

## Fortunata Houde

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**Sent:** Thursday, July 11, 2024 5:14 PM  
**To:** King, Laoise; Michael Piscitelli; Courtney Hendricson  
**Cc:** Doug Hausladen; Fortunata Houde; Fox, Adam G.; Anderson, Scott T.; Jankovich, Richard T; Bordiere, Craig M  
**Subject:** CHA\_TaskOrder\_USPG-West\_Scope\_Draft\_24-0419 (002)  
**Attachments:** CHA\_TaskOrder\_USPG-West\_Scope\_Draft\_24-0419 (002).docx;  
UnionStaton\_WestLot\_Scope-Exhibits\_24-0626\_.pdf

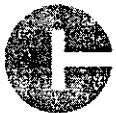
Good evening,

Attached is the draft scope of design services the Department developed with CHA for the NHUS West Lot Garage, Intermodal facility as well as the Route 1 (Union Avenue) Improvements scope. This scope takes design to the 30% level. We are requesting the City to begin their review/comment with a goal of advancing a vote at the next OC meeting. I will be requesting the Project Team represented at the next OC meeting to ask any questions you may have. If we could please add this as an agenda item.

Thank you,

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**SCOPE OF WORK:  
UNION STATION WEST LOT INTERMODAL CENTER & UNION AVENUE IMPROVEMENTS  
ASSIGNMENT NO. 1 – PRELIMINARY ENGINEERING**

**Introduction**

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This is Assignment No. 1 to be completed by Clough, Harbour & Associates, LLP (CHA/Consulting Engineer) in support of the proposed Intermodal Center on the West Lot of Union Station, New Haven, and improvements to Union Avenue between the Church Street South and Columbus Avenue intersections (exclusive) under State Project No. 0301-0562. The overall scope of the project includes:

- A multistory parking garage with a bus depot for intracity and intercity buses on the ground level, spaces for rental car parking, and commuter parking spaces (West Lot Intermodal Transportation Center);
- An at-grade pedestrian plaza connecting the parking garage to Union Station.
- Union Avenue modifications to provide traffic calming, multimodal accommodations, and access to the proposed parking garage.

The project area is shown in Exhibit 1. The proposed Intermodal Center site is owned by the State of Connecticut. Union Avenue in the project area will be considered a state road (SR), formerly U.S. Route 1, for the purposes of this project. Parking operations are currently managed by Park New Haven/New Haven Parking Authority (PNH).

The project is being advanced in partnership with the City of New Haven and PNH, and in coordination with public-private redevelopment of the existing East Lot at Union Station. Redevelopment of the East Lot is planned to include private development and commuter parking facilities for Union Station; the existing East Lot currently accommodates approximately 260 commuter parking spaces.

The West Lot Intermodal Center will be designed to maximize the number of commuter parking spaces while maintaining other programming for the site and site restrictions on footprint and height.

State Project No. 0301-0562 is planned for construction after completion of the platform and canopy improvements at Union Station.

Design and construction will be financed with 100% State funds.

This scope of work describes the tasks that will be completed by the Consulting Engineer for the Preliminary Engineer phase of the project, including:

- Task 1. CEPA Public Scoping
- Task 2. Preliminary Site Investigations
- Task 3. Functional Design Development
- Task 4. Traffic Impact Study
- Task 5. Preliminary Design (30%) Development for Union Avenue
- Task 6. Agency/Stakeholder Coordination & Meetings

Support services for the East Lot Redevelopment project will be provided by the Consulting Engineer under a separate task order assignment.

Final Design services and Design Services during Construction will be provided by the Consulting Engineer under a separate task order assignment.

## General Assumptions

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1. The project design and milestone deliverables will be developed in general accordance with CTDOT's *Consultant Design Administration Manual* and *Project Development Guide*.
2. The Consulting Engineer will prepare and submit all construction documents in accordance with CTDOT's *Digital Project Development Manual, Version 6.8*.
3. The Consulting Engineer will prepare the design in accordance with the current (as of the approval date of this Scope) applicable and governing provisions of local, state, and national standards, codes and requirements, including but not limited to:
  - *2022 Connecticut State Building Code*, Department of Administrative Services, and adopted model codes, including:
    - a. 2021 International Plumbing Code
    - b. 2021 International Mechanical Code
    - c. 2021 International Energy Conservation Code
    - d. 2020 National Electrical Code (NFPA 70)
    - e. 2017 ICC A117.1 Accessible and Usable Buildings & Facilities
  - *2018 Connecticut State Fire Safety Code*, Department of Administrative Services
  - *2018 Connecticut State Fire Prevention Code*, Department of Administrative Services
  - *Accessible and Usable Buildings and Facilities* (ICC A117.1), ICC
  - *Manual on Uniform Traffic Control Devices (MUTCD) 11<sup>th</sup> Edition, December 2023*, USDOT
  - *Highway Design Manual, Revised January 2023*, CTDOT
  - *Geotechnical Engineering Manual, 2005 Edition, Revised January 2020*, CTDOT
  - *ConnDOT Drainage Manual, 2000* (last Revised December 2003), CTDOT
  - *Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way*, U.S. Access Board
  - *Traffic Control Signal Design Manual (Revision 4, January 2021)*, CTDOT
  - *Highway Standard Sheets*, CTDOT
  - *Traffic Standard Sheets*, CTDOT
4. CTDOT will provide and maintain the active survey file and digital terrain models (DTMs) for the existing ground surface for the project area, including all topographical survey data, any necessary updates and revisions that may be requested by the Consulting Engineer for changed field conditions, expanded project limits, additional utility information, or other design needs.
5. CTDOT will provide and/or obtain all as-built/record drawings for the existing Union Station, adjacent railroad/railyard infrastructure, and Union Avenue.
6. CTDOT will provide and/or obtain all readily available documentation of geotechnical investigations completed on the proposed Intermodal Center site.
7. CTDOT will provide existing peak hour traffic data and relevant major traffic generator information for the project area and adjacent traffic study area.
8. Permanent access will be maintained between the ground level of the proposed Intermodal Center, the existing railyard, and the existing Amtrak easement.
9. The mitigation of temporary access impacts to the railyard and the Amtrak easement during construction of the Intermodal Center will be contemplated during the Final Design phase.
10. The mitigation of impacts to existing bus operations, Union Station delivery operations, and rental car parking that currently occupy the proposed Intermodal Center site will be implemented by others.

