



# NEW PARK avenue



TRANSIT AREA · COMPLETE STREETS STUDY

March 2017

# Acknowledgements

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# Introduction

The Town of West Hartford has set forth this planning study to focus on evaluating improvement designs for infrastructure around the Flatbush and Elmwood CTfastrak stations. The recent opening of these stations, as well as the approval of the 616-620 New Park Housing development, has provided the New Park Avenue corridor with a catalyst for economic growth and a unique opportunity to become a multimodal conduit between these transit centers and the rest of West Hartford. The fundamental challenge for New Park Avenue is the juxtaposition of the auto-centric corridor with industrial and suburban style retail uses, four lanes of vehicular traffic, no bicycle accommodations, and narrow sidewalks with the expected influx of pedestrians and bicyclists.

This study has sought to promote a more balanced and integrated Complete Streets system on New Park Avenue in accordance with the goals set forth in the Town's Plan of Conservation and Development (POCD). A review of the zoning map and code pertinent to the corridor will be conducted and recommendations for changes will be developed.

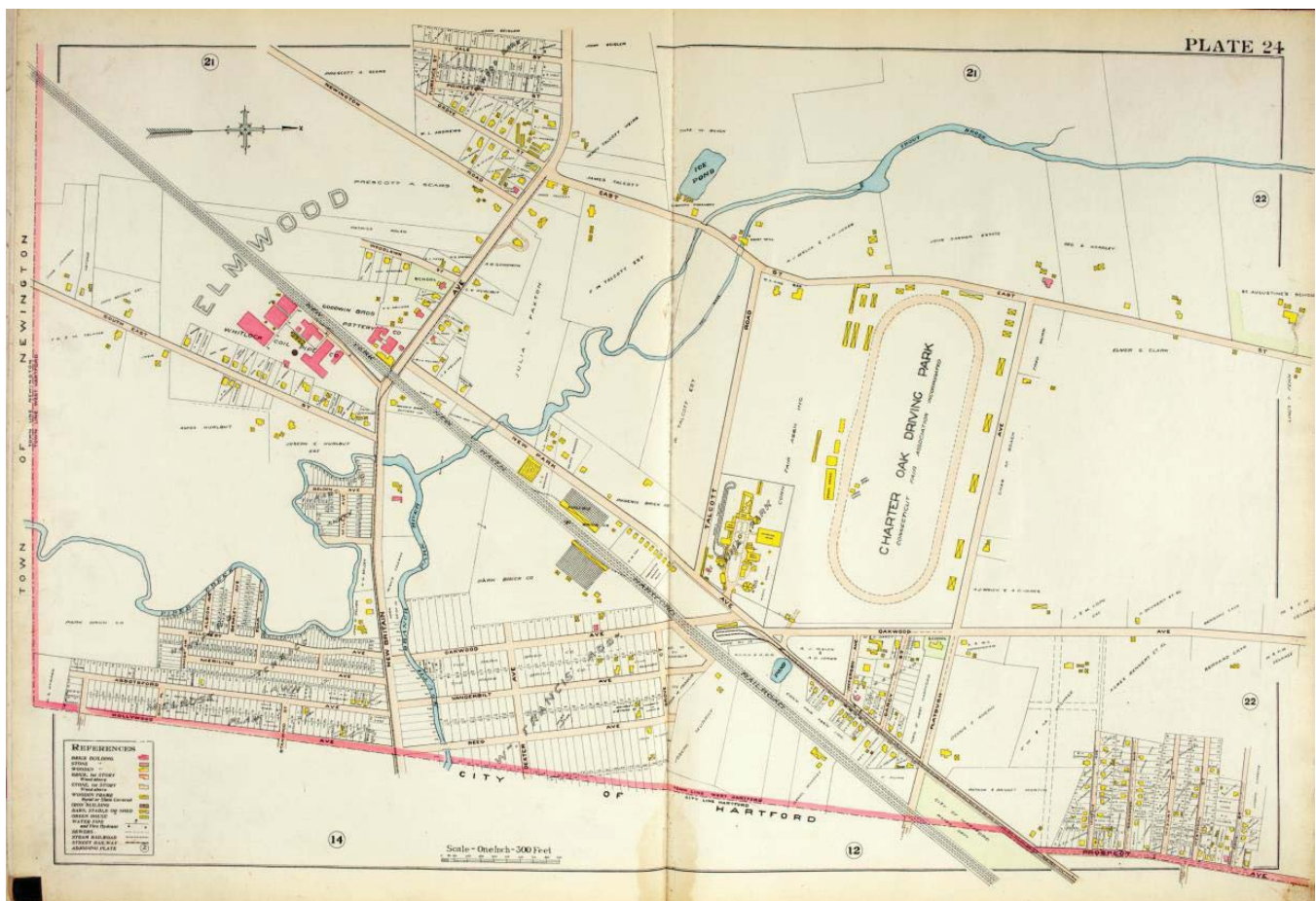
The study area has seen several major infrastructure improvements in recent years, including CTfastrak and its two stations located along New Park Avenue, the State of Connecticut's streetscape improvements to New Britain Avenue, Town investment in the Trout Brook multi-use trail system and the construction of a new Charter Oak International Academy intra-district magnet school. However, significant infrastructure improvements still remain to be addressed to improve traffic, pedestrian and bicycle accessibility and safety in order for the area to capitalize on supporting ridership growth of the two new CTfastrak stations.

The implementation of complete streets measures on New Park Avenue has the potential to manage traffic volumes, reduce vehicle speeds, and create safer operations for vehicles, pedestrians and bicyclists. In order to accurately assess the impacts of this project the Town has evaluated the existing traffic conditions of New Park Avenue and with the help of the Connecticut Department of Transportation has projected them into the future of 2030. This comprehensive analysis has incorporated the points of view of planners, engineers, urban designers, landscape architects, a Technical Advisory Committee of representative key stakeholders as well as the general public in order to best serve the needs of all pedestrians, cyclists, motorists, and transit users of New Park Avenue.

# Chapter 1 - Existing Conditions

The New Park Avenue corridor begins in the south at New Britain Avenue and continues north for just over a mile to the Hartford city line. In 2015, the Connecticut Department of Transportation (CT DOT) opened stations for the new bus rapid transit line, CTfastrak, at the intersections of New Park Avenue and New Britain Avenue and New Park Avenue and Flatbush Avenue, just under a mile apart. These two new transit stops have provided the Town of West Hartford with an opportunity to reevaluate the best use of the corridor, especially with respect to Complete Streets design concepts.

## CORRIDOR HISTORY



Atlas of the City of Hartford, Connecticut, including, also, the town of West Hartford- L.J. Richards & Company - 1909

New Park Avenue runs parallel to the New Haven – Hartford rail line for the entirety of the roadway, both in West Hartford as well as in Hartford where the roadway terminates at Park Street. The CTfastrak dedicated busway, which runs between the railway and New Park Avenue, is a recent addition to the transit profile in the vicinity of the roadway, which has dominated the area since the late 1800's.

Maps from the early 20th century detail four rail lines running parallel to New Park Avenue, as well as a street railway that terminated just south of the new Flatbush CTfastrak stop. The street railway line connected to lines on Park Street and Farmington Avenue, allowing people from the more populated Hartford area to travel easily and quickly to some of the destinations on New Park Avenue in West Hartford.

Charter Oak Park was a regionally famous location for both vehicle and horse racing and was located along the entirety of the property between what was formerly Oakwood Avenue (now Jefferson Avenue) and East Street (now South Quaker Lane), south of Flatbush Avenue. In addition to the race track, Luna Park operated across from the end of the street line for a brief period in the early 20th century, drawing crowds in the thousands, primarily via public transit.

In the intervening years the street railway was eliminated and the number of rail lines reduced from four to two as the focus of the corridor became more auto-centric. The Luna Park and Charter Oak Park properties were redeveloped primarily as large industrial land uses and continue to dictate the character of the neighborhood today. The dedication of the corridor to the large scale industrial and vehicular uses runs counter to the human scale development that many post-industrial areas attempt to attain.

## NATURAL ENVIRONMENT

The topography of New Park Avenue in West Hartford is well suited to the railroad it parallels. A small change in elevation is experienced south of Talcott Road on the otherwise flat roadway. Trees are found in areas along the corridor, typically with a caliper of less than one foot. Many businesses are landscaped with low growing shrubs, however it is not uncommon to encounter properties with only paved surface between the building frontage and the sidewalk.

The most prominent environmental feature of the New Park Avenue corridor is Trout Brook, which crosses under New Park Avenue flowing west to east approximately 800 feet north of New Britain Avenue. Trout Brook continues east and joins with Piper Brook to become the south branch of the Park River. Wildlife such as ducks and other birds are regularly observed in the area of Trout Brook, including bald eagles.





Trout Brook under New Park Avenue



## ARCHITECTURE

The building and site design found on the New Park Avenue corridor vary somewhat from property to property. Several properties are developed with one story brick buildings set back from the roadway approximately 40 feet with parking provided on the side and to the rear of the parcel, such as the Holland Kitchens building.



Holland Kitchens

This type of building design is common throughout the corridor, particularly in the section south of Talcott Road. Newer buildings in the southern section, such as the New Park Commons development, have a similar site layout but utilize the area between the building face and the curb line for store front parking.



New Park Commons

In the central portion of the corridor, buildings are typically larger scale and set back further from the roadway. The Raymour and Flanagan Furniture building is set back approximately 120 feet from the roadway and provides the majority of its parking directly between the roadway and the building frontage.



Raymour & Flanagan Furniture

The new CTfastrak stations provide a more current style of architecture and site layout compared to what is found along the rest of the corridor, with wider sidewalks as shown at the Flatbush station.



Flatbush CTfastrak Station



## LAND USE & ZONING

The land in the New Park Avenue corridor was developed primarily with industrial uses prior to the adoption of the state's first zoning ordinance in 1924. The land used for Charter Oak Park housed factories which eventually became home to Pratt & Whitney before its current use by the Colt Manufacturing Company. Historical land further south into Elmwood includes large pottery and brick making businesses.

The zones that govern the New Park Avenue corridor have remained largely unchanged since their inception nearly a century ago. While a small portion in the northwest extreme of the corridor is zoned General Business District (BG), the majority of the area is currently zoned as either General Industrial District (IG) or Restricted Industrial District (IR), both of which are defined by the same purpose statement in the Town of West Hartford Zoning Ordinance, Section 177-3. It reads, in part:

*“The purpose of these districts is to provide for the continued coexistence of the residential, commercial and industrial uses while continuing to emphasize that these districts are primarily commercial and industrial in nature. The residential and commercial uses are considered essential to support and serve the industrial uses in these districts as well as in the Industrial Park and Exclusive Industrial Districts, where no residential or commercial uses are permitted. To further these objectives, residential uses are permitted only as a component in development projects which contain a mix of residential and nonresidential uses.”*

This zoning language has factored into the formation of what is known as the West Hartford Home Design District; a consortium of businesses which all specialize in various aspects of the home design and improvement field. These businesses can be found throughout the corridor, and compliment the Home Depot store as more individualized shopping experiences.

## VISUAL ASSESSMENT

In order to assess the aesthetic quality of the corridor, it is helpful to view the roadway in three distinct character segments. The Flatbush character segment begins at the Hartford city line in the north and ends at Jefferson Avenue in the south. The West Hartford Place character segment continues from Jefferson Avenue south to Talcott Road, and the Elmwood character segment encompasses the southern portion of the corridor from Talcott Road to New Britain Avenue.

Each character segment was qualitatively and quantitatively assessed in terms of aesthetic and design character. The data gathered provide a conscious and or subconscious image of the area about which a perception is formulated. A space which achieves the finest of these qualities will exhibit a uniquely recognizable sense of place. The visual assessment of this corridor is limited to what the driver or the pedestrian on New Park Avenue actually sees.

The Flatbush character segment exhibits strong aesthetic elements in the consistent and updated traffic signal

appurtenances, retail businesses built close to the roadway, and the newly developed Flatbush CTfastrak stop. The Flatbush character segment has weak aesthetic elements in the wide roadway sections with the narrow sidewalks and buffers and the notable unused and underused large buildings.

The West Hartford Place character segment displays strong aesthetic elements in its large open green spaces, the small businesses located in the area between Jefferson Avenue and Darcy Street, and the wide buffer with street trees between the roadway and the sidewalk. The weaker aesthetic elements exhibited in the character segment include large “big box” retail stores, barbed wire fence immediately adjacent to the sidewalk as well as inconsistency and outdated signal appurtenances.

The Elmwood character section exhibits strong aesthetic elements in the Trout Brook and Trout Brook Trail to the west of the corridor, the outdoor patio seating at the Corner Pug restaurant and at the newly constructed Elmwood CTfastrak station. The segment displays weaker aesthetic elements in the overhead power lines and the large existing undeveloped or underdeveloped properties.

## CRASH DATA

Data from the most recent three years of crash history of the corridor was provided by the West Hartford Police Department and was reviewed for any abnormal type or frequency. Table 1 summarizes the number of crashes experienced at each distinct location on the corridor.

**Table 1: Crash Data**

Roadway Segment/Intersection	2013	2014	2015	Total
Prospect Avenue/Layton Street	6	4	1	11
Foley Street	5	8	13	26
Flatbush Avenue	9	5	10	24
Jefferson Avenue/Darcy Street	9	15	10	34
Home Depot/BJ's Parking Lot	11	13	8	32
Oakwood Avenue	3	4	4	11
Talcott Road	5	4	10	19
Between Talcott Road/New Britain Avenue	14	9	7	30
New Britain Avenue	5	5	10	20
<b>Total</b>	<b>67</b>	<b>67</b>	<b>73</b>	<b>207</b>

The number of crashes experienced in the Home Depot and BJ's parking lot includes one crash experienced at the West Hartford Place driveway intersection with New Park Avenue. The remaining 31 were all reported in the parking lot and the majority involved a backing vehicle.

In the southern section of the corridor, between Talcott Road and New Britain Avenue, a high percentage of the crashes reported were rear-end type crashes. This type of crash is often found more frequently on roadways with relatively high speeds and vehicles slowing to a near stop in order to make a right turn movement. Excessive access points being provided along a roadway can exacerbate this type of crash condition.

The crashes reported are not of a type or frequency uncommon to a roadway of similar character and volume to New Park Avenue.

## **ACCESS MANAGEMENT**

Access management represents a process which allows for safe and efficient access from private properties along a given roadway by minimizing the number and size of conflict points, therefore ensuring the safety of drivers utilizing the roadway. The process balances the needs of property owners to have sufficient access for residents and customers with those of through trips, for which frequent conflict points result in a decrease in efficiency and safety.

