STAMFORD TRANSPORTATION CENTER
MASTER PLAN

September 2010

Stantec

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EXECUTIVE SUMMARY

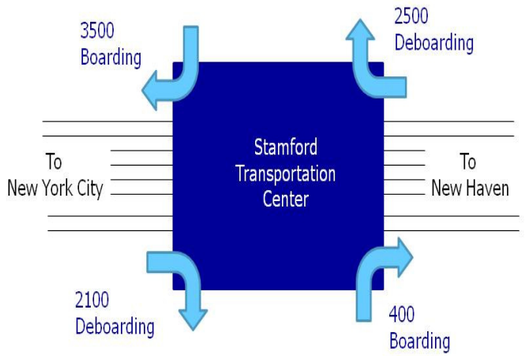
Introduction

The City of Stamford is a primary economic engine in Fairfield County and one of several in the State of Connecticut. The Stamford Transportation Center (STC) is a major pipeline for the work force that feeds that engine. With nearly a quarter-million people utilizing various modes of transportation throughout the City on any given day, sustainable improvements to the City's transportation hub are vital to Stamford's and the State of Connecticut's short- and long-term economic well being. At the present time, the STC has numerous deficiencies including components that are in disrepair or are operating at substandard levels of service with features posing potential public safety issues. To address these issues, it is imperative that a systematic investment program be developed and implemented for the STC. Given the many challenges in today's economy, this program needs to initially address functional deficiencies with minimal investment and an optimized cost-benefit ratio. In the long term, the investment program must transform the STC into a regional transportation hub with the necessary amenities, capacity, interconnectivity, and iconic stature to attract patronage as well as assert Stamford's presence as a vital economic destination in the State and a gateway to both New England and New York.

Regional transportation in and around the City is dominated by automobile traffic on two major highways: the Merritt Parkway and Interstate 95. Each of these routes is well over capacity, and standstill traffic is common during peak hours. In contrast, only 30,000 people use the STC on a daily basis, which if properly configured, could handle roughly twice that volume leading to a measurable reduction in all the negative attributes commonly associated with highway congestion. The implementation of this Master Plan and its associated improvements to the STC will allow for the full capture of its underutilized capacity. These improvements will address four of the major deficiencies of the current facility including:

1) Parking constraints
2) Platform congestion
3) Physical plant deterioration
4) Vehicle congestion

The cause of transportation deficiencies at the STC may be traced to Stamford's progression into a major corporate center in the Tri-State region. The City is located along Amtrak's Northeast corridor which stretches from Washington D.C. to Boston, MA and links Stamford to other corporate centers in the northeast. Certainly, some of Stamford's recent growth may be attributed to its proximity to Manhattan, but it is also a result of a well educated labor force, numerous urban amenities, a desirable quality of life, a vibrant downtown and the presence of several large corporate developments in close proximity to the STC. The new Transit Oriented Developments (TOD's), along with the recent (2001) reconfiguration of the station with center island platforms, have resulted in more than a two-fold increase in travel through the STC. Much of this additional volume is comprised of commuters whose destination is Stamford, CT. In fact, there are now more commuters arriving in Stamford during the morning peak than there are commuters leaving Stamford for other destinations (see figure to right).



The significant competitive edge that Stamford has achieved as compared to neighboring cities and towns is attributable to its transportation availability. The past and recent success of the STC now dictates the need for additional investment in the transportation hub. In the mid 1980's the STC was primarily designed as an origination point for commuters to NYC. As a result, the station's design is most conducive to in- and out-of-town commuters who choose to drive to the station in the morning, utilize the parking garages, and board a train to New York and then reverse that pattern in the evening. The STC 1) now has marginally acceptable levels of service, 2) was not designed to provide efficient intermodal connectivity and 3) presents public safety concerns. Without future investment into the STC as part of a corridor-wide enhancement strategy to shift more commuters to mass transit, the opportunity to attract desirable new TOD's and enhance job growth may pass. The investment must provide sustainable transportation choices in contrast to the past emphasis on the automobile. Improvements to the STC must facilitate efficient shuttle operations, encourage walking and bicycling to the station, reduce traffic congestion around the station and minimize the need for costly and space-consuming parking structures. Success in implementing these measures will also inspire greater private investment in a variety of TOD's in the vicinity of the STC.

In preparation of this Master Plan (see Figure 1), much research and analysis was performed and numerous STC stakeholders were solicited for input over a nine- month study period. As a result, the following goals were established to address the aforementioned deficiencies:

- Reduce travel times by improving station access/egress and intermodal connections.
- Provide new and innovative parking options, better management of existing parking and limited additional parking while generally discouraging automobile reliance.
- Create an aesthetically pleasing, well functioning STC that is integral to the community and serves as an iconic landmark.
- Meet and exceed the needs of all travelers who pass through the STC.

Research and Analysis

Following are evaluations of the primary elements of the STC:

Rail: The existing tracks and platforms have enough capacity to support future growth, however the center portions of platforms are overcrowded as is evident in the photo below. This condition is attributable to the station's configuration. Additional access and commuter amenities at the ends of the platforms, particularly the island platforms, will optimize platform utilization, enhance safety and reduce both travel distances and travel time.

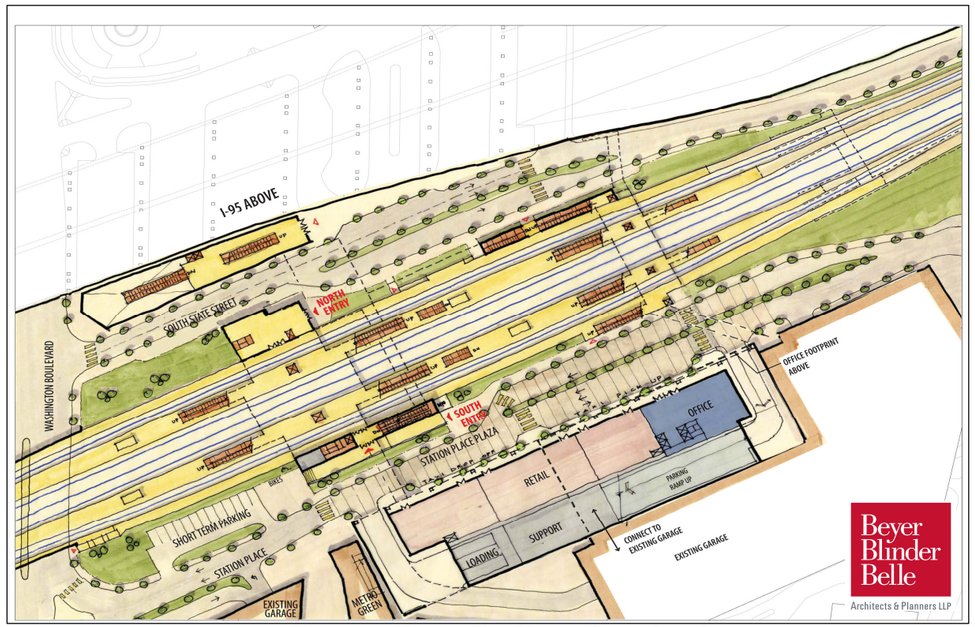


Figure 1 – Master Site Plan at Street Level

Vehicles: There are only a limited amount of improvements that can be made to the roadway network without significant costs and impacts to the nature and character of the station environment. Therefore the emphasis needs to be on the reduction in traffic volume rather than increasing roadway capacity. Additionally, critical improvement projects such as the widening of the Atlantic Street Bridge should continue to be advocated.

Parking: Given current commitments by the State of Connecticut, the existing older garage should be replaced, and the parking capacity of the STC should be modestly increased although not concentrated in one location. For the long term, a limited increase in parking supply should be provided concurrent with incentives/policies to reduce further parking demand and/or fully utilize the existing parking capacity in the station vicinity.

Bus Depot: A comprehensive rehabilitation is needed at the bus depot to better serve patrons and provide easier and better intermodal connections. Emphasis on aesthetics and access to retail and commuter services is encouraged to appeal to a broader spectrum of riders.

Pedestrians and Bicyclists: To reduce vehicle congestion and parking demand, incentives for non-vehicular access to the station and associated services are encouraged. Improvements may include dedicated and landscaped routes for pedestrians and bicyclists, improved bicycle storage facilities at the station and safety measures to reduce pedestrian/bicycle conflicts with vehicles at major intersections.

Governance: An organization should be formed, with stakeholder participation, to inform and provide oversight of multi-modal operations and to advocate for improvements to shuttle and taxi services as noted in the sections below.

Shuttles: Shuttle operations represent a substantial component (over 10%) of those using the STC on a daily basis. These shuttles should be organized to operate more efficiently, and all shuttle operators should be licensed and registered with the STC.

Taxis: Generally, taxi operation at the STC is satisfactory except for weekends, when there are no controls on dispatch. This issue needs to be addressed as part of the overall governance of the STC.

Signage and Intelligent Transportation Systems: There is a universal and unanimous call amongst stakeholders for improved information dissemination to commuters, tourists, residents and all patrons of the STC. Given the modest costs involved and lack of opposition, implementation is a top priority of the Master Plan in the near term.

Sustainability: As is common with current transportation enhancement projects, sustainability is a priority and enhancing mass transit ridership is the best way to accomplish this. Additionally, other objectives should be to reduce the building's energy consumption and carbon foot-print, achieve efficiency in future construction means and methods, manage storm water, and utilize green-rated building products.

Economics There are several potential revenue sources that are largely untapped at this time including those from Transit Oriented Development rights, additional ridership, parking and retail leases. Revenue may also be generated from shuttle fees and advertising. Collectively, potential fees may generate amortized revenue of up to $3 million annually, which may be used to offset cost for the estimated $60 million (2010 dollars) in capital improvements recommended for the STC.

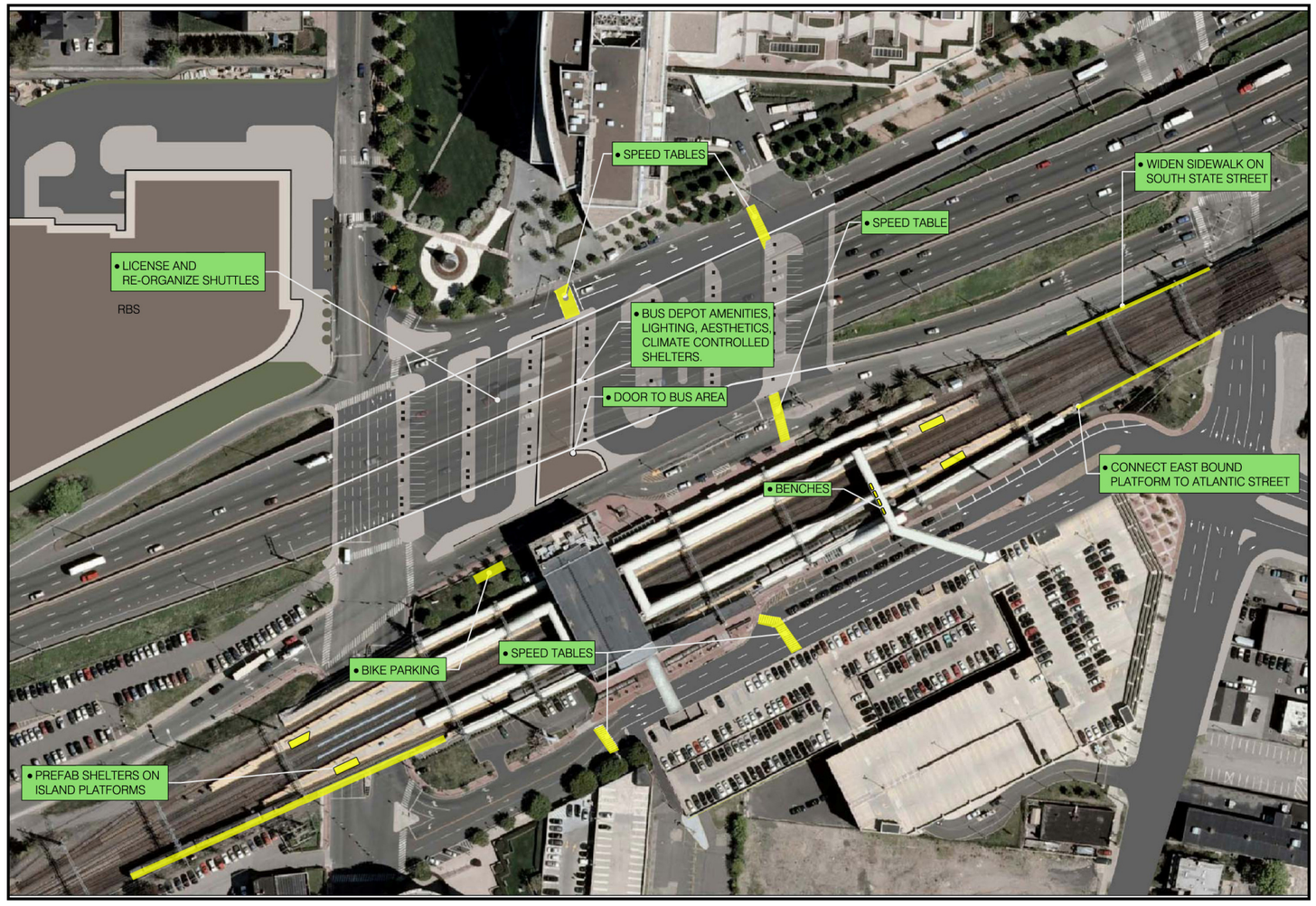


Figure 2 - Near Term Improvements

The following is a list of the individual improvement projects that comprise the overall Master Plan program and their associated costs.

SUMMARY OF IMPROVEMENTS

IMPROVEMENT	Quick Fixes (0-2 years)	Short Term (2–5 Years)	Mid Term (5-10 Years)	Long Term (10-25 Years)	Remarks (All dollar figures shown represent current construction prices without inflation projections)
PLATFORM CONGESTION					
Connect East Bound Platform to Atlantic Street	<$100k				Improves connectivity to east side and reduces some travel distances
Extend Platform Canopies			$2M to $4M		Encourages full use of platforms thereby reducing congestion at center
Construct New West Pedestrian Bridge – Extend South Platform over Washington		$5M to $10M			Improves connectivity to west side, links with new development, eliminates pedestrian – vehicle conflicts, reduces travel distances and increases safety
New Access to Pedestrian Tunnel				$1M to $3M	Reduces congestion at tunnel entrance and increases safety
Prefabricated Shelters at Ends of Island Platforms	<$100k				Encourages full use of platforms thereby reducing congestion at center
Extend East Pedestrian Bridge over South State Street			$3 M to $5M		Improves connectivity to other platforms and downtown and improves pedestrian safety
Extend East Bound Platform over Atlantic Street			See Remarks		Eliminates pedestrian- vehicle conflicts. Included in Atlantic Street Bridge Replacement Project
STATION/BUS DEPOT CONDITION					
Construct Canopy over Shuttle Bus Entrance	<$100k				Provides improved amenity for shuttle users and better interconnectivity
Station Signage		$100k to $200k			Improves information and pedestrian flow
Governance	<$100k				Provides management with feedback from users and helps to implement Master Plan
Landscape Improvements – Short Term		$300k to $500k			Enhances facility, encourages pedestrian travel and patronage
Landscape Improvements – Mid Term			$300k to $500k		Enhances facility, encourages pedestrian travel and patronage
STC Station Building Improvements – Immediate	$300k - $500k				Includes new door at the north end of the tunnel, removal of stairs replace with a ramp near North State Street entrance, new connection between the bus depot and the rotunda area and addition of a ticket machine on the lower level. These provide improved connectivity, convenience for patrons and shorter travel distances.
STC Station Building Improvements – Mid Term			$1.5 M to $2.5 M		Includes renovation of waiting areas on street level for both the north and south areas. Provides additional waiting space, reducing congestion in existing waiting area.
Shuttle Licensing and Reorganization	<$100k				Organizes existing operations and reduces congestion and provides additional revenues
STC Lighting			$400k to $800k		Improves security around STC improves aesthetics
Bus Depot Amenities (lighting, painting, bird deterrent)	$300k - $400k				Provides improved amenities for bus depot patrons and encourages patronage
Bus Depot Expansion – Phase 1			$4M to $5M		Provides an upgraded facility for bus depot patrons and encourages patronage
Bus Depot Expansion – Phase 2				$4M to $5M	Provides an upgraded facility for bus depot patrons and encourages patronage
Expanded Station Building over South State Street			$10M to $20M		Provides improve intermodal connectivity and an expanded and reorganized waiting room thereby encourage patronage
VEHICULAR TRAFFIC CONGESTION					
Widen sidewalk on South State Street	<$100k				Provides a safe pedestrian travel route to STC
Intelligent Transportation Systems with Gateways			$500k to $1M		Provides real time information for commuters to encourage patronage and alerts through drivers to facility to increase safety
Improve Station Place			$2M to $3M		Increases capacity of pick up area and adds a bypass lane around stopped vehicles.
Bikeway Route to STC and Additional Bike Amenities		$200k to $400k			Encourages bicycle use at STC and reduces reliance on automobile.
Enforcement During Peak Hours	<$100k				Reduces congestion and unsafe practices around STC.
Canopy over Drop Off on South State Street			$2M to $3M		Encourages full use of drop off area.
Speed Tables on North & South State Streets, Station Place	<$100k each				Calms traffic in vicinity of STC and encourages pedestrian travel.
PARKING CAPACITY					
Replacement Parking for Older Garage		See Remarks			Eliminates a deteriorated garage. State has already funded this project.
Demo existing garage			$1M to $2M		Provides site for potential TOD development.
Provide Additional 150 spaces			$6M to $8M		Increases parking capacity at STC.
Provide Additional 500 spaces				$12M to $16M	Increases parking capacity at STC.
TOTALS	**$1.6M to $2.5M**	**$6M to- $11M**	**$33M to- $55M**	**$20M to $28M**	**Cumulative Total For All Projects Over Extended Period is Approximately $60 to $100 Million**

Conclusion

This Master Plan for the Stamford Transportation Center recommends a program of improvement projects and a sequence for their implementation to optimize the benefits versus the investments. Figures 2 and **3** show these near and long-term improvements respectively. These projects will require public and private investment over a period of time of not more than 25 years and in proportion to the benefits to be realized by each party. Successful implementation of this program will rely on achieving a balance among the disparate interests of stakeholders and the attainment of the aforementioned Master Plan goals. This balance will ensure the long term well being of the STC so that it can help support the economic growth of the City of Stamford, and in turn the economy of the State of Connecticut. This Plan does not represent a risky proposition, but rather a necessary investment into one of the greatest economic assets of the State and one of the most prominent cities in the Northeast.