11. CTDOT will determine environmental remediation requirements to address potentially hazardous materials in the project area prior to construction. These requirements will be coordinated with the proposed parking garage design during the Final Design phase.
12. CTDOT will complete a Permit Needs Determination Form (PNDF) to determine the likely permitting activities required for the project.
13. CTDOT will initiate utility coordination including sending utility notification letters to utility owners in the project area.
14. Electric vehicle charging stations for 20% of the proposed parking spaces will be planned for the parking garage, based upon electrical grid capacity and site constraints.
15. The relocation of existing high-mast lighting currently located on the proposed Intermodal Center site will be completed by others.
16. The temporary and/or permanent relocation of existing catenary supports to accommodate the construction of the proposed Intermodal Center will not be contemplated under this Scope of Work.

### **TASK 1. CEPA Public Scoping**

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The proposed project will be financed with 100% State funds and as such will be subject to the Connecticut Environmental Policy Act (CEPA) (Connecticut General Statutes [CGS] Sections 22a-1 through 22a-1h, inclusive, and where applicable, CEPA regulations Section 22a-1a-1 through 22a-1a-12, inclusive, of the Regulations of Connecticut State Agencies [RCSA]).

As defined in the Generic Environmental Classification Document (ECD) for Connecticut State Agencies, effective date of March 2, 2021, the Proposed Action of constructing a new parking garage that provides for an increase in capacity of 200 vehicles or more requires Public Scoping to determine whether an Environmental Impact Evaluation (EIE) is required for the Proposed Action in accordance with CEPA.

This Scope of Work includes activities by the Consulting Engineer in support the Public Scoping process. The Build alternatives for the Proposed Action that will be presented during Public Scoping will be prepared by the Consulting Engineer under Tasks 3 and 5. The preparation of subsequent environmental documentation and the associated assessment of impacts of the Proposed Action, as required, will be provided by the Consulting Engineer under a separate scope of work.

#### **1.1 Project Purpose and Need**

The Consulting Engineer will coordinate with CTDOT to develop a concise purpose and need (P/N) statement for the project. CTDOT will provide initial language for the draft P/N which the Consulting Engineer will review and incorporate into a draft P/N statement. A draft P/N statement will be submitted to CTDOT for review and comment. The Consulting Engineer will finalize the P/N statement based on CTDOT comments, and once approved, will incorporate the P/N statement in the Scoping Notice and other Public Scoping documentation. CTDOT will provide all existing and documented data, evidence, studies, investigations, and findings prepared by others to support the stated need for the Proposed Action. Any additional data collection, analyses, studies, or investigations that may be required by the Consulting Engineer to support the stated need are not included in this Scope of Work.

#### **1.2 CEPA Scoping Notice**

The Consulting Engineer will assist CTDOT with the preparation of a CEPA Scoping Notice for publication in the Connecticut *Environmental Monitor*. The Consulting Engineer will prepare a draft Scoping Notice for CTDOT review. CTDOT will then finalize the notice and coordinate for publication in the *Environmental Monitor*. It is assumed that a Public Scoping Meeting will be conducted for this project; the meeting is included under Task 1.4, Public Scoping Meeting.

### **1.3 Description of Proposed Action and Alternatives**

The Consulting Engineer will prepare a detailed description of the Proposed Action (Preferred Alternative) including the basis of selection of the Proposed Action as the preferred alternative. A draft description will be submitted to CTDOT for review and comment. The Consulting Engineer will refine the description based on CTDOT comments, and once approved, will incorporate the project description into the Public Scoping documentation.

### **1.4 Public Scoping Meeting**

The Consulting Engineer will prepare for and attend one (1) Public Scoping Meeting to be conducted during Task 3, Functional Design Concept Development, and Task 5, Preliminary Design (30%) Development for Union Avenue. The Consulting Engineer will schedule the Public Scoping Meeting in coordination with CTDOT, including securing an appropriate meeting venue in New Haven. It is assumed that up to four (4) consultant staff will attend the meeting. In addition, the Consulting Engineer will provide the following services in support of the meeting:

- Prepare and present a formal PowerPoint presentation with the Consulting Engineer's equipment.
- Prepare color exhibits illustrating the project area, key environmental constraints, and Build Alternative. The exhibits will be of a size and scale suitable for public review.
- Develop and provide copies of a meeting agenda, sign-in sheet, and comment forms and supply pens for public use at the meeting.
- Review all public and Agency comments received during the meeting and received by CTDOT during the public comment period. Public comments will be compiled and provided to CTDOT for the public record and for determining whether an EIE will be required for the Proposed Action.

At least one week prior to the Public Scoping meeting, a dry-run meeting will be held with CTDOT representatives to prepare for the meeting. All materials to be presented to the public will be reviewed by CTDOT for approval at this time.

The Consulting Engineer will procure oral translation services for the Public Scoping meeting and/or written translation of meeting materials and communications if those are determined by CTDOT as being required for the meeting.

CTDOT will provide the Consulting Engineer with a recording of the public scoping meeting. The Consulting Engineer will arrange for transcription services and provide CTDOT with a written transcript of the presentation and all verbal comments recorded at the meeting with a Report of Meeting.