As a whole, New Park Avenue has frequent curb cuts due to the large number of commercial and private properties that are accommodated by the Home Design District as well as the many other retail establishments on the corridor. This scenario creates an excessive amount of conflict points along the roadway. In order to minimize these conflict points and better manage the balance between access and mobility along the corridor, a number of access points have been identified as redundant and are proposed to be eliminated. They are identified on concept drawings with a circled “X”.

## **PEDESTRIAN FACILITIES**

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

At the outset of the corridor study, a field assessment of the existence and condition of sidewalk material was conducted and presence of landscaping was noted with the intent of later recommending appropriate facilities for New Park Avenue. Sidewalks are present along the entire length of roadway but consist of a combination of brick, concrete, and asphalt sections that vary in width and condition. Many of these sections are becoming overtaken with vegetation and are adjacent to the edge of pavement creating an unsafe environment for New Park Avenue’s travelers. Also, little streetscaping exists along the corridor by means of landscaping or green space between the roadway and buildings.



In addition, a number of intersections are lacking in pedestrian amenities, including accessible ramps, pedestrian countdown timers, and sidewalk connections. At the intersection of New Park Avenue and Talcott Road painted crosswalks are available for pedestrian use; however there is no pedestrian detection and no dedicated pedestrian phase for the traffic signal to permit a crossing.

## **BICYCLE FACILITIES**

Cycling is commonly comparable to walking as an inexpensive way to get from one place to another. Providing the speed of two wheels and the ease of a childhood skill, riding a bicycle is a convenient method of transportation that is both healthy and environmentally friendly. Sharing many of the aforementioned pedestrian accommodations, bicycle facilities are a crucial aspect of the complete streets experience.

West Hartford is fortunate to have Trout Brook Trail as part of their long-term greenway project. The greenway is popular with bicycle commuters as well as recreational cyclists and joggers. Weekends see especially heavy use of the trail's 1.7 miles, however users often avoid the southern ending of the path at New Park Avenue due to the lack of crosswalk or other facility that would grant cyclists safe access to this section of the corridor or the continuation of the bike facilities to the north and south of New Park Avenue. This disconnect leaves riders with the less than desirable options of riding on sidewalks, joining the traffic on the roadway or crossing the four lanes of vehicular traffic.

Furthermore, the corridor of New Park Avenue lacks any bicycle facilities, including but not limited to road shoulders, bike lanes, shared lanes, pavement markings, bicycle sensitive traffic signals, and bike parking amenities. As a major commercial route in the Home Design District of West Hartford these facilities have the potential to create a safe and enjoyable riding experience for all roadway users.

To the north, New Park Avenue in Hartford provides striped bicycle lanes in the northbound and southbound directions, and to the south a multiuse trail has been constructed along the CTfastrak busway beginning at the Newington Junction Station stop.

## **TRANSIT FACILITIES & SERVICE**

Approximately one third of the general populace does not possess a driver's license for age, health, financial, legal, or other reasons. To maintain independence and equity among citizens, it is important to facilitate alternative modes of travel beyond a personal vehicle, especially in geographies with dispersed origins and destinations. It is particularly significant that some form of public transportation is available to connect people and places that cannot be easily reached via walking or cycling.

Hartford is an example of a place that historically has not been easily accessible to all residents of the New Park Avenue area however in recent years CT DOT implemented the state's first bus rapid transit system, CTfastrak. This integrated bus system utilizes dedicated roadways for the entirety of their trips throughout many of the Hartford suburbs into the capital city.

New Park Avenue recently opened two CTfastrak access points, the Elmwood Station at the southern section of the corridor and the Flatbush Station towards the northern limit of the corridor. These stations are compliant with the Americans with Disabilities Act and provide many pedestrian friendly amenities. However neither station provides bicycle parking facilities and has limited vehicle parking spaces based on the daily ridership experienced by the transit system.

The corridor is also accessible via CTransit to aid the local community in their travels. This is another form of bus service that is owned and operated by CT DOT to serve Hartford and its metropolitan area. CTransit Hartford operates over thirty local and twelve express bus routes between five and seven days per week. These buses travel along the shared roadways traveling between twenty six towns in the capital region.

CTransit Route 153 can be accessed at two locations on New Park Avenue, the Flatbush Avenue Station, and the West Hartford Place Station. Both of these stations are sidewalk stops that provide shelter to riders who wait for the shuttles. Pedestrians are accommodated with ample sidewalk space, adequate lighting as well as a crosswalk and pedestrian friendly signal at the Flatbush Avenue intersection with New Park Avenue. These buses are also equipped with bike racks on their exterior to accommodate cyclists as well as the traveling pedestrian.

## ROADWAY INVENTORY

The New Park Avenue corridor spans 1.07 miles from the New Britain Avenue intersection in the southwest to the Hartford city line in the northeast. The corridor is comprised of six signalized intersections and four unsignalized intersections of Town owned roadways with New Park Avenue.

The signalized intersection of Prospect Street and New Park Avenue provides northeast and southwestbound approaches on New Park Avenue, a southbound approach on Prospect Street, and a westbound approach from the 430 New Park Avenue driveway. Layton Street also intersects with New Park Avenue immediately south of Prospect Street, however it only provides a travel lane in the westbound direction, away from the intersection. As such, it is not affected by the signalization.

The northeastbound New Park Avenue approach provides a combined left turn/through lane and a combined right turn/through lane and the southwestbound New Park Avenue approach provides a combined left turn/through lane and a channelized right turn lane onto Prospect Avenue. The southbound Prospect Avenue approach provides two right turn



Elmwood Section Northbound

lanes, which operate in essence as through lanes, and one left turn lane with 50 feet of vehicle storage capacity. The posted speed limit on Prospect Avenue is 30 miles per hour and the posted speed limit on New Park Avenue is 35 miles per hour.

The unsignalized intersection of Foley Street and New Park Avenue provides northeastbound and southwestbound approaches on New Park Avenue and an eastbound approach on Foley Street. The New Park Avenue approaches both provide two travel lanes in each direction while the Foley Street approach provides one lane. While a fourth leg to this intersection is not located directly across New Park Avenue from Foley Street, access driveways to West Hartford Wine & Liquor and Dunkin' Donuts are located within 20 feet to the north and south, respectively.

The signalized intersection of Flatbush Avenue and New Park Avenue provides northeastbound and southwestbound approaches on New Park Avenue and eastbound and westbound approaches on Flatbush Avenue. The northeastbound and southwestbound New Park Avenue approaches each provide through & through/right and a dedicated left turn lane. The northeastbound left turn lane provides a storage length of 160 feet and the southwestbound left turn lane provides approximately 230 feet of storage length.

The westbound Flatbush Avenue approach provides dedicated left turn, through, and right turn lanes, while the eastbound Flatbush Avenue approach provides a left turn lane with 50 feet of storage capacity as well as a through lane and a combined through/right turn lane. The posted speed limit on Flatbush Avenue is 25 miles per hour.

Darcy Street and Jefferson Avenue connect to each other and do not provide through access to any other roadways from New Park Avenue. Each intersects with New Park Avenue at an unsignalized intersection and each provides a one lane



eastbound approach to the intersection. Dedicated left turn lanes are provided on the New Park Avenue northeastbound approach to each intersection with 50 feet of vehicle storage at Jefferson Avenue and 130 feet of storage at Darcy Street. Both roadways intersect with New Park Avenue opposite an access driveway to the Raymour & Flanigan Furniture/ Appletree parking lot.

The sole access driveway to the BJ's Wholesale Club/Home Depot/ALDI development, sometimes referred to as West Hartford Place, meets New Park Avenue across from the southern Raymour & Flanigan/Coastal Tool driveway at a signalized intersection. The northeastbound New Park Avenue approach provides a left turn lane with 300 feet of storage capacity as well as a through lane and a shared through/right turn lane. The southeastbound New Park Avenue approach provides a dedicated left turn lane with approximately 200 feet of storage capacity, a dedicated right turn lane with approximately 250 feet of storage capacity as well as two dedicated through lanes.

The eastbound approach on West Hartford Place provides a left turn lane, a combined left turn/through lane and a right turn lane. The westbound driveway provides a one lane approach to the intersection with no turning restrictions.

The signalized intersection of Oakwood Avenue and the Colt's Manufacturing Company driveway with New Park Avenue provides northeastbound and southwestbound approaches on New Park Avenue, a northbound approach on Oakwood Avenue and an eastbound approach on the Colt driveway. The northeastbound approach provides a combined left turn/through lane and a combined through/right turn lane while the southwestbound approach provides a left turn lane, a through lane and a combined through/right turn lane.

The northbound Oakwood Avenue approach provides two striped lanes without lane markings which typically function as an exclusive right turn lane and a shared left turn/through lane. The eastbound approach from the Colt driveway provides one lane of travel with no turning restrictions. The posted speed limit on Oakwood Avenue is 25 miles per hour. It should be noted that a northern portion of Oakwood Avenue also exists, running north from Flatbush Avenue to Park Road, however the section between Flatbush Avenue and New Park Avenue has been discontinued.

The signalized intersection of Talcott Road and New Park Avenue provides northeastbound and southwestbound approaches on New Park Avenue and an eastbound approach on Talcott Road. An access driveway to the Kelly's Salon & Spa property provides a fourth leg to this intersection, however is not controlled by the signal. The northeastbound approach provides a shared left turn/through lane and a dedicated through lane while the southwestbound approach provides a dedicated right turn lane and two through lanes. The eastbound approach provides dedicated left and right turn lanes. The posted speed limit on Talcott Road is 30 miles per hour, and for 700 feet on the western end of the roadway the travel lanes are separate by a planted median measuring 20 feet in width. Gaps in the median are provided to allow access to the Colt Manufacturing Company's access driveways.

The signalized intersection of New Britain Avenue, New Park Avenue and Railroad Place provides northwestbound and southeastbound approaches on New Britain Avenue, a southwestbound approach on New Park Avenue, and a northeastbound approach on Railroad Place offset approximately 65 feet southwest of New Park Avenue. Railroad Place provides no through access to any other Town owned roadways.

The southwestbound New Park Avenue approach provides a dedicated left turn lane and a shared left/right turn lane. The southeastbound New Britain Avenue approach provides a dedicated left turn lane and two through lanes, while the northwestbound approach provides a dedicated right turn lane and two through lanes. The Railroad Place approach provides a one lane approach and is controlled by the signal operations. The posted speed limit on New Britain Avenue is 35 miles per hour.

## TRAFFIC ANALYSIS

Turning movement counts were conducted on Thursday March 31, 2016 from 7:00 a.m. until 9:00 a.m. and from 4:00 p.m. until 6:00 p.m. in order to capture the weekday peak hour volumes, and on Saturday April 2, 2016 from 11:00 a.m. until 1:00 p.m. to capture the peak weekend traffic volume. The peak hours of traffic were identified to be 7:45 a.m. until 8:45 a.m. during the weekday morning, 4:30 p.m. until 5:30 p.m. during the weekday afternoon, and 12:00 p.m. until 1:00 p.m. on Saturdays.

These volumes were analyzed in the existing condition, and then sent to the CTDOT Planning Bureau to be grown to the expected conditions of the year 2030, based on background traffic growth and all other traffic generating developments currently planned for the area. All proposed Alternative roadway configurations were analyzed under these 2030 conditions.

Capacity and Queue analyses for the signalized study intersections were conducted using Synchro Professional Software, version 9.0.

## CAPACITY ANALYSIS

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

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

LOS is a measure of the delay experienced by stopped vehicles at an intersection. LOS is rated on a scale from A to F, with A describing a condition of very low delay (less than 10 seconds per vehicle), and F describing a condition where delays will exceed 80 seconds per vehicle for signalized intersections. Control delay is the difference between the travel time that would have occurred in the absence of the intersection control and the travel time that results because of the presence on the intersection control.

These definitions for v/c ratio and LOS, as well as the methodology for conducting signalized intersection capacity analyses, are taken from the “2000 Highway Capacity Manual” published by the Transportation Research Board.



586 New Park Avenue - Looking South

Appendix D presents a summary of the levels of service at the following intersections with New Park Avenue:

- Prospect Avenue
- Flatbush Avenue
- West Hartford Place/Raymour & Flanigan Furniture Driveway
- Oakwood Avenue/Colt's Manufacturing Company Driveway
- Talcott Road
- New Britain Avenue/Railroad Place

Copies of the analysis worksheets for the morning and afternoon peak hours are attached as Appendix E. For analysis purposes, the New Park Avenue approaches are referred to as northbound and southbound and the side street approaches are typically referred to as eastbound and westbound. The volumes used for these analyses were primarily collected on Thursday, March 31, 2016 and Saturday, April 2, 2016. Those counts, as well as a figure depicting a summary of the existing condition volumes, are attached as Appendix A.

The intersections of New Park Avenue at Talcott Road, Oakwood Avenue, West Hartford Place and Prospect Avenue all operate efficiently at LOS B or LOS A in the weekday morning, weekday afternoon and Saturday peak hours. The intersection of New Britain Avenue and New Park Avenue operates acceptably at LOS D during the weekday morning and afternoon peak hours and at LOS C during the Saturday peak hour. The intersection of Flatbush Avenue and New Park Avenue operates poorly at LOS E during the weekday morning and Saturday peak hours, and at LOS D during the weekday afternoon peak hour.

## QUEUE ANALYSIS

Background and Combined Condition 95th percentile (design) queue lengths were reviewed at each intersection in the study area. The 95th percentile (design) vehicle queue lengths represent the maximum queue lengths that can be expected at each of the critical approach lanes of the study area intersections. The queue lengths are provided in the Synchro analysis worksheets in Appendix E. Additionally, Appendix D provides a summary of the queue lengths for the critical lanes at each intersection in the study.

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

- Eastbound left turn lane at the intersection of New Britain Avenue and New Park Avenue during all peak hours.
- Westbound through movement at the intersection of New Britain Avenue and New Park Avenue during the weekday afternoon and Saturday peak hours.
- Westbound left/through movement at the intersection of the New Park Avenue and Oakwood Avenue/Colt Driveway during the weekday afternoon peak hour.
- Eastbound left turn movement at the intersection of New Park Avenue and West Hartford Place during the Saturday peak hour.
- Eastbound through movement at the intersection of New Park Avenue and West Hartford Place during the weekday afternoon and Saturday peak hour.
- Northbound left turn movement at the intersection of New Park Avenue and West Hartford Place during the Saturday peak hour.
- Westbound through movement at the intersection of New Park Avenue and Flatbush Avenue during the weekday afternoon peak hour.
- Northbound left turn and southbound left/through movements at the intersection of New Park Avenue and Flatbush Avenue during the afternoon and Saturday peak hours.
- Northbound through/right turn and southbound left turn movements at the intersection of New Park Avenue and Flatbush Avenue during all peak hours.



