATIONS
Professional Engineer CT
Congress of New Urbanism
Engineer In Training MA

EXPERIENCE
7 Years with Fuss & O'Neill
8 Years Professional Experience

Lauren is a Senior Engineer and Project Manager in Fuss & O'Neill's Community Development studio. A Connecticut Licensed Professional Engineer and an accredited professional with the Congress of New urbanism, she has over 8 years of experience of civil site design.

Lauren has contributed to a wide variety of projects including commercial and residential development, site conditions assessments, school construction, State and Local permitting, and utility retrofits.

Lauren is an active mentor the Hartford ACE Mentor Program, which introduces high school students to architecture, construction, and engineering professions.

Lauren works full-time in the Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

Site Design and Renovation, Cheney Bennett Academy, Manchester, CT: Civil Engineer for the site design of the historic renovation to this iconic school on Main Street.

Facilities Master Plan, Simsbury Public Schools, Simsbury, CT: Project Manager for this master planning effort. Project responsibilities included existing conditions reports and the analysis of public school sites with recommendations for improvements.

Site Design and Renovation, Mansfield Elementary School, Mansfield, CT: Civil Engineer for the site design of the renovation and expansion of the elementary school in Mansfield. Project is currently in the design phase.

Athletic Building Site Design, Choate Rosemary Hall, Wallingford, CT: Civil Engineer for a new twin rink hockey facility on the main campus. Project responsibilities for this LEED Gold project includes site and civil design, as well as state and local permitting.

Campus Site Design, University of Hartford, West Hartford, CT: Civil Engineer for two projects for the university. The first is the improvements to the Gengras Center for Student Success (CSS). We were responsible for stormwater management, site utilities, erosion, and sediment controls.

The second project was at the Barney School of Business expansion where she provided stormwater management, site utilities, erosion, and sediment controls design services.

School of Graduate Studies Historic Renovation, Yale University, New Haven, CT: Civil Engineer for this tight urban site with an interior courtyard. The $103M renovation required drainage design, utility routing and coordination plans, and erosion and sedimentation control plan services,

344 Winchester Avenue, Winstanley Enterprises, New Haven, CT: Civil Engineer for this adaptive reuse and site remediation project in order to allow redevelopment of a 250,000 square foot single story high ceiling manufacturing building for reuse as offices, warehousing, data center, and library storage. This 15-acre development abutted the Farmington Canal bike trail and included reconstruction of a portion of Winchester Avenue to provide streetscape and traffic calming features. Our services included survey, civil engineering, traffic engineering, landscape architecture, and environmental site assessment and remediation. We were responsible for all of the environmental permits with CT DEEP, including filing of a remedial action plan.

University Law School, Yale University, New Haven, CT: Civil Engineer for the site/civil design services relative to the renovation of the Yale University Law School, Baker Hall, and the courtyard adjacent to Tower Parkway, Ashmun Street, and the Yale Central Power Plant.

Dining Services, Yale University, New Haven, CT: Civil Engineer for improvements at 344 Winchester Avenue related to the fit-out of building for Yale Foodservice Department facilities, including repairs to environmental controls, site improvements, and FOG design.

Pedestrian Bridges at 100 College Street, Winstanley Enterprises, New Haven, CT: Project Manager for the permitting, design, and construction for the ongoing project, which will create a pedestrian corridor beginning at 300 George St, crossing over MLK Jr Blvd, passing through the 100 College St site, crossing over South Frontage Rd and terminating at Yale Medical. The purpose of the corridor will be for pedestrian and vivarium related movements through an enclosed condition space between pharmaceutical companies and Yale University's medical school.

Luce Hall, Yale University, New Haven, CT: Project Manager for the design and construction for the renovation project that addressed building and site related drainage issues. Site drainage retrofits and roof drainage connections were integrated into the existing site to prevent stormwater runoff from flooding Luce Hall's eastern entrance.

Stuart Harris, PE

Structural

"I get a great deal of satisfaction from designing a project that solves a problem for someone – utilizing my experience to identify the need, develop and select the most appropriate solution, and prepare design documents so it can be built."

sharris@fando.com 800.286.2469 x5232

EDUCATION
BS, Civil Engineering - 1981
University of Connecticut

BA, Liberal Studies - 1981
Fairfield University

LICENSES & REGISTRATIONS
Professional Engineer CT
Professional Engineer NY
Professional Engineer NJ
Professional Engineer MA
Professional Engineer RI

PROFESSIONAL AFFILIATIONS
American Soc of Civil Eng
American Concrete Institute
Assoc State Dam Safety Offcls
Structural Engineers Coalition

EXPERIENCE
22 Years with Fuss & O'Neill
40 Years Professional Experience

Stu is our Chief Structural Engineer. His responsibilities include project management, staff coordination, quality assurance/quality control, business development, and client satisfaction. He has served as a project manager and structural engineer for a broad spectrum of structural design projects.

Stu's experience includes field investigations of existing structures, preparation of inspection reports, rating calculations, structure type studies, preliminary design plans, final design plans, specifications, quantity calculations, and cost estimates for a wide variety of structural rehabilitation, alteration, replacement, demolition, temporary construction and new construction projects.

Stu works part-time in our Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

Connecticut DOT Task Based Bridge Rehabilitation/Replacement Program, CT:
Project Manager for the design of three bridge rehabilitation projects in Hartford and Waterford, two superstructure replacement projects in Preston and a culvert rehabilitation project in Franklin. The Hartford projects consisted if the rehabilitation of a 14-span steel stringer viaduct carrying I-84, an adjacent 3-span structure carrying an off-ramp off I-84 WB and a local road over Route 15. Specific repairs included parapet upgrades to current standards, deck patching and rehabilitation (including the installation of a cathodic protection system), link slab construction over the piers, deck joint replacement, spot stringer repairs as required, bearing replacements, raising

the superstructure to increase the vertical clearance under the bridge, protective fencing, removal of bridge mounted signs and substructure rehabilitation. The projects also included highway and maintenance of traffic design. The Waterford project involved the rehabilitation a 182-foot-long, two-span steel beam and concrete deck structure that carries I-395 northbound and southbound over Route 85 and a commuter parking lot. This project utilized accelerated bridge construction techniques to replace the existing deck with precast concrete deck panels and reopen the bridge to traffic in 7 days. Additional work included eliminating the raised median and installing median barriers, bearing replacement, repairing and painting the steel superstructure and substructure repairs. Traffic on mainline I-395 was closed and traffic was re-routed across Route 85 via existing off and on ramps, utilizing temporary signalization and regional detours. The Preston projects included the replacement of two single span concrete superstructures on Route 2A with pre-stressed concrete deck units. The project was complicated by having to maintain an existing high pressure fluid filled electric duct with zero movement tolerance that was supported by the existing superstructure. Substructure repairs included an ultra high performance concrete facing to bridge cracks and protect against future deterioration. The Franklin project involved re-lining two twin-cell 72" diameter asphalt-coated corrugated metal pipe (ACCMP) culverts that convey Beaver Brook under Route 207.

Route 148 Bridge over Pattaconk Brook, CTDOT, Chester, CT: Project Manager for the complete replacement of an existing bridge with a structural steel superstructure on integral abutments, including hydraulic engineering, and permitting. This ENR New England award winning project required extensive coordination with town officials, adjacent businesses, property owners, residents, CTDOT, utility owners, and the town's streetscape designer. Accelerated Bridge Construction methods were implemented to expedite construction and disruption to the local community.

Modification of Existing Structure, Main Street over Route 72, City of New Britain, CT: Lead Structural Engineer charged to modify an existing 270' two-span steel structure to carry an architect designed pedestrian enclosure to become a showcase structure for the City of New Britain. Specific structural tasks included supporting a road diet with widened pedestrian sidewalks, detailing a bridge mounted brick pavers system with proper drainage, and modifying the existing parapets and wingwalls to support the unique 15' high curved steel/aluminum pedestrian enclosure with polycarbonate infill panels. Concrete sculpture supports were also required on the structure sidewalk and at the bridge joints as bookends to the pedestrian enclosure. The final condition was rated in BrR (formerly Virtis) to determine an as-designed load rating.

Connecticut DOT List 15-18 Bridge Rehabilitation Program, CT: Project Manager for the preliminary and final design of four complete bridge replacements, including structural, roadway and maintenance of traffic design; hydraulic, floodway and scour analyses; environmental permit applications and construction support services.

Daniel Whittemore, PE

Structural

"Out of all structures, I find bridges to be one of the most elegant expressions of human development. Ubiquitous but often invisible, we all rely on bridges every day to carry out the routine of our lives. Keeping them safe and operating is a joy to me!"

dwhittemore@fando.com 800.286.2469 x5383

EDUCATION
BS, Civil Engineering - 1998
University of Massachusetts at Amherst

LICENSES & REGISTRATIONS
Professional Engineer CT

PROFESSIONAL AFFILIATIONS
Structural Engineers Coalition

EXPERIENCE
5 Years with Fuss & O'Neill
21 Years Professional Experience

Dan has many years of diversified bridge design experience. He has worked with both private and public bridge owners spanning the gamut from bridge design to inspection, replacement, protection and rehabilitation. Dan's experience touches the design, documentation, analysis, and management of bridge projects from the local to the signature scale.

Dan is an internationally published author and scholarly-cited leader in sustainable bridge design whose work has been incorporated into design standards by many agencies and municipalities, most notably the 2015 Iowa Department of Transportation's Bridge Design Manual.

Dan works full-time in the Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

Beehive Bridge, Main Street over Route 72, City of New Britain, CT: Senior Structural Engineer charged to modify an existing 270' two-span steel structure to carry an architect-designed pedestrian enclosure to become a showcase structure for the City of New Britain. Specific structural tasks included supporting a road diet with widened pedestrian sidewalks, detailing a bridge mounted brick pavers system with proper drainage, and modifying the existing parapets and wingwalls to support the unique 15' high curved steel/aluminum pedestrian enclosure with polycarbonate infill panels. Concrete sculpture supports were also required on the structure sidewalk and at the bridge joints as bookends to the pedestrian enclosure. The

final condition was rated in BrR (formerly Virtis) to determine an as-designed load rating. This project transformed the pedestrian and bicycle conditions connecting the downtown area to the CTfastrak station and Broad Street neighborhood through innovative public art, complete streets, and streetscape designs. The exiting five lanes were reduced to three lanes, creating space for bike lanes, wider sidewalks (growing from a 10-foot-width to as much as 21 feet wide), trees, and plantings. Additionally, unique sculptures and pedestrian enclosures create an iconic structure that enhances the new walkable space.

Pedestrian Bridge Evaluation, University of Hartford, West Hartford, CT: Senior Structural Engineer for an evaluation of an existing pedestrian bridge crossing the Park River at the University of Hartford's West Hartford campus. Inspected the bridge superstructure and its above-grade portions. Reviewed original design drawings and analyzed the bridge inspection. Evaluated alternative deck replacements, considering weight, durability, suitability for pedestrian traffic, and cost. Presented findings and recommendations to facility personnel at a closure meeting.

Pedestrian Walkways, Filley Park, Town of Bloomfield, CT: Lead Structural Engineer for the substructure support for two prefabricated pedestrian stream crossings. Dan worked with the manufacturer to design custom trusses with exaggerated cambers and embedded brick pavers to achieve the look desired for the site with the tight hydraulic constraints.

Tamarack Road over Wetland, Evergreen Walk Master Association, Inc., South Windsor, CT: Project Manager and Technical Lead for this project to evaluate observed conditions on an existing prefabricated 100' long steel truss carrying a two-lane access roads within the Evergreen Walk shopping center. After a hands-on field inspection, Dan determined that improper drainage of salt infused roadway runoff had destabilized the weathering steel rust layer. Dan made suggested repair details to correct this condition and provided construction to the structure owner.

Bridge Replacement, Route 150 Bridge over Wharton Brook, Wallingford, CT: Senior Structural Engineer for the complete replacement of the existing bridge with a structural steel superstructure on conventional abutments, including increased span for improved hydraulics, staged reconstruction of the bridge and channel, approach roadway reconstruction, and maintenance of two-way traffic during construction.

I-84 EB/WB over Market Street, Connecticut Department of Transportation, Hartford, CT: Project Manager for the structural rehabilitation of two structures, a 14-span steel stringer viaduct carrying I-84 and an adjacent 3-span structure carrying an off-ramp off I-84 WB. Specific repair details included parapet upgrades to current standards, deck rehabilitation, spot stringer repairs as required, bearing replacements, and substructure rehabilitation. Project components included plan development, specifications, and cost estimates in compliance with CTDOT's Digital Design Environment and to the new 817 Standard Specification.

Anders Carlton, EIT

Structural Engineer

"The challenges and problems that present themselves in various projects are what push us to become better problem solvers and better engineers."

acarlton@fando.com 800.286.2469 x5579

EDUCATION
BS, Civil Engineering - 2019
University of Connecticut

LICENSES & REGISTRATIONS
Engineer In Training CT

EXPERIENCE
2 Years with Fuss & O'Neill
2 Years Professional Experience

Anders joined Fuss & O'Neill after graduating from the University of Connecticut with her undergraduate degree in Civil Engineering. She has been working as a Structural Engineer in the Transportation Division under the Bridges and Structures Team in Manchester, Connecticut. Since joining Fuss & O'Neill, she has been able to experience both working on horizontal and vertical structures, allowing for her knowledge of Structural Engineering to expand and diversify. Anders has a well developed understanding of structural analysis, AASHTO bridge design standards, building rehabilitation, and the design aesthetics that must be incorporated into building and bridge design.

Anders works full-time in the Manchester, Connecticut office.

REPRESENTATIVE PROJECTS:

I-84 WB over Market Street, Connecticut Department of Transportation, Hartford, CT:
Structural Engineer for the structural rehabilitation of two structures, a 14-span steel stringer viaduct carrying I-84 and an adjacent three-span structure carrying an off-ramp off I-84 WB. Specific repair details included parapet upgrades to current standards, deck rehabilitation (including the installation of a cathodic protection system), spot stringer repairs as required, bearing replacements, and substructure rehabilitation. Project components included plan development, specifications, and cost estimates in compliance with CTDOT's Digital Design Environment and to the new 817 Standard Specification.

Bridge Nos. 03374 and 01708, Route 2 WB/EB over West Road, CTDOT, Marlborough, CT: Structural Engineer for two bridge rehabilitation projects. Bridge 03374 is a three-span, 120-foot structure carrying Route 2 westbound over West Road. Bridge 01708 is a three-span, 120-foot structure carrying Route 2 eastbound over West Road. Both structures are comprised of reinforced concrete decks supported by six steel beams on concrete abutments and piers. Structural preliminary design tasks included review of documents, bridge inspection, and load rating. Structural final design tasks included incorporation of all comments, preparing a structure plan set, preparing required structure Special Provisions, estimation of structure quantities, and preparation of a proposal estimate.

Bridge Replacement, Route 150 Bridge over Wharton Brook, CTDOT, Wallingford, CT: Structural Engineer for the replacement of the existing bridge with a structural steel superstructure on conventional abutments, including increased span for improved hydraulics, staged reconstruction of the bridge and channel, approach roadway reconstruction, and maintenance of two-way traffic during construction.

Park River Pedestrian Bridge Evaluation, University of Hartford, West Hartford, CT: Structural Engineer for inspection of an existing bridge superstructure and above grade portions of the substructure. Reviewed original design drawings and performed a limited structural analysis. Evaluated three alternative deck replacements.

Barker Road Bridge Evaluation, City of Pittsfield, MA: Structural Engineer for bridge inspection services for this five-ton capacity bridge currently rated in fair condition. Bridge inspection services included site assessment, deck coring and testing, and lead paint testing. The evaluation will lead to recommended repairs to deficient bridge elements.

Bridge No. 02931, Route 2A (Poquetanuck Road) over Poquetanuck Cove, CTDOT, Preston, CT: Structural Engineer for the rehabilitation of this single-span concrete slab built in 1928. The structure is 17.42 feet with an out-to-out width of 36'-6". Structural tasks include: general plan, layout/coordinates, borings, stage construction plans, abutment, culvert details, wingwalls, bridge railings, and utility details.

Bridge Nos. 03178 and 03179, CTDOT, Waterbury, CT: Structural Engineer for two five-span structures that carry Route 8 southbound and northbound over the Metro-North Railroad (MNRR). Both bridges are approximately 700 feet long with a vertical clearance of more than 70 feet above MNRR. The superstructures of both bridges consist of steel plate girders supported by reinforced concrete piers and abutments. Several spans are continuous over the piers with expansion and fixed pin and hanger connections. Structural preliminary design tasks included review of documents, bridge inspection, and load rating. Structural final design tasks included incorporation of all comments; design and detail of all new structure components and structural repairs; evaluation of the rehabilitated structure for seismic forces primarily to determine sufficient superstructure support length and lateral restraint in order to prevent superstructure collapse; and performance of a load rating and completion of a Load Rating Report.

JEFFREY R. JURZYNSKI, P.L.S.

Survey Manager

Mr. Jurzynski is the Survey Manager for Pereira Engineering and is responsible for managing the Land Surveying Department. Mr. Jurzynski performs such duties as project estimates, contract/proposal writing, survey marketing, client contact, field and office manpower scheduling, acquisition of surveying equipment, land record research, determination of boundaries, final mapping presentation and signing of all final survey mapping. In addition, he is responsible and accountable for budgetary and invoicing determination for all land surveying projects.

PROJECT EXPERIENCE:

Municipal Projects:

- Bridgeport Public Library - 2534 East Main Street; Bridgeport, CT
- Bridgeport WPCA – East & West Wastewater Treatment Plants; Bridgeport, CT
- City of Bridgeport - East End Civic Block Redevelopment Project; Bridgeport, CT
- City of Bridgeport - Klein Memorial Auditorium; Bridgeport, CT
- City of Bridgeport - Discovery Museum; Bridgeport, CT
- City of Danbury - Downtown Danbury TOD Streetscape Renaissance Project; Danbury, CT
- City of New Britain - Area S2-153 I/I Removal Project; New Britain, CT
- GNHWPCA Sewer Separation Project; New Haven, CT
- Old Lyme Shores Beach Association; Old Lyme, CT
- South Windsor Pumping Stations; South Windsor, CT
- Stamford WTP - Dewatering & Chemical Receiving Facility; Stamford, CT
- City of West Haven – Oyster River Wastewater Pumping Station; West Haven, CT

Public Utility Companies:

- Aquarion Water Company
- Altice USA; Connecticut
- Altice USA: New York
- The United Illuminating Company; Shelton, CT
- Verizon

Housing Authorities:

- Park City Communities; Bridgeport, CT
- Stratford Housing Shiloh Gardens; Stratford, CT

Federal Projects:

- United States Postal Service; 115 Boston Avenue; Bridgeport, CT
- United States Postal Service; Granby Post Office; Granby, CT
- United States Postal Service; New Britain Main Post Office; New Britain, CT

- **Commercial Projects:**
- People's United Bank; 2115 Dixwell Avenue; Hamden, CT

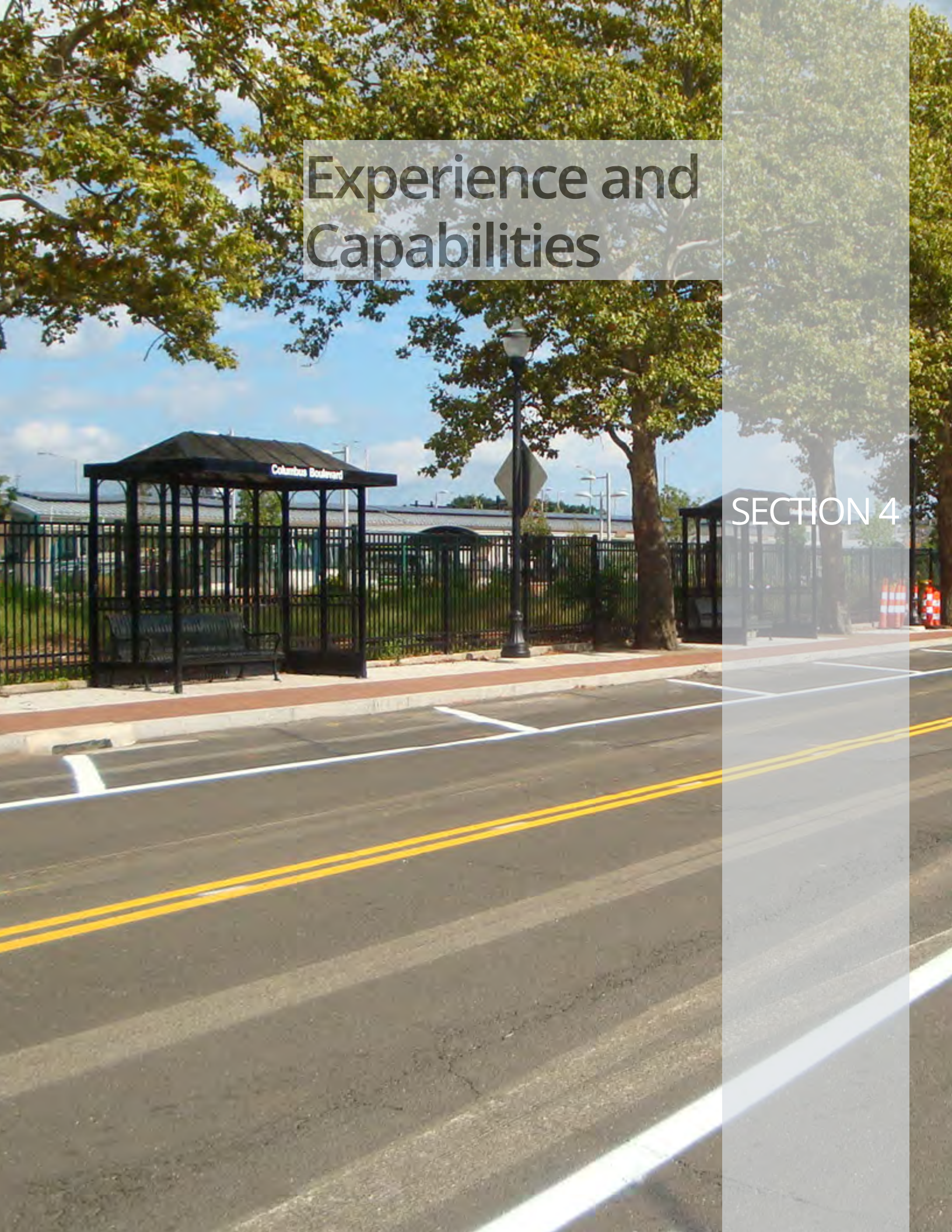
- Shelton River Front Development Project; Shelton, CT
- Webster Bank; 436 Slater Road; New Britain
- 502 Howe Avenue; Mixed Use Development; Shelton, CT
- 1180 East Main Street; Mixed Use Development; Torrington, CT
- Webster Bank; 1 Main Street; Torrington, CT
- Norwalk Marine Contractors; Stratford, CT

REGISTRATIONS AND CERTIFICATIONS:
Professional Land Surveyor CT, License #0014202

HEALTH AND SAFETY TRAINING:
OSHA 10 Hour Construction Program (2020)

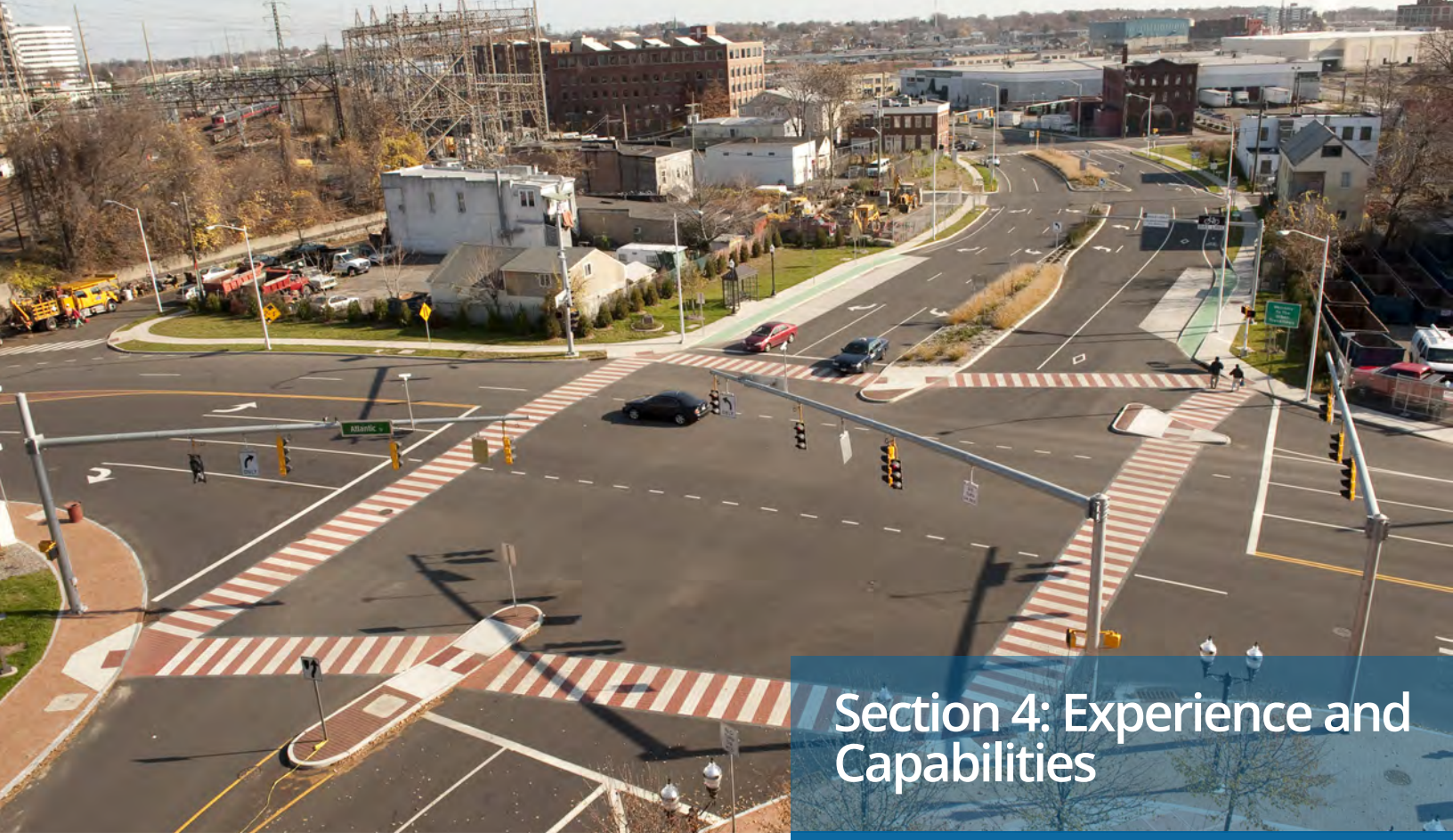
EDUCATION:

Greater Hartford Technical College, Hartford, CT



Experience and Capabilities

SECTION 4



Section 4: Experience and Capabilities

Fuss & O'Neill aims to create sustainable, productive, and healthy places for people to live, work, and play. We are nationally recognized for the contemporary and compelling traffic and transportation designs we develop, offering a wide range of transportation services including traffic calming, traffic signal design, intersection improvements, roadway geometry, and context sensitive techniques from initial preliminary design stages through construction.

With 258 total full-time employees and 219 full-time professional/technical staff, and two offices in Connecticut, Fuss & O'Neill can provide the City of Stamford with a deep bench of technical staff to successfully implement design services for safe routes to schools.

Merging functionality and aesthetics generates safe pedestrian and bicycle-friendly streets, so that students can get to school safely. Our renowned traffic and transportation engineers know that schools are the cornerstone of neighborhoods.

We live here. We work here. We shop here. We send our children to schools here. We are invested in creating pedestrian and bicycle-friendly routes to schools. By starting with students biking and walking to school, communities become safe places for everyone to walk and bike.

To complete our team, we have collaborated with our trusted teaming partner, Pereira Engineering for Land Survey and Right-of-Way services. Pereira Engineering has been providing land survey and engineering services in Connecticut since 2000. They are a Shelton-based Connecticut certified MBE/DBE firm with 7 total full-time employees and 3 full-time professional employees.

These are not just projects to us, they are investments in our hometowns. Herein we present to you an overview of our experience and capabilities and our experiences with transportation projects in the City of Stamford.

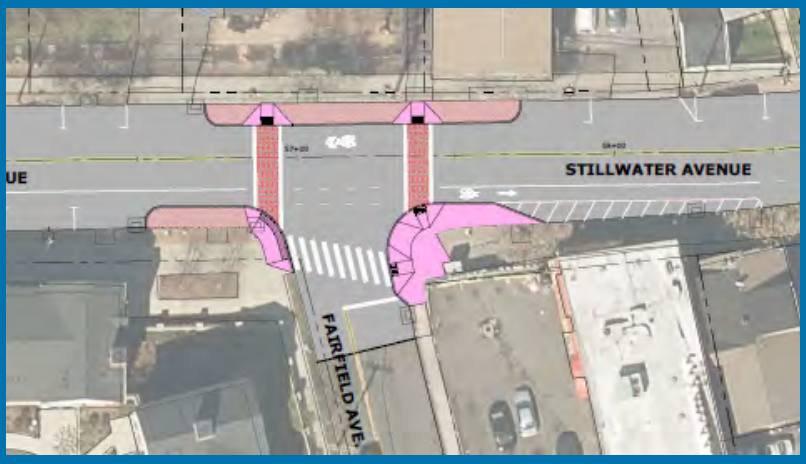
Citywide Traffic, Transportation, and Safety Improvements

Stamford, CT

Project Highlights

- Designed roadway and intersection reconfigurations to improve pedestrian and bicycle safety, including the design of new ADA compliant sidewalks to ensure safe routes to destinations, including a number of safe routes to schools.
- Designed curb extensions and new high visibility crosswalks to improve pedestrian safety and to calm traffic. Including retroreflective thermoplastic crosswalks, curb extensions at corners, "turning vehicles yield to pedestrians" signs, "no turn on red" signs, bike lanes, road diets, ADA compliant sidewalk ramps, pavement marking, and parking improvements.
- Implementation of leading pedestrian intervals (LPI) at traffic signals and Rectangular Rapid Flashing Beacons (RRFBs).
- Projects have been done in conjunction with programmed capital improvement projects on city roadways such as Hope Street, Stillwater Avenue, Strawberry Hill/Newfield Streets, Long Ridge Road, and West Broad Street.

Fuss & O'Neill has been providing traffic and transportation services to the City of Stamford for nearly two decades. For the past several years, we have been providing these services on an on-call basis, creating traffic and transportation safety improvements throughout the City. Many of these projects have integrated proven measures to reduce crashes and improve safety. These projects have included design for retroreflective thermoplastic crosswalks, curb extensions at corners, "turning vehicles yield to pedestrians" signs, "no turn on red" signs, bike lanes, road diets, pavement marking, and parking improvements. We have provided survey services at many of these projects.



Hope Street and Tom's Road Improvements

Fuss & O'Neill provided the design for new sidewalks to 200 feet of roadway to improve pedestrian and bicycle safety at Hope Street and Tom's Road after students were seen walking in the streets to Dolan Middle School. Sidewalks were created along the western side of the street which combined sidewalks from the north and south, where previously no sidewalks existed. The improvements included an ADA compliant sidewalk ramp, crosswalk improvements, and bike lanes.