It is assumed that oral and/or written translation services and transcription services for the Public Scoping meeting will be provided by third-party vendors and will be allowable direct costs for this assignment.

## **TASK 2. Preliminary Site Investigations and Documentation**

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### **2.1 Site Inventory and Documentation**

For the project area, the Consulting Engineer will compile pertinent available data; review/confirm topographic survey mapping provided by CTDOT; obtain environmental resource mapping from readily available GIS data sources; perform field reconnaissance; and produce documentation of the existing site conditions including mapping, photos, and written narrative, as required. This inventory could include:

- Verification of overhead utility locations.
- Verification of drainage systems and determination of site drainage characteristics and patterns.
- Location, style, type, size, and character of existing lighting, security, communications features.
- Physical/geometric characteristics of Union Avenue and existing access to and from Union Station.
- Verification of existing traffic controls.
- Sight lines from project site.

- Vehicular traffic patterns, traffic flow, on-site bus/shuttle/delivery vehicle operations, and observed operational issues.
- Nature and location of access and access controls to and from the railyard and Amtrak easement.
- Pedestrian and bicycle access and circulation patterns.
- Compilation of environment resource mapping.

It is assumed that six (6) man-days will be required for field reconnaissance performed under this task. All field work will be performed in accordance with applicable CTDOT maintenance and protection of traffic requirements and applicable safety rules and regulations. Safety signing, vests, hard hats, etc. will be utilized, as appropriate, by field personnel. No access to the track or railroad safety training will be required.

## **2.2 Underground Utility Surveying**

The Consulting Engineer will procure the services of an underground surveying company to mark-out the locations of existing primary and secondary underground utility facilities (including electrical, water, gas, communications, sanitary/septic) on the site of the proposed Intermodal Center and within Union Avenue. CTDOT will perform field survey of the mark-outs and will incorporate this information in the active survey file for the project. Task 2.2 will be completed prior to initiating Task 2.3.

## **2.3 Subsurface Exploration Program**

The Consulting Engineer will prepare and implement a subsurface exploration program (SEP) for the proposed Intermodal Center site and Union Avenue improvements in accordance with the applicable provisions of CTDOT's *Geotechnical Engineering Manual*. Specifically, the Consulting Engineer will:

- Review existing subsurface data and geotechnical reports provided by CTDOT from previous exploratory efforts.
- Develop a boring contract bid package for the SEP to be submitted to CTDOT for review and approval. The package will include a brief narrative, boring contract specifications, boring location plan, and detailed estimate of boring quantities. For scoping purposes, the Consulting Engineer anticipates the SEP will include the following:
  - Four (4) borings at the anticipated corners of the parking garage footprint to depths of 100 ft.
  - Four (4) borings within the footprint of the parking garage footprint to depths of 75 ft.
  - Continuous split-spoon sampling within all parking garage borings to depths of 20 feet, or through fill material, whichever is greater, and at standard 5-foot intervals thereafter.
  - Three (3) borings in Union Avenue to depths of 8 ft to determine roadway subgrade conditions.
- Facilitate coordination with Metro-North Railroad to discuss any special conditions or requirements for the boring contractor's work adjacent to the railroad.
- Mark the boring locations on-site prior the start of the SEP.
- Inspect the SEP in accordance with the applicable provisions of CTDOT's *Geotechnical Engineering Manual*. The Consulting Engineer will provide one on-site inspector who will: coordinate with the drilling subcontractor, CTDOT, PNH, and the geotechnical project engineer; observe the drilling operations; complete daily inspection reports; log the soil samples; and direct drilling adjustments in the field based on the conditions encountered.
- Select samples and submit to a qualified laboratory for index, corrosivity, and strength testing. Additional testing may be selected based on conditions encountered during the SEP.

## **Task 2.3 Assumptions**

- Environmental special provisions will be required in the boring contract to address potential environmental contamination and containment such as: soil handling, drill rig and equipment decontamination, soil cuttings and drill fluid drumming, borehole backfilling, and personal protective

equipment (PPE) requirements. The Consulting Engineer will develop these special provisions for inclusion with the boring contract bid package to be submitted to CTDOT for review and approval.

- The Consulting Engineer will provide an environmental scientist to address specific conditions encountered during subsurface exploration.
- Drilling operations will be completed during normal working hours.
- Drilling operations, including mobilization and staging of equipment, will be coordinated to minimize disturbance of the existing West Lot operations.
- A *Call Before You Dig* ticket will be obtained by the boring contractor a minimum of 48 hours in advance of drilling operations.
- Metro-North Railroad flaggers will not be required for the drilling operations.

#### **2.4 Geotechnical Engineering Report**

The Consulting Engineer will prepare a Draft Geotechnical Report in conjunction with the functional design development of the proposed parking garage and in general accordance the applicable requirements of the CTDOT *Geotechnical Engineering Manual*. The report will include preliminary foundation design recommendations based on the findings of the SEP. The draft will be submitted for CTDOT review and comment.

The Consulting Engineer will prepare and submit a Final Geotechnical Report that addresses CTDOT comments on the draft report.

### **TASK 3. Functional Design Development**

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The Consulting Engineer will develop the preliminary design parameters and functional design concepts for the proposed Intermodal Center under this task using the findings of the *Union Station East & West Lot Development Study* (Svigals + Partners, October 2022) as a preliminary basis for this work. It is anticipated the functional design development will be an iterative process involving input from CTDOT, PNH, and other stakeholders. Meetings associated with the functional design development will be completed under Task 6, Agency/Stakeholder Meetings & Coordination. The Consulting Engineer will also complete a community parking supply and demand study, as required, under this task.

