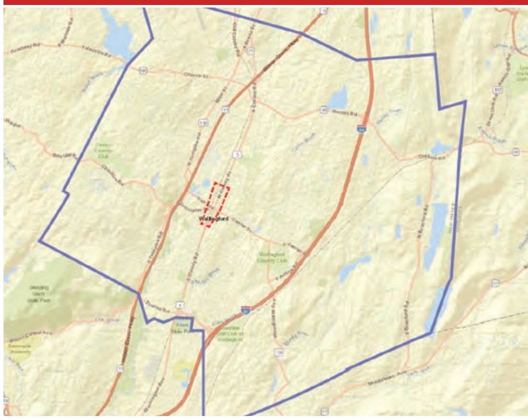
Wallingford Pedestrian Connectivity Improvements Study

North-South Colony Road (State Route 5)

April, 2020 | **Prepared For:** | **Prepared By:**



Town of Wallingford

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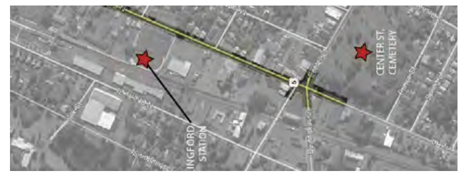

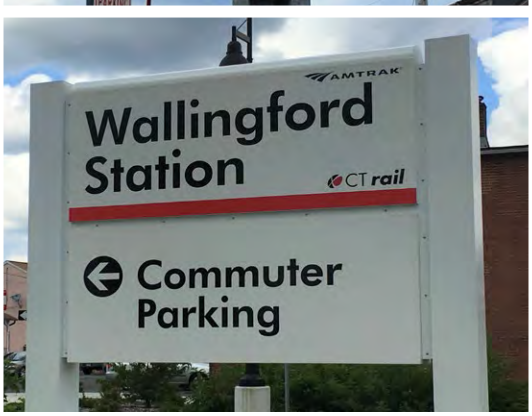

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1.0 Introduction

Wallingford Pedestrian Connectivity Improvements Study

The Town of Wallingford has engaged with BSC Group to provide engineering and planning documents for improvements to the pedestrian connectivity along portions of North and South Colony Street (State Route 5) in the vicinity of the new rail platform and the Town Center. This study has been funded by a grant award from the State of Connecticut Office of Policy and Management (OPM) with a match by the Town of Wallingford. The limits of this study are approximately 250 feet south of the Quinnipiac Street intersection to approximately 630 feet north of the Wallingford Train Station. The goal of this study is to identify pedestrian enhancements along the Colony Street corridor to provide a safer, and more comfortable experience to the public. With the development of the new railroad station, Wallingford sees this corridor as a vital link between the rail station and the downtown area. With proper planning, pedestrian circulation improvements can help spur economic growth in this region of town and energize the vitality of the area.

View of the project area

Previous reports have been prepared for this area and their results have been taken into consideration. The Town of Wallingford has completed streetscape projects in the areas along Center Street, Quinnipiac Street, and the western portion of Hall Avenue. These streetscape improvements were an important part of the recommendations in the Town's Transit-Oriented Development Plan adopted in 2016. It is the intention of this study to piggyback on these recent projects to provide the link from these areas to the new railroad station.

The existing pedestrian facilities include narrow sidewalks, long crosswalks, several wide curb cuts, excessive vehicular speeds, and limited pedestrian level lighting. These elements present safety concerns for the pedestrians between the station area and the Town Center. Addressing these concerns is essential to the Town's economic development and planning strategies for this area. This report identifies opportunities to improve the pedestrian experience in the area, as well as citing challenges to further improvements to the corridor. Each alternate that was investigated will be identified and the pros and cons discussed.

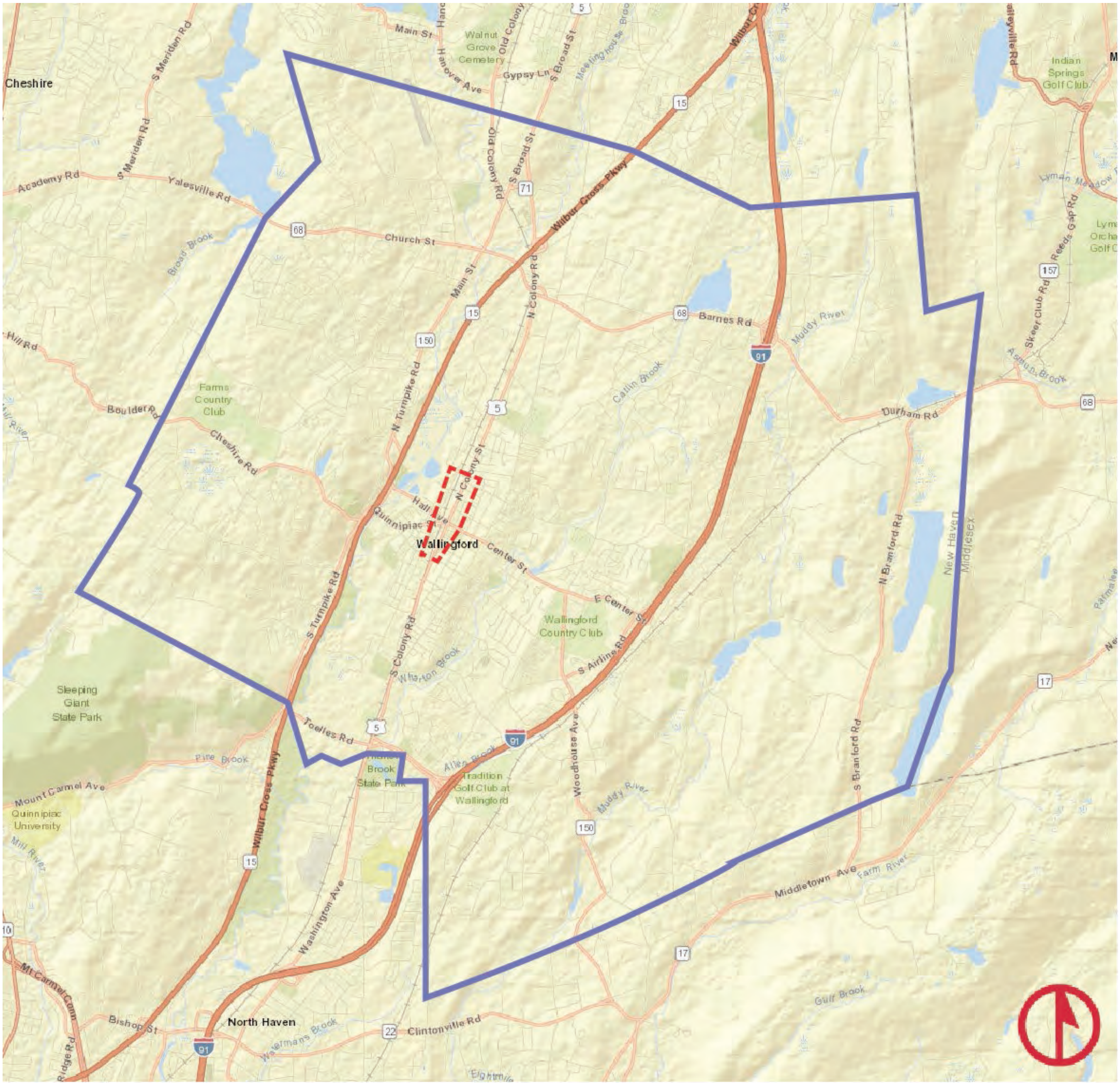


Figure 1: Corridor Location Plan Source: Wallingford GIS

One major initiative researched in this study is the cost and benefit of relocating overhead power utilities along North and South Colony Street. The existing poles that line the corridor would be removed with power and communication lines relocated underground, routed through sub-surface utility duct banks. Corresponding lines servicing commercial, residential and community destinations would also be constructed below the surface. The result will be a more appealing, open air downtown destination route designed to create a more aesthetic and inviting atmosphere for future development and multi-modal activity. This report will identify the anticipated costs for the relocation of the above ground utilities to a subsurface network and the potential benefits.

Figure 2: Project Limits

Source: Google Earth

2.0 Existing Conditions

In This Section

a. Overview of Corridor

2.0 Existing Conditions

Overview of Corridor

North and South Colony Street (State Route 5) is a two lane roadway classified as a Minor Arterial by CT DOT with an approximate annual average daily traffic (AADT) of 12,900 vehicle trips. The limits of this study are approximately 250 feet south of the Quinnipiac Street intersection to approximately 630 feet north of the Wallingford Train Station along North and South Colony Street. The roadway corridor currently exhibits inadequate pedestrian facilities including narrow sidewalks, long crosswalks, several wide curb cuts and limited pedestrian level lighting. The pedestrian issues are further exacerbated by the historically excessive vehicular speeds along the roadway. The combination of inadequate pedestrian facilities and the excessive vehicular speeds make the pedestrian experience less comfortable than desired.

There are approximately 45 properties along this corridor. These properties include a diverse blend of land uses such as mixed-use, residential, retail, restaurants, auto service and repair, religious activities, and medical offices. With such a mix of uses, this area of Town has wonderful opportunity for further growth creating a more active community. A few of the potential pedestrian generating properties include the new Wallingford Train Station, the Most Holy Trinity Church, and the Parker Place Apartments just to the north of the study area.

View of the project area

While on-street parking is currently allowed on both sides of Route 5, it is not fully utilized. The majority of the parcels also have individual driveways and off-street parking associated with their property. However, it is understood that on-street parking provides a convenience for many of the smaller retail establishments and residential properties.

The existing lighting on the street includes typical "cobra head" style street lighting for the roadway with spillover light illuminating the sidewalks. With many of the buildings close to the sidewalk and/or large parking lot areas immediately behind the existing sidewalk there is a limited number of trees along the study area. The majority of the trees are located at the northern end of the study area along the eastern side of Route 5 where the uses are mostly residential. Unfortunately, the root systems of many of these larger trees are lifting the sidewalk and creating tripping hazards.

The corridor is fully served by public utilities. Both electrical and communications are overhead located on poles just beyond the existing curb line. Subsurface utilities of water, sewer, gas, and drainage systems are all located within the roadway. Further discussion of these utilities is located in Section 4.0 of this report.

3.0 Pedestrian and Infrastructure Alternatives

In This Section

a. Option 1

b. Option 2

c. Parking Iventory and Analysis

3.0 Pedestrian and Infrastructure Alternatives

Introduction

During the discussions with Town staff, a vision of what this section of North Colony Street should look like was developed. Two clear alternatives came to the surface and were further developed. These alternatives were to enhance the pedestrian experience along the corridor while minimizing right-of-way impacts to the abutting properties. Both concepts would be greatly enhanced by the relocation of the overhead utilities to underground structures, but could be implemented without the utility relocation. Knowing that the relocation of the overhead utilities would be a costly and lengthy process, the goal of this study was to keep the streetscape improvements and the utility relocation process separate and distinct. The relocation of these utilities will be further discussed in Section 4 of this report.

View of the project area

Option 1 includes a more multimodal view of the corridor that would include dedicated bike lanes and a reduction of on-street parking. A parking study was completed within the area to help understand the needs of the current businesses and what available off-street parking is located within proximity of these businesses. The results of the study show there is significant off-street parking available within the area. However, agreements between the Town and the local owners may be required to allow more public use of these lots to make this an attractive option and help reduce on-street parking and add dedicated cycling facilities. The parking study is included at the end of this section of the report for further clarification. Option 2 is similar to Option 1 but eliminates the proposed bike lanes and returns much of the on-street parking back to the corridor.

Option 1
(Bike Lane Option)

This option includes pedestrian improvements throughout the study area as well as dedicated bike lanes along the roadway creating a multi-modal element to the corridor. In order to include dedicated bike lanes, some on-street parking was eliminated. To support the elimination of the on-street parking along the western side of the road, a parking study was completed to identify available off-street parking in close proximity to the study area.

Conceptual design Option 1 was prepared with the following goals:

- Enhance pedestrian comfort and safety and improve connectivity between rail station and Center Street
- Improve ADA compliance
- Provide bicycle facilities
- Manage on-street parking
- Enhance aesthetics
- Maintain traffic operations
- Manage property access

View of the project area

Pedestrian Safety, Comfort, and Connectivity

- Minimum 6 foot wide concrete sidewalks are recommended throughout project area
- Crosswalk distances have been minimized by providing perpendicular crossings, providing curb bumpouts, and through the use of a refuge island
- Improve street lighting via supplementation with pedestrian realm decorative lighting
- Expand width of pedestrian area where pedestrian space is deficient
- Provide crosswalk across North Colony Street at rail station

Bicycle Facilities

- Provide 5' wide bike lanes on both sides of North Colony Street
- Provide bike racks at strategic locations

On-Street Parking

- Remove parking from west side of North Colony Street
- Maintain 8' wide parking lane on east side of North Colony Street
- Protect parking lanes with curb bumpouts

Aesthetics

- Provide street trees where trees are absent and space allows.
- Space trees a minimum of 30' apart
- Provide 4' wide (measured curb to sidewalk) by 6' long (measured along curb and sidewalk) tree pits.
- Provide small trees (such as Syringa reticulata) below power lines.
- Provide decorative pedestrian area lighting to match existing decorative lighting on Center Street
- Space new lighting a minimum of 50' apart, locate one unit between existing utility poles with pole mounted lighting
- Provide brick buffer area (4' min. preferred width) between curb and sidewalk
- Provide landscaped curb bumpouts and refuge island

Traffic Operations

- Maintain traffic and queuing lanes
- Reduce traffic lanes from 12' feet to 11' feet wide
- Provide geometry that allows for unimpeded turns for SU vehicles
- Provide geometry that allows for WB-62 turn movements that require no more than encroachment into same direction traffic lanes (no encroachment upon oncoming traffic lanes)

Property Access

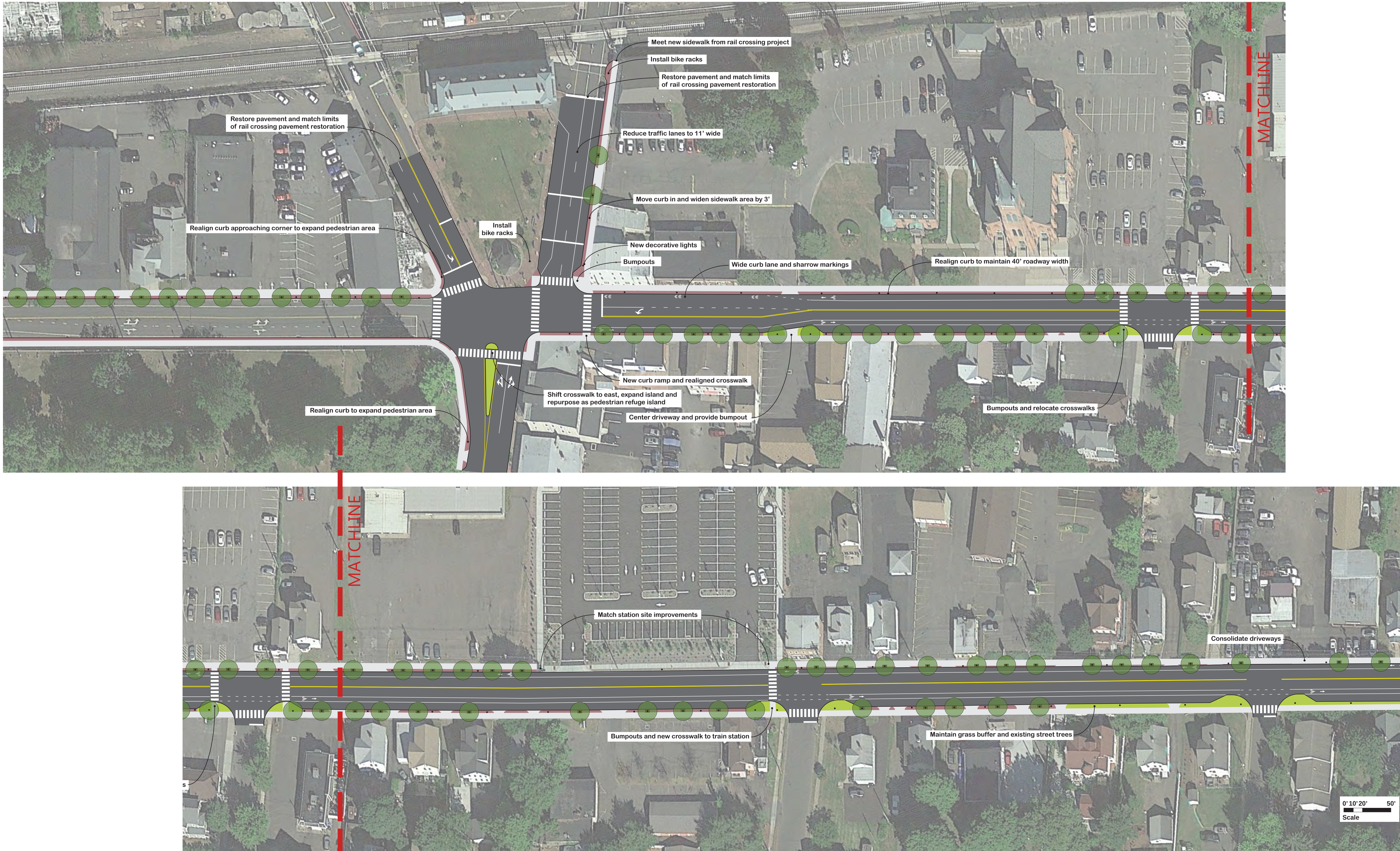
- Maintain access to all properties
- Consolidate multiple driveways where feasible
- Remove non-functioning driveway aprons
- Reduce driveway widths to the following:
- 10' wide for residential (width at sidewalk, excludes curb radius)
- 12-16' wide for low volume commercial or one-way commercial
- Maximum 24' wide for two-way high volume commercial or driveways with regular truck traffic
- Minimize grade change of sidewalk across driveways by accommodating grade change within buffer area between curb face and edge of sidewalk where feasible