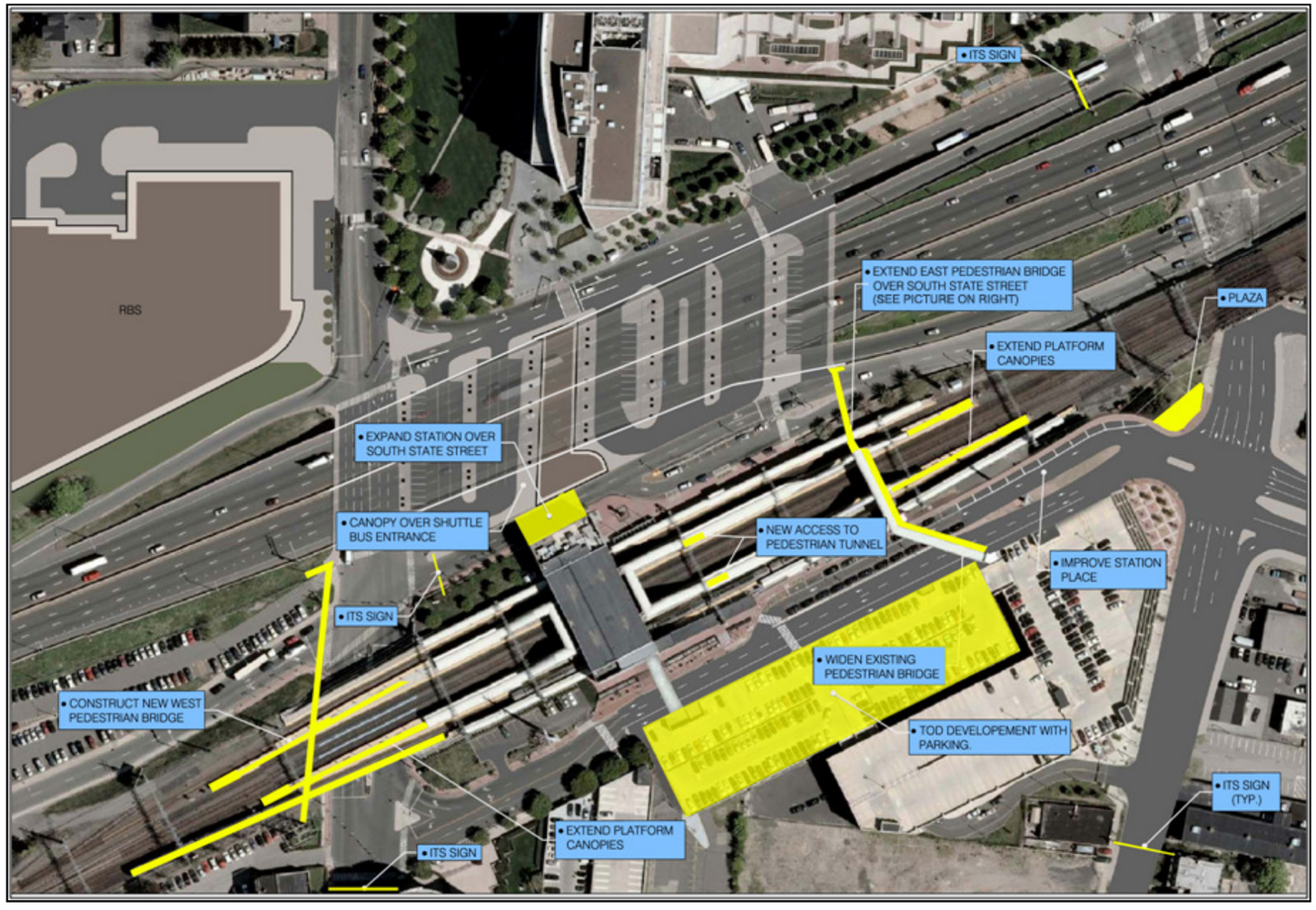


Figure 3 - Long Term Improvements

Extend East Pedestrian Bridge

I. INTRODUCTION

A. PROJECT OVERVIEW

The City of Stamford's high density urban core is becoming centered on Connecticut's most active intermodal station and is a model of smart growth and Transit-Oriented Development (TOD). It is the only station in an urban center on the New Haven Line which can be accessed from points 360 degrees around the station, providing an ideal setting for continued TODs. The Stamford Transportation Center (STC) is a critical asset to the city and the region and is the busiest station on the New Haven rail line outside of Grand Central Terminal. It serves approximately 24,500 rail passengers (Metro-North and Amtrak) and more than 3500 bus and shuttle service passengers daily. The purpose of this project is to generate a plan to better accommodate this passenger volume along with projected ridership growth over the next 25 years. The future success of Stamford and the region relies on the ability of the STC to meet the needs of transit users in the most efficient, convenient and safe manner. In addition, with appropriate planning and capital investment, the STC will become the focal point for civic pride, serving as an amenity to the community. It will help enhance the economic and cultural value of the City and the community it encompasses

Although the STC was designed primarily for Stamford residents commuting to New York, today it serves a growing and complex set of users. These include commuters to Stamford from the west and east as well as employees going from the STC to places of work in Stamford by bus, shuttle, taxi and foot. For the last decade, Metro-North commuter rail ridership has outpaced forecasts, with the most significant growth in the reverse direction travel (away from Manhattan in the morning peak) and intrastate travel. The STC has become the catalyst for transit-oriented development with significant projects underway or planned in both the Downtown and South End. With the opening of the Royal Bank of Scotland facility in 2009, the development of Metro-Green, the Gateway/Manager site, multiple phases of the Harborpoint and Yale & Town projects, Trump Parc and the Ritz Carlton, both the volume and proportion of transit use will increase significantly. The STC also serves patrons of Amtrak, intercity bus patrons on CT Transit, Peter Pan and Greyhound, and a wide range of other customers going to and from Stamford for work and leisure travel.

While some investment of federal, state and local funds at the STC has occurred over the last 15 years, including the reconstruction of the station (1998) and a major parking garage expansion (2003), these investments have failed to keep pace with the increase in ridership and the increase in deterioration. A recently released engineering condition report on the older of the two garages indicates significant structural and maintenance deficiencies. Poor levels of service on platforms, as well as significant bottlenecks during peak hours, have been documented in recent pedestrian studies. Analysis has also revealed safety issues with egress from the platforms during emergency situations and anticipated increases in ridership will further jeopardize rail patrons' safety.

Transit use is anticipated to increase significantly in the future as gasoline prices rise, environmental issues gain more prominence, highway congestion continues, employment increases in Stamford and new rail cars finally arrive. In response, the following goals and objectives should be endorsed by all stakeholders to bring the facility up to the standards of a major transportation hub and reflect its current use patterns.

B. GOALS AND OBJECTIVES

The goal of this study was to prepare a comprehensive plan that casts a vision for the 25 year planning horizon and includes incremental steps to ultimately achieve that vision. The following objectives were the focus of the plan:

- Reduce travel times by improving access/egress and the intermodal connections within the STC
- Provide parking, including innovative parking options, while discouraging reliance on the automobile
- Create an attractive STC to serve as a community amenity, destination and landmark
- Insure that the STC adequately and efficiently serves the different sets of users and their needs

II. PROJECT CONTEXT

Site History

The station, which had its origin in the 1860s, was originally owned by the New Haven and Hartford Railroad. Over time the City of Stamford became the eventual owner. In 1980, plans were announced for a new station and construction began in 1983. The station building spanning over the tracks, along with an 880-space parking garage, was completed in 1985. Meanwhile, Interstate 95, which is adjacent to the railroad, was becoming highly congested with more than 150,000 vehicles per day. The nearby Merritt Parkway experienced similar congestion, well beyond its design capacity. In 1985, after several high profile accidents at toll booths, the State removed tolls from I-95 and the Parkway. This added to the growth of traffic, particularly on the Interstate. As a result of this growth and subsequent traffic delays and the increased capacity of the island platforms, more commuters started choosing the railroad as an alternative to the automobile. Rail ridership increased at the STC, and it became clear that improvements were needed at the station. This increased ridership and the anticipation of future growth are the primary driving forces behind this Master Plan.

Since 1990 several projects have been completed at the station. The State designed new island platforms, which were completed in the late 1990s. This expansion of station capacity led to a substantial increase in rail ridership. The City reorganized the space under the I-95 viaduct into a bus station and constructed a building that connected North State Street with the original station tunnel. The bus station provided an intermodal link to the rail operations and the passageway provided improved connectivity between the downtown and the STC while providing additional retail opportunities. In 2000, the ownership of the station was transferred from the City to the State of Connecticut. The most recent project at the station, in 2004, expanded the existing parking garage to provide an additional 1100 spaces to accommodate the increased demand.

Regional Context

Stamford is located 35 miles northeast of New York City on the busy Northeast Rail Corridor between New York City and Boston, The estimated population for Stamford in 2007 is 118,500, making it the fourth largest city in Connecticut and the eighth largest city in New England. It is the largest city in southwestern Fairfield County, and the Stamford Transportation Center (STC) is a catalyst of its growth. Many companies have located their headquarters in Stamford as a response to the high cost of operating in New York City, and Stamford is known for its corporate headquarters, financial services, and retail and research activities. Among the firms in Stamford are General Electric Capital Corporation, Pitney Bowes, Purdue Pharma, UBS Corporation and, most recently, the Royal Bank of Scotland (RBS) which opened its North American headquarters in Stamford. There also remains a strong connection between Stamford and New York City's financial sector. In addition, incentives provided by the State of Connecticut have helped to draw firms from Westchester to Stamford, including, most recently, Starwood Hotels. It is, therefore, vital to Stamford and the State that the STC can safely and efficiently handle the necessary workforce for these businesses to thrive.

Stamford is also located within a major transportation network in which the STC plays an important role. Interstate 95 and the Merritt Parkway connect the New York Metropolitan area and the Mid-Atlantic States to Connecticut and the rest of New England. Over 150,000 vehicles per day use these highways in Stamford. Supplementing this vehicle access to the City is the New Haven line of the Metro-North Commuter Railroad and Amtrak, which make frequent stops in Stamford. According to Metro-North, over 120,000 riders use the New Haven Line on a daily basis, making it one of the busiest rail lines in the country outside of New York City. The tracks for the New Haven Line are part of the Northeast Corridor, Amtrak's busiest rail corridor in the United States with over 9,000,000 patrons in 2008 and contribute to the STC status as the second busiest Amtrak station in Connecticut. This connection to the Northeast Corridor is an important asset to the City's business community as an alternative mode of transportation to important business centers along the east coast. The City of Stamford is located along Long Island Sound, which is used primarily for recreational purposes but could be used for a potential ferry link between Stamford, LaGuardia Airport and Midtown Manhattan.

According to the Business Council of Fairfield County, the workforce in Stamford has one of the highest educational levels in the U.S., with nine out of ten workers having a high school diploma and 45.9 % having a bachelor's degree or higher. This results in Stamford having a higher median income and per capita income when compared to the State as a whole. The higher income levels attract employees to Stamford for higher paying jobs which contribute to Stamford having a higher cost for housing than other locations in the State. This leads workers to live in the less expensive communities upstate and commute to Stamford. The City is dependent on the health of the entire regional economy for its success which is directly connected to the quality of the transportation network in the region. The interconnected issues for Stamford and the Region are economic development, housing costs and land use, and transportation.

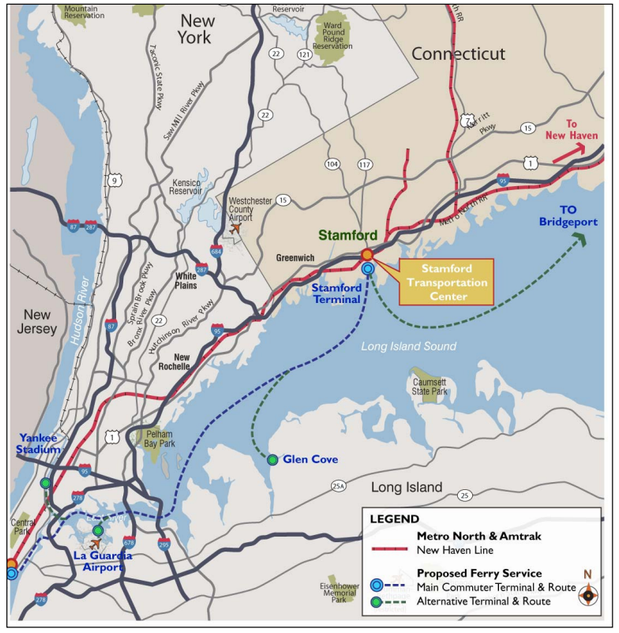


Figure 1 - Stamford's Regional Context

Future Growth

The Master Plan adopted by the City in 1977 restricted future office development to the inner core. The 1984 Master Plan continued this approach and established a "downtown first" goal for intense, compact, multi-use pedestrian friendly development. The City wanted to pursue smart growth, transit oriented development, urban infill and Brown fields redevelopment. These policies were repeated in the City's most recent Master Plan, adopted in 2002 with the following objectives for future growth:

- 80% of new housing be directed to the greater downtown (core, corridor and collar) and the South End
- 70% of new office development in the greater downtown with 60% in the core and corridor and 10% in the collar, including the south end adjacent to the STC.
- Create a vibrant, seven days a week, pedestrian friendly downtown focused both the Transportation Center and the historic core area to its immediate north
- Protect and enhance the quality of life in Stamford's neighborhoods
- Celebrate and enhance the city's corridors, greenways, waterfronts and gateways among other unique Stamford qualities

The plan recognized the interdependency of traffic/transit, economic development and land use/urban design. It found that the City will not be able to build enough vehicular traffic capacity to meet demand without destroying the quality of life and the neighborhoods that are part of the fabric of the community. In order to reduce the number of commuters coming from farther away, the City will need to provide housing affordable at the various income levels needed to fuel the economic engine. The management of Stamford's traffic issues will require several strategies including cooperation by employers, additional use of mass transit and strategic land decisions, putting development where it is accessible by transit.

The center of the City is shifting south with significant development being constructed, approved or in the approval process. As this process is occurring, the STC is becoming even more central to the hub of the commercial business district. It is distinguished from other stations in urban settings on the New Haven Line in that it can be accessed from points 360 degrees around the station. This provides greater access to the station and encourages its prominence as a center for TOD development.

New developments that are under way or proposed within the vicinity of the STC are found in the table below:

	Location	GSF	Residential Units	Hotel Rooms	Parking
Metro Green	Station Place	325,000 office	238		900
Gateway	Washington Boulevard West of STC	500,000 office (proposed)	T.B.D.		T.B.D.
Royal Bank of Scotland (RBS)	Washington Boulevard and North State Street	400,000 office			1200
Harbor Point	Washington Blvd & Atlantic Street	400,000 office	3155	115	8000
Yale & Towne	Henry and Pacific Streets	360,000 retail	1000	100	3000

Table 1 - New Developments

Metro Green

Gateway

Yale and Towne

Harbor Point

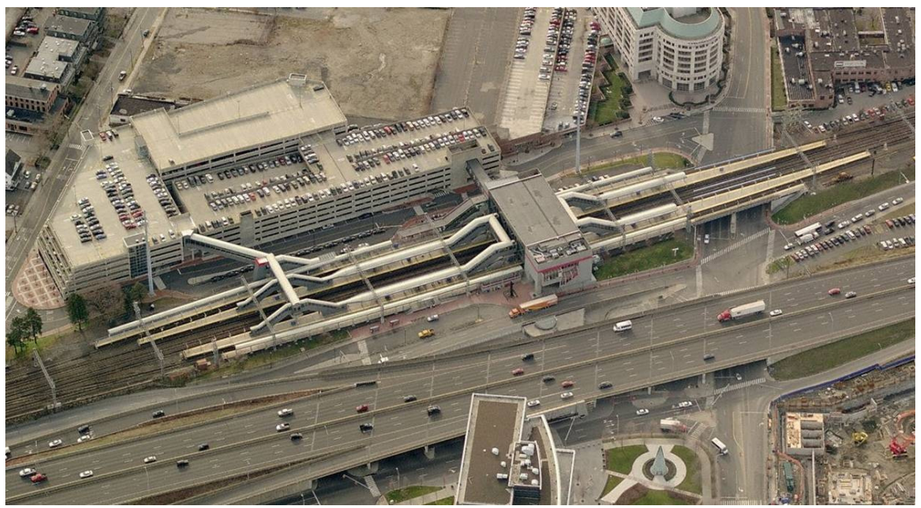
III. TRANSPORTATION CENTER EVALUATION

A. RAIL

Background

Passenger service at the STC is provided by Metro-North Railroad, Amtrak and Shore Line East. Metro-North's commuter service is by far the largest service and runs from New Haven to New York City with 191 trains daily that originate or stop at the STC. During the peak hour, trains are arriving or departing on at least one of the four loading tracks every 3 to 4 minutes. Amtrak provides service with three routes along the Northeast Corridor. Currently there are 40 scheduled Amtrak trains stopping daily at the STC. Shore Line East is the third railroad that operates at the STC on a very limited basis and connects to stations east of New Haven and is operated by Amtrak for ConnDOT.