Long Ridge Road Sidewalks and Pedestrian Improvements

Fuss &O'Neill provided the design for sidewalks and pedestrian improvements on Long Ridge Road from Cold Spring Road to Stamford Health Medical Group complex to provide a safe connection from Bull's Head intersection to the complex. This complex is a major traffic generator and located on CT Transit's bus route (line 336), but lacked pedestrian access. The project installed ADA compliant sidewalks and ramps, traffic signal modifications, and new or relocated crosswalks.

Glenbrook Road at Scofield Avenue Improvements

Fuss & O'Neill is providing a conceptual design plan for improvements on the northwest corner of Glenbrook Road and Scofield Avenue intersection, near Julia A. Stark Elementary School. A bump out and curb-line extensions will be implemented to improve the intersection sigh distance for vehicles exiting Scofield Avenue. The design also includes ADA improvements and the design of a new crosswalk spanning Glenbrook Road.

Strawberry Hill Avenue Extension Improvements

For roadway improvements along at the Strawberry Hill Avenue between 5th Street and the intersection of Strawberry Hill Avenue at Prospect Street/Grove Street/Hoyt Street and Hillandale Avenue (five point intersection), our team provided the concept plan for the implementation of bike lanes and lane arrangement revisions. Improvements included re-striping the corridor with consistent lane widths, intersection lane assignments, reconfiguration of crosswalks, accessible sidewalks and sidewalk ramps. Special attention was given to the Strawberry Hill Avenue corridor adjacent to Stamford High School and the existing intersection configuration of Strawberry Hill Avenue at Holcomb Avenue.

Selleck Street and Fairfield Avenue Intersection Improvements

A topographic survey was performed and easement mapping was created for roadway and intersection improvement plans at the intersection of Selleck Street and Fairfield Avenue. Both of these were done under an expedited schedule. The proposed improvements on Selleck Street consist of enhancing and re-defining the lane configurations, as well as identifying the possibility of incorporating on-street parking. During the design phase, easement mapping was needed at Fairfield Avenue when additional scope was applied to the project.

Boxer Square Park Transportation Design

AASHTO AMERICA'S transportation awards 2020 Winner

Fuss & O'Neill provided design services for the reconstruction of the intersection of Stillwater Avenue and Smith Street. This project reduced the overall size of the intersection, eliminated the median island, relocated Boxer Square statue, provided a bike lane on Stillwater Avenue to Smith Street, and increased the size of the park. Intersection improvements included the relocation of the southern curb line and sidewalk, removal of the center island, installation of ADA compliant sidewalk ramps, modifications of the drainage system, and the furnishing of new pavement markings and signs.

Intersection Improvements at Magee and Shippan Avenues

Fuss & O'Neill provided the design concept for Magee Avenue that includes lane dieting, on-street parking on the east side of the roadway, and a dedicated southbound bike lane. On Shippan Avenue, the proposed improvements consist of lane dieting, on-street parking on both the east and west sides, and a north-bound dedicated bike lane. Additionally, a concept design for a roundabout at the intersection of Magee Avenue, Shippan Avenue, and Harbor Drive has been completed to improve traffic flow and increase pedestrian and bicycle safety.

Greenwich Avenue Corridor Improvements and Roundabout Design

Fuss & O'Neill advanced the preliminary design alternative of a roundabout through remaining design submissions as part of CTDOT's LOTCIP. Planned improvements included the design of new sidewalks and RRFB actuated crosswalks, replacement of the stop-controlled intersection with a roundabout and revisions to the approaching roadway alignments. The roundabout design considerations consisted of geometric constraints, grading, drainage, lighting, coordination with overhead and underground utilities, property impacts, and enhanced erosion and sedimentation control elements due to CTDEEP coastal permits.

Additional Projects with Pedestrian Safety Elements

Stamford, CT

Bridge Street and Roxbury Road Concept Plan

256 Washington Boulevard Concept Plan

Summer Street HAWK Conceptual Layout

Glenbrook Road at Scofield Avenue Improvements

Bedford at Forest/Prospect Concept Plan

Franklin Street Concept Plan

Greylock Place Concept Plans

Bedford Street at 3rd Street Improvements

Turner Road Improvements

Waterford Lane Park Improvements

Stamford Purple Bridge Concept Plan

Cul-de-sac Design at Main Street

Roxbury Road Improvements

Citywide Signal Upgrade System Phases D, E, F, and G

HAWK Signal Design

Southfield Avenue at Dolphin Cove Crossing

Garden Street Streetscape Graphics

Long Ridge Road Pavement Re-Striping

Greenwich Avenue at Milton Street Pedestrian Crossing

Selleck at Fairfield Avenue Improvements

South State Street at Washington Boulevard

Harbor Drive Concept Plan

East Main Street Improvements

West Broad Street Improvements

Hartford Riverwalk

Riverfront Recapture, Inc, - Hartford-Windsor, CT

Fuss & O'Neill has provided design, permitting and construction documents for multiple phases of the waterfront park and multi-use path system on Connecticut River. Including Bulkeley Bridge Walkabout, Riverwalk North, Riverwalk Downtown, Riverwalk South/ Gateway, and renovation of Charter Oak Landing and Riverside Park including boat ramp. Total project area approximately 14 acres with a 1.5 mile trail system. Challenges such as environmental contamination, State and Federal regulatory issues (EPA, DEEP, ACOE), property ownership issues, and limited development and maintenance costs have been met successfully. Key components include creative design and engineering solutions due to narrow site constraints, replacement of a portion of the existing floodwall with flood control gate for daily on-grade access under I-91 from historic Coltsville Complex area, and design to withstand periodic flooding and minimize hydraulic impacts. Once fully completed, Riverwalk will reconnect the local communities to the river through a continuous, accessible, multi- use path system extending from Riverside Park south to Charter Oak Landing.

Large Project Area - The Riverwalk North Extension project extends along the Connecticut River from the Greater Hartford Jaycees Community Boathouse northerly for approximately 2.5 miles towards Windsor.

Multidisciplinary Project - We are providing survey, design, permitting, and construction support.

Connecticut Department of Transportation On-call Experience

Environment

Community

Infrastructure

With one of the largest traffic and transportation engineering departments in Connecticut, further supported by our diversity of disciplines, we provide a wide range of services to the Connecticut Department of Transportation (CTDOT). We currently serve as the CTDOT's Task-Based Traffic and Safety on-call consultant, the Environmental Planning Studies and Regulatory Investigations consultant, and the Task-based Bridge Rehabilitation/ Replacement on-call consultant.

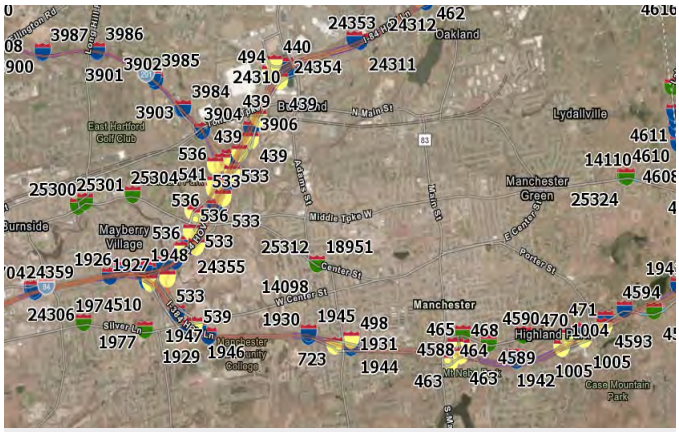
We have experience in all facets of traffic/transportation engineering, including corridor studies, traffic signal system analysis and design, highway signing, bridge design, safety studies, wetlands permitting, traffic impact studies, parking studies, at-grade railroad crossing, NEPA, CEPA, Environmental Impact Assessments, pedestrian safety considerations, pavement markings, as well as maintenance and protection of traffic.

Our years of service have given us a thorough understanding of CTDOT expectations and design standards. Knowing their policies and procedures translates to less re-work. Our established relationships keep tasks on schedule and within budget.

RELEVANT CTDOT PROJECTS

CTDOT District 1 APS Signal Design - Hartford, CT

- Designed the upgrade of existing pedestrian control features at 53 locations in the Hartford area.
- Project work included construction/reconstruction of curb ramps, blended transitions, and sidewalk extensions.

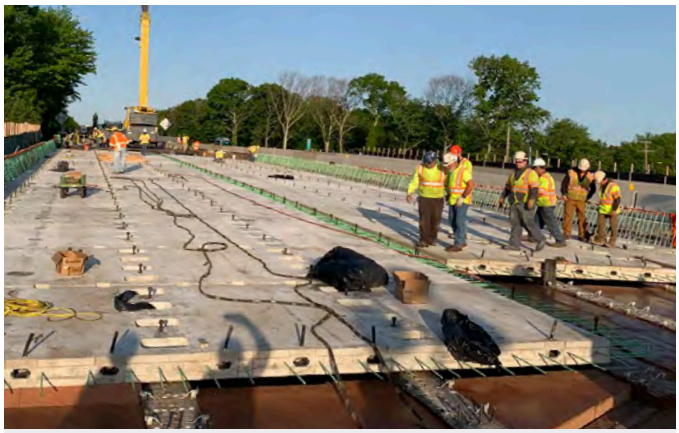


Horizontal Curve Signing - District 1, CT

- Performing field reviews of existing conditions.
- Utilizing a ball-bank indicator to determine appropriate advisory speeds.
- Developing construction plans for installing horizontal curve warning signs and advisory ramp speed signs.

CTDOT District 4 Clearance Retiming - Various, CT

- Retimed yellow and red vehicle traffic control signal clearance intervals, pedestrian clearance intervals, and pre-emption settings at approximately 341 state-owned and -maintained traffic control signals in 42 towns.
- All plans and designs were prepared and submitted in accordance with CTDOT's Digital Design Environment.



I-395 over Route 84 Bridge - Waterford, CT

- Rehabilitating Bridge No. 00255, a 182-foot-long, two-span steel beam and concrete deck structure.
- Replacing the existing 7.25-inch-thick reinforced concrete deck with 8.5-inch-thick precast reinforced concrete deck panels continuous over the pier.
- Providing construction administration support.

Botanical Survey for Realignment of Route 34 over the Housatonic River - Oxford/Monroe, CT

- Focused the survey on this 42-acre site during the blooming period, in which plant species are most easily identified.
- Conducted the meander surveys and collected specimens for identification purposes.
- Compiled a list of all plant species observed within the survey area and compiled a map of species locations.
- Compiled a final report for the DOT after consultation.

ADDITIONAL CTDOT PROJECTS:

Enhancement Program Liaison - Statewide

Route 2 over West Road Bridge Repair - Marlborough, CT

District 3 Signal Design - Various, CT

Route 147 Bridge over Coginchaug River Replacement - Middlefield, CT

Northern Long-Eared Bat Acoustic Surveys - Various, CT

Route 70 Bridge over Broad Brook Replacement - Cheshire, CT

Railroad Station Environmental Assessment and Impact Evaluation - Orange, CT

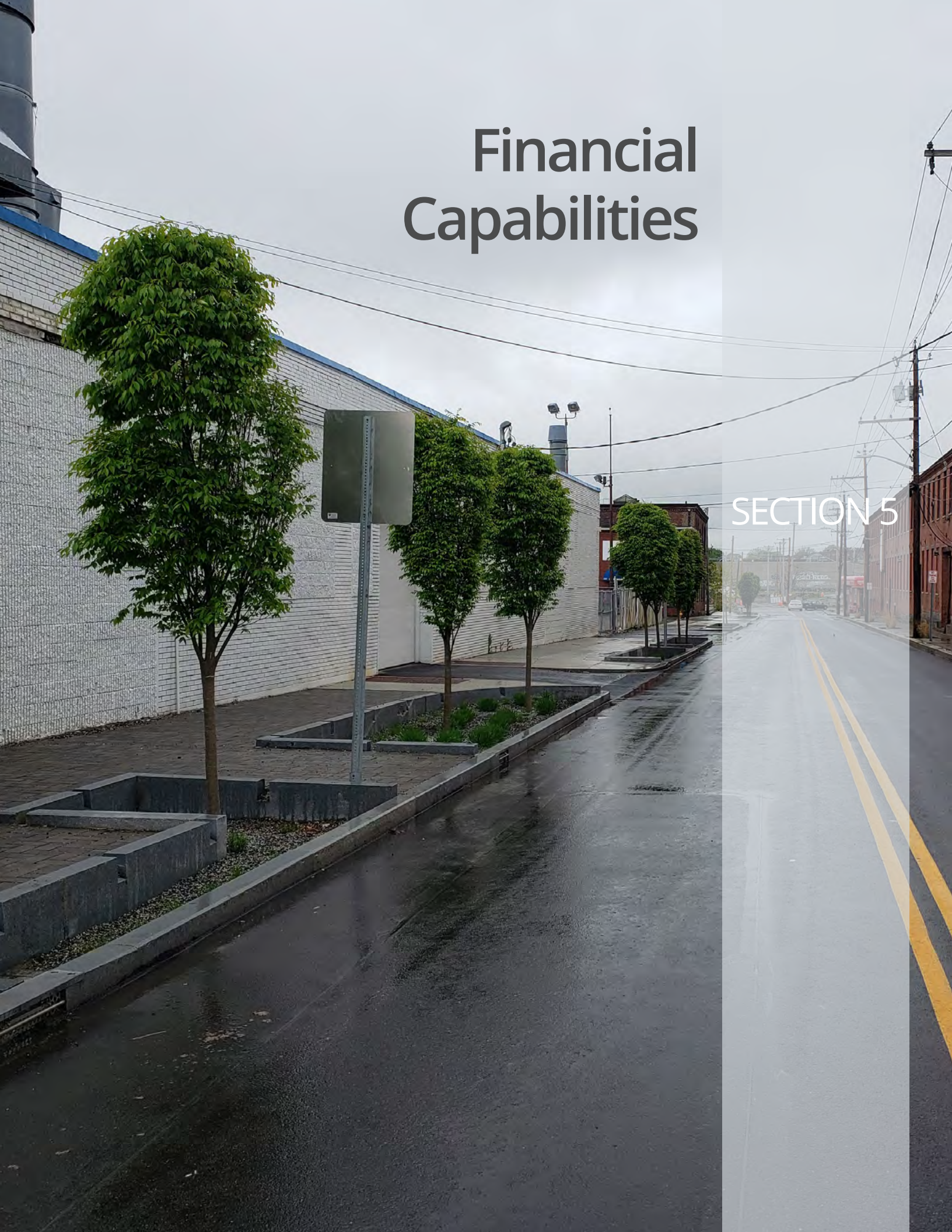
Route 2A over Poquetanuck Cove Bridge Rehabilitation - Preston, CT

Airport Road over Route 15 Bridge Repair - Hartford, CT

I-84 over Market Street Bridge Repair - Hartford, CT

Route 207 over Beaver Brook (Culvert Rehabilitation) - Franklin, CT

I-84 over Metro North Railroad Bridge Repair - Waterbury, CT



Financial Capabilities

SECTION 5

Section 5: Financial Capabilities

Fuss & O'Neill has worked on multiple City of Stamford projects in the last three years. As specified on page 15 on the RFP, financial capabilities information is not required in this case.

Fuss & O'Neill's gross revenues have risen for more than ten years. Bank of America's commitment of a seven-figure revolving line of credit to Fuss & O'Neill is a strong indication of their confidence in our financial stability, sound management practices, professional integrity, and practical fiscal understanding. Fuss & O'Neill can provide additional data on the firm's financial stability if requested.

Project Understanding, Approach, Scope of Services, and Project Schedule

SECTION 6

Section 6: Project Understanding, Approach, Scope of Services, and Project Schedule

Project Understanding and Key Issues

It is our understanding the City of Stamford is seeking the services of a consulting engineering firm to provide design services for the preparation of construction contract plans and documents for sidewalk and access improvements within the vicinity of several public schools and transit facilities in Stamford. Fuss & O'Neill understands the purpose of this project is to improve pedestrian safety, as well as traffic operation and flow at the following locations as identified in Section 2.0 of the RFP:

- West Hill High School and Roxbury Elementary School
- Dolan Middle School and Toquam Elementary School
- Newfield Elementary School and AITE High School
- Scofield Magnet Middle School and Northeast Elementary School
- Stillmeadow Elementary School and Westover Elementary School
- Davenport Ridge, Turn of River, and Springdale Schools
- 0.25-mile Walkshed of CT Transit Bus Lines

Our design professionals understand that a successful project starts with understanding the City's vision of being a place where people of all ages and abilities can safely and conveniently walk and bicycle to all destinations. Addressing the physical elements while creating an inviting, safe and efficient design for all users will be our focus.

Following our thorough review of this RFP and based on our knowledge and full research of information, the City has recently completed the Stamford Bicycle and Pedestrian Plan (2019) which acknowledges there are numerous schools that can be made accessible by pedestrians, including young children within one mile, if safe and comfortable facilities existed. Fuss & O'Neill understands that walking is an essential means of transportation for students in Stamford since the public school district does not provide service to students that reside within that range.

The Bicycle and Pedestrian Plan also references the Neighborhood Traffic Calming Master Plan (2011) which is used as a baseline to identify locations where there are gaps in the City-wide sidewalk system. The Traffic Calming Plan also serves as a blueprint showing traffic calming improvements that can help slow speeding vehicles, reduce cut-through traffic, and better manage traffic on non-residential streets. Together, these two studies have received significant support from the surrounding community through an extensive series of public/stakeholder outreach, design charrettes, and neighborhood meetings.

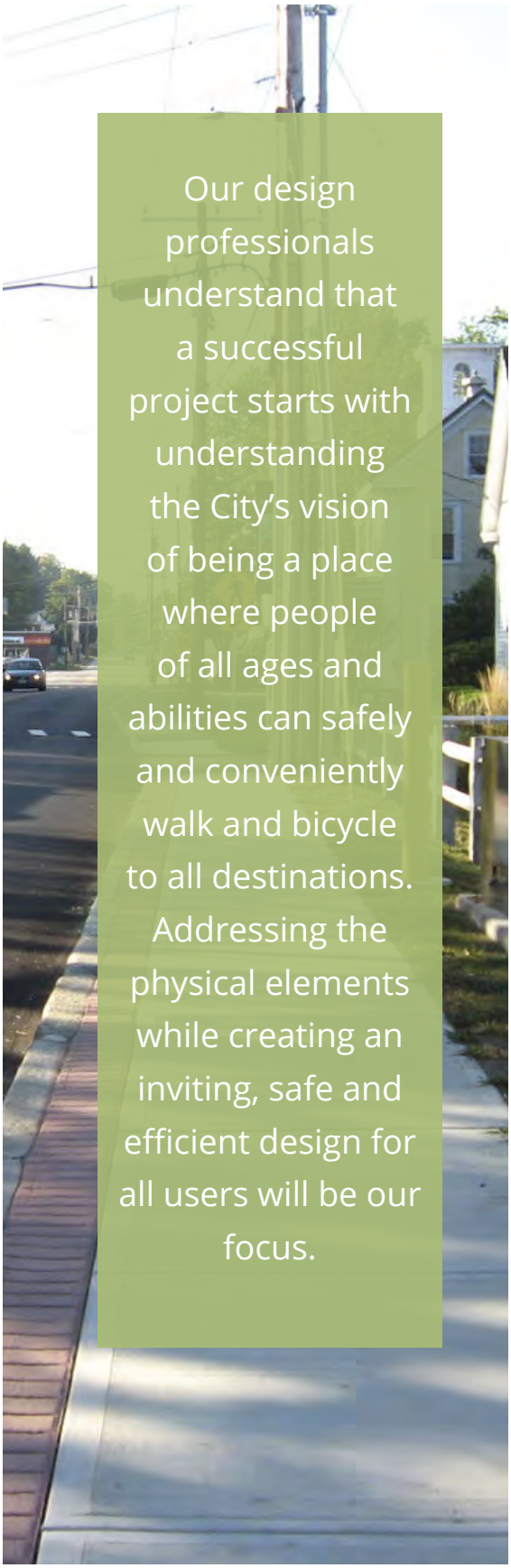
After reviewing each of the project sites, Fuss & O'Neill is aware of the potential challenges that exist:

- Lack of available right-of-way width
- Drainage impacts where new curbing may be necessary
- Existing obstructions (fire hydrants, utility poles, vegetation, etc.)
- Rock excavation
- Existing steep slopes adjacent to the roadway
- Disruption to local traffic and private property during construction

It is our understanding this Safe Routes to School and Access to Public Transit Facilities project intends to create additional safe crossings to schools and remove barriers that prevent more students from walking to school. This would also improve existing operations at school drop-off/pick-up zones or locations by reducing traffic volume. The following improvements are anticipated:

- Reconstruct existing deteriorated sidewalk/Construct segments of new sidewalk
- Sight distance improvements within existing ROW (revised geometry, clearing of vegetation)
- ADA-compliant pedestrian ramps
- High visibility drop-off/pick-up zones
- High visibility crosswalks and signage
- Road Diet
- Curb Extensions
- Upgrade metal beam rail to current MASH standards

Through our on-going projects and close relationships within the City, Fuss & O'Neill has learned that this project will likely be 80% federally funded by the Surface Transportation Block Grant Program Set-Aside (STBG), which replaces the Transportation Alternatives Program (TAP). As such, the CTDOT's Local Roads Unit will provide oversight of design activities. Fuss & O'Neill will complete all tasks as outlined in Section 2.0 of the RFP on a schedule to be established by the City of Stamford and/or Federal/State Department of Transportation to meet the project funding deadlines.



Our design professionals understand that a successful project starts with understanding the City's vision of being a place where people of all ages and abilities can safely and conveniently walk and bicycle to all destinations. Addressing the physical elements while creating an inviting, safe and efficient design for all users will be our focus.

Design of the sidewalk will comply with Section 12.K – SIDEWALKS of the Stamford Zoning regulations. Construction contract plans and documents shall conform to the State of Connecticut Department of Transportation's Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, FORM 818 including latest supplements. A separate set of contract plans and specifications will be prepared for each of the school areas identified in Section 2.0 of the RFP.

Project Approach

Fuss & O'Neill's project team approach is to work with the City of Stamford to ensure that the purpose and need of this project are established and achieved. Our team has reviewed the project description and desired work elements included in the request for proposals and will perform all services in accordance with City and CTDOT standards. Additionally, Fuss & O'Neill's numerous projects that have been performed for private clients throughout the City help solidify familiarity with City requirements. We have performed design services for many projects that are administered by municipalities with CTDOT oversight and federal funding and we are intimately familiar with the requirements of projects administered this way.

The Fuss & O'Neill project team will approach the project in a context sensitive way to design a useful, practical pedestrian facility in a cost-effective manner. This will include the following:

- Preservation and enhancement of natural resources within each corridor.
- A design that can be implemented with minimal disruption to adjacent properties and the environment.
- Enhanced usability and safety for all sidewalk users.
- A design that functions on a fiscally responsible maintenance regimen

Fuss & O'Neill will team with Pereira Engineering, LLC (Pereira) for survey services to form a solid team with regional and local experience. Our team will draw upon its collective experience to meet the challenges and opportunities of providing multi-disciplined services for this project.

The proposed technical approach for this project will include the following major tasks:

- Right of Way & Topographic Field Survey
- Permitting
- Design Meetings, Utility Coordination & Public Involvement
- Concept Design
- Preliminary Design (30%)
- Semi-Final Design (70%)
- Final Design (100%)
- Bidding Assistance & Design Services During Construction

Right-of-Way and Topographic Field Survey

Under this task, existing information will be collected and reviewed, including the City's flight data, current City reports, maps and project documentation. A visual inspection of the site will be performed to determine site constraints and evaluate potential improvements, including sight distance. Supplemental information will be sought from the City and area utilities as required.

Pereira will develop a working model space drawing for each project site using 2016 Aerial Imagery provided by the Capital Region Council of Governments. Pereira will also prepare a Class A-2 baseline where necessary throughout the project limits. Horizontal control shall be tied to the North American Datum (NAD 83) and vertical control shall be tied to the North American Vertical Datum (NAVD88). Ties to this control will be made available to the City upon request. All survey field notes, baseline stationing, on-site benchmarks, control point ties, and project coordinates shall be in English units. A minimum of two (2) permanent benchmarks will be required and maintained throughout each project site. The City's flight data with one (1) foot contours and property lines will be imported into the working space model to complete the preliminary survey base map.

Fuss & O'Neill will review the preliminary survey base map and identify areas that will require supplemental topographic field survey or easement/taking property maps. Pereira will prepare a Class T-2 topographic survey within the project limits as defined by the area between center line of roadway to five (5) feet behind the sidewalk. This will also include field measurement for location of all overhead and underground utilities, utility pole numbers and ownership, location and elevations of manholes, hydrants, size and invert elevation of storm water drains and sanitary sewer lines. The topographic field survey will also include locations for edge of pavement, trees, stonewalls, and permanent street furniture within the survey corridor. All topographic field survey will be performed under approval of the City Project Manager.

The final base map will be prepared using the latest version of AutoCAD Civil 3D with contours generated at a one (1) foot interval and at a plotting scale of 1" = 20'. All mapping will be in compliance with the CTDOT Location Survey Manual. Right of way lines, property lines, easements, means of ingress and egress, and apparent boundary encroachments will conform to horizontal accuracy Class A-2. The survey will be in accordance with the Regulations of Connecticut State Agencies and the "Standards for Surveys and Maps in the State of Connecticut" adopted by the Connecticut Association of Land Surveyors.

Permitting

Just prior to beginning design, Fuss & O'Neill will request, if necessary, a review of the project site through CTDEEP's Natural Diversity Database (NDDB) to ensure our design accommodates wildlife or plant life that need special consideration/handling during construction. An initial review of the current NDDB maps (published December 202) for Stamford indicates the project corridor is not within any areas that are indicative of the presence of a State or Federal listed species.

Construction of this project is anticipated to require an environmental permit due to the anticipated total area of disturbance. Additional project coordination with other agencies may be necessary. A permit from CTDOT District 3 Maintenance will be required for any work in the State right of way. The anticipated permitting application and coordination efforts will be confirmed

in coordination with CTDOT but are anticipated to include:

- CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities Permit
- CTDOT Encroachment Permit

The project team will be sure to collaborate their permitting efforts with the City of Stamford and will work with their regulatory Boards and Commissions to ensure a project outcome that fits the needs of community residents.

Design Meetings, Utility Coordination and Public Involvement

Design Meetings

Fuss & O'Neill anticipates a project kick-off meeting with the City and progress meetings at agreed upon milestone intervals to obtain project input from City staff as well as receiving input from CTDOT.

Utility Coordination

Fuss & O'Neill strongly believes that early coordination with utility companies on any project results in fewer delays during construction as a result of utility conflicts. Early coordination will be initiated with utilities during the preliminary design phase to determine whether utility companies have existing or planned facilities through the project area. An initial review of the corridor indicates there are various underground water, sewer, and gas, including indications of electric and telecommunications facilities, located throughout the project limits. Utility coordination will be required especially where obstructions, such as utility poles, either currently exist or will conflict with new sidewalk construction.

Public Involvement

Engaging public involvement and opinion in the design process is a critical milestone that Fuss & O'Neill will help the City achieve through our experience with Public Outreach efforts. We will work with the site stakeholders, residents, businesses, and City personnel to design a plan for each school area that will be mutually agreeable to all parties. Our transportation engineers and design professionals will work together to develop the desired improvements that balance property constraints, natural resources, accessibility requirements, and aesthetic improvements. Fuss & O'Neill has improved the public involvement experience for other similar projects by presenting rendered photos showing existing project areas with superimposed proposed sidewalk improvements. This provided a visual representation of what the proposed improvements would look like after construction and had a great impact during the public involvement process.

Having completed numerous pedestrian connectivity projects, our team has the experience and expertise to lead successful meetings and to induce the participation process. If the City prefers a virtual public information meeting, Fuss & O'Neill is extremely adept at presenting projects in the virtual environment. Fuss & O'Neill has presented in multiple virtual public information meetings for various municipalities for more than a year and can present using various virtual meeting platforms.

A public information meeting for each school area will be conducted to present conceptual design level plans and solicit ideas and concerns from neighboring properties, organizations & businesses, and other potential sidewalk users. Public review and comments will be assessed with the City and incorporated into the design of the project if warranted and feasible. Meeting minutes with action items will be generated from the public information meeting during the presentations and later submitted to the City for the record. The action items will be addressed and incorporated into the project documents where warranted and feasible. A second meeting for each school area will be conducted to present the preliminary design plans which will address comments made on the concept plans.

Fuss & O'Neill will arrange for necessary recording equipment for each meeting. A copy of the typed transcript along with the actual recording will be provided to the City within 72 hours of the meeting. The City shall be responsible for developing and publishing the Legal Notice for each meeting with the community.

Concept Design

Following completion of base map development, conceptual plans at a scale of 1 inch = 20 feet will be produced for each school area. Conceptual plans will provide horizontal alignments, layout of sidewalk and access improvements, and preliminary right of way impacts to adjacent private properties. These plans will be submitted to the City and presented at the public informational meeting for each school area. Preliminary construction estimates, including potential right of way and utility costs, will also be developed.

Preliminary Design (30%)

Preliminary design plans will be produced based on our field investigation findings, studies, natural resource considerations, input from Public Information Meetings, and City staff. The proposed plans will include at a minimum: existing topography, minor drainage improvements, miscellaneous details, sidewalk and access improvement layout, horizontal alignment, construction plans, roadway profiles (if necessary), critical cross sections, signage and pavement markings, and will also identify potential right of way impacts and utility conflicts along with requirements for test pitting. Review of the preliminary design plans by City staff and CTDOT staff is essential in determining the final location of sidewalks. Fuss & O'Neill's project team will develop the design in coordination with the City and CTDOT.

Fuss & O'Neill will also identify any potential needs for downstream drainage improvements as a result of this project. Areas where new curbing will be necessary for sidewalks may require storm sewer and gutter flow analysis to determine any affects on the downstream drainage system. A report will be developed that will identify potential needs for downstream drainage improvements, including estimated costs.

All right of way impacts to adjacent private properties will also be identified at this preliminary design phase. The Fuss & O'Neill team has extensive experience preparing easement maps indicating easements and/or taking areas for the project, if required. Having a thorough understanding of the CTDOT requirements will facilitate the preparation of the maps and minimize

review periods. After preliminary review, we do foresee the need for several easement maps since there are areas of new sidewalk proposed where it did not exist previously.

Semi-Final Design (70%)

Upon acceptance of the preliminary design plans from the City and CTDOT review and public information meetings, Fuss & O'Neill will review the comments and ideas generated from reviews performed by the City and CTDOT as well as the comments generated at the public informational meetings. Comments will be incorporated, where warranted and feasible, into a Semi-Final Design (70%) submission to the City and CTDOT. The Semi-Final Design submission will include drawings with sufficient construction detail, including construction staging areas, a Semi-Final Design opinion of probable construction costs, and draft specifications for each of the school areas.

Final Design (100%)

Fuss & O'Neill recommends requesting that CTDOT forego its requirement for the Final Plans for Review Submission (90%) due to the nature of the project in an effort to expedite the project schedule.

Upon acceptance of the semi-final design plans from the City and CTDOT review, Fuss & O'Neill will review and incorporate any comments, where warranted and feasible, into a Final Design (100%) submission to the City and CTDOT. The final design submission will include final bid packages for each of the school areas, as well as any required design certifications.

Bidding Assistance and Design Services During Construction

Fuss & O'Neill will provide electronic construction contract plans and specifications for bidding each of the school areas, and assist the City in preparing bid forms, unit price schedules and estimates. Fuss & O'Neill will respond to information requests (RFIs) and prepare addendums if necessary. Fuss & O'Neill will perform a bid analysis of the contractor bids and provide a recommendation for award based on the bid analysis.