## Chapter 2 - Preliminary Alternatives

This chapter will serve to introduce the technical efforts related to the development of the preliminary alternatives for improvements for Complete Streets design and facilitating Transit Oriented Development.



New Park Avenue and Surrounding Street Network

### PUBLIC OUTREACH EFFORTS

Public participation in this study has been vital to its success. Outreach to a diverse group of key stakeholders has aided in creating suggestions which will resonate with pedestrians, cyclists, motorists, and transit riders as the study progresses. Representative stakeholder groups include, but are not limited to, town officials, the Elmwood Business Association, Home Design District Association, business owners, community interest groups, West Hartford Bicycle Advisory Committee, emergency service personnel, residents, school community personnel, CTfastrak personnel, CTtransit personnel, and other stakeholders in the community.

The goal of the public involvement effort has been to provide accurate information about the study to the public and facilitate proactive public participation. This has been undertaken with the overarching purpose of achieving a consensus among the diverse groups of patrons regarding the development of Complete Streets alternatives, especially in the area of the two CTfastrak stations, and potential Transit Oriented Development supportive updates to current zoning ordinances.

The specific methods of implemented public involvement are outlined as follows:

### Technical Advisory Committee Meetings

The Technical Advisory Committee (TAC) was selected to be a representative group of the key stakeholders and members of the community with knowledge of the corridor and other planning studies in the area. The TAC convened to meet with Fuss & O'Neill's transportation and planning staff throughout the study at strategically important points in order to provide guidance and direction while helping to identify significant issues to review. It was also the responsibility of the TAC to use their specialized knowledge to evaluate the progress of the study and make further suggestions to motivate the investigation in a forward direction. Meeting agendas and minutes for the TAC are provided in Appendix B.

### Pop-Up Kiosks

In the days preceding the public Planning and Design Workshops, Fuss and O'Neill's Transportation Engineer Matthew Skelly and the Town of West Hartford's Town Planner Todd Dumais organized pop-up kiosks at the CTfastrak stations in Elmwood and Flatbush to promote the workshops and initiate the public participation. At these pop-up kiosks, commuters were engaged in a dialogue about the New Park Avenue Corridor and the Town's planning efforts in the area. Flyers were handed out that described the schedule and methods of the workshops and how to get involved in the planning study. Links to the town website as well as the project's Facebook page were also included for the public's general knowledge. A copy of this flyer is provided in Appendix B.



Pop-Up Kiosk



Public involvement at the pop-up kiosks was a key feature of this study in part due to the generally industrial and commercial land use of the corridor. Property owners within the study area were notified of the public workshop, however given the current and historic land uses of the corridor, the number of residents is much lower that would be found in comparably sized areas of West Hartford. Also, given that one thrust of this study is a discussion of the most appropriate land uses for Transit Oriented Development, it was important to engage transit riders. Furthermore, these pop-up kiosks allowed for key observations regarding the habits of transit users; especially that commuter transit use appeared to correlate almost perfectly at these two stops with parking availability. In addition to commuter use, a significant number of transit users at the Flatbush station were observed to be utilizing the service to reach the Charter Oak Marketplace in Hartford.

## Planning and Design Workshop 1

Workshop 1 was the first of two major efforts to involve the general public in this study and gather input from each unique perspective. The objective of this studio-like gathering was to provide stakeholders with a background on the corridor itself along with information regarding the scope of work to be performed and a timeframe for that work to be completed. The group was introduced to the Fuss & O'Neill team and their qualifications to work on this project as well as the Town of West Hartford staff who initiated the project. With the stage set, the participants were broken up into groups to analyze the corridor's three established character sections: The Elmwood section, The West Hartford Place section, and The Flatbush section. The groups discussed how each member utilizes the particular character section and the challenges that they encounter in various areas. Each group had its own set of large format plans plotted to scale to draw on in order to identify what was liked and disliked about New Park Avenue, as well as sketch what features could be added to the corridor in the future to generally improve its utility.



Workshop 1 Discussion Groups

Gathering together at the end of the afternoon and evening sessions, the facilitator of each character section discussed the main concerns and ideas that were established throughout the session. The discussion points were recorded using flip charts to then be used in the development of the preliminary alternatives. This was a crucial phase to the public outreach of this study because the Fuss & O'Neill team had the opportunity to interact with the key stakeholders of this project and hear their concerns first hand. It was a chance to illustrate and analyze desirable changes and features that corridor travelers would like to see more of in the future. Copies of all workshop schedules, publications, posters, flyers, and data can be found in Appendix C.



Workshop 1 Presentation

## Survey

The survey consists of twelve simple, multiple choice questions that poll the uses of each participant as well as the concerns and desires for a better utilized New Park Avenue. The survey was published using SurveyMonkey® and a copy of all questions, along with the most recent results, are provided in Appendix B. An online survey was created in order to contact a more widespread and diverse population, especially those who may not have been able to attend a workshop.

As part of the public outreach effort of this study, the survey was developed to help further understand how the corridor operates today and how it could be improved for better connectivity and Transit Oriented Development in the future. The survey was linked from the Town of West Hartford's website as well as the project's Facebook page and remained active throughout the duration of the study.

Approximately 90 people participated in this survey, with the majority of those being people who live, work, shop, and/or exercise on New Park Avenue, thus visiting the corridor multiple times per week. Knowing how people use the corridor is a key component in understanding the existing culture in order to design for future uses. A large majority of people conveyed their desire to have more businesses along the corridor as well as better sidewalks. These desires synthesize with

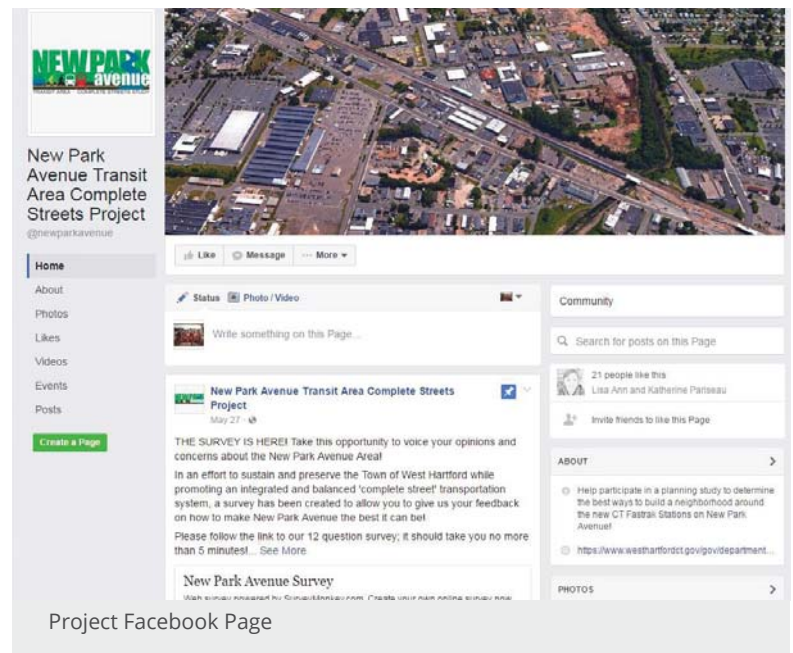


the TOD and Complete Streets methodologies that drive this study. Lastly, the biggest frustrations on New Park Avenue were conveyed as vehicles traveling too quickly, and the lack of diversity in the land uses. With all of the responses gathered and data collected this survey was a major success and aided in developing the key design features that will be presented to the public.

## Study Facebook Page

In order to extend the public outreach further and appeal to the increasingly large portion of society that responds to social media, a Facebook page was created for this project. This page is used as an environment to announce and share the successes of the workshop, publicize the aforementioned survey, as well as

communicate relevant mentions of New Park Avenue and its developments in other news mediums. The site has reached over two hundred people and is commonly used by residents to keep track of upcoming events that pertain to the study.



For many West Hartford residents, as well as people interested in transportation developments in the greater Hartford region, Facebook groups have become a prominent way to communicate quickly and effectively to a large number of people. Given the groundswells of interest that these Facebook groups can create, the project website was a crucial medium to receive feedback from the community and to keep stakeholders apprised of study landmarks and happenings.

## SAFETY CONSIDERATIONS

Improving safety is a paramount component of this project and it was an enormous concern brought to light by the participants in the public outreach efforts. The same message was heard many times from many different perspectives - that both pedestrians and cyclists are unable to feel safe navigating the corridor due to the speeds of vehicles and the quality or lack of bicycle and pedestrian facilities. Based on these responses, landscape architects and traffic engineers collaborated to arrive at solutions to make New Park Avenue safe for all of its users. These solutions fall into a number of different categories, detailed below.

### Lighting

Creating a well-lit area is important to the creating the feeling of safety for pedestrians and motorists alike. However, New Park Avenue currently only utilizes “vehicle-scale” lighting. This lighting is tall with widespread illumination so that cars can navigate the wide roadway at night. A more suitable replacement would be for “human-scale” lighting to be added to the current lighting scheme. This would be less intense and friendlier to the human eye, rather than bright fluorescents,

and would be designed for both pedestrians and motorists to utilize and enjoy along the corridor. Advances in lighting technology allow for lighting to be installed that is more appropriate for pedestrians as well as being bright enough for motorists, and is often paid for with grant funding. These state of the art lighting schemes also tend to cost less to upkeep and are more energy efficient.

## Utilities

Electrical and telephone lines can be a danger to pedestrians and motorists alike. Strong winds, ice, or a car crash all have the potential send these live wires to the ground creating life-threatening situations for any nonprofessional. Based on this hazard, the Town should work collaboratively with the utility company in moving these facilities underground. In addition to safety, this would greatly improve the aesthetics of the corridor as well as the lifespan of the cables. Without the telephone poles and power lines, New Park Avenue would appear less industrial and more inviting to pedestrians bicyclists, property owners, and potential new businesses. This suggestion comes directly from feedback received from the TAC, and while the cost may prove to be prohibitive in the short term, it is suggested for a long term improvement.

## Access Management

New Park Avenue as a whole has many access points, often referred to as “curb cuts”. The Elmwood and Flatbush sections have generally well controlled access management; however the central portion of the corridor is cluttered with redundant driveways and wide curb cuts that create an excessive number of conflict points. Within the preliminary alternatives described in this chapter, a number of these redundant access points will be eliminated.

Access management represents a process which allows for safe and efficient access from private properties along a roadway while minimizing the number and size of conflict points. The process balances the needs of property owners to have sufficient access for residents and customers with those of through trips, due to the fact that frequent conflict points result in a decrease in efficiency and safety. New Park Avenue is also not supported by an adjacent network of local roadways running north-south in the immediate vicinity, thus limiting the options for alternate property access.



New Park Avenue and Surrounding Street Network

## PRELIMINARY ALTERNATIVE OPTIONS

The following preliminary alternatives have been developed directly from the input received through the public outreach efforts completed throughout the early stages of this project. It is important to understand that no single alternative presented in this memo must stand alone; each one is intended to create options for New Park Avenue, so that pieces can be mixed and matched to create an ideal design for the future corridor. Conceptual illustrations of all alternatives can be found in Appendix A.

The core suggestions consistent among these alternatives include improved pedestrian and bicycle facilities as well as amendments to zoning regulations and enhanced streetscape elements in an effort to better establish a sense of place. While these suggestions may change between alternatives, the geometric suggestions at each intersection and the signal coordination of the corridor remain constant throughout. The following suggestions are common to alternatives 2, 3, and 4:

- The intersection of New Park Avenue and New Britain Avenue is proposed to taper down to one receiving lane northbound, heading into the study corridor. As both the New Britain Avenue westbound right turn and eastbound left turn movements provide one turning lane onto New Park Avenue, only one receiving lane can be utilized at a time. Therefore the secondary receiving lane could be removed without significantly impacting traffic flow.
- Additionally, the signal at the intersection of New Park Avenue and New Britain Avenue was excluded from any coordination efforts along the corridor for a number of reasons, most prominent of which being that it is already coordinated with other signals along New Britain Avenue to the east and west of New Park Avenue. Another reason is its distance from the other signalized intersections along the study corridor. The next closest signalized intersection on New Park Avenue is with Talcott Road, almost one-half mile away. This makes the signal at the intersection of New Park Avenue and New Britain Avenue an undesirable candidate to coordinate with the other five signals on New Park Avenue within the study limits. Additionally, the signal at the intersection of New Park Avenue and New Britain Avenue was excluded from any coordination efforts along the corridor for a number of reasons, most prominent of which being that it is already coordinated with other signals along New Britain Avenue to the east and west of New Park Avenue. Another reason is its distance from the other signalized intersections along the corridor. The next closest signalized intersection on New Park Avenue is with Talcott Road, almost one-half mile away. This makes the signal at the intersection of New Park Avenue and New Britain Avenue an undesirable candidate to coordinate with the other five signals within the study limits.
- The intersection of New Park Avenue and Talcott Road is suggested to be reduced from three southbound approach lanes to two, comprised of a dedicated right turn lane and a dedicated through lane. This reduction in lanes is suggested in order to accommodate the bicycle and pedestrian facilities depicted in the various preliminary alternatives. Even after optimizing the timing of the signal, this lane reduction creates a scenario of increased delay;

however the longer queue lengths can be accommodated in the proposed storage capacity and the increased delay is expected to lower vehicle speeds in the area which aids in creating the feeling of safety for pedestrians and bicyclists.

- The intersection of New Park Avenue and Oakwood Avenue is expected to experience an increase in capacity due to the coordination of the signals along the corridor, therefore allowing the reduction of a travel lane to accommodate the bicycle facilities while also improving the overall function of the intersection.
- The intersection of New Park Avenue and West Hartford Place is proposed to decrease from four southbound lanes to three, comprised of a through/left turn lane, a right turn lane, and a dedicated through/right turn lane, and a dedicated right turn lane. With the incorporation of improved signal coordination, the average delays to be experienced by motorists are only slightly increased as a result of this lane reduction.
- The geometry at the intersection of New Park Avenue and Flatbush Avenue is suggested to remain unchanged throughout all four of the suggested preliminary alternatives. After growing the traffic volumes to the design year 2030 and analyzing the traffic capacity, it was apparent that this intersection is likely to experience high levels of delay and would not as easily be able to accommodate any separated bicycle facilities. Therefore shared pavement markings (sharrows) may be incorporated into these travel lanes to provide connectivity north along the corridor to the bike lanes provided in Hartford while at the same time maintaining the flow of vehicle traffic.
- The intersection of New Park Avenue and Prospect Avenue is also suggested to remain unchanged in all four of the suggested preliminary alternatives. The Town of West Hartford recently made improvements to this intersection's southbound approach to accommodate two right turn lanes and the intersection has been operating efficiently. The sharrows may be carried through the travel lanes to match those installed at the intersection with Flatbush Avenue, should they be installed, in order to connect with the bike lanes just north across the town line in the City of Hartford.