#### **3.1 Preliminary Design Parameters**

The Consulting Engineer will develop and document a set of preliminary design parameters to define the basic requirements, design criteria, standards, and preferences for the proposed Intermodal Center. The design parameters will inform the development of the alternative functional design concepts under this task. This task will define and/or confirm the following for the proposed Intermodal Center:

- Applicable building codes, life safety requirements, and design standards.
- Target parking supply, parking space size, and space allocation for standard, accessible, van accessible, electric vehicle, and rental car spaces in the parking garage.
- Design vehicle(s) for the ground level bus depot.
- Minimum dimensions for parking spaces (all types), bus berths, and drive aisles.
- Site size and usage requirements, including:
  - Confirmation of overall parcel footprint and site adjacencies.
  - Desirable and minimum setback requirements to existing station building, railyard, Amtrak easement, and Union Avenue.
  - Minimum vertical clearances for the ground level bus depot, van accessible levels, and typical parking levels.
  - Site access requirements for vehicular traffic to and from the railyard, Amtrak easement, rear of station building, and Union Avenue.

- Site access requirements for pedestrians to and from the parking garage, bus depot, station building, and Union Avenue.
- Structure height limitations based on SHPO recommendations, assumed not to notably exceed the height of the existing station building.
- Stair and elevator provisions.
- Other programmatic needs such as patron waiting areas, lavatories, storage spaces, and other interior space needs.
- Bicycle parking opportunities, including electric bicycle charging provisions.
- Parking Access and Revenue Control System (PARCS) provisions, including basic requirements for integration with the existing PARCS at Union Station.
- Safety and security requirements.
- Other agency and stakeholder design preferences and requirements as determined through consultation with CTDOT and other stakeholders.
- Utility constraints.
- Snow removal and snow storage limitations.

The Consulting Engineer will document the preliminary design parameters in a memorandum for CTDOT review and comment. One round of review and comment with subsequent revisions is included in this scope.

### **3.2 Functional Design Concepts**

The Consulting Engineer will develop up to two (2) alternative functional design concepts for the Intermodal Center based on the design parameters developed under Task 3.1 and the following provisions and considerations:

- Vehicular access to/from Union Avenue consisting of separate or combined access for buses and commuter vehicles. Work will include analysis of vehicular entry/exit demand (based on findings of the traffic study) for the parking garage to determine the required number, configuration, and locations of vehicular lanes. Work will also include siting of PARCS (fare transaction zones) at entry/exit points.
- Ground level provisions including circulation requirements for buses, bus berth layout, patron waiting areas, pedestrian accommodations, and coordination with railyard and Amtrak easement access.
- Parking garage provisions including ramp configuration, internal circulation and traffic flow, parking space layout on each level, anticipated floor-to-floor heights and clearances based on preliminary structural member sizes and depths.
- Layout and access for other interior spaces including lavatories; storage rooms; and mechanical, electrical, and server rooms.
- Pedestrian access and circulation including access and flow from parking to a vertical core comprised of elevators and egress stair leading to grade and to other egress stairs as required by applicable codes. Work will include assessment of elevator capacity to verify the required number of elevators, and assessment of location relative to functionality and life safety.
- Bicycle parking facilities and access from Union Avenue.
- Constructability limitations based on existing site constraints, proximity to existing adjacent facilities and structures, and temporary access requirements for the railyard and Amtrak easement.
- Preliminary assessment of alternative options for snow removal, snow storage and/or snow melting system accommodations.

The Consulting Engineer will develop up to six (6) concept-level drawings (including plans for ground level, typical level, and roof level; longitudinal and transverse sections; exterior elevations; and isometric



views) for each of the two (2) proposed functional design concepts, as necessary, to adequately convey the following for each of the two alternative functional design concepts:

- Overall site layout including access locations/configurations and relationship to the site and abutting features (including existing station building, rail infrastructure, Amtrak easement, Union Avenue street line).
- Internal circulation and traffic flow.
- Parking space and drive aisle layout for each level.
- Anticipated floor-to-floor heights and clearances for each level.
- Structural grid including location and approximate size of shear walls.
- Location of elevator/stair core, egress stairs, and pedestrian connections to the existing station and Union Avenue.
- Access provisions for the railyard and Amtrak easement.
- Snow storage opportunities.

The Consulting Engineer will also document the relative advantages and disadvantages of each alternative and provide a parking space tabulation chart for each depicting the allocation of parking spaces for each level.

The Consulting Engineer will then review the preliminary functional design concepts with CTDOT, City of New Haven, PNH and other stakeholders (meetings under Task 6). As required, the Consulting Engineer will refine the functional design concepts and/or develop alternative sub-concepts for subsequent presentation and discussion with CTDOT, the City, and other stakeholders (meetings under Task 6). As required, the Consulting Engineer will then further refine a preferred preliminary functional design concept for subsequent presentation as the Proposed Action at the Public Scoping Meeting (under Task 1.4).

### **3.3 Parking Supply and Demand Study**

If requested by CTDOT, the Consulting Engineer will complete a commuter parking supply and demand study to assess the existing and future need for commuter parking for Union Station. Existing and future commuter parking supply includes public and private facilities in the area of Union Station. Existing commuter parking demand data will be obtained as available from facility operators, or estimated using point-in-time parking space utilization counts, to the extent which access to these facilities will allow. Future or potential parking demand will be estimated from CTDOT's waitlist for parking permits and from ridership growth and travel demand projections for transit services originating from Union Station. Ridership and travel demand data will be obtained, as available, from others; the Consulting Engineer will not be responsible for developing ridership growth or travel demand forecasts under this Scope of Work. The methodology, data, and findings for the commuter parking supply and demand study will be summarized in a brief technical memorandum for review by CTDOT. The labor effort associated with this study is assumed to be up to 160 staff-hours.