Fuss & O'Neill will review all shop drawings for specialty products when warranted.

Post Construction Service

Fuss & O'Neill believes follow up after construction has been completed is as important as any other part of the design process. This phase is beneficial to both the designers and the end users ensuring that all facets of the design have been properly implemented and are functioning appropriately. Fuss & O'Neill can prepare as built record drawings and a project site reference manual to include all project related specifications, procedures and warranty information. Fuss & O'Neill can also perform a post construction site walk and meeting with the City and community stakeholders to facilitate site turnover and overall project review. Fuss & O'Neill prides itself on a community-based approach throughout our process and is available to answer questions well after the project is performed.

Scope of Services

At your request, we are pleased to provide this detailed scope of services for transportation engineering support services for the proposed sidewalk, drainage and/or public transit improvements throughout your city. The scope of services provided below will be tailored to each project site with sub-tasks since Addendum No. 1 noted multiple construction contracts will be generated from this work.

Task 01 – Right of Way & Topographic Survey

Topographic Survey

We will import and review the City of Stamford's available flight data and conduct supplemental Topographic Surveys and generate Right of Way (ROW) boundaries for each project site where necessary. The goal is to create a base map for the project that can be used for the design of the proposed sidewalk and pedestrian facility improvements.

The local land records will be researched for mapping, title and utility information pertinent to the above-referenced property and abutting properties. Local utility companies listed on the Connecticut Department of Transportation Utility Owners by Town List will be contacted for information pertinent to the location of their underground and overhead utilities within the project area.

Horizontal control for the survey will be based on the North American Datum of 1983 (NAD 83) and vertical control will be based on the North American Vertical Datum of 1988 (NAVD 88).

The field survey will incorporate the location of the following property and topographic features: property and street right-of-way monumentation, walls, fences, trees, buildings, structures, driveways, edge of pavement, edge of parking, pavement markings, top and bottom of curbs, walks, plantings, visible signs of utilities, utilities marked out by others, top of frame and invert elevations of storm and sanitary sewers, manholes, water gates, gas gates, electric and telephone hand holes, poles, signs, and lights.

Visible evidence of encroachments and/or easements will also be located and depicted on the survey. Field locations of property boundaries will be compared to title information. Any discrepancies will be resolved or depicted on the plan.

Mapping will be prepared using AutoCAD Civil 3D software and contours will be depicted at one foot intervals. Finished floor elevations will be depicted for buildings and structures within the project area. Spot elevations will be depicted at entry/exit doors. The plan will also depict the location of features collected by the field survey. Flood zones and Aquifer Protection Areas within the project area, if any, will be depicted using current Federal Emergency Management Agency (FEMA) FIRM and local mapping, respectively.

The field survey will be prepared in accordance with the accuracies of a Class A-2 Property/Boundary Survey and a Class T-2

Topographic Survey as defined in the "Standards for Surveys and Maps in the State of Connecticut," prepared and adopted by the Connecticut Association of Land Surveyors, Inc., August 29, 2019.

Task 02 – Permitting and City Approvals

Permitting

We anticipate preparing three (3) permit applications and/or obtaining three (3) approvals: a CTDEEP General Stormwater permit, a CTDOT Encroachment permit and city approvals from either the Engineering Bureau and/or the Environmental Protection Board. Any other permits that need to be prepared are not part of this design proposal (see assumptions below).

- CTDOT Encroachment Permit
  - Fuss & O'Neill will prepare a submittal to the CTDOT District 3 office for encroachment permit review any proposed work in the State right of way. This work shall include but is not limited to the design of sidewalks, curbing, accessible ramps, signing and pavement markings, landscape and/or turf establishment elements, and/or drainage improvements.
    - The submittal will contain a letter and the Preliminary Design (30%) plans as the Encroachment Permit will be submitted after the PD phase.
    - It is assumed that the encroachment permit review will not require major changes to the design as to alter the project's intended design.
    - Fuss & O'Neill will re-submit the design plans and a response letter with the Semi-Final Design (70%) submission which incorporates any comments District 3 had pertaining to the PD set.
    - A second round of comments, if necessary, will be included in the Final Design (100%) submission.

- CTDEEP General Stormwater Permit
  - This general permit authorizes the discharge of stormwater and dewatering wastewaters to surface waters from construction activities on a site, as defined in this general permit, with a total disturbance of one or more acres of land area on a site, regardless of project phasing.
  - Based on the total area to be disturbed by the subject project, CTDEEP will require an application for the "General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities". The following are services necessary to complete these requirements.
    - We will complete the CTDEEP registration form for the stormwater General Permit which will also be stamped and signed by a Professional Engineer. A Stormwater Pollution Control Plan (SWPCP), specific to the site, will be developed to meet the requirements of the CTDEEP General Permit.
    - The permit registration and/or application fee will be covered and paid for by the City of Stamford.
  - During construction, the permit also requires weekly inspections by a qualified professional and monthly turbidity monitoring to ensure compliance with the permit. We assume that City forces or the Construction

Inspector will be responsible for this work; therefore, no fees associated with stormwater inspections or monitoring have been included in this agreement.

- The Department of Energy and Environmental Protection (DEEP) gave notice of a tentative decision to reissue with modifications the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (construction general permit) The Department intends to reissue the construction general permit with modifications to become effective on October 1, 2021. Based on a preliminary review of a draft of the construction general permit that will be reissued, we assume that turbidity monitoring will not be required. Therefore, no fees associated with turbidity monitoring have been included in this agreement

- City Approvals
  - Fuss & O'Neill will meet with the City staff to receive their initial feedback regarding the project and confirm the approval process (one meeting assumed). We do not anticipate a presentation to the Planning & Zoning Commission will be required for approval. Additional activities that we anticipate providing include:
    - Respond to Engineering or EPB comments, performing revisions to the plans to facilitate approval, and perform revisions to plans for final filing. We have included one (1) round of revisions per project to address technical comments from the City staff.

Task 03 – Design Meetings, Utility Coordination & Public Involvement

Scope Review/Assignment Meeting

- Fuss & O'Neill will organize one (1) kick-off meeting.

Design Development Meetings and Coordination

- Fuss & O'Neill will attend two (2) meetings for design-related discussions/reviews and status updates after the Preliminary Design (30%) and Semi-Final Design (70%) submissions.
- We will participate in bi-monthly video conference calls with City staff to coordinate design elements, discuss proposed conditions and convey any potential issues. We anticipate up to twelve (12) video conference calls.
- A separate agreement can be provided if attendance at additional meetings is requested.

Utility Notification Letter, Meeting and Coordination

- Fuss & O'Neill will send a project description and location plan to all utility companies listed on the CTDOT Utility Contact List that have facilities in the vicinity the proposed design project.
- Fuss & O'Neill will coordinate with those utility companies whose facilities are affected by the proposed improvements.
- Coordination will begin after the Preliminary Design (30%) submission.
- Fuss & O'Neill will attend one (1) field utility meeting per project before the Semi-Final Design (70%) phase in order to familiarize the utility companies with the proposed improvements and incorporate any recommendations or

adjustments necessary based on the utility owners review.

Public Information/Involvement Meetings

- Fuss & O'Neill will attend and conduct stakeholder meetings for each school area in the City of Stamford at the following design stages:
    - Following the Concept Design
    - Following the Preliminary Design (30%)
    - A total of 14 meetings have been assumed for this project to discuss the proposed improvements
- Fuss & O'Neill will assist in producing the subsequent material and will communicate the following items:
    - It is assumed the City of Stamford will run all public information meetings, confirm facility availability, arrange the meetings to be held in the neighborhoods or either fully virtual or hybrid as well as develop all Legal Notices to be published in the local newspaper at least 10 days prior to the scheduled date of each meeting.
    - Fuss & O'Neill will arrange for necessary recording equipment for each meeting
    - Fuss & O'Neill will develop presentation via PowerPoint
        - Describe early analysis findings
        - Provide photographs
        - Create boards to display applicable data
        - Present concept drawings
        - Request input and/or concerns
    - Conduct record keeping and provide documentation by generating one (1) copy of the typed transcript of each subject project's meeting along with the actual recording of the meeting and a PDF of the transcript within 72 hours of the meeting.
    - Depict updated drawings by presenting Preliminary Design (30%) plans at the second meeting
- We have assumed these meetings can be in held in person but are prepared to facilitate the meeting in a virtual platform such as Zoom, Webex, Microsoft Teams, or Google Meet if an in person meeting is not feasible.

Task 04 – Concept Design

This phase of the project will advance the plans to a design completion of approximately 10%. All plans will be provided at a scale of 1 inch = 20 feet, unless otherwise noted. The conceptual drawings will provide initial alignments, layouts, and impacts to be reviewed and discussed. An on-site field review will be completed, and opinion of costs will be generated to determine approximate construction values associated with each project. The conceptual drawings produced within this task will be utilized to initiate the first public outreach or information meeting, see Task 03.

Task 05 – Preliminary Design (30%)

This phase of the project will advance the plans to a design completion of approximately 30%. All plans will be provided at a scale of 1 inch = 20 feet, unless otherwise noted.

Preliminary Horizontal and Vertical Design

- Develop preliminary baseline alignments and horizontal geometry for all segments as necessary in accordance with the following resources:
  - Highway Design Manual; Connecticut Department of Transportation, Revised 2013
  - City of Stamford Zoning Regulations, Section 12K
  - A Policy on Geometric Design of Highways and Streets; American Association of State Highway and Transportation Officials, Seventh Edition, 2018
  - Urban Street Design Guide; National Association of City Transportation Officials, 2013

Preliminary Drainage Design

- Fuss & O'Neill will develop plans and details to relocate existing storm drainage facilities that are necessary to provide safe and accessible routes. Fuss & O'Neill will request information from City engineering staff on drainage issues that they are aware of.
- We will develop preliminary layout of structures, outlets and pipes. Improvements will be limited to relocating the existing drainage inlets and connecting to the existing system.
- A stormwater narrative will be provided for each subject project location to identify proposed improvements or further evaluations of the downstream stormwater network, if necessary.

Cover, Gen. Notes & Legend, Index Plan and Exist. Conditions Plans

- A preliminary cover sheet, general notes and legend plan, index plan and existing conditions plan will be created indicating the project area and the topographic layout.
- Miscellaneous Details
- Preliminary details anticipated for construction will include items such as the following: curbing, pavement sections, sidewalks, pavement markings, erosion control systems, ADA-compliant pedestrian ramps, etc. Fuss & O'Neill will utilize the City of Stamford details for the design of sidewalk.

Retaining Wall Design

- Areas that necessitate the incorporation and design of a retaining wall due to physical constraints, Right of Way impacts, or grading concerns will require additional information and details within the contract documents.
- Develop a retaining wall specification, if necessary.

Typical Cross Sections Plans

- Typical Cross Sections will only be developed for roadway segments that entail improvements such as road diets or recharacterization of streets.

Construction Plans

- Construction plans utilizing the horizontal alignment/baselines will be used to identify the proposed layout, materials, and construction activities necessary to reconstruct roadway corridors and intersection improvements.
- The baseline information will be provided in order to establish the alignments within the field. The centerline information will assist in locating and constructing the proposed roads or sidewalks within the project area.
    - Right-of-Way and Rights to Construct Designations
        - We do anticipate property acquisitions, permanent easements and/or land swaps for this project. Therefore, Fuss & O'Neill will create a Schedule of Property Owners table for those affected properties indicating the type of encroachment and estimated area where applicable. This table will be incorporated within the design report.
        - Any required and/or formal right-of-way, taking or easement maps can be provided, if requested, at an additional cost. See allowances below.
        - We do also anticipate the need to obtain temporary rights for incidental construction. These areas will be identified on the general construction plans. Rights may consist of but are not limited to; Right to Grade, Right to Construct Sidewalk, Right to Construct Driveway, Right to Install Fence, Right to Install Sedimentation Control Systems etc.

Profiles

- Develop preliminary profiles and vertical geometry for the project routes where necessary. The proposed profiles will be designed in accordance with the above mentioned references. Special attention will be given to the crosswalks to ensure approved grades are met per ADA and/or PROWAG requirements.

Grading, Drainage and Erosion & Sedimentation Control Plans

- Preliminary drainage modifications and erosion control & sedimentation features will be shown in approximate locations based on the proposed horizontal geometry and preliminary profiles. The drainage design and its' associated structures and pipes will be advanced once all test pits are performed and underground utilities are identified after preliminary design.
- Rights to install erosion control may be necessary. These designations will be shown within the general roadway construction plans as previously mentioned.
- Preliminary grading will be advanced in the following design phase.

Preliminary Design (PD) Plans

- Preliminary plan sheets, as detailed in the PD Submission section below and described above, will be developed for each of the roadway segments, consistent with CTDOT standard practice for preliminary design plans. We expect to work closely with City Staff in completing the preliminary design.

Preliminary Design Construction Cost Estimate

- Fuss & O'Neill will prepare a preliminary construction cost estimate, based on the Cost Estimating Guidelines (2019).

Preliminary Design Report

- The Preliminary Design Report will include, but not be limited to the following contents: Project Description, Design Exceptions, Traffic Control, Rights of Way, Crash History, Utilities, Schedule, and Construction Cost.

PD Submission

The Preliminary Design Submission to the City will include the following materials in Portable Document Format:

- Electronic copy consisting of:
  - Cover Sheet
  - General Notes & Legend Plan
  - Index Plan
  - Existing Conditions Plans
  - Miscellaneous Details
  - Typical Cross Sections Plans
  - Construction Plans
  - Profiles
  - Grading, Drainage and Erosion & Sedimentation Control Plans
- Electronic copy of Preliminary Design Construction Cost Estimate
- Electronic copy of Preliminary Design Report

Post-Submission Tasks

- Submission of Plans to Utilities & Field Utility Meeting – See Task 03
- Submit Encroachment Permit Request – See Task 02
- Coordinate Test Pits – See Task 07
- PD Review Meeting – See Task 03

Task 06 – Semi-Final Design (70%)

Respond to PD Comments

- Fuss & O'Neill will respond to one (1) round of comments from the City and CTDOT in regards to the Preliminary Design submission to progress the design into the Semi-Final Design (70%) phase. It is assumed that all PD comments will be provided at one time prior to the initiation of SFD design.

Semi-Final Horizontal and Vertical Design

- Fuss & O'Neill will finalize the proposed geometry, horizontal alignments and vertical baselines for all segments as necessary within the project limits.

Utility Test Pits

- This activity shall include labor, equipment, and materials to locate the proposed test pit location, dig the test pit, monitor the operation, collect required information, and repair the roadway. One day of test pits is included in this proposal for a Fuss & O'Neill staff member to attend & record pertinent information.
- Fuss & O'Neill will incorporate the information gathered from the requested test pits in order to continue advancing the design. All test pits shall be performed prior to advancing to the Final Design (100%) submission.
- The City shall provide police traffic control and waive any permit fees for these test pits within city owned streets. An encroachment permit will be necessary and in place prior to any test pits on state routes. Test pits for private or City owned utilities may be fully reimbursable and shall be paid and coordinated by the City of Stamford.

Semi-Final Design (70%) Plans

- This phase of the project will advance the preliminary design plans to a design completion of approximately 70%. PD comments and value engineering items, as necessary, will be incorporated, as will the additional semi-final design phase elements detailed below.

Grading, Drainage and Erosion & Sedimentation Control Plans

- Grading will be advanced to ensure proper drainage, curb returns and conformance with ADA/PROWAG requirements at crosswalks and walkable surfaces.
- Draft proposed contours will be depicted within the grading plans to begin investigating drainage concerns and walkability requirements.
- Rights to grade may be necessary. These designations will be shown within the general construction plans as previously mentioned.

Critical Cross Sections

- Fuss & O'Neill will develop cross sections only at critical areas along the corridor. Known utilities will be shown in each section including but not limited to storm & sanitary sewer, gas, electric and water will be added into the cross sections.

Maintenance and Protection of Traffic Plans

- Detailed maintenance and protection of traffic plans (MPT) will not be developed. It is assumed CTDOT's MPT templates will be sufficient in maintaining safe traffic operations. Fuss & O'Neill will prepare pedestrian protection plans for construction purposes if necessary.

Bid Package

- The City will provide the front end boilerplate materials to Fuss & O'Neill. Fuss & O'Neill will provide a unit cost bid tabulation form, and make minor modifications to the City materials in order to create a coordinated bid package. We

have assumed the following City staff will review and comment on the Bid Package within its entirety.

- Transportation, Traffic and Parking
- Engineering
- Public Works
- Purchasing

Semi-Final Design Construction Cost Estimate

- Fuss & O'Neill will update and submit quantity computations and the anticipated construction estimate for the project.

Semi-Final Design Report

- The Preliminary Design Report will be advanced and updated to include the latest information, schedule, and construction cost.

Semi-Final Design Submission

The Semi-Final Design Submission to the City will include the following materials in Portable Document Format:

- Electronic copy consisting of:
  - Cover Sheet
  - General Notes & Legend Plan
  - Index Plan
  - Existing Conditions Plans
  - Miscellaneous Details
  - Typical Cross Sections Plans
  - Construction Plans
  - Profiles
  - Grading, Drainage and Erosion & Sedimentation Control Plans
  - Critical Cross Sections
  - MPT Templates
- Electronic copy of Semi-Final Design Construction Cost Estimate
- Electronic copy of Draft Bid Package
- Electronic copy of Semi-Final Design Report

Post-Submission Tasks

- Send Revised Plans to Utility Companies
- Submit Response to CTDOT Encroachment Permit Comments – See Task 02
- SFD Review Meeting – See Task 03

Task 07 – Final Design (100%)

Respond to SFD Comments

- Fuss & O'Neill will respond to one (1) round of comments from the City in regards to the Semi-Final Design submission to progress into the Final Design (100%) phase. It is assumed that all SFD comments will be provided at one time prior to the initiation of final design.
- Fuss & O'Neill will review and incorporate applicable comments from DOT in regards to the Encroachment Permit request.

Final Design (100%) Plans

- This phase of the project will advance the semi-final design plans to a design completion of approximately 100%. SFD comments and value engineering items, as necessary, will be incorporated.

Bid Package

- Finalize the overall Bid Package and Specifications.

Final Design Construction Cost Estimate

- Fuss & O'Neill will update and submit quantity computations and the anticipated construction estimate for the project.

Final Design Report

- The Final Design Report will be completed to include the latest information, schedule, and construction cost.

Final Design Submission

The FD submission to the City will include the following materials:

- Three (3) hard copies of the plans consisting of:
    - Cover Sheet
    - General Notes & Legend Plan
    - Index Plan
    - Existing Conditions Plans
    - Miscellaneous Details
    - Typical Cross Sections Plans
    - Construction Plans
    - Profiles
    - Grading, Drainage and Erosion & Sedimentation Control Plans
    - Critical Cross Sections

  - MPT Templates
- FD Construction Cost Estimate
- Special Provisions & Bid Package
- Final Design Report

Task 08 – Bidding Assistance & Design Services During Construction

Fuss & O'Neill will respond and resubmit documents addressing any ancillary items from the city per their 100% review.

The Construction Document (CD) submission to the City will include the following materials per any remaining comments following the 100% deliverable:

- Plans
- Estimate
- Bid Package
- Design Report

The Cities Purchasing Agent will advertise, post the bid package on the City Website, conduct the bid opening, and prepare the initial bid tabulation. Fuss & O'Neill will provide support in the bid analysis and qualifications review, as needed.

Fuss & O'Neill will also assist the city with reviewing all shop drawings for specialty products, if necessary.

Allowances

A drainage analysis, design check list or any additional hydrologic or hydraulic reports will be evaluated during each project kickoff meeting and will be included under additional professional services.

The preparation of temporary contract easement maps, permanent easement maps, and/or taking maps for any affected properties or land strips within the seven projects will be evaluated throughout the design process and will be included under additional professional services.

Assumptions

The scope detailed above was developed with the following assumptions. Should any of these assumptions prove to be incorrect, additional scope and fee may result.

Right of Way & Topographic Survey

1. Periods of adverse weather could impact the ability to perform field work which therefore could delay the completion

of the survey. Field survey and wetland delineation can be performed during a time period when there is no ground frost and/or minimal snow cover.

2. Storm and sanitary structures will be clear of any snow or debris obstructing the pipe inverts. Storm and sanitary invert elevations at structures filled with snow or debris will not be obtained. Revisiting the site to obtain storm and sanitary inverts in structures that have had snow or debris removed will be considered additional.
3. The city will provide existing sanitary sewer collection and other infrastructure system mapping.
4. Wetlands will not be field delineated or flagged as it is assumed the project limits for the first six projects do not extend within coastal or inland wetland areas.
5. Utilities will be compiled from field information as well as existing record mapping. The use of ground penetrating radar (GPR) to locate underground utilities will not be performed as part of this task. If the use of GPR to locate underground utilities is required, it will be provided under a separate agreement.
6. The actual field location of monumentation agrees with record information within an allowable tolerance.
7. Iron pins will not be set at property corners that are not currently monumented. If pins are required at every property corner, an additional task authorization will be required for this service.
8. Additional survey, evaluation, wetland flagging, watercourse information and/or design of drainage improvements to the final discharge point and CCTV of the stormwater system are not included in this scope.
9. Surveys, data collection, analysis, and reports pertaining to C.G.S. sec 22a will not be required and are not included in this scope.
10. Individual property and boundary surveys, formal right-of-way, easement, or taking maps, if required, will be provided under a separate task authorization. An allowance value per each property map can be provided when requested.
11. Mylars necessary for municipality filing are not included in this proposal and will be provided at an additional cost per mylar.

Design

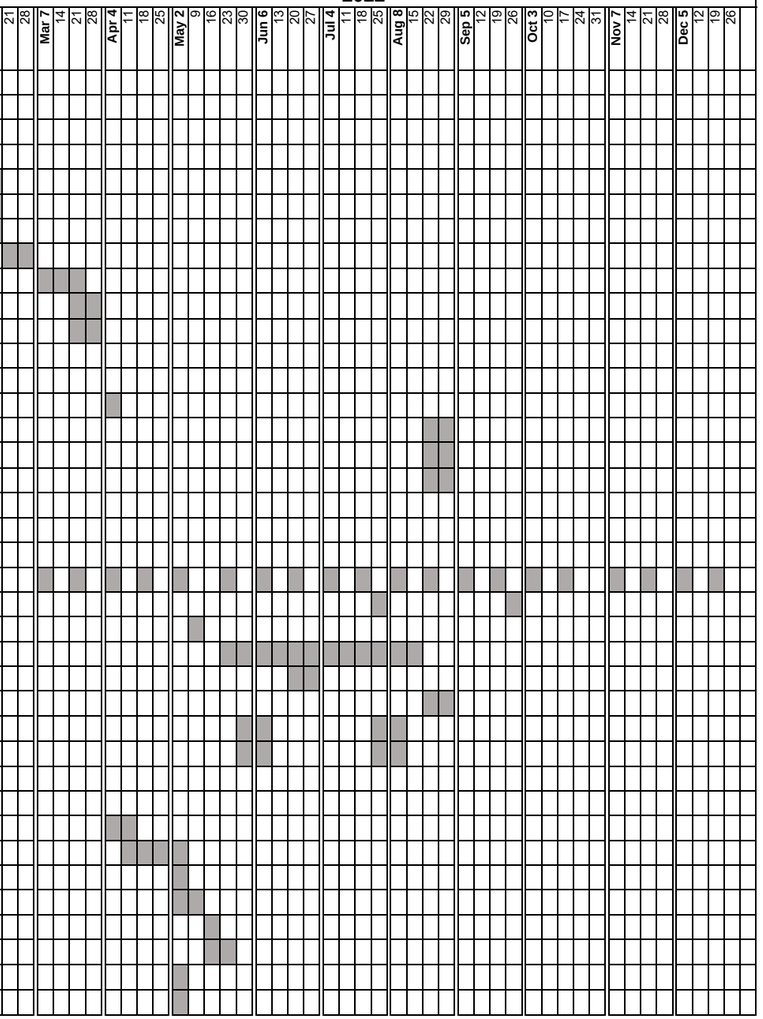
1. CTDOT Standard Specifications for Road, Bridges, Facilities and Incidental Construction Form 818 will be utilized with the corresponding cost estimate items.
2. The horizontal and vertical alignment of the elements (centerlines, curb lines, and sidewalks/crossings) will become final after the SFD (70%) submission is complete. Changes to these elements after the start of the FD (100%) phase will be considered extra work.
3. The city will conduct and be responsible for all procurement tasks if necessary, or formally request CTDOT to lead the procurement process per city procedures. Property maps and title mylars will be provided, if necessary.
4. Pavement Marking & Signing Plans, Electrical, Lighting, Landscape, Streetscape, Utility or detailed MPT plans will not be generated as part of this contract.
5. Traffic studies or capacity analyses will not be conducted as part of this scope.
6. This scope does not include the evaluation of the storm drainage system to its ultimate discharge outlet, nor does it include CCTV inspection.

7. If test pits are recommended or required, all test pits must be scheduled and completed prior to progressing into the Final Design (100%) phase in order to capture potential adjustments/conflicts.
8. Traffic control will be required during test pits. We anticipate the City of Stamford will provide police protection and waive any necessary bonds and permits for these tasks as necessary.
9. No warranty, or guarantee, is expressed, or implied concerning the granting of permits or approvals required for this project, or timelines for review and action, by regulatory agencies.
10. Existing pipe and sewer structure materials are non-hazardous.
11. Environmental hazardous materials evaluations and remediation design (CTDOT Task 110, 210, 220, and 310) are not included and assumed to be completed by others.
12. The completion of a Coastal Area Management (CAM) permit or Inland Wetlands is not included.
13. Coordination with the NDDB (Natural Diversity Data Base) is not included.
14. A Flood Management Certification for FEMA or CTDEEP review is not included.
15. Significant project delays initiated or caused by others (City of Stamford, regulatory agencies, utility companies, etc.), resulting in the project schedule being pushed back by more than 180 days, may result in the need for additional design budget.
16. Consultations during construction beyond shop drawing reviews are not included within this agreement as well as inspection services. A separate proposal can be provided should the City request it.
17. Meeting attendance is limited to the meetings expressly detailed in the scope of services. A separate agreement can be provided if attendance at additional meetings is requested
18. Poles that are not owned by the City of Stamford may necessitate relocation due to new construction. Payments for such relocations will be coordinated between the City and the Utility Pole owner.

FUSS & O'NEILL

PROJECT DESIGN SCHEDULE
SAFE ROUTES TO SCHOOLS AND PUBLIC TRANSIT FACILITIES
CITY OF STAMFORD, CT

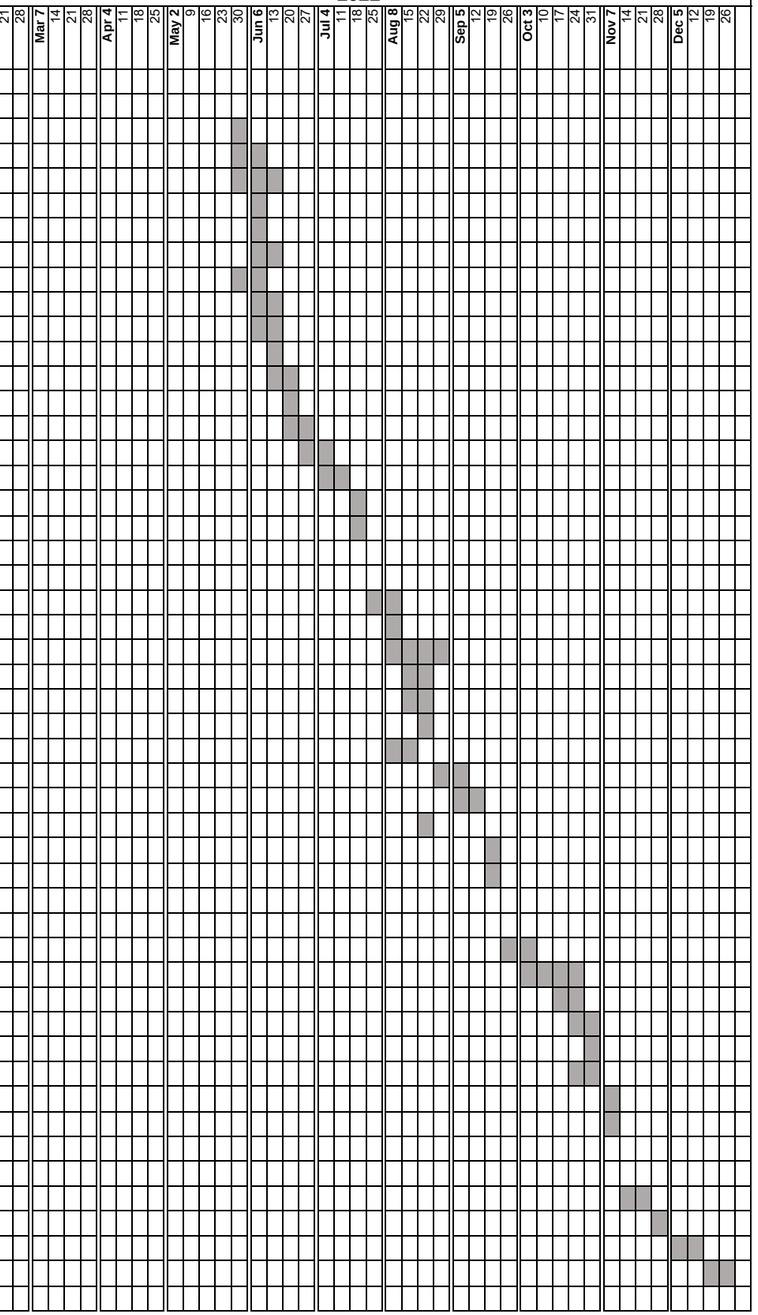
Task Name	Duration (weeks)	Labor Classifications (# of labor hours)						
		Officer	Sr. Eng II	Sr. Eng I	Eng II	Eng I	CAD Tech III	Clerical
TASK 01 - RIGHT OF WAY & TOPOGRAPHIC SURVEY								
01.1 - Develop working model space drawing	1						24	
01.2 - Create base line alignments using 2016 Aerial Imagery	2						56	
01.3 - Import property lines	1						16	
01.4 - Import City's flight data w/ 1' contours	1						16	
01.5 - Review base map (topo and ROW/property lines)	2	2	16	24	40			
01.6 - Field measure survey items (assume 1 survey crew chief, 1 survey technician)	3						240	
01.7 - Finalize model space base drawing	2						80	
TOTALS	**12**	**2**	**16**	**24**	**40**	**0**	**432**	**0**
TASK 02 - PERMITTING AND CITY APPROVALS								
02.1 - Request environmental screening (CTDEEP NDDB)	1			2	4			1
02.2 - Prepare CTDEEP Stormwater Discharge Permit	2	1	2	8	24	24		2
02.3 - Prepare CTDOT Encroachment Permit	2	1	2	16	40	56		2
TOTALS	**5**	**2**	**4**	**26**	**68**	**80**	**0**	**5**
TASK 03 - DESIGN MEETINGS, UTILITY COORDINATION & PUBLIC INVOLVEMENT								
03.1 - Attend project kick-off meeting	1	2	1	1				
03.2 - Attend progress meetings (bi-monthly)	20	10	40	40	10			
03.2 - Attend design review meetings (1 after PD, 1 after SFD)	2		4	4	2			
03.3 - Notify utilities, request mapping and current/planned work	1		1	8	16	16		4
03.4 - Utility Coordination	12		12	40	40			4
03.5 - Coordinate/Attend utility field meetings (assume 7 total)	2		42	42				
03.6 - Prepare "For Information Only" contract utility plans	2			8	24	40		
03.7 - Prepare/attend Public Information meetings (assume 14 total)	4	28	44	60	80	80		28
TOTALS	**44**	**40**	**144**	**203**	**172**	**136**	**0**	**36**
TASK 04 - CONCEPT DESIGN								
04.1 - Establish horizontal alignments	2		4	16	56	40		
04.2 - Develop preliminary conceptual layout (10% design level)	4	2	24	64	120	120		
04.3 - Identify ROW impacts to private properties	1		4	16	24			
04.4 - Prepare opinion of probable costs	2		4	16	32	32		8
04.5 - Submit draft concept plans for City review	1	2	4	8	12	12		2
04.6 - Incorporate City comments; finalize concept plans	2		4	24	40	40		
04.7 - Identify utility impacts and test pit locations	1		2	32	16	24		
TOTALS	**13**	**4**	**46**	**176**	**300**	**268**	**0**	**10**