The STC was once dominated by the west bound commute into New York City; however ridership is growing for intrastate travel connecting to cities and towns east of the STC. These commuters provide a valuable labor pool to work in the growing office and commercial enterprises in the City. The high cost of housing, the increased congestion on the highways and the increasing cost of fuel have led to this growing trend. The availability of well paying, desirable jobs in the Stamford marketplace may be fueling the demand for commuting to the City. In addition to intrastate travel, there has also been a growing trend in the reverse commute into Stamford, from primarily New York City, but also from other cities west of Stamford. The strong connection between the financial markets in New York and the firms that are providing these services in Stamford is one of the reasons for the increase. During the morning peak period the passengers deboarding in Stamford exceed those leaving from Stamford for both points west and east. The ability of the STC to handle the current ridership and the projected growth is paramount to the success of Stamford and the region.



Aerial View of Stamford Transportation Center (STC)

Existing Conditions

The Stamford railroad station consists of five tracks, one of which is a through track that does not allow trains to stop at the platforms. The side platforms can accommodate 10 cars while the two island platforms can accommodate a train with 12 cars. The station building is elevated and straddles the tracks. Access is provided to the station building via stairs, elevators and escalators. Interconnectivity is provided to all the tracks from underneath via a tunnel.

The island platforms currently experience crowding, particularly around the stairs that lead into the tunnel. The tunnel is an important link to the shuttle and bus services as well as the primary pedestrian route into downtown via North State Street. To access the tunnel stairs, passengers must navigate through a narrow section of the platform, which is often filled with passengers waiting to board the train which they have just deboarded. The opening to these stairs is located within close proximity to supporting columns for the station building. All of these factors lead to pedestrian flow conflicts and hence a substantial queue during peak hours to access the tunnel or egress the platforms.

Crowded Platforms at STC

The center of the station platforms tends to be the most crowded, particularly during inclement weather. Passengers wait in the station building until they see their train arriving and then attempt to dash down the stairs to meet the train when it comes in. Either end of the platform sees minimal use. The lack of alternative, covered and/or conditioned waiting areas and insufficient access points along the full length of the platforms is a cause of this congestion.

Passengers also tend to crowd the center island platforms because of concern that the track may be changed at the last minute and they may need to make an up and over maneuver to meet their train. Waiting on the island platforms allows commuters access to two tracks while waiting on the side platforms only provides access to one. It has been observed on a number of occasions that when the train enters the station between a side and island platform, the majority of the passengers will board from the island platform even though the trains will open doors on both sides.

The platforms also serve as a waiting area for patrons transferring between trains. Passengers on the New Haven Line transfer from express trains to local trains and between the main line and the New Canaan Branch. Passengers from Metro-North transfer to Amtrak and Shore Line East.

Analysis/Assessment

In 2008, Amtrak reported total weekday ridership of 1200 passengers. This is significantly less than Metro-North's ridership in the westbound direction which was 11,600 per day during 2007. Therefore as Metro-North has the dominant percentage of ridership at the STC, their ridership was used in evaluating the capacity of the Center.

Daily on and off counts were taken by Metro-North from 1992 to 2007. The total daily ridership in the inbound (westbound) direction is presented in Table 1. The number of passengers deboarding at Stamford grew at a faster rate than those that boarded at Stamford. This trend demonstrates that Stamford is not only a suburban feeder station into New York City, but also a destination for commuters as well.

Table 2 - Weekday Inbound (Westbound) Metro-North Ridership (1992-2007)

YEAR	ON	% TOTAL	% ANNUAL	OFF	% TOTAL	% ANNUAL	TOTAL	% TOTAL	% ANNUAL
	BOARD	CHANGE	CHANGE	DEBOARD	CHANGE	CHANGE		CHANGE	CHANGE
1992	4,432			1,869			6,301		
1996	4,945	11.6	2.9	2,209	18.2	4.5	7,154	13.5	3.4
2001	6,126	23.9	4.8	3,680	66.6	13.3	9,806	37.1	7.4
2007	7,725	26.1	4.4	3,929	6.8	1.1	11,654	18.8	3.1
CUMMULATIVE		**74.3**	**3.8**		**110.2**	**5.1**		**85.0**	**4.2**

SOURCE: Connecticut Department of Transportation/Metro-North Railroad

During the period between 1996 and 2001, the island platforms were added to the station, creating the capacity for the large increase in ridership that is shown in the table. This substantial improvement to the STC provided the impetus for new businesses to come to Stamford and the incentive for new commuters to use the railroad. From 1992 to 2007, the total ridership increased a total of 85%. Annualized, this increase equates to an annual growth of 4.2%. During that time frame, there was only one economic downturn during the late 1990's so the growth rate may not be sustainable, particularly in light of the current recession. However, this growth rate will be used as a conservative measure for the high end projection that could be experienced at the STC.

A review of the ridership data shows that Stamford bound ridership has increased at a greater rate than those traveling to New York City or other destinations. This can be seen in the trends for those deboarding during weekday inbound, those boarding during weekday outbound and those deboarding during the AM peak "reverse" commute outbound travel times. This trend is further demonstrated in Figure 1 which shows that during the morning peak period, 4600 passengers were deboarding in Stamford while 3900 passengers were boarding trains leaving the STC.

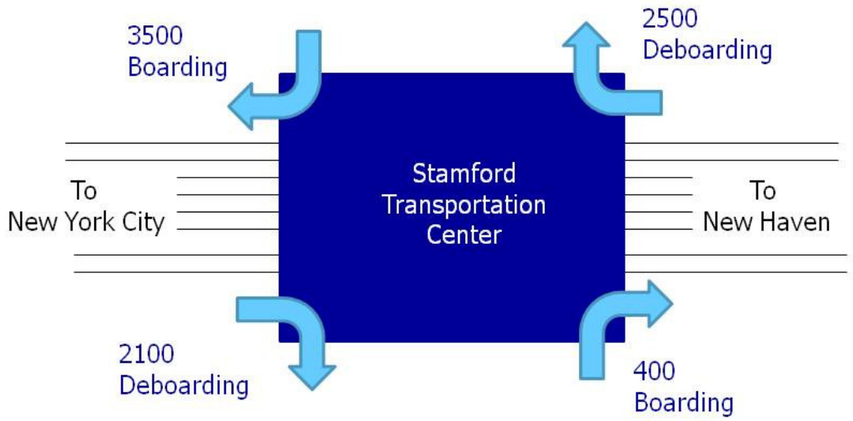


Figure 2 - Boarding and Deboarding During the Morning Peak Period

Projections

To perform an analysis of future conditions, projections of future ridership growth scenarios were generated. The scenarios used frame out the entire range of that growth from a conservatively low estimate to conservatively high estimate. The existing ridership for Metro-North was projected for three scenarios (low growth, medium and high) for the three design years, 2015, 2020 and 2035. The growth rates that were utilized for these scenarios were based on three factors, all of which influence the ridership:

1) Regional growth in population

2) Ridership growth on New Haven line

3) Ridership growth at Stamford Station

The three growth scenarios would be influenced by the following factors:

Low Growth (0.75%) (Based on population growth in the City)

- Relatively inexpensive fuel prices compared to the cost for transit use
- Ineffective Traffic Demand Management (TDM) measures to discourage use of single occupant vehicles
- Slow or negative economic growth
- Few companies relocating to Stamford

Medium Growth – (1.5%) (Precedent: - New Haven line ridership growth)

- Parking and fuel prices make commute comparable to cost of transit
- Continued congestion on highways into Stamford
- Modest levels of development

High Growth (4.0%) (Precedent: 1992 – 2007 Stamford ridership change)

- Significant increase in fuel or parking prices or other financial barriers to auto use
- Better train service (new cars, reduced headway between trains)
- Financial incentives to take mass transit/effective TDM
- Significant economic development activity/companies relocating to Stamford

The Connecticut Department of Transportation typically uses a growth rate of between 1% and 1.5% for rail ridership. This number reflects the long history of the entire New Haven Line. This value was used for the medium growth scenario. Half of that rate or 0.75% was used as the low growth projection. This rate reflects the growth in Stamford's population from 1990 to 2000. According to the U.S. Census Bureau, the population in the City of Stamford grew from 108,056 in 1990 to 117,083 in 2000. This equates to an annual growth rate of 0.81%. A high growth rate of 4% was used, which reflects the recent growth rate in ridership over the last 15 years at the Stamford station. While the results for 2009 are not available, it is informally reported by the MTA that the affect of the economic recession has been a reduction of approximately 4% in ridership. This will create an anomaly in these long term projected trends. Table 3 shows the existing Metro-North ridership and the projected growth for the low, medium and high growth scenarios.

Table 3 - Metro-North Ridership - Existing and Projected AM Inbound (Westbound)

LOW GROWTH (0.75%)				MEDIUM GROWTH (1.5%)			HIGH GROWTH (4.0%)		
YEAR	ON	OFF	TOTAL	ON	OFF	TOTAL	ON	OFF	TOTAL
2001	6,126	3,680	9,806	6,126	3,680	9,806	6,126	3,680	9,806
2007	7,725	3,929	11,654	7,725	3,929	11,654	7,725	3,929	11,654
2015	***8,000***	***4,100***	***12,100***	***8,300***	***4,200***	***12,500***	***9,400***	***4,800***	***14,200***
2020	***8,300***	***4,200***	***12,500***	***9,000***	***4,600***	***13,600***	***11,400***	***5,800***	***17,200***
2035	***9,300***	***4,800***	***14,100***	***11,200***	***5,700***	***16,900***	***20,600***	***10,500***	***31,100***

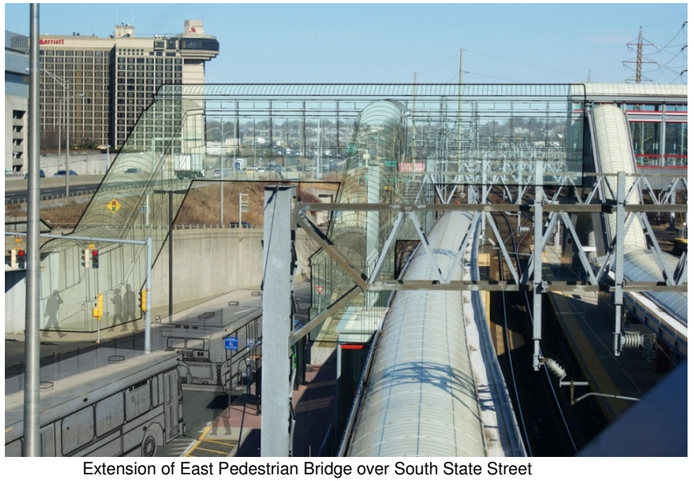
LEGEND: Existing Ridership – 6,000 ***Projected Ridership 10,000***

With the low growth rate, there is a total increase in total ridership of 21% by the year 2035. Under medium growth, the total increase is approximately 45% by 2035. Under the high growth scenario, ridership will almost triple the current ridership.

Life Safety Issues

An analysis was performed for platform egress in accordance with the National Fire Protection Association (NFPA) 130 which governs the emergency egress of passengers from Fixed Guideway Transit Facilities such as the Stamford Transportation Center. The NFPA regulation requires that there be sufficient egress capacity to evacuate the station platform in 4 minutes or less and to reach a safe refuge in 6 minutes.

Egress from the side platforms consists of stairs and ramps which discharge to grade. The center platforms are served by stairs connecting to the tunnel or stairs and escalators that ascend to either the east pedestrian bridge which connect to the parking garage or the elevated station building over the tracks. NFPA regulations require that one of the escalators for each platform be considered as out of service when computing egress capacity. This factor has the greatest impact on the center platforms which have three escalators which provide egress. According to the analysis, it would take more than twice as long to leave the center platforms as the sides. In addition, the island platforms would take 4.1 minutes to evacuate which is slightly longer than the NFPA requirement. Based on this analysis, the ability to evacuate the island platforms within the NFPA requirements is marginal based on current ridership and will become problematic with ridership increases.



Extension of East Pedestrian Bridge over South State Street

Access and Egress

The need to provide additional means of egress and more connections should take several different forms at the STC. The ends of all the side platforms connect to city streets except for the east end of the southern platform. A stair and sidewalk down to Atlantic Street is a relatively inexpensive means to provide more connectivity to the city. It eliminates the need to walk up Station Place in order to access the platforms and reduces the travel for passengers deboarding the train, wanting to connect to the places east of the station. In addition to the connection down to the street, it is desirable to provide a connection over Atlantic Street to access the east side of the street. By elevating the pedestrian way over the street, it eliminates the vehicle-pedestrian conflicts and makes it easier to cross the street. This work should be coordinated with the replacement of the Atlantic Street bridge that is being planned by ConnDOT.

The existing east pedestrian bridge does not connect to the side platform or down to South State Street. This final link should be made to provide additional connections between the city street network and the station. Similar to the east pedestrian bridge, a new west pedestrian bridge should be provided. This will link all the ends of the platforms, encouraging full use of the platform length. It should also cross South State Street and be linked to the existing surface lot. If a parking structure is built on this lot, this bridge will provide needed access into the STC. The bridge could also link the Gateway development project with the STC. As part of the west pedestrian bridge project, the platform should be extended over Washington Boulevard. Similar to the extension on the east end of the STC, this new bridge will eliminate the pedestrian-vehicle conflicts which exist in trying to cross a wide street such as Washington Boulevard.

In addition to the proposed bridges, a new set of stairs on the island platforms should be constructed down to the tunnel which currently is a critical link in the STC. By providing another set of stairs, it will reduce the conflicting pedestrian flows and the associated congestion in trying to pass through the restricted platform width to enter the stair portal.

Conclusions and Recommendations

The existing tracks and platforms have enough capacity to support future growth, however the center portions of platforms are often overcrowded as seen in the picture on the right. This condition is attributable to the station's configuration. Additional access and commuter amenities at the ends of the platforms, particularly the island platforms, will optimize platform utilization, enhance safety and reduce both travel distances and travel time.

The conclusion above was the result of the analysis of the capacity of the existing platforms that revealed that they have sufficient capacity to handle even the highest growth projection. However, the ability to egress from the platforms within the required time is the governing factor which will determine station capacity and drive the design process. Furthermore, the need to disperse passengers along the full length of the platforms will ensure that the platforms will be efficiently and fully utilized. Providing additional interconnections between the platforms will also increase the utilization of the side platforms. Specific projects which achieve the desired dispersion and additional access include the following:

- Connect the southern platform with Atlantic Street
- Extend the southern platform over Atlantic Street
- Extend the existing east pedestrian bridge over South State Street
- Provide additional stair access to the existing pedestrian tunnel under the island platforms
- Extend the southern platform over Washington Boulevard
- Construct a new western pedestrian bridge spanning across the tracks and over South State Street to the surface parking lot

B. VEHICULAR

Background

Interstate 95 and the Merritt Parkway provide vehicular access to Stamford from towns and cities east of the City. These towns provide workers critical to the functioning of the economic engine that Stamford has become for the region. These highways are very congested and currently serve traffic volumes well in excess of their design capacity. This congestion has led to significant delays during the morning rush hour heading west toward Stamford as well as the reverse direction in the afternoon. On the positive side, this congestion, along with other factors, has motivated commuters to seek alternative means of getting to work in Stamford. The railroad has provided such a viable option and it is demonstrated in the ridership growth trends discussed in the previous section.

While a number of commuters have chosen alternate modes of transportation, there are still others who continue to use the highways, predominately in single occupant vehicles. There are several factors which influence these commuters in their choice of transportation modes. The strongest of these influences is the time it takes to commute and the cost of the commute. When these factors extend beyond the tipping point, commuters will choose to leave the car behind and use mass transit.

Existing Condition

There are five major roads that feed into the STC complex. These would include North State Street, South State Street and Station Place traversing east-west. Atlantic Street and Washington Boulevard have a north-south orientation. Each of these is described in detail below.

Station Place

The road narrows to two lanes at the station building, constrained by the location of the station's plaza and the parking garage. A wide stair is located at this constriction connecting the station to the street. This stair encourages drop offs at this location causing backups on the roadway. During the evening rush period, it was observed that vehicles will stop within the travel way to drop off or pick up passengers, backing up traffic on Station Place since there is not another lane to bypass stopped vehicles. While there are signs which prohibit these actions, there is no enforcement of these regulations. There appears to be insufficient capacity to accommodate the drop offs, taxis and through traffic which currently use the drive. During the evening rush, drivers wanting to pick up passengers are often queued down onto Atlantic Street. It was observed that since the opening of the Urban Transitway, some vehicles were using Station Place as a cut through to reach Washington Boulevard and destinations west of the station.

Station Place also provides access to the ConnDOT owned station parking garage and the parking garage for Metro Center which is located on the west end of the STC. There is a small, gate controlled parking lot for station employees located on the west end of Station Place along the platform. Space this close to the station should be used for patrons of the station rather than employees.