Advantages of the Proposed Design

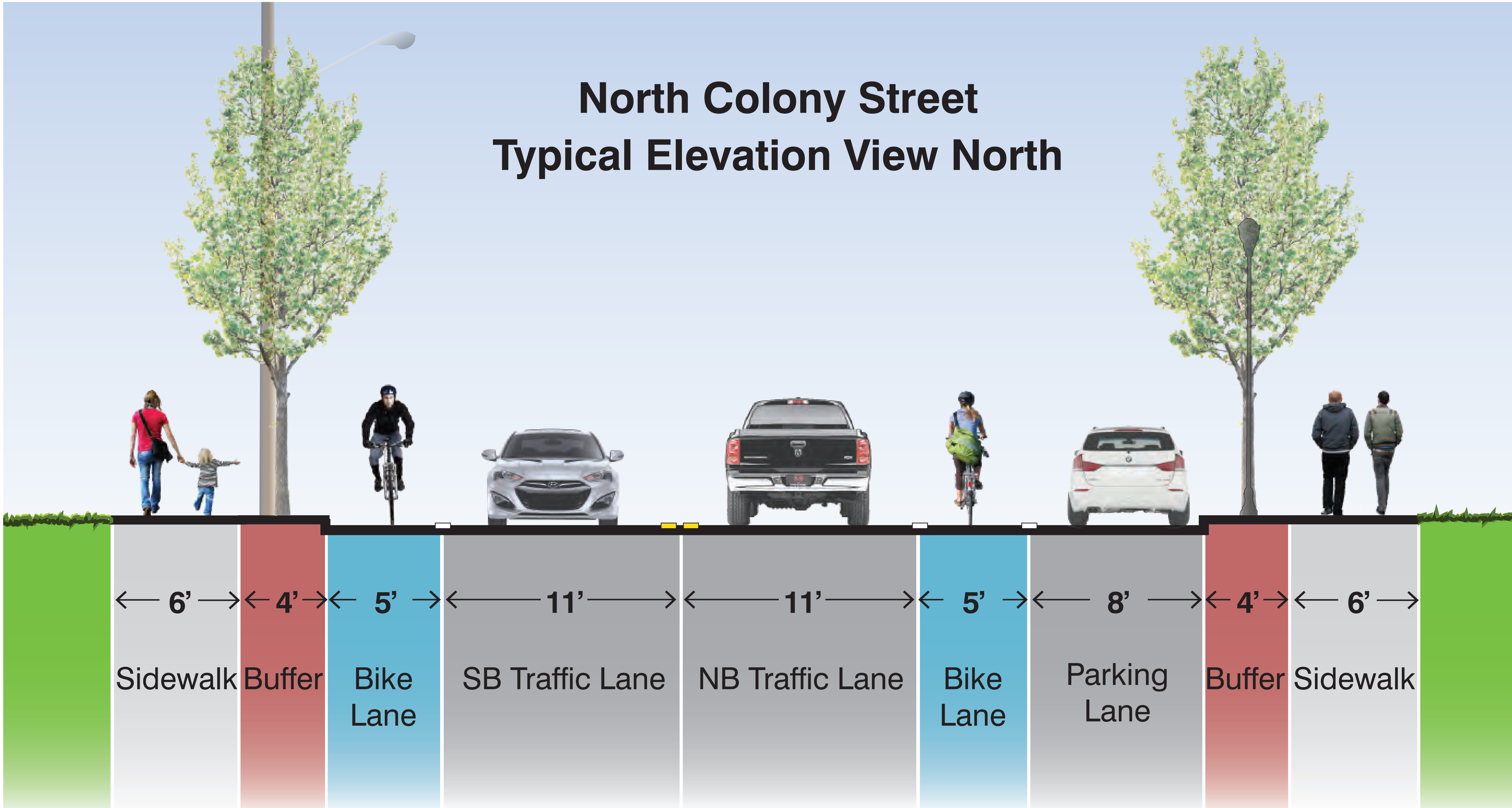
- Improves quality and safety of pedestrian environment.
- Accommodates multi-modal traffic including pedestrians, bicyclists, and electric scooters.
- Consistent with the Wallingford TOD Plan (2016)
- Consistent with the State Connectivity Grant awarded to Wallingford in 2017 as it supports transit-oriented development in the downtown

Disadvantages of the Proposed Design

- Reduces the amount of on-street parking within the project area (a parking study suggests that there is ample on and off street parking available in the project area to meet parking demand). On-street parking may be more desirable to the local merchants to place potential customers directly in front of their establishment.



Option 1: Conceptual Plan



Option 1: Section View

Option 2

(Two side On-Street Parking Option)

This option includes pedestrian improvements throughout the study area as well as maintaining on-street parking along the entire study area.

Conceptual design Option 2 was prepared with the following goals:

- Enhance pedestrian comfort and safety and improve connectivity between rail station and Center Street
- Improve ADA compliance
- Manage on-street parking
- Enhance aesthetics
- Maintain traffic operations
- Manage property access

Pedestrian Safety, Comfort, and Connectivity

- Minimum 6 foot wide concrete sidewalks are recommended throughout project area
- Crosswalk distances have been minimized by providing perpendicular crossings, providing curb bumpouts, and through the use of a refuge island
- Improve street lighting via supplementation with pedestrian realm decorative lighting
- Expand width of pedestrian area where pedestrian space is deficient
- Provide crosswalk across North Colony Street at rail station

View of the project area

Bicycle Facilities

- None – If this option is chosen, the Town should consider exploring opportunities for bike routes along secondary roads in the area

On-Street Parking

- Maintain 8' wide parking lane on east and west sides of North Colony Street
- Protect parking lanes with curb bumpouts

Aesthetics

- Provide street trees where trees are absent and space allows.
- Space trees a maximum of 30' apart
- Provide 4' wide (measured curb to sidewalk) by 6' long (measured along curb and sidewalk) tree pits.
- Provide small trees (such as Syringa reticulata) below power lines.
- Provide decorative pedestrian area lighting to match existing decorative lighting on Center Street
- Space new lighting a maximum of 50' apart, locate one unit between existing utility poles with pole mounted lighting
- Provide brick buffer area (4' min. preferred width) between curb and sidewalk
- Provide landscaped curb bumpouts and refuge island

Traffic Operations

- Maintain traffic and queuing lanes
- Reduce traffic lanes from 12 feet to 11 feet wide
- Provide geometry that allows for unimpeded turns for SU vehicles
- Provide geometry that allows for WB-62 turn movements that require no more than encroachment into same direction traffic lanes (no encroachment upon oncoming traffic lanes)

Property Access

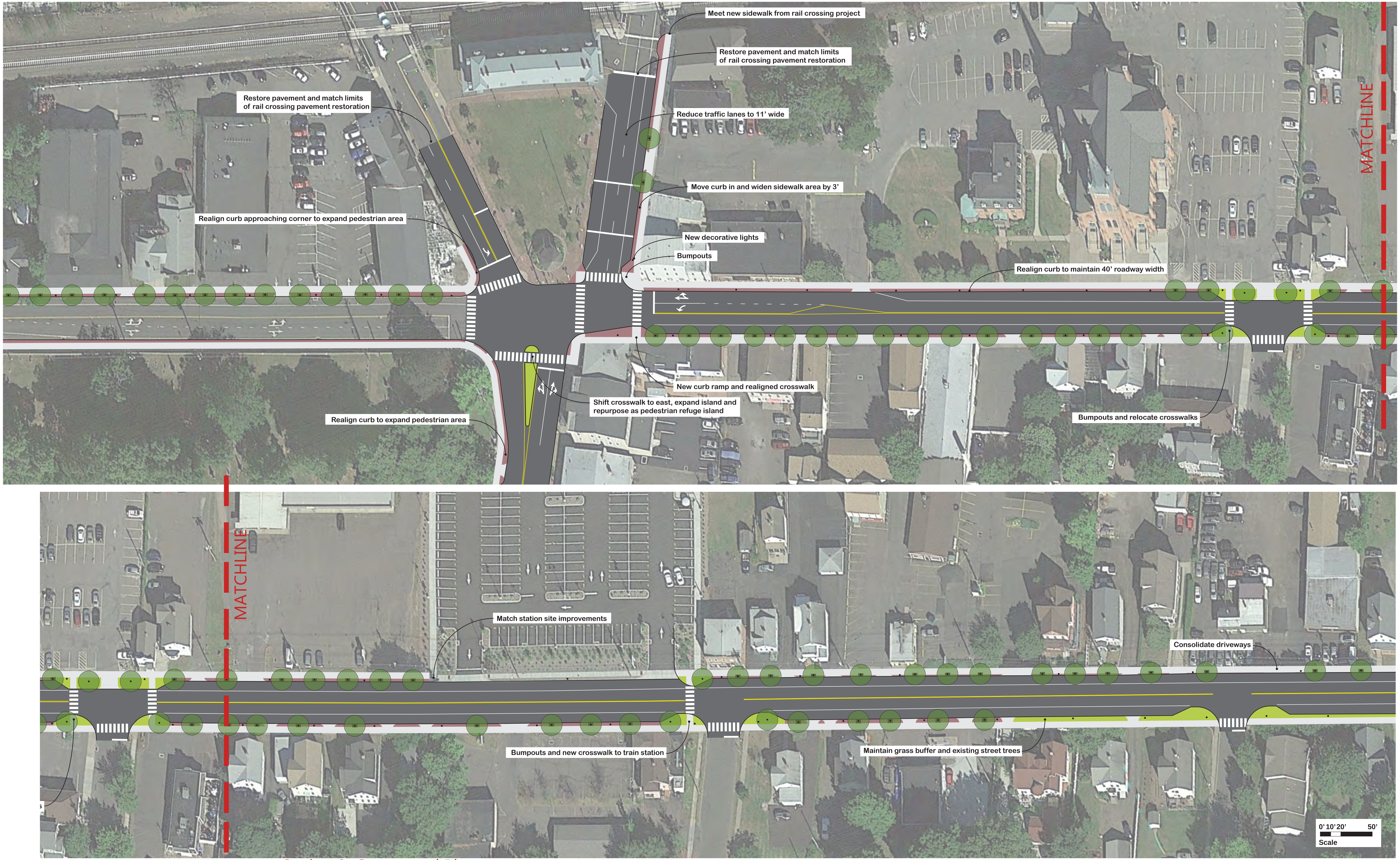
- Maintain access to all properties
- Consolidate multiple driveways where feasible
- Remove non-functioning driveway aprons
- Reduce driveway widths to the following:
    - 10' wide for residential (width at sidewalk, excludes curb radius)
    - 12-16' wide for low volume commercial or one-way commercial
    - Maximum 24' wide for two-way high volume commercial or driveways with regular truck traffic
- Minimize grade change of sidewalk across driveways by accommodating grade change within buffer area between curb face and edge of sidewalk where feasible

Advantages of the Proposed Design

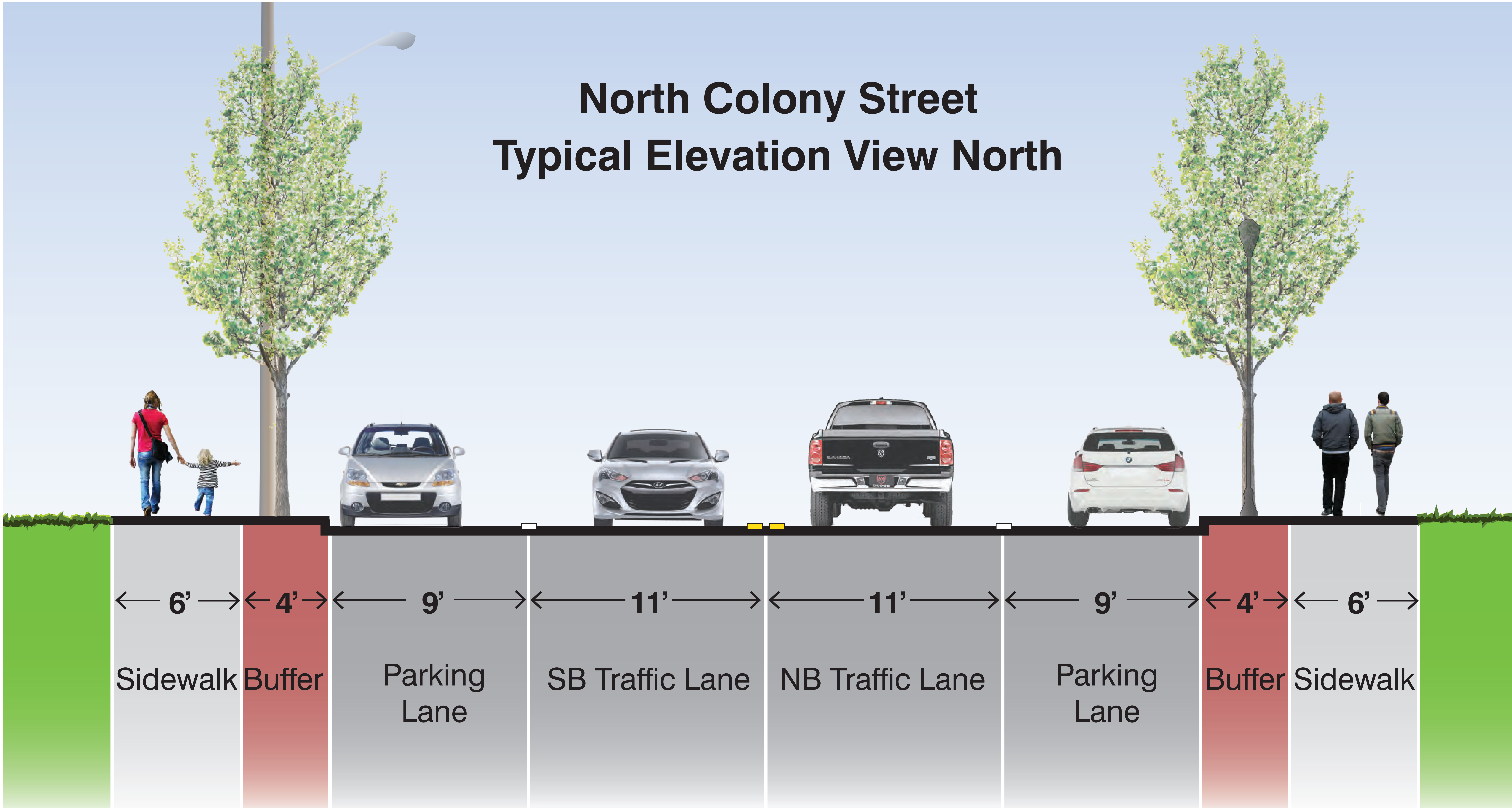
- Presents similar features as Option 1 with the exception of bike facilities.
- Maintains current inventory of on-street parking within the project area
- On-street parking lanes, if utilized, may have a traffic calming effect.

Disadvantages of the Proposed Design

- Does not accommodate bicyclists.
- Not consistent with multimodal goals of the Wallingford Transit Oriented Development Plan.



Option 2: Conceptual Plan



Option 2: Section View

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Wallingford Parking Inventory and Analysis

March 29, 2019, Revised February 19, 2020

Introduction

The purpose of this inventory analysis is to establish the existing demand for off-street parking located along the North Colony Street corridor. The parking focus area (shown below) includes parcels directly adjacent to North Colony Street, between Parker Street and Hall Avenue. This location is in close proximity to the train station on North Cherry Street, which was recently constructed as part of the Hartford Rail Line project.