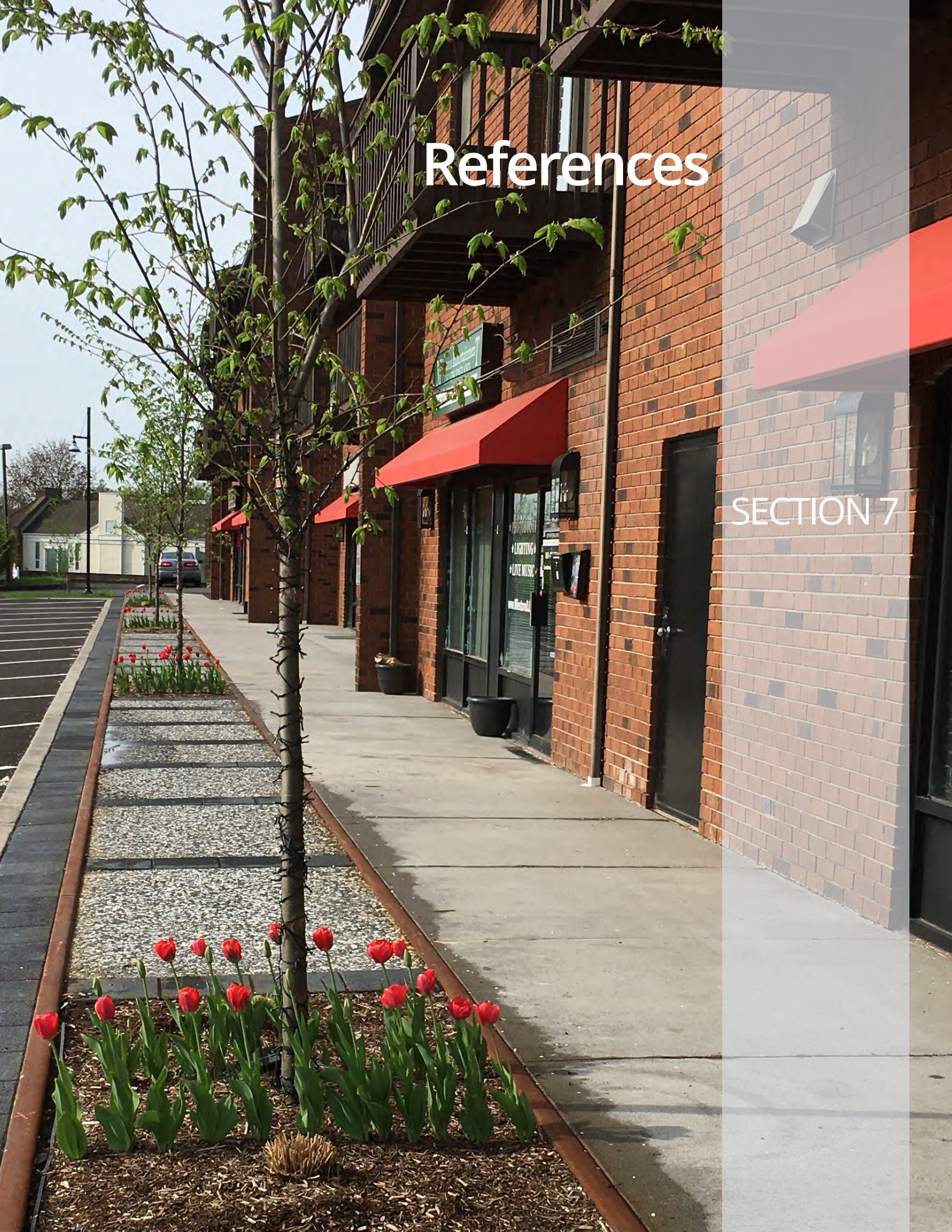


FUSS & O'NEILL

PROJECT DESIGN SCHEDULE
SAFE ROUTES TO SCHOOLS AND PUBLIC TRANSIT FACILITIES
CITY OF STAMFORD, CT

Task Name	Duration (weeks)	Labor Classifications (# of labor hours)						
		Officer	Sr. Eng II	Sr. Eng I	Eng II	Eng I	CAD Tech III	Clerical
TASK 05 - PRELIMINARY DESIGN (30%)								
05.1 - Revise/finalize horizontal alignments and layout	1		2	4	14	10		
05.2 - Prepare cover sheet, general notes, index plans	2			8	16	16		
05.3 - Prepare existing conditions plans	3						120	
05.4 - Develop miscellaneous details sheets	1			2	8	24		
05.5 - Develop typical sections	1		2	8	12	24		
05.6 - Complete CTDOT drainage design checklist	2			16	24			
05.7 - Drainage design - minor modifications	2			16	24	40		
05.8 - Drainage design - storm sewer and gutter glow analysis as needed	2		4	24	80	40		
05.9 - Identify downstream drainage improvements; prepare memo	2		2	16	24	24		2
05.10 - Prepare list of Special Provisions	1			4				
05.11 - Revise opinion of probable costs	2		2	16	24	24		
05.12 - Prepare hydrant report	1			8				2
05.13 - Perform test pits	2				40		40	
05.14 - Resolve utility conflicts	2		4	24	40	40		
05.15 - Prepare preliminary design report	2		2	16	56			4
05.16 - Submit preliminary design to City/CTDOT	1	12	4	8	16	16		2
TOTALS	**27**	**12**	**22**	**170**	**378**	**258**	**160**	**10**
TASK 06 - SEMI-FINAL DESIGN (70%)								
06.1 - Respond to PD comments	2	2	4	24	40	80		
06.2 - Finalize horizontal and vertical design	1		2	8	24	40		
06.3 - Advance all preliminary design plans	4		8	56	80	136		
06.4 - Prepare grading. Drainage and sedimentation & erosion control plans	2		2	16	40	56		
06.5 - Develop critical cross sections	2		8	32	80	80		
06.6 - Prepare Maintenance and Protection of Traffic Plans	1			4	8	12		
06.7 - Develop special provisions	2		4	16	40			4
06.8 - Revise opinion of probable costs	2		2	16	24	24		
06.9 - Prepare draft contract documents (bid package)	2	4	16	40				8
06.10 - Semi-Final design report	1		2	4	14			2
06.11 - Submit semi-final design to City and CTDOT	1	4	4	8	16	16		2
TOTALS	**20**	**10**	**52**	**224**	**366**	**444**	**0**	**16**
TASK 07 - FINAL DESIGN (100%)								
07.1 - Incorporate all Semi-Final review comments	2	2	2	24	40	80		
07.2 - Prepare Final Contract Plans.	4		8	56	80	160		
07.3 - Prepare Final Special Provisions.	2		2	8	16			2
07.4 - Prepare Final Construction Cost Estimate.	2		2	16	24	24		
07.5 - Prepare Final Design Report	1							
07.6 - Assemble quantity computations	2		2	4	8			
07.7 - Submit final design to City and CTDOT	1	4	4	8	16	16		2
TOTALS	**14**	**6**	**20**	**116**	**184**	**280**	**0**	**4**
TASK 08 - BIDDING ASSISTANCE AND DESIGN SERVICES DURING CONSTRUCTION								
08.1 - Prepare bid package	2	2	8	16	32			4
08.2 - Respond to bidder questions	1		4	8				
08.3 - Complete bid analysis and recommendation to award	2		8	16	32			
08. 4 - Shop drawing review (assume 10 per site)	2		8	40	24	16		
TOTALS	**7**	**2**	**28**	**80**	**88**	**16**	**0**	**4**





References

SECTION 7

References

Edward Gentile, PE
Town of Darien, Director of Public Works
203.656.7364
egentile@darienct.gov
2016 - Present

Larry Baril, PE
Town of Avon, Town Engineer
860.409.4322
lbaril@avonct.gov
2011 - Present

Mark Moriarty, PE
City of New Britain, Director of Public Works
860.826.3374
mark.moriarty@newbritainct.gov
2014 - Present

Forms

SECTION 8

Contractor's Statement

Pursuant to Section 103.1 of the Stamford Code of Ordinances, I hereby provide the following:

If a joint venture, trustee, partnership, limited liability company or partnership, the names and addresses of all joint ventures, beneficiaries, partners or members:

Not applicable

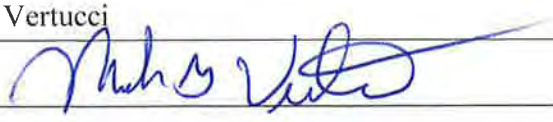
If a corporation, the names and addresses of all officers, and the names and addresses of all parties owning over 10% of its common stock or over 10% of its preferred stocks. If any of said stockholders is a holding corporation, the names and addresses of all persons owning a beneficial interest in over 10% if the common or preferred stock of said holding company.

Please see attached Ownership Disclosure

The names and positions of all persons listed hereinabove who are elected or appointed officers or employees of the City of Stamford.

Not applicable

Name of Bidder/Proposer: Mark Vertucci

Signature of Bidder/Proposer: 

Title: Vice President

Company Name: Fuss & O'Neill, Inc.

Address: 146 Hartford Road, Manchester, CT 06040

Indicate if company submitting this proposal is: _____MBE _____WBE _____DBE

Fuss & O'Neill, Inc.
Ownership Disclosure
July 22, 2021

Fuss & O'Neill, Inc.

	Owner	Principal Occupation/Position in Company	Business Address	% Owned	Shares
1	Audet, Dean (PE)	Senior Vice President, Director	317 Iron Horse Way, #204, Providence, RI 02908	5.71%	8.0
2	St. Germain, Tim (PE)	Senior Vice President, Director	1550 Main St., Suite 400, Springfield, MA 01103	5.71%	8.0
3	DeSantos, Ted (PE, PTOE)	Senior Vice President, Director	146 Hartford Road, Manchester, CT 06040	5.71%	8.0
4	Chambers, John (PG, LSP)	Executive Vice President of Operations	146 Hartford Road, Manchester, CT 06040	5.71%	8.0
5	Lapinski, Craig (PE, LEED, AP BD +C)	Senior Vice President, Director	146 Hartford Road, Manchester, CT 06040	5.71%	8.0
6	Danielson, Robert (LEP, CPG)	Vice President, Director	146 Hartford Road, Manchester, CT 06040	3.57%	5.0
7	Mas, Erik (PE)	Vice President, Director	1550 Main St., Suite 400, Springfield, MA 01103	3.57%	5.0
8	Bernardin, Eric (PE)	Vice President	1550 Main St., Suite 400, Springfield, MA 01103	3.57%	5.0
9	Forzley, Phil (PE)	Vice President	205 Billings Farm Rd., #6B White River Junction, VT 05001	3.57%	5.0
10	Grigg, Kevin **(President/CEO)**	CEO, President, Director	146 Hartford Road, Manchester, CT 06040	3.57%	5.0
11	Mailman, Kurt (PE)	Vice President	146 Hartford Road, Manchester, CT 06040	3.57%	5.0
12	Barbash, Adam (PE)	Vice President	146 Hartford Road, Manchester, CT 06040	3.57%	5.0
13	Martin, Shawn (PE)	Vice President	317 Iron Horse Way, #204, Providence, RI 02908	3.57%	5.0
14	Solloway, Kristen (PE)	Vice President	146 Hartford Road, Manchester, CT 06040	3.57%	5.0
15	Sullivan, Kevin (PE, LEED AP)	Vice President	108 Myrtle St., Suite 502, Quincy, MA 02171	3.57%	5.0
16	May, Robert	Senior Vice President	146 Hartford Road, Manchester, CT 06040	3.57%	5.0
17	Nanowski, Katherine	Vice President, Director	146 Hartford Road, Manchester, CT 06040	3.57%	5.0
18	Snape, Margaret	Director of Human Resources	146 Hartford Road, Manchester, CT 06040	3.57%	5.0
19	Fryer, JoAnn (PE)	Vice President	50 Commercial Street, Manchester, NH 03101	3.57%	5.0
20	Landry, Elizabeth (PE, CEM, CBCP)	Vice President	146 Hartford Road, Manchester, CT 06040	3.57%	5.0
21	Johnson, Kevin (PE, PTOE, NETTCP)	Executive Vice President of Business Developmt	317 Iron Horse Way, #204, Providence, RI 02908	3.57%	5.0
22	Vertucci, Mark (PE, PTOE)	Vice President	146 Hartford Road, Manchester, CT 06040	3.57%	5.0
23	Bafna, Sudip (PE, CHMM)	Vice President	146 Hartford Road, Manchester, CT 06040	3.57%	5.0
24	DeLany, Daniel (PE)	Vice President	1550 Main St., Suite 400, Springfield, MA 01103	3.57%	5.0
25	Ferrero, Chris (RLA, AICP, CNU)	Vice President	146 Hartford Road, Manchester, CT 06040	2.86%	4.0
26	Mas, Diane (PhD, REHS/RS, CC-P	Vice President	1550 Main St., Suite 400, Springfield, MA 01103	0.71%	1.0
				100.00%	140.0

Non-Collusion Affidavit

The undersigned, having been duly sworn, affirms and says that to the best of his/her knowledge and belief:

1. The prices in this Proposal have been arrived at independently without collusion, consultation, communication, or agreement with any other Proposer or with any competitor for the purpose of restricting competition.

2. Unless otherwise required by law, the prices, which have been quoted in this Proposal, have not been knowingly disclosed by the Proposer and will not knowingly be disclosed by the Proposer prior to opening, directly or indirectly, to any other Proposer or to any competitor.

3. No attempt has been made or will be made by the Proposer to induce any other person, partnership or corporation to submit or not to submit a Proposal for the purpose of restricting competition.

Name of Proposer: Fuss & O'Neill, Inc.

By: _____

Print Name: Mark Vertucci

Title: Vice President

ACKNOWLEDGMENT

STATE OF Connecticut

COUNTY OF Hartford ss. Manchester

Date: September 28, 2021

Personally appeared Mark A. Vertucci, as Vice President of the above named firm, and attested that the foregoing statements are true and accurate to the best of his/her knowledge and belief.

_____
Signature of Notary Public
My Commission Expires: August 31, 2025

EFFECTIVE: 2/24/09

PATRICIA O'SKI NOTARY PUBLIC CONNECTICUT

City of Stamford

State of Connecticut Contractor Verification (in accordance with Public Act 16-67)

Compliance Affidavit

I, the undersigned, personally and on behalf of Fuss & O'Neill, Inc. (Contractor), having been duly sworn, affirm and say that I have read, understand and am in compliance with Public Act 16-67 Concerning the Disclosure of Certain Education Personnel Records, Criminal Penalties for Threatening in Educational Settings and the Exclusion of a Minor's Name from Summary Process Complaints, and that neither I nor said Contractor, to the best or my knowledge, is in possession of any information indicating a finding of abuse or neglect or sexual misconduct, or otherwise have knowledge of such a condition(s) for any employees working on the project identified in RFQ/RFP or Bid S- 846 (RFQ/RFP or Bid Number). Further, if I or said Contractor become aware of any information indicating such a finding, or otherwise gain knowledge of such a condition, I and/or said Contractor will immediately forward such information to the City of Stamford.

Contractor Name: Fuss & O'Neill, Inc.

Street Address: 146 Hartford Road

City, State, Zip: Manchester, CT 06040

Title of person completing this form: Vice President

Signature: [signature]

Printed Name: Mark Vertucci

Date: 9/28/21

ACKNOWLEDGMENT

STATE OF Connecticut

COUNTY OF Hartford ss. Manchester

Date: September 28, 2021

Personally appeared Mark G. Vertucci, as Vice President of the above named Contractor, and attested that the foregoing statements are true and accurate to the best of his/her knowledge and belief on behalf of himself and said Contractor.

[signature]
Signature of Notary Public

My Commission Expires: August 31, 2025

PATRICIA FOGARTY NOTARY PUBLIC CONNECTICUT

CERTIFICATE OF CORPORATE RESOLUTION
RFQ/RFP

I, Amy Jagodowski, SECRETARY OF Fuss & O'Neill, Inc.

A CORPORATION EXISTING UNDER THE LAWS OF THE STATE OF Connecticut, DO HEREBY CERTIFY THAT THE FOLLOWING IS A TRUE COPY OF CERTAIN RESOLUTIONS ADOPTED BY THE BOARD OF DIRECTORS OF SAID COMPANY, AT A MEETING THEREOF DULY CALLED AND HELD ON THE 27th DAY OF July, 20 21.

"RESOLVED, THAT THE Vice President

OF THE CORPORATION BE AND IS HEREBY AUTHORIZED TO SIGN

A CONTRACT WITH THE CITY OF STAMFORD, CONNECTICUT FOR

Design Services for Safe Routes to Schools and Public Transit Facilities, RFP/RFQ No. 846".

I, FURTHER CERTIFY THAT, Mark Vertucci IS THE DULY ELECTED Vice President OF Fuss & O'Neill, Inc.

AND THE FOREGOING RESOLUTION HAS NOT BEEN MODIFIED OR REPEALED AND IS IN FULL FORCE AND EFFECT.

IN WITNESS WHEREOF, I HAVE, HEREUNTO, SUBSCRIBED BY NAME AND AFFIXED THE SEAL OF SAID CORPORATION THE 29th DAY OF September, 20 21.

Amy C. Jagodowski
SECRETARY

FUSS & O'NEILL, INC. CORPORATE SEAL CONNECTICUT

CERTIFICATION AS TO CONTRACT SIGNATORY

For Limited Liability Companies (LLCs)

(Effective 9/1/2011)

NOT APPLICABLE

I, _____ a _____ of _____,
(name of member or manager) (Member or Manager) (name of LLC)

LLC, a limited liability company organized and existing under the laws of the State of Connecticut (hereinafter the "Company"), hereby certify that:

1. that _____ is run by _____
(name of LLC) (Members or Managers)

2. that _____ is a _____ of _____
(name of contact signatory) (Member/Manager) (name of LLC)

and

3. that as such _____ is not prohibited from or
(name of Member/Manager who is contract signatory)
limited by the articles of organization from binding the LLC.

IN WITNESS HEREOF, the undersigned has affixes his/her signature this _____ day of

_____, 20_____.

NOT APPLICABLE

(LLC Seal)
(Circle this L.S. if there is no seal)

_____
Secretary (name of Secretary)

PROPOSER'S INFORMATION AND ACKNOWLEDGEMENT FORM

RFP No: 846

Date: September 28, 2021

Proposer's Name: Fuss & O'Neill, Inc.

Street Address: 146 Hartford Avenue

Manchester, CT 06040

City State Zip

Business Telephone: 860.646.2469

Email: mvertucci@fando.com

DUNS Number: 04-510-9659 Tax Id. No.: 06-0845648

Indicate (Yes/No) if company submitting this proposal is:

No MBE No WBE No DBE

(If yes, attach relevant certification)

Signature: _____ Date: 9/28/21

Printed Name: Mark Vertucci

Title: Vice President

Addenda Acknowledgement – check and note date of addendum

X Addenda No. 1 October 1, 2021	☐ Addenda No. 2
☐ Addenda No. 3	☐ Addenda No. 4
☐ Addenda No. 5	☐ Addenda No. 6
☐ Addenda No. 7	☐ Addenda No. 8
☐ Addenda No. 9	☐ Addenda No. 10
☐ Addenda No. 11	☐ Addenda No. 12

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

► **Go to *www.irs.gov/FormW9* for instructions and the latest information.**

Give Form to the requester. Do not send to the IRS.

Print or type. See **Specific Instructions** on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

Fuss & O'Neill, Inc.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☑ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ► _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ►

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

146 Hartford Road

Requester's name and address (optional)

6 City, state, and ZIP code

Manchester, CT 06040

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN,* later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

0	6	–	0	8	4	5	6	4	8

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here **Signature of U.S. person** ► Jm K-K. **Date** ► 4/9/2021

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9.*

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES
CONTRACT COMPLIANCE REGULATIONS
NOTIFICATION TO BIDDERS

(Revised 09/3/15)

The contract to be awarded is subject to contract compliance requirements mandated by Sections 4a-60 and 4a-60a of the Connecticut General Statutes; and, when the awarding agency is the State, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-71(d) of the Connecticut General Statutes.

According to Section 46a-68j-30(9) of the Contract Compliance Regulations, every agency awarding a contract subject to the contract compliance requirements has an obligation to "aggressively solicit the participation of legitimate minority business enterprises as bidders, contractors, subcontractors and suppliers of materials." "Minority business enterprise" is defined in Section 4a-60 of the Connecticut General Statutes as a business wherein fifty-one percent or more of the capital stock, or assets belong to a person or persons: "(1) Who are active in daily affairs of the enterprise; (2) who have the power to direct the management and policies of the enterprise; and (3) who are members of a minority, as such term is defined in subsection (a) of Section 32-9n." "Minority" groups are defined in Section 32-9n of the Connecticut General Statutes as "(1) Black Americans . . . (2) Hispanic Americans . . . (3) persons who have origins in the Iberian Peninsula . . . (4)Women . . . (5) Asian Pacific Americans and Pacific Islanders; (6) American Indians . . ." An individual with a disability is also a minority business enterprise as provided by Section 4a-60g of the Connecticut General Statutes. The above definitions apply to the contract compliance requirements by virtue of Section 46a-68j-21(11) of the Contract Compliance Regulations.

The awarding agency will consider the following factors when reviewing the bidder's qualifications under the contract compliance requirements:

(a) the bidder's success in implementing an affirmative action plan;
(b) the bidder's success in developing an apprenticeship program complying with Sections 46a-68-1 to 46a-68-17 of the Administrative Regulations of Connecticut State Agencies, inclusive;
(c) the bidder's promise to develop and implement a successful affirmative action plan;
(d) the bidder's submission of employment statistics contained in the "Employment Information Form", indicating that the composition of its workforce is at or near parity when compared to the racial and sexual composition of the workforce in the relevant labor market area; and
(e) the bidder's promise to set aside a portion of the contract for legitimate minority business enterprises. See Section 46a-68j-30(10)(E) of the Contract Compliance Regulations.

INSTRUCTIONS AND OTHER INFORMATION

The following BIDDER CONTRACT COMPLIANCE MONITORING REPORT must be completed in full, signed, and submitted with the bid for this contract. The contract awarding agency and the Commission on Human Rights and Opportunities will use the information contained thereon to determine the bidders compliance to Sections 4a-60 and 4a-60a CONN. GEN. STAT., and Sections 46a-68j-23 of the Regulations of Connecticut State Agencies regarding equal employment opportunity, and the bidder's good faith efforts to include minority business enterprises as subcontractors and suppliers for the work of the contract.

1) Definition of Small Contractor

Section 4a-60g CONN. GEN. STAT. defines a small contractor as a company that has been doing business under the same management and control and has maintained its principal place of business in Connecticut for a one year period immediately prior to its application for certification under this section, had gross revenues not exceeding fifteen million dollars in the most recently completed fiscal year, and at least fifty-one percent of the ownership of which is held by a person or persons who are active in the daily affairs of the company, and have the power to direct the management and policies of the company, except that a nonprofit corporation shall be construed to be a small contractor if such nonprofit corporation meets the requirements of subparagraphs (A) and (B) of subdivision 4a-60g CONN. GEN. STAT.

MANAGEMENT: Managers plan, organize, direct, and control the major functions of an organization through subordinates who are at the managerial or supervisory level. They make policy decisions and set objectives for the company or departments. They are not usually directly involved in production or providing services. Examples include top executives, public relations managers, managers of operations specialties (such as financial, human resources, or purchasing managers), and construction and engineering managers.

BUSINESS AND FINANCIAL OPERATIONS: These occupations include managers and professionals who work with the financial aspects of the business. These occupations include accountants and auditors, purchasing agents, management analysts, labor relations specialists, and budget, credit, and financial analysts.

MARKETING AND SALES: Occupations related to the act or process of buying and selling products and/or services such as sales engineer, retail sales workers and sales representatives including wholesale.

LEGAL OCCUPATIONS: In-House Counsel who is charged with providing legal advice and services in regards to legal issues that may arise during the course of standard business practices. This category also includes assistive legal occupations such as paralegals, legal assistants.

COMPUTER SPECIALISTS: Professionals responsible for the computer operations within a company are grouped in this category. Examples of job titles in this category include computer programmers, software engineers, database administrators, computer scientists, systems analysts, and computer support specialists

ARCHITECTURE AND ENGINEERING: Occupations related to architecture, surveying, engineering, and drafting are included in this category. Some of the job titles in this category include electrical and electronic engineers, surveyors, architects, drafters, mechanical engineers, materials engineers, mapping technicians, and civil engineers.

OFFICE AND ADMINISTRATIVE SUPPORT: All clerical-type work is included in this category. These jobs involve the preparing, transcribing, and preserving o f written communications and records; collecting accounts; gathering and distributing information; operating office machines and electronic data processing equipment; and distributing mail. Job titles listed in this category include telephone operators, bill and account collectors, customer service representatives, dispatchers, secretaries and administrative assistants, computer operators and clerks (such as payroll, shipping, stock, mail and file).

BUILDING AND GROUNDS CLEANING AND MAINTENANCE: This category includes occupations involving landscaping, housekeeping, and janitorial services. Job titles found in this category include supervisors of landscaping or housekeeping, janitors, maids, grounds maintenance workers, and pest control workers.

CONSTRUCTION AND EXTRACTION: This category includes construction trades and related occupations. Job titles found in this category include boilermakers, masons (all types), carpenters, construction laborers, electricians, plumbers (and related trades), roofers, sheet metal workers, elevator installers, hazardous materials removal workers, paperhangers, and painters. Paving, surfacing, and tamping equipment operators; drywall and ceiling tile installers; and carpet, floor and tile installers and finishers are also included in this category. First line supervisors, foremen, and helpers in these trades are also grouped in this category.

INSTALLATION, MAINTENANCE AND REPAIR: Occupations involving the installation, maintenance, and repair of equipment are included in this group. Examples of job titles found here are heating, ac, and refrigeration mechanics and installers; telecommunication line installers and repairers; heavy vehicle and mobile equipment service technicians and mechanics; small engine mechanics; security and fire alarm systems installers; electric/electronic repair, industrial, utility and transportation equipment; millwrights; riggers; and manufactured building and mobile home installers. First line supervisors, foremen, and helpers for these jobs are also included in the category.

MATERIAL MOVING WORKERS: The job titles included in this group are Crane and tower operators; dredge, excavating, and lading machine operators; hoist and winch operators; industrial truck and tractor operators; cleaners of vehicles and equipment; laborers and freight, stock, and material movers, hand; machine feeders and offbearers; packers and packagers, hand; pumping station operators; refuse and recyclable material collectors; and miscellaneous material moving workers.

PRODUCTION WORKERS: The job titles included in this category are chemical production machine setters, operators and tenders; crushing/grinding workers; cutting workers; inspectors, testers sorters, samplers, weighers; precious stone/metal workers; painting workers; cementing/gluing machine operators and tenders; etchers/engravers; molders, shapers and casters except for metal and plastic; and production workers.

3) Definition of Racial and Ethnic Terms (as used in Part IV Bidder Employment Information) (Page 3)

White (not of Hispanic Origin)-All persons having origins in any of the original peoples of Europe, North Africa, or the Middle East. Black (not of Hispanic Origin)-All persons having origins in any of the Black racial groups of Africa. Hispanic- All persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.	Asian or Pacific Islander- All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes China, India, Japan, Korea, the Philippine Islands, and Samoa. American Indian or Alaskan Native- All persons having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.