Additionally, a main theme of all alternatives is the suggestion of a “road diet” concept. A road diet is a technique in transportation development that involves trimming down unnecessary or underutilized lanes of a roadway in order to make it narrower and provide more space in the right of way for complete streets features. This practice is used for traffic calming purposes as well as to provide a safe space for multiple modes of travel.





Elmwood CTfastrack Station Looking North

## Alternative 1

In this alternative, signal timings along New Park Avenue were adjusted to operate as a coordinated corridor. By coordinating the signal network, the phasing and timing of multiple intersections becomes synchronized to enhance the operation of the arterial flow of traffic. Through Synchro Professional Software, the five northern signals in the corridor were programmed to function as a coordinated unit to create a “green wave” that corresponds to the posted speed limit of 35 miles per hour. While operating as a coordinated unit, when a platoon of vehicles passes through a green light at the intersection of New Park Avenue and Prospect Avenue and travels at the posted speed limit south through the corridor, the majority of the time it would encounter a green light at every intersection without having to wait.

In Alternative 1, no geometric changes were made to the corridor to accompany this coordination of signals. The alternative was designed as a minimalistic scenario to alleviate vehicle congestion along the roadway, and will serve as a baseline for comparison to other alternative solutions.

## Alternative 2

For this alternative option, New Park Avenue is proposed to operate as a coordinated corridor while adopting a number of geometric changes to provide space in the roadway for complete streets accommodations. With the exclusion of a northbound travel lane at the intersection of New Park Avenue and New Britain Avenue, five on-street parking spaces have been added to the lower-Elmwood section of the corridor, approximately between the Corner Pug and the industrial access road on the west side of New Park Avenue. Shared lane markings (sharrows) were investigated as an option for bicycle user accommodations, but due to high volumes and speeds, they were deemed inappropriate.

North of the industrial access road, the southbound lanes narrow from two 10 foot lanes down to one lane with the addition of a crosswalk leading into a pocket park at the terminus of Trout Brook Trail. This pocket park serves as the beginning of the two-way separated bike lanes on the western, southbound side of New Park Avenue, providing one 5.5 foot lane in each direction and a two foot buffer. The buffer should have removable bollards to help promote the safety of bicyclists. These separated bike lanes serve to extend the Trout Brook Trail north onto New Park Avenue. Alongside these two-way separated bike lanes, approximately between New Park Commons and the intersection of New Park Avenue and Talcott Road, one 10 foot travel lane in each direction with an 11 foot two-way left turn lane (TWLTL) are proposed for vehicles to more easily access the commercial properties in this section of the corridor.

It should be noted that traffic signal modifications will be required at the signalized intersections of New Park Avenue at West Hartford Place and Talcott Road to provide for bicycle signals and phasing at the cycle track side street crossings. Provision of these dedicated signals will significantly reduce the potential for conflicts between bicyclists on the cycle track and vehicles turning on to the side streets from New Park Avenue.

New Park Avenue is proposed to have two travel lanes in each direction between its intersection with Talcott Road and West Hartford Place. North of the intersection with West Hartford Place, the two-way separated bike lanes depart from the New Park Avenue roadway section at another pocket park. This pocket park is expressly placed so that the two-way separated bike lanes could potentially run east and meet with Oakwood Avenue and continue towards Charter Oak Academy at a later phase of the project. A partial visual representation of this preliminary alternative is shown below, illustrating the pocket park at the current terminus of the Trout Brook Trail and the TWLTL beginning at the Hartford baking, Co.; the full corridor plan is referenced in Appendix C.

### Alternative 3

This alternative option is similar to Alternative 2; however, instead of having two-way separated bike lanes, this option consists of one-way separated bike lanes on either side of the street corresponding to the flow of traffic. Each bike lane is 4.5 feet wide with a two foot buffer separating it from traffic. This alternative also incorporates smaller pocket parks at both the Trout Brook Trail and West Hartford Place. A partial visual representation of this preliminary alternative is shown below; the full corridor plan is referenced in Figure 2 of Appendix C.



Inset of Alternative 3

## Alternative 4

This preliminary option is also similar to Alternative 2; however, the TWLTL between the Trout Brook Trail and Talcott Road is constructed as a colored, textured center lane and also incorporates sections of a raised median with built planters in areas where left turns are not needed. This alternative utilizes the same one-way separated bike lanes and smaller pocket parks as Alternative 3. A partial visual representation of this preliminary alternative is shown below; the full corridor plan is referenced in Appendix C.



Inset of Alternative 4

## Chapter 3 - Evaluation of Preliminary Alternatives

This chapter will serve to evaluate the suitability of each alternative as it relates to Complete Streets design, facilitating Transit Oriented Development, and maintaining existing traffic flow.



Trout Brook Trail

### TRAFFIC ANALYSIS

The existing traffic volumes discussed in Chapter 1, were submitted to the Connecticut Department of Transportation (CTDOT) Planning Division who projected the counts to the 2030 design year. The future volumes provided by the State consider all pertinent land development plans in the area as well as any known construction projects that would divert



additional trips onto New Park Avenue during the time frame. This volume data is presented in Appendix A. All capacity analyses for the signalized study intersections were conducted using Synchro Professional Software, version 9.0, and copies of the analysis worksheets for all peak hours analyzed have been attached as Appendix E.

It should be noted that Alternatives 3 and 4 have essentially the same traffic operations. The main difference between the two options is the two-way left turn lane (TWLTL); Alternative 3 illustrates a paved two-way left turn lane while Alternative 4 provides the same space for a TWLTL, however between the Trout Brook Trail and Talcott Road this lane is constructed as a colored, textured center lane and also incorporates sections of a raised median with built planters in areas where left turns are not needed. While the two options would vary slightly in terms of available turning area in certain locations, the traffic operations for the intersections analyzed are nearly identical. Given this similarity, the following analysis, tables, and Synchro reports are not duplicated for these two alternatives.

## Capacity Analysis

In discussing intersection capacity analyses results, two terms are used to describe the operating condition of the road or intersection. These two terms are volume to capacity (v/c) ratio and level of service (LOS). The v/c ratio is a ratio of the volume of traffic using an intersection to the maximum number of vehicles that can utilize the intersection during an hour (its capacity). The v/c ratio can be used to describe the percentage of capacity utilized by a single intersection movement, a combination of movements, an entire intersection approach, or the intersection as a whole. LOS is a measure of the delay experienced by stopped vehicles at an intersection. LOS is rated on a scale from A to F, with A describing a condition of very low delay (less than 10 seconds per vehicle), and F describing a condition where delays will exceed 80 seconds per vehicle for signalized intersections.

Utilizing this methodology, the traffic data provided, and the current geometry of the corridor, the six signalized intersections within the study area are expected to experience an increase in the v/c ratio during the weekday morning, afternoon, and Saturday peak hours when traffic volumes are projected into 2030. This increase in traffic volume is primarily based on CTDOT's expectation that the number of residents in West Hartford, generally, and the number of vehicles accessing New Park Avenue will both increase in the referenced fourteen year time span.

However, not all study area intersections experience degradation in level of service when analyzed with projected 2030 traffic volumes. While the intersection of New Park Avenue and Talcott Road does have an increased v/c ratio, it remains at LOS B in all peak hours for Alternative 1. Similarly, the intersection of New Park Avenue and West Hartford Place will remain at LOS B in the weekday morning and afternoon peak hours and LOS C in the Saturday peak hour with the projected 2030 traffic volumes.

The analysis of 2030 volumes using the current geometry of New Park Avenue provides a base for comparison when evaluating the preliminary alternatives. For example, when compared to the 2030 condition, Alternative 1 performs best

overall for the intersections of Talcott Road and Oakwood Avenue with New Park Avenue; while Alternatives 3 & 4 perform best overall during the weekday morning peak hour at New Britain Avenue and West Hartford place. Either of these scenarios can be attributed to the design features of each alternative as well as their respective volumes through the corridor during that time of day. New Park Avenue functions generally as a commuter roadway during the week, with the majority of the volume heading north toward Hartford during the morning peak hour, and the majority of volume heading south, away from Hartford, during the afternoon peak hour. This switch in the directional volume means that left turns onto Talcott Road, for example, would be easier to make during the morning peak hour when less opposing traffic is present.

When comparing the four different Alternatives, traffic operations for the intersections of Flatbush Avenue and Prospect Avenue with New Park Avenue are identical. The only recommended changes to these signals are timing changes as network optimization indicated that the network functions better as a whole without these signals running in coordination with the remainder of the network. For the remainder of the network, Alternative 1 generally provides the lowest delay and volume to capacity ratios as compared to Alternatives 2 and 3 & 4. This bears out the current, auto-centric roadway configuration which favors convenience of the automobile users over comfort and safety of the bicycle and pedestrian roadway users.

Between Alternative 2 and Alternatives 3 & 4, Alternative 2 has lower delay at New Britain Avenue, which corresponds with the additional southbound lane of traffic in this Alternative, however the overall Level of Service is the same in both Alternatives. For the Talcott Road, Oakwood Avenue and New Park Avenue intersections, Alternatives 3 & 4 generally offer lower delay and volume to capacity ratios than Alternative 2. This can largely be attributed to the extra signal time required to provide a phase at each intersection for bicyclists in Alternative 2.

For an overview of the evaluation of each alternative, Table 1 of Appendix D has been provided as a summary of the level of service, v/c ratios, and overall delay times for all of the New Park Avenue study intersections. As shown in Table 1, Alternatives 3 and 4 provide the best traffic calming throughout the corridor, and represent the best application of good Complete Streets design principles.

## Queue Analysis

In addition to the capacity, the 95th percentile (design) queue lengths were also reviewed for each approach at each intersection in the study area under each of the alternatives. These queue lengths represent the maximum amount of queuing that can be expected at each of the critical approach lanes of the study area intersections during the peak hours analyzed. Tables 2-5 of Appendix D provide a summary of the expected queue lengths for each study intersection in each alternative.

Overall the queue lengths in the suggested alternatives have increased throughout the corridor when compared to the queue lengths of the projected 2030 traffic volumes. While remembering that the projected 2030 scenario has no geometric or signal timing adjustments, this escalation is due to the aforementioned probable increase of people living and traveling through West Hartford, particularly the New Park Avenue area. Additionally, Alternatives 2, 3 and 4 include facilities to accommodate pedestrians, cyclists, motorists, and transit riders which consequently decrease available lane space for vehicle traffic while creating a safe multi-modal environment for all to use. It is understood that with the installation and proper maintenance of the proposed facilities, the vehicular use on New Park Avenue will decrease over time and therefore the queue lengths will also decrease proportionally.



Flatbush CTfastrak Station Looking South

## PLANNING AND DESIGN WORKSHOP 2

Workshop 2 was the second of two public workshops conducted as a part of this study effort. Workshop 1 aimed to gain basic knowledge from the community that can only be acquired from daily use of the corridor. Using that information, a number of Alternatives were developed and those Alternatives were presented back to the community. Members of the study team explained Alternatives 1-4 and how they incorporated the input received at Workshop 1 that led to various design elements. Two presentations were made at Workshop 2, one in the afternoon and another in the evening on April

24, 2016. Over the course of the day, over 20 members of the public came and offered feedback on the Alternatives. Copies of all workshop publications, posters, and data can be found in Appendix B.

The attending public was briefed on each alternative, the design features, traffic analysis, and landscape design of each option, as well as the potential for adjustments that could be made to the Town Zoning Ordinance that could be adopted in order to compliment the roadway options and further enforce the new feel and functionality of the corridor. The presentation was then opened up for discussion of the alternatives and any additional questions were addressed. Large format plans plotted to scale were also provided around the room so that participants could examine the layouts up close and physically draw in any remaining desirable features not depicted on them. All discussion points were noted for future reference in the development process.

One key design element discussed at Workshop 2 was how the separated bike lanes would be divided from traffic. The design called for a 2 foot painted median strip between the bicycle lanes and the traveled way as a safe separation method between the two modes of transport. This application has been used successfully in many municipalities throughout the country. The desire for a vertical separating element within the two foot buffer was also expressed by the community and was included as part of all options with this buffer.

Another concept discussed in some detail during the open forum portion was the best way to incorporate Transit Oriented Development (TOD) along the corridor. In order to describe the shape of the corridor as it corresponds to TOD the analogy of a “barbell” was discussed to consider the two CTfastrak stations as hubs for TOD within a radius of approximately one-quarter mile. The space along the corridor in between the two ends of the barbell may be best served to continue its industrial and commercial uses while strengthening the multi-modal connectivity from Hartford moving south towards Elmwood as well as west towards West Hartford Center. The discussion also revealed that these TOD zones may create a natural incentive for developers, which will give the Town of West Hartford, and more importantly the New Park Avenue corridor a better opportunity to thrive economically.



Workshop 2 Presentation



Over the course of both Workshop 2 sessions, participants provided the most positive feedback about Alternative 3 and Alternative 4, both featuring separated bicycle lanes on each side of the roadway. The pocket parks at the Trout Brook Trail and leading up toward West Hartford Place were popular design features, providing users with a place to rest or leave their bicycles while patronizing local businesses. The TWLTL and planted median design features drew positive comments regarding alleviating congestion and weaving, as did the additional on-street parking in the Elmwood section of the corridor.

## DESIGN CHARACTERISTICS

Across the four developed Alternatives, many different design features exist that can be incorporated into the overall New Park Avenue redesign to promote an integrated balance of Complete Streets concepts while also promoting TOD and increasing regional connectivity through West Hartford.

One prominent design characteristic is the two-way left turn lane (TWLTL) that is incorporated into all three of the alternatives, shown in Figure 1 below. The TWLTL allows vehicles making a left turn to be safely removed from the flow of through traffic, resulting in less mainline queueing as vehicles wait for a break in oncoming traffic to proceed with the turning maneuver. The integration of this characteristic also necessitates the provision of one lane of traffic flowing in each direction, making left turns more manageable by only having one lane of oncoming traffic to cross. This design feature provides increased safety for motorists, transit riders, pedestrians and cyclists who utilize the roadway.