South State Street

The street rises steeply from the intersection of Washington Boulevard to accommodate the tunnel structure which connects the main portion of the station to the bus station, shuttle area and North State Street. This grade makes it impossible to see activity beyond the crest of the hill where the station drop off is located.
This lack of visibility of the drop off area creates a safety concern for the STC. When traveling eastbound on South State Street, the driver does not get a sense that they are entering a station complex and should therefore be aware of stopping or turning vehicles and pedestrian activity. As an example, there is a CT Transit stop just over the crest of the hill, dropping off passengers to the STC and then making a left turn onto Guernsey Street which creates an unsafe condition. During the morning peak drop off, it was also observed that drivers were not using the full length of the drop off area. There appears to be sufficient room along the sidewalk for those wishing to drop off, but they choose to double and triple stop at the building entrance, blocking those behind them from entering the drop off area. Similar to Station Place, there are signs which prohibit this practice, but there is no enforcement during the peak hours. After stopping at the entrance drivers may also want to turn onto Guernsey to reverse direction. However, when a vehicle enters the drop off area, they are prohibited from turning onto Guernsey by a curbed plaza. Drivers must then travel down South State Street and change direction by turning right on Atlantic or continuing down to Elm, since a left turn onto Atlantic is prohibited from South State Street.

Existing Streets Around STC

Lastly, similar to Station Place, the stairs on the north side of the building may encourage people to stop on South State Street.

North State Street

Similar to South State Street, there are few visual cues that one is approaching a busy, intermodal transportation center with its many vehicular and pedestrian movements. The speed limit on North State Street is 25 mph although the majority of the vehicles are traveling in excess of that. This creates safety issues for pedestrians trying to access the STC. There is a signalized at grade, midblock crossing for the pedestrian to access the lower passageway into the station. The focus needs to be shifted from vehicular travel to pedestrian on North State Street between Atlantic and Washington to address the needs of the STC rather than the vehicles passing through it.

Washington Boulevard

A westbound ramp onto 95 is located just north of the interstate viaduct and is accessed via a left turn from northbound Washington. Those coming southbound on Washington, can make a similar left turn onto South State Street to access eastbound 95. These conflicting movements create significant congestion during the afternoon peak and conflict with pedestrian movements accessing the STC. The bridge carrying the railroad over Washington Blvd. was replaced in 2002. With the reconstruction, the number of travel lanes was increased to 6 lanes, but little was done for pedestrians. This now needs to be addressed to improve STC functions.

Atlantic Street

The roadway under the bridge consists of only two lanes. There are narrow sidewalks on either side of the roadway between the bridge piers. The State DOT is currently studying the widening of this bridge to accommodate additional vehicle lanes. According to the DOT, it will be take more than 5 years before the bridge could be completed. . Atlantic Street has been widened south of the bridge to the intersection with the Urban Transitway which creates traffic issues for northbound traffic as two lanes need to taper down to one lane. The intersection just north of the bridge with South State Street and the off ramp from I-95 east bound is a congested intersection and is often impacted by the restriction at the railroad bridge. Vehicles traveling east on South State Street are prohibited from turning left into the downtown area and those traveling east on the off ramp are prohibited from turning right on Atlantic to access the south end. This frustrates drivers who not familiar with the area and have been observed to disregard this prohibition. Guidance, through signage, should be provided to those unfamiliar with the area as to how to reach their destination

Urban Transit Way

To the south of the railroad bridge over Atlantic, the City has recently opened the Urban Transitway. This new road is located at the intersection of Atlantic and Station Place and will eventually provide more direct access to the East Main Street area. A portion of the Phase 1 Urban Transitway was opened in the summer of 2009. This roadway connects with Atlantic Street at a signalized intersection, directly across from Station Place. This segment consists of one travel lane, one HOV lane and a bicycle lane in each direction on the road. Sidewalks are provided on each side of the roadway. The first phase of the project terminates at Elm Street. A second phase is designed which will extend the transit way to East Main Street. This roadway provides a direct link to the STC for residents living on the east side of the City. It also provides a direct connection to the CT Transit facility on Myrtle Street. The transit way is well landscaped and will have Intelligent Transportation Systems (ITS) providing drivers with real time information regarding transit connections and parking space availability.

Drop Off/Pick Up

Patrons being dropped off/picked up at the station use South State Street for west bound trains and Station Place for east bound trains. The New York bound trains is still the dominant direction for drop off and pick up. The drop off on South State Street consists of a drop off lane along the curb, a through lane and another stopping lane on the opposite curb. A bus pick up is also located along the curb line. The drop off on Station Place is shared with the taxi queue. Similar to the north side, there is a lane along the curb, a through lane and a lane along the opposite curb.

Analysis/Assessment

Vehicular traffic operations at area intersections were evaluated as part of this study. The traffic analysis assumed a linear growth of background traffic volumes and included development-generated traffic. The traffic analysis also took into account the ongoing and planned roadway projects required by the State Traffic Commission. It does not reflect any future work required for current or future development applications.

The traffic analysis assumed a linear growth of background traffic volumes of 1% per year over the study period which is consistent with most other traffic studies in the area. Additionally, development-generated traffic was considered in the analysis over and above this background traffic growth. The following existing or near term developments were included in this analysis:

- Harbor Point (All phases)
- Gateway
- RBS
- Park Square West
- Yale and Towne (All phases)
- Metro Green
- Lord and Taylor Redevelopment
- Tresser Square

Trump Parc 969 High Ridge Road
Atlantic Hotel and Residences

The 1% annual background traffic growth rate, which excludes future development-specific vehicle trips, was selected based on several considerations. As with the nation as a whole, the economic recession in 2008 and 2009 saw stagnation or decrease in traffic volumes on most roadways in Connecticut, including those in Stamford. This breaks the trend of usually uninterrupted traffic growth on area roadways for several decades. Also, the major corridors in the Stamford region such as I-95 and Merritt Parkway are already congested during peak hours, further limiting the potential for future background traffic growth. Originally designed for 100,000 vehicles per day. I-95 is experiencing traffic volumes in excess of 150,000 vehicles per day. For planning purposes, the 1% annual rate therefore seems a conservative assumption.

In addition to reflecting existing and near term developments in the area, the traffic analysis also takes into account the ongoing and planned roadway projects. The following road improvements were also considered in the analysis:

- Improvements to Washington Boulevard, Atlantic Street, Pacific Street and Canal Streets (Required by State Traffic Commission approval)
- Widening of Atlantic Street Underpass
- Urban Transitway Phases 1 and 2

The improvements to the street network are those that have already been identified by the State Traffic Commission for implementation and do not reflect any future work required for current or future development applications. The analysis covers 24 signalized intersections around the transportation center, including those along main access corridors in the area: North State Street, South State Street, Station Place, the Urban Transitway, Henry Street, Washington Boulevard, Atlantic Street, Pacific Street and Canal Street.

Overall, the 2010 traffic operations at area intersections are marginally acceptable, defined as LOS D or better in an urbanized area. However, the various levels of service (LOS) are expected to progressively deteriorate over the study period if the background growth levels are to continue and no changes are made to the street network and/or the STC. The replacement of the railroad bridges over city streets is one area where physical construction will have a tremendous impact on traffic congestion. These narrow bridges create severe traffic constrictions between the downtown area and the developing south end. The intersection of Henry Street and Atlantic Street is another problematic intersection that needs to be reconstructed to improve the level of service. This reconstruction will require the purchase of rights of way in order to construct the recommended improvement. Some funding has already been set aside by developers in the area and that amount should be used as a base to complete some of these projects although more funds need to be collected.

The constricted environment surrounding the STC provides little opportunity for additional physical street improvements to address future-year vehicular intersection capacity deficiencies except as noted otherwise. It is not feasible to build enough supply to meet the projected demand nor would it be desirable to do so. Other measures are needed therefore to help mitigate the traffic congestion.

Traffic Mitigation

The mitigation measures will need to be focused on the demand side of traffic and not on providing supply. Some mitigation measures were presented in the *Stamford Master Plan 2002* prepared by Abeles Phillips Preiss & Shapiro, Inc. and the Regional Plan Association. These measures should be more aggressively implemented. These strategies would include the following measures by employers:

- Flextime, alternate work schedules or four day weeks
- Telecommuting
- Guaranteed ride home programs for those working late
- Carpool and vanpool matching
- Commuter choice programs including tax incentive subsidies for transit use

It was stated in the previous City Master Plan that the implementation of these measures could reduce peak hour single occupant driving by 10 percent. More aggressive measures to be implemented by City government include the following:

- Lower maximum parking ratios
- Lower parking ratios near the train station and increase floor area ratios
- Cashing out of “free” employee parking
- Transfer development rights to decrease development away from transit centers and increase it near transit

The report stated that these strategies could reduce single occupant driving by 20 percent.

Conclusions and Recommendations

There is only a limited amount of physical reconfiguration that can be done to mitigate vehicle congestion, without dramatic impacts to the environment and right-of way surrounding the STC. Therefore the focus will need to be on demand mitigation. Some of the recommendations proposed would include the following:

- Reconstruct the intersection of Henry Street and Atlantic Street as has been previously identified in a number of traffic studies
- Continue to pursue with ConnDOT and others the reconstruction of the bridges which carry the railroad over city streets.
- More aggressively pursue demand mitigation measures as outlined
- Better enforcement of current traffic rules will also help to eliminate drop off-pick up operations in active travel lanes. This can be done with police enforcement or license plate recognition technology.
- Separate pedestrian circulation from vehicle traffic with pedestrian bridges mentioned in the Rail Section

C. PARKING

Background

The station and its garages were originally built and located based on providing convenient access to the platforms for commuters destined for Manhattan. The garages have functioned well with this design approach. However, with the growing number of commuters with Stamford as their destination, the necessity of having the garages so close to the platforms requires further scrutiny. The State has committed to replacing the existing, older garage and providing an additional 200 spaces which would bring the total State controlled spaces to excess of 2200. Their preference would be to provide these spaces in one garage while others would argue that the dispersion of parking around the STC may be more appropriate. The number of spaces that are required to meet the existing demand appears to be in excess of that currently provided. In contrast to this, there is excess parking inventory in some of the garages and lots within walking distance of the station.

Existing Condition

Presently, station parking demand is primarily provided by the 1,912-space STC Garage on Station Place and the 120-space, State-owned surface parking lot located at the corner of South State Street and Washington Boulevard. Various groups have said that this number is inadequate as evidenced by a two year waiting list. The garage actually consists of two structures, one built in the late 1980's with a capacity of about 800 cars and the latter built in 2002, which has a capacity of about 1100. Cars primarily enter and exit the garage from Station Place which creates some congestion along this road. Another entrance/exit is located along Atlantic Street, but is used by the public infrequently. ConnDOT has concluded that the older of the structures is structurally deficient and needs to be replaced. During the Fall of 2009, ConnDOT performed some interim repairs to the structure to reduce its on-going liability and forestall the inevitable replacement structure.

Station Place with Parking Garages on South Side

Analysis/Assessment

Quantity of Parking Spaces

Based on data supplied by the operator of the STC Garage, Pro Park America ("Pro Park"), and on observations of the surface parking lot, the garage and surface lot are over 90% occupied. Pro Park indicated that it has become necessary to close the garage to daily parkers for a minimum of two hours per day during a typical business day to hold spaces available for monthly parking pass holders.

When parking utilization rises above 90%, that facility has reached what is known as its practical capacity. Practical capacity reflects the operational efficiency of a parking facility beyond which users find difficulty in locating an available space. This increases their frustration level and the opportunity for vehicle/vehicle or vehicle/pedestrian conflict. Based on standard planning and design practices, it is desirable to maintain an available parking space surplus of 10% of the capacity of a garage or system during the peak demand hour. This ensures that, even during times of peak demand, sufficient spaces will be available to accommodate parking space turnover in a safe and efficient manner.

Using a 90% practical capacity, parking at the STC is currently experiencing a combined peak period parking deficit of approximately 95 spaces, exclusive of the waiting list. This is probably understated because of the aforementioned closures by ProPark. One of the factors contributing to the parking deficit may be the overnight and/or weekly parking that occurs at the site by out of town patrons. It has been reported that the garage is used by some persons from New York City to garage their cars. In addition, with the Amtrak activity, there may be those using Amtrak that are leaving their vehicles overnight or longer.

According to the 2004 Stamford Multimodal Circulation Study, approximately 39% of the rail transit passengers whose trips originated from the STC drove to and parked at the STC; indicating that 61% arrived by some other means (i.e. pedestrian, dropped-off, etc.) In 2009, the single occupancy automobile usage percentage of the modal split had increased to at least 48% of the MTA reported average of 3,952 people that originated from the STC on a daily basis, during on-peak hours. For comparison with other New Haven main line stations, Stamford is in the middle for the alone and park mode between a low of 44% for the New Haven station and a high of 75% for the Westport station. In comparing all the modes that utilize cars, (alone and parked, drop off and car pool) Stamford has a 78% modal split, while the lowest split is at the New Haven station with 68%.

The increase in the percentage in modal split from 2004 to 2009 may be attributable to the additional parking capacity that came on line after the 2004 study was completed. It appears to demonstrate that if more parking were provided, more patrons would use it and increase the traffic congestion around the STC. If the modal split continues to increase or the ridership grows, or a combination thereof, the parking deficit at the STC will become more problematic as demonstrated after the 2004 study.

As with rail ridership and vehicle congestion, three scenarios were evaluated in this Master Plan. Low growth of 0.75%, a medium growth of 1.5% and high growth based on 4.0%. Table 5 illustrates projections of average on-peak rail ridership originating from the STC based on these projected growth rates. Due to the continuing economic slowdown, it is assumed that there will be no growth during 2010.

Table 4 - On Peak Rail Ridership Projections

Year	2009 (Actual)	2015	2020	2035
Low - 0.75% Growth	3,952	4,100	4,200	4,800
Medium - 1.5% Growth	3,952	4,300	4,600	5,700
High - 4.0% Growth	3,952	4,800	5,800	10,600

Table 6 translates the projected yearly growth in on-peak transit riders originating from the STC into the projected peak hour parking demand. It maintains the existing modal split of 48% for commuters who drive and park at the station. This is likely to be the upper limit of the range in parking demand.

Table 5 - Project Peak Period Parking Demand

Year	2009 (Actual)	2015	2020	2035
Drive and Park Percentage (Modal Spilt)	48%	48%	48%	48%
Low - 0.75% Growth	1,924	1,970	2,010	2,300
Medium - 1.5% Growth	1,924	2,100	2,200	2,700
High - 4.0% Growth	1.924	2,300	2,800	5,100

Based on these demand figures, Table 7 indicates the peak period practical parking space deficits expected at the STC parking facilities if no expansion takes place to accommodate the increased demand. This table is based on a current practical capacity of 1,829 and the current modal split of 48% for commuters who drive and park.

Table 6 - Peak Hour Practical Parking Space Deficits

Year	2009 (Actual)	2015	2020	2035
Low - 0.75% Growth	-95	-140	-180	-470
Medium - 1.5% Growth	-95	-270	-370	-870
High - 4.0% Growth	-95	-470	-970	-3270

Again, due to the parking operator's policy of closing the facility to commuter parkers during a portion of the business day, these potential deficit figures are likely lower than the actual deficits that will be experienced at the STC Garage. For planning purposes, we would recommend providing sufficient parking to satisfy one of the two growth scenarios:

1) Medium growth scenario

2) High growth with City policy implemented to lower the modal split to 25% (as compared to 48%)

In either scenario, an additional 750 to 1000 spaces over the 25 year period will be required. These could be added in 150 to 200 space increments provided within TOD developments around the STC every 5 years. This is significantly lower than the standards projections would dictate. At each milestone when spaces will be added, the parking should be revaluated to confirm these projections.

Aerial View Showing Parking Garages South of STC

Pricing of Parking Spaces

The parking rate charged at the Transportation Center Garage is $1.00 for the first hour, $8.00 for 16 hours, $10 for 24 hours and a $70 monthly rate. These rates are slightly lower than the $9.00 daily maximum and $75.00 monthly rates charged at City-owned facilities and significantly lower than the rates charged at privately owned or operated facilities which range from $2.00 per hour to $3.50 per hour, $6.00 to $20.00 daily and $65.00 to $95.40 monthly. On-street parking meter rates are currently set at $1.00 per hour.

The parking operators at nearly every station between Mount Vernon and New Haven maintain a waiting list of potential parking customers trying to obtain a monthly permit. At the time of this report, other than the Mount Vernon and Port Chester, NY stations, every rail station for which information could be obtained, has a waiting list of potential monthly parking customers at least six (6) months long. At two (2) years, the wait for monthly parking permits at the Stamford Transportation Center is relatively short compared to other stations such as Rye. The size of the waiting list indicates that demand is greater than the supply. One reason for this may be due to the fact that the pricing is not consistent with the market. Current parking policy, as advocated by urban planner, Dr. Shoup of UCLA, is to price the parking until the demand is approximately 85% of the supply and continue to adjust the pricing to maintain this level of supply and demand. It is not practical and politically expedient to implement this approach in the short term, but there are changes that can be made in the pricing structure to reduce demand at the facility. In particular, the use of the STC parking rate premiums for out of state and out of town residents should be considered. It is most desirable to generate growth at the STC from TOD residents and businesses as well as intra state travel, rather than from commuters driving in from outlying areas to take the train into Manhattan. For references purposes, other stations along the New Haven line have higher fees and/or do not provide monthly permits for out of town residents.