BIDDER CONTRACT COMPLIANCE MONITORING REPORT

PART 1 – Bidder Information

Company Name: Fuss & O'Neill, Inc. Street Address: 146 Hartford Road City & State: Manchester, CT Chief Executive: Kevin Grigg, PE	Bidder Federal Employer Identification Number: 06-0845648 Or Social Security Number:
Major Business Activity: (brief description) Full-service consulting firm specializing in engineering, planning, and scientific studies. Serving both public and private sector clients for more than 95 years, we provide solutions that maximize value and address our clients' long-term needs.	Bidder Identification (response optional/definitions on page 1) -Bidder is a small contractor? Yes ☐ No ☑ -Bidder is a minority business enterprise? Yes ☐ No ☑ (If yes, check ownership category) Black ☐ Hispanic ☐ Asian American ☐ American Indian/Alaskan Native ☐ Iberian Peninsula ☐ Individual(s) with a Physical Disability ☐ Female ☐ -Bidder is certified as above by State of CT? Yes ☑ No ☐
Bidder Parent Company: (If any)	
Other Locations in CT: Trumbull, CT (If any)	

PART II - Bidder Nondiscrimination Policies and Procedures

1. Does your company have a written Affirmative Action/Equal Employment Opportunity statement posted on company bulletin boards? Yes ☑ No ☐	7. Do all of your company contracts and purchase orders contain non-discrimination statements as required by Sections 4a-60 & 4a-60a Conn. Gen. Stat.? Yes ☑ No ☐
2. Does your company have the state-mandated sexual harassment prevention in the workplace policy posted on company bulletin boards? Yes ☑ No ☐	8. Do you, upon request, provide reasonable accommodation to employees, or applicants for employment, who have physical or mental disability? Yes ☑ No ☐
3. Do you notify all recruitment sources in writing of your company's Affirmative Action/Equal Employment Opportunity employment policy? Yes ☑ No ☐	9. Does your company have a mandatory retirement age for all employees? Yes ☐ No ☑
4. Do your company advertisements contain a written statement that you are an Affirmative Action/Equal Opportunity Employer? Yes ☑ No ☐	10. If your company has 50 or more employees, have you provided at least two (2) hours of sexual harassment training to all of your supervisors? Yes ☑ No ☐ N/A ☐
5. Do you notify the Ct. State Employment Service of all employment openings with your company? Yes ☑ No ☐	11. If your company has apprenticeship programs, do they meet the Affirmative Action/Equal Employment Opportunity requirements of the apprenticeship standards of the Ct. Dept. of Labor? Yes ☐ No ☐ N/A ☑
6. Does your company have a collective bargaining agreement with workers? Yes ☐ No ☑ 6a. If yes, do the collective bargaining agreements contain non-discrimination clauses covering all workers? Yes ☐ No ☐ 6b. Have you notified each union in writing of your commitments under the nondiscrimination requirements of contracts with the state of CT? Yes ☐ No ☐	12. Does your company have a written affirmative action Plan? Yes ☑ No ☐ If no, please explain. 13. Is there a person in your company who is responsible for equal employment opportunity? Yes ☑ No ☐ If yes, give name and phone number: Maggie Snape (860) 646-2469, ext. 5289

1. Will the work of this contract include subcontractors or suppliers? Yes ☐ No ☐

1a. If yes, please list all subcontractors and suppliers and report if they are a small contractor and/or a minority business enterprise. (defined on page 1 / use additional sheet if necessary)

1b. Will the work of this contract require additional subcontractors or suppliers other than those identified in 1a. above? Yes ☐ No ☐

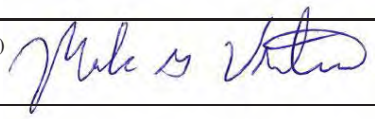
PART IV - Bidder Employment Information Date:

JOB CATEGORY *	OVERALL TOTALS	WHITE (not of Hispanic origin)		BLACK (not of Hispanic origin)		HISPANIC		ASIAN or PACIFIC ISLANDER		AMERICAN INDIAN or ALASKAN NATIVE	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Management	78	54	21			1		1	1		
Business & Financial Ops	37	29	6					1	1		
Marketing & Sales											
Legal Occupations											
Computer Specialists											
~~Architecture/Engineering~~ Professionals	151	84	52	2	3	2	2	4	2		
Office & Admin Support	22		19		2		1				
Bldg/ Grounds Cleaning/Maintenance											
~~Construction & Extraction~~ Technicians	18	10	4		1	1	1	1			
Installation , Maintenance & Repair											
Material Moving Workers											
Production Occupations											
TOTALS ABOVE	306	177	102	2	6	4	4	7	4		
Total One Year Ago	312	187	101	2	6	3	4	5	4		
FORMAL ON THE JOB TRAINEES (ENTER FIGURES FOR THE SAME CATEGORIES AS ARE SHOWN ABOVE)											
Apprentices											
Trainees											

*NOTE: JOB CATEGORIES CAN BE CHANGED OR ADDED TO (EX. SALES CAN BE ADDED OR REPLACE A CATEGORY NOT USED IN YOUR COMPANY)

1. Which of the following recruitment sources are used by you? (Check yes or no, and report percent used)				2. Check (X) any of the below listed requirements that you use as a hiring qualification (X)		3. Describe below any other practices or actions that you take which show that you hire, train, and promote employees without discrimination
SOURCE	YES	NO	% of applicants provided by source			
State Employment Service	☑	☐	2	x	Work Experience	Fuss & O'Neill implements, monitors, and enforces our Affirmative Action/Equal Opportunity Employment Policy Statement and program in conjunction with all applicable Federal and State laws, regulations and executive orders. In order to implement our Affirmative Action/Equal Opportunity Employment Program, Fuss & O'Neill will develop written strategies and plans designated to correct any deficiencies identified. Furthermore, our policy statement, as well as the Labor and Anti-discrimination Poster, shall be posted and otherwise made known to all workers in the company's home office, each satellite office, and at each job site. Managers and supervisory staff will be advised of their responsibilities to ensure the success of this program.
Private Employment Agencies	☑	☐	3	x	Ability to Speak or Write English	
Schools and Colleges	☑	☐	7		Written Tests	
Newspaper Advertisement	☐	☑		x	High School Diploma	
Walk Ins	☐	☑		x	College Degree	
Present Employees	☑	☐	1		Union Membership	
Labor Organizations	☐	☑		x	Personal Recommendation	
Minority/Community Organizations	☑	☐	1		Height or Weight	
Others (please identify)	☑	☐	86		Car Ownership	
*Job Board	☐	☐			Arrest Record	
	☐	☐			Wage Garnishments	

Certification (Read this form and check your statements on it CAREFULLY before signing). I certify that the statements made by me on this BIDDER CONTRACT COMPLIANCE MONITORING REPORT are complete and true to the best of my knowledge and belief, and are made in good faith. I understand that if I knowingly make any misstatements of facts, I am subject to be declared in non-compliance with Section 4a-60, 4a-60a, and related sections of the CONN. GEN. STAT.

(Signature)	(Title)	(Date Signed)	(Telephone)
	Vice President	9/28/2021	(860)646-2469, x5381

Prior Work Products

APPENDIX

HOPE STREET AT TOMS ROAD

CITY OF STAMFORD · CONNECTICUT

SIDEWALK EXTENSION & ROADWAY WIDENING

SEPTEMBER 21, 2018

REVISION DATE

PREPARED FOR

CITY OF STAMFORD
GOVERNMENT CENTER, 7th FLOOR
888 WASHINGTON BOULEVARD
STAMFORD, CT 06904

PREPARED BY

FUSS & O'NEILL
146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
860.646.2469
www.fando.com

GENERAL NOTES:

1. CONSTRUCTION SPECIFICATIONS:
   Connecticut Department of Transportation, Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817, dated 2016

CONSTRUCTION NOTES:

GENERAL

1. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSIONS OR LOCATION.
2. DO NOT RELY SOLELY ON ELECTRONIC VERSIONS OF DRAWINGS SPECIFICATIONS, AND DATA FILES THAT ARE PROVIDED BY THE ENGINEER. FIELD VERIFY LOCATION OF PROJECT FEATURES.
3. THE CONTRACTOR SHALL PERFORM NECESSARY CONSTRUCTION NOTIFICATIONS, APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK AS REQUIRED BY THE CONTRACT DOCUMENTS.
4. FENCES, MAIL BOXES, ETC. SHALL BE REMOVED AND REPLACED AS NECESSARY TO PERFORM THE WORK. UNLESS OTHERWISE INDICATED, ALL SUCH WORK SHALL BE PAID FOR UNDER CLEARING AND GRUBBING.
5. ALL AREAS DISTURBED BY THE CONTRACT BEYOND PAYMENT LIMITS SHALL BE RESTORED AT NO ADDITIONAL COST TO THE CITY. PAVEMENT SHALL BE REPLACED IN ACCORDANCE WITH THE DRAWINGS OR SPECIFIED OTHERWISE BY THE CITY OF STAMFORD.
6. THE CONTRACTOR SHALL MAINTAIN SIDE SLOPES AND DRAINAGE SWALES DURING CONSTRUCTION TO PREVENT PONDING AND EROSION.
7. THE CONTRACTOR SHALL NOT STORE ANY APPARATUS, MATERIALS, SUPPLIES OR EQUIPMENT ON DRAINAGE STRUCTURES OR WITHIN 100 FEET OF WETLANDS.
8. THE CONTRACTOR SHALL GRADE PROPOSED SLOPES TO MEET EXISTING SLOPES WHERE SHOWN ON PLANS, IN ACCORDANCE WITH THE MINIMUM AND MAXIMUM SLOPES SPECIFIED.
9. ALL STREET EXCAVATIONS SHALL BE COMPLETELY CLOSED AT THE END OF EACH WORKING DAY BY BACKFILLING, COVERING WITH STEEL PLATES MAY BE ALLOWED IF APPROVED BY THE ENGINEER.
10. WHERE ENCOUNTERED, UNSUITABLE MATERIAL SHALL BE REMOVED TO A DEPTH OF AT LEAST 12-INCHES BELOW THE BOTTOM OF TRENCH EXCAVATIONS AND REPLACED WITH GRANULAR FILL, UNLESS OTHERWISE SPECIFIED.
11. DURING THE PROCESS OF WORK, THE CONTRACTOR SHALL CONDUCT OPERATIONS AND MAINTAIN THE AREA OF CONSTRUCTION ACTIVITIES, INCLUDING SWEEPING AND SPRINKLING OF STREETS AS NECESSARY, TO MINIMIZE CREATION AND DISPERSION OF DUST.
12. WHERE EXISTING FENCES ARE TO BE REMOVED AND RESET, A TEMPORARY CONSTRUCTION FENCE SHALL BE ERECTED AFTER REMOVAL FOR THE PROTECTION OF THE RESIDENTS. TEMPORARY CONSTRUCTION FENCES SHALL BE PAIN FOR UNDER CLEARING AND GRUBBING.
13. ALL HIGHWAY LINE MONUMENTATION WITHIN THE PROJECT LIMITS MUST BE DELINEATED AND PROTECTED FROM DAMAGE OR MOVEMENT. ANY COST ASSOCIATED WITH RESETTING OF THE MONUMENTATION SHALL BE AT THE CONTRACT'S EXPENSE.
14. THE CONTRACTOR SHALL COMPLETE ALL LAYOUTS, SURVEYS, ETC. REQUIRED FOR CONSTRUCTION OF THE PROJECT AS SHOWN AND AS SPECIFIED.
15. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THE PROPER STORM DRAINAGE AND SANITARY FLOWS ARE MAINTAINED THROUGHOUT CONSTRUCTION.
16. ALL PROPOSED MANHOLES, MANHOLE COVERS AND FRAMES, CATCH BASINS, AND CATCH BASIN GRATES AND FRAMES (IF ANY) SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF STAMFORD.
17. REMOVAL OF ALL TREES WITHIN THE EXCAVATION LINES SHALL BE PAID FOR BY CLEARING AND GRUBBING.

WORK RESTRICTIONS:

1. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, FIRE HYDRANTS, AND UTILITIES WITHOUT APPROPRIATE PERMITS.
2. ALL CONSTRUCTION ACTIVITIES, INCLUDING THE LOADING AND UNLOADING OF MATERIALS AND EQUIPMENT, SHALL BE LIMITED TO THE HOURS OF TO THE HOURS 9:00AM TO 4:00PM ON MONDAY THROUGH FRIDAY, 8:00AM TO 3:00PM ON SATURDAY, AND 12:00PM TO 6:00PM ON SUNDAY. ANY WORK PERFORMED DURING WEEKDAY NIGHTS SHALL REQUIRE A PERMIT.

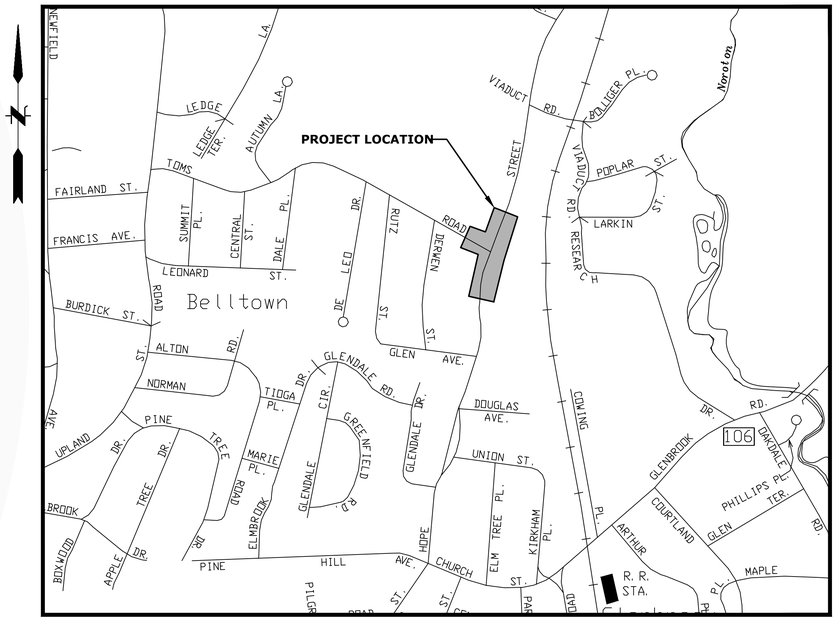
REGULATORY REQUIREMENTS:

1. BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY, PERFORM CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
2. DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND LOCAL REQUIREMENTS.

EARTHWORK

1. NOTIFY UTILITY LOCATOR SERVICE AT LEAST 72 HOURS BEFORE STARTING EXCAVATION. "CALL BEFORE YOU DIG" AT 1-800-922-4455 OR 811.
2. STOP WORK IN THE VICINITY OF SUSPECTED CONTAMINATED SOIL, GROUNDWATER OR OTHER MEDIA. IMMEDIATELY NOTIFY THE CITY SO THAT APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN. RESUME WORK IN THE IMMEDIATE VICINITY ONLY UPON DIRECTION BY THE CITY.

SHEET INDEX



LOCATION MAP
SCALE: 1" = 500'

UTILITIES:

1. THE CONTRACTOR SHALL NOTIFY "CALL BEFORE YOU DIG" AT 1-800-922-4455 AND THE CITY AT LEAST 72 HOURS...WHAT ELSE... PRIOR TO EXCAVATING AT ANY LOCATION, SATURDAYS, SUNDAYS, AND HOLIDAYS EXCLUDED. A COPY OF THE CBYD PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER PRIOR TO EXCAVATION.
2. LOCATIONS OF EXISTING PIPES, CONDUITS, UTILITIES, FOUNDATIONS AND OTHER UNDERGROUND OBJECTS ARE NOT WARRANTED TO BE CORRECT AND THE CONTRACTOR SHALL HAVE NO CLAIM ON THAT ACCOUNT SHOULD THEY BE OTHER THAN SHOWN.
3. TEST PITS TO LOCATE EXISTING UTILITIES MAY BE ORDERED BY THE ENGINEER.
4. TERMINATE EXISTING UTILITIES IN CONFORMANCE WITH LOCAL, STATE AND INDIVIDUAL UTILITY COMPANY STANDARD SPECIFICATIONS AND DETAILS. COORDINATE UTILITY SERVICE DISCONNECTS WITH UTILITY REPRESENTATIVES.
5. THE CONTRACTOR SHALL COORDINATE THE WORK AND WORK SCHEDULE WITH UTILITY COMPANIES. PROVIDE ADEQUATE NOTICE TO UTILITIES TO PREVENT DELAYS IN CONSTRUCTION.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESETTING OF FRAMES, GRATES, GATES, VALVE BOXES ETC. WHICH SHALL BE DONE IN ACCORDANCE WITH INDIVIDUAL UTILITY COMPANY REQUIREMENTS.
7. RIM ELEVATIONS FOR MANHOLES, VALVE COVERS, GAS AND WATER GATES AND PULL BOXES, AND OTHER STRUCTURES SHALL BE SET OR RESET FLUSH TO FINISH GRADE.
8. ALL NEW CATCH BASIN STRUCTURES SHALL INCLUDE TRAPS.
9. EXISTING STRUCTURES SHALL BE CORED PRIOR TO INSTALLING PIPE.
10. THE TYPE, SIZE AND LOCATION OF DEPICTED UNDERGROUND UTILITIES ARE APPROXIMATE REPRESENTATIONS OF INFORMATION OBTAINED FROM FIELD LOCATIONS OF VISIBLE FEATURES, EXISTING MAPS AND PLANS OF RECORD, UTILITY MAPPING, AND OTHER SOURCES OF INFORMATION OBTAINED BY THE ENGINEER. ASSUME NO GUARANTEE AS TO THE COMPLETENESS, SERVICEABILITY, EXISTENCE, OR ACCURACY OF UNDERGROUND FACILITIES. FIELD VERIFY THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES.
11. INTERIOR DIAMETERS OF STORM DRAIN AND SANITARY SEWER STRUCTURES SHALL BE DETERMINED BY THE PRECAST MANUFACTURER, BASED ON THE INDICATED PIPE SYSTEM LAYOUT AND LOCAL MUNICIPAL STANDARDS.

    MINIMUM INTERIOR DIAMETERS:
    0 TO 20 FEET DEEP; 4 FEET.
    20 FEET OR GREATER; 5 FEET.

STAGING/MPT NOTES:

1. APPROPRIATE PEDESTRIAN DETOUR AND CONSTRUCTION SIGNS SHALL BE IMPLEMENTED DURING CONSTRUCTION.
2. RESIDENTIAL OWNERS SHALL BE ABLE TO ACCESS THEIR DRIVEWAYS DURING CONSTRUCTION. ANY CONFLICTS OR CLOSURES TO DRIVEWAY APRONS TO PREVENT ACCESS/EGRESS SHALL BE COORDINATED IN ADVANCE WITH THE CITY OF STAMFORD AND THE OWNERS.
3. THE CONTRACTOR SHALL PROVIDE CONTINUOUS ACCESS TO COMMERCIAL DRIVEWAYS DURING CONSTRUCTION. ANY TEMPORARY CLOSURES OR CHANGES IN TRAFFIC PATTERNS AT COMMERCIAL ENTRANCES/EXITS SHALL BE COORDINATED IN ADVANCE WITH THE CITY OF STAMFORD AND THE OWNERS.

FINAL DESIGN

PROJ. No.: 20180287.A30
DATE: SEPTEMBER 2018

COV-01

LONG RIDGE ROAD
SIDEWALK IMPROVEMENTS

STAMFORD · CONNECTICUT

SEPTEMBER 22, 2021

CONSTRUCTION NOTES - ADDITIONAL TO FORM 818

GENERAL

1. ALL WORK WITHIN THE STATE RIGHT-OF-WAY WILL COMPLY WITH FORM 818, "THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES AND INCIDENTAL CONSTRUCTION" WITH THE LATEST SPECIAL PROVISIONS AND TYPICAL STATE STANDARD DETAILS. IN ANY CASE WHERE THE CONSTRUCTION IS NOT SPECIFICALLY DETAILED IN THE FORM 818, THE WORK WILL BE COMPLETED AS DIRECTED BY THE ENGINEER OR DISTRICT PERMIT SECTION REPRESENTATIVE.
2. REMOVAL OF PAVEMENT MARKINGS ALONG STATE ROADWAYS SHALL BE COMPLETED BY A NON-DESTRUCTIVE METHOD IN COMPLIANCE WITH THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD, BRIDGES AND INCIDENTAL CONSTRUCTION FORM 818 SECTION 12.11 AS REVISED.
3. NEW PAVEMENT MARKINGS SHALL BE PAINTED WITH EPOXY RESIN PAINT IN COMPLIANCE WITH THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION FOR ROADS, BRIDGES, AND INCIDENTAL CONSTRUCTION FORM 818 SECTION 12.10 AS REVISED.
4. NEW SIGN MATERIAL AND SHEETING SHALL BE MADE OF REFLECTIVE MATERIAL IN COMPLIANCE WITH STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, AND INCIDENTAL CONSTRUCTION FORM 818 SECTION 12.08 AS REVISED. TYPE 1 REFLECTIVE SHEETING SHALL BE USED FOR SIGNS WITH WHITE BACKGROUND, TYPE 3 REFLECTIVE SHEETING SHALL BE USED FOR SIGNS WITH COLORED BACKGROUND EXCEPT FOR SIGNS WITH RED BACKGROUND THAT SHALL BE TYPE 8 OR 9 REFLECTIVE SHEETING.
5. ALL SIGNS AND PAVEMENT MARKINGS INSTALLED WITHIN STATE RIGHT-OF-WAY MUST CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND THE LATEST STATE OF CONNECTICUT CATALOG OF SIGNS AS REVISED.
6. ANY DAMAGE TO THE EXISTING CURB, SIDEWALK OR ANY OTHER HIGHWAY APPURTENANCES DURING THE DEVELOPMENT OF THE PERMITTED SITE WILL BE REPLACED BY THE CONTRACTOR AS DIRECTED BY THE DISTRICT 3 PERMIT SECTION AT NO COST TO THE STATE.
7. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSIONS OR LOCATION. COORDINATE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.
8. DO NOT RELY SOLELY ON ELECTRONIC VERSIONS OF DRAWINGS SPECIFICATIONS, AND DATA FILES THAT ARE PROVIDED BY THE ENGINEER. FIELD VERIFY LOCATION OF PROJECT FEATURES.
9. ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND PAYMENT LIMITS SHALL BE RESTORED AT NO ADDITIONAL COST TO THE CITY. PAVEMENT SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.
10. THE CONTRACTOR SHALL MAINTAIN SIDE SLOPES AND DRAINAGE SWALES DURING CONSTRUCTION TO PREVENT PONDING AND EROSION.
11. ALL STREET EXCAVATIONS SHALL BE COMPLETELY CLOSED AT THE END OF EACH WORKING DAY BY BACKFILLING. COVERING WITH STEEL PLATES MAY BE ALLOWED IF APPROVED BY THE ENGINEER.
12. WHERE ENCOUNTERED, UNSUITABLE MATERIAL SHALL BE REMOVED TO A DEPTH OF AT LEAST 12-INCHES BELOW THE BOTTOM OF TRENCH EXCAVATIONS AND REPLACED WITH GRANULAR FILL, UNLESS OTHERWISE SPECIFIED.
13. REMOVAL OF ALL TREES WITHIN THE EXCAVATION LINES SHALL BE PAID FOR BY CLEARING AND GRUBBING.
14. ALL GUIDE RAIL SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS AND ISSUED REVISIONS/SUPPLEMENTS, AND STANDARD DETAILS.

WORK RESTRICTIONS:

1. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, FIRE HYDRANTS, AND UTILITIES WITHOUT APPROPRIATE PERMITS.
2. ALL CONSTRUCTION ACTIVITIES, INCLUDING THE LOADING AND UNLOADING OF MATERIALS AND EQUIPMENT, SHALL BE LIMITED TO THE HOURS OF 9:00AM TO 4:00PM ON MONDAY THROUGH FRIDAY, 8:00AM TO 3:00PM ON SATURDAY, AND 12:00PM TO 6:00PM ON SUNDAY. ANY WORK PERFORMED ON A SUNDAY MAY REQUIRE A NOISE WAIVER AND ANY WORK DURING WEEKDAY NIGHTS SHALL REQUIRE A PERMIT.
3. A STREET OPENING PERMIT FROM THE CITY OF STAMFORD WILL BE REQUIRED, ALONG WITH A CT DOT ENCROACHMENT PERMIT.

EROSION AND SEDIMENT CONTROL:

1. THE CONTRACTOR SHALL INSTALL THE SPECIFIED EROSION CONTROL DEVICES BEFORE BEGINNING OTHER WORK ON SITE AND MAINTAIN THEM FOR THE DURATION OF THE PROJECT.
2. REFER TO THE DRAWINGS FOR EROSION AND SEDIMENT CONTROL LOCATIONS.
3. IMPLEMENT ALL NECESSARY MEASURES REQUIRED TO CONTROL STORMWATER RUNOFF, DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE, PERFORM CORRECTIVE ACTION AS NEEDED, FOR EROSION CLEAN-UP AND REPAIRS TO OFF SITE AREAS, IF ANY, AT NO COST TO OWNER.

CONSTRUCTION LAYOUT

1. PROVIDE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED SITE IMPROVEMENTS. FIELD VERIFY EXISTING PAVEMENT AND GROUND ELEVATIONS AT THE INTERFACE WITH PROPOSED PAVEMENTS AND DRAINAGE STRUCTURES BEFORE START OF CONSTRUCTION.
2. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, FIELD VERIFY PROPOSED UTILITY ROUTES AND IDENTIFY ANY INTERFERENCES OR OBSTRUCTIONS WITH EXISTING UTILITIES OR PUBLIC RIGHTS-OF-WAY.
3. IMMEDIATELY INFORM THE ENGINEER IN WRITING IF EXISTING UTILITY CONDITIONS CONFLICT OR DIFFER FROM THAT INDICATED AND IF THE WORK CANNOT BE COMPLETED AS INDICATED.
4. BOUNDS OR MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.
5. THE PERMITTEE SHALL CONTACT MR. VINCENT HANCHURUCK, DEPARTMENT'S DISTRICT SURVEY UNIT, AT (203) 389-3112 PRIOR TO ANY CONSTRUCTION WITHIN THE STATE RIGHT-OF-WAY.
6. THE PERMITTEE WILL BE RESPONSIBLE FOR ALL ENGINEERING COTS SHOULD THE CTDOT BOUNDARY / SURVEY MARKERS BE DISTRUBED OR DAMAGED.
7. IN THE EVENT THE DEPARTMENT DETERMINES THE SUBJECT CTDOT BOUNDARY / SURVEY MARKERS NEED TO BE REPLACED DUE TO THE PROPOSED DEVELOPMENT, THE DEPARTMENT WILL FURNISH NEW MONUMENTS, WHICH THE PERMITTEE WILL BE REQUIRED TO INSTALL UNDER THE DIRECTION OF A CONNECTICUT LICENSED SURVEYOR.
8. THE CTDOT BOUNDARY / SURVEY MARKERS SHALL BE VERIFIED AND ACCEPTED BY THE DISTRICT 3 SURVEY PRIOR TO RELEASING THE ENCROACHMENT PERMIT BOND.

PREPARED FOR

CITY OF STAMFORD
LONG RIDGE ROAD
STAMFORD, CT

PREPARED BY

FUSS & O'NEILL
146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
860.646.2469
www.fando.com

GENERAL NOTES:

1. CONSTRUCTION SPECIFICATIONS:
   Connecticut Department of Transportation, Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 818, dated 2020 and Supplemental Specifications dated July 2021.
2. DESIGN:
   Connecticut Department of Transportation Highway Design Manual, dated 2003 and A Policy on Geometric Design of Highways and Streets (AASHTO)

STAGING/MPT NOTES:

1. APPROPRIATE PEDESTRIAN DETOUR AND CONSTRUCTION SIGNS SHALL BE IMPLEMENTED DURING CONSTRUCTION.
2. RESIDENTIAL OWNERS SHALL BE ABLE TO ACCESS THEIR DRIVEWAYS DURING CONSTRUCTION. ANY CONFLICTS OR CLOSURES SHALL BE COORDINATED IN ADVANCE WITH THE CITY OF STAMFORD AND THE OWNERS
3. THE CONTRACTOR SHALL PROVIDE CONTINUOUS ACCESS TO COMMERCIAL DRIVEWAYS DURING CONSTRUCTION. ANY TEMPORARY CLOSURES OR CHANGES IN ADVANCE WITH THE CITY OF STAMFORD AND THE OWNERS

SITE RESTORATION

1. PROVIDE 4 INCHES OF TOPSOIL AND SEED TO AREAS DISTURBED DURING CONSTRUCTION AND NOT DESIGNATED TO BE RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.)
2. REPAIR DAMAGES RESULTING FROM CONSTRUCTION LOADS, AT NO ADDITIONAL COST TO THE CITY.
3. RESTORE AREAS DISTURBED BY CONSTRUCTION OPERATIONS TO THEIR ORIGINAL CONDITION OR BETTER, AT NO ADDITIONAL COST TO THE CITY.

UTILITIES:

1. THE CONTRACTOR SHALL NOTIFY "CALL BEFORE YOU DIG" AT 1-800-922-4455 AND THE TOWN AT LEAST 72 HOURS PRIOR TO EXCAVATING AT ANY LOCATION, SATURDAYS, SUNDAYS, AND HOLIDAYS EXCLUDED. A COPY OF THE CBYD REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER PRIOR TO EXCAVATION.
2. LOCATIONS OF EXISTING PIPES, CONDUITS, UTILITIES, FOUNDATIONS AND OTHER UNDERGROUND OBJECTS ARE NOT WARRANTED TO BE CORRECT AND THE CONTRACTOR SHALL HAVE NO CLAIM ON THAT ACCOUNT SHOULD THEY BE OTHER THAN SHOWN.
3. TEST PITS TO LOCATE EXISTING UTILITIES MAY BE ORDERED BY THE ENGINEER.
4. TERMINATE EXISTING UTILITIES IN CONFORMANCE WITH LOCAL, STATE AND INDIVIDUAL UTILITY COMPANY STANDARD SPECIFICATIONS AND DETAILS. COORDINATE UTILITY SERVICE DISCONNECTS WITH UTILITY REPRESENTATIVES.
5. THE CONTRACTOR SHALL COORDINATE THE WORK AND WORK SCHEDULE WITH UTILITY COMPANIES. PROVIDE ADEQUATE NOTICE TO UTILITIES TO PREVENT DELAYS IN CONSTRUCTION.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESETTING OF FRAMES, GRATES, GATES, VALVE BOXES ETC. WHICH SHALL BE DONE IN ACCORDANCE WITH INDIVIDUAL UTILITY COMPANY REQUIREMENTS.
7. RIM ELEVATIONS FOR MANHOLES, VALVE COVERS, GAS AND WATER GATES AND PULL BOXES, AND OTHER STRUCTURES SHALL BE SET OR RESET FLUSH TO FINISH GRADE.
8. ALL NEW CATCH BASIN STRUCTURES SHALL INCLUDE HOODS.
9. EXISTING STRUCTURES SHALL BE CORED PRIOR TO INSTALLING PIPE.
10. THE TYPE, SIZE AND LOCATION OF DEPICTED UNDERGROUND UTILITIES ARE APPROXIMATE REPRESENTATIONS OF INFORMATION OBTAINED FROM FIELD LOCATIONS OF VISIBLE FEATURES, EXISTING MAPS AND PLANS OF RECORD, UTILITY MAPPING, AND OTHER SOURCES OF INFORMATION OBTAINED BY THE ENGINEER. ASSUME NO GUARANTEE AS TO THE COMPLETENESS, SERVICEABILITY, EXISTENCE, OR ACCURACY OF UNDERGROUND FACILITIES. FIELD VERIFY THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES.
11. INTERIOR DIAMETERS OF STORM DRAIN AND SANITARY SEWER STRUCTURES SHALL BE DETERMINED BY THE PRECAST MANUFACTURER, BASED ON THE INDICATED PIPE SYSTEM LAYOUT AND LOCAL MUNICIPAL STANDARDS.

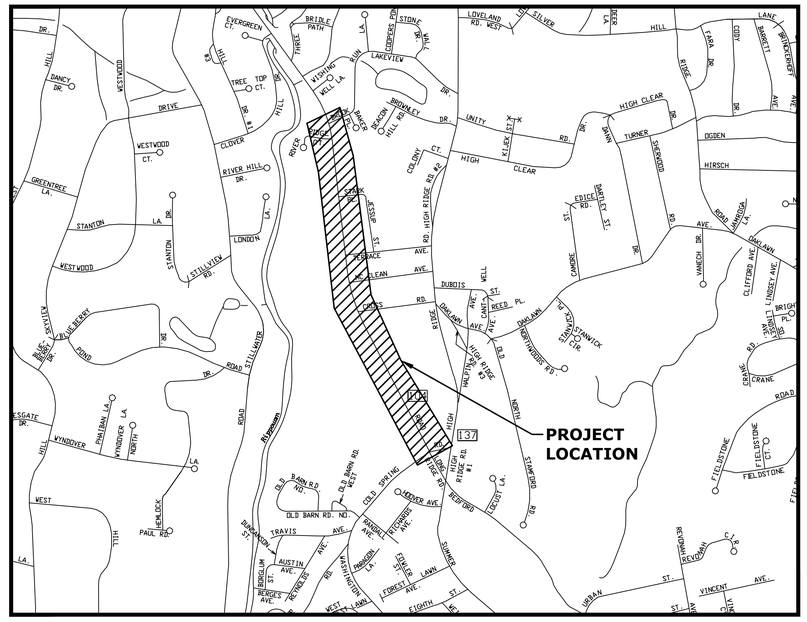
    MINIMUM INTERIOR DIAMETERS:
    0 TO 20 FEET DEEP; 4 FEET.
    20 FEET OR GREATER; 5 FEET.