Another prominent design characteristic common to these alternatives is the dedicated bicycle accommodations that have been proposed. In Alternative 2, the two-way separated bike lanes provide one 5.5 foot lane in each direction and a two foot painted buffer separating the cyclists from the motorists. This spacing provides a feeling of safety for all users by allowing adequate space for two oncoming cyclists to pass as well as the southbound traffic flow on New Park Avenue to travel alongside with minimal interaction. In Alternatives 3 and 4, the one-way separated bike lanes are located on either side of the roadway with each lane providing a 4.5 foot bicycle lane and a two foot buffer space as separation from the vehicular traffic.



Two-Way Separated Bicycle Lane



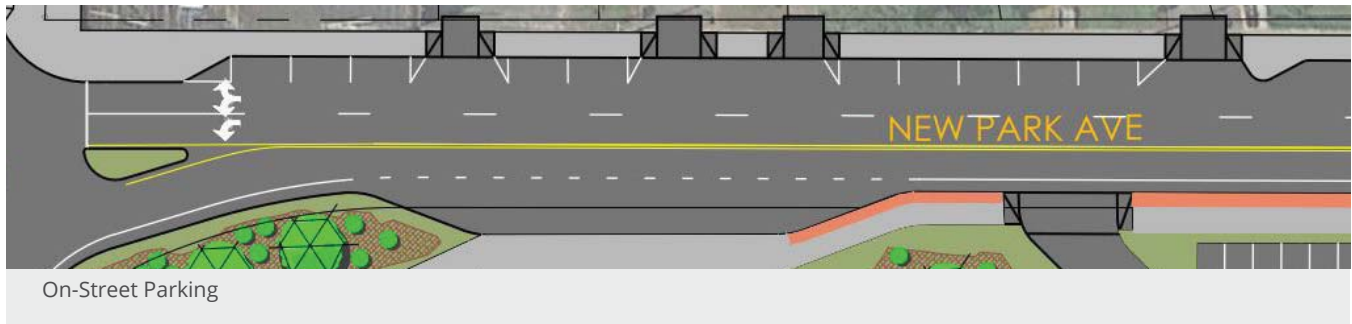
One-Way Separated Bicycle Lanes

A unique design characteristic suggested for this project is the construction of pocket parks in each of the three alternatives. These small landscaped spaces, shown in Figure 4, provide an identifiable point for the Trout Brook Trail to join New Park Avenue and continue north through West Hartford Place in a safe and aesthetically pleasing manner. Allowing pedestrians to sit and relax while walking along New Park Avenue while also providing a place for cyclists to park their bikes and enjoy the corridor on foot will put more feet on the street and promote a more balanced travel way. As part of the streetscape, pocket parks would also aid in establishing a sense of place along New Park Avenue and has the potential to be an exceptional defining element of the corridor.



Pocket Parks

Lastly, an important design characteristic depicted in Alternative 2, is on-street parking. This feature would provide more access to the Elmwood CTfastrak station as well as to the businesses along this southern section of New Park Avenue. This on-street parking could increase the economic viability of the Elmwood/New Park Avenue neighborhood and create a more desirable location for developers of mixed-use properties, which are an important aspect of Complete Streets and TOD.



The net result of this combination of suggested design features is an environment in which motorists will be more inclined to travel at the speed limit given the limited lane space and proximity to cyclists, therefore increasing the feeling of safety for both. These features will also aid in creating a balanced traffic flow throughout the corridor as well as bringing more attention to the Trout Brook Trail. These features also serve as a compliment to works of art that could be incorporated to the landscape surrounding the corridor to further enhance the aesthetics of the neighborhood, helping to establish New Park Avenue as a destination instead of a throughway.

## RIGHT OF WAY OPTIONS

The final design consideration reviewed as a part of this study pertained to the portion of the corridor between the curb and the limits of the right of way. This space is outside of the lines that the Town of West Hartford is permitted to develop. Additional work outside of the right of way may also have a positive effect on the corridor, but is covered by zoning recommendations rather than design considerations.

Beginning with the narrowest section of this roadside design, 5 feet of space outside of the curb could be redesigned. A 5 foot concrete sidewalk with human scale lighting has the potential to make an industrial corridor feel safer and easier to navigate. The sidewalk could also be split longitudinally; with the inside 2.5 feet being built of brick or stamped concrete while the outside 2.5 feet remains concrete. Another possibility in the latter scenario would be to have a 2 foot banding along the edge of the stamped concrete to match the banding at the CTfastrak station. This is a small feature that would help to establish a sense of place and belonging to the New Park Avenue corridor.

In areas where more space is found between the curb and the limits of the right of way, more options can be presented for redesign of the space. One of these options includes a 5 foot sidewalk with the inside or outside 2.5 feet being made up of a grass strip. This addition of green space not only provides a pleasant aesthetic, but also a permeable surface for rainwater runoff to aid in the management of stormwater. This green space is also usable for buffer plants or a small flowering tree. Adding vertical elements to a sidewalk landscape benefits the people on the sidewalk, motorists as well as the environment. People walking or biking along the roadway have some shade during the sunny summer months while the vertical elements help to focus motorists on the road ahead.

The more space that is available between the curb and the limit of the right of way, the more Complete Streets features can be incorporated into the New Park Avenue corridor design. These features are detailed, up to 15 feet within the right of way, in Appendix F, which also illustrates various streetscape options within the median of the TWLTL in Alternative 4.

## EVALUATION

While the design of the Alternatives allows for a large amount of mix and match between the different components, overall it is the recommendation of this study that Alternative 4 provides the most effective solution to the challenges faces by New Park Avenue. The buffered bicycle lanes accommodate the large and growing bicycle ridership in West Hartford, and help to provide a separation from traffic to pedestrians. The two-way combined bicycle lane configuration considered in Alternative 2 requires a separate bicycle phase at several intersections which degrades traffic capacity. The separated bicycle lanes allow traffic to continue to flow as it otherwise would.

The options considered south of the Trout Brook Trail should all continue to be considered as viable alternatives for this small but important segment. The on-street parking may be desirable to business owners and help to spur economic development, while the continued bicycle lanes provide safe and comfortable connectivity for bicyclists to and from New Britain Avenue and points south. Given the regional connectivity goals of this study, continued bicycle lanes are an appropriate choice for this area.



## Chapter 4 - Zoning & Conclusions

This Chapter will review the final elements of this study which come together to complete the picture of how the New Park Avenue corridor can best be utilized by the Town of West Hartford. Zoning considerations play a pivotal role in the type of development that will be planned for the corridor, and as such must be incorporated into the larger plan.

Additionally, a brief review of the best strategy for construction phasing and an opinion of overall cost of Alternative 4 will be discussed.

### TRANSIT ORIENTED DEVELOPMENT AND COMPLETE STREETS

Transit oriented development (TOD) is an approach for establishing specialized land uses around a transit station or transit corridor. TOD works best in a community where multiple modes of transportation are interconnected with various land uses, such as on New Park Avenue where the Trout Brook Trail and the newly incorporated CTfastrak stations compliment the many retail establishments already along the corridor as well as the residential neighborhoods that surround it. Some of the key components of this type of development style include land uses that facilitate compact, pedestrian oriented , mixed-use buildings that help create a sense of place, thus allowing people of all ages and abilities to live a convenient, active and affordable lifestyle.

This type of development is most effective within the impact zone, the approximate  $\frac{1}{4}$  -  $\frac{1}{2}$  mile radius around a transit station or stop where people are most likely to be traveling as a pedestrian or bicyclist around these various modes of transportation. Communities that incorporate TOD methodologies commonly have a high population density and establish flexible parking requirements around their multi-use buildings. These buildings typically have a greater floor to area ratio (FAR) through the efficient use of multiple stories and storefronts that face the sidewalk lined streets. Their parking and pedestrian accommodations are sufficient to meet the demands of this type of development.

These development patterns are often complemented by Complete Streets practices. Complete Streets is a design method that enables safe access to the roadway and its amenities to all travelers. The goal of this methodology is to facilitate the friendly environment for vehicles and bicycles to travel simultaneously while pedestrians can also enjoy the corridor with comfort and ease. Together these key concepts aid in creating a welcoming environment for people, regardless of their preferred mode of transportation, to travel around and through the Town of West Hartford.

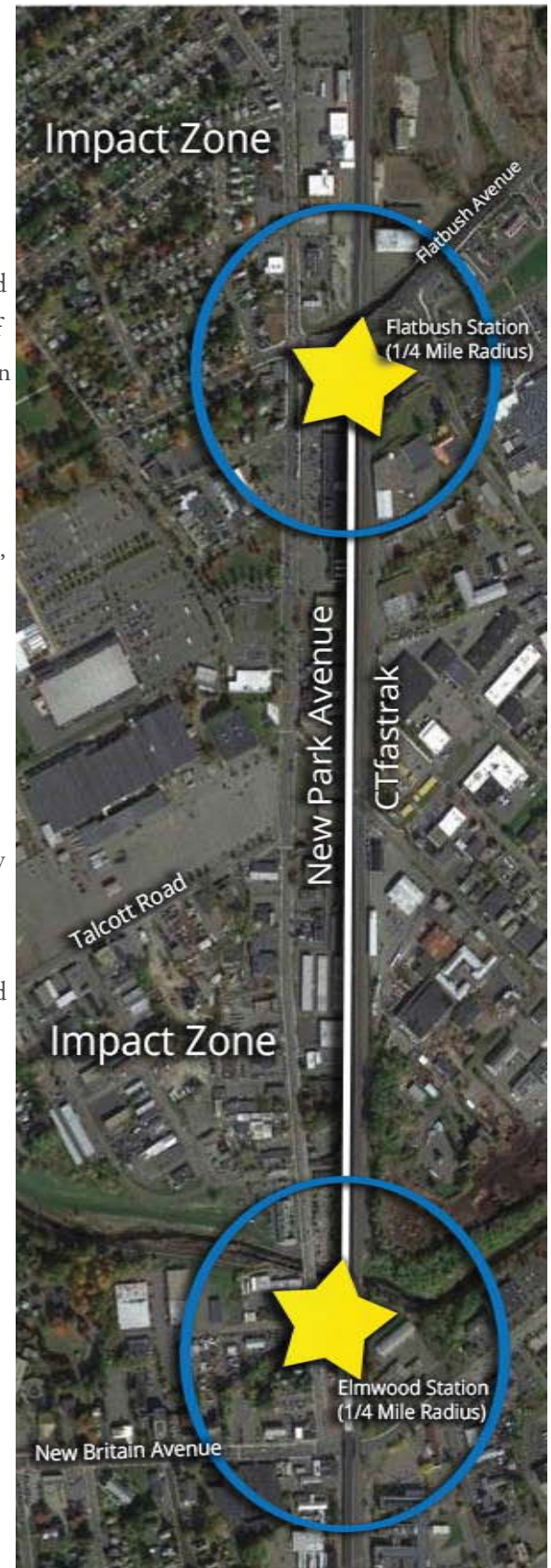
## ZONING

Zoning is a legal vehicle which insures a municipality's vision is implemented consistently over time. Historically the New Park Avenue corridor has been an industrial center of West Hartford, however, has transitioned to a more auto oriented and service retail environment over the past several decades. Development and redevelopment opportunities have been enhanced by the recent establishment of two CTfastrak stations, one each in the Elmwood and Flatbush areas. While it is assumed that the Town will want to retain much of its industrial base in this area, mixed use TOD patterns must also be an option for the corridor, particularly around the Elmwood station as an extension of the traditional center Elmwood neighborhood.

Currently the New Park Avenue corridor is zoned into three primary districts, the "General Industrial," the "Restricted Industrial," and the "General Business." In addition, there is the "Traditional Neighborhood Design District," an overlay zone at the southern end of the corridor, and the West Hartford Place "Special Development District" the encompasses the Home Depot, BJ's, Aldi and Chick-fil-a site. In all, these zones do not specifically encourage transit oriented development or public realm design and in many cases have standards, requirements and permitting processes that run contrary to this type of development and design pattern.

As the corridor has continued to transition into more auto-oriented retail and service, the current zoning districts and tools available within them, do not match the unique characteristics of the overall New Park Avenue Corridor.

The general approach to the potential redevelopment opportunities associated with the New Park Avenue corridor has been developed through a collaborative and public process. This approach seeks to allow Transit Oriented Development and public realm opportunities in an area approximately one quarter mile radius from the CTfastrak stations. This includes implementing public realm and streetscapes appropriate to the desired development patterns. Between the CTfastrak stations and generally beyond the walk radius there is a desire to maintain existing land uses and zoning to insure non TOD economic development opportunities, yet treat the streetscape in such a way as to maintain visual focus on the public realm



aesthetic and corridor consistency rather than parking lots and service areas generally associated with the more industrial uses. Potential TOD districts for the Flatbush and Elmwood station areas are illustrated to the right.

Implications to the New Park Avenue corridor of such patterns include but are not necessarily limited to:

- Build to lines
- Wide sidewalks and streetscaping
- Complete Streets approach to public realm corridors
- On street parking (wherever possible)
- Furniture zones
- Pedestrian activity / vitality

Given that there is now a more auto-oriented retail land use, zoning goals that support the New Park Avenue corridor economic development should include allowing TOD development opportunities to flourish, and to create an aesthetic commensurate with such development patterns throughout the corridor. The details of the recommendations should be vetted through additional study and public outreach. Preliminary recommendations include but are not necessarily limited to:

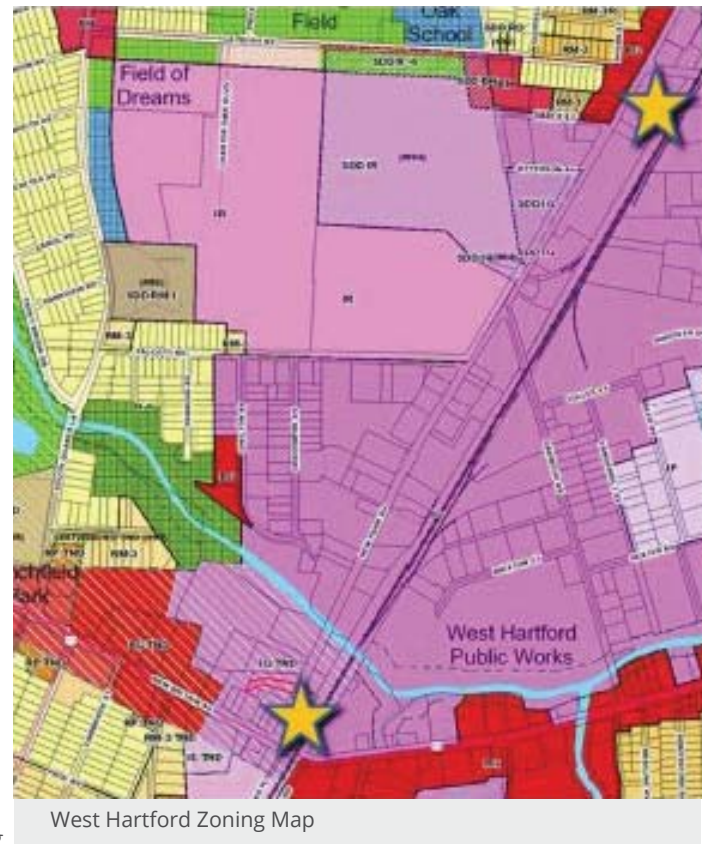
- Insure TOD typologies in TOD opportunity areas
  - Establish specific district boundaries
  - Develop district guidelines and bulk requirements
  - Provide use and building configuration flexibility for development outside the New Britain Avenue and New Park Avenue corridors
  - Create district wide parking plan
  - Promote parcel consolidation and cross parcel connectivity
  - Consideration of limited bonus incentives
- Maintain industrial / commercial opportunities in non-TOD areas
  - Develop street frontage guidelines

Zoning options that would support the above mentioned recommendations should be established as area specific tools. These tools should be implemented in either a short or long term time frame, depending on their approach and level of involvement with the community. The following are options for consideration, with the short term option listed first and the long term options to follow.