Based on this information regarding the rates and parking characteristics at other stations along the New Haven Line, and on the current parking rates charged at the Stamford Transportation Center, it may be possible to achieve the following rates with little to no drop in the demand for parking:

- Monthly Parking rate: $85 – $95
- Hourly Parking rate: $1.00 – $1.50
- Max. 24-hr. rate: $10.00 – $12.00

Further changes in the rate structure are also recommended to provide tiered pricing rates. The closer the parking is located to the STC, the higher the price should be. Valet parking would be priced at a higher rate for those who would desire such a service. Preference parking rates should be considered for City of Stamford residents as well as in state parkers over out of state parkers. Parking discounts could be provided for those who arrive in smaller vehicles or higher occupancy vehicles. ProPark has developed a new, patented small car detection system called the nanoMAX^{TM}. This system can measure the size of the vehicle entering into the parking facility and provide a unique parking rate based on the vehicle's actual size. The system is currently in use at the Charles Square Parking Garage in Cambridge, Massachusetts. In addition to this detection system, they also provide dedicated small car parking areas for those who choose to use smaller vehicles such as Smart Cars and Mini Coopers. This allows for more parking spaces within the same footprint occupied by traditional cars.

Valet parking has been used successfully at the Scarborough Station in Briarcliff Manor. It was originally implemented in 2007 due to the loss of spaces caused by construction. The program was renewed after construction was complete because the patrons liked the service so much. Parking permit prices were raised by $200 per year to pay for the service. It helped to reduce the waiting list and provides a desirable amenity for patrons. The service is provided by ProPark which operates the STC garage. The New Jersey Transit Station at Millburn also provides valet parking as a way to mitigate demand for additional parking. It has been used successfully for 7 years but at this point demand is outpacing the additional supply provided by valet service. Before embarking on this service at the STC, it is recommended that a survey of existing patrons and those on the waiting list be polled to determine if this is a desirable service for them and one for which they would be willing to pay a premium.

Location of Parking Spaces

There are several privately owned developments around the STC that have proposed providing parking spaces in new structures for STC commuters. These would include the following:

- Gateway
- Metro-Green
- 650 Atlantic Street
- Stamford Manhattan Transit Group

In addition to these developments, the existing surface lot owned by CDOT could be converted into a two level parking deck. A portion of the existing, older garage could also be used for parking. A plan of the various parking locations is shown in Figure 3:

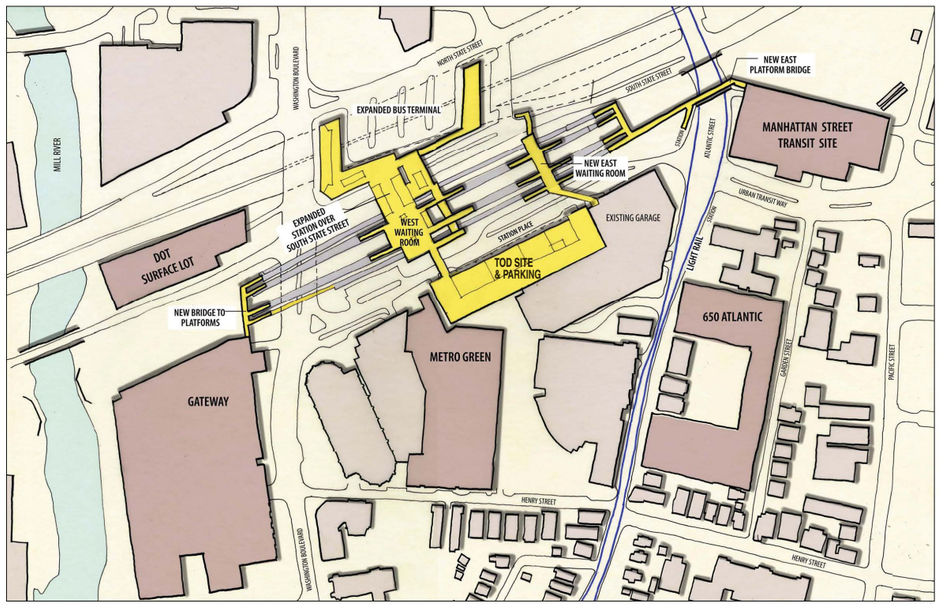


Figure 3 – Potential Parking Locations

ConnDOT has indicated that there is greater efficiency in operating a single, larger garage. However, providing parking at various locations will allow the parking to be dispersed and reduce the traffic impact of a single large garage on the local street network. It will also mitigate the impact of the loss of parking during the demolition phase of the existing garage. Incorporating parking into proposed contextual developments will reduce the visual impact of the parking garages on the community. The parking structures should not dominate the neighborhood, but be integrated within to eliminate the "dead zones" typically created by parking garages. At a minimum, the street level of the garage should incorporate some retail or other commercial enterprise to engage the adjacent street front.

Parking Information Systems

To better facilitate available parking for the commuter, Intelligent Transportation Systems (ITS) should be provided for real time information on the number of available spaces at each parking location. These ITS systems should be incorporated into gateway signage at all points approaching the STC facility. This would help to establish the presence of the STC and provide valuable information to commuters as to their parking options. ITS should be provided on North and South State Streets, Washington Boulevard and Atlantic Street.

ITS System for Parking Garage

Modal Split

As stated in an earlier section titled “Quantity of Parking Spaces”, a goal is to reduce the modal split for commuters who drive to the station and park. For the 4% growth rate, a reduction in the parking component from 48% to 25% is required over the 25 year period to keep the additional parking space requirement to under 1000 spaces in that time frame. This will increase ridership without the need to significantly increase the number of parking spaces. There are several policies that begin to address this goal. These would include the following:

- Improving alternate access such as bicycle and pedestrian connections (See Pedestrian and Bicycle Section)
- Encouraging the development of residential units within the vicinity of the STC through TOD developments
- Provide additional and better parking at other stations along the New Haven line to discourage the use of the Stamford station by commuters with stations in closer proximity to their residence.
- Provide improved and more frequent bus and shuttle services particularly during the peak hour, to encourage more ridership while reducing the number of vehicles on the road.

All of these policies will help to reduce the 48% mode that currently parks a single occupant car at the STC. The Bay Area Rapid Transit (BART) system in California, has established guidelines for station access. In 1998, 38% of patrons drove and parked at transit stations. Their target for 2010 was to reduce this percentage to 31%. This reflects their access hierarchy which prioritizes walking and places the least priority for the drive and park mode. Motivation for this approach is better environmental stewardship, better land use and transportation conditions around their stations and the lack of sufficient funding to continue building more parking spaces.

Conclusions and Recommendations

The overall recommendation is to provide limited additional parking spaces while reducing the parking demand at the STC for long term sustainability and encouragement of Transit Oriented Development (TOD). To accomplish this, policies need to be implemented to reduce the demand for single occupant vehicles to drive to the station and park their cars in a parking garage and to utilize other available parking spaces in the area. These policies include:

- Establish the appropriate quantity of parking so as to minimize the congestion around the station. At this time we estimate that an increase of 200 spaces in the next 5 years as originally suggested by ConnDOT is an acceptable target. The parking needs should be evaluated periodically as a result in fluctuations in the influencing market factors (economy, fuel prices, environmental awareness, etc.)

- Establish a tiered parking fee structure that provides priority to residents and smaller and/or high occupancy vehicles. The fee structure should also reflect the proximity of the parking to the station. Lastly, a valet service option should also be provided. Making these adjustments may help to normalize the demand for parking at Stamford as compared to other stations along the New Haven line and may also provide additional revenue.

- Provide parking at multiple locations to reduce overall travel distances/times, reduce traffic congestion issues and provide flexibility during parking garage construction phases. These multiple locations can be achieved by integrating STC parking into future privately funded developments. In addition, existing private property owners should be encouraged to make excess parking inventory available for STC users including locations in the downtown area which currently have a surplus.

- Provide variable message signage throughout the STC area providing better information to commuters which will reduce wasted travel times around the STC and the by-products thereof.

- Develop policies that will stimulate alternative ways to access the station including better and more attractive bicycle and walking routes as well as better and more frequent service by mass transit vehicles (public and private) during peak hours to the station.

D. BUS

Background

The Stamford Transportation Center serves 454 buses per weekday according to 2009 CT Transit bus schedules. Buses enter the STC travelling west from North State Street and queue at one of four bays, all located beneath I-95 which likely has an adverse effect on bus ridership. Scheduled dwell time for most buses is two minutes. Exiting buses depart west onto North State Street (one-way westbound).

The STC is a major pulse point for the CT Transit system. While the location of this pulse point is not ideal from a bus transit perspective, and not an ideal aesthetic environment, there is limited land available in the downtown area where a bus depot is preferred. The STC location also provides better intermodal connection at its current location.

Existing Condition

CT Transit, which operates the bus service for the State, has its bus depot located under I-95, between North and South State Street. This area is noisy from the traffic which surrounds it and travels overhead. The materials surrounding the depot are hard, reflective surfaces such as steel, concrete and asphalt. It is dark with limited lighting and devoid of color except for grey concrete and black asphalt. The area is pressure washed several times a year but there is significant dust and debris kicked up by vehicles and droppings from birds roosting on the girders of the I-95 viaduct. In short, it is not a very desirable location to pick up a bus and is certainly a deterrent for the casual user.

Bird Droppings in Bus Depot

Bus Depot Under I-95 Viaduct

The buses operate from early in the morning until late at night and therefore lighting and security are important issues. Patrons must feel secure in the environment and with that increased sense of security may come additional ridership.

There are some bus shelters and benches provided for patrons waiting for the buses, but none of these spaces is conditioned nor are readily accessible to restrooms. Patrons waiting for buses during cold weather must wait in the gateway building, standing near the entrance on North State Street to compensate for the little information that is provided regarding bus arrival and departure. More of this discussion can be found in the section on signage.

Four streets carry a majority of local bus traffic. These include North State Street, Atlantic Street, Washington and Tresser Boulevards. Buses operate in a circulating pattern on these streets, departing west on North State, travelling north on Washington, east on Tresser and north on Atlantic Street. Once on Atlantic Street, routes become diffuse with a majority of bus routes turning off Atlantic within one mile of the STC. A majority of returning buses travel south down Atlantic Street and turn west onto North State Street.

Analysis/Assessment

Buses enter the STC west of the bays and dwell at one of four bays, facing north towards North State Street. The most heavily used bays are Bay 1 and Bay 4, handling 131 and 130 buses per weekday, respectively. The table below lists the bay and the bus routes and direction that each of these serves.

BAY	DIRECTION	BUS ROUTES
1	Eastbound	11, 11a,11b,13,14, I-Bus
2	South/Southwest	21,21a, 22, 22a, 24, 24b
3	Northbound	31a,31b,31c,31d,32,33,33b,34,34a
4	East/Southeast	41,41a,41b,42,43,43a,44,44a,44b,44c,45x

Table 7 - Assigned Bus Bays and Routes

The Commuter Connection (CC) bus stand is located parallel to Track 5 of the train station (separate from bus station). The CC buses include the Central, Bulls Head, and East lines. There is limited use of these buses. The private shuttles are likely the cause of that. The CC buses operate every 30 minutes from approximately 6:30 AM to 9:30 AM and 3:30 PM to 7:00 PM. These buses are not included in bus counts for Bays 1 through 4.

There is a direct route to White Plains, New York connecting to Port Chester and White Plains, via the Bee Line in Westchester County. Greyhound provides service to Union Station in New Haven and to Boston South Station and Port Authority Bus Terminal in New York City

Bus service begins at 5:10 am and commences at 11:50 pm. The densest activity occurs between 6 to 9:00 am and 3 to 6:00 pm with 113 buses in the morning peak and 99 buses in the afternoon peak. Bus arrivals

and departures operate in pulses with several buses departing at the same time and several minutes between bus departures. This pattern occurs throughout the day with the gap between pulses shortening at peak hours. The clustering pattern of several bus departures at the same time does, however, remain present throughout the day.

One of the bus stops for CT Transit is located just over the crest of the hill on South State Street. The bus discharges passengers on the side of the street for connection to the STC. The bus then navigates to the left hand lane to make a turn onto Guernsey Street. This stop is a dangerous one in that other drviers cannot see over the top of the hill for the bus that is stopped in the travel lane. CT Transit has suggested that this stop be relocated to Guernsey Street. In order for this to be implemented, a crosswalk is needed from the east side of Guernsey to the west side. This will connect with the crosswalk at the light on South State Street. This location of the bus stop seems to be a much safer one than the present location.

It has been suggested previously and then confirmed at a public meeting that a connection is needed between the rotunda area in the tunnel and the bus depot. By providing this connection, buses can pull into the depot and stop at this location, discharging passengers who may want to connect with the trains and then proceed to their designated bay. This concept will encourage the intermodal connectivity that is desired. It also provides a better connection for those making the reverse connection from the train to the bus, by reducing travel distances to make the bus connection.

Some space within the bus depot is dedicated to parking for tenants in the STC and others. This valuable space should be used for buses to queue at the station without having to park at their designated bay. CT Transit is also planning to purchase articulated buses in the near future which will require additional space which will need to be accommodated in this general vicinity.

Conclusions and Recomendations

For the bus depot there are a variety of improvements that can be made that can be segregated into short term “quick fixes” and also long term improvements. For the short term, improvements that would improve the area for patrons and may encourage additional ridership include:

- Provide more regular cleaning of the bus depot area
- Install bird deterrents to control birds roosting in the beams and other areas
- Provide some sound attenuation to reduce the noise impact.
- Increase the lighting levels within the facility.
- Provide a waiting area connected to the existing lower level passageway
- Provide a connection between the rotunda in the lower level to the bus area
- Relocate the parking within the bus depot to other sites in the STC.
- Relocate the bus stop on South State Street to Guernsey Street with the required crosswalk being added

For the long term, a more comprehensive reconstruction of the bus depot is recommended. The anticipated growth in bus ridership requires reconfiguring the area below I-95 currently reserved for buses and shuttles to a more efficient and user-friendly experience. The plan proposes relocating the current building by linking the tunnel level of the STC with North State Street towards the west and providing frontage along Washington Boulevard. The location of this proposed building extends the concept of establishing a street presence for the station and still provides a direct connection for pedestrians to North State Street. The expanded terminal will house a new bus waiting area and retail spaces that will have retail frontage on Washington Boulevard. The relocation will also create one contiguous space below I-95 to expand the bus waiting area for future needs. The design of the proposed bus terminal building should be transparent and inviting, in keeping with the expansion of the station building. The level of rider accessibility and comfort should also be extended into the bus waiting area with an upgrade in lighting, weather protection, and signage.

New Bus Station in Bridgeport

The photos above are of the Intermodal Transportation Center that was recently constructed in Bridgeport. This new state of the art facility provided a 10,000 square foot passenger terminal with 17 bus bays. It provides a direct connection to the railroad via a covered walkway. This facility was a significant improvement over the previous facility providing greater capacity and better amenities for GBTA patrons.

Roosevelt Avenue Terminal – Queens, NY

E. PEDESTRIAN AND BICYCLES

Background

When given sidewalks, traffic calmed streets to walk along, safe and convenient ways to cross streets and a comfortable and attractive environment, most people are willing to walk further to reach public transportation. The environment surrounding the STC lacks many of these essential elements which would encourage more pedestrian activity. An August 2008 study by Project for Public Spaces (PPS) identified some of the pedestrian deficiencies in downtown Stamford and in particular the vicinity of the STC. Of primary concern was the lack of comfortable pedestrian access and connectivity to adjacent land uses. According to their study, the streets communicate that they are for vehicles and not for pedestrians. PPS provided many suggestions for improving the pedestrian environment.

As shown on Figure 4, a large part of the downtown and south end are within a 10 minute walk of the STC.

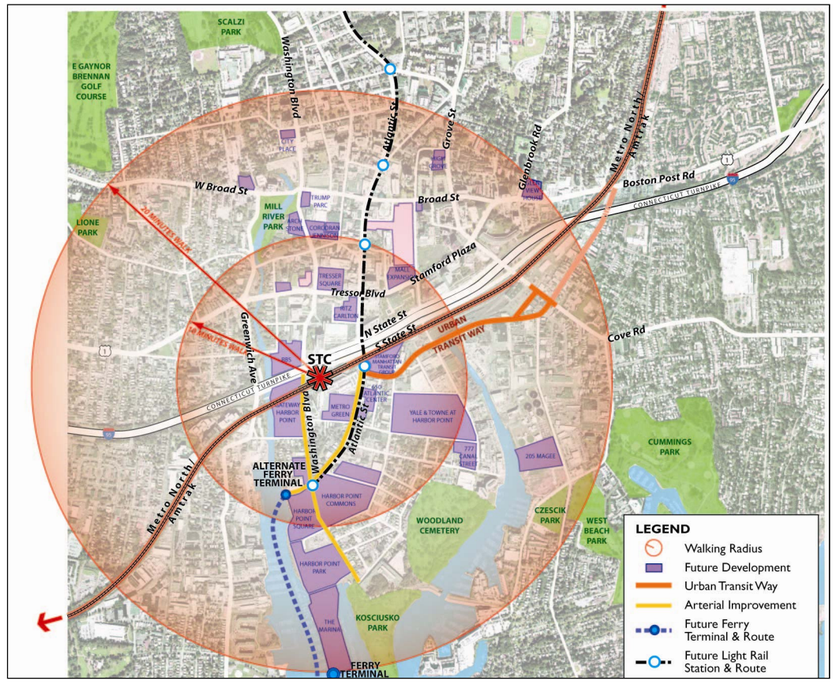


Figure 4 - STC at Center of City

All of the downtown and the entire south end are within a 20 minute walk of the STC. As has been demonstrated in many other urban centers, it is not unreasonable to walk 10 minutes to catch a train or a bus. Making the pedestrian travel routes more pedestrian friendly, will go a long way toward encouraging this sustainable modal choice. Currently, the entire area surrounding the STC is dominated by the automobile. With I-95 overhead and the various on/off ramps within the STC area that drivers are rushing to access, pedestrian safety is clearly a concern.