INSTALLATION OF MANHOLE FRAMES, CATCH BASIN TOPS, AND GAS AND WATER GATES TO FINISH GRADE:

1. THE PROCEDURE FOR INSTALLING MANHOLE FRAMES, CATCH BASIN TOPS, AND GAS AND WATER GATES SHALL BE AS STIPULATED IN THE FOLLOWING STEPS.
   a. CATCH BASINS, MANHOLES, AND GAS AND WATER GATES SHALL INITIALLY BE INSTALLED TO THE TOP OF THE SUBBASE LAYER, PLATED, AND MARKED WITH LOCATIONS REFERENCED.
   b. AFTER DRAINAGE, SANITARY SEWER, AND GAS AND WATER GATE STRUCTURES ARE PLATED, THE BASE COURSE OF BITUMINOUS CONCRETE SHALL BE INSTALLED TO THE GRADES SHOWN ON THE PLANS.
   c. FROM THE REFERENCE MARKS THE BASE COURSE OF PAVEMENT SHALL BE CUT, THE STRUCTURES EXPOSED AND THE TOPS PLACED TO FINAL GRADE.
   d. THE FRAMES AND TOPS SHALL BE BROUGHT TO FINAL GRADE USING AN APPROPRIATE COMBINATION OF CONCRETE RISER RINGS, CEMENT MORTAR, CONCRETE BRICKS AND STEEL SHIMS, AS NECESSARY.
   e. THE FRAMES AND TOPS SHALL BE ALIGNED TO MATCH THE PROPOSED CROSS SLOPE AND GRADE OF THE SURROUNDING PAVED SURFACE TO THE EXTENT PRACTICABLE.

PAVEMENT

1. AT A MINIMUM, CONSTRUCT ACCESSIBLE ROUTES, PARKING SPACES, RAMPS, SIDEWALKS AND WALKWAYS IN CONFORMANCE WITH THE FEDERAL AMERICANS WITH DISABILITIES ACT AND WITH STATE AND LOCAL LAWS AND REGULATIONS (WHICHEVER ARE MORE STRINGENT).



LOCATION MAP
SCALE: 1" = 800'

SHEET INDEX

FINAL DESIGN

PROJ. No.: 20180287.A60
DATE: SEPTEMBER 2021

COV-01

FUSS & O'NEILL

FINAL TECHNICAL MEMORANDUM

TO: Mr. James Travers, City of Stamford
Mr. Garrett Bolella, PE, PTOE, City of Stamford

FROM: Charles Harlow, PE
Mark G. Vertucci, PE, PTOE
John Guzze, PE

DATE: June 19, 2019

RE: Long Ridge Road – Sidewalks and Pedestrian Improvements
Stamford, Connecticut
Engineering Assessment - Technical Memorandum

Fuss & O'Neill has been retained to evaluate the three-quarter mile section of Long Ridge Road (Route 104) between its intersection with Cold Spring Road (Route 137) and River Ridge Court for the implementation of sidewalks and pedestrian safety improvements. This memorandum has been prepared to document our engineering assessment of the study area and identify potential improvements that can enhance the corridor in the short term.

Roadway Inventory

Long Ridge Road (Route 104) is a stated owned and maintained roadway in which the corridor of interest spans 0.75 miles from its intersection with Cold Spring Road to the south to its intersection with River Ridge Court to the north. Within the project study area, Long Ridge Road consists of four lanes of

travel (two in each direction) with auxiliary turning lanes at various intersections and commercial driveways. The roadway is classified as a principal arterial roadway with an Average Daily Traffic (ADT) of 21,500 vehicles per day (vpd) just south of Route 15 (Merritt Parkway) and 21,100 vpd just north of Cold Spring Road by the CTDOT. Shoulder widths along the corridor vary from approximately one-foot to five-feet, and on-street parking is not accommodated within the study area. The posted speed limit on Long Ridge Road is 40 miles per hour between River Ridge Court and Cold Spring Road. The corridor is comprised of three signalized intersections and various unsignalized intersections, as well as numerous other driveway curb cuts.

The signalized intersection of Long Ridge Road (Route 104) and Cold Spring Road (Route 137) provides a north/southbound approach on Long Ridge Road and an east/westbound on Cold Spring Road.

The southbound approach on Long Ridge Road provides a dedicated left turn lane with approximately 75 feet of vehicle storage capacity, two through lanes and a dedicated right turn lane with approximately 150 feet of vehicle storage capacity. The northbound approach provides a dedicated left turn lane with approximately 75 feet of vehicle storage capacity, one through lane and one combined through/ right turn lane. The westbound approach on Cold Spring Road provides a dedicated left turn lane with approximately 75 feet of vehicle storage capacity, one through lane and one combined through/ right turn lane. The eastbound approach provides two dedicated left turn lanes with approximately 215 feet of vehicle storage capacity, one through lane and one combined through/ right turn lane. The posted speed limit is 40 miles per hour on Long Ridge Road and 25 miles per hour on Cold Spring Road.

The signalized intersection of Long Ridge Road (Route 104) at the Lord & Taylor driveway and Gen Re Reinsurance Company driveway provides a north/southbound approach on Long Ridge Road, an eastbound approach at the Genesis Insurance Company driveway and a westbound approach at the Lord & Taylor driveway.

The southbound approach on Long Ridge Road provides a combined through/ right turn lane and a combined through/ left turn lane. The northbound approach provides a yield protected channelized right turn lane with approximately 165 feet of vehicle storage capacity, one through lane and one combined through/left turn lane. The westbound approach at the Lord & Taylor driveway provides a dedicated left turn lane with approximately 175 feet of vehicle storage capacity and a combined through/ right turn lane with approximately 175 feet of vehicle storage capacity. The eastbound approach at the Gen Re Reinsurance Company driveway provides a dedicated left turn lane with approximately 200 feet of vehicle storage capacity and a combined through/ right turn lane with approximately 200 feet of vehicle storage capacity. The posted speed limit is 40 miles per hour on Long Ridge Road with no posted speed limit on the eastbound and westbound approaches.

The signalized intersection of Long Ridge Road (Route 104) at Terrace Avenue and Stamford Health Medical Group south driveway provides a north/southbound approach on Long Ridge Road, an westbound approach Terrace Avenue and a eastbound approach at the Stamford Health Medical Group south driveway.

The north/southbound approaches on Long Ridge Road provide a combined through/ right turn lane and a combined through/ left turn lane. The westbound approach on Terrace Avenue provides a combined left/through/right turn lane. The eastbound approach at the Stamford Health Medical Group south driveway provides a combined through/ right turn lane and a dedicated left turn lane with approximately 150 feet of vehicle storage capacity. The posted speed limit is 40 miles per hour on Long Ridge Road and 25 miles per hour on Terrace Avenue with no posted speed limit on the eastbound approach.

Crash Data

Crash data for the Long Ridge Road corridor between Cold Spring Road and River Ridge Court was obtained from the University of Connecticut Crash Repository database. The records were gathered for the most recent three years of available data, 2016 through 2018, and reviewed to determine any existing crash patterns related to pedestrian activity that may be mitigated with proposed improvements and to determine any abnormal crash type or frequency. *Table 1* summarizes the number of crashes experienced at each distinct location on the corridor.

Table 1 – Crash Data Summary

Roadway Segment/Intersection	2016	2017	2018	Total	Average
River Ridge Court to Terrace Avenue	8	5	2	15	5
Terrace Avenue to Lord & Taylor north site driveway	2	0	4	6	2
Lord & Taylor north site driveway to Cold Spring Road	4	8	5	17	6
Total	**14**	**13**	**11**	**38**	**13**

The 0.23 mile roadway section of Long Ridge Road between River Ridge Court and Terrace Avenue experienced a total of 15 crashes over the three-year period. The crashes were mostly rear-ended and sideswipe, same direction collision types. In total over the three year span, nine of the total crashes were rear-end, five were sideswipe same direction and one was an angle collision. A majority of the crashes were concentrated at the intersection of Long Ridge Road and Terrace Avenue. No crash patterns or frequencies were observed.

The 0.20 mile roadway section of Long Ridge Road between Terrace Avenue and the Lord & Taylor northerly site driveway experienced a total of six crashes over the three-year period. The crashes were mostly rear-ended and sideswipe, same direction collision types. In total over the three year span, three of the total crashes were rear-end, two were sideswipe same direction and one was an angle collision. No crash patterns or frequencies were observed.

The 0.27 mile roadway section of Long Ridge Road between the Lord & Taylor northerly site driveway and Cold Spring Road experienced a total of 17 crashes over the three-year period. The crashes were mostly rear-ended and sideswipe, same direction collision types. In total over the three year span, 10 of the total crashes were rear-end, four were sideswipe same direction, two were unknown, and one was an angle collision. A majority of the crashes were concentrated at the intersection of Long Ridge Road and the Gen Re Reinsurance Company southerly driveway. No abnormal crash patterns or frequencies were observed and there were no pedestrian or bicycle related crashes reported.

Pedestrian & Bicycle Facilities

Every trip begins and ends on foot, and walking is the least expensive way to get from one place to another. Besides providing direct access to commercial, civic, recreational, academic, and other destinations, good pedestrian facilities are essential to the success of every other travel mode. These facilities include sidewalks of adequate width, visible crosswalks, accessible ramps, pedestrian signals, and a variety of streetscaping measures that also affect comfort and safety. Appropriate lighting, shading, and resting places are important components of the pedestrian experience. Pedestrian routes should be direct and well maintained to aid in walkability.

Through conversations with the City of Stamford Staff and local business owners it was determined that the corridor experiences a significant pedestrian presence with a majority of pedestrians stemming from the Stamford Health Medical Group, various bus stops within the study area and surrounding residential and commercial buildings.

At the outset of this project, a field assessment of the location and condition of sidewalks was conducted. Concrete sidewalks are not present throughout the majority of the study area. Sidewalks are provided towards the south end of project with a bituminous concrete sidewalk located on the west side of Long Ridge Road starting at 120 Long Ridge Road and continuing south for approximately 450 feet to 60 Long Ridge Road. Field measurements indicate a width of less than 5 feet wide, non-compliant with the design standards required by the Americans with Disabilities Act of 1990 (ADA) and the Public Right-of-Way Accessibility Guidelines (PROWAG).

Concrete sidewalks are also provided toward the south end of the project area located on the west side of Long Ridge Road starting at 60 Long Ridge Road and continuing south for approximately 175 feet before terminating at Cold Spring Road. In addition, a concrete sidewalk is provided on the east side of Long Ridge Road starting at the Lord & Taylor south access driveway and continuing south for approximately 365 feet before terminating at Cold Spring Road.

At the signalized intersection of Long Ridge Road (Route 104) and Cold Spring Road (Route 137) the concrete sidewalks located on the east and west side of the roadway are not accompanied by exclusive pedestrian phases, painted crosswalks, or pedestrian actuated push buttons spanning across the southbound approach; however, the northeast accessible ramp meets the design standards required by the Americans with Disabilities Act of 1990 (ADA) and the Public Right-of-Way Accessibility

Guidelines (PROWAG) while the northwest accessible ramp is missing a detectable warning strip and contains no landing area.

At the signalized intersection of Long Ridge Road (Route 104) at the Lord & Taylor driveway and the Gen Re Reinsurance Company driveway, no sidewalk, accessible ramps, or crosswalks are provided; however, two pedestrian actuated push buttons are provided on either side of the northern leg of the intersection, neither of which are ADA or PROWAG compliant.

At the intersection of Long Ridge Road (Route 104) at Terrace Avenue and Stamford Health Medical Group south driveway, no sidewalk, accessible ramps, or crosswalks are provided; however, two pedestrian actuated push buttons are provided on either side of the northern leg of the intersection, neither of which are ADA or PROWAG compliant.

This section of Long Ridge Road lacks any bicycle facilities, including but not limited to bicycle lanes, shared lanes, pavement markings, bicycle sensitive traffic signals, and bicycle parking amenities. The Long Ridge Road Corridor is a main north-south arterial that connects the neighborhoods, schools, and commercial building in northern Stamford and along the corridor to the downtown area. This contributes to the presence of pedestrians and bicyclists in the study area, thus improved pedestrian and bicycle facilities are essential to create a safe and enjoyable experience for all roadway users.

Transit Facilities & Service

The Long Ridge Road corridor is accessible via CT Transit to aid the local community in their travels. This is a form of bus service that is owned and operated by CTDOT to serve Stamford and its metropolitan area. CT Transit Stamford Route 336 operates between the Stamford Transportation Center and Stamford's Bulls Head district via Washington Boulevard. From Bulls Head, the route turns northward on Long Ridge Road. Route 336 buses also serve Atlantic Square.

Stamford (CT Transit) Route 336 can be accessed at eleven locations within the project area. Of the eleven bus stops located along the project area, six are located on the west side of Long Ridge Road providing bus service to the south and five are located on the east side of Long Ridge Road providing bus service to the north. The three most southern bus stops are located within the sidewalk on either side of the roadway with only one of the northbound bus stop providing a shelter to riders who wait for shuttles. All other bus stops along the project area are not located on the sidewalk with only two bus stops located on the western side of Long Ridge Road providing a shelter.

None of these stops provide a striped pull-off area, only a sign indicating to pedestrians where to wait for the bus. Lighting provided along the corridor is primarily suited for vehicular roadway illumination, and is not scaled to be comfortable to pedestrians/transit users. The CT Transit buses are typically also equipped with bike racks on their exterior to accommodate cyclists.

With a lack of pedestrian amenities/facilities along the project area it is difficult for bus riders to switch between the northbound and southbound bus services, limiting the use of the service for commuters. A

review of ridership statistics at each of the eleven bus stops along the corridor indicates that there are pockets of low usage at some of the bus stops throughout the corridor. It is recommended that the connectivity be improved between the east and west sides of Long Ridge Road for pedestrians and transit users while reducing/consolidating the number of bus stops for increased operational efficiency and to allow users to cross Long Ridge Road at safer locations.

Traffic Analysis

Capacity and queue analyses for the signalized and unsignalized study intersections in the study corridor were conducted using Synchro Professional Software, version 10.0.

Capacity Analysis

In discussing intersection capacity analyses results, two terms are used to describe the operating condition of the road or intersection. These two terms are volume to capacity ratio (v/c) and level of service (LOS).

The v/c ratio is a ratio of the volume of traffic using an intersection to the total capacity of the intersection (the maximum number of vehicles that can utilize the intersection during an hour). The v/c ratio can be used to describe the percentage of capacity utilized by a single intersection movement, a combination of movements, an entire intersection approach, or the intersection as a whole.

LOS is a measure of the delay experienced by stopped vehicles at an intersection. LOS is rated on a scale from A to F, with A describing a condition of very low delay (less than 10 seconds per vehicle), and F describing a condition where delays will exceed 50 seconds per vehicle for unsignalized intersections and 80 seconds per vehicle for signalized intersections. Delay is described as a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

V/C ratio and LOS are both generally used to describe the operation (based on delay time) of signalized intersections. These definitions for v/c ratio and LOS, as well as the methodology for conducting signalized and unsignalized intersection capacity analyses, are taken from the "2000 Highway Capacity Manual" published by the Transportation Research Board.

Using the above referenced methodologies, the weekday morning and weekday afternoon peak hour background capacity analyses were conducted at the following intersections:

- Lord & Taylor driveway and Gen Re Reinsurance Company driveway
- Terrace Avenue and Stamford Health Medical Group south driveway

Table No. 2 attached presents a summary of the levels of service at the signalized intersections for the background conditions during both peak hours. The background condition includes 2019 existing traffic volumes adjusted to the 2024 build year using an ambient growth rate of 0.75% per year to account for normal traffic growth in the study area. This growth rate was obtained from the Connecticut Department of Transportation (CTDOT) Bureau of Planning. The background condition also includes projected future traffic volumes from the proposed 120-292 Long Ridge Road residential development and vacant office space as calculated by the previous traffic impact study prepared by Fuss & O'Neill for that project.

Copies of the analysis worksheets can be found attached for the weekday morning, and afternoon peak hours, respectively.

For analysis purposes, the Long Ridge Road approaches are referred to as northbound and southbound and the side street approaches are typically referred to as eastbound and westbound. The volumes used for these analyses were obtained from the 120-292 Long Ridge Road Traffic Impact Study conducted by Fuss & O'Neill. The traffic volume figures used for this analysis can be found attached.

The signalized intersection of Long Ridge Road (Route 104) at the Lord & Taylor driveway and Gen Re Reinsurance Company driveway operates acceptably at LOS A during the weekday morning peak hour and LOS C during the weekday afternoon peak hour under background conditions.

The signalized intersection of Long Ridge Road (Route 104) at Terrace Avenue and Stamford Health Medical Group south driveway operates acceptably at LOS A during the weekday morning peak hour and LOS C during the weekday afternoon peak hour under background conditions.

It is recommended to add pedestrian crosswalks, ramps, pedestrian signals, pedestrian actuated push buttons, and concurrent pedestrian phasing with a leading pedestrian interval (LPI) at each of the intersections analyzed above to improve the connectivity between the east and west sides of Long Ridge Road for pedestrians and transit users.

Queue Analysis

Background and combined condition 95th percentile (design) queue lengths were reviewed at each signalized intersection in the study area. The 95th percentile (design) vehicle queue lengths represent the maximum queue lengths that can be expected at each of the critical approach lanes of the study area intersections. The queue lengths are provided in the Synchro capacity analysis worksheets, which are attached. *Table 3* attached provides a summary of the queue lengths for the critical lanes at each intersection.

The 95th percentile queue lengths experienced along the corridor are contained within the provided storage capacity for the turning movements analyzed with the exception of the following movements:

- Eastbound left turn movement at the intersection of Long Ridge Road (Route 104) at the Lord & Taylor driveway and Gen Re Reinsurance Company driveway during the weekday morning peak hour by two vehicle lengths. This queue is contained within the Gen Re site and does not impact traffic operations on Long Ridge Road.

Conclusion and Recommendations

The Long Ridge Road Corridor is a main arterial that connects the neighborhoods in northern Stamford to the downtown area and provides regional access to the City of Stamford from the Merritt Parkway mostly through vehicular traffic with limited pedestrian, cyclist and public transit rider safety, connectivity and functionality. The presence of nine CT*transit* bus stops, the Stamford Health Medical Group and surrounding residential and commercial land uses within the 0.75 mile study area presents opportunity for pedestrians, cyclists and public transit riders to use the Long Ridge Road corridor as a pedestrian friendly roadway facility.

To establish increased pedestrian safety, continuity and functionality along the Long Ridge Road corridor, the following preliminary improvements are recommended:

- Provide a continuous ADA and PROWAG accessible pedestrian route along the west side of Long Ridge Road with the addition of new 6 foot concrete sidewalks.
    - The west side of the roadway provides adequate right of way width and grading limits for the design of a concrete sidewalk through its entirety, with the exception of the 275' section of roadway between the Sunoco gas station just south of River Ridge Court and the northerly Stamford Health Medical Group driveway. This section provides a steep slope at the back of the guiderail which poses a pinch point in the design of concrete sidewalk along Long Ridge Road, in its entirety. Close attention shall be given to this section of roadway during design to provide a safe and constructible concrete sidewalk.
- Improve the connectivity between the east and west sides of Long Ridge Road for pedestrians and transit users by adding and upgrading pedestrian crosswalks, pedestrian ramps, pedestrian signals with pedestrian actuated push buttons, concurrent pedestrian phasing, and LPI's at the following signalized intersections with Long Ridge Road:
    - Lord & Taylor driveway and Gen Re Reinsurance Company driveway
    - Terrace Avenue and Stamford Health Medical Group south driveway
    - Cold Spring Road
- Install or upgrade bus shelters at each bus stop within the concrete sidewalks
- Eliminate bus stops along the corridor for increased operational efficiency and safer travel routes for transit users and pedestrians at the following locations:
    - Northbound Bus Route
        - Long Ridge Road at Cold Spring Road
        - Long Ridge Road at Stark Place
    - Southbound Bus Route
        - Long Ridge Road at River Ridge Court
        - Long Ridge Road at Cross Road
        - Long Ridge Road opposite CVS Pharmacy
- Consider the restriping of Long Ridge Road to provide narrower 10.5 foot exterior travel lanes and 11 foot interior travel lanes thereby providing wider 3' – 5' shoulders to support increased vehicle and pedestrian safety. The reduction in travel lane width and increase in shoulder width will provide opportunity to smoothly tie into the future Merritt Parkway trail project.

- As an alternative to sidewalks, consider implementation of a 10 foot wide combined multi-use trail on the west side of the roadway.

Should you have any questions regarding this technical memorandum, please contact us at 860-646-2469.

Attachments:

-Traffic Volume Figures
-Synchro Reports
-Long Ridge Road Bus Route 336 Ridership Data

Table 2
Signalized Intersection Level of Service Summary
Long Ridge Road
Stamford, Connecticut

Signalized Intersections	Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
	Background	Background
Long Ridge Rd. at Lord & Taylor driveway and Gen Re Reinsurance Company driveway	**0.62/LOS A/8.3***	**0.85/LOS C/20.7**
EB Approach	LOS E	LOS F
WB Approach	LOS E	LOS D
NB Approach	LOS A	LOS B
SB Approach	LOS A	LOS B
Long Ridge Rd. at Terrace Ave. and Stamford Health Medical Group south driveway	**0.80/LOS B/19.4**	**0.87/LOS C/26.1**
EB Approach	LOS F	LOS E
WB Approach	LOS E	LOS D
NB Approach	LOS A	LOS A
SB Approach	LOS B	LOS D

*Values indicated are intersection max v/c Ratio/LOS/Delay (sec)

Table 4
Queue Length Summary
Long Ridge Road
Stamford, Connecticut

Intersection	Approach Lane	2024 AM Background Queue	2024 PM Background Queue	Available Storage
Long Ridge Rd. at Lord & Taylor driveway and Gen Re Reinsurance Company driveway	EB Left Turn	30 Feet	250 Feet	200 Feet
	EB Through/Right	0 Feet	40 Feet	200 Feet
	WB Left Turn	10 Feet	40 Feet	175 Feet
	WB Through/Right	10 Feet	5 Feet	175 Feet
	NB Through/Left	230 Feet	430 Feet	1,250 Feet
	NB Right	0 Feet	5 Feet	165 Feet
	SB Through/Left	115 Feet	200 Feet	900 Feet
	SB Right Turn	0 Feet	0 Feet	900 Feet
Long Ridge Rd. at Terrace Ave. and Stamford Health Medical Group south driveway	EB Left Turn	125 Feet	125 Feet	150 Feet
	EB Through/Right	75 Feet	120 Feet	150 Feet
	WB Approach	165 Feet	75 Feet	900 Feet
	NB Approach	145 Feet	285 Feet	900 Feet
	SB Approach	635 Feet	720 Feet	>1,000 Feet

TECHNICAL MEMORANDUM

TO: Mr. Lazarus Pittman, Transportation Engineer III
Division of Traffic Engineering
Connecticut Department of Transportation

FROM: Mark G. Vertucci, PE, PTOE, Fuss & O'Neill
John Guzze, PE, Fuss & O'Neill
Garrett Bollela, PE, PTOE, Traffic Engineer, City of Stamford

DATE: April 14, 2020

RE: Safety Analysis
Long Ridge Road Proposed Lane Width Reductions

This technical memorandum will serve to summarize our analysis of the safety impacts of the proposed reduction in travel lane widths on Long Ridge Road between Cold Spring Road and Wire Mill Road, a length of approximately 2.1 miles. The travel lane widths are proposed to be reduced from 12 feet to 11 feet and 10.5 feet respectively on the interior and exterior lanes.

IHSDM Safety Analysis

This section of Long Ridge Road (Route 104) currently consists of two 12-foot lanes in each direction with turn lanes at major intersections. The functional classification of Long Ridge Road in this area is an urban principal arterial roadway and the posted speed limit is 40 miles per hour. The Interactive Highway Safety Design Model (IHSDM) Version 15.0 professional software was used to analyze the safety of converting the existing 12' lanes into an 11' inner through lane and a 10.5' outer through lane.

It should be noted that the segment of Long Ridge Road (Route 104) from its intersection with the driveway to 900 Long Ridge Road to Wire Mill Road is a five lane road with two through lanes southbound and three through lanes northbound. The rightmost through lane northbound becomes a right turn only lane onto Route 15 Northbound north of the Wire Mill Road intersection. There are no crash prediction models in the Highway Safety Manual for 5-lane roadway sections, therefore IHSDM is unable to provide an analysis for a five lane roadway segment. For analysis purposes, this stretch was analyzed as a four lane section, consistent with the rest of the project area.

The three year period from 2020-2023 was analyzed for crash frequency and type, and the results were found to be identical for both lane width configurations. IHSDM software crash analysis reports for both 12' dual through lanes and 11' inner through lane with 10.5' outer through lane widths are provided at the end of this memorandum. The total number of predicted vehicle crashes throughout the analyzed 2.1 mile roadway section is 37.04 crashes. In addition to vehicle crash predictions, safety analysis was also run for pedestrian and bicycle modes using the proposed lane widths. As with the vehicular analysis, there was no difference in number of crashes predicted for both lane width configurations.

Crash Type	Predicted Crashes 2020-2023
	Fatal Injury
Collision with Bicycle	0.20
Collision with Pedestrian	0.70

Institute of Transportation Engineers (ITE) Traffic Engineering Handbook Guidance

According to the ITE Traffic Engineering Handbook, "on Urban Streets, 10 feet should be the default width for general-purpose lanes at speed of 45 MPH or less". The Handbook goes on to further state "Widths of mixed traffic lanes should be based on multimodal safety and capacity, as well as broader community goals. From a safety perspective, the Midwest Research Center has conducted extensive research on the relationship of arterial lane width to safety. Generally speaking, 10 ft. lanes are no less safe than wider lanes on arterials with speeds of 45 MPH or less.

Traffic engineering guidance has traditionally stated that the capacity of an urban street lane is decreased at widths below 12 ft. The previous edition of the *Highway Capacity Manual* (2000) provided adjustment factors indicating that any reduction in lane width below 12 ft. changes the capacity of a signalized intersection by about 3% per foot of width. However, more recent research concluded that lanes between 10 ft. and 12 ft. have roughly the same capacity. Therefore, the 2010 *Highway Capacity Manual* introduced a new adjustment factor for lane width at signalized intersections, with lanes from 10 ft. to 12.9 ft. having an adjustment factor of 1.00. It is worth re-stating that the City of Stamford is not requesting 10 ft. lanes but rather 11 foot interior and 10.5 foot exterior travel lanes (adjacent to a shoulder), which further reduces the impact on LOS.

ITE/CNU *Walkable Urban Thoroughfares Handbook* (An ITE recommended Practice)

The joint ITE/CNU *Walkable Urban Thoroughfares Handbook* (An ITE recommended Practice) provides guidance on lane width for urban arterials. The Handbook States "on the lower-speed urban thoroughfares, a range of widths from 10 to 12 feet on arterials is appropriate."
Research on the relationship between lane width and traffic crashes found no statistically significant relationship between lane width and crash rate on arterial streets (TRB).

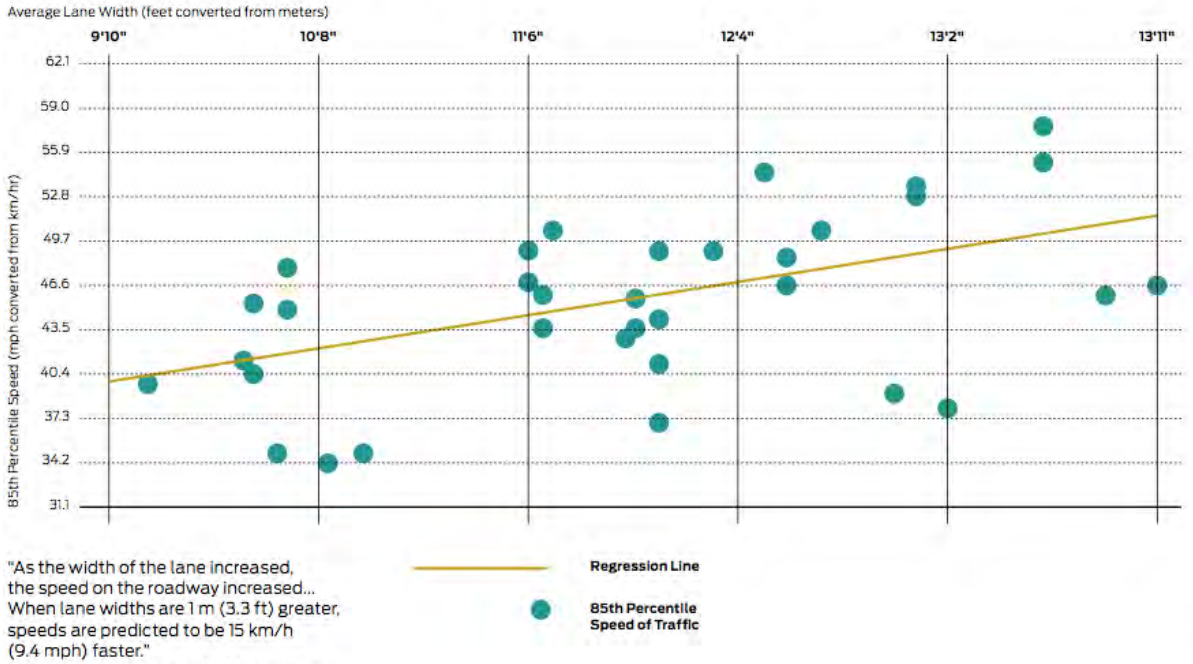
AASHTO Guidance

The AASHTO *Policy on Geometric Design of Highways and Streets*, commonly referred to as the "Green Book," states that "Lane Widths may vary from 10 ft. to 12 feet" for Rural and Urban Arterials. Lane widths as low as 10 feet may be used in areas where truck and bus volumes are relatively low. This is the case on Long Ridge where recorded heavy vehicle percentages have averaged between 1.3 and 1.6 percent per the "Stamford High Ridge/Long Ridge Road Corridor Study".

NACTO Guidance

The NACTO Urban Street Design Guide states that lane widths of 10 feet are appropriate in urban areas and have a positive impact on a street's safety without impacting traffic operations. In terms of speed reduction, narrower travel lanes have been shown to reduce vehicle speeds and they are widely used as traffic calming measures. As the width of the lane increased, the speed of the roadway increased. Lane widths of approximately 3 feet greater had 85th percentile speeds of greater than 9 mph faster. As noted in the chart below, a reduction in travel lane width of 12 feet to 10.5 feet on Long Ridge Road is predicted to decrease 85th percentile speeds by as much as 4 mph.

Wider travel lanes are correlated with higher vehicle speeds.



"As the width of the lane increased, the speed on the roadway increased... When lane widths are 1 m (3.3 ft) greater, speeds are predicted to be 15 km/h (9.4 mph) faster."

Chart source: Fitzpatrick, Kay, Paul Carlson, Marcus Brewer, and Mark Wooldridge. 2000. "Design Factors That Affect Driver Speed on Suburban Streets." *Transportation Research Record* 1751: 18–25.

NYSDOT Guidance

The New York State Highway Design Manual for Urban Arterial roadways permits a minimum lane width of 10 feet when there is a small percentage of truck traffic on the arterial roadway as noted in the NYSDOT Highway Design Manual on Page 2-44:

https://www.dot.ny.gov/divisions/engineering/design/dqab/hdm/hdm-repository/chapt_02.pdf (see page 2-44)

Similar Arterial Corridor Examples

FHWA has recently done research documenting the positive effects of narrower lanes and shoulders on travel speeds and safety of freeways. On US-59 in Houston, Texas a limited access freeway with similar cross section to Long Ridge Road was reconfigured from three 12' lanes to four 10.5' lanes. This resulted in increased levels of service, reduced travel speeds, and decreased crashes due to better functionality of the roadway. Their 2016 guidance document, including data from the Houston case study, can be reviewed at the link below:

https://ops.fhwa.dot.gov/publications/fhwahop16060/fhwahop16060.pdf

Locally, on Route 1 (East Main Street) in Stamford, CT, travel lane widths ranging from 10'-10.5' were recently approved for the exterior lanes by the Connecticut Department of Transportation which has provided for lower vehicle operating speeds and safer passage for multimodal transit. This roadway also shares many similar attributes to Long Ridge Road (Route 104).