## SHORT TERM RECOMMENDATION

- **Minor modifications to underlying zoning text:**  
(Moderately prescriptive) A hybrid of the text amendment and guidelines approach, this zoning scenario would include minor text adjustments which would not adversely affect underlying zones but which would promote desired development and aesthetic patterns and goals. This option could also be tied by reference to a set of established design guidelines. (see discussion on Guidelines Approach below.) This option would not be TOD area specific; therefore the established text and guidelines would need to be applicable to a broader set of development scenarios and areas within the respective underlying zones.

- **Pros:** Easily established and little controversies as the underlying zones remain fundamentally unchanged.
- **Cons:** Additional care and study associated with the application of text amendments and referenced guidelines (if applicable) to other areas of the underlying zones. Similar to the guidelines approach, this scenario will not necessarily insure TOD or the New Park Avenue corridor aesthetic or development compatibility in TOD opportunity areas or along the mid-section of the corridor. Depending on level of modifications, this option would come close to the “Modify underlying zones” option.



## LONG TERM RECOMMENDATIONS

- **Guidelines Approach: (Least prescriptive)** This strategy would establish design guidelines and “recommended” bulk requirements in established TOD district areas and along the corridor in nondistrict areas. As this option is a guideline, techniques should be established to incentivize the use of the guidelines such as bonus densities, expedited permitting process etc. In this option, guidelines would be referenced within the underlying zones specific to the corridor areas.
- **Pros:** Guidelines are relatively easy to establish through a collaborative public process and are generally seen as less controversial as they are an “option” for development rather than a rezoning of property. Although guidelines tend to have less legislative control over development practices, they are very flexible with respect to accommodating a variety of redevelopment situations.
- **Cons:** Despite the aforementioned recommended incentives for use, the guidelines approach will not necessarily insure TOD or the New Park Avenue corridor aesthetic or development compatibility in TOD opportunity areas or along the mid-section of the corridor. Guidelines are legislatively more difficult to enforce.





TOD opportunity areas



1/4 mile walk from stations



Single use high density multifamily housing opportunities



#### New Park Ave Corridor Treatment A

- A. Establish Building wall - Build to lines
- B. Parking in rear
- C. Wide Sidewalks
- D. Ground floor retail uses on New Park and New Britain Ave. Mixed uses above.
- E. Min./Max. building heights
- F. Density bonus
- G. Shared parking
- H. Internal connectivity
- I. On street parking where possible



#### New Park Ave Corridor Treatment B

- J. Establish landscape wall
- K. Buffer parking
- L. Vertical Elements (trees, lights, etc.)



- **Establish overlay zone: (Moderately prescriptive)** This option is a combination of the guidelines approach and zone change. Overlay zones or districts may be optional or mandated. If mandated, this option fundamentally becomes a zone change (discussed below) or comprehensive underlying zone re-write. Normally these zones are “use optional” and incentivized. It would be a separate standalone zoning code. The overlay zone, unlike a “floating zone” would be prescriptive to a particular area such as the New Park Avenue corridor. Bulk requirements and uses are developed from community visioning and establish the requirements of the zone. Prospective development entities would have the option of using the overlay or the underlying zone however, incentives such as increased density and expedited permit processes often help sway the decision toward the optimal choice. It is similar to the guidelines approach but if selected as the preferred method it is more legally prescriptive than guidelines.
  - **Pros:** Creates a separate “overlay” zone with standalone zoning requirements and has no impact to underlying zoning and therefore potential land owner opposition would be mitigated. With appropriate incentives it will insure development and corridor aesthetic compatibility through zoning enforcement.
  - **Cons:** Provides the option to continue to use the underlying zone. This might not be a desirable outcome in certain areas. Incentives may be required.
  
- **Modifications to underlying zoning codes: (Most prescriptive)** Modifications would include text and bulk zoning requirements specific to designated districts within the underlying zones while preserving underlying zones in other areas of town. This is similar to the guidelines approach but provides greater and more specific control and mandates compatibility within the designated districts. It would be similar to an all-out zone change as this approach constitutes legislative compatibility without the option to utilize underlying zone regulations within the district. Recommendations could be made to increase density and FAR’s as well as update land use requirements. Certain land uses could also be restricted or a moratorium could be implemented as the Town sees fit. Caution should be taken in the development of the text. It is critical to provide the development community enough flexibility to meet market demands within the visionary guidelines established by the municipality. The town could miss opportunities associated with tightly restrictive bulk requirements that may not satisfy appropriate market conditions.
  - **Pros:** Insures development and corridor aesthetic compatibility through zoning compliance and enforcement.
  - **Cons:** Requires substantive text amendments to underlying zoning codes and greater care in the development of the regulations. There may also be controversy associated with district landowner’s unwillingness to place new or additional development restrictions on their properties. In addition, this scenario might preclude non TOD economic development opportunities in certain areas.

- **Zone Change: (Most prescriptive)** Self-explanatory; A new zone could be created from collaborative visioning and targeted properties are changed from their current underlying zone to the new zone.
  - **Pros:** Complete control and enforcement of desired development patterns and aesthetic goals.
  - **Cons:** No flexibility for underlying use opportunities and would likely be a sensitive subject with property owners within effected areas. Also creates an entirely new zone in town for a site specific areas.

While the above zoning approaches offer the Town of West Hartford a range of options and consequences, it is the recommendation of this study that based on the foregoing analysis, the most effective and achievable long term approach for the New Park Avenue corridor would be the “Establish Overlay Zone” option.

## CONSTRUCTION



### Phasing Plan

The construction effort for the recommendations made by this study can be largely broken down into two separate stages, which could be undertaken in either order: between the curbs and outside of the curbs. An important feature of the recommended improvement program is that existing curb locations are closely maintained along the majority of the corridor. Maintaining curb location not only minimizes impacts to adjacent properties but also allows for roadway improvements and sidewalk/landscaping improvements to be constructed independently.

The entire corridor provides enough curb to curb width to maintain at least one lane of traffic in each direction during roadway construction. The roadway recommendations will be achieved through a pavement mill and overlay. The new traffic patterns will essentially begin along a portion of the corridor during construction, as one lane of traffic in each direction will be maintained during construction.

Drainage structures should be adjusted as necessary prior to the milling/reclamation phase of the project. Any curbing requiring replacement should also be replaced before the top course of pavement is installed. New sidewalks, where required may be constructed on an independent timeline.

This project will likely require the full replacement of traffic signals at the intersections with Talcott Road, Oakwood Avenue, and West Hartford Place. New traffic signal appurtenances including controller foundations, pedestal and span pole foundations, conduits, and handholes should be coordinated with the sidewalk and curbing work. New traffic signals should be put in operation only after completion of the roadway work when the new lane arrangements and traffic patterns are in effect.

Given the implementation of new traffic patterns, it is recommended that roadway work takes place as continuously as possible and preferably in a south to north direction. Center medians in the southern portion of the study area should



be installed along with any other new curbing. Landscaping elements, both in the center medians and along the roadway edge, roadside furniture, way-finding signage and roadside artwork should be installed after curbing and sidewalk. The final construction tasks required include installation of the top course of bituminous concrete and final line striping.

### **Preliminary Order of Magnitude Opinion of Cost**

Based on the improvements to New Park Avenue detailed in this report, it is assumed that all pavement restoration is to be done as a four inch mill and overlay. Considering the aforementioned improvements, a full depth reconstruction will not be required. This improvement will take place on the sections of New Park Avenue between New Britain Avenue and Darcy Street, as well as between Foley Street and Layton Street.

It was determined that the curbing along New Park Avenue is granite stone curbing, with the majority of it being in good condition. A further study should be conducted to determine the suitability of the curbing on a piece-by-piece basis. It is assumed that post roadway reconstruction, 90% of the original curbing will be reset while 10% will need to be replaced. A value was not quantified for the amount of curbing required for the islands within the TWLTL. Therefore, it is considered part of the 25% contingency for minor items which can be referenced on Line B of the work estimate provided on page 46.

Similar to the curbing, the sidewalk does not all need to be replaced. There are several sections that are in good condition and will be able to be preserved through construction. Examples of these sections include in front of New Park Commons, as well as along the Colt property north to the West Hartford Place driveway. Further investigation should be conducted to determine the preservation status of the sidewalk on a piece-by-piece basis.

Some further assumptions were made when determining the percentage allowances that compose the sum shown as Line D of the work estimate provided on page 46. Considering New Park Avenue is an existing roadway in a well-developed area it is unlikely that there will be extensive clearing and grubbing or grading that will need to be done. For this reason, the “Clearing and Grubbing” and “Earthwork” items are shown at their minimum percentage. The cost for drainage was assumed at 2% to include the replacement tops and grates that will most likely be needed for the multitude of catch basins and manholes throughout the length of roadway. Landscaping was taken as a higher percentage due to the increased amount of street trees and park area that will be incorporated into the new and improved New Park Avenue. “Maintenance and Protection of Traffic”, “Mobilization” and “Construction Staking” are all standard items when reconstructing a roadway therefore median percentages were applied as placeholders until the design moves forward and more accurate estimates can be made.

Construction Cost Estimate | LOTCIP Application  
New Park Avenue Transit Area Complete Streets Study, West Hartford

Major and Minor Contract Items

Item No.	Item	Unit	Quantity	Unit \$	Total Cost
0202513	REMOVAL OF CONCRETE SIDEWALK	s.y.	2348	\$ 15.00	\$ 35,220.00
0202529	CUT BITUMINOUS CONCRETE PAVEMENT	l.f.	450	\$ 4.00	\$ 1,800.00
0406171	HMA S0.5	ton	6450	\$ 106.00	\$ 683,700.00
0406236	MATERIAL FOR TACK COAT	gal	2805	\$ 2.00	\$ 5,610.00
0601020	STAMPED CONCRETE	s.f.	12900	\$ 20.00	\$ 258,000.00
0813021	6" GRANITE STONE CURBING	l.f.	1000	\$ 55.00	\$ 55,000.00
081400	RESET STONE CURBING	l.f.	8100	\$ 25.00	\$ 202,500.00
0921001	CONCRETE SIDEWALK	s.f.	21140	\$ 10.00	\$ 211,400.00
0922500	BITUMINOUS CONCRETE DRIVEWAY (COMMERCIAL)	s.y.	2260	\$ 45.00	\$ 101,700.00
0922501	BITUMINOUS CONCRETE DRIVEWAY (RESIDENTIAL)	s.y.	70	\$ 40.00	\$ 2,800.00
0939001	SWEEPING FOR DUST CONTROL	hr	35	\$ 60.00	\$ 2,100.00
942001	CALCIUM CHLORIDE FOR DUST CONTROL	ton	15	\$ 800.00	\$ 12,000.00
943001	WATER FOR DUST CONTROL	m.gal	1964	\$ 1.50	\$ 2,946.00
1210101	4" WHITE EPOXY RESIN PAVEMENT MARKINGS	l.f.	14700	\$ 0.25	\$ 3,675.00
1210102	4" YELLOW EPOXY RESIN PAVEMENT MARKINGS	l.f.	8815	\$ 0.35	\$ 3,085.25
1210105	EPOXY RESIN PAVEMENT MARKINGS, SYMBOLS AND LEGENDS	s.f.	915	\$ 3.00	\$ 2,745.00
1210106	12" WHITE EPOXY RESIN PAVEMENT MARKINGS	l.f.	1320	\$ 1.30	\$ 1,716.00
Major Items Subtotal					\$ 1,585,997
Minor Items Subtotal		25	% of Line "A"		\$ 396,499
Major and Minor Contract Items Subtotal (A + B)					\$ 1,982,496

Other Item Allowances

Clearing and Grubbing (0.5% - 6%)	0.5	% of Line "C"	\$ 9,912
Earthwork (suggested 5% - 12%)	5	% of Line "C"	\$ 99,125
Drainage (suggested 2% - 10%)	2	% of Line "C"	\$ 39,650
Landscaping (suggested 1% - 10%)	6	% of Line "C"	\$ 118,950
M & P of Traffic (suggested 0.5% - 6%)	5	% of Line "C"	\$ 99,125
Mobilization (suggested 3.5% - 10%)	5	% of Line "C"	\$ 99,125
Construction Staking (suggested 0.2% - 3%)	2	% of Line "C"	\$ 39,650
<b>D Other Items Subtotal</b>			<b>\$ 505,537</b>

<b>E CONTRACT SUBTOTAL (C + D)</b>	<b>\$ 2,488,033</b>
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Inflation Costs (Simple Method)