According to the FHWA Study, *National Bicycling and Walking Study,* bicycling and walking typically account for 25 to 50% of all personal trips in European cities, as well as the vast majority of all public transportation access trips. This stands in sharp contrast to the U.S. where the share of personal trips by non-motorized means is less than 10% and automobile park and ride accounts for a major share of suburban train access. The Stamford station is consistent with this finding as the primary means of access to the STC has historically been via the automobile. This includes either a single occupant vehicle which was driven and parked at the garage or a commuter being dropped off by friends or family. With the anticipated growth in rail ridership for the next 25 years and the desire for a more sustainable environment and a healthier population, it is desirable to encourage alternative means which would include walking, bicycling and the bus. The investment in bicycle parking immediately adjacent to the station platforms and support facilities is far less expensive than that required for car parking. Included in this alternate means of access should be preferential treatment for more efficient, smaller and alternative fuel vehicles.

Existing Condition

Observations from the PPS Study regarding existing conditions include the following:

- High speed traffic exists at along North State Street
- No street level commercial activity in the area
- Intersection of Washington Boulevard and South State Street is difficult to cross
- Insufficient sidewalk on the southwest corner of Washington and South State Street
- I-95 is a barrier between the STC and downtown
- Bus depot is dark and unwelcoming
- Greater visibility is needed for the STC gateway and crosswalk
- Amenities are needed along pedestrian routes
- Washington Boulevard needs to include some urban design elements south of Tressor Boulevard. These would include on street parking, a planted median and aesthetic lampposts.
- The pedestrian environment is rather stark with an extensive amount of concrete supporting the I-95 viaduct.

Station Plaza

Pedestrian Friendly Streetscape

Other observations that we have made included:

a) Station Place, which is the hub for picking up patrons in the afternoon, is at the center of the STC. It is devoid of any trees or vegetation, but has a cascading fountain which operates during warmer weather. There is some formal landscaping on the west end of the street and around the Metro Center complex. On the east end, the landscaping consists primarily of existing trees that were allowed to mature rather than a formalized plan. There is a mixture of street lighting types along Station Place and during the evening hours, which are not very effective in lighting the pedestrian routes within the STC environment. Brick pavers and granite curb are used on the sidewalks on the station side of the street.

b) The intersection of Atlantic Street with North State Street is a difficult intersection for pedestrians to cross, particularly in the south bound direction. Cars can turn right onto North State Street or turn right onto the eastbound ramp for 95 within a short distance. While a right turn on red is prohibited at this intersection, it has been observed that drivers are ignoring this posting. This leaves the pedestrian to try to figure out where the driver is headed as he is crossing the street. Crossing under the railroad bridge is also an undesirable experience for the pedestrian with its dark, narrow sidewalk and the open railroad bridge overhead.

c) Approaching the station from the west on South State Street, where most patrons get dropped off for their morning commute, there are streets trees, lighting and pavers in the sidewalks from Washington Boulevard up to the main stair into the STC on the North side. There are several trees at the east end of the station above a concrete retaining wall. Beyond the STC to the east, South State Street becomes a stark, canyon like space between the retaining wall for I-95 to the north and the retaining wall for the railroad to the south. As one approaches the intersection with Atlantic Street, the sidewalk narrows unexpectedly to less than three feet. Pedestrians attempt to walk this narrow sidewalk or use the street, both of which are not safe since vehicles on the street, particularly past the station, are traveling well above the 25 mph city limit.

Of particular importance is the “greening” of the area surrounding the STC to soften the overhead I-95 structure and reemphasize the urban streetscape. While the overhead highway and railroad structures block available sunlight, there are opportunities for “pocket parks” at street corners to enhance the pedestrian experience and soften the harshness of the abundance on steel, concrete and asphalt. Additionally, greater visibility of the STC through gateway signage on the approaches should be provided to alert motorists to the different nature of this area and the potential for pedestrian, bus and shuttle movements.

According to SWRPA’s recently completed *South Western Region Rail Station Parking Study*, dated May 2009, the Stamford Transportation Center has a total of 129 bicycle parking spaces. There are bicycle racks near the bus depot under I-95 on the north side of the station, near the entrance to the station off South State Street and on the south side of the station, adjacent to the east bound platform. The racks which are below I-95 are covered while the others are not. There are no bicycle lockers on site and there are no signs that direct cyclists as to where the racks are located. However, there are signs that provide warnings of where bicycles are not welcome.

Sign in Front of STC


Bike Storage near Bus Depot

Presently, there are no marked bicycle routes connecting to the STC except for those on the new Urban Transitway. The Mill River Greenway promises new bicycle routes which will connect the newly renovated Mill River Park with Kosciusko Park in the south end with the STC as an important node in that trail.

With respect to the use of alternative fuel and smaller more efficient vehicles, no incentives are provided at the STC. Avis does provide rental cars near the STC at its facility on Station Place. No other shared use vehicles are available at the site.

Analysis/Assessment

Several pedestrian counts were conducted over the last 2 years. These include counts by EarthTech performed in 2008 as part of the Gateway Development project application and counts by South Western Regional Planning Agency (SWRPA) in 2009 to analyze the impact of the RBS building on pedestrian flow. EarthTech’s study area was limited to access from the Gateway site on the west of Washington Boulevard into the station and within the tunnel providing access to the center platforms. The capacity of each egress component was evaluated. The sliding doors at the north end of the tunnel with a four foot wide opening restriction results in a level of service D.

SWRPA took pedestrian counts in May 2009 primarily along Washington Boulevard and the STC lower level passageway. The study area was from the Richmond Hill intersection to the intersection with Station Place. The morning peak was between 8:15 am to 8:30 am with 1678 pedestrians. During the AM peak, 84% of the pedestrian flow that uses the tunnel is out toward the City and 16% is into the STC. Of the pedestrians walking north toward the City in the passageway, 58% were headed toward North State Street and the balance 42% were headed toward the shuttles. The evening peak was during the 5:00 pm to 5:15 pm interval with 1044 pedestrians. Of the pedestrians walking south in the passageway, 62% were coming from North State Street and the balance were coming from the shuttles.

An analysis was performed in accordance with the *Transit Capacity and Quality of Service Manual – 2nd Edition.* This analysis examined pedestrian flow based on level of service, similar to that performed for vehicular traffic. Two critical areas were examined, the east pedestrian bridge and the tunnel. For the east pedestrian bridge, the stairways and the escalators that contribute to the bridge have a larger capacity than the bridge itself. The capacity of the bridge is less than the sum of the access points that feed into it. Furthermore, the bridge does not extend to the west bound (north) side platform or to South State Street.

A similar analysis was performed on the tunnel under the tracks. The capacity of the tunnel is greater than the stairs that provide access to it. Additional center platforms stairs connecting to the tunnel could be provided without overcrowding the tunnel. However, the doors at the end of the tunnel only have half the capacity of the tunnel and therefore is a constriction in pedestrian flow.

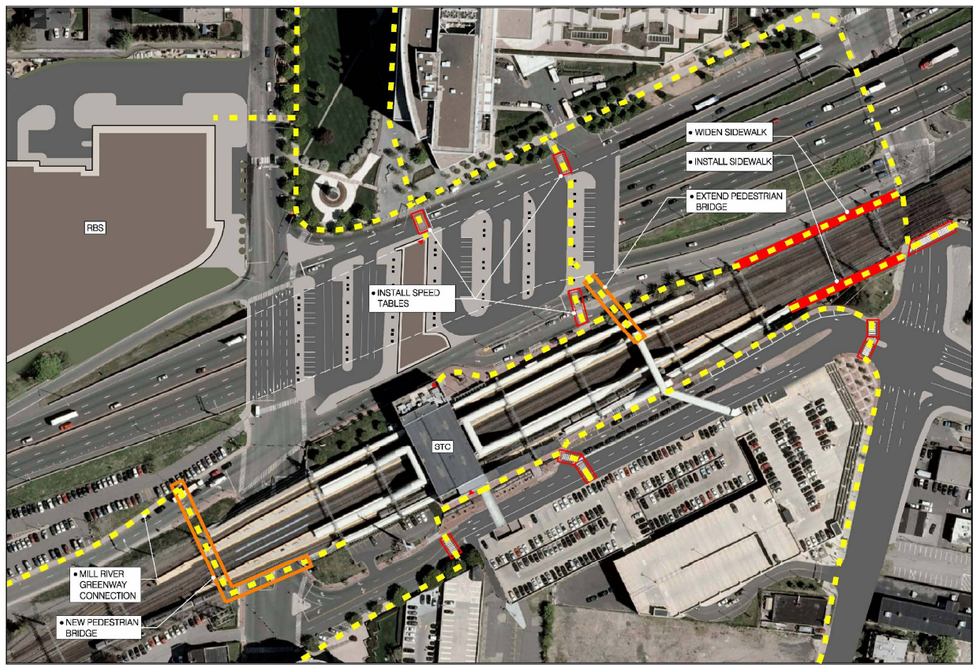


Figure 5 - Pedestrian Route Map

To improve the pedestrian connections, there are several approaches which can be taken including providing more real time information (see Signage and ITS Section) and slowing vehicle traffic through the STC. Where possible, the needs of the pedestrian should be given preference over the vehicle within the STC environment. This can be achieved by providing speed tables at street crossings on North and South State Streets as well as on Station Place. These features will help to calm traffic within this area and alert drivers to the potential of pedestrian movements. Where speed tables are not practical, it may be necessary to separate the pedestrians from the vehicles through the use of pedestrian bridges. As discussed in the rail section, these could be across Washington Boulevard and Atlantic Streets. They could also be tied into proposed developments on the properties abutting the STC. These improvements are shown on the pedestrian route map, Figure 5.

In addition to those items discussed above, the PPS Study made the following recommendations for improving the pedestrian environment:

- Encourage the use of UBS plaza for events and dining
- Connect the Mill River Bikeway and Pedestrian Trail to STC
- Organize artists to paint murals on concrete walls or light art to brighten under bridges
- Add news “zipper” at gateway to STC, visible to UBS plaza and add train/bus information above entrance (see Signage and ITS signage section)
- For the long term, limit North State between Atlantic and Washington to HOV vehicles, buses, shuttles
- Create bicycle “stations” at STC with secure parking, lockers and repair services

News “Zipper”

“The Way” Lighting, Brooklyn, New York

According to the SWRPA study previously referenced, utilization of these bicycle racks was between 40 and 42 % at the time of the survey. However, with the designation of bike routes to the STC, the provision of better facilities for bicyclists and the recognition and promotion of bicycles as an alternate means of accessing the STC, the demand for bicycle parking will far exceed the current demand.

Bike Lockers

Bike Rental Station

Several concerns are typically raised by cyclists who desire to use their bikes to access facilities. These would include theft, convenience and accessibility. Theft is one of the biggest impediments to cycling. This has also been an issue at the STC. Enclosed spaces or at least highly visible ones are desired to reduce the number of thefts. Having the ability to clean up or change once you reach your destination is another issue that needs to be addressed. At the STC, the only restrooms that are available are on the concourse level. Finally, bike storage needs to be easy to use and safe, close to the intended destination. In addition to

addressing these concerns at the destination itself, there is also the need for clearly defined bike routes coming into the STC.

Conclusions and Recommendations

The STC environment could minimally be defined as North State Street to the north, Atlantic Street to the east, Washington Boulevard to the west and Station Place to the south. The environment around the STC should be made more pedestrian friendly to promote walking and biking as modal choices. Pedestrian friendly improvements include:

- Replace the doors at the north end of the tunnel to provide more pedestrian capacity into and out of the tunnel.
- Make improvements to the streetscape which could include plantings, replacing asphalt pavement with pavers, consistent lighting and sidewalk sections along with other street amenities.
- Gateway signage at each entrance to the STC area would be beneficial in alerting drivers to the STC.
- Provide an area of refuge between North State Street and the I-95 entrance ramp to assist pedestrians attempting to cross this area.
- The concrete retaining wall and abutments should receive a treatment to improve aesthetics.
- Install speed tables at crossings on North and South State Streets, as well as on Station Place
- Widen the sidewalk on South State Street near the intersection with Atlantic Street
- Improve the lighting levels along the pedestrian routes to the STC to provide a greater sense of security

A plan showing the pedestrian routes to the STC and associated potential improvements is shown in Figure 5. The proposed landscaping improvements are shown on Figure 6.

Encouraging alternative means of access to the station will help to reduce the number of vehicles that continue to congest the area. Bicycles are an untapped modal use that could be greatly enhanced at the STC. Specific measures would include:

- Prepare a bike route plan and make the necessary improvements in signing and striping to provide access to the STC from the various neighborhoods surrounding the site
- Investigate the possibility of indoor space or at least covered space for bicycle storage
- Locate bike racks close to the entrance points to the STC
- Provide separate racks which could accommodate scooters

Speed Table

Pocket Landscape Park
Stamford, CT

Asphalt Pavers
Iona College – New Rochelle

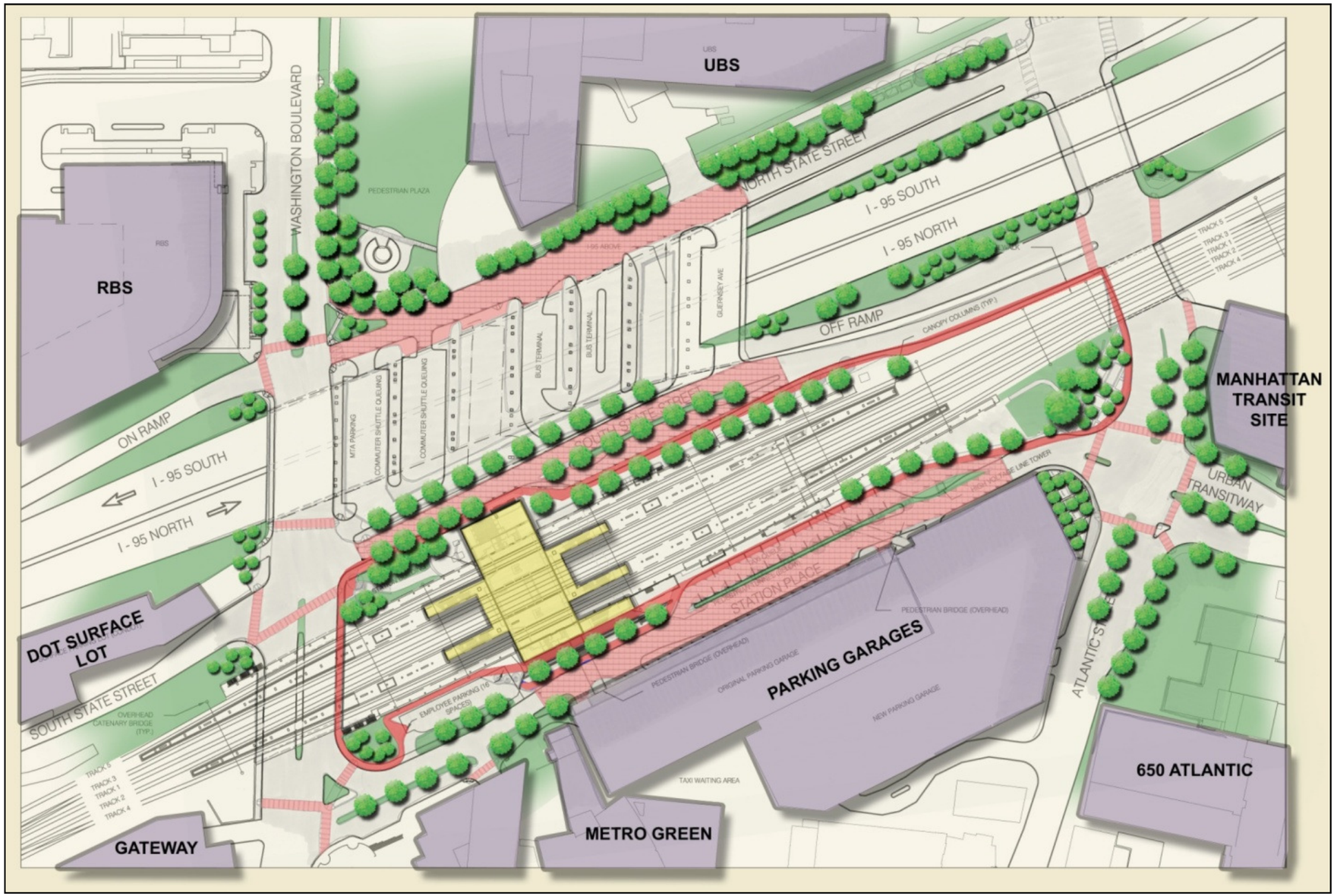


Figure 6 - Proposed Landscaping Plan

The proposed landscaping plan develops a consistent sidewalk pattern around the perimeter of the STC to help identity its location. Street trees and pocket parks are developed where possible to green up the neighborhood and try to soften the harsh concrete and asphalt materials. Pavers are used on the street in critical locations around the STC to calm traffic and create more focus on pedestrians rather than vehicles. Crosswalks within the vicinity of the STC can receive a similar treatment. A single street lighting treatment would be used throughout to further identify the STC location.