The North Colony Street corridor is comprised of a diverse blend of land uses such as mixed-use residential, retail, restaurants, auto service and repair, and medical offices. Most parcels in the corridor include either private residential driveways with parking, private parking for individual businesses, and shared surface parking lots that serve the various businesses. On-street parking is allowed on both sides of Route 5, although it is rarely utilized.

Figure 1 – Parking Focus Area

Methodology

FHI used Wallingford's Assessors data via the GIS viewer and Google Earth to inventory land uses in the study area. All surface parking lots within the study area were inventoried and parking spaces for each lot and driveway were counted. On-street parking capacity, based upon permitted parking areas and linear feet of curbside space on North Colony Street was inventoried.

Findings

There are a total of 1,049 parking spaces in the study area. This number includes the Wallingford Station surface parking lot with 140 spaces and the parking lot for the Most Holy Trinity Church which has 175 parking spaces. There are approximately 65 on-street parking spaces on the east side and 75 on-street parking spaces on the west side of North Colony Road.

A parking calculator based upon the ITE Parking Generation Manual was utilized to determine the parking requirements for each use. Land use in the corridor includes the following:

- Auto Sales/Service
- Church
- Commercial/Industrial
- Gas Station
- Medical Office
- Office
- Personal Service
- Private Education
- Residential
- Restaurant
- Retail
- Retail Food
- Self-Storage

Gross floor areas were calculated for each use. This unit of measure was used to establish parking demand. **The peak parking demand hour was determined to be on weekends between 9 am and 1 pm**. This is driven primarily by demand created by Most Holy Trinity Church which has a peak demand of 245 spaces. The church site has parking capacity of 175 spaces resulting in off-site demand of 70 spaces, presumably met by adjacent private lots and on-street. The total peak parking demand for the study corridor is estimated to be 801 parking spaces.

Given an inventory of 1,049 spaces, there is a potential surplus of parking when considering on-street, off-street public parking, and private parking. Given the surplus of parking supply and the low observed usage of on-street parking on North Colony Street, FHI has determined that the removal of on-street parking from one side of North Colony Street is feasible without adversely impacting business operations in the area.

Figure 2- Parking Demand

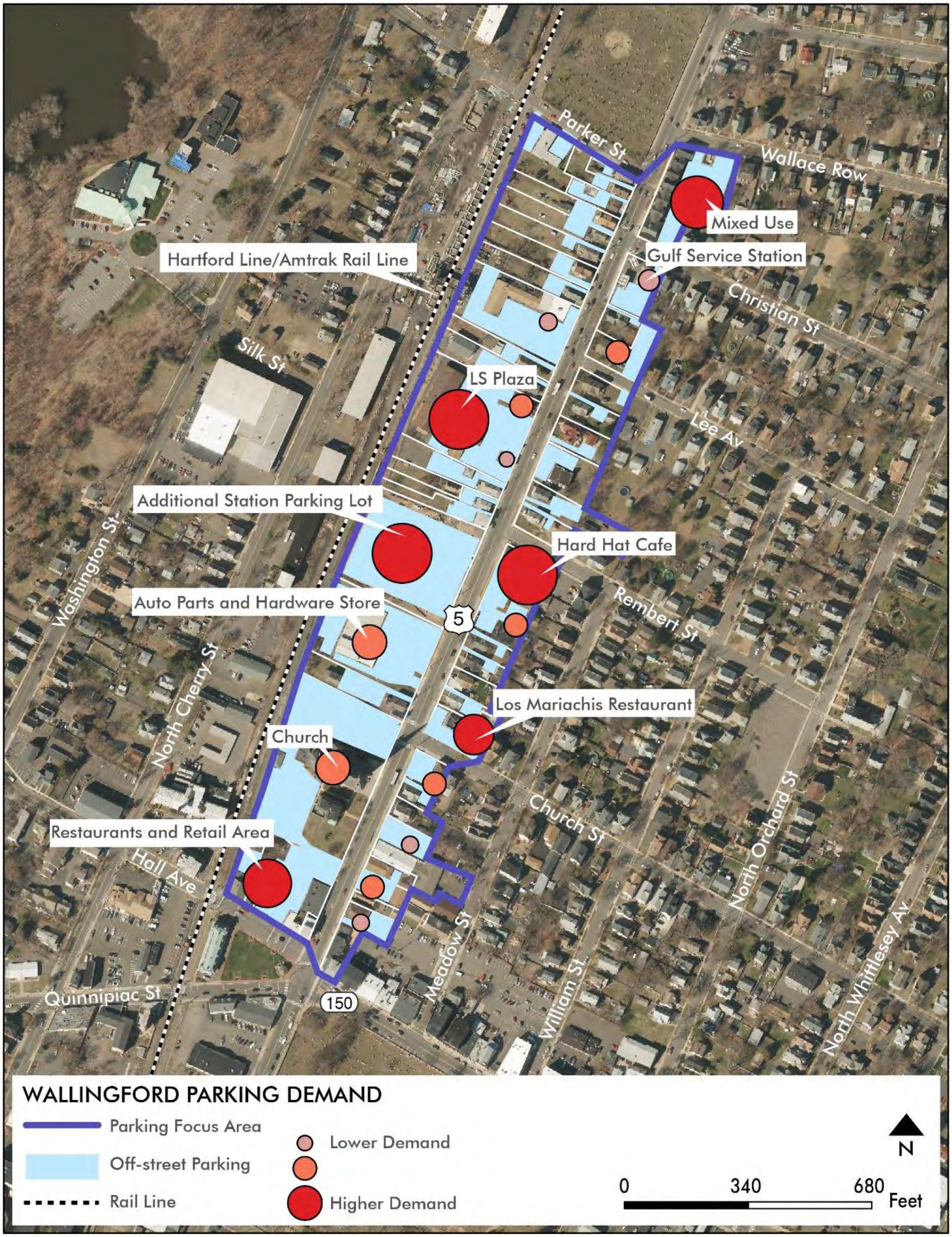
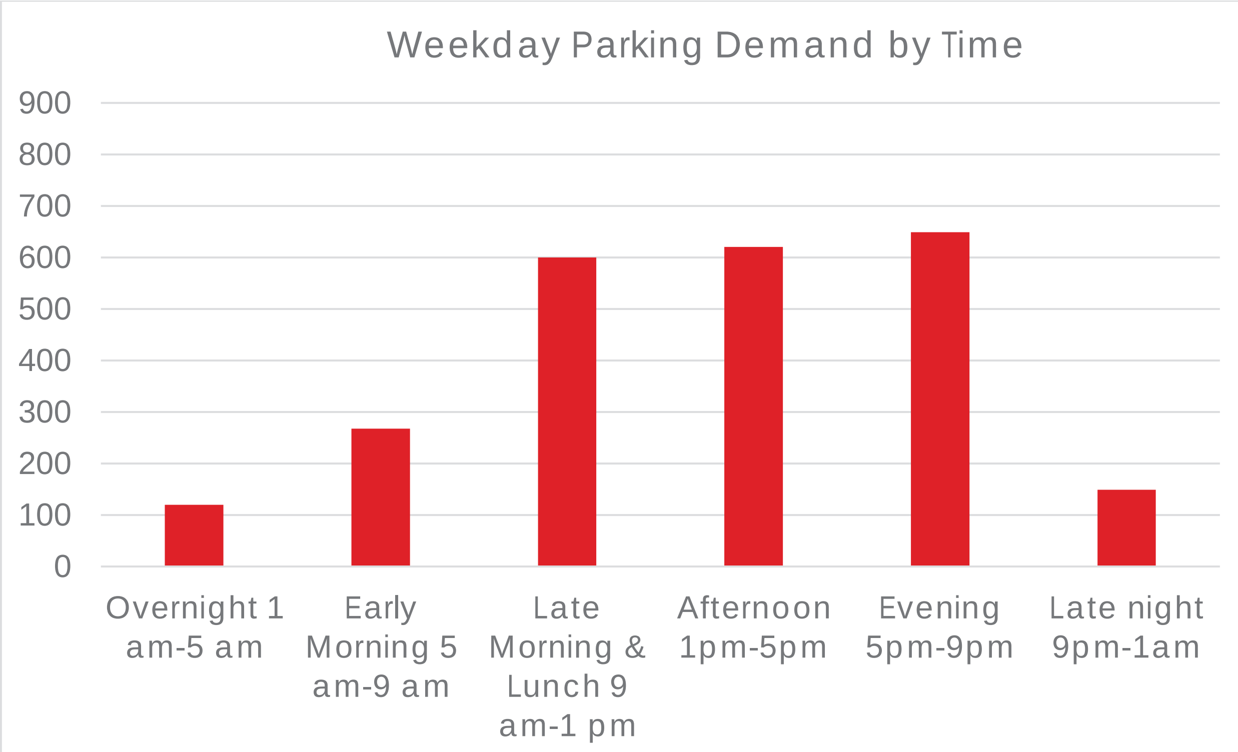
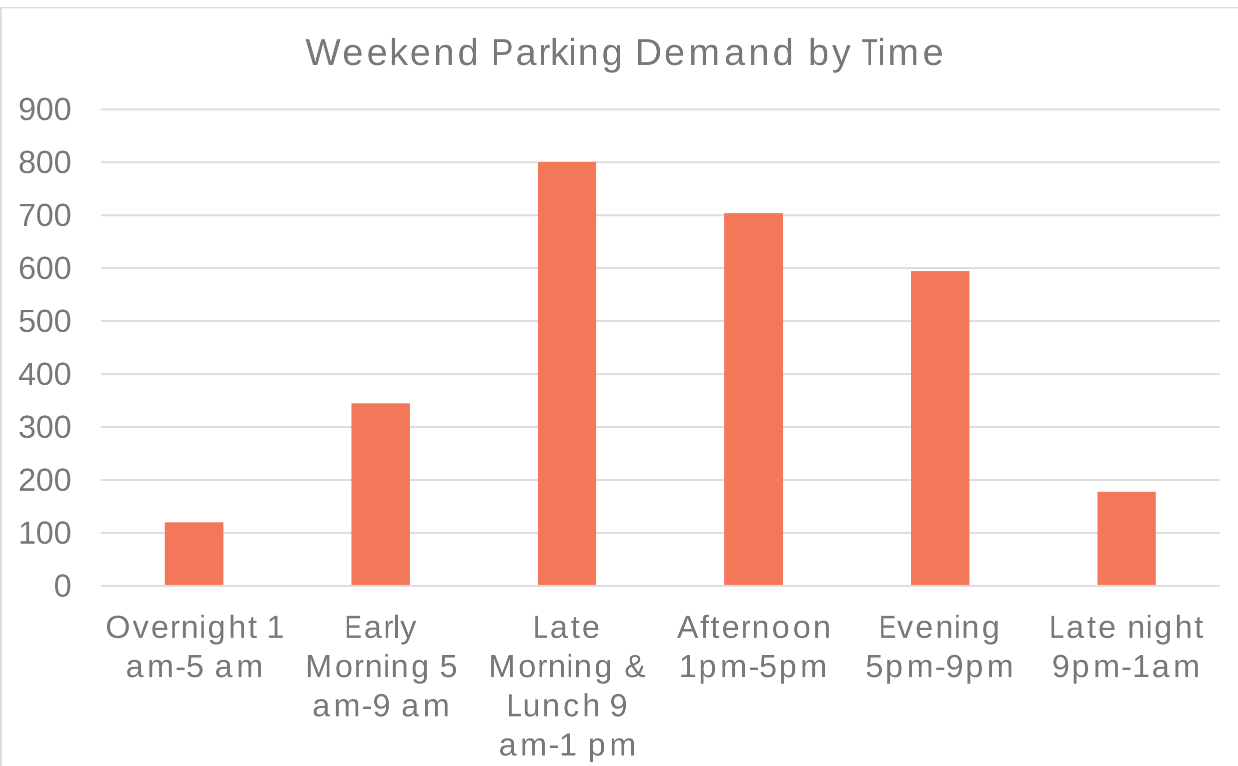


Figure 3- Parking Demand by Weekday vs Weekend





4.0 Utilities: Relocation

In This Section

a. Overview

b. Existing Utilities Plan

4.0 Utilities: Relocation

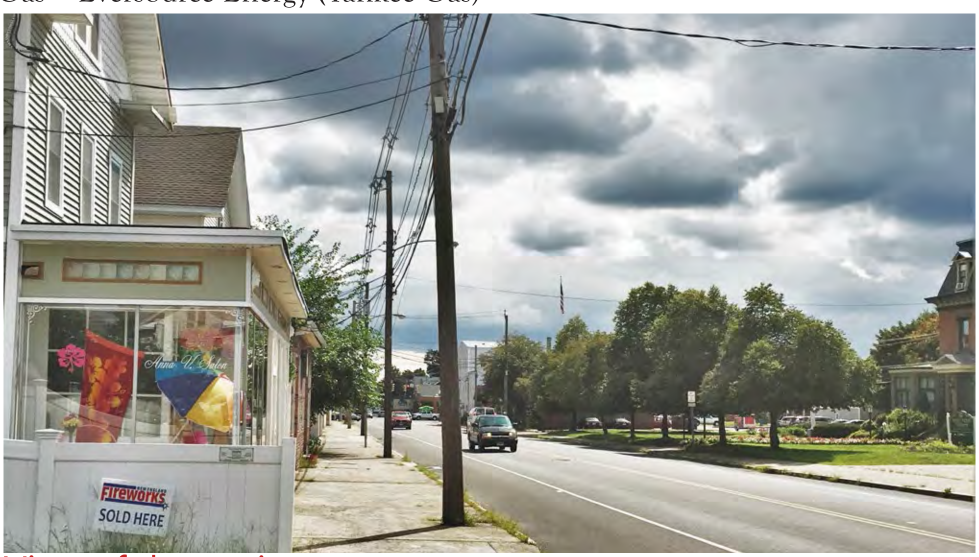
Overview

The study corridor is served by an overhead power and communication network serving the properties on both sides of North Colony Street. To provide a more aesthetic and potentially more reliable system, it may be desirable to relocate these systems to a subsurface duct bank network. However, the relocation of these systems will require a significant upfront capital cost. While the benefits of relocating the above ground utilities is clear, the success of the pedestrian connectivity project does not require the relocation of these utilities. This section will focus on the pros and cons of relocation the above ground utilities, while considering that State Route 5 has a full network of utilities within its right-of-way.

Existing Conditions

North and South Colony Street has both overhead utilities and underground utilities within its corridor. Within the study limits, there are over 40 customers utilizing their services. The utilities that are within the corridor are:

- Electric – Wallingford Dept. of Public Utilities – Electric Division
- Communications – Frontier Communications
- Cable TV – Comcast
- Water – Wallingford Dept. of Public Utilities – Water & Sewer Division
- Wastewater – Wallingford Dept. of Public Utilities – Water & Sewer Division
- Gas – Eversource Energy (Yankee Gas)



View of the project area

The overhead utilities are carried on utility poles that have a mix of ownership between Frontier and Wallingford Electric. The poles alternate sides within the corridor; along South Colony Street the poles are located on the east side of the roadway up to the intersection with Quinnipiac Street. Within the intersections of Quinnipiac Street and Hall Avenue, the communication services are brought underground through the intersection and back up onto overhead poles on the north side of the intersection. From the intersection with Hall Avenue, the communications are on the west side of North Colony Street while the electrical services remain on the east side. The utilities then converge on the east side of the street in front of Rosa's Deli and switch back again to the west side in front of Napa Auto Parts. The overhead utilities stay on the west side for the remainder of the study area. The 3-phase primary distribution voltage in Wallingford is 13,800 volts. Within the corridor there are 10 pole mounted transformers.

The underground utilities include water, sewer, and gas services along with the roadway drainage system. Throughout most of the corridor there are two water services. Based on available utility mapping, one is a 6" service while the other is a 10" that changes to a 12" service. The sewer system in the area starts as a 12" VCP pipe at the northern limits of the study and increases in size to a 20" VCP pipe prior to turning down Quinnipiac Street in a 24" VCP pipe. This system appears to be an older system, but much of it has been recently lined. The gas service within the corridor is a 6" steel pipe service.

The utility providers were contacted to determine if they have any plans in the near future to upgrade their systems/equipment in the area. Each utility responded that they do not have any plans, nor anticipate any plans to upgrade their systems within the next 5 years.

Proposed Improvements

The proposed improvements to the utilities surrounding the pedestrian connectivity improvements along North Colony Street revolve around the relocation of the overhead utilities and place them within an underground system. While the relocation of the overhead utilities and the elimination of the utility poles would significantly improve the "walkability" and aesthetics of the corridor, it would be a very costly undertaking.