Conclusions

Based on the results of the IHSDM analysis and additional research regarding 10.5' arterial travel lane widths, it is the professional opinion of Fuss & O'Neill, Inc. and the City of Stamford Transportation, Traffic, and Parking (TTP) Department that the proposed reduction in lane widths will not have an impact to the safety of vehicular traffic operations along the Long Ridge Road corridor. In addition, the provision of wider shoulders will result in safer operations for bicyclists.

Attachments: Crash Prediction Evaluation Reports

Interactive Highway Safety Design Model

Crash Prediction Evaluation Report

Proposed 10.5' Outer Lane and 11' Inner Lane

April 8, 2020

Disclaimer

The Interactive Highway Design Model (IHSDM) software is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its content or use thereof. This document does not constitute a standard, specification, or regulation.

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Table of Contents

List of Tables

List of Figures

Report Overview

Report Generated: Apr 8, 2020 9:35 AM
Report Template: System: Multi-Page, 508 Compliant [System] (mlcpm4, Mar 20, 2020 11:37 AM)

Evaluation Date: Wed Apr 08 08:24:13 EDT 2020
IHSDM Version: v15.0.0 (Oct 31, 2019)
Crash Prediction Module: v10.0.0 (Oct 31, 2019)

User Name: gdepasquale
Organization Name: Fuss & O'Neill
Phone: 860-646-2469
E-Mail: gdepasquale@fando.com

Project Title: Long Ridge Road
Project Comment: Created using wizard
Project Unit System: U.S. Customary

Highway Title: Long Ridge Rd 10.5' Lane
Highway Comment: Copied from Long Ridge Rd (v1)
Highway Version: 1

Evaluation Title: Evaluation 5
Evaluation Comment: Created Wed Apr 08 08:23:46 EDT 2020

Minimum Location: 10+50.000
Maximum Location: 133+10.000
Policy for Superelevation: AASHTO 2011 U.S. Customary
Calibration: HSM Configuration
Crash Distribution: HSM Configuration
Model/CMF: HSM Configuration
First Year of Analysis: 2020
Last Year of Analysis: 2023
Empirical-Bayes Analysis: None
First Year of Observed Crashes:
Last Year of Observed Crashes:

Disclaimer Regarding Crash Prediction Method

IMPORTANT NOTICE ABOUT COMPARING RESULTS FROM HIGHWAY SAFETY MANUAL FIRST EDITION (2010) MODELS TO RESULTS FROM NEW MODELS DEVELOPED UNDER NCHRP PROJECTS 17-70 AND 17-58

Since the publication of the Highway Safety Manual - First Edition (HSM-1), in 2010 by the American Association of State Highway and Transportation Officials (AASHTO), multiple research efforts have been undertaken through the National Cooperative Highway Research Program (NCHRP) to develop safety performance models for road segment and intersection facility types that were not initially reflected in the HSM-1, in order to expand the breadth and depth of the HSM in the future.

The IHSDM Crash Prediction Module (CPM) is intended as a faithful implementation of HSM Part C predictive methods. As NCHRP projects to develop new predictive methods for the HSM are completed, FHWA works to incorporate the new methods into IHSDM, sometimes in advance of publication in the HSM. The following new crash predictive methods have been accepted by NCHRP project panels and incorporated into IHSDM, while pending AASHTO's approval for incorporation into a future edition of the HSM:

- Roundabouts: completed in 2018 under NCHRP Project 17-70, the new methods will provide improved outcomes for the safety analysis of roundabouts.
- 6+ lane and one-way urban/suburban arterials (including models for segments and intersections): completed under NCHRP Project 17-58.

However, in the absence of local calibration factors (see HSM-1 Part C, Appendix A for guidance on calibration of the predictive models), it is neither appropriate nor advisable to directly compare the results from new models (from NCHRP Projects 17-58 and 17-70) to results from HSM-1 models, as the models were not calibrated to the same base state data sets, and consequently can produce unexpected results. If local calibration factors are available and applied to both new models and HSM-1 models, then it may be appropriate to directly compare the results.*[Note: Work being performed under NCHRP Project 17-72 (Update of Crash Modification Factors for the Highway Safety Manual) is expected to re-calibrate many of the old (HSM-1) and new (e.g., NCHRP 17-70) models to data from a single (or small number of) states, that would allow results from all models to be directly compared.]*

The models produced for NCHRP Project 17-70 have independent value in terms of informing the design of a roundabout and assessing the effects of different design characteristics on the expected safety performance of a roundabout.

The HSM-1 interim method previously included in IHSDM for evaluating roundabouts on urban/suburban arterials (i.e., evaluating an existing intersection and then applying a Crash Modification Factor for replacing the existing intersection with a roundabout) has been deactivated in IHSDM, to minimize any confusion with the new roundabout methodology.

Section Types

Section 1 Evaluation

Section: Section 1
Evaluation Start Location: 10+50.000
Evaluation End Location: 133+10.000
Area Type: Urban
Functional Class: Arterial
Type of Alignment: Divided, Multilane
Model Category: Urban/Suburban Arterial
Calibration Factor: 4D=1.0; 5T=1.0;

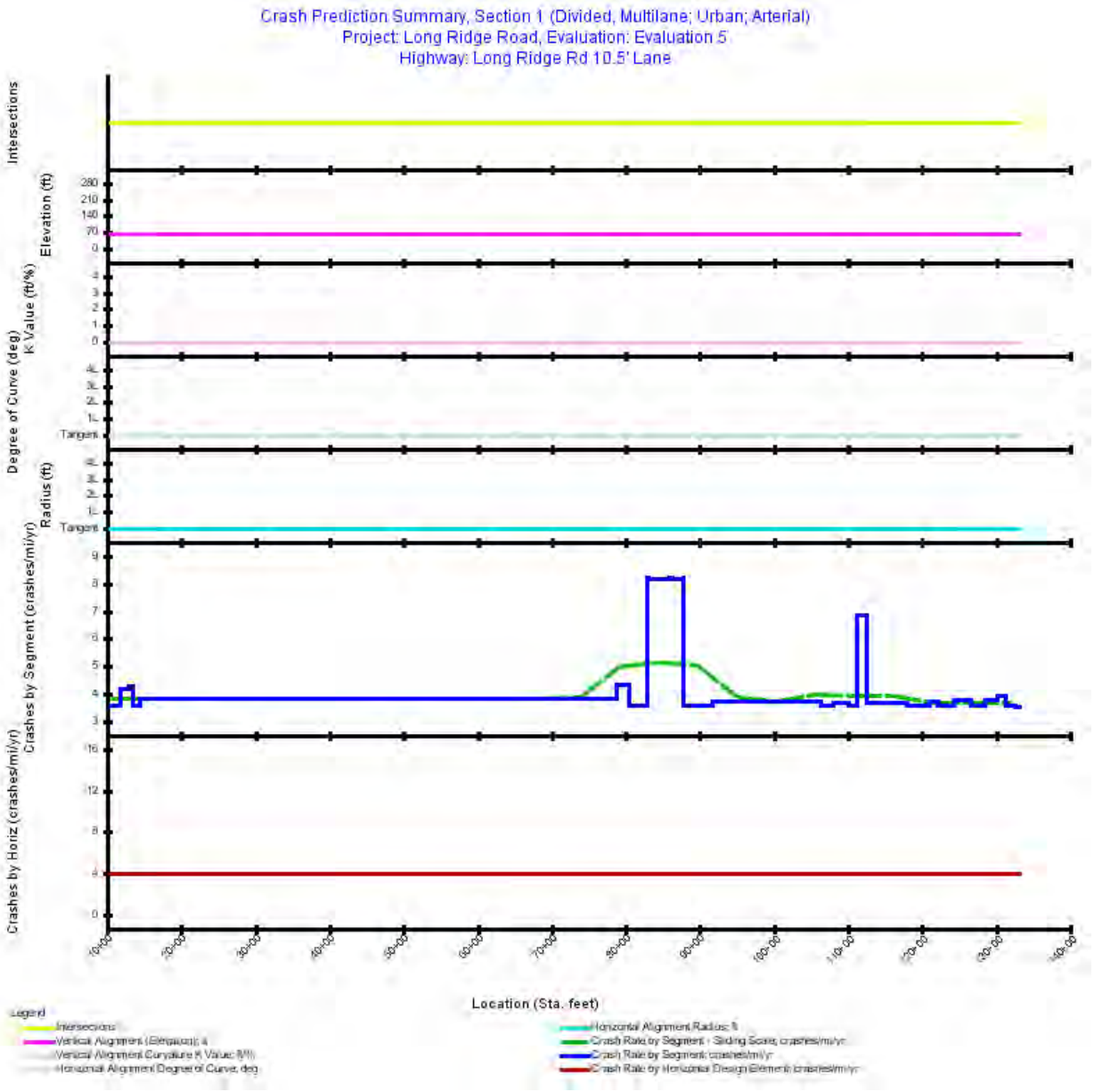

Figure 1. Crash Prediction Summary (Section 1)

Table 1. Evaluation Highway - Homogeneous Segments (Section 1)

Seg. No.	Type	Start Location (Sta. ft)	End Location (Sta. ft)	Length (ft)	Length(mi)	AADT	Number Major Commercial Driveways	Number Minor Commercial Driveways	Number Major Industial/Institutional	Number Minor Industial/Institutional	Number Major Residential Driveways	Number Minor Residential Driveways	Number Other Driveways	Lighting	Automated Speed Enforcement	Density (fixed objects /mi)	Median Width (ft)	Type	Effective Median Width (ft)	Speed Level	Number Rail Highway Crossings	Average Shoulder Width (ft)	Average Lane Width (ft)
1	4D	10+50.000	11+00.000	50.00	0.0095	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	10.75
2	4D	11+00.000	11+75.000	75.00	0.0142	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	10.75
3	4D	11+75.000	13+00.000	125.00	0.0237	2020-2023: 20,101	0	1	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	10.75
4	4D	13+00.000	13+50.000	50.00	0.0095	2020-2023: 20,101	0	0	0	1	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	10.75
5	4D	13+50.000	14+06.000	56.00	0.0106	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.48	Intermediate/High	0	0.00	10.75
6	4D	14+06.000	14+50.000	44.00	0.0083	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	2.98	Intermediate/High	0	0.00	10.75
7	4D	14+50.000	78+75.000	6,425.00	1.2169	2020-2023: 20,101	2	1	3	2	0	14	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	10.75
8	4D	78+75.000	80+36.000	161.00	0.0305	2020-2023: 20,101	0	0	0	0	1	0	0	true	false	0.0	1.00	Traversable Median	3.01	Intermediate/High	0	0.00	10.75
9	4D	80+36.000	82+35.000	199.00	0.0377	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.51	Intermediate/High	0	0.00	10.75
10	4D	82+35.000	82+74.000	39.00	0.0074	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.49	Intermediate/High	0	0.00	10.75
11	4D	82+74.000	82+90.000	16.00	0.0030	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	3.96	Intermediate/High	0	0.00	10.75
12	5T	82+90.000	83+00.000	10.00	0.0019	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	2.29	Intermediate/High	0	0.00	10.75
13	5T	83+00.000	83+05.000	5.00	0.0009	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.32	Intermediate/High	0	0.00	10.75
14	5T	83+05.000	85+80.000	275.00	0.0521	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	10.75
15	5T	85+80.000	86+30.000	50.00	0.0095	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	10.75
16	5T	86+30.000	87+75.000	145.00	0.0275	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	10.75
17	5T	87+75.000	87+80.000	5.00	0.0009	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	10.75
18	4D	87+80.000	88+01.000	21.00	0.0040	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	3.10	Intermediate/High	0	0.00	10.75
19	4D	88+01.000	88+25.000	24.00	0.0046	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.60	Intermediate/High	0	0.00	10.75
20	4D	88+25.000	90+20.000	195.00	0.0369	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.49	Intermediate/High	0	0.00	10.75
21	4D	90+20.000	91+75.000	155.00	0.0294	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	2.99	Intermediate/High	0	0.00	10.75
22	4D	91+75.000	106+40.000	1,465.00	0.2775	2020-2023: 20,101	0	0	0	0	1	4	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	10.75
23	4D	106+40.000	108+01.000	161.00	0.0305	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	3.01	Intermediate/High	0	0.00	10.75
24	4D	108+01.000	110+00.000	199.00	0.0377	2020-2023: 20,101	0	0	0	0	0	1	0	true	false	0.0	1.00	Traversable Median	7.51	Intermediate/High	0	0.00	10.75
25	4D	110+00.000	110+31.000	31.00	0.0059	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.46	Intermediate/High	0	0.00	10.75

Seg. No.	Type	Start Location (Sta. ft)	End Location (Sta. ft)	Length (ft)	Length(mi)	AADT	Number Major Commercial Driveways	Number Minor Commercial Driveways	Number Major Industial/Institutional	Number Minor Industial/Institutional	Number Major Residential Driveways	Number Minor Residential Driveways	Number Other Driveways	Lighting	Automated Speed Enforcement	Density (fixed objects /mi)	Median Width (ft)	Type	Effective Median Width (ft)	Speed Level	Number Rail Highway Crossings	Average Shoulder Width (ft)	Average Lane Width (ft)
26	4D	110+31.000	110+50.000	19.00	0.0036	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	3.37	Intermediate/High	0	0.00	10.75
27	4D	110+50.000	110+55.000	5.00	0.0009	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.41	Intermediate/High	0	0.00	10.75
28	4D	110+55.000	111+20.000	65.00	0.0123	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	10.75
29	4D	111+20.000	112+60.000	140.00	0.0265	2020-2023: 20,101	2	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	10.75
30	4D	112+60.000	117+90.000	530.00	0.1004	2020-2023: 20,101	0	0	0	2	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	10.75
31	4D	117+90.000	118+50.000	60.00	0.0114	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	10.75
32	4D	118+50.000	119+80.000	130.00	0.0246	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	10.75
33	4D	119+80.000	120+95.000	115.00	0.0218	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	10.75
34	4D	120+95.000	122+10.000	115.00	0.0218	2020-2023: 20,101	0	0	0	0	0	1	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	10.75
35	4D	122+10.000	124+40.000	230.00	0.0436	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	10.75
36	4D	124+40.000	126+68.000	228.00	0.0432	2020-2023: 20,101	0	0	0	0	0	2	0	true	false	0.0	1.00	Traversable Median	7.50	Intermediate/High	0	0.00	10.75
37	4D	126+68.000	128+50.000	182.00	0.0345	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	3.00	Intermediate/High	0	0.00	10.75
38	4D	128+50.000	130+20.000	170.00	0.0322	2020-2023: 20,101	0	0	0	1	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	10.75
39	4D	130+20.000	131+25.000	105.00	0.0199	2020-2023: 20,101	0	0	0	1	0	0	0	true	false	0.0	1.00	Traversable Median	3.01	Intermediate/High	0	0.00	10.75
40	4D	131+25.000	132+55.000	130.00	0.0246	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.51	Intermediate/High	0	0.00	10.75
41	4D	132+55.000	132+90.000	35.00	0.0066	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	10.00	Non-Traversable Median	11.00	Intermediate/High	0	0.00	10.75
42	4D	132+90.000	133+10.000	20.00	0.0038	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	5.00	Non-Traversable Median	8.50	Intermediate/High	0	0.00	10.75

Table 2. Predicted Highway Crash Rates and Frequencies Summary (Section 1)

First Year of Analysis	**2020**
Last Year of Analysis	**2023**
Evaluated Length (mi)	**2.3220**
Average Future Road AADT (vpd)	**20,101**
Predicted Crashes	
Total Crashes	**37.04**
Fatal and Injury Crashes	**10.38**
Property-Damage-Only Crashes	**26.66**
Percent of Total Predicted Crashes	
Percent Fatal and Injury Crashes (%)	**28**
Percent Property-Damage-Only Crashes (%)	**72**
Predicted Crash Rate	
Crash Rate (crashes/mi/yr)	**3.9881**
FI Crash Rate (crashes/mi/yr)	**1.1178**
PDO Crash Rate (crashes/mi/yr)	**2.8703**
Predicted Travel Crash Rate	
Total Travel (million veh-mi)	**68.14**
Travel Crash Rate (crashes/million veh-mi)	**0.54**
Travel FI Crash Rate (crashes/million veh-mi)	**0.15**
Travel PDO Crash Rate (crashes/million veh-mi)	**0.39**

Table 3. Predicted Crash Frequencies and Rates by Highway Segment/Intersection (Section 1)

Segment Number/Intersection Name/Cross Road	Start Location (Sta. ft)	End Location (Sta. ft)	Length (mi)	Total Predicted Crashes for Evaluation Period	Predicted Total Crash Frequency (crashes/yr)	Predicted FI Crash Frequency (crashes/yr)	Predicted PDO Crash Frequency (crashes/yr)	Predicted Crash Rate (crashes/mi/yr)	Predicted Travel Crash Rate (crashes/million veh-mi)
1	10+50.000	11+00.000	0.0095	0.136	0.0339	0.0094	0.0245	3.5804	0.49
2	11+00.000	11+75.000	0.0142	0.203	0.0508	0.0141	0.0366	3.5733	0.49
3	11+75.000	13+00.000	0.0237	0.396	0.0989	0.0279	0.0711	4.1791	0.57
4	13+00.000	13+50.000	0.0095	0.162	0.0404	0.0114	0.0290	4.2702	0.58
5	13+50.000	14+06.000	0.0106	0.152	0.0380	0.0106	0.0274	3.5804	0.49
6	14+06.000	14+50.000	0.0083	0.119	0.0298	0.0083	0.0215	3.5804	0.49
7	14+50.000	78+75.000	1.2169	18.666	4.6664	1.3053	3.3611	3.8348	0.52
8	78+75.000	80+36.000	0.0305	0.531	0.1327	0.0374	0.0952	4.3516	0.59
9	80+36.000	82+35.000	0.0377	0.540	0.1349	0.0375	0.0974	3.5804	0.49
10	82+35.000	82+74.000	0.0074	0.106	0.0264	0.0074	0.0191	3.5804	0.49
11	82+74.000	82+90.000	0.0030	0.043	0.0108	0.0030	0.0078	3.5804	0.49
12	82+90.000	83+00.000	0.0019	0.062	0.0155	0.0045	0.0111	8.1977	1.12
13	83+00.000	83+05.000	0.0009	0.031	0.0077	0.0022	0.0055	8.1762	1.11
14	83+05.000	85+80.000	0.0521	1.704	0.4261	0.1226	0.3035	8.1814	1.11
15	85+80.000	86+30.000	0.0095	0.310	0.0776	0.0223	0.0553	8.1977	1.12
16	86+30.000	87+75.000	0.0275	0.899	0.2247	0.0647	0.1600	8.1814	1.11
17	87+75.000	87+80.000	0.0009	0.031	0.0078	0.0022	0.0055	8.1977	1.12
18	87+80.000	88+01.000	0.0040	0.057	0.0142	0.0040	0.0103	3.5804	0.49
19	88+01.000	88+25.000	0.0045	0.065	0.0163	0.0045	0.0117	3.5804	0.49
20	88+25.000	90+20.000	0.0369	0.529	0.1322	0.0368	0.0954	3.5804	0.49
21	90+20.000	91+75.000	0.0294	0.420	0.1051	0.0292	0.0759	3.5804	0.49
22	91+75.000	106+40.000	0.2775	4.130	1.0326	0.2882	0.7444	3.7216	0.51
23	106+40.000	108+01.000	0.0305	0.437	0.1092	0.0304	0.0788	3.5804	0.49
24	108+01.000	110+00.000	0.0377	0.555	0.1389	0.0387	0.1001	3.6844	0.50
25	110+00.000	110+31.000	0.0059	0.084	0.0210	0.0058	0.0152	3.5804	0.49
26	110+31.000	110+50.000	0.0036	0.051	0.0129	0.0036	0.0093	3.5804	0.49
27	110+50.000	110+55.000	0.0009	0.013	0.0034	0.0009	0.0024	3.5704	0.49
28	110+55.000	111+20.000	0.0123	0.176	0.0440	0.0122	0.0318	3.5733	0.49
29	111+20.000	112+60.000	0.0265	0.725	0.1812	0.0523	0.1288	6.8325	0.93
30	112+60.000	117+90.000	0.1004	1.487	0.3717	0.1037	0.2680	3.7032	0.51
31	117+90.000	118+50.000	0.0114	0.163	0.0407	0.0113	0.0294	3.5804	0.49
32	118+50.000	119+80.000	0.0246	0.352	0.0880	0.0245	0.0635	3.5733	0.49
33	119+80.000	120+95.000	0.0218	0.312	0.0780	0.0217	0.0563	3.5804	0.49
34	120+95.000	122+10.000	0.0218	0.327	0.0817	0.0228	0.0589	3.7529	0.51
35	122+10.000	124+40.000	0.0436	0.624	0.1560	0.0434	0.1126	3.5804	0.49
36	124+40.000	126+68.000	0.0432	0.650	0.1624	0.0454	0.1171	3.7619	0.51
37	126+68.000	128+50.000	0.0345	0.494	0.1234	0.0343	0.0891	3.5804	0.49
38	128+50.000	130+20.000	0.0322	0.487	0.1218	0.0340	0.0878	3.7833	0.52
39	130+20.000	131+25.000	0.0199	0.311	0.0777	0.0218	0.0560	3.9089	0.53
40	131+25.000	132+55.000	0.0246	0.353	0.0882	0.0245	0.0636	3.5804	0.49
41	132+55.000	132+90.000	0.0066	0.094	0.0235	0.0065	0.0170	3.5449	0.48
42	132+90.000	133+10.000	0.0038	0.054	0.0134	0.0037	0.0097	3.5449	0.48
Total			2.3220	37.041	9.2602	2.5955	6.6647	3.9881	

Table 4. Predicted Crash Frequencies and Rates by Horizontal Design Element (Section 1)

Title	Start Location (Sta. ft)	End Location (Sta. ft)	Length (mi)	Total Predicted Crashes for Evaluation Period	Predicted Total Crash Frequency (crashes/yr)	Predicted FI Crash Frequency (crashes/yr)	Predicted PDO Crash Frequency (crashes/yr)	Predicted Crash Rate (crashes/mi/yr)	Predicted Travel Crash Rate (crashes/million veh-mi)
Tangent	10+50.000	133+10.000	2.3220	37.041	9.2602	2.5955	6.6647	3.9881	0.54

Table 5. Predicted Crash Frequencies by Year (Section 1)

Year	Total Crashes	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)
2020	9.26	2.60	28.029	6.67	71.972
2021	9.26	2.60	28.029	6.67	71.972
2022	9.26	2.60	28.029	6.67	71.972
2023	9.26	2.60	28.029	6.67	71.972
Total	37.04	10.38	28.029	26.66	71.972
Average	9.26	2.60	28.029	6.67	71.972

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Table 6. Predicted Five Lane or Fewer Crash Type Distribution (Section 1)

Element Type	Crash Type	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)	Total Crashes	Percent Total (%)
Highway Segment	Collision with Animal	0.00	0.0	0.31	0.8	0.32	0.9
Highway Segment	Collision with Bicycle	0.20	0.5	0.00	0.0	0.20	0.5
Highway Segment	Collision with Fixed Object	0.53	1.4	4.10	11.1	4.63	12.5
Highway Segment	Collision with Other Object	0.03	0.1	0.10	0.3	0.13	0.3
Highway Segment	Other Single-vehicle Collision	0.53	1.4	0.55	1.5	1.08	2.9
Highway Segment	Collision with Pedestrian	0.70	1.9	0.00	0.0	0.70	1.9
Highway Segment	Total Single Vehicle Crashes	1.98	5.4	5.07	13.7	7.05	19.0
Highway Segment	Angle Collision	0.32	0.9	0.76	2.1	1.08	2.9
Highway Segment	Driveway-related Collision	0.58	1.6	1.46	3.9	2.04	5.5
Highway Segment	Head-on Collision	0.16	0.4	0.14	0.4	0.29	0.8
Highway Segment	Other Multi-vehicle Collision	0.36	1.0	1.36	3.7	1.71	4.6
Highway Segment	Rear-end Collision	6.52	17.6	13.31	35.9	19.82	53.5
Highway Segment	Sideswipe, Opposite Direction Collision	0.07	0.2	0.03	0.1	0.11	0.3
Highway Segment	Sideswipe, Same Direction Collision	0.40	1.1	4.53	12.2	4.93	13.3
Highway Segment	Total Multiple Vehicle Crashes	8.40	22.7	21.59	58.3	29.99	81.0
Highway Segment	Total Highway Segment Crashes	10.38	28.0	26.66	72.0	37.04	100.0
	Total Crashes	10.38	28.0	26.66	72.0	37.04	100.0

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Interactive Highway Safety Design Model

Crash Prediction Evaluation Report

Existing 12' Lanes

April 8, 2020

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Table of Contents

List of Tables

List of Figures

Report Overview

Report Generated: Apr 8, 2020 9:47 AM
Report Template: System: Multi-Page, 508 Compliant [System] (mlcpm4, Mar 20, 2020 11:37 AM)

Evaluation Date: Wed Apr 08 09:14:13 EDT 2020
IHSDM Version: v15.0.0 (Oct 31, 2019)
Crash Prediction Module: v10.0.0 (Oct 31, 2019)

User Name: gdepasquale
Organization Name: Fuss & O'Neill
Phone: 860-646-2469
E-Mail: gdepasquale@fando.com

Project Title: Long Ridge Road
Project Comment: Created using wizard
Project Unit System: U.S. Customary

Highway Title: Long Ridge Rd 12' Lane
Highway Comment: Copied from Long Ridge Rd 11' Lane (v1)
Highway Version: 1

Evaluation Title: Evaluation 2
Evaluation Comment: Created Wed Apr 08 09:13:59 EDT 2020

Minimum Location: 10+50.000
Maximum Location: 133+10.000
Policy for Superelevation: AASHTO 2011 U.S. Customary
Calibration: HSM Configuration
Crash Distribution: HSM Configuration
Model/CMF: HSM Configuration
First Year of Analysis: 2020
Last Year of Analysis: 2023
Empirical-Bayes Analysis: None
First Year of Observed Crashes:
Last Year of Observed Crashes:

Disclaimer Regarding Crash Prediction Method

IMPORTANT NOTICE ABOUT COMPARING RESULTS FROM HIGHWAY SAFETY MANUAL FIRST EDITION (2010) MODELS TO RESULTS FROM NEW MODELS DEVELOPED UNDER NCHRP PROJECTS 17-70 AND 17-58

Since the publication of the Highway Safety Manual - First Edition (HSM-1), in 2010 by the American Association of State Highway and Transportation Officials (AASHTO), multiple research efforts have been undertaken through the National Cooperative Highway Research Program (NCHRP) to develop safety performance models for road segment and intersection facility types that were not initially reflected in the HSM-1, in order to expand the breadth and depth of the HSM in the future.

The IHSDM Crash Prediction Module (CPM) is intended as a faithful implementation of HSM Part C predictive methods. As NCHRP projects to develop new predictive methods for the HSM are completed, FHWA works to incorporate the new methods into IHSDM, sometimes in advance of publication in the HSM. The following new crash predictive methods have been accepted by NCHRP project panels and incorporated into IHSDM, while pending AASHTO's approval for incorporation into a future edition of the HSM:

- Roundabouts: completed in 2018 under NCHRP Project 17-70, the new methods will provide improved outcomes for the safety analysis of roundabouts.
- 6+ lane and one-way urban/suburban arterials (including models for segments and intersections): completed under NCHRP Project 17-58.

However, in the absence of local calibration factors (see HSM-1 Part C, Appendix A for guidance on calibration of the predictive models), it is neither appropriate nor advisable to directly compare the results from new models (from NCHRP Projects 17-58 and 17-70) to results from HSM-1 models, as the models were not calibrated to the same base state data sets, and consequently can produce unexpected results. If local calibration factors are available and applied to both new models and HSM-1 models, then it may be appropriate to directly compare the results.*[Note: Work being performed under NCHRP Project 17-72 (Update of Crash Modification Factors for the Highway Safety Manual) is expected to re-calibrate many of the old (HSM-1) and new (e.g., NCHRP 17-70) models to data from a single (or small number of) states, that would allow results from all models to be directly compared.]*

The models produced for NCHRP Project 17-70 have independent value in terms of informing the design of a roundabout and assessing the effects of different design characteristics on the expected safety performance of a roundabout.

The HSM-1 interim method previously included in IHSDM for evaluating roundabouts on urban/suburban arterials (i.e., evaluating an existing intersection and then applying a Crash Modification Factor for replacing the existing intersection with a roundabout) has been deactivated in IHSDM, to minimize any confusion with the new roundabout methodology.