F. SHUTTLES

Background

The shuttle operations are located under the I-95 viaduct and consist of over 35 shuttle services between the STC and places of employment. This service has also grown to include connection to residential communities as well as hotels in the area. Currently, there is no license fee or permitting required of the shuttles that operate at the STC (currently represents over 10% of STC users). There is little, if any coordination between the various operators at the facility and the number of shuttles continues to grow. This issue has been raised before and to date, no significant action has taken place. Employers and building owners have been offering this service to attract employees and tenants who would otherwise not utilize the STC.

Existing Condition

The corporate shuttle staging area underneath I-95 is west of the bus station area. Shuttle buses access this area either via North State Street or Washington Boulevard and leave the area traveling west via North State Street. The shuttle bus pick-up and drop-off area is limited to two bays, resulting in congested conditions during peak periods when the demand is the highest. There are no signs identifying shuttle positions. The morning peak is typically the more problematic of the peak periods as shuttles queue to meet the same train. Management at the station has provided manpower during the morning to try and control the operations. The shuttles typically access the STC on a "first-come, first-served" basis without any formal governance. The resulting traffic congestion leads to safety-related problems, such as potentially dangerous pedestrian crossings and vehicle-pedestrian interaction. This occurs as passengers must weave their way around parked shuttle buses and across active traffic lanes to board their shuttles as they arrive. During this period, shuttles can back up onto Washington Boulevard.

Shuttle Entry to STC

The only amenities for the shuttle user are a few benches. There is no enclosed waiting area. Users wait in the STC during inclement weather and then rush to meet their shuttle when it arrives. Shuttles are primarily under the cover of the I-95 viaduct except for the last 100 feet when they are exposed to the weather just before entering the STC building. Within the staging area, there is a row of parking for MTA police vehicles which congests this already tight area.

Analysis/Assessment

In total, 28 employers provide 37 shuttle vehicles between their workplaces and the STC. The average number of daily passengers carried by the shuttles varies widely, from one employer that shuttles five passengers per day to another that shuttles about 375 employees to and from the STC. The size of the shuttle vehicles also varies, ranging from seven-passenger cars to 28 passenger shuttle buses. Typically, those employers who shuttle fewer passengers require smaller and fewer shuttle vehicles. In addition to those already providing service to the STC, the Harbor Point and Yale and Towne site are obligated to provide shuttle service between their developments and the STC on a regular basis.

Most employers provide shuttle service in the AM and PM peak hours only, picking up employees at the STC in the morning peak hour and transporting them to their workplace. In the evening peak hours, the same shuttles will bring the employees from the workplaces back to the STC. Depending upon the travel time to and from the STC, some shuttles can make as many as four trips per hour. In all cases, the employers contract with private companies to provide the shuttle service. A number of the employers contract with J & R Tours, Pro-Park, or Park Avenue. Some employers utilize limousine companies for their shuttle service. Nine of the 28 employers are located south of the I-95 mainline. The other 19 are located north of I-95.

Shuttle Staging Area Under I-95

Shuttle counts were conducted in January 2010 during the morning and evening peak periods and are comparable to SWRPA counts in May 2009. The peak hour shuttle use was 658 in the morning and 684 in the afternoon. Based on the 2007 Metro-North On/Off survey, there were 1590 passengers deboarding from inbound trains during the morning peak hour and 934 passengers from the outbound trains during the morning peak deboarding in Stamford. Of the 2,524 passengers deboarding during this period 26% used the shuttles.

Projecting the peak hour use for both the medium growth and high growth scenarios would increase shuttle use to 700 to 1000 passengers per hour for the 10 year period. For the 25 year period, that growth would increase to 1000 to 1800 passengers per hour. The current staging area can accommodate between 12 and 15 shuttles staged at one time with an equal amount in the travel lanes. If the average bus were loading 20 passengers, a demand of 1000 would require 50 shuttles to be accommodated. Clearly additional space is needed for this operation and some consolidation is needed to make sure that the shuttles more efficiently utilize their capacity. The elimination of the station employee parking within this area is essential to provide the needed space for growth. In addition, there may be opportunities to incentivize those shuttle buses that do consolidate and have a high occupancy percentage to be able to drop off and pick up closer to the platforms.

There are a number of alternatives that can assist in managing the demand for space at the shuttle boarding area in the STC. They include assigning different boarding locations for shuttles or consolidating shuttle services.

One strategy is to assign spaces to individual shuttle buses. This could be accomplished by requiring shuttle bus operators to register, for a fee, with the STC to receive a designated shuttle space. For this to work successfully, the operators would need to report the number of shuttle buses, frequency of services, and number of riders on each. The benefit of this alternative is that passengers would know exactly where to meet

their shuttle resulting in shorter travel time and greater safety since there will be fewer risky crossings/interactions with motor vehicle traffic. The STC, however, would be required to make regular inquiries and update the shuttle parking spaces for this alternative to be successful.

Another alternative is to consolidate various shuttle services. CT Transit, or another transit provider, can provide shuttle(s) to consolidate and replace some of those operated by employers. Norwalk Transit District provides similar shuttle service from its South Norwalk Rail Station. A potential negative aspect of this alternative for riders, is that each new shuttle would make a series of stops, while now riders are typically transported directly to their workplace. Another challenge of this alternative is securing funding and vehicles to begin this new service.

A more simplified and our recommended approach to the above alternative is to require shuttle buses that serve the different areas of Stamford to board in different locations. For example, the shuttle buses that serve employers north of I-95 could remain boarding in the current location and the shuttle buses that serve employers south of I-95 could board at a different location. Though only nine employers are based south of I-95, two of these employers transport over 350 employees each on a daily basis. The proposed shuttle for the Harbor Point and Yale and Towne developments will create additional shuttles for the south end. The resulting shift of the southernmost employer shuttles would provide congestion relief at the existing shuttle pick-up area. The benefit of this alternative compared to the first alternative is that the maintenance required by STC is minimal. The challenge is designating an area for the southernmost employer shuttles to provide their pick-up and drop-off. An expanded pick up area on Station Place would be required.

In an effort to provide sustainable travel options, the shuttles which use the STC should be encouraged to convert to Compressed Natural Gas (CNG) or other alternative fuels for their vehicles. These more sustainable fuels will help to reduce reliance on fossil fuels and help to make the STC facility a more sustainable facility. Many shuttles at airports and college campuses use these alternative fuels for their fleets of vehicles. One incentive that could be offered is preferential drop off/pick up areas closer to the station platforms. A convenient, nearby filling station that would offer this fuel will also help to garner support for this objective.

Conclusions and Recommendations

The limited staging area for the shuttles demands that this area be organized and consolidated as much as possible. This has been a recommendation in the past and has not successfully been implemented. It cannot be stated strongly enough that this needs to occur to accommodate the anticipated ridership growth that will occur at the STC and to provide the necessary workforce to make Stamford successful. All shuttles that pick up passengers at the STC should be properly licensed and registered for a fee, similar to State requirements at Bradley Airport. In addition to providing a better understanding of who is providing shuttle services and when, it will provide protection to patrons to assure them that the shuttle they are boarding is a valid and properly authorized service. In summary, the recommendations for the shuttles are as follows:

- Reorganize and license shuttles
- Eliminate parking within the shuttle staging area
- Install canopy to provide continuous protection from inclement weather
- Provide benches and other amenities for shuttle users
- Encourage the use of alternative fuels for the shuttle vehicles
- For the 10 year horizon, investigate relocating the shuttles to minimize travel times in conjunction with the expansion of the Station Place and the South State Street Plaza

CNG Shuttle Vehicle & Fueling Station

G. SIGNAGE AND INTELLIGENT TRANSPORTATION SYSTEMS

Background

The STC is a complex and cumbersome facility to navigate, particularly for those unfamiliar with its layout. Routes to destinations are indirect and sometimes circuitous. Therefore signs are necessary to ensure that patrons reach their destination, especially when trying to make a tight connection between transportation modes. One of the predominant complaints from patrons continues to be the lack of proper signage. This issue had been highlighted in the previous report prepared in 2004 and to date, little has been done to improve it. This lack of proper signage creates frustration for users, delays in reaching their destination and congestion in passageways as confused pedestrians attempt to find their way. While the seasoned commuter may tolerate this inconvenience, the casual user may be discouraged from future use or from the potential of making a change in modal use for their travel needs.

Existing Condition

The information systems provided at the STC are both lacking in quality and quantity. As an example, there are numerous locations where there are gaps in information such as at the platform areas around the stairs to the pedestrian tunnel which facilitates the intermodal connection to the buses and shuttles. There is also a lack of consistency in signage graphics. Typically, for a transportation facility of this size, a uniform signage program is created so that it is easier for the patronage to process the information on the signs quickly. The ad hoc and temporary nature of many of the signs that are fabricated by the numerous different entities within the STC, leads to confusion amongst the patronage and increases their travel times. This signage also reduces the prominence of the facility as a destination.

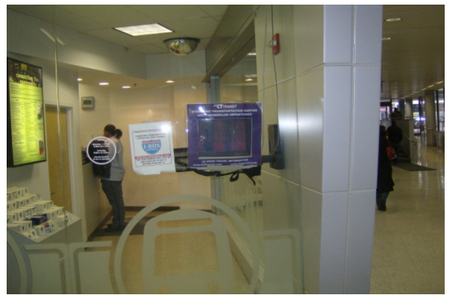
Sign Over Entrance to Tunnel Stairs

Ad Hoc Signage

Existing Signs at STC

The quantity and quality problem that plagues the fixed message signs in the STC also plagues the variable message signs. Currently there is a lack of real time information with respect to trains, shuttles, buses and parking. This lack of information creates confusion amongst the patronage and increases travel times, which in turn also, has an adverse effect on ridership.


Train Information Screens


Bus Information Screen

During the preparation work in preparing this Master Plan, numerous visits were made to the STC and numerous meetings were held. On each one of these station visits, without fail, patrons asked questions about travel directions and destinations. At each of the meetings, questions were raised about the lack of signage. This issue was also previously identified in the 2004 study. Addressing the issues with regards to the lack of information provided to the patrons should be a top priority since it is a consistent complaint amongst all stakeholders and can be implemented at a relatively modest cost.

Analysis/Assessment

As per previous sections of the report, there is a demonstrated need for a comprehensive signage improvement program. This need was identified in 2004 and continues to be an issue. The following attributes define good signage:

- Redundant
- Consistent
- Legible
- Understandable
- Visible
- Contextual

These attributes should be used in developing a new sign package within the STC. As part of this sign package, a series of graphic maps should be prepared for the complex to orient the patronage within the STC and also within the neighborhood and/or city. These should include the “You Are Here” type map graphics identifying the pedestrian’s current location and locating the various STC destinations. These graphics should be located at critical locations within the complex, as well as include printed maps which can be distributed to patrons within the building. There typically are opportunities to get assistance from private funding for these maps which highlight local destinations.

Signed gateways on roadways approaching the STC are important features which help to define the area and alert drivers to the significant activity that will be occurring. Incorporating Intelligent Transportation Systems (ITS) into these gateways increases the functionality of these features. For the purposes of this study, the

primary STC area has been defined as North State Street to the north, Atlantic Street to the east, Station Place to the south and Washington Boulevard to the west. Better signage can better help motorists on these roadways understand the nature of the interface between pedestrian and vehicle traffic in the area and to adjust their driving patterns accordingly. Along with other landscape and pedestrian friendly features, signed gateways will also lead to increased safety amongst all stakeholders.

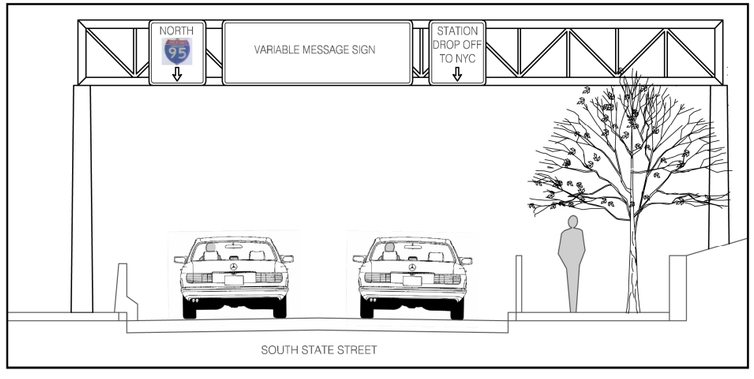


Figure 7 - Proposed Gateway Sign Structure with ITS

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Conclusions and Recommendations

There is full consensus that timely train and bus information is critical to the commuting public and that it is currently lacking at the STC. This information should be located along the major passages within the STC and be displayed in a manner which allows the commuter to view them while still moving toward their destination. Large schedule boards for both train and bus schedules are typical in most major transportation hubs and are expected by the traveling public. In addition to these schedule boards, information needs to be provided at both the train platforms and the bus boarding locations. Similar type signs are already in use on other Metro-North facilities in the Tri-State area.

The signage both within the STC and its vicinity, needs improvement. Signage should direct commuters to the STC and provide real time information regarding their transportation mode. The following are recommendations for signing and ITS:

- Develop a comprehensive sign plan for the STC complex.
- Prepare a station map and an area map for display in multiple locations in and around the STC.
- Provide new ITS systems to provide real time information to commuters. Coordinate this effort with ongoing work by SWRPA, CT Transit, shuttle bus operators and the City for the Urban Transitway.
- Provide larger higher quality and larger quantity screens with real time train and bus information throughout the STC.
- Install new signed gateways approaching the STC and incorporate fixed and variable message features.

Train Schedule Board
Grand Central Terminal – New York

Real Time Train Information
Signage on Platforms

H. TAXIS

Background

The taxi service at the STC provides another travel modal option for the public. There are four taxi companies that provide service to the STC including Everyready, Independent, Stamford Taxi and USA Taxi. The operation, licensing and fares charged by taxis are regulated by the State of Connecticut. In past years, the taxi operations at the STC have been difficult to manage with regard to the taxi stand, staging and dispatch. Many of these issues have been resolved at the time of this report preparation, but should be improved to dove tail with future improvements made to the STC.

Existing Condition

During the weekday, the current system uses a dispatcher located in a booth along the southern platform. This dispatcher maintains a line of 6 to 8 taxis during non-peak periods along the south side of the south platform drop off and up to 10 to 12 during peak hours. Taxis not waiting in the platform side queue, wait in another queue behind the parking garage. When additional taxis are needed, the platform side dispatcher calls the dispatcher in the garage, who then releases the necessary taxis. Taxis then exit the garage via the driveway to the south of the garage and then travel on Atlantic Street to Station Place. This dispatch system is only in operation during the weekday. No system is in operation on the weekend. It has been reported that on weekends, taxis take up many of the waiting spaces at the station and can form a queue all the way down to Atlantic Street.

Taxis are located on Station Place, south of the station platforms. It has been suggested that a better location for them would be on the north side of the station. In this way, the various modes of transportation into the City would be located on the same side. Furthermore, the north side is currently the predominant destination for the STC patrons.

Analysis/Assessment

Taxi counts were provided by station management for two days in November 2009. Each taxi as it enters and leaves the taxi queue must swipe a card. Data from midnight to midnight was examined. There was no taxi activity before 6:00 am. The morning peak period is from 9:00 am to 10:00 am when 67 fares per hour were counted. The evening peak period is extended over a two hour period from 6:00 pm to 8:00 pm when fares were 62 per hour. The total number of fares per day averaged 671 for the two days for which counts were provided. Taxi use spikes during the morning and afternoon rush periods as would be expected. The level of taxi use is more sustained during the evening period which could be related to security concerns.

The existing taxi counts were projected for the medium and high growth scenarios as discussed in previous sections of this report. For the 5 year period, the peak hour taxi use would increase to between 65 to 75 fares per hour. This amount is manageable within the current system. Even for the 10 year time horizon, assuming proportional growth of taxi use compared to rail use, the number of peak hour fares would increase to 70 to 90 fares per hour. This will likely require better coordination between the dispatchers to provide the necessary cabs, particularly for the high growth scenario. The 25 year horizon will be even more challenging, with usage increasing to 90 to 160 fares per peak hour. As part of the recommendation for improvement to Station Place, the length of the drop off will be extended further toward Atlantic Street. This increase in length will also provide some additional length for the taxi queue. Currently, the dispatcher can line up 12 to 14 taxis along Station Place. With the increase in length proposed for the pick up area, this number can grow to 20 vehicles which, with additional operation management procedures and sufficient room for the taxi stand, the anticipated demand for taxis can be met.

Conclusions and Recommendations

The existing taxi operation at the STC appears to be functioning without the dysfunction that had plagued the operation in recent years. The system is well coordinated and provides reasonably good service to patrons during the weekday. On the weekends, without the dispatchers in place, the taxi operation becomes more ad hoc and needs to be controlled. Therefore, in the short term, we are recommending the following:

- Provide some level of enforcement on weekends to keep the taxis in the proper staging area
- In longer term, provide additional queuing length for the taxi stand when the waiting area on Station Place is expanded toward Atlantic Street.

Aerial View of Taxi Stand

I. STATION BUILDING

Background

The Stamford Transportation Center station building spans over the railway tracks and has primary entrances on South State Street, Station Place, and at North State Street via a lower level gateway passageway. Built in the 1980's, it is constructed of concrete, steel and glass. It was originally criticized for its functional failings such as a lack of shelter and long, indirect routes to platforms. The station underwent a major renovation in the late 1990's in an attempt to correct some of these deficiencies. The major improvements included new platform canopies, new stairs and escalators to platforms, and a pedestrian bridge connecting to the adjacent parking garage.