The removal of the overhead utility poles would greatly open up the corridor for pedestrian movements by providing better ADA access and allowing groups of people to walk side-by-side along the street. The right-of-way along this stretch of North Colony Street is very close to the back of the existing walks, leaving very little room to expand the walk system. Even without relocating the entire overhead system below ground, several poles will require relocation to increase the sidewalk widths. Many of the buildings are placed directly behind the walk. This urban feel is often desired by retailers, but leaves little flexibility to enhance the sidewalks and include site amenities such as bike racks and benches. Removal of the overhead utilities will assist with opening up the visual aspects of the corridor by removing the canopy of wires and cables and allow for additional plantings.

Underground utility installations can increase public safety by providing less chance for vehicle contact with utility poles, improve the aesthetics of neighborhoods, and may increase the assessment value of the nearby properties. It is estimated that the assessment value will increase by 2.5%. (based on Maryland Dept of Transportation Research Report "Cost Benefits for Overhead/Underground Utilities" October 2003) Research indicated that properties in areas where underground utilities are in place are more desirable than properties located in areas with overhead utilities installations.

The benefits include:

- New equipment extends service life by 20 years
- Increased reliability /decreased risk of outages due to weather and pole damage
- Pole removal reduces obstacles and creates a safer roadway
- Increased sidewalk space for amenities such as lighting and trees
- Increased sidewalk width to promote pedestrian access to downtown
- Creates potential for a "complete streets" appearance
- Increased property values
- Underground utilities do not require regular tree trimming/bush clearing.

The constraints include:

- Greater initial cost
- Increase in duration of outages as location of fault is more difficult to locate
- Increased construction time and associated traffic delays
- Increased costs to customers to change from overhead to underground electric service (this may require additional work inside to bring services up to current code requirements)
- Securing easements and right of way for service lines, manholes, transformer pads

Maintenance Cost

Initial and Modification Costs

The following initial costs must be provided for installation:

- Structures (poles/foundations or ducts/vaults)
- Conductors -or cables with associated hardware
- Site work
- Construction work
- Engineering
- Sales Tax
- Administration and project management

Life Cycle Costs

Life cycle costs are the total costs of ownership of an asset or facility from its inception to the end of its useful life. These costs include design, engineering, construction, operation, maintenance, and repair of the asset. Life-cycle costs provide the information to compare project alternatives from the perspective of the least cost of ownership over the life of the project or asset. These costs are projected over a 40-year life, and the net present value is calculated to convert these costs (that are incurred on various years) to a single equivalent cost at the beginning of that time.

Life-cycle cost calculations use the "time value of money" concept to evaluate alternatives on a common basis. Cost computations bring all anticipated expenses of a project or asset over its entire useful life to a present-day value, that is then used for comparison with other alternatives. The electrical distribution circuit life-cycle costs are a function of many factors and can vary greatly from one project to another. Life-cycle costs are influenced by the line design required to meet the specific need, the geographic area through which the line is to be built, the regulatory and permitting requirements of the jurisdiction(s) involved, and many other factors. Because each distribution line project is unique, the life-cycle costs for each project are specific to that application, and caution should be exercised in any attempt to compare life-cycle costs across different projects in different time periods. This report will discuss in detail the major elements of costs included in life-cycle costs, the factors influencing those costs, and the overall impact of the cost factors on a life-cycle analysis.

In the case of life-cycle cost analysis for the distribution lines, the operating utilities have a common view of what cost elements should be included and how they should be considered. There is general agreement that the life-cycle cost comparisons should be used to compare two assets that have a roughly equivalent useful life. Analysis of the distribution circuit costs shows that operations and maintenance costs incurred beyond year 25 have very little bearing on the value of a project and therefore, become insignificant in terms of materially changing the overall life-cycle cost evaluation. For example, if there are no anticipated major investments for a rebuild or upgrade beyond year 25, whether the estimated life of a distribution line alternative is 35 years or 40 years becomes less significant. The critical factor is that alternatives be compared over an equivalent lifetime.

The following items are the major components of the life-cycle cost of an electric distribution line:

- Costs of scheduled inspection and servicing of equipment/components
- General repairs
- Emergency repairs and all other activities required to keep a line in proper operating condition.

PEDESTRIAN CONNECTIVITY

NORTH COLONY STREET

IN

WALLINGFORD CONNECTICUT

EXISTING UTILITY PLAN

PREPARED FOR:

TOWN OF WALLINGFORD
45 SOUTH MAIN STREET
WALLINGFORD, CT 06492

BSC GROUP
300 Winding Brook Drive
Glastonbury, Connecticut 06033
860 652 8227

Job No.: 83726.00 Date: 08–27–2019
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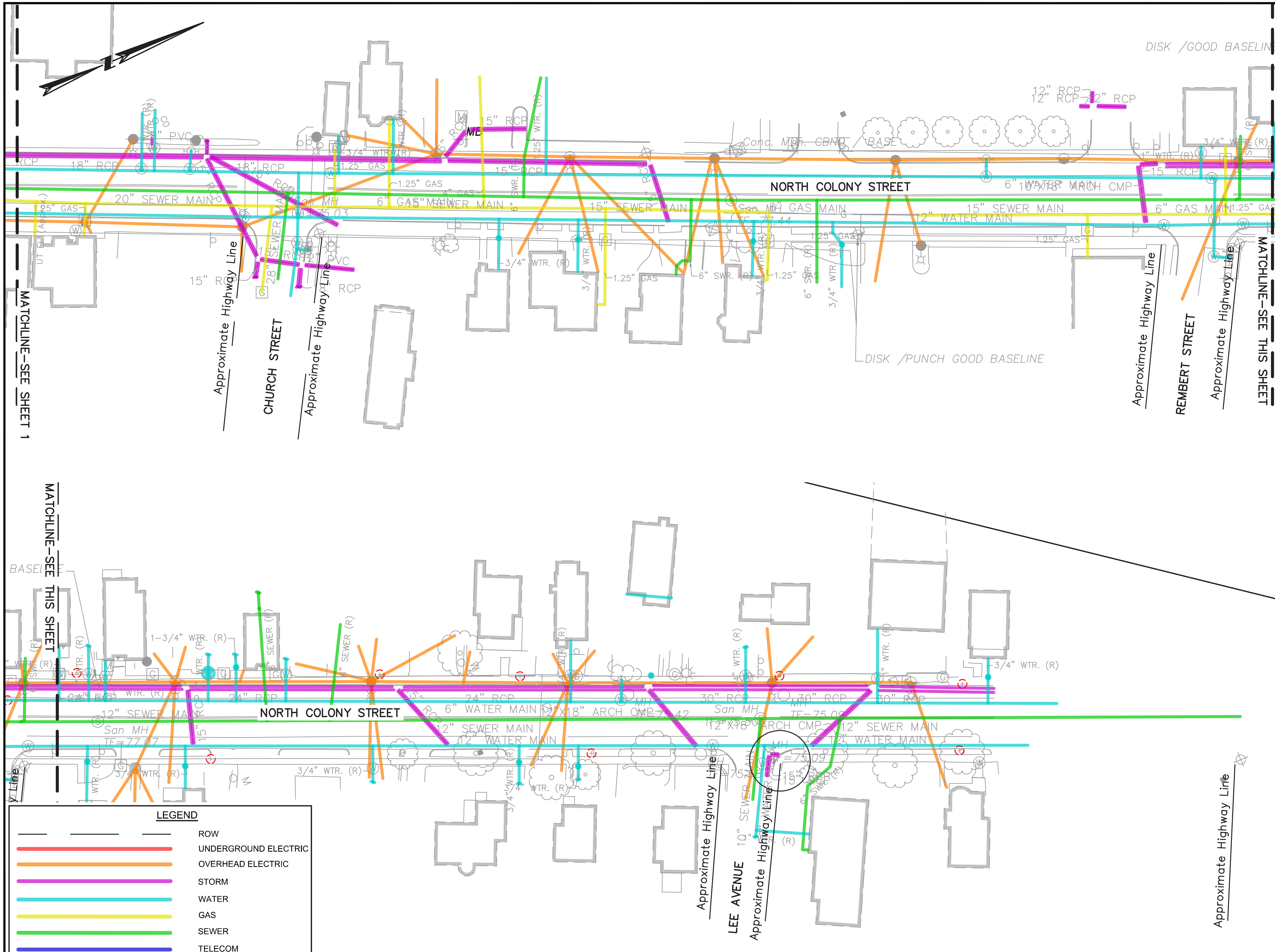

PEDESTRIAN CONNECTIVITY

NORTH COLONY STREET

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Job No.: 83726.00 Date: 08–27–2019
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Distribution Line Maintenance Costs

Proper line maintenance is required to achieve optimum levels of service reliability. A highly reliable distribution line begins with sound design, including mechanical, dielectric, and thermal aspects; good construction practices such as field inspection/repair to minimize installation problems; and high-quality materials, including conductors, structures, hardware, and splices. Once constructed and put into service, a distribution line reliability and performance is then dependent upon good maintenance practices, with appropriate time intervals and techniques.

Distribution line maintenance tasks are specifically designed to reduce the probability of occurrence of the most common types of outages. Common maintenance tasks are focused on periodic inspection of the structural and electrical components of a line.

Routine maintenance activities include:

- Climbing inspections, performed at intervals based on age, deterioration, reliability history
- Wood pole inspection, testing and treating, typically performed on a frequency interval based reliability indicators, such as failure rates, level of deterioration experience encountered, line criticality, and cost considerations
- Wood pole replacement, typically performed after inspection I treatment activities; program typically starts with replacing those on critical lines with higher outages or older poles
- Inspection to identify hot spots on splices and connectors
- Steel pole repainting

Even though some distribution lines are located underground, a considerable amount of routine maintenance still must be performed to ensure that the underground system performs reliably. Depending upon the type of underground system involved, maintenance can include the inspection and other required actions within underground vaults, transformers, or switch gear stations as well as along the route of an underground line. Typical activities may include work associated with conduits, work associated with conductors and devices, retraining and reconnecting cables in manholes, including transfer of cables from one duct to another, and repairing conductors, splices, grounds, and electrolysis prevention devices for cables.

Maintenance of underground manholes and vaults includes cleaning ducts, manholes, and sewer connections, minor alterations of handholes, manholes, or vaults, refastening/repairing/moving racks, ladders, or hangers in manholes or vaults, repairing sewers and drains, walls and floors, rings and covers, re-fireproofing cables and repairing supports, and repairing/moving boxes and potheads. Sheath-bonding equipment in splice vaults and cable-temperature monitoring systems also need to be maintained.

Because of the nature of underground systems and their design, safety restrictions can be an issue with maintenance activities. Space within vaults and manholes is limited, and depending upon the type of equipment being inspected or maintained, special protective measures for personnel may be required. These all add to the time and expense for the maintenance activity, whatever it may be.

Conclusion

This report aids the utilities, public officials, and the public in comparing the estimated costs of different electric distribution configurations. The life-cycle costs of electric distribution lines include costs that are included to permit and build a line, operate the line with resulting electrical energy loses, and maintain the line over its useful life. These costs are projected over a 40-year life, and the net present value is calculated to convert these costs (that are incurred on various years) to a single equivalent cost at the beginning of that time period.

Maintenance is a factor since each type of installation requires different levels of maintenance and costs. Other maintenance activities for overhead lines include climbing inspections, foot patrols, and infrared inspections to identify hot spots on splices and conductors. Underground lines also require maintenance inspections, cleaning of ducts, manholes, etc., and moving or repairing boxes and potheads. Predicting the future maintenance costs has proven to be challenging for underground lines.

Benefits

- New equipment extends service life
- Increased reliability /decreased risk of outages due to weather and pole damage
- Pole removal reduces obstacles and creates a safer roadway
- Increased sidewalk space for amenities such as lighting and trees
- Increased sidewalk width to promote pedestrian access to downtown
- Creates a more aesthetically pleasing “complete streets” appearance
- Increase in property values
- Upgraded communications service to local stakeholders

Constraints

- Cost
- Reduced access to equipment for maintenance and repairs
- Increased traffic delays during construction
- Easements and right of way for service lines, manholes, switchgears, and transformers
- Customer resistance
- Utility conflicts
- Potential handling of existing contaminated soils during construction

4.1 Utilities: Cost/Benefit Analysis

In This Section

a. Summary

b. Tables

4.1 Utilities: Cost/Benefit Analysis

Summary

The feasibility study is intended to provide a structured approach to analyze the viability of relocating overhead utilities to underground facilities in the project area. The feasibility study was conducted in a “matrix format”, whereas the needs and parameters were established, then measured/scored in a relative manner. The process was completed with data provided by the Wallingford Public Utilities (The Wallingford Electric Division), Frontier Communications, and Comcast. As discussed in 4.0, these utilities maintain pole-mounted infrastructure within the project area. The feasibility study is an item-by item comparison of defined critical parameters which allows the work to be quantified.

The critical parameters utilized in the feasibility study include:

- Initial cost of new construction, modification, etc.
- Real estate and right-of-way considerations.
- Life-cycle cost of the existing and proposed facility.
- Maintenance costs.

In order to provide a comparison between underground utility relocation and the above ground facility, a cost benefit analysis was performed in order to develop this comparison and to apply cost factors to these critical parameters.

Utility relocation along the North Colony Street corridor within the study limits is achievable. The overhead power lines and associated telecommunications service lines can be moved to an underground facility beneath the sidewalks on either the east or west sides of North Colony Street. The preferred utility corridor would be beneath the sidewalk on the west side of the road, running parallel to the roadway, where there is generally more width between the curb and commercial store frontages, less conflicts with other subsurface utilities, and less maintenance and protection of traffic required during construction. The electrical distribution power lines could run within a 4-duct conduit box either flat or stacked, with telecommunications line running alongside the duct within separate conduits. Service lines to abutting properties would be run underground to each. Minor property takes would likely be requires providing space for three (3) new, above ground concrete pads for transformers and switch gears located along the corridor, also on the west side of the road.

Another factor to be considered is the added real estate value attributed to reliability of the system and the perceived value of much improved future aesthetics. A two and a half percent (2.5%) value was used for this study. When applied to the current value of the properties within the study limits, this amounts to a $255,000 benefit in the case of underground relocation.

It should be noted that the existing power and telecommunications facilities are currently 20 years old. For purposes of this study, a 40-year life cycle of facilities is used so underground relocation would add 20 years to the current facilities life cycle. This value was calculated to be a benefit of approximately $525,000.

The differences in maintenance costs are negligible when comparing overhead to underground systems. Routine repair and inspection is far more efficient in the overhead system, but outages and repairs due to weather and collisions are more frequent for the overhead facility within the life cycle.

The following table simplifies the comparison of the critical parameters:

TABLE
COST-BENEFIT ANALYSIS
OVERHEAD to UNDERGROUND UTILITY RELOCATION AND ROADAY RECONSTRUCTION WITH AMENITIES

Costs

Category	Cost
Real Estate and Easements *	$50,000
Subsurface Infrastructure - Electric	$2,146,800
Subsurface Infrastructure - Communications	$1,166,100
Surficial Improvements	$997,100
Pole Removals	$132,000
TOTAL	**$4,492,000**

Category	Benefit Value	Cost
Increased Reliability - Electric	avoids periodic weather outages	$0
Increased Reliability - Telecommunications	avoids periodic weather outages	$0
Decreased Maintenance Costs - Electric	new upgraded equipment due in 2040	$0
Decreased Maintenance Costs - Telecommunicaitons	new upgraded equipment due in 2040	$0
Increased Property Value	estimated to be 2.5% increase over the lifecyle (40 year) span	$254,975
Aesthetic Improvements - Perceived Value		
Enhanced Development Potential		
Lifecycle equipment Replacement Savings- Electrical Systems	20 year replacement cycle extended for new upgraded equipment est 33% of underground cost 50% depreciatd	$354,222
Lifecycle equipment Replacement Savings- Communication Systems	20 year replacement cycle extended for new upgraded equipment est 33% of underground cost 50% depreciatd	$192,407
TOTAL		**$801,604**

These Items are further detailed in the appendices

* Estimated $10,000 per anticipated easement for surface equipment. Actual costs will depend on the negotiations with the property owner.