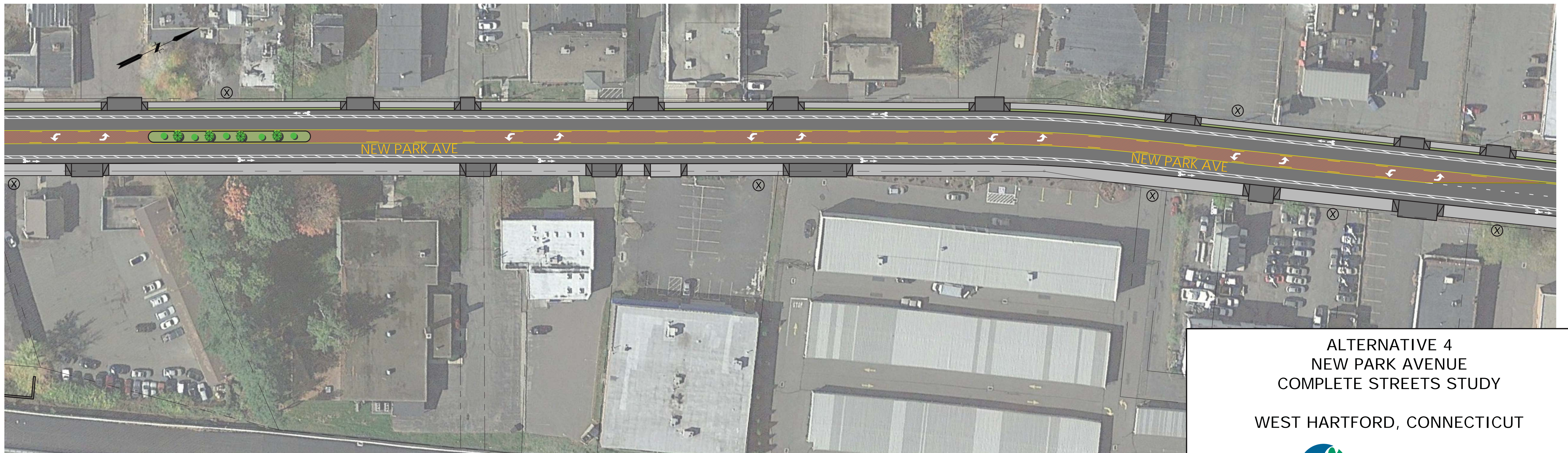
Date of Estimate (provide date of estimate)	Dec-16
Anticipated Bid Date (provide anticipated bid date)	Dec-16
Annual Inflation (4% annually for all LOTCIP projects)	4%
<b>F Inflation Subtotal</b>	0.0% of Line "E" <b>\$ -</b>

<b>G TOTAL CONTRACT COST ESTIMATE (E + F) (Rounded to nearest \$1000)</b>	<b>\$ 2,488,000</b>
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LOTCIP Project Costs Summary

Contract Cost Estimate (Line "G")		\$ 2,488,000
Contingencies (10% for all LOTCIP projects)	10%	\$ 248,800
Incidentals (10% for all LOTCIP projects)	10%	\$ 248,800
ROW	LS	N/A
Utilities	LS	N/A
<b>TOTAL PROJECT COST</b>		<b>\$ 2,985,600</b>





ALTERNATIVE 4  
NEW PARK AVENUE  
COMPLETE STREETS STUDY

WEST HARTFORD, CONNECTICUT



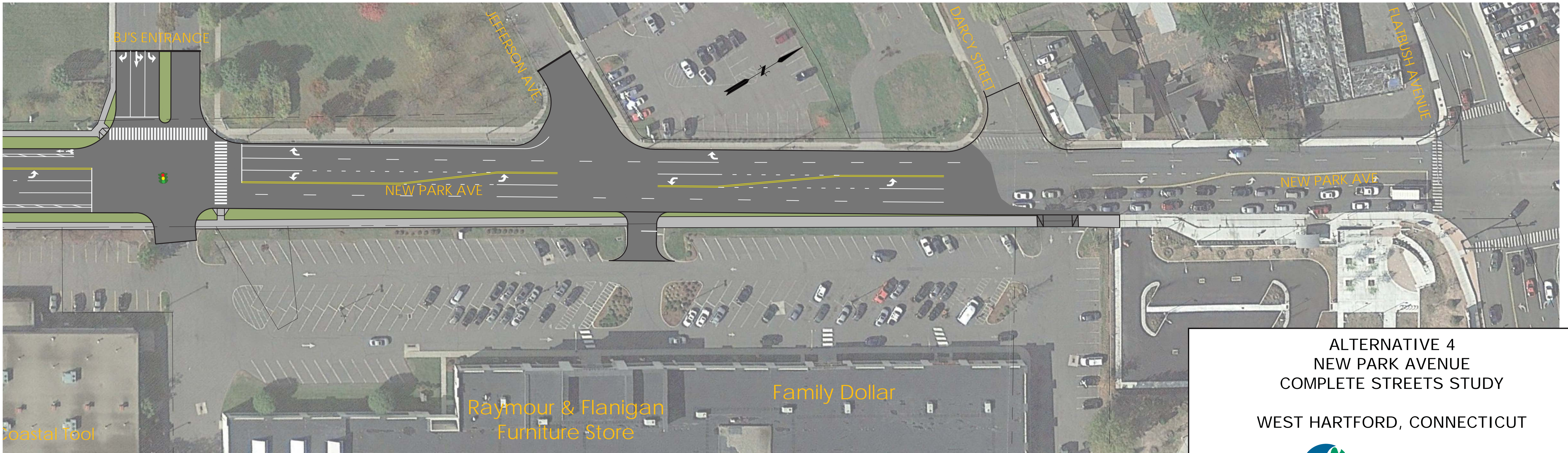
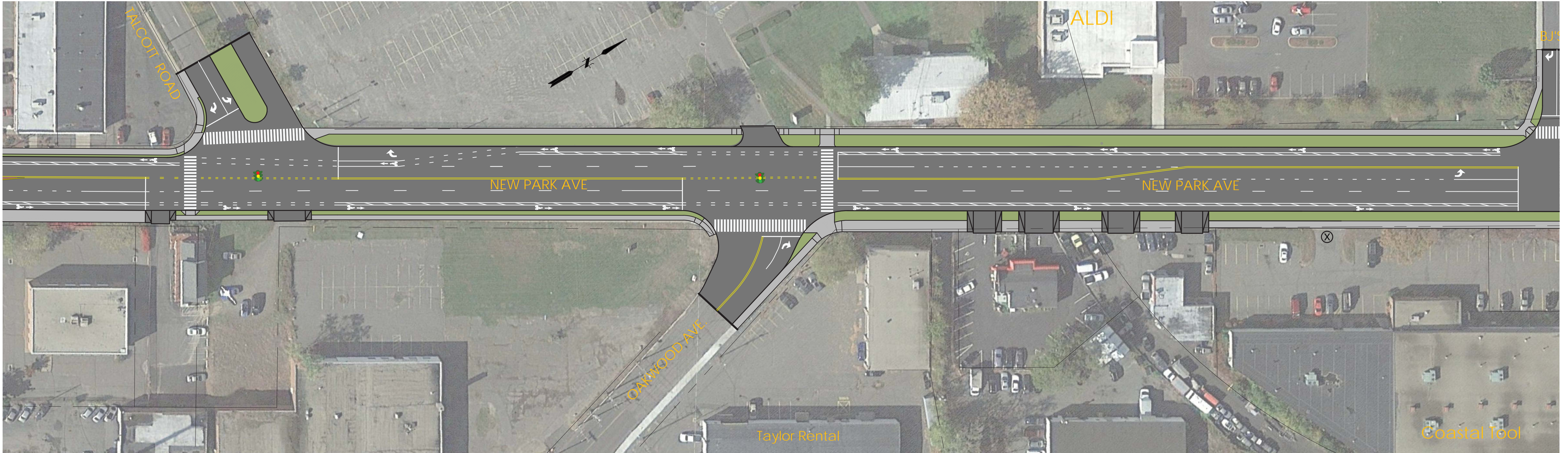
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MANCHESTER, CONNECTICUT 06040  
860.646.2469  
www.fando.com

2014.1346.A10  
SCALE: 1" = 40'

DECEMBER, 2016



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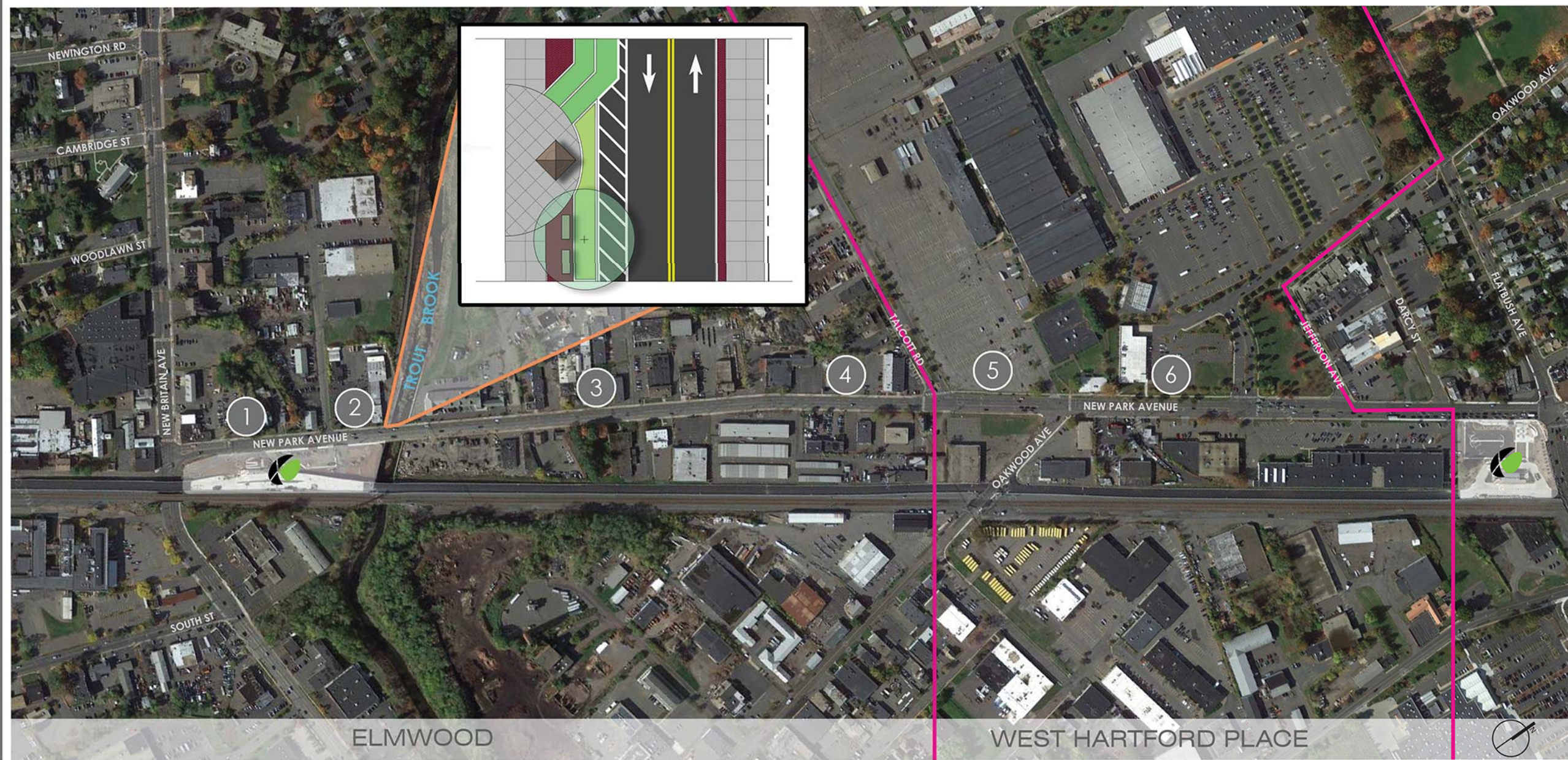
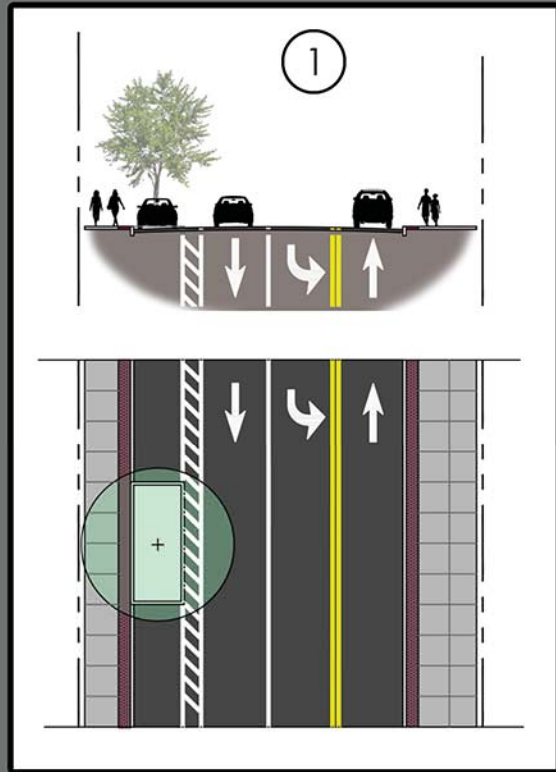
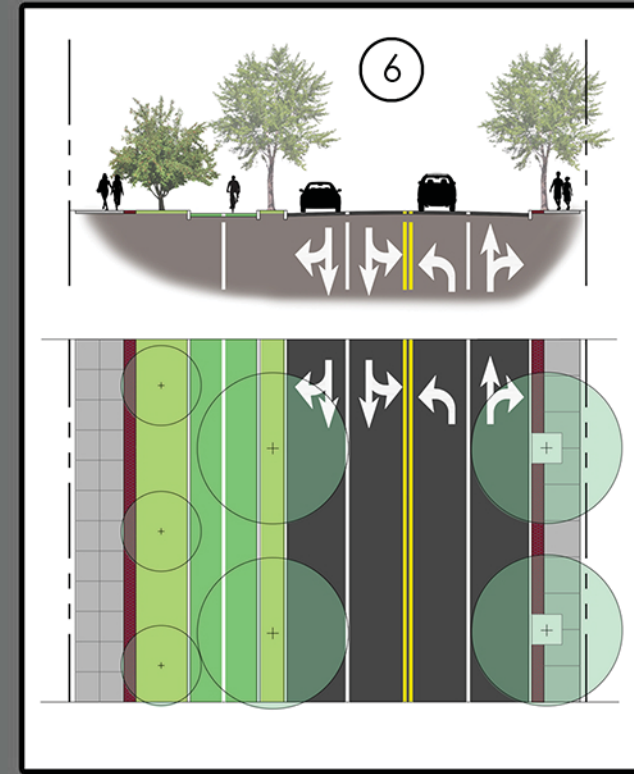
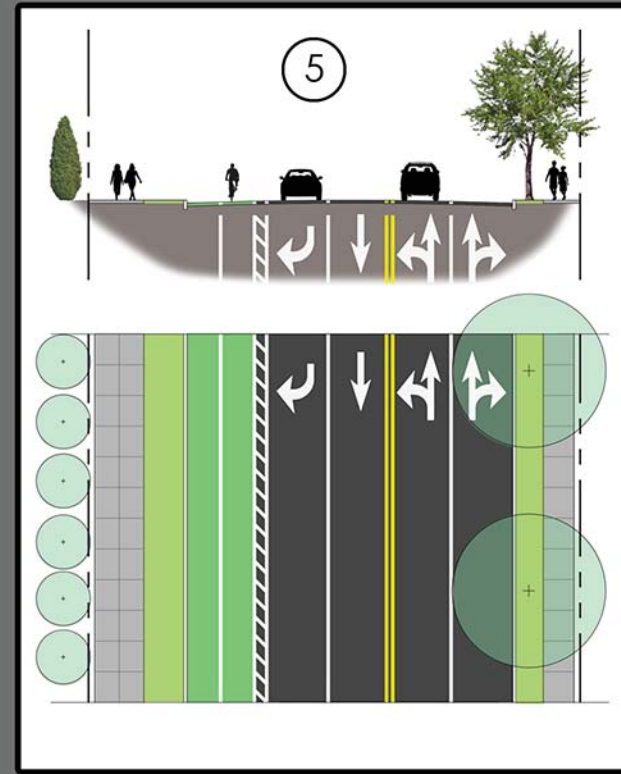
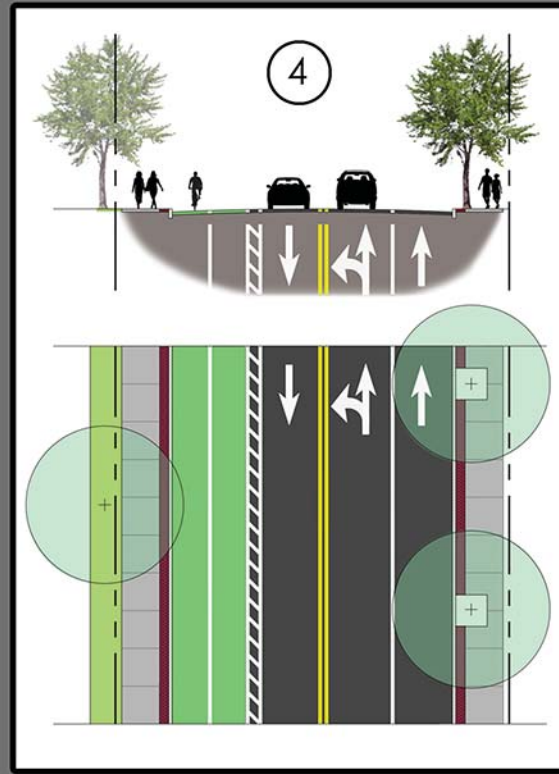
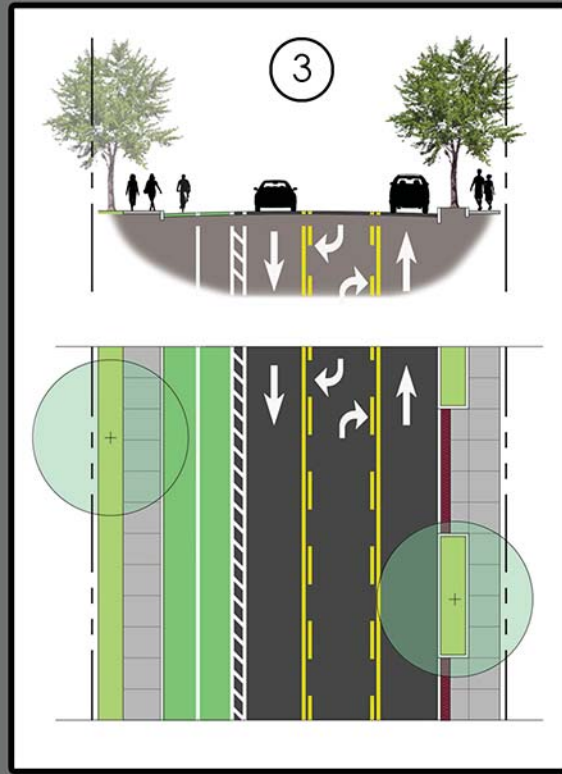
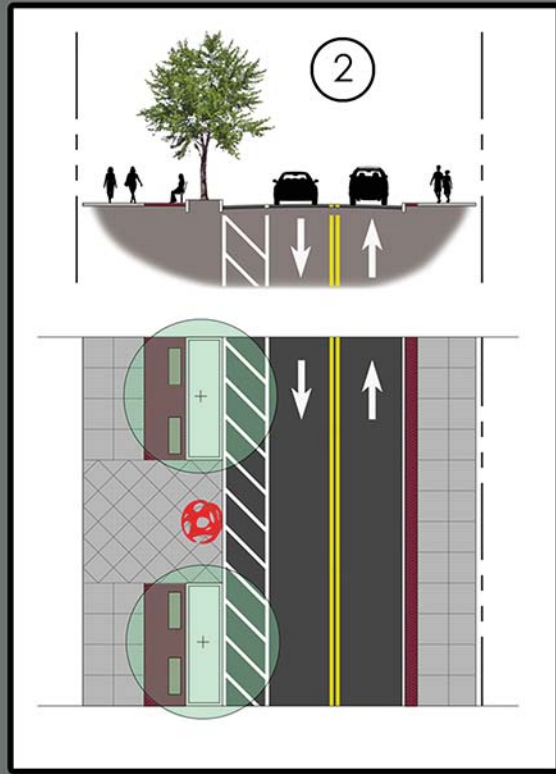