#### **Task 3 Assumptions:**

- The parking garage will meet the building code requirements for an open parking garage and will use a precast concrete structural system.
- There will be no roof on the parking garage.
- Aesthetic design concepts will be developed by the Consulting Engineer under a subsequent task order assignment.
- Cost estimates will not be required.

### **TASK 4. Traffic Impact Study**

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The Consulting Engineer will complete a Traffic Impact Study (TIS) for the proposed Intermodal Center to determine the potential impacts that new trip generation from the proposed site will have on Union Avenue and the adjacent street network in the study area. The study area includes the following intersections:

1. Union Avenue & Church Street Extension
2. Union Avenue & Union Station West Lot Driveway
3. Union Avenue & Union Station Passenger Drop-off Driveway
4. Union Avenue & Pedestrian Midblock Crossing between Union Station Drop-off and Pick-up
5. Union Avenue & Union Station Passenger Pick-up Driveway
6. Union Avenue & Union Station Parking Garage Access #1
7. Union Avenue & Columbus Avenue/Union Station Parking Garage Access #2 (East Lot)
8. Union Avenue & Meadow Street
9. Union Avenue & West Water Street
10. Union Avenue/State Street & Water Street

The TIS and documentation will inform the CEPA evaluation (to be completed under a separate task order assignment) and will inform the site layout and access provisions at Union Avenue. The analyses will include the existing condition (year 2024), no-action condition (year 2034 – the estimated time of completion (ETC) for the project), build condition (year 2034), and future build condition (year 2054 – ETC +20).

The proposed West Lot parking improvements with a minimum of 200 new parking spaces will qualify as a Major Traffic Generator (MTG) and will ultimately require certification from the Office of the State Traffic Administration (OSTA). As such, the analyses completed under this task will be consistent with the requirements of an OSTA application, and Step 1 of the MTG certification process will be completed to facilitate approval of the traffic data to be used for the analyses. The Consulting Engineer will complete subsequent steps of the MTG certification process under a subsequent task order assignment.

The TIS will include the following work items:

#### **Existing Data Collection, Compilation and Review**

- **Traffic Data.** The Consulting Engineer will compile and review traffic volume data provided by CTDOT and obtained from other sources including previous traffic studies for Union Station, Union Avenue, and/or any available studies for other land development or community planning initiatives affecting the study area transportation system. Other traffic data to be provided by CTDOT for the study area will include: heavy vehicle percentages by location/movement, Peak Hour Factors (PHFs), pedestrian/bicycle volumes, and 85<sup>th</sup> percentile speed data for Union Avenue. The Consulting Engineer will coordinate with OSTA to obtain traffic data for approved MTG certificates.
- **Accident Data.** The Consulting Engineer will collect and compile the latest three years of readily available accident reports for collisions in the study area. This information will be obtained from the Connecticut Crash Data Repository maintained by UConn.
- **Signal Plans.** The Consulting Engineer will collect the current signal plan for each of the study intersections from the City of New Haven and CTDOT, as applicable.
- **Roadway and Transportation System Improvement Plans.** The Consulting Engineer will collect plans from CTDOT and City of New Haven for any planned and/or programmed roadway, intersection, traffic signal, sidewalk, bikeway, bus system, or other capital improvement projects that need to be accounted in the future (ETC and/or ETC+20) conditions.

#### **Existing Condition Analyses**

##### *Traffic Network*

The Consulting Engineer will create a Synchro traffic network representing the existing condition.

### *Level-of-Service Analysis*

The Consulting Engineer will perform intersection capacity analyses for the study intersections during the weekday morning (AM) and evening (PM) peak hours for the existing condition using the current version of Synchro and SimTraffic software with performance metrics reported using the HCS methodology.

### *Queue Calculations*

The Consulting Engineer will perform and report queue calculations (50th percentile and 95th percentile) for the existing condition at the study intersections (all movements).

### *Crash Analysis*

The Consulting Engineer will summarize and document the accident data in tabular form. The location and nature of notable accident trends/patterns will be identified and described, including those associated with pedestrian or bicycle crashes. Collision diagrams, as available, will be compiled.

### *Documentation*

The Consulting Engineer will prepare tables, graphics and narrative for the existing condition, including analysis results and identified issues. Synchro summary reports of the capacity and queue analyses will also be compiled.

## **No-Action Condition Analyses**

### *Traffic Network*

The Consulting Engineer will create the no-action condition Synchro network by updating the existing condition network to reflect the programmed roadway and transportation system improvements that are expected to be completed by ETC.

### *No-Action Traffic Volumes*

The Consulting Engineer will estimate traffic volumes for the no-action condition for the weekday AM and PM peak hours and will prepare traffic volume diagrams for review and approval under the Step 1 OSTA MTG process. The traffic volume estimates will include background growth and traffic volumes from developments with approved MTG certificates that are expected to be completed by ETC.

### *Level-of-Service Analysis*

The Consulting Engineer will perform intersection capacity analyses for the study intersections during the weekday morning (AM) and evening (PM) peak hours for the no-action condition using the CTDOT-approved no-action traffic volumes.

### *Queue Calculations*

The Consulting Engineer will perform and report queue calculations (50th percentile and 95th percentile) for the no-action condition at the study intersections (all movements).

### *Documentation*

The Consulting Engineer will prepare tables, graphics and narrative for the no-action condition, including analysis results and identified issues. Synchro summary reports of the capacity and queue analyses will also be compiled.

## **Build Condition Analyses**

### *Traffic Network*

The Consulting Engineer will create the build condition Synchro network by updating the no-action condition network to reflect changes to Union Avenue for proposed access to/from the proposed Intermodal Center.