Utility Contacts

The following sources were used in providing data for developing costs and assumptions for developing benefits:

- Wallingford Department of Public Utilities/Electrical Division
- 100 John Street, Wallingford, CT
- Ed Rizzo, Chief Engineer
- (203) 294 2271
-
- Wallingford Department of Public Utilities/Water Division
- 100 John Street, Wallingford, CT
- Tom Flannery
- (203) 949 2660
-
- Frontier Communications
- N Colony Road, Meriden CT
- Marino Limauro
- State Roads Telecommunications Engineering
- mal414@ftr.com
- (203) 771-3111
-
- Rafal Piotrowicz
- Telecommunications Specialist, Service Connection
- Outside Network Engineering
- rfp247@ftr.com
-
- Yankee Gas Corp./Eversource Energy
- 107 Selden Street
  Berlin, CT 06037
-
- Comcast Cable TV of Connecticut
- Jim Bitzas
- Regional Construction Director
- 1110 East Mountain Road
- Westfield MA 01085
- (413) 642 8582

5.0 Summary of Options

In This Section

a. Conclusions

b. Renderings

5.0 Summary of Options

The Town of Wallingford has initiated this study with the goal to identify pedestrian enhancements along the Colony Street corridor to provide a safer, and more comfortable experience to the public. With the development of the new railroad station, Wallingford sees this corridor as a vital link between the rail station and the downtown area. During the study process, several factors were looked at to accomplish this goal.

- Improving Sidewalk conditions (width, ADA ramps, heaving)
- Limiting Right-of-Way Impacts
- Reducing Sidewalk Obstructions (utility poles, obtrusive vegetation, encroachments)
- Reducing/eliminating curb cuts
- Reducing crosswalk lengths
- Traffic calming strategies (bump-outs, reduction of lane widths)

The project area was studied as two separate projects that could be accomplished on their own, or together. The streetscape pedestrian connectivity improvements were looked at to improve the "walkability" of the corridor without significant utility relocations. The second view of the corridor was to analyze the feasibility and costs associated with relocating all the overhead utilities into a subsurface duct bank system.

For the pedestrian connectivity improvements, both options are a viable way to improve pedestrian movements in the area. Option 2 will provide all the pedestrian improvements of Option 1, but maintains most of the on-street parking that currently exists. Based on initial conversations, on-street parking is a significant benefit to the residents and businesses along the corridor. Option 1 removes a significant amount of the on-street parking to accommodate dedicated bike lanes along the roadway. Dedicated bike lanes may be preferred depending on the type and density of future development around the train station. The estimated construction costs for both Option 1 and Option 2 are approximately $4,400,000.

It is universally accepted that relocating the overhead utilities has aesthetic benefits for the corridor by creating less obstacles, and a more open view of the area. However, relocating these utilities would be very costly. These costs include manholes, duct banks, switchgears, transformers, right-of-way acquisitions, house re-connections, and a certain amount of other utility relocations. A preliminary estimate for this work is $4.500,000.

However, there are some benefits to moving the utilities below ground such as longer lifespan for the equipment, less environmental damage (trees, wind, snow and ice, etc.), less damage from vehicle accidents, improved sidewalk accessibility, and higher property values. A cost/benefit analysis was prepared with a look at a 40-year cycle. As mentioned above, the initial costs for the relocation of the overhead utilities is approximately $4,500,000. Projected value (benefit) of the relocation would come in added property values and life-cycle replacement costs at an approximately total of $800,000 in today's dollars.

With these improvements, both with and without the relocation of the overhead utilities, this corridor can be significantly improved to enhance the pedestrian experience and promote more foot traffic in the area.

Existing Condition

Option 1: Conceptual Rendering

Existing Condition

Option 1: Conceptual Rendering

Existing Condition

Option 2: Conceptual Rendering

Existing Condition

Option 2: Conceptual Rendering

6.0 Public Involvement

In This Section

a. Public Response

b. Conclusion

6.0 Public Involvement

The Town of Wallingford held a public information meeting on February 27, 2020 to outline the improvements of the two options and generate public feedback. This meeting was held in Town Hall and open to all residents and attended by town staff. The design team initially discussed the main goals of the study, and explained the important features of the two options as well as the implications and benefits of relocating the above ground pole mounted utilities into a subsurface conduit system. After the initial presentation, the public was offered the opportunity to express their opinions of the presented materials, and present additional ideas and concerns they may have. The following represents a list of items that were discussed during the meeting.

View of the presentation to the public

The discussion during the public comment phase generated some good ideas and valid concerns. The group did not have an overwhelming majority supporting one Option over the other. The conversation appeared to be in support of a bike lane, however there were mixed opinions on whether North Colony Street is the appropriate location due to its high traffic volumes and busy intersections. There was significant support to move the bike lane to lower volume roads which run parallel to North Colony Street.

Lively public discussion

Public comments

Public Comments from Meeting — February 27, 2020

	Comment	Response
1	Consider bike lanes in both directions on same side of road.	Noted. Additional challenges occur at intersections.
2	Consider bike lanes on Quinnipiac Street to promote people traveling from Quinnipiac Trail to the center of town.	This project has the potential to initiate further pedestrian connectivity projects such as continuing along Quinnipiac Street.
3	Is 11’ width lane appropriate with the amount of tractor trailer traffic?	11’ lane width is a ConnDOT recommended width for this classification of roadway.
4	Is there enough space on the side of the road for a 4’ buffer and 6’ sidewalk without intruding into people’s lawns?	A 4’ buffer and 6’ sidewalk will be typical along the corridor. In areas such as intersections and where the right-of -way is reduced, the buffer may be reduced or eliminated.
5	Whose driveways are being narrowed?	This study has not investigated each driveway. It has been noted that there are several excessively wide driveways and some abandoned cub cuts. These could be reduced or eliminated to provide a better pedestrian experience while maintaining the functionality of the property. During the design phase these property owners will be notified.
6	Will trucks be able to make the turns with the reduced lane widths?	The final design will accommodate truck turning movements.
7	Is congestion a concern due to the lane width change?	The project will have extensive analysis completed by the design team and ConnDOT in regard to traffic counts, turning movements, traffic light timing, etc.
8	Where will people park that live in four-story apartments?	Private parking lots are not anticipated to be removed or tampered with. Additionally, both Option 1 and Option 2 have on-street parking whether it be on one side or both sides of the road.
9	Majority of the people attending are in favor of the underground utilities.	Noted.
10	Move bike lanes or trucks to secondary streets.	This is a valid consideration, but outside the scope of this study.
11	Drivers will be more aware of pedestrians / bicyclists once the change takes place (ex. New Haven).	Noted.
12	Traffic generally exceeds 30 mph. Can speed bumps be considered on State Routes?	Speed bumps are rarely considered for State Routes.
13	Suggests crosswalks with flashing beacons.	Noted. Most crosswalks are located at signalized intersections with a pedestrian phase.
14	Why is there parking on the East and not the West?	The West side has an abundance of off-street parking for the commercial businesses, while the East side has more residential buildings and minimal off-street parking. Therefore, the East side of North Colony Road was preferred for the on-street parking.
15	Utility easements and transformers may be an issue with underground utilities.	Noted.

16	What are the current ADA compliance issues?	There are some areas of the sidewalk that do not meet current ADA requirements whether it be due to utility poles or other intruding objects reducing the walk width, or non-conforming sidewalk ramps.
17	Are there bus stops in this area, and will this project impede flow of traffic?	There are bus stops on North Colony Road. The changes suggested shall not impede the flow of traffic.
18	Would a local shuttle bus connecting this area with Main Street be considered?	Local shuttle buses will not likely be considered. This project may initiate greater pedestrian connectivity from Main Street to North Colony Road.
19	Underground electric lines improve aesthetics, enhances property values, invites commerce – Long term increases tax base.	Noted.
20	Bike lanes shown on Option 1 are a great start to linking more bike routes to Quinnipiac trail, to Senior Center, and on Town owned open space/Parks & Recreational Areas.	Noted.
21	Bike lanes and foot traffic will support having more customers & clients in the area.	Noted.
22	100% support bike lanes – they need buffers, especially from car doors in the parking area. Love the bump outs.	Noted.
23	100% in favor of bike lanes and pedestrians having a walkable, attractive downtown to spend time in. This can be done with a little creativity, fortitude & elbow grease.	Noted.
24	Consideration for persons with developmental disability and to provide/keep bus stops, provide enhanced ADA compliant sidewalk, etc. for their use.	Noted.

Conclusion

Following the discussions during the public information meeting, the comments and suggestions generated were taken into consideration. The majority of people in attendance understood the aesthetic and functional benefits of relocating the above ground utility to a below ground system, however, they also understood the significant costs associated with this scope of work. Due to the high costs of relocation, it is recommended that the relocation of utilities be explored further only if separate funding sources are made available to the town to support the relocation.

In reference to the connectivity part of the study, most of the participants understood the benefits of increased pedestrian connectivity in providing an opportunity for increased economic development in the area. Many of the participants were also in favor of providing more opportunities for a dedicated cycling network in town. However, based on the concerns that were expressed about traffic and on-street parking along North Colony Street, it is our recommendation that Option 2 be selected as the preferred option, and the town explore placing bike lanes on more local/less traveled streets that run parallel to North Colony Street. Bike routes along North Cherry Street or Washington Street would create less impact on traffic than a route along North Colony Street. These connections could provide dedicated cycling access to Hall Avenue and ultimately link to the Quinnipiac Linear Trail.

The selection and implementation of Option 2 will improve the pedestrian connectivity along the North Colony Street corridor and around the train station with improved sidewalks, pedestrian level lighting, intersection bump outs, and more street trees to enhance the streetscape. The additional foot traffic and local connections will help increase the potential for economic development in the area.

7.0 Appendix

In This Section

a. Cost Estimates

b. Survey Plans

c. Design Plans

Construction Cost Estimate

Reconstruction of North/South Colony Road Wallingford, Connecticut

Pedestrian Improvments and Utility Relocation

Option 1 - Bike Lane Option

Major and Minor Contract Items

Item No.	Item	Unit	Quantity	Unit $	Total Cost
0202000	EARTH EXCAVATION	c.y.	7000	$ 21.40	$ 149,800
0209001	FORMATION OF SUBGRADE	s.y.	13500	$ 2.80	$ 37,800
0304002	PROCESSED AGGREGATE BASE	c.y.	4500	$ 42.00	$ 189,000
0406171	HMA S0.5	ton	1500	$ 115.00	$ 172,500
0406172	HMA S0.375	ton	1500	$ 140.00	$ 210,000
0406236	MATERIAL FOR TACK COAT	gal	2200	$ 5.60	$ 12,320
0406267	MILLING OF HMA (0" TO 4")	s.y.	500	$ 9.80	$ 4,900
0507001	TYPE "C" CATCH BASIN	ea.	6	$ 3,500.00	$ 21,000
0507831	CONVERT CATCH BASIN TO MANHOLE	ea.	6	$ 2,400.00	$ 14,400
0814001	GRANITE STONE CURBING	l.f.	500	$ 60.00	$ 30,000
0814002	RESET GRANITE STONE CURBING	l.f.	2300	$ 30.00	$ 69,000
0815001	BITUMINOUS CONCRETE LIP CURBING	l.f.	500	$ 7.20	$ 3,600
0921001	CONCRETE SIDEWALK	s.f.	27500	$ 11.00	$ 302,500
0921005	CONCRETE SIDEWALK RAMP	s.f.	6000	$ 20.00	$ 120,000
0921014	CONCRETE PAVING BRICK	s.f.	14295	$ 25.40	$ 363,093
0921039	DETECTABLE WARNING STRIP	ea.	20	$ 240.00	$ 4,800
1210101	4" WHITE EPOXY RESIN PAVEMENT MARKINGS	l.f.	6146	$ 0.40	$ 2,458
1210102	4" YELLOW EPOXY RESIN PAVEMENT MARKINGS	l.f.	4608	$ 0.40	$ 1,843
1210105	EPOXY RESIN PAVEMENT MARKINGS, SYMBOLS AND LEGENDS	s.f.	1070	$ 4.40	$ 4,708
1210106	12" WHITE EPOXY RESIN PAVEMENT MARKINGS	l.f.	1144	$ 3.20	$ 3,661
0922500	BITUMINOUS CONCRETE DRIVEWAY	s.y.	450	$ 50.00	$ 22,500
09XXXXX	CONCRETE DUCTBANK (6 CONDUIT)	l.f.	2500	$ 50.00	$ 125,000
1003XXX	LIGHT STANDARD	ea.	96	$ 6,000.00	$ 576,000
1008XXX	ELECTRICAL CONDUIT IN TRENCH (lighting)	l.f.	2500	$ 30.00	$ 75,000
1008XXX	CONDUIT IN TRENCH (communications)	l.f.	2250	$ 30.00	$ 67,500
1008XXX	ELECTRICAL MANHOLE	ea.	4	$ 10,000.00	$ 40,000
1008XXX	UNDERGROUND ELECTRICAL (mainline)	l.f.	2500	$ 200.00	$ 500,000
1008XXX	UNDERGROUND ELECTRICAL (serviceline)	l.f.	2250	$ 200.00	$ 450,000
1008XXX	ELECTRICALTRANSFORMERS AND SWITGH GEARS	ea.	3	$ 20,000.00	$ 60,000
1008XXX	COMMUNICATIONS MANHOLE (FRONTIER)	ea.	5	$ 5,000.00	$ 25,000
1008XXX	UNDERGROUND COMMUNICATIONS (FRONTIER)	l.f.	2500	$ 225.00	$ 562,500
1008XXX	UNDERGROUND COMMUNICATIONS (CATV)	l.f.	2500	$ 10.00	$ 25,000
SubTotal					**$ 4,245,883**
Minor Items Subtotal (0% at Final Design)		15	% of Line "A"		**$ 636,883**
Major and Minor Contract Items Subtotal (A + B)					**$ 4,882,766**
Other Item Allowances					
Clearing and Grubbing (suggested 0.5% - 2%)		0.5	% of Line "C"		$ 24,414
M & P of Traffic (suggested 2% - 5%)		4	% of Line "C"		$ 195,311
Mobilization (suggested 4% - 10%)		7	% of Line "C"		$ 341,794
Construction Staking (suggested 1% - 2%)		1	% of Line "C"		$ 48,828
Other Items Subtotal					**$ 610,347**
CONTRACT SUBTOTAL (C + D)					**$ 5,493,113**
Inflation Costs (Simple Method)					
Date of Estimate (provide date of estimate)		Aug-19			
Anticipated Bid Date (provide anticipated bid date)		Apr-20			
Annual Inflation (4% annually, 0% at Final Design)		4%			
Inflation Subtotal		2.4%	of Line "E"		**$ 131,835**
TOTAL CONTRACT COST ESTIMATE (E + F) (Rounded to nearest $1000)					**$ 5,625,000**

LOTCIP Project Costs Summary		
Contract Cost Estimate (Line "G")		$ 5,625,000
Contingencies (20%)	20%	$ 1,125,000
Incidentals (18%)	18%	$ 1,012,500
ROW	LS	$ 50,000
Utilities (incl. 33 pole removals)	LS	$ 132,000
TOTAL PROJECT COST		**$ 7,944,500**