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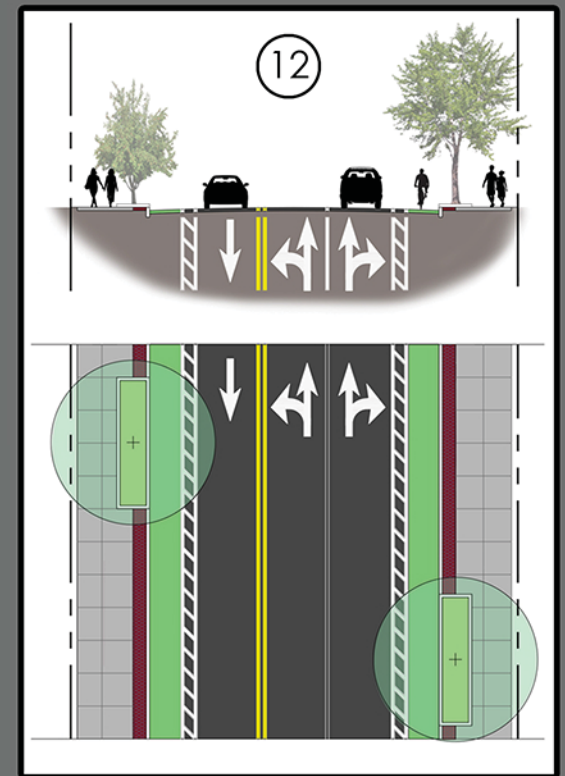
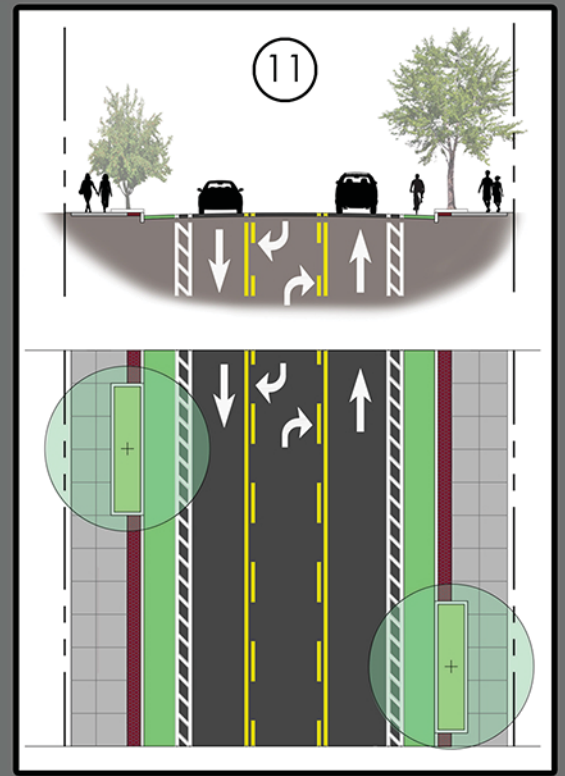
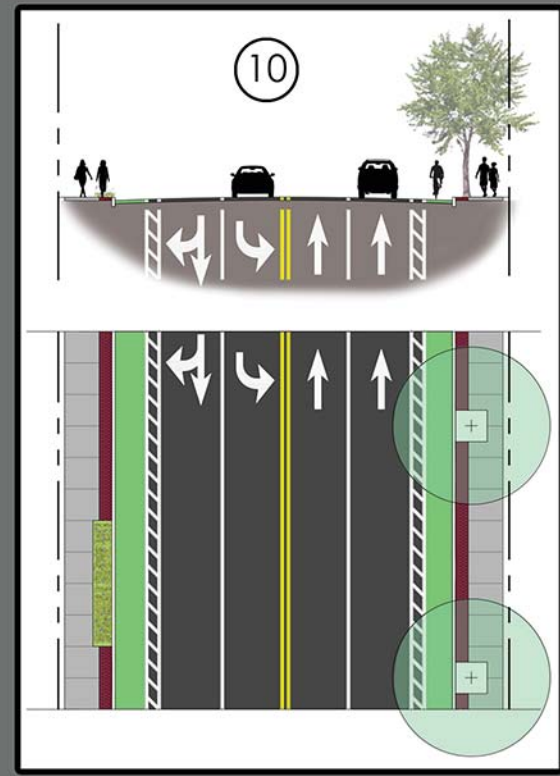
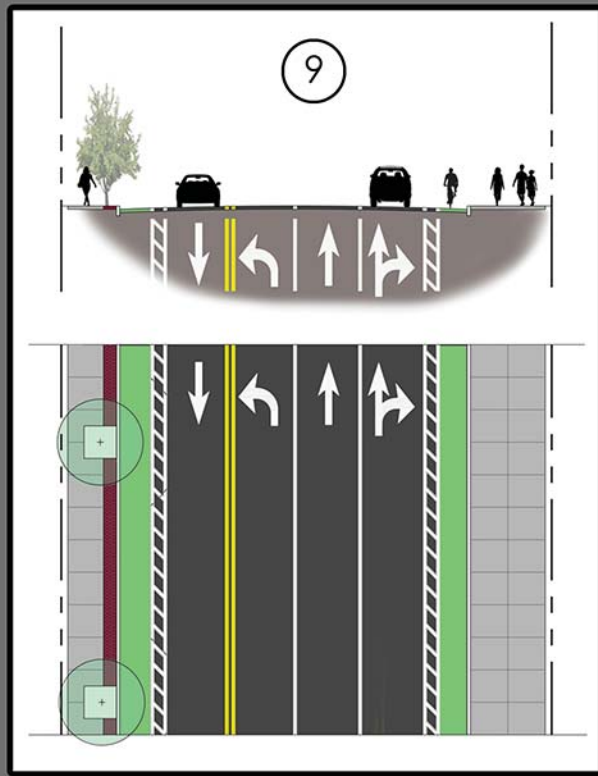
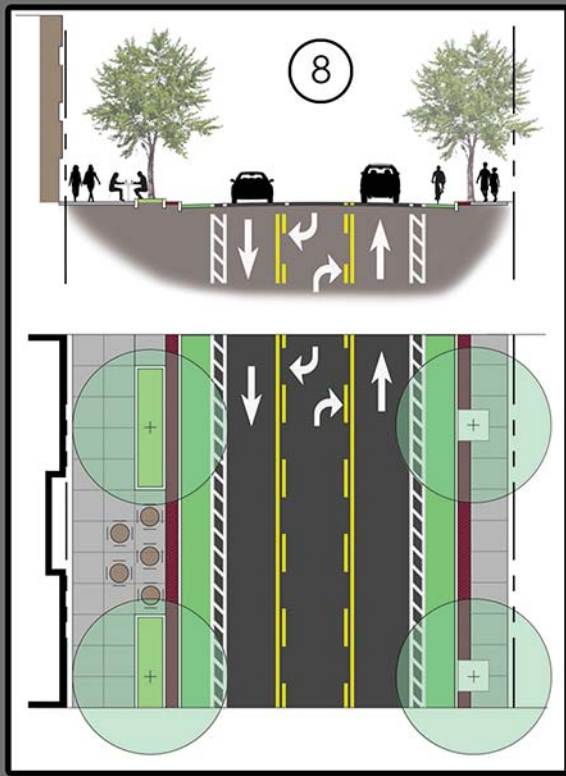
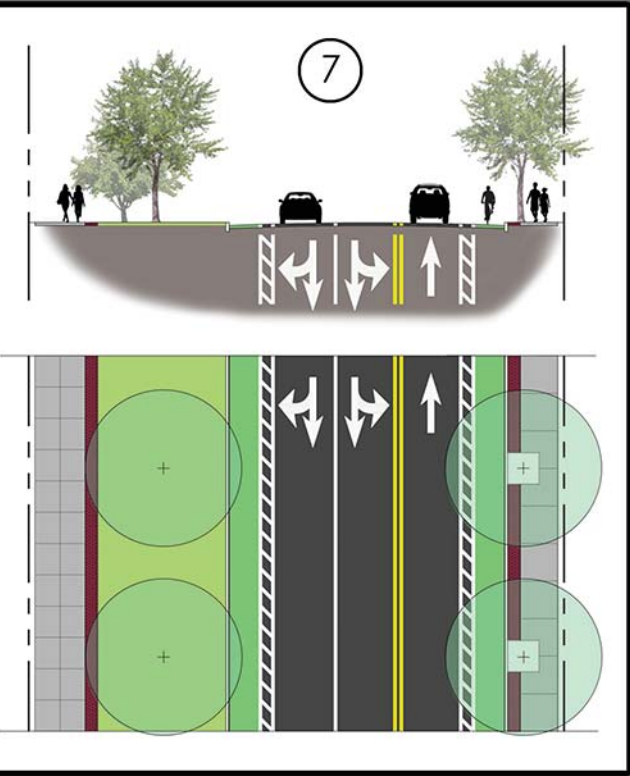
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DECEMBER, 2016













# NEW PARK avenue



TRANSIT AREA · COMPLETE STREETS STUDY