### *Trip Generation*

The Consulting Engineer will estimate weekday AM and PM peak hour trip generation from the proposed Intermodal Center site using existing parking garage trip generation data, and will assign these trips to the traffic network based on existing commuter travel patterns at Union Station.

*Build Condition Traffic Volumes*

The Consulting Engineer will estimate traffic volumes for the build condition for the weekday AM and PM peak hours and will prepare traffic volume diagrams for review and approval under the Step 1 OSTA MTG process. The traffic volume estimates will consist of no-action volumes combined with the trip generation estimated under this task.

#### *Level-of-Service Analysis*

The Consulting Engineer will perform intersection capacity analyses for the study intersections during the weekday morning (AM) and evening (PM) peak hours for the build condition using the CTDOT-approved build traffic volumes.

#### *Queue Calculations*

The Consulting Engineer will perform and report queue calculations (50th percentile and 95th percentile) for the build condition at the study intersections (all movements).

#### *Documentation*

The Consulting Engineer will prepare tables, graphics and narrative for the build condition, including analysis results and identified issues. Synchro summary reports of the capacity and queue analyses will also be compiled.

#### *Mitigation Assessment*

The Consulting Engineer will determine the nature of off-site improvements that are necessary to address any significant traffic impacts associated with the proposed Intermodal Center. These improvements, as required, will be documented in the Technical Report under this task and addressed by the Union Avenue improvements prepared under Task 5.

### **Future Build Condition Analyses**

#### *Traffic Network*

The Consulting Engineer will create the future build condition Synchro network by updating the build condition network to reflect any mitigation for potential traffic impacts associated with the proposed Intermodal Center. The update will also reflect the programmed roadway and transportation system improvements that are expected to be completed by ETC+20.

#### *Future Build Condition Traffic Volumes*

The Consulting Engineer will estimate traffic volumes for the future build condition for the weekday AM and PM peak hours and will prepare traffic volume diagrams for CTDOT review. The traffic volume estimates will consist of future condition volumes with additional background growth for ETC+20 and traffic volumes from developments with approved MTG certificates that are expected to be completed between ETC and ETC+20.

#### *Level-of-Service Analysis*

The Consulting Engineer will perform intersection capacity analyses for the study intersections during the weekday morning (AM) and evening (PM) peak hours for the future build condition using the future build traffic volumes.

#### *Queue Calculations*

The Consulting Engineer will perform and report queue calculations (50th percentile and 95th percentile) for the future build condition at the study intersections (all movements).

#### *Documentation*

The Consulting Engineer will prepare tables, graphics and narrative for the future build condition, including analysis results and identified issues. Synchro summary reports of the capacity and queue analyses will also be compiled.

#### *Mitigation Assessment*

The Consulting Engineer will determine the nature of additional Union Avenue improvements that may be needed to address unacceptable traffic operations (assumed to be LOS E or F) at the study intersections. The nature and extent of these improvements will be reviewed with CTDOT and City of New Haven, and as required, will be documented in the TIS Report under this task and addressed by the Union Avenue improvements prepared under Task 5.

## **TIS Report**

The Consulting Engineer will prepare a TIS Report that will provide a concise description of the investigations and analyses conducted to evaluate the traffic impacts of the project. The document will include text and graphics appropriate to describe: [1] the study process and methods, [2] existing, no-action, build, and future build traffic conditions, [3] the identified traffic impacts, and [4] recommended improvements, if any, to mitigate significant traffic impacts under the build condition and to address unacceptable traffic operations under the future build condition. A technical appendix will also be provided containing the technical data and analyses supporting the information presented in the report.

## **TASK 5. Preliminary Design (30%) Development for Union Avenue**

The Consulting Engineer will complete the design report, design plans, and cost estimate outlined in this task in support of the Preliminary Design (30%) Development for Union Avenue. The typical roadway cross section will be based on the Union Avenue concept plan prepared by the City of New Haven (dated January 16, 2024) and attached for reference (Exhibit 2).

### **5.1 Preliminary Design Report**

The Consulting Engineer will prepare a Preliminary Design Report in accordance with the applicable requirements of Section 303.04 of CT DOT's *Project Development Guide*. Design and documentation efforts included in this task are:

- Determination and documentation of design criteria for Union Avenue.
- Identification of any non-standard design values and design exceptions for controlling design criteria.
- Preliminary pavement design, assumed to be full-depth reconstruction.
- Assessment of the existing roadway drainage system and characteristics, including major drainage areas, stormwater quality issues, flooding and capacity issues, and system condition and maintenance issues.
- Assessment of existing overhead and underground utility infrastructure, potential impacts, and nature and extent of relocations required for the improvements, including limits of relocating existing overhead lines underground in the area of the proposed Intermodal Center.
- Determination of property impacts, rights-of-way and easement needs for the Union Avenue improvements. Preparation of a Preliminary Schedule of Property Owners with a base survey plan, if required.
- Assessment of illumination needs for Union Avenue in the project area including preparation of a preliminary illumination concept in accordance with current national and state standards and guidance, including the AASHTO Roadway Lighting Design Guide and the National Electrical Code.
- Development of a preliminary construction staging scheme.

The Consulting Engineer will also incorporate a summary and key findings from each of the following into the Preliminary Design Report:

- CEPA Public Scoping (Task 1).
- Preliminary site investigations, including the Subsurface Exploration Program (Task 2).
- Functional design development process, including selection of a preferred alternative (Task 3).
- TIS (Task 4).

### **5.2 Preliminary Plans**

The Consulting Engineer will develop the preliminary plans for Union Avenue to a 30% design level. Plans will be organized into three (3) subsets for the Preliminary Design (PD) submission, including General, Highway, and Traffic. Scope provisions for individual design disciplines are outlined in the following subtask breakdown.