Construction Cost Estimate

Reconstruction of North/South Colony Road Wallingford, Connecticut

Pedestrian Improvments and Utility Relocation

Option 2 - Two side On-Street Parking Option

Major and Minor Contract Items

Item No.	Item	Unit	Quantity	Unit $	Total Cost
0202000	EARTH EXCAVATION	c.y.	7000	$ 21.40	$ 149,800
0209001	FORMATION OF SUBGRADE	s.y.	13500	$ 2.80	$ 37,800
0304002	PROCESSED AGGREGATE BASE	c.y.	4500	$ 42.00	$ 189,000
0406171	HMA S0.5	ton	1500	$ 115.00	$ 172,500
0406172	HMA S0.375	ton	1500	$ 140.00	$ 210,000
0406236	MATERIAL FOR TACK COAT	gal	2200	$ 5.60	$ 12,320
0406267	MILLING OF HMA (0" TO 4")	s.y.	500	$ 9.80	$ 4,900
0507001	TYPE "C" CATCH BASIN	ea.	6	$ 3,500.00	$ 21,000
0507831	CONVERT CATCH BASIN TO MANHOLE	ea.	6	$ 2,400.00	$ 14,400
0814001	GRANITE STONE CURBING	l.f.	500	$ 60.00	$ 30,000
0814002	RESET GRANITE STONE CURBING	l.f.	2300	$ 30.00	$ 69,000
0815001	BITUMINOUS CONCRETE LIP CURBING	l.f.	500	$ 7.20	$ 3,600
0921001	CONCRETE SIDEWALK	s.f.	27500	$ 11.00	$ 302,500
0921005	CONCRETE SIDEWALK RAMP	s.f.	6000	$ 20.00	$ 120,000
0921014	CONCRETE PAVING BRICK	s.f.	14295	$ 25.40	$ 363,093
0921039	DETECTABLE WARNING STRIP	ea.	20	$ 240.00	$ 4,800
1210101	4" WHITE EPOXY RESIN PAVEMENT MARKINGS	l.f.	5218	$ 0.40	$ 2,087
1210102	4" YELLOW EPOXY RESIN PAVEMENT MARKINGS	l.f.	4608	$ 0.40	$ 1,843
1210105	EPOXY RESIN PAVEMENT MARKINGS, SYMBOLS AND LEGENDS	s.f.	330	$ 4.40	$ 1,452
1210106	12" WHITE EPOXY RESIN PAVEMENT MARKINGS	l.f.	1144	$ 3.20	$ 3,661
0922500	BITUMINOUS CONCRETE DRIVEWAY	s.y.	450	$ 50.00	$ 22,500
09XXXXX	CONCRETE DUCTBANK (6 CONDUIT)	l.f.	2500	$ 50.00	$ 125,000
1003XXX	LIGHT STANDARD	ea.	96	$ 6,000.00	$ 576,000
1008XXX	ELECTRICAL CONDUIT IN TRENCH (lighting)	l.f.	2500	$ 30.00	$ 75,000
1008XXX	CONDUIT IN TRENCH (communications)	l.f.	2250	$ 30.00	$ 67,500
1008XXX	ELECTRICAL MANHOLE	ea.	4	$ 10,000.00	$ 40,000
1008XXX	UNDERGROUND ELECTRICAL (mainline)	l.f.	2500	$ 200.00	$ 500,000
1008XXX	UNDERGROUND ELECTRICAL (serviceline)	l.f.	2250	$ 200.00	$ 450,000
1008XXX	ELECTRICALTRANSFORMERS AND SWITGH GEARS	ea.	3	$ 20,000.00	$ 60,000
1008XXX	COMMUNICATIONS MANHOLE (FRONTIER)	ea.	5	$ 5,000.00	$ 25,000
1008XXX	UNDERGROUND COMMUNICATIONS (FRONTIER)	l.f.	2500	$ 225.00	$ 562,500
1008XXX	UNDERGROUND COMMUNICATIONS (CATV)	l.f.	2500	$ 10.00	$ 25,000
SubTotal					**$ 4,242,256**
Minor Items Subtotal (0% at Final Design)		15	% of Line "A"		**$ 636,338**
Major and Minor Contract Items Subtotal (A + B)					**$ 4,878,595**
Other Item Allowances					
Clearing and Grubbing (suggested 0.5% - 2%)		0.5	% of Line "C"		$ 24,393
M & P of Traffic (suggested 2% - 5%)		4	% of Line "C"		$ 195,144
Mobilization (suggested 4% - 10%)		7	% of Line "C"		$ 341,502
Construction Staking (suggested 1% - 2%)		1	% of Line "C"		$ 48,786
Other Items Subtotal					**$ 609,825**
CONTRACT SUBTOTAL (C + D)					**$ 5,488,420**
Inflation Costs (Simple Method)					
Date of Estimate (provide date of estimate)		Aug-19			
Anticipated Bid Date (provide anticipated bid date)		Apr-20			
Annual Inflation (4% annually, 0% at Final Design)		4%			
Inflation Subtotal		2.4%	of Line "E"		**$ 131,722**
TOTAL CONTRACT COST ESTIMATE (E + F) (Rounded to nearest $1000)					**$ 5,620,000**

LOTCIP Project Costs Summary		
Contract Cost Estimate (Line "G")		$ 5,620,000
Contingencies (20%)	20%	$ 1,124,000
Incidentals (18%)	18%	$ 1,011,600
ROW	LS	$ 50,000
Utilities (incl. 33 pole removals)	LS	$ 132,000
TOTAL PROJECT COST		**$ 7,937,600**

Construction Cost Estimate

Reconstruction of North/South Colony Road Wallingford, Connecticut

Pedestrian Improvements

Option 1 - Bike Lane Option w/o Utility Relocation

Major and Minor Contract Items

Item No.	Item	Unit	Quantity	Unit $	Total Cost
0202000	EARTH EXCAVATION	c.y.	7000	$ 21.40	$ 149,800
0209001	FORMATION OF SUBGRADE	s.y.	13500	$ 2.80	$ 37,800
0304002	PROCESSED AGGREGATE BASE	c.y.	4500	$ 42.00	$ 189,000
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0406236	MATERIAL FOR TACK COAT	gal	2200	$ 5.60	$ 12,320
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0814001	GRANITE STONE CURBING	l.f.	500	$ 60.00	$ 30,000
0814002	RESET GRANITE STONE CURBING	l.f.	2300	$ 30.00	$ 69,000
0815001	BITUMINOUS CONCRETE LIP CURBING	l.f.	500	$ 7.20	$ 3,600
0921001	CONCRETE SIDEWALK	s.f.	27500	$ 11.00	$ 302,500
0921005	CONCRETE SIDEWALK RAMP	s.f.	6000	$ 20.00	$ 120,000
0921014	CONCRETE PAVING BRICK	s.f.	14295	$ 25.40	$ 363,093
0921039	DETECTABLE WARNING STRIP	ea.	20	$ 240.00	$ 4,800
1210101	4" WHITE EPOXY RESIN PAVEMENT MARKINGS	l.f.	6146	$ 0.40	$ 2,458
1210102	4" YELLOW EPOXY RESIN PAVEMENT MARKINGS	l.f.	4608	$ 0.40	$ 1,843
1210105	EPOXY RESIN PAVEMENT MARKINGS, SYMBOLS AND LEGENDS	s.f.	1070	$ 4.40	$ 4,708
1210106	12" WHITE EPOXY RESIN PAVEMENT MARKINGS	l.f.	1144	$ 3.20	$ 3,661
0922500	BITUMINOUS CONCRETE DRIVEWAY	s.y.	450	$ 50.00	$ 22,500
09XXXXX	CONCRETE DUCTBANK (6 CONDUIT)	l.f.		$ 50.00	$ -
1003XXX	LIGHT STANDARD	ea.	96	$ 6,000.00	$ 576,000
1008XXX	ELECTRICAL CONDUIT IN TRENCH (lighting)	l.f.	2500	$ 30.00	$ 75,000
1008XXX	CONDUIT IN TRENCH (communications)	l.f.		$ 30.00	$ -
1008XXX	ELECTRICAL MANHOLE	ea.		$ 10,000.00	$ -
1008XXX	UNDERGROUND ELECTRICAL (mainline)	l.f.		$ 200.00	$ -
1008XXX	UNDERGROUND ELECTRICAL (serviceline)	l.f.		$ 200.00	$ -
1008XXX	ELECTRICALTRANSFORMERS AND SWITGH GEARS	ea.		$ 20,000.00	$ -
1008XXX	COMMUNICATIONS MANHOLE (FRONTIER)	ea.		$ 5,000.00	$ -
1008XXX	UNDERGROUND COMMUNICATIONS (FRONTIER)	l.f.		$ 225.00	$ -
1008XXX	UNDERGROUND COMMUNICATIONS (CATV)	l.f.		$ 10.00	$ -
SubTotal					**$ 2,390,883**
Minor Items Subtotal (0% at Final Design)		15	% of Line "A"		**$ 358,633**
Major and Minor Contract Items Subtotal (A + B)					**$ 2,749,516**

Other Item Allowances

Clearing and Grubbing (suggested 0.5% - 2%)	0.5	% of Line "C"	$ 13,748
M & P of Traffic (suggested 2% - 5%)	4	% of Line "C"	$ 109,981
Mobilization (suggested 4% - 10%)	7	% of Line "C"	$ 192,466
Construction Staking (suggested 1% - 2%)	1	% of Line "C"	$ 27,495
Other Items Subtotal			**$ 343,690**
CONTRACT SUBTOTAL (C + D)			**$ 3,093,206**

Inflation Costs (Simple Method)

Date of Estimate (provide date of estimate)	Aug-19		
Anticipated Bid Date (provide anticipated bid date)	Apr-20		
Annual Inflation (4% annually, 0% at Final Design)	4%		
Inflation Subtotal	2.4%	of Line "E"	**$ 74,237**
TOTAL CONTRACT COST ESTIMATE (E + F) (Rounded to nearest $1000)			**$ 3,167,000**

LOTCIP Project Costs Summary		
Contract Cost Estimate (Line "G")		$ 3,167,000
Contingencies (20%)	20%	$ 633,400
Incidentals (18%)	18%	$ 570,060
ROW	LS	$ 5,000
Utilities	LS	$ 20,000
TOTAL PROJECT COST		**$ 4,395,460**

Construction Cost Estimate

Reconstruction of North/South Colony Road Wallingford, Connecticut

Pedestrian Improvements

Option 2 - Two side On-Street Parking Option w/o Utility Relocation

Major and Minor Contract Items

Item No.	Item	Unit	Quantity	Unit $	Total Cost
0202000	EARTH EXCAVATION	c.y.	7000	$ 21.40	$ 149,800
0209001	FORMATION OF SUBGRADE	s.y.	13500	$ 2.80	$ 37,800
0304002	PROCESSED AGGREGATE BASE	c.y.	4500	$ 42.00	$ 189,000
0406171	HMA S0.5	ton	1500	$ 115.00	$ 172,500
0406172	HMA S0.375	ton	1500	$ 140.00	$ 210,000
0406236	MATERIAL FOR TACK COAT	gal	2200	$ 5.60	$ 12,320
0406267	MILLING OF HMA (0" TO 4")	s.y.	500	$ 9.80	$ 4,900
0507001	TYPE "C" CATCH BASIN	ea.	6	$ 3,500.00	$ 21,000
0507831	CONVERT CATCH BASIN TO MANHOLE	ea.	6	$ 2,400.00	$ 14,400
0814001	GRANITE STONE CURBING	l.f.	500	$ 60.00	$ 30,000
0814002	RESET GRANITE STONE CURBING	l.f.	2300	$ 30.00	$ 69,000
0815001	BITUMINOUS CONCRETE LIP CURBING	l.f.	500	$ 7.20	$ 3,600
0921001	CONCRETE SIDEWALK	s.f.	27500	$ 11.00	$ 302,500
0921005	CONCRETE SIDEWALK RAMP	s.f.	6000	$ 20.00	$ 120,000
0921014	CONCRETE PAVING BRICK	s.f.	14295	$ 25.40	$ 363,093
0921039	DETECTABLE WARNING STRIP	ea.	20	$ 240.00	$ 4,800
1210101	4" WHITE EPOXY RESIN PAVEMENT MARKINGS	l.f.	5218	$ 0.40	$ 2,087
1210102	4" YELLOW EPOXY RESIN PAVEMENT MARKINGS	l.f.	4608	$ 0.40	$ 1,843
1210105	EPOXY RESIN PAVEMENT MARKINGS, SYMBOLS AND LEGENDS	s.f.	330	$ 4.40	$ 1,452
1210106	12" WHITE EPOXY RESIN PAVEMENT MARKINGS	l.f.	1144	$ 3.20	$ 3,661
0922500	BITUMINOUS CONCRETE DRIVEWAY	s.y.	450	$ 50.00	$ 22,500
09XXXXX	CONCRETE DUCTBANK (6 CONDUIT)	l.f.		$ 50.00	$ -
1003XXX	LIGHT STANDARD	ea.	96	$ 6,000.00	$ 576,000
1008XXX	ELECTRICAL CONDUIT IN TRENCH (lighting)	l.f.	2500	$ 30.00	$ 75,000
1008XXX	CONDUIT IN TRENCH (communications)	l.f.		$ 30.00	$ -
1008XXX	ELECTRICAL MANHOLE	ea.		$ 10,000.00	$ -
1008XXX	UNDERGROUND ELECTRICAL (mainline)	l.f.		$ 200.00	$ -
1008XXX	UNDERGROUND ELECTRICAL (serviceline)	l.f.		$ 200.00	$ -
1008XXX	ELECTRICALTRANSFORMERS AND SWITGH GEARS	ea.		$ 20,000.00	$ -
1008XXX	COMMUNICATIONS MANHOLE (FRONTIER)	ea.		$ 5,000.00	$ -
1008XXX	UNDERGROUND COMMUNICATIONS (FRONTIER)	l.f.		$ 225.00	$ -
1008XXX	UNDERGROUND COMMUNICATIONS (CATV)	l.f.		$ 10.00	$ -
SubTotal					**$ 2,387,256**
Minor Items Subtotal (0% at Final Design)		15	% of Line "A"		**$ 358,088**
Major and Minor Contract Items Subtotal (A + B)					**$ 2,745,345**

Other Item Allowances

Clearing and Grubbing (suggested 0.5% - 2%)	0.5	% of Line "C"	$ 13,727
M & P of Traffic (suggested 2% - 5%)	4	% of Line "C"	$ 109,814
Mobilization (suggested 4% - 10%)	7	% of Line "C"	$ 192,174
Construction Staking (suggested 1% - 2%)	1	% of Line "C"	$ 27,453
Other Items Subtotal			**$ 343,168**
CONTRACT SUBTOTAL (C + D)			**$ 3,088,513**

Inflation Costs (Simple Method)

Date of Estimate (provide date of estimate)	Aug-19		
Anticipated Bid Date (provide anticipated bid date)	Apr-20		
Annual Inflation (4% annually, 0% at Final Design)	4%		
Inflation Subtotal	2.4%	of Line "E"	**$ 74,124**
TOTAL CONTRACT COST ESTIMATE (E + F) (Rounded to nearest $1000)			**$ 3,163,000**

LOTCIP Project Costs Summary		
Contract Cost Estimate (Line "G")		$ 3,163,000
Contingencies (20%)	20%	$ 632,600
Incidentals (18%)	18%	$ 569,340
ROW	LS	$ 5,000
Utilities	LS	$ 20,000
TOTAL PROJECT COST		**$ 4,389,940**

Construction Cost Estimate

Reconstruction of North/South Colony Road Wallingford, Connecticut

Utility Relocation

Major and Minor Contract Items

Item No.	Item	Unit	Quantity	Unit $	Total Cost
0202000	EARTH EXCAVATION	c.y.		$ 21.40	$ -
0209001	FORMATION OF SUBGRADE	s.y.		$ 2.80	$ -
0304002	PROCESSED AGGREGATE BASE	c.y.		$ 42.00	$ -
0406171	HMA S0.5	ton		$ 115.00	$ -
0406172	HMA S0.375	ton		$ 140.00	$ -
0406236	MATERIAL FOR TACK COAT	gal		$ 5.60	$ -
0406267	MILLING OF HMA (0" TO 4")	s.y.		$ 9.80	$ -
0507001	TYPE "C" CATCH BASIN	ea.		$ 3,500.00	$ -
0507831	CONVERT CATCH BASIN TO MANHOLE	ea.		$ 2,400.00	$ -
0814001	GRANITE STONE CURBING	l.f.		$ 60.00	$ -
0814002	RESET GRANITE STONE CURBING	l.f.		$ 30.00	$ -
0815001	BITUMINOUS CONCRETE LIP CURBING	l.f.		$ 7.20	$ -
0921001	CONCRETE SIDEWALK	s.f.		$ 11.00	$ -
0921005	CONCRETE SIDEWALK RAMP	s.f.		$ 20.00	$ -
0921014	CONCRETE PAVING BRICK	s.f.		$ 25.40	$ -
0921039	DETECTABLE WARNING STRIP	ea.		$ 240.00	$ -
0922500	BITUMINOUS CONCRETE DRIVEWAY	s.y.		$ 50.00	$ -
09XXXXX	CONCRETE DUCTBANK (6 CONDUIT)	l.f.	2500	$ 50.00	$ 125,000
1003XXX	LIGHT STANDARD	ea.		$ 6,000.00	$ -
1008XXX	ELECTRICAL CONDUIT IN TRENCH (lighting)	l.f.		$ 30.00	$ -
1008XXX	CONDUIT IN TRENCH (communications)	l.f.	2250	$ 30.00	$ 67,500
1008XXX	ELECTRICAL MANHOLE	ea.	4	$ 10,000.00	$ 40,000
1008XXX	UNDERGROUND ELECTRICAL (mainline)	l.f.	2500	$ 200.00	$ 500,000
1008XXX	UNDERGROUND ELECTRICAL (serviceline)	l.f.	2250	$ 200.00	$ 450,000
1008XXX	ELECTRICALTRANSFORMERS AND SWITGH GEARS	ea.	3	$ 20,000.00	$ 60,000
1008XXX	COMMUNICATIONS MANHOLE (FRONTIER)	ea.	5	$ 5,000.00	$ 25,000
1008XXX	UNDERGROUND COMMUNICATIONS (FRONTIER)	l.f.	2500	$ 225.00	$ 562,500
1008XXX	UNDERGROUND COMMUNICATIONS (CATV)	l.f.	2500	$ 10.00	$ 25,000
SubTotal					**$ 1,855,000**
Minor Items Subtotal (0% at Final Design)		15	% of Line "A"		**$ 278,250**
Major and Minor Contract Items Subtotal (A + B)					**$ 2,133,250**