Section Types

Section 1 Evaluation

Section: Section 1
Evaluation Start Location: 10+50.000
Evaluation End Location: 133+10.000
Area Type: Urban
Functional Class: Arterial
Type of Alignment: Divided, Multilane
Model Category: Urban/Suburban Arterial
Calibration Factor: 4D=1.0; 5T=1.0;

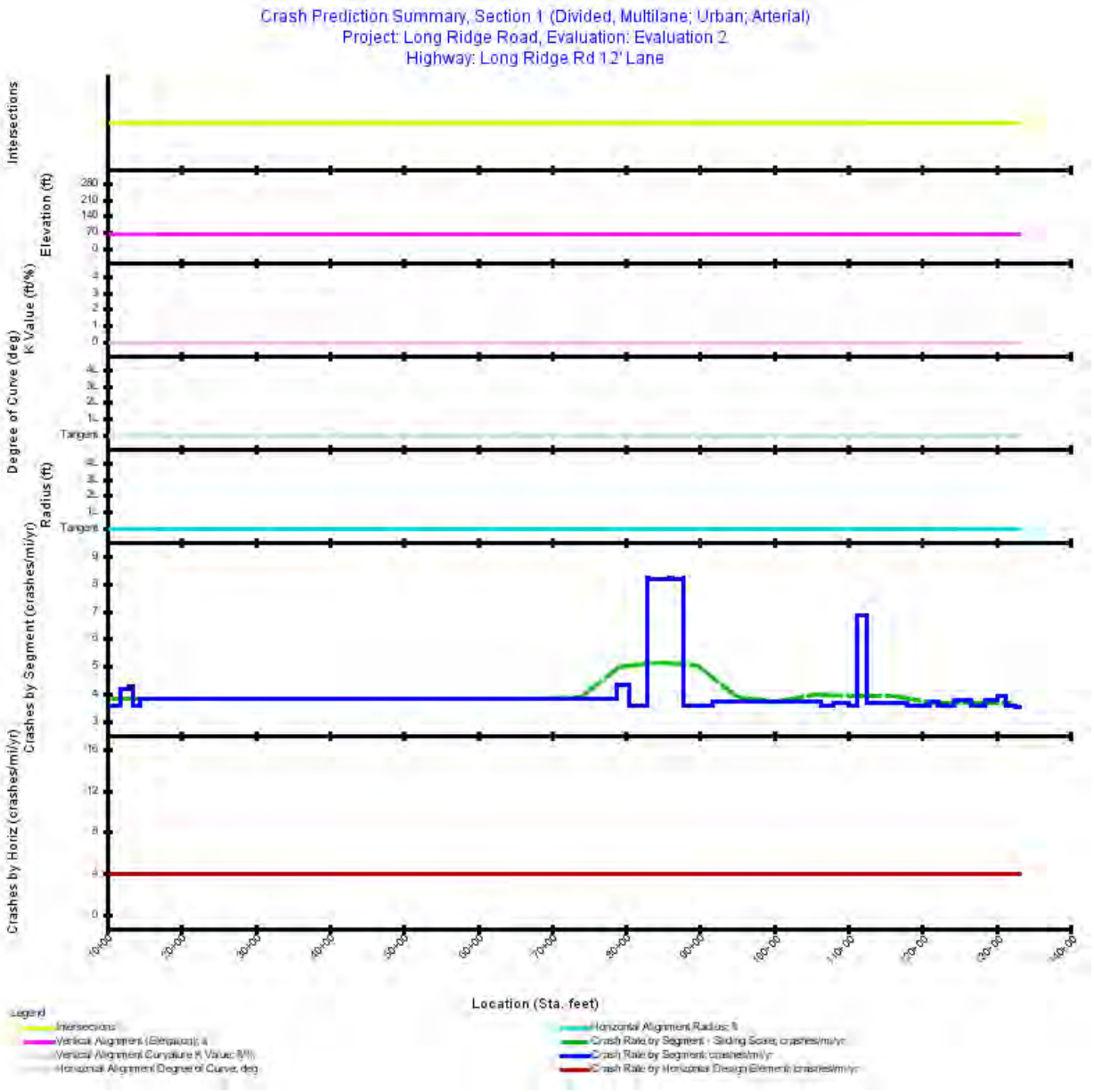


Figure 1. Crash Prediction Summary (Section 1)

Table 1. Evaluation Highway - Homogeneous Segments (Section 1)

Seg. No.	Type	Start Location (Sta. ft)	End Location (Sta. ft)	Length (ft)	Length(mi)	AADT	Number Major Commercial Driveways	Number Minor Commercial Driveways	Number Major Industial/Institutional	Number Minor Industial/Institutional	Number Major Residential Driveways	Number Minor Residential Driveways	Number Other Driveways	Lighting	Automated Speed Enforcement	Density (fixed objects /mi)	Median Width (ft)	Type	Effective Median Width (ft)	Speed Level	Number Rail Highway Crossings	Average Shoulder Width (ft)	Average Lane Width (ft)
1	4D	10+50.000	11+00.000	50.00	0.0095	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	12.00
2	4D	11+00.000	11+75.000	75.00	0.0142	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	12.00
3	4D	11+75.000	13+00.000	125.00	0.0237	2020-2023: 20,101	0	1	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	12.00
4	4D	13+00.000	13+50.000	50.00	0.0095	2020-2023: 20,101	0	0	0	1	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	12.00
5	4D	13+50.000	14+06.000	56.00	0.0106	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.48	Intermediate/High	0	0.00	12.00
6	4D	14+06.000	14+50.000	44.00	0.0083	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	2.98	Intermediate/High	0	0.00	12.00
7	4D	14+50.000	78+75.000	6,425.00	1.2169	2020-2023: 20,101	2	1	3	2	0	14	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	12.00
8	4D	78+75.000	80+36.000	161.00	0.0305	2020-2023: 20,101	0	0	0	0	1	0	0	true	false	0.0	1.00	Traversable Median	3.01	Intermediate/High	0	0.00	12.00
9	4D	80+36.000	82+35.000	199.00	0.0377	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.51	Intermediate/High	0	0.00	12.00
10	4D	82+35.000	82+74.000	39.00	0.0074	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.49	Intermediate/High	0	0.00	12.00
11	4D	82+74.000	82+90.000	16.00	0.0030	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	3.96	Intermediate/High	0	0.00	12.00
12	5T	82+90.000	83+00.000	10.00	0.0019	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	2.29	Intermediate/High	0	0.00	12.00
13	5T	83+00.000	83+05.000	5.00	0.0009	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.32	Intermediate/High	0	0.00	12.00
14	5T	83+05.000	85+80.000	275.00	0.0521	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	12.00
15	5T	85+80.000	86+30.000	50.00	0.0095	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	12.00
16	5T	86+30.000	87+75.000	145.00	0.0275	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	12.00
17	5T	87+75.000	87+80.000	5.00	0.0009	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	12.00
18	4D	87+80.000	88+01.000	21.00	0.0040	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	3.10	Intermediate/High	0	0.00	12.00
19	4D	88+01.000	88+25.000	24.00	0.0046	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.60	Intermediate/High	0	0.00	12.00
20	4D	88+25.000	90+20.000	195.00	0.0369	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.49	Intermediate/High	0	0.00	12.00
21	4D	90+20.000	91+75.000	155.00	0.0294	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	2.99	Intermediate/High	0	0.00	12.00
22	4D	91+75.000	106+40.000	1,465.00	0.2775	2020-2023: 20,101	0	0	0	0	1	4	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	12.00
23	4D	106+40.000	108+01.000	161.00	0.0305	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	3.01	Intermediate/High	0	0.00	12.00
24	4D	108+01.000	110+00.000	199.00	0.0377	2020-2023: 20,101	0	0	0	0	0	1	0	true	false	0.0	1.00	Traversable Median	7.51	Intermediate/High	0	0.00	12.00
25	4D	110+00.000	110+31.000	31.00	0.0059	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.46	Intermediate/High	0	0.00	12.00

Seg. No.	Type	Start Location (Sta. ft)	End Location (Sta. ft)	Length (ft)	Length(mi)	AADT	Number Major Commercial Driveways	Number Minor Commercial Driveways	Number Major Industial/Institutional	Number Minor Industial/Institutional	Number Major Residential Driveways	Number Minor Residential Driveways	Number Other Driveways	Lighting	Automated Speed Enforcement	Density (fixed objects /mi)	Median Width (ft)	Type	Effective Median Width (ft)	Speed Level	Number Rail Highway Crossings	Average Shoulder Width (ft)	Average Lane Width (ft)
26	4D	110+31.000	110+50.000	19.00	0.0036	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	3.37	Intermediate/High	0	0.00	12.00
27	4D	110+50.000	110+55.000	5.00	0.0009	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.41	Intermediate/High	0	0.00	12.00
28	4D	110+55.000	111+20.000	65.00	0.0123	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	12.00
29	4D	111+20.000	112+60.000	140.00	0.0265	2020-2023: 20,101	2	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	12.00
30	4D	112+60.000	117+90.000	530.00	0.1004	2020-2023: 20,101	0	0	0	2	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	12.00
31	4D	117+90.000	118+50.000	60.00	0.0114	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	12.00
32	4D	118+50.000	119+80.000	130.00	0.0246	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	12.00
33	4D	119+80.000	120+95.000	115.00	0.0218	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	12.00
34	4D	120+95.000	122+10.000	115.00	0.0218	2020-2023: 20,101	0	0	0	0	0	1	0	true	false	0.0	1.00	Traversable Median	11.00	Intermediate/High	0	0.00	12.00
35	4D	122+10.000	124+40.000	230.00	0.0436	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	12.00
36	4D	124+40.000	126+68.000	228.00	0.0432	2020-2023: 20,101	0	0	0	0	0	2	0	true	false	0.0	1.00	Traversable Median	7.50	Intermediate/High	0	0.00	12.00
37	4D	126+68.000	128+50.000	182.00	0.0345	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	3.00	Intermediate/High	0	0.00	12.00
38	4D	128+50.000	130+20.000	170.00	0.0322	2020-2023: 20,101	0	0	0	1	0	0	0	true	false	0.0	1.00	Traversable Median	1.00	Intermediate/High	0	0.00	12.00
39	4D	130+20.000	131+25.000	105.00	0.0199	2020-2023: 20,101	0	0	0	1	0	0	0	true	false	0.0	1.00	Traversable Median	3.01	Intermediate/High	0	0.00	12.00
40	4D	131+25.000	132+55.000	130.00	0.0246	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	1.00	Traversable Median	7.51	Intermediate/High	0	0.00	12.00
41	4D	132+55.000	132+90.000	35.00	0.0066	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	10.00	Non-Traversable Median	11.00	Intermediate/High	0	0.00	12.00
42	4D	132+90.000	133+10.000	20.00	0.0038	2020-2023: 20,101	0	0	0	0	0	0	0	true	false	0.0	5.00	Non-Traversable Median	8.50	Intermediate/High	0	0.00	12.00

Table 2. Predicted Highway Crash Rates and Frequencies Summary (Section 1)

First Year of Analysis	**2020**
Last Year of Analysis	**2023**
Evaluated Length (mi)	**2.3220**
Average Future Road AADT (vpd)	**20,101**
Predicted Crashes	
Total Crashes	**37.04**
Fatal and Injury Crashes	**10.38**
Property-Damage-Only Crashes	**26.66**
Percent of Total Predicted Crashes	
Percent Fatal and Injury Crashes (%)	**28**
Percent Property-Damage-Only Crashes (%)	**72**
Predicted Crash Rate	
Crash Rate (crashes/mi/yr)	**3.9881**
FI Crash Rate (crashes/mi/yr)	**1.1178**
PDO Crash Rate (crashes/mi/yr)	**2.8703**
Predicted Travel Crash Rate	
Total Travel (million veh-mi)	**68.14**
Travel Crash Rate (crashes/million veh-mi)	**0.54**
Travel FI Crash Rate (crashes/million veh-mi)	**0.15**
Travel PDO Crash Rate (crashes/million veh-mi)	**0.39**

Table 3. Predicted Crash Frequencies and Rates by Highway Segment/Intersection (Section 1)

Segment Number/Intersection Name/Cross Road	Start Location (Sta. ft)	End Location (Sta. ft)	Length (mi)	Total Predicted Crashes for Evaluation Period	Predicted Total Crash Frequency (crashes/yr)	Predicted FI Crash Frequency (crashes/yr)	Predicted PDO Crash Frequency (crashes/yr)	Predicted Crash Rate (crashes/mi/yr)	Predicted Travel Crash Rate (crashes/million veh-mi)
1	10+50.000	11+00.000	0.0095	0.136	0.0339	0.0094	0.0245	3.5804	0.49
2	11+00.000	11+75.000	0.0142	0.203	0.0508	0.0141	0.0366	3.5733	0.49
3	11+75.000	13+00.000	0.0237	0.396	0.0989	0.0279	0.0711	4.1791	0.57
4	13+00.000	13+50.000	0.0095	0.162	0.0404	0.0114	0.0290	4.2702	0.58
5	13+50.000	14+06.000	0.0106	0.152	0.0380	0.0106	0.0274	3.5804	0.49
6	14+06.000	14+50.000	0.0083	0.119	0.0298	0.0083	0.0215	3.5804	0.49
7	14+50.000	78+75.000	1.2169	18.666	4.6664	1.3053	3.3611	3.8348	0.52
8	78+75.000	80+36.000	0.0305	0.531	0.1327	0.0374	0.0952	4.3516	0.59
9	80+36.000	82+35.000	0.0377	0.540	0.1349	0.0375	0.0974	3.5804	0.49
10	82+35.000	82+74.000	0.0074	0.106	0.0264	0.0074	0.0191	3.5804	0.49
11	82+74.000	82+90.000	0.0030	0.043	0.0108	0.0030	0.0078	3.5804	0.49
12	82+90.000	83+00.000	0.0019	0.062	0.0155	0.0045	0.0111	8.1977	1.12
13	83+00.000	83+05.000	0.0009	0.031	0.0077	0.0022	0.0055	8.1762	1.11
14	83+05.000	85+80.000	0.0521	1.704	0.4261	0.1226	0.3035	8.1814	1.11
15	85+80.000	86+30.000	0.0095	0.310	0.0776	0.0223	0.0553	8.1977	1.12
16	86+30.000	87+75.000	0.0275	0.899	0.2247	0.0647	0.1600	8.1814	1.11
17	87+75.000	87+80.000	0.0009	0.031	0.0078	0.0022	0.0055	8.1977	1.12
18	87+80.000	88+01.000	0.0040	0.057	0.0142	0.0040	0.0103	3.5804	0.49
19	88+01.000	88+25.000	0.0045	0.065	0.0163	0.0045	0.0117	3.5804	0.49
20	88+25.000	90+20.000	0.0369	0.529	0.1322	0.0368	0.0954	3.5804	0.49
21	90+20.000	91+75.000	0.0294	0.420	0.1051	0.0292	0.0759	3.5804	0.49
22	91+75.000	106+40.000	0.2775	4.130	1.0326	0.2882	0.7444	3.7216	0.51
23	106+40.000	108+01.000	0.0305	0.437	0.1092	0.0304	0.0788	3.5804	0.49
24	108+01.000	110+00.000	0.0377	0.555	0.1389	0.0387	0.1001	3.6844	0.50
25	110+00.000	110+31.000	0.0059	0.084	0.0210	0.0058	0.0152	3.5804	0.49
26	110+31.000	110+50.000	0.0036	0.051	0.0129	0.0036	0.0093	3.5804	0.49
27	110+50.000	110+55.000	0.0009	0.013	0.0034	0.0009	0.0024	3.5704	0.49
28	110+55.000	111+20.000	0.0123	0.176	0.0440	0.0122	0.0318	3.5733	0.49
29	111+20.000	112+60.000	0.0265	0.725	0.1812	0.0523	0.1288	6.8325	0.93
30	112+60.000	117+90.000	0.1004	1.487	0.3717	0.1037	0.2680	3.7032	0.51
31	117+90.000	118+50.000	0.0114	0.163	0.0407	0.0113	0.0294	3.5804	0.49
32	118+50.000	119+80.000	0.0246	0.352	0.0880	0.0245	0.0635	3.5733	0.49
33	119+80.000	120+95.000	0.0218	0.312	0.0780	0.0217	0.0563	3.5804	0.49
34	120+95.000	122+10.000	0.0218	0.327	0.0817	0.0228	0.0589	3.7529	0.51
35	122+10.000	124+40.000	0.0436	0.624	0.1560	0.0434	0.1126	3.5804	0.49
36	124+40.000	126+68.000	0.0432	0.650	0.1624	0.0454	0.1171	3.7619	0.51
37	126+68.000	128+50.000	0.0345	0.494	0.1234	0.0343	0.0891	3.5804	0.49
38	128+50.000	130+20.000	0.0322	0.487	0.1218	0.0340	0.0878	3.7833	0.52
39	130+20.000	131+25.000	0.0199	0.311	0.0777	0.0218	0.0560	3.9089	0.53
40	131+25.000	132+55.000	0.0246	0.353	0.0882	0.0245	0.0636	3.5804	0.49
41	132+55.000	132+90.000	0.0066	0.094	0.0235	0.0065	0.0170	3.5449	0.48
42	132+90.000	133+10.000	0.0038	0.054	0.0134	0.0037	0.0097	3.5449	0.48
Total			2.3220	37.041	9.2602	2.5955	6.6647	3.9881	

Table 4. Predicted Crash Frequencies and Rates by Horizontal Design Element (Section 1)

Title	Start Location (Sta. ft)	End Location (Sta. ft)	Length (mi)	Total Predicted Crashes for Evaluation Period	Predicted Total Crash Frequency (crashes/yr)	Predicted FI Crash Frequency (crashes/yr)	Predicted PDO Crash Frequency (crashes/yr)	Predicted Crash Rate (crashes/mi/yr)	Predicted Travel Crash Rate (crashes/million veh-mi)
Tangent	10+50.000	133+10.000	2.3220	37.041	9.2602	2.5955	6.6647	3.9881	0.54

Table 5. Predicted Crash Frequencies by Year (Section 1)

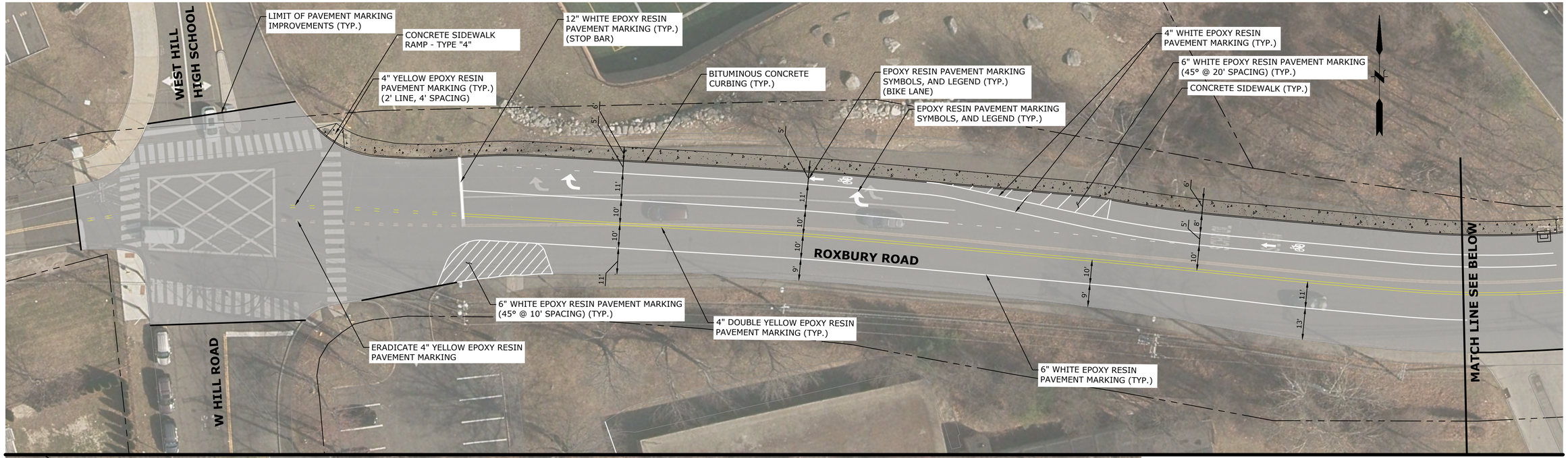
Year	Total Crashes	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)
2020	9.26	2.60	28.029	6.67	71.972
2021	9.26	2.60	28.029	6.67	71.972
2022	9.26	2.60	28.029	6.67	71.972
2023	9.26	2.60	28.029	6.67	71.972
Total	37.04	10.38	28.029	26.66	71.972
Average	9.26	2.60	28.029	6.67	71.972

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.

Table 6. Predicted Five Lane or Fewer Crash Type Distribution (Section 1)

Element Type	Crash Type	FI Crashes	Percent FI (%)	PDO Crashes	Percent PDO (%)	Total Crashes	Percent Total (%)
Highway Segment	Collision with Animal	0.00	0.0	0.31	0.8	0.32	0.9
Highway Segment	Collision with Bicycle	0.20	0.5	0.00	0.0	0.20	0.5
Highway Segment	Collision with Fixed Object	0.53	1.4	4.10	11.1	4.63	12.5
Highway Segment	Collision with Other Object	0.03	0.1	0.10	0.3	0.13	0.3
Highway Segment	Other Single-vehicle Collision	0.53	1.4	0.55	1.5	1.08	2.9
Highway Segment	Collision with Pedestrian	0.70	1.9	0.00	0.0	0.70	1.9
Highway Segment	Total Single Vehicle Crashes	1.98	5.4	5.07	13.7	7.05	19.0
Highway Segment	Angle Collision	0.32	0.9	0.76	2.1	1.08	2.9
Highway Segment	Driveway-related Collision	0.58	1.6	1.46	3.9	2.04	5.5
Highway Segment	Head-on Collision	0.16	0.4	0.14	0.4	0.29	0.8
Highway Segment	Other Multi-vehicle Collision	0.36	1.0	1.36	3.7	1.71	4.6
Highway Segment	Rear-end Collision	6.52	17.6	13.31	35.9	19.82	53.5
Highway Segment	Sideswipe, Opposite Direction Collision	0.07	0.2	0.03	0.1	0.11	0.3
Highway Segment	Sideswipe, Same Direction Collision	0.40	1.1	4.53	12.2	4.93	13.3
Highway Segment	Total Multiple Vehicle Crashes	8.40	22.7	21.59	58.3	29.99	81.0
Highway Segment	Total Highway Segment Crashes	10.38	28.0	26.66	72.0	37.04	100.0
	Total Crashes	10.38	28.0	26.66	72.0	37.04	100.0

Note: *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.



LEGEND:

- PAVEMENT MARKING IMPROVEMENT AREA
- CONCRETE SIDEWALK

FOR INFORMATION PURPOSES ONLY

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.			XX/XX	XX

SEAL

SEAL

SCALE:
HORZ.: 1" = 20'
VERT.:
DATUM:
HORZ.:
VERT.:
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GRAPHIC SCALE

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CITY OF STAMFORD

DRAFT CONCEPT PLAN

ROXBURY RD ROAD DIET

STAMFORD CONNECTICUT

PROJ. No.: 20180287.B10
DATE: JANUARY 2019

CON-04

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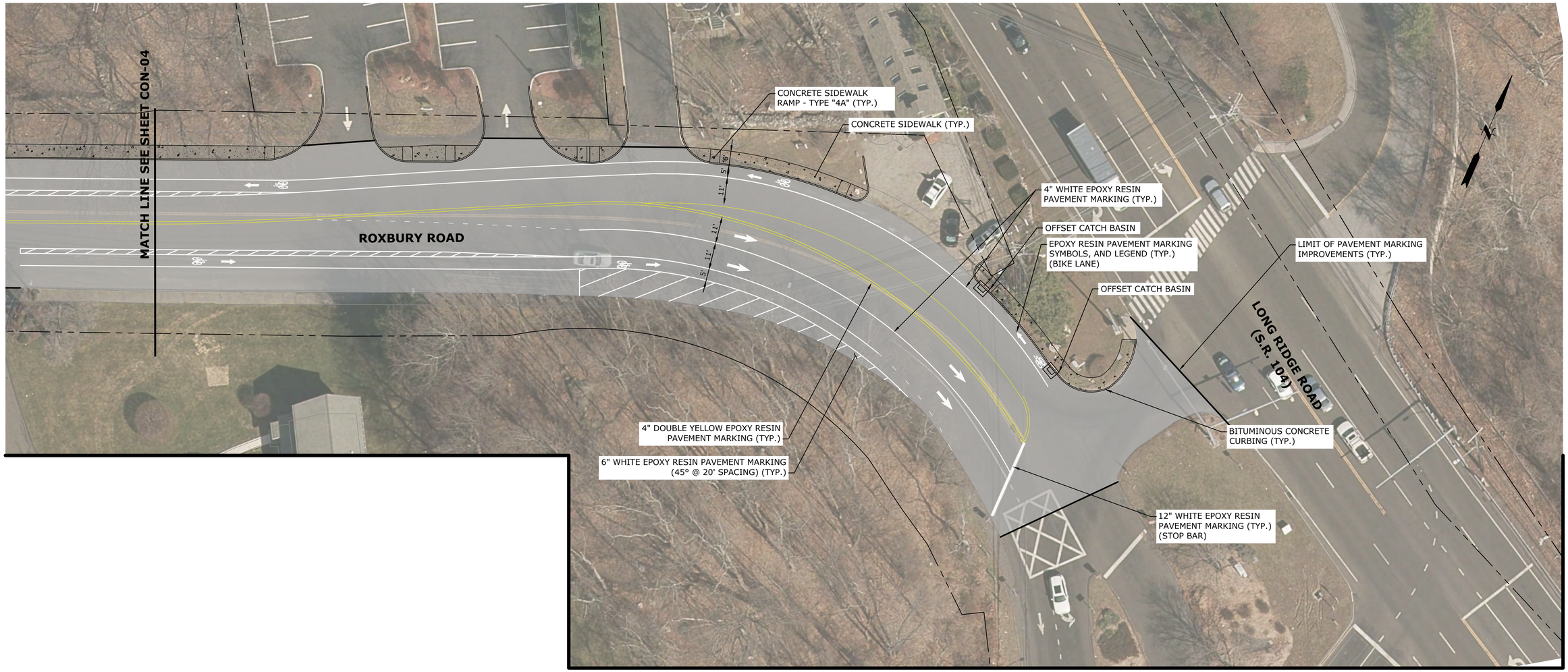

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LEGEND:

PAVEMENT MARKING IMPROVEMENT AREA

CONCRETE SIDEWALK

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No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.			XX/XX	XX

SEAL

SEAL

SCALE:
HORZ.: 1" = 20'
VERT.:
DATUM:
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20 10 0 20
GRAPHIC SCALE

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DATE: JANUARY 2019

CON-05

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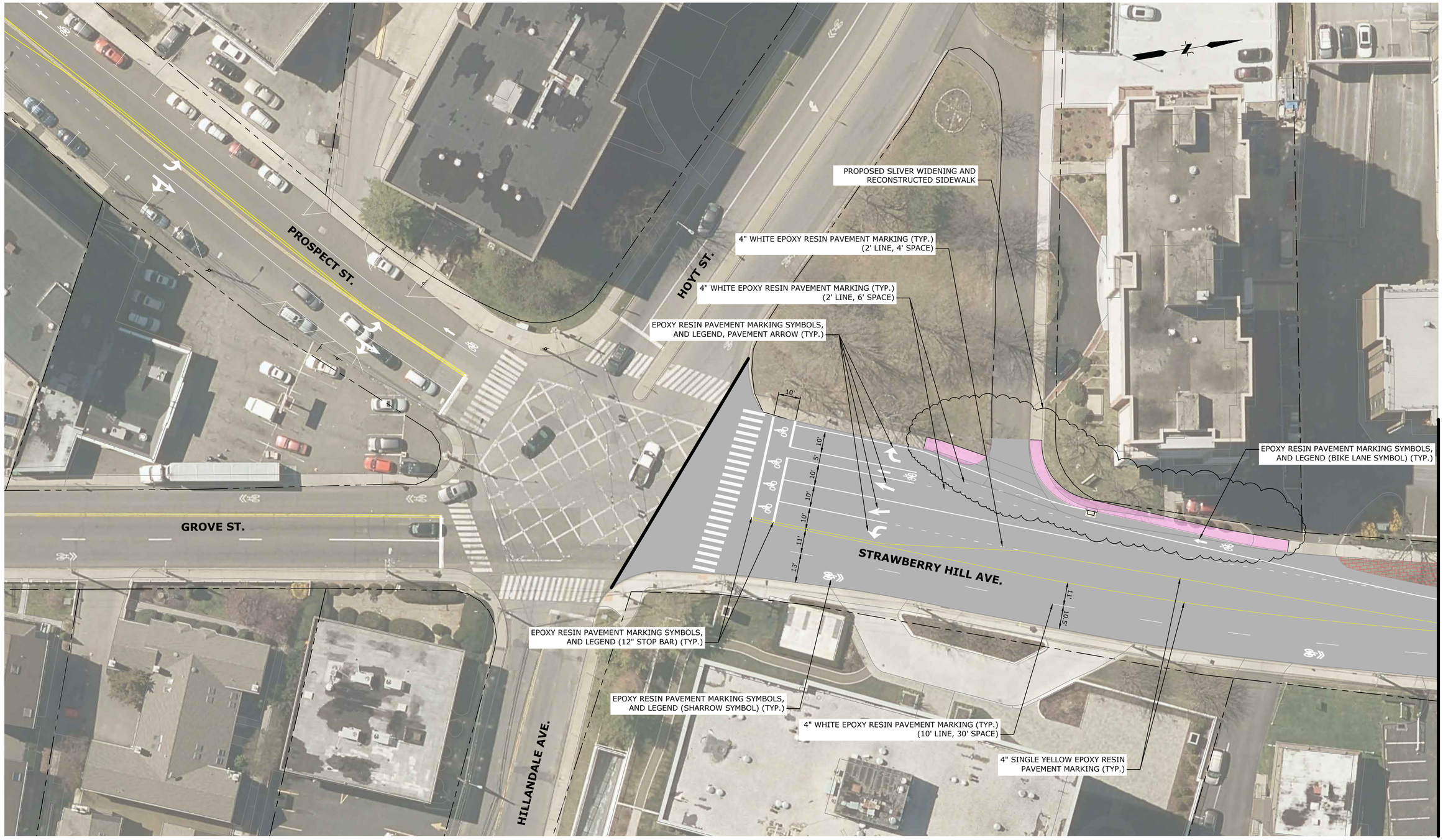

FOR INFORMATION PURPOSES ONLY

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.			XX/XX	XX

SEAL

SEAL

SCALE:
HORZ.: 1" = 20'
VERT.:
DATUM:
HORZ.:
VERT.:
20 10 0 20
GRAPHIC SCALE

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CITY OF STAMFORD

CONCEPT PLAN

STRAWBERRY HILL AVE. EXTENSION IMPROVEMENTS

STAMFORD CONNECTICUT

PROJ. No.: 20180287.B60
DATE: DECEMBER 2020

CON-01

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LAYER STATE:
MS VIEW:

MATCH LINE SEE SHEET CON-01

4" WHITE EPOXY RESIN PAVEMENT MARKING (TYP.)

STAMPED BITUMINOUS CONCRETE (TYP.)

EPOXY RESIN PAVEMENT MARKING SYMBOLS, AND LEGEND (BIKE LANE SYMBOL) (TYP.)

4" WHITE EPOXY RESIN PAVEMENT MARKING (TYP.) (2' LINE, 6' SPACE)

CUT CONCRETE SIDEWALK MATCH NEAREST JOINT

END CONCRETE CURBING

BEGIN CONCRETE CURBING

END CONCRETE CURBING

CUT CONCRETE SIDEWALK MATCH NEAREST JOINT

BEGIN CONCRETE CURBING MATCH EXISTING

MATCH LINE SEE SHEET CON-03

STRAWBERRY HILL AVE.

4" WHITE EPOXY RESIN PAVEMENT MARKING (10' LINE, 30' SPACE) (TYP.)

EPOXY RESIN PAVEMENT MARKING SYMBOLS, AND LEGEND (SHARROW SYMBOL) (TYP.)

THERMOPLASTIC CROSSWALK (TYP.)

4" WHITE EPOXY RESIN PAVEMENT MARKING (2' LINE, 4' SPACE) (TYP.)

BITUMINOUS CONCRETE DRIVEWAY (COMMERCIAL)

FURNISHING AND PLACING TOPSOIL TURF ESTABLISHMENT

4" WHITE EPOXY RESIN PAVEMENT MARKING (2' LINE, 6' SPACE) (TYP.)

4" YELLOW EPOXY RESIN PAVEMENT MARKING (TYP.)(45° AT 50' SPACING)

4" SINGLE YELLOW EPOXY RESIN PAVEMENT MARKING (TYP.)

MATCH LINE SEE ABOVE

4" SINGLE YELLOW EPOXY RESIN PAVEMENT MARKING (TYP.)

4" WHITE EPOXY RESIN PAVEMENT MARKING (TYP.)

STRAWBERRY HILL AVE.

4" WHITE EPOXY RESIN PAVEMENT MARKING (10' LINE, 30' SPACE) (TYP.)

EPOXY RESIN PAVEMENT MARKING SYMBOLS, AND LEGEND (SHARROW) (TYP.)

4" YELLOW EPOXY RESIN PAVEMENT MARKING (TYP.)(45° AT 50' SPACING)

MATCH LINE SEE SHEET CON-03

FOR INFORMATION PURPOSES ONLY

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.			XX/XX	XX

SEAL

SEAL

SCALE:
HORZ.: 1" = 20'
VERT.:
DATUM:
HORZ.:
VERT.:
20 10 0 20
GRAPHIC SCALE

FUSS & O'NEILL
146 HARTFORD ROAD
MANCHESTER, CONNECTICUT 06040
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CITY OF STAMFORD

CONCEPT PLAN

STRAWBERRY HILL AVE. EXTENSION IMPROVEMENTS

STAMFORD CONNECTICUT

PROJ. No.: 20180287.B60
DATE: DECEMBER 2020

CON-02

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