### **A. Highway**

The Consulting Engineer will prepare PD highway plans, sections, notes, and details to define the following within the Union Avenue work limits:

- Overall nature and limits of demolition and removals.
- Horizontal and vertical alignments and layout information.
- Typical roadway cross section with full-depth pavement section design.
- Travel lane, turn lane, and parking lane layout and dimensions.
- Crosswalk locations, raised crosswalk locations, curb ramp details, cycle track layout, and bus boarding area layout.
- Intermodal Center driveway/site access.
- Modifications to the passenger pick-up and drop-off area at Union Station.
- Nature and extent of streetscape improvements and existing sidewalk modifications.
- Schematic drainage system modifications and improvements. It is assumed that existing stormwater system outlet pipes will be utilized.
- Roadway cross sections at 50-ft intervals and as required at critical sections.

### **B. Traffic**

The Consulting Engineer will prepare PD traffic plans, notes, and details to define the following:

- New signage and pavement markings, and modification of existing signage and pavement markings as required on Union Avenue.
- Nature and existing of new traffic control equipment and/or existing equipment modifications.
- Maintenance and protection of traffic (MPT) including temporary traffic control measures and temporary pedestrian accommodations.

### **C. Other Plans & Drawings**

Other plans that the Consulting Engineer will prepare for the PD submission include the following:

- General plans subset including title sheet and general notes.

### **5.3 Preliminary Construction Cost Estimate**

The Consulting Engineer will prepare a preliminary construction cost estimate based on quantity take-offs from the PD and in accordance with CTDOT's latest Cost Estimating Guidelines. Unit prices for highway and traffic items will be obtained from CTDOT's Estimator program, as available, or determined based on industry pricing guidelines (such as recent RSMMeans data).

## **TASK 6. Agency/Stakeholder Coordination & Meetings**

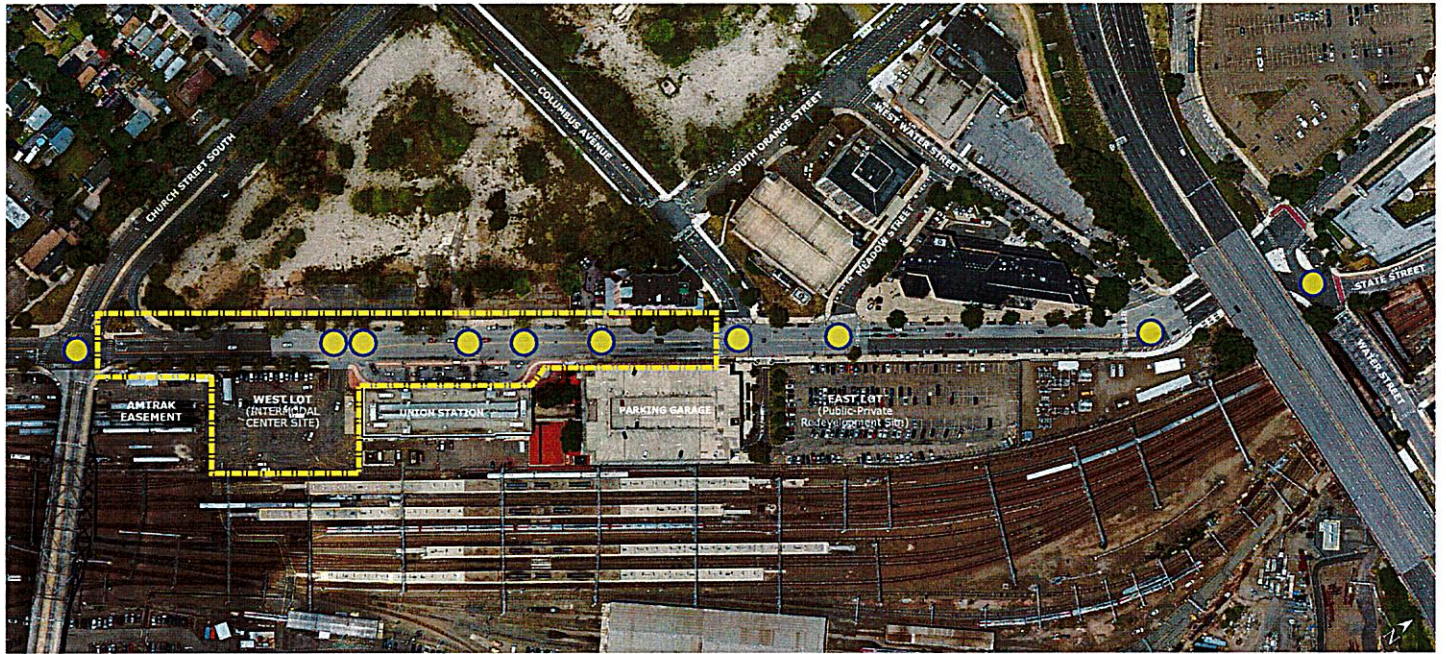
The Consulting Engineer will prepare for, attend, and facilitate meetings with CTDOT and other involved agencies and stakeholders as required during the preliminary engineering phase to coordinate data collection; discuss progress; discuss design decisions; coordinate project activities; review draft products and deliverables; and solicit stakeholder input. These meetings could involve the following:

- CTDOT Facilities Design coordination, including project status meetings and preparatory discussions for meetings with other agencies and stakeholders. Assume 16 bi-weekly meetings and 8 preparatory discussions.
- CTDOT Inter-unit coordination, including meetings with Office of Transit, Office of Rail, OEP, District Maintenance, Traffic, Highways, Hydraulics & Drainage, and others as needed. Assume 10 meetings.
- CTDOT OSTA coordination. Assume 1 meeting.