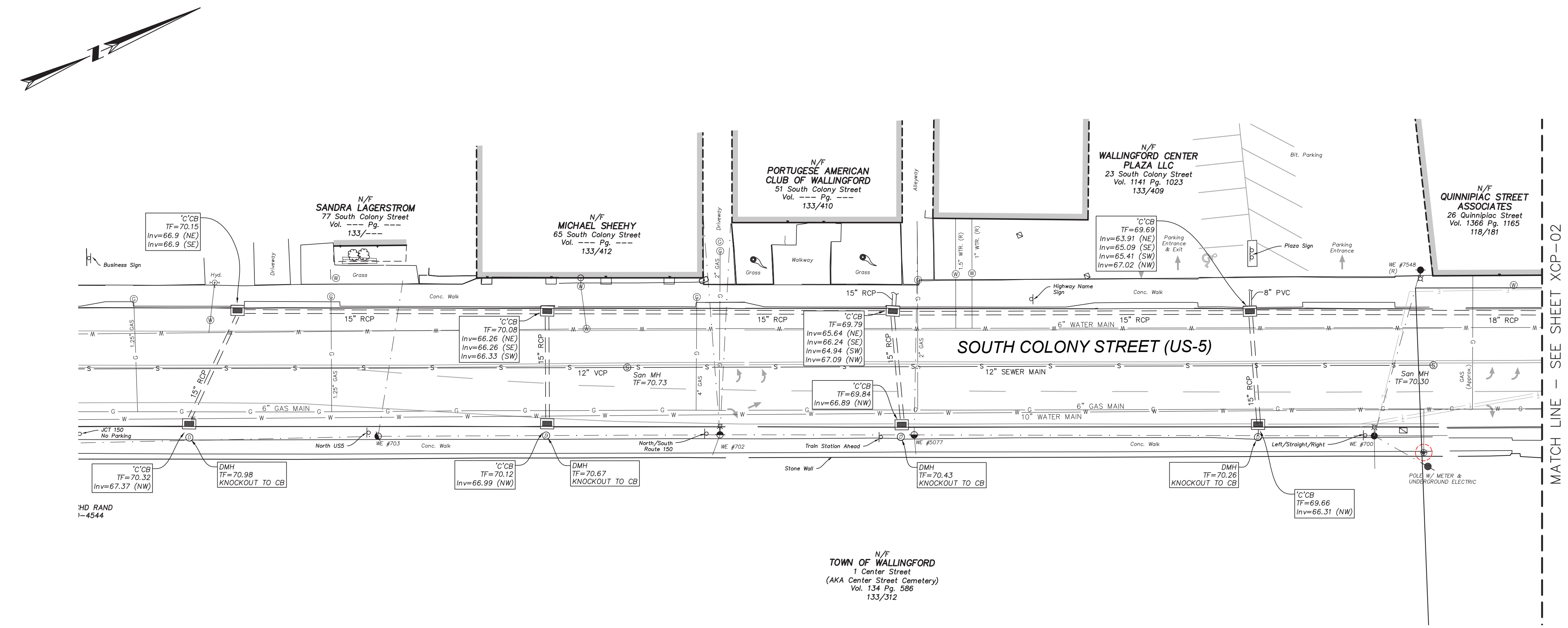
Other Item Allowances

Clearing and Grubbing (suggested 0.5% - 2%)	0.5	% of Line "C"	$ 10,666
M & P of Traffic (suggested 2% - 5%)	4	% of Line "C"	$ 85,330
Mobilization (suggested 4% - 10%)	7	% of Line "C"	$ 149,328
Construction Staking (suggested 1% - 2%)	1	% of Line "C"	$ 21,333
Other Items Subtotal			**$ 266,657**
CONTRACT SUBTOTAL (C + D)			**$ 2,399,907**

Inflation Costs (Simple Method)

Date of Estimate (provide date of estimate)	Aug-19		
Anticipated Bid Date (provide anticipated bid date)	Apr-20		
Annual Inflation (4% annually, 0% at Final Design)	4%		
Inflation Subtotal	2.4%	of Line "E"	**$ 57,598**
TOTAL CONTRACT COST ESTIMATE (E + F) (Rounded to nearest $1000)			**$ 2,458,000**

LOTCIP Project Costs Summary		
Contract Cost Estimate (Line "G")		$ 2,458,000
Contingencies (20%)	20%	$ 491,600
Incidentals (18%)	18%	$ 442,440
ROW	LS	$ -
Utilities (incl. 33 pole removals)	LS	$ 132,000
TOTAL PROJECT COST		**$ 3,524,040**

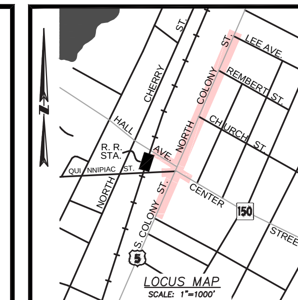


LEGEND

- WALK SIGNAL
- UNDERGROUND UTILITY BOX
- TRAFFIC CONTROL BOX
- TRAFFIC SIGNAL POLE
- FLAG POLE
- LIGHT POLE
- UTILITY POLE
- UTILITY POLE W/LIGHT
- ELECTRIC MANHOLE
- SANITARY MANHOLE
- STORM MANHOLE
- WATER MANHOLE
- OTHER MANHOLE
- CATCH BASIN
- GAS GATE
- GAS METER
- SIGN
- MAIL BOX
- HYDRANT
- BOLLARD
- UNDERGROUND GAS
- UNDERGROUND ELECTRIC
- UNDERGROUND TELEPHONE
- STORM DRAINAGE
- SANITARY SEWER
- WATER LINE
- OVERHEAD WIRE
- STOCKADE FENCE
- CHAINLINK FENCE
- PICKET FENCE
- IRON FENCE
- BUILDING
- BUILDING (APPROXIMATE)

ABBREVIATIONS

(R)	RECORD
WTR.	WATER LATERAL
SWR.	SEWER LATERAL
RCP	REINFORCED CONCRETE PIPE (STORM)
PVC	POLYVINYL CHLORIDE PIPE (STORM)
CONC.	CONCRETE
BIT.	BITUMINOUS PAVEMENT



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SOUTH COLONY STREET (U.S. ROUTE 5)

IN

WALLINGFORD CONNECTICUT

EXISTING CONDITIONS PLAN

OCTOBER 29, 2018

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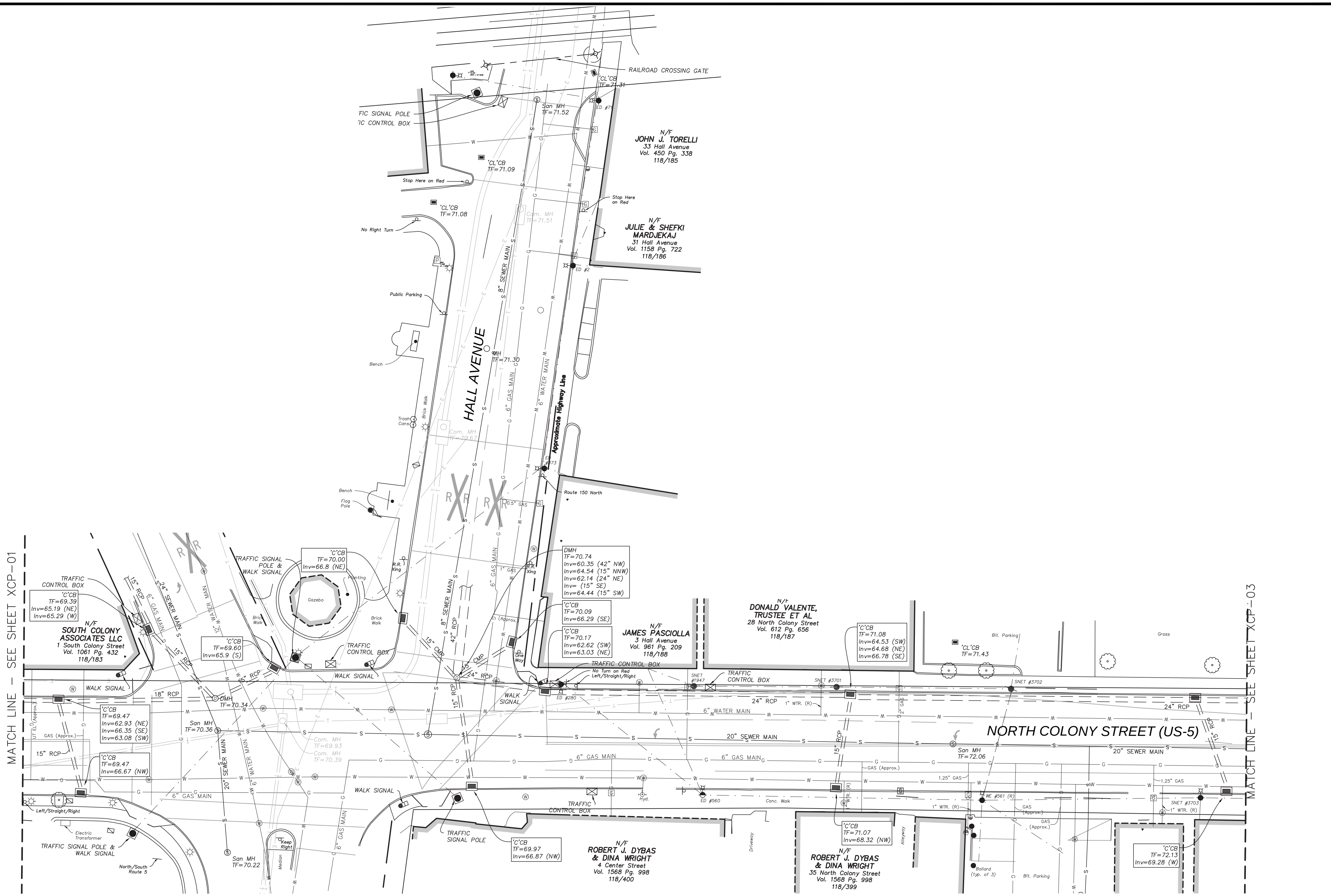

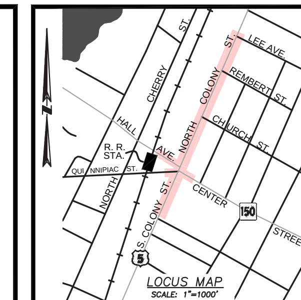

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HALL AVENUE & NORTH COLONY STREET (U.S. ROUTE 5)

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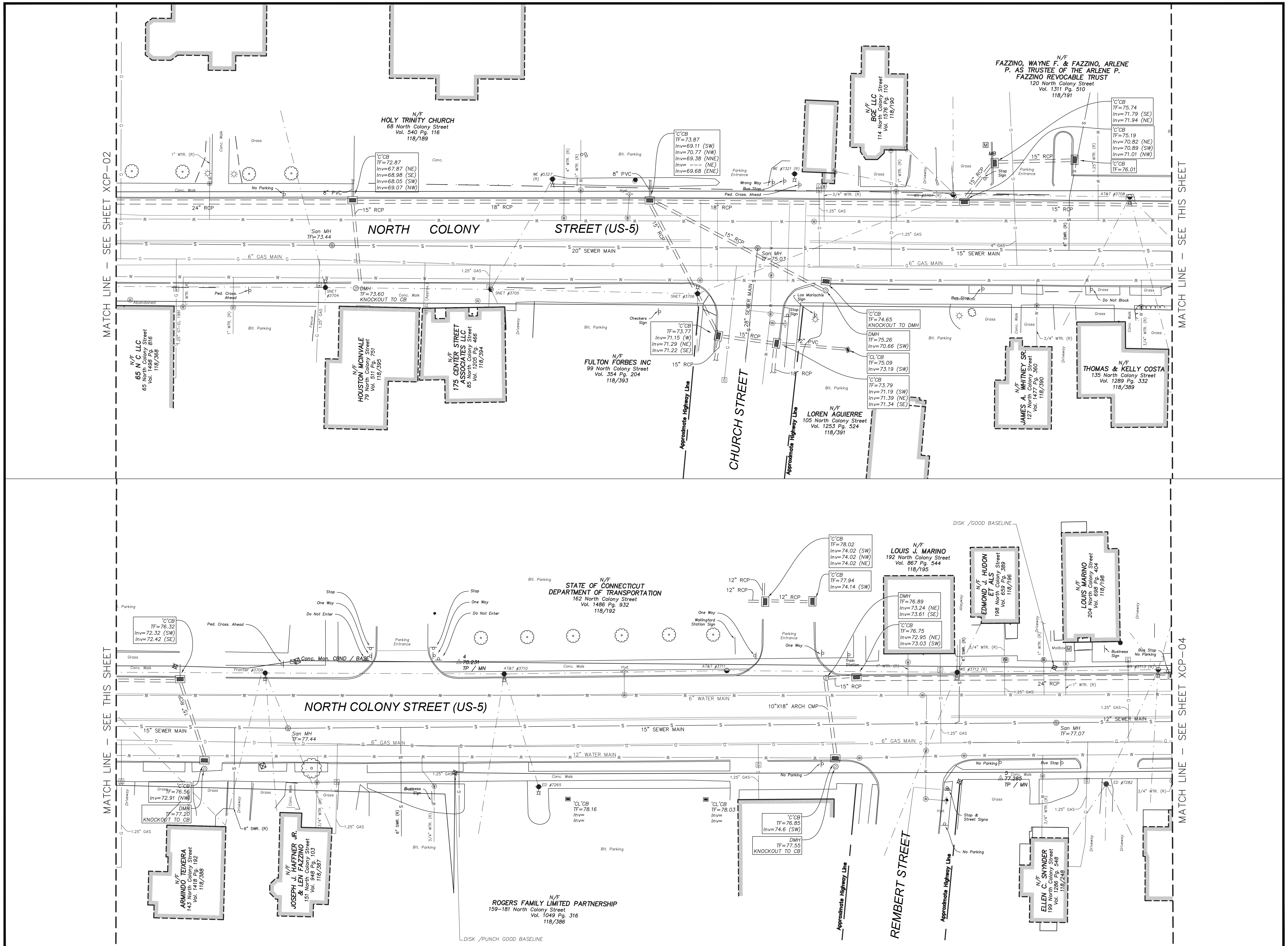

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NORTH COLONY STREET (U.S. ROUTE 5)

IN

WALLINGFORD CONNECTICUT

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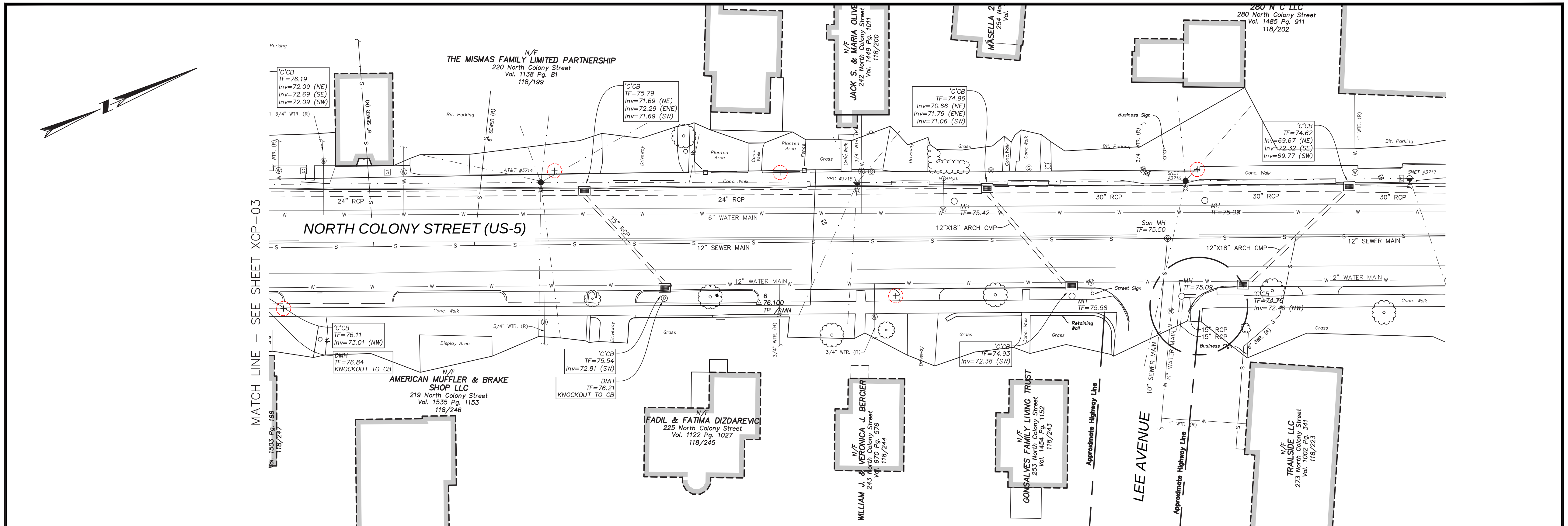