- Connecticut SHPO. Assume 1 meeting.
- Amtrak Coordination. Assume 2 meetings.
- Utility Coordination. Assume 1 meeting.
- City of New Haven, including Park New Haven and various departments. Assume 4 meetings.

CTDOT will assist the Consulting Engineer with meeting coordination and scheduling. The number of Consulting Engineer staff attending each meeting will depend on the purpose of each meeting but will generally include the Project Manager and up to two (2) technical staff. The Facilities Design coordination and project status updates will generally involve the Project Manager. The Consulting Engineer will prepare and distribute an agenda (as required), meeting materials (as required), and meeting summary for each meeting. Up to xx (xx) meetings will be conducted on-site or in New Haven; the balance will be conducted virtually using Microsoft Teams.





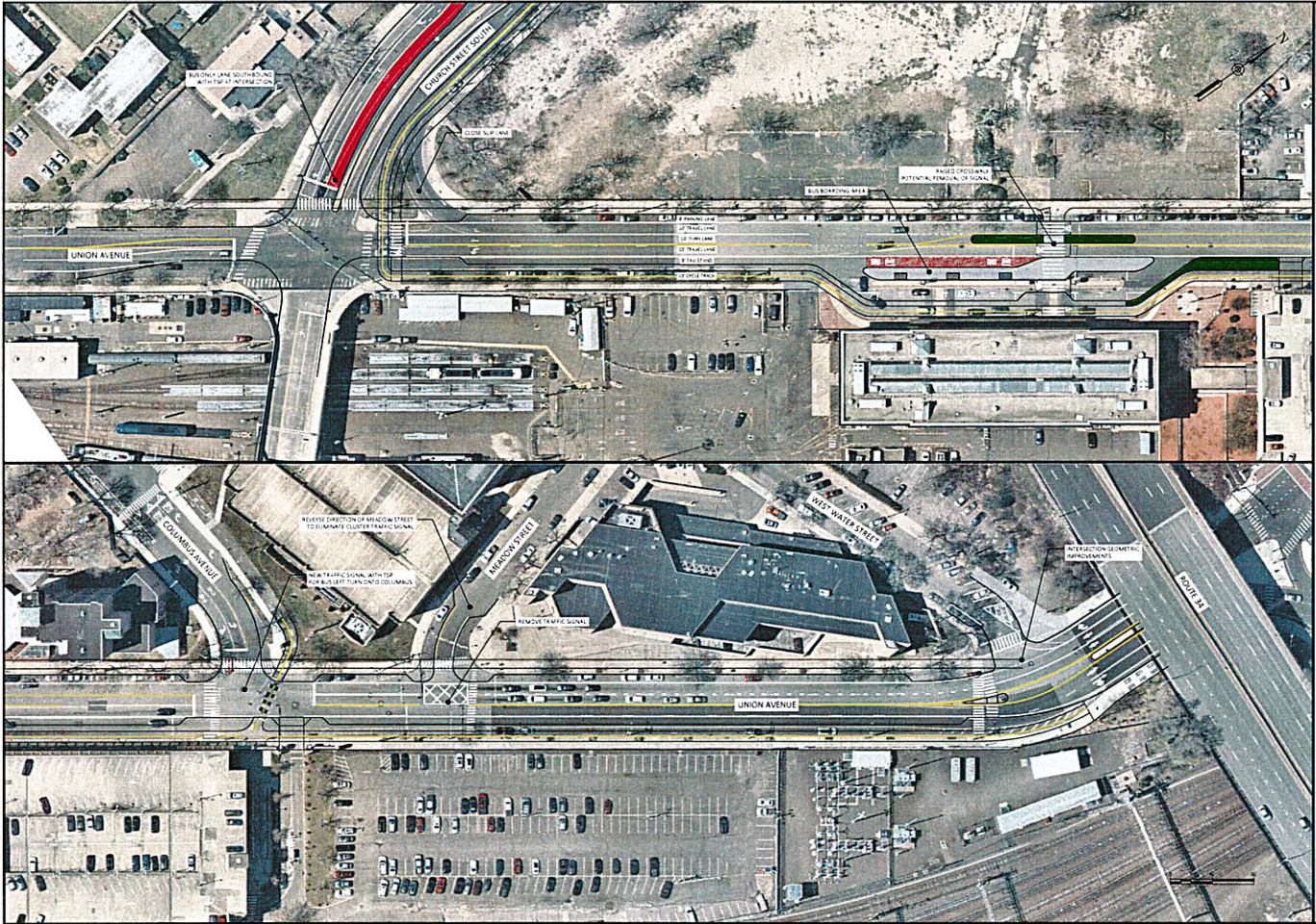
**LEGEND**

-  PROJECT AREA
-  TRAFFIC IMPACT STUDY INTERSECTION



DESIGNER/DATE: [Blank] / [Blank] CHECKED BY: [Blank] / [Blank]	NOT TO SCALE	SHEET NO.: [Blank] BLOCK: [Blank]		PROJECT NUMBER: 032140562 PROJECT DESCRIPTION: UNION STATION WEST LOT INTERMODAL CENTER & UNION AVENUE IMPROVEMENTS LOCATION: NEW HAVEN DRAWING NO.: PROJECT AREA MAP	DATE: [Blank] PAGE: [Blank]
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Exhibit 1 | Project Area Map



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No.	Revised From	Date

  
**CITY OF NEW HAVEN**  
**DEPARTMENT OF ENGINEERING**  
 THE HONORABLE JUSTIN M. ELICKER, MAYOR  
 GIOVANNI ZINNY, P.E., CITY ENGINEER

UNION AVENUE	
Drawn By:	A. WEBER
Checked By:	A. WEBER
Date:	1/16/2024
Project No.:	

Project Name: CONCEPT PLAN  
**C-1**

Exhibit 2 | Union Avenue Concept Plan