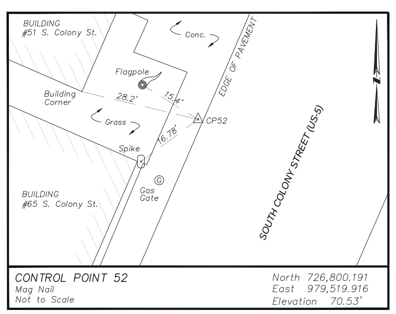

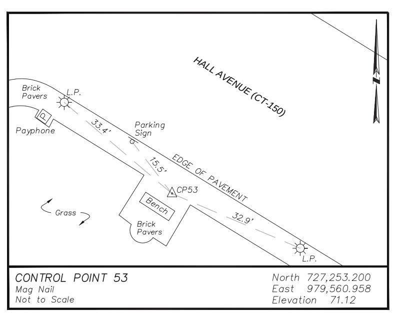

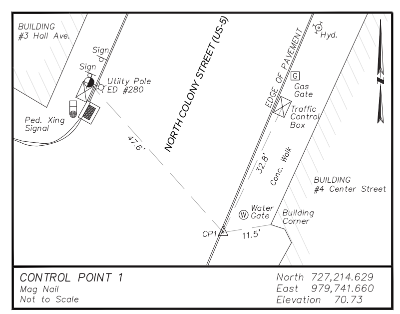

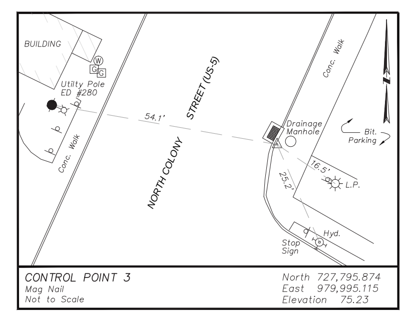

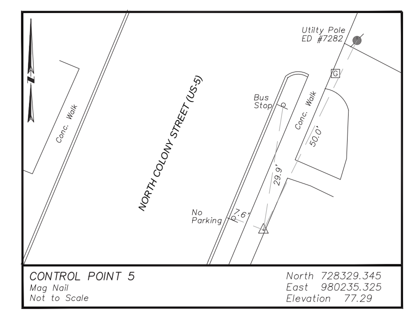

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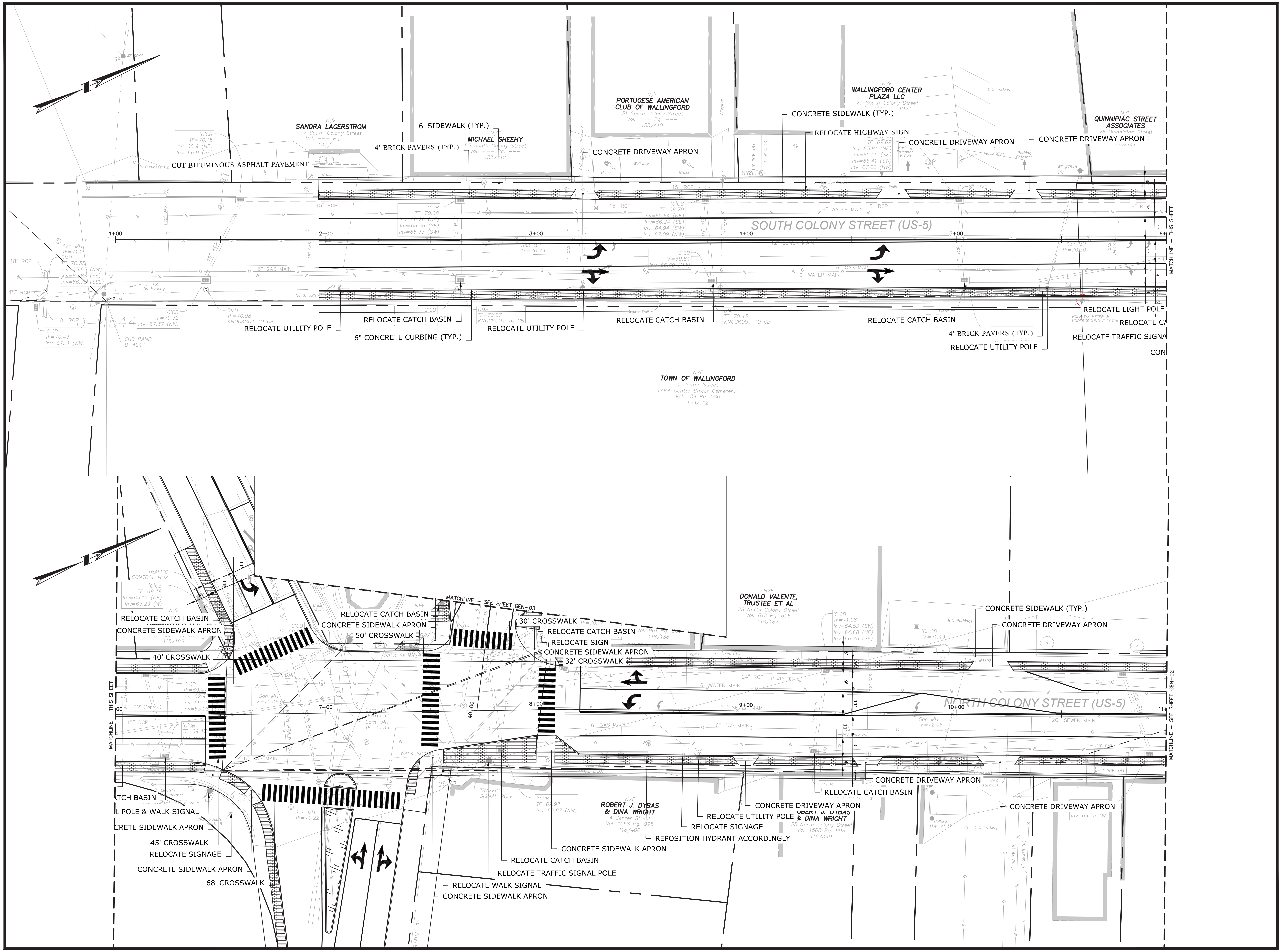

PEDESTRIAN CONNECTIVITY - OCTOBER 29, 2018

PEDESTRIAN CONNECTIVITY

NORTH COLONY ROAD IN WALLINGFORD CONNECTICUT

GENERAL PLAN

March 17, 2020

REVISIONS:

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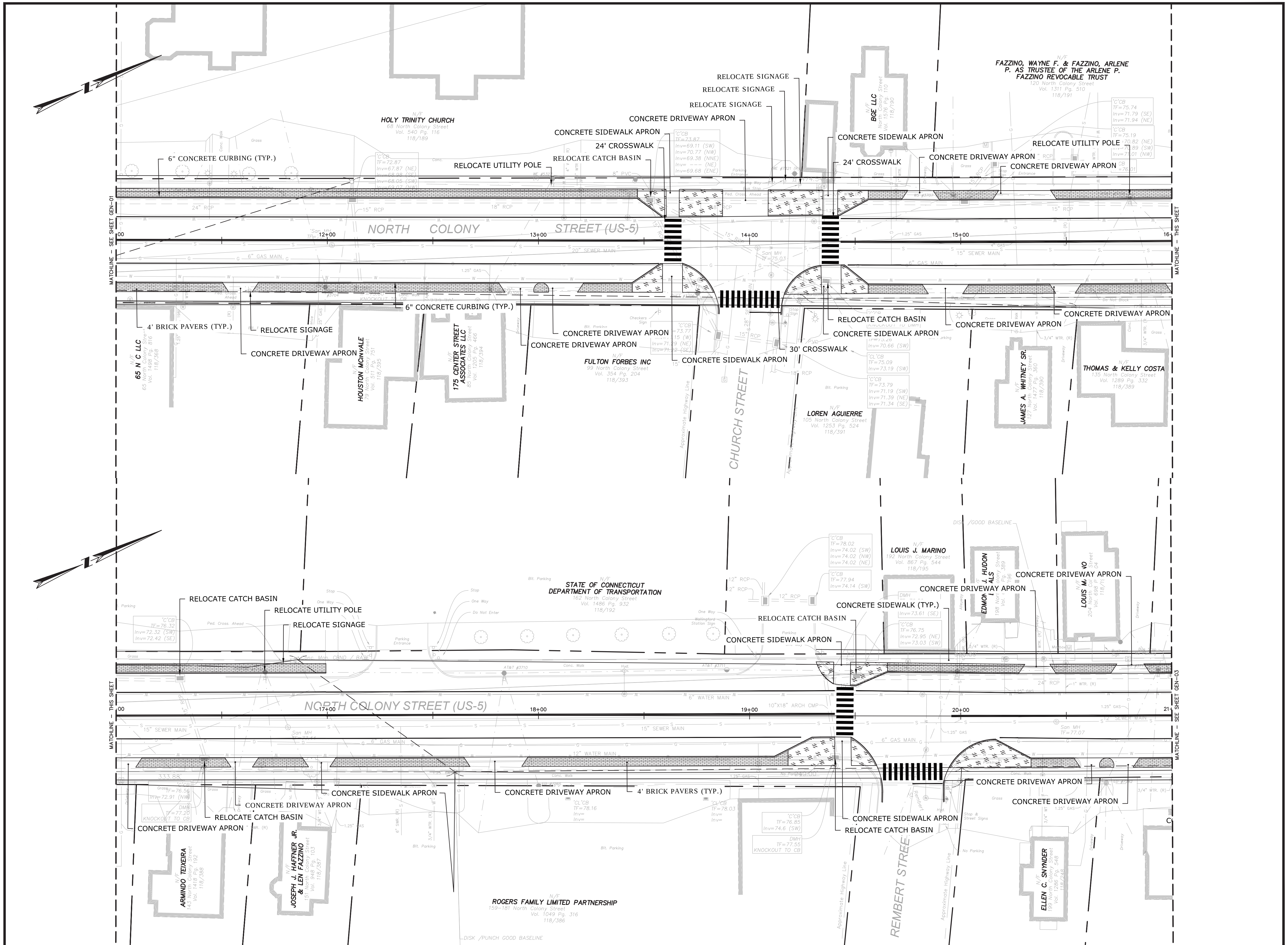

PEDESTRIAN CONNECTIVITY - OCTOBER 29, 2018

PEDESTRIAN CONNECTIVITY

NORTH COLONY ROAD
IN
WALLINGFORD CONNECTICUT

GENERAL PLAN

March 17, 2020

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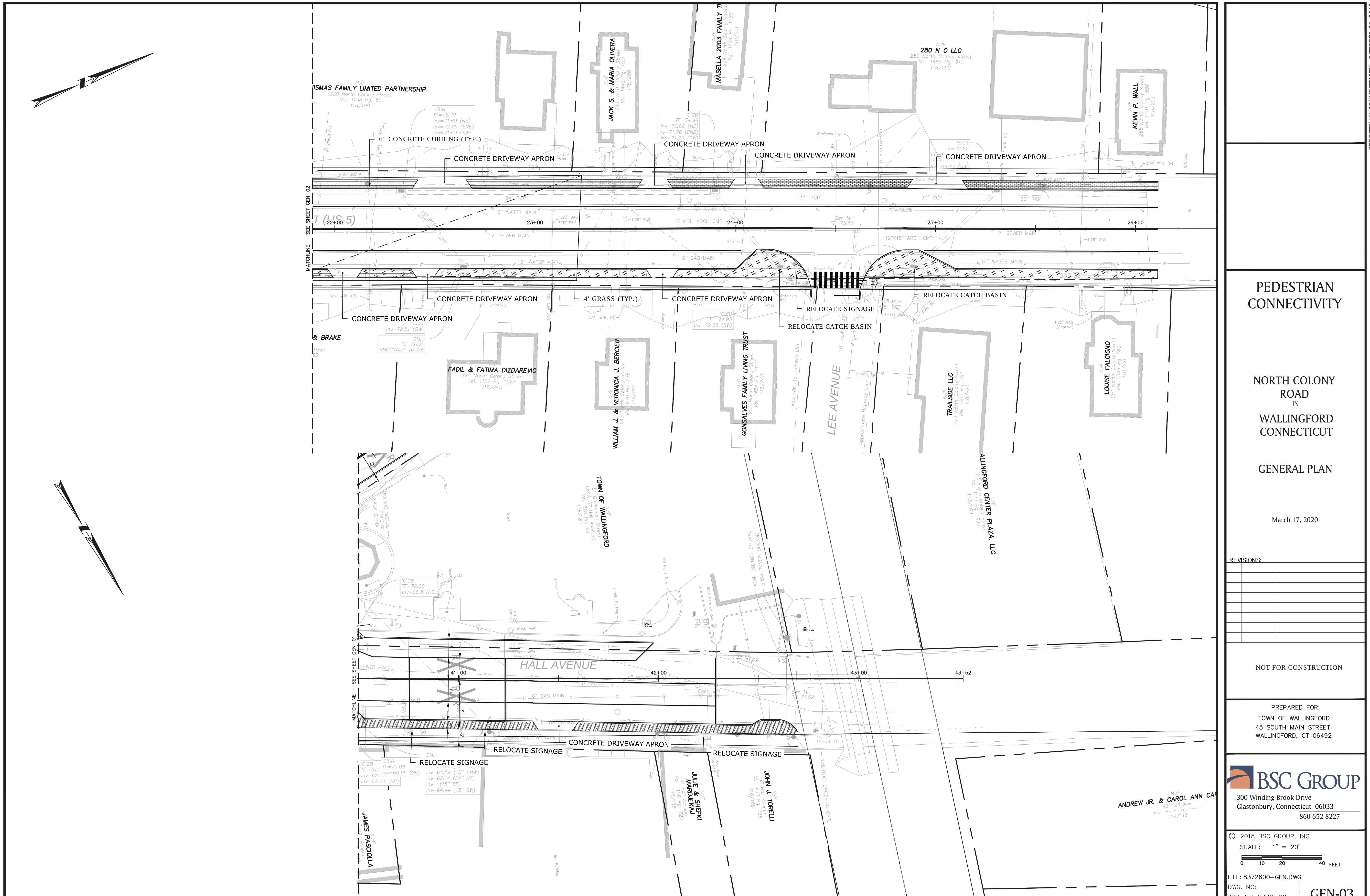
PEDESTRIAN CONNECTIVITY - OCTOBER 29, 2018
PEDESTRIAN CONNECTIVITY
NORTH COLONY ROAD
IN
WALLINGFORD CONNECTICUT
GENERAL PLAN
March 17, 2020
REVISIONS:
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SCALE: 1" = 20'
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FILE: 8372600-GEN.DWG
DWG. NO:
JOB. NO: 83725.00
GEN-03
6" CONCRETE CURBING (TYP.)
CONCRETE DRIVEWAY APRON
4' GRASS (TYP.)
RELOCATE SIGNAGE
RELOCATE CATCH BASIN
MATCHLINE - SEE SHEET GEN-02
MATCHLINE - SEE SHEET GEN-01
LEE AVENUE
HALL AVENUE
22+00
23+00
24+00
25+00
26+00
41+00
42+00
43+00
43+52
280 N C LLC
KEVIN P. WALL
JACK S. & MARIA OLIVERA
MASELLA 2003 FAMILY TRUST
FADIL & FATIMA DIZDAREVIC
WILLIAM J. & VERONICA J. BERCIER
GONSALVES FAMILY LIVING TRUST
TRAILSIDE LLC
LOUISE FALCIGNO
TOWN OF WALLINGFORD
WALLINGFORD CENTER PLAZA, LLC
JULIE & SHEFKI MARDJEKAJ
JOHN J. TORELLI
JAMES PASCIOLLA
ANDREW JR. & CAROL ANN

8.0 References

In This Section

a. References

The following sources were used in providing research, and data for assumptions for developing this report:

Cost Benefits for Overhead vs. Underground Utilities
Edwards and Kelsey, Inc.
August 2003
Maryland State Highway Administration
Office of Policy & Research

Out of Sight, Out of Mind 2012
An Updated Study on the Undergrounding Of Overhead Power Lines
Prepared by: Kenneth L. Hall, P.E. Hall Energy Consulting, Inc.
Prepared for: Edison Electric Institute
January 2013

Wallingford Transit Oriented Development Plan
FHI
July 25, 2016
Wallingford Planning and Zoning Commission

Connecticut General Assembly
Office of Labor Relations
OLR Research Report
Underground Electric Lines
October 3, 2011
Kevin McCarthy, Principal Analyst

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