In addition to the track level, which is approximately at the street level entrance to the facility at South State Street and Station Place, the building is comprised of two other levels. There is a concourse level above the tracks that includes the primary waiting area, and a tunnel level below the tracks, South State Street, and the I-95 viaduct.

A series of escalators on the north side of the building brings patrons up to the concourse level and down to the tunnel level. The south side of the building is accessed via stairs and escalators. Elevators are provided at each end of the station for accessibility. On the eastern end of the tracks, an elevated pedestrian walkway connects the 4th floor of the parking garage across Station Place to the concourse level and is partially protected from the elements with glass walls, but is unconditioned.

Existing Condition/Analysis/Assessment

Northern Side of STC (South State Street)

The South State Street entry serves as a major access point to the train platforms from the north. It is unconditioned and not fully enclosed. There is a raised lobby with steps and doors facing directly onto South State Street's narrow sidewalk. This important entry should be reconfigured and enclosed to provide a more comfortable and functional space for riders.

North Side of Station Building

Southern Side of STC (Station Place)

The Station Place entry serves as a major access point to the train platforms from the south. The space is unconditioned and not fully enclosed. Currently the raised lobby has steps and doors leading directly onto a narrow sidewalk, limiting its capacity. This important entry should be enclosed and the approach to the entrance should be reconfigured to provide safer and more comfortable access to the station and platforms.

South Side of Station Building

STC Concourse Level

The concourse level is dominated by a Metro-North ticket booth in the center of the waiting area. The ticket window for Amtrak is located around side of the booth, obscured from view by the elevator shafts. The elevator shafts in the waiting area block sight lines and are especially prominent given the relatively small waiting area at this level that also accommodates a newspaper/magazine shop and a Dunkin Donuts. Outside of the conditioned waiting area, there is a coffee shop with tables situated in unconditioned space. The only public restrooms in the station building are located on the concourse level.

The Concourse is the primary passenger waiting area for the station. The waiting room experiences significant crowding during peak times and is exacerbated by the Metro North and Amtrak ticket booths located at the center of the waiting area. These kiosks and the elevator cores obscure views and obstruct pedestrian flow. Passenger comfort and visibility should be improved in the space by reorganizing some of the existing program spaces.

Existing Concourse

Retail on Concourse Level

Lower Level Passageway

The tunnel level provides connections between the different platforms and the concourse level and provides safe passage to the north side of South State Street. The tunnel level also facilitates the intermodal connection to the shuttles and the bus depot and eventually connects to North State Street and the downtown beyond. There are a number of offices and retail spaces in the tunnel that include offices for the MTA Police, the station manager and the security firm. Retail space includes a barber shop, wine shop and watch/clock repair. While the tunnel level below the tracks is unconditioned just south of the tracks, the bulk of the tunnel level is conditioned and a pair of sliding doors separates the two spaces.

Stairs and Ramp at North End of Gateway Building

Door Restriction and Stairs at North End of Tunnel

The existing tunnel level and access to the bus and shuttle area is circuitous to navigate, partially conditioned, and poorly lit. In order to facilitate a more comfortable intermodal environment, the tunnel level should be upgraded to provide a more seamless, safe, and comfortable user experience.

East Pedestrian Bridge

The existing east pedestrian bridge is an unenclosed walkway connecting the eastern end of 3 of the 4 train platforms with the parking garage. Pedestrian flow and comfort should be improved along the bridge in order to encourage greater use of the eastern bridge as an alternative access to platforms.

Building Expansion

The most pressing issues surrounding the station's function as an intermodal hub which serves the needs of Stamford and its neighbors include providing capacity, functionality, safety, and accessibility. Additionally, tapping into private development potential for the station is critical to the city so that it serves an important civic role in Stamford. With the station and its rail tracks currently land locked between I-95 to the north and proposed developments surrounding the station, the expansion of the Stamford Transportation Center is constrained. A series of carefully located additions that seek to add capacity, commuter comfort, circulation clarity and better access to the station's main spaces must be prepared. The proposed design presented in this Master Plan seeks to significantly improve physical connections between transportation modes, between the station and the city, and between the station and the street.

Precedents

Intermodal Stations

A station building that is well lit and transparent dramatically improves the perception of the building as open, inviting and active.

Bus Terminals

Roosevelt Station - Queens, New York

Ashdod Connex Bus Terminal, Israel

The extensive use of glazing, natural and artificial light at the ground level facilitates a visual connection between riders and buses and improves the experience in the waiting areas.

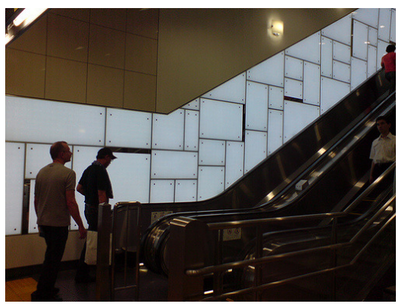
Parking Garages

Garage exteriors should be architecturally treated with screens that are well lit from within, presenting interesting facades that blend in with urban surroundings. Where feasible, the ground floor should provide retail space to enliven the streetscape.

Public Art

Public art should be integrated into the public circulation space to invite interest and create a pedestrian friendly environment.

South Street Station, New York



Shinjuku Station, Tokyo

Conclusions and Recommendations

The improvements to the physical plant of the station buildings have been segregated into two time horizons. There are a number of short term modest cost improvements that can be made to the STC building to improve accessibility, convenience and efficiency for patrons. Long term improvements are discussed in the alternative development section.

Short Term Improvements

For the northern entrance into the STC the following improvements are recommended: (See Figure 8)

- Relocate the existing entrance and steps that face north to the east of the entry space. This will allow for greater space to provide at-grade access to the entry space from the east and more space at the sidewalk along South State Street.
- Provide automatic doors at the new east entrance facing the existing plaza to enclose the entry space.
- Enclose the entry with glass to make it more transparent and condition the space.
- Improve finishes and lighting to make it more inviting and user-friendly.
- Provide conveniently located bicycle racks adjacent to the new entry.

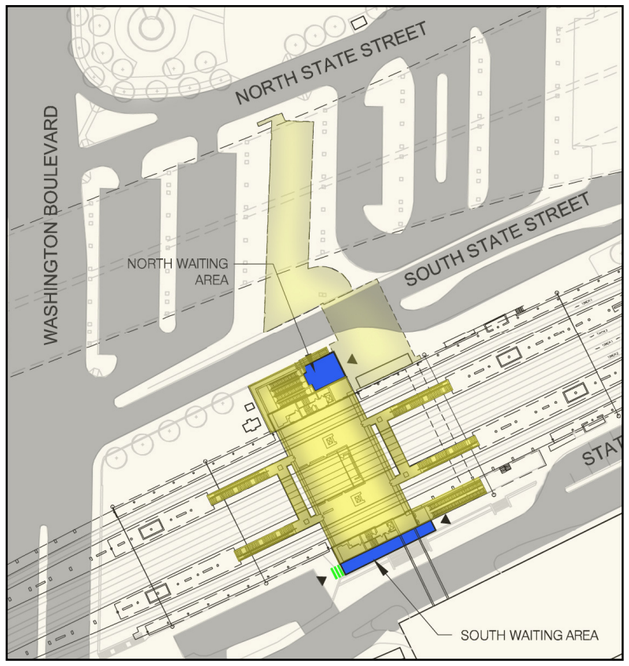


Figure 8 - Proposed Expanded Waiting Areas

For the southern entrance into the STC off Station Place, it is recommended to provide the following improvements: (See Figure 8)

- Remove the existing steps facing south to the sidewalk. Redirect access to the entry to the east and west with new steps and ramps, providing easier access to queuing areas and ADA accessibility to the station.
- Enclose the entry with glass walls and doors and condition the space.
- Improve finishes and lighting to make it more inviting and user-friendly.
- Provide conveniently located bicycle racks adjacent to the entrance

For the concourse level of the STC, the following improvements are recommended:

- Reduce the size of Amtrak and Metro North office/ticket booths to free up additional area for passenger waiting
- Provide more seating on east and west ends for a more user-friendly experience.
- At the top of the escalators and stairs, provide glass enclosures and doors to provide better conditioned space within the waiting area while maintaining visibility and security.
- Improve finishes and lighting to make the waiting area more inviting and user-friendly.

For the lower level passageway, the following improvements are recommended: (See Figure 9)

- Provide an enclosed and conditioned waiting space for bus/shuttle commuters.
- Upgrade retail connectors in the enclosed waiting area.
- Provide a wider door opening at end of the tunnel connecting to the bus depot to alleviate congestion during peak times.
- Design a glass entry at North State Street to provide a more transparent and welcoming entry for the Transportation Center facing the city.
- Replace floor finishes to create a safer walking surface that is easier to maintain.
- Improve signage and way finding between the train station and the bus and shuttle areas.
- Provide a ticket vending machine on the lower level
- Improve exterior lighting and finishes at the bus and shuttle areas under I-95.
- Improve interior lighting and finishes to make the space more user friendly.

For the existing East Pedestrian Bridge, provide the following improvements:

- Enclose the bridge space with glass doors at the ends and condition the space.
- Provide new seating on the west side of the bridge.

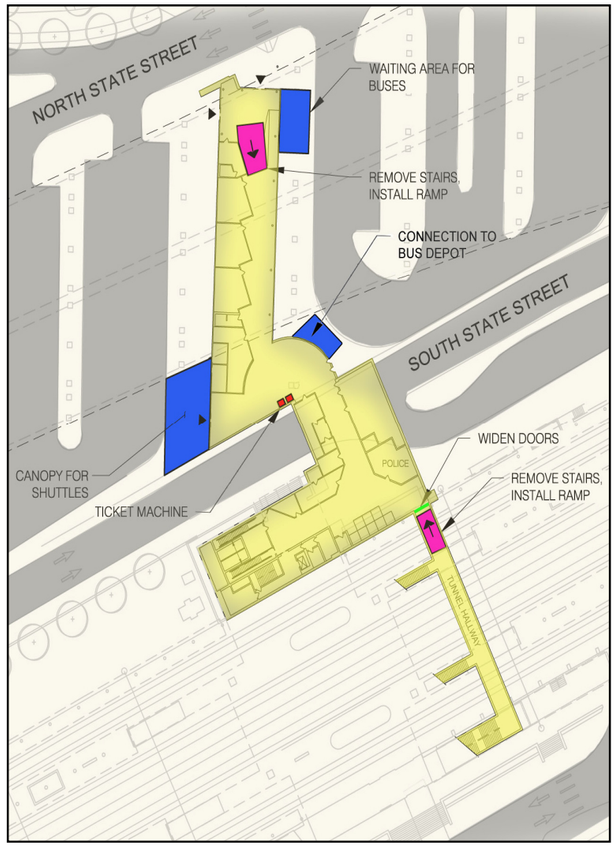


Figure 9 - Proposed Improvements to Lower Level

J. SUSTAINABILITY

Background

The City of Stamford is a member of International Council for Local Environmental Initiatives (ICLEI) – Local Governments for Sustainability. In recent years, the city has received awards for its program to reduce greenhouse gas emissions from the Clean Air - Cool Planet, the U.S. E.P.A. and the Northeast Energy Efficient Partnership. Stamford has achieved three of the milestones in the Cities for Climate Protection Program and has developed a Stamford Cool and Green 2020 Policy which includes a number of sustainability initiatives. Smart growth, transit oriented development and Brownfield's redevelopments are key aspects to Stamford's approach to land use. The City has implemented a number of sustainable features in their public facilities and encourages their use in private development as well.

In response to greater concern for environmental stewardship, the U.S. Green Building Council developed a green building certification system called LEED which stands for Leadership in Energy and Environmental Design. This system which began in 1998 provides certification that a building was designed and built using strategies aimed at improving performance across all the factors that matter most to the environment including energy savings, water efficiency, CO_2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. The State of Connecticut has passed legislation (P.A. 07-242) that requires all new or renovated commercial buildings with a cost of $2 million or more to comply with LEED criteria or equivalent. This act applies to both public and private sector buildings.

Existing Conditions

Since the STC was built prior to the implementation of the LEED program, it was not specifically designed to meet the LEED criteria. The nature of the facility as a public intermodal transportation center, along with the bicycle storage addresses the alternative transportation credits. The development of TOD sites around the STC and community connectivity enable additional LEED credits. Additionally, on the platforms, recycling centers are provided for the segregation of trash, newspapers as well as bottles and cans.

Analysis/Assessment

Mass transit can play a large role in energy conservation and the reduction of emissions when compared to single occupant vehicles. Rail travel uses approximately one fifth of the energy needed per passenger-mile as automobile travel and, therefore, reduces green house gases. This is due to the high mechanical efficiency and the number of passengers that a train can carry. The emission reductions can be particularly large when combined with TOD development which tends to eliminate a percentage of short vehicle trips which have a higher per mile energy consumption and emission rates due to cold starts and congested conditions. Therefore, rail tends to reduce emissions in densely populated areas and reduces exposure to harmful emissions such as CO, toxics and particulates. Electrified grade separated trains also reduce noise emissions.

Site Selection

There are a number of opportunities to make the transportation center more sustainable. Development of TODs around the STC and the requisite increase in development density, community connectivity and the reduction in required parking capacity are achievable credits under LEED. Zoning regulations and approvals by land use commissions should recognize the benefits of this type of development and incentivize developers during their construction process.

Vehicle Charging Station
Neon Garage – New Haven, CT

Photovoltaic Roof Panels
Stillwell Avenue Station – Brooklyn, NY

Water

The efficient use of water is another important criterion for LEED certification. This applies to water efficient landscaping and the capture and reuse of rainwater to provide irrigation water or toilet flush water. The use of water conserving plumbing fixtures will reduce the use of water at the center. As fixtures need to be replaced, low flow units should be installed. Any new construction should comply with reduced flow criteria.

Energy

Encouraging the use of low emitting and fuel efficient vehicles around the center could be achieved by providing discount to those parking these types of vehicles in the garage, providing charging stations for hybrid vehicles and requiring shuttles to use alternative fuels. ProPark currently provides such charging at the Neon Garage in New Haven and the Charles Square Garage in Cambridge, Massachusetts. Site design should minimize the addition of impervious surfaces and control the quantity and quality of the runoff. Light colored materials on the site and roof surfaces or green roofs can be used to reduce the heat island effect. New lighting should be light emitting diode (LED) while minimizing the light pollution affect on adjacent properties.

With the high cost of energy, the dwindling supply of fossil fuels and the United States' increased reliance on foreign sources, it is important to maximize the energy efficiency of building systems at the STC. This effort should examine the choices made for the building's skin, windows and insulation which affect the amount of heating and cooling required. The amount of natural light provided into the space versus the need for artificial lighting are also important factors. Choices made for the HVAC equipment and the electrical fixtures and equipment will determine the energy needs of the building. The highest, feasible energy efficient equipment should be provided. While the initial cost may be more, the long term operating costs will be less and the building will decrease its environmental footprint. Providing alternate energy sources such as photovoltaic panels on roof tops are possible at the STC.

Material Resources

Recycle, reduce and reuse has also been recognized by the Green Building Council as important attributes of LEED certified buildings. Providing building users the opportunity to recycle is one of the criteria that the STC is already making efforts to achieve. In addition to consumer products, LEED encourages the use of recycled materials, the diversion of construction waste from disposal and the reuse of existing walls, floors and roofs. The expansion of the station building over South State Street rather than constructing a new station is more consistent with the LEED approach.

Indoor Air Quality

Finally, LEED certification requires an examination of the indoor environmental quality. The delivery of outside air, increased ventilation and the use of low emitting materials all have a positive effect on the quality of the built environment. The choices for paints, coatings, adhesives, sealants and carpets can be made for any new construction to be compliant with the certification requirements. Day lighting of internal spaces is a LEED criterion but is also desirable from a transportation center design perspective. Patrons need to be able to view the exterior so they can see when their transportation has arrived or where their connection is located.

Conclusions and Recommendations

As is common with current transportation enhancement projects, sustainability is a priority and enhancing mass transit ridership is the best way to accomplish this. Additionally, it is the City's desire that improvements at the STC include sustainability features to the greatest extent possible. This is consistent with the State's requirement for all new or renovated commercial building construction. The Stamford Transportation Center should be designed as not only a model of transportation efficiency, but also a model of how station buildings could be constructed to meet the highest green standards.

More specifically, we recommend the following:

- Develop TOD site at existing garage
- Encourage other TOD development around STC with Zoning Regulations and commission approvals
- Improve bicycle facilities
- When replacing existing equipment and fixture, use more sustainable options
- Encourage use of alternative fueled shuttle vehicles
- Provide charging stations in parking garage for hybrid vehicles
- Design and construct improvements to at least LEED silver standards
- Investigate the possibility of providing a Zip Car or similar shared used vehicles

Bike Station Facility
Union Station – Washington, D.C.

Shared Vehicle (Zip Car)

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IV. ALTERNATIVE DEVELOPMENT

A. ALTERNATIVES CONSIDERED

Several alternatives were considered for the long term redevelopment of the station complex. These alternatives include the following:

- Alternative 1 – No Build Scenario (No improvements are made, just routine maintenance)
- Alternative 2 – Expand Station Building over South State Street, private development on existing garage site, additional station access and new pedestrian bridges
- Alternative 3 - New Station Building on Station Place with additional access and pedestrian bridge

Table 8 - Summary of Alternate Costs

	Alternate 1 "No Build"	Alternate 2 Expand Station over South State, TOD at garage	Alternate 3 Replace Garage with Station/TOD
Platform/Rail	$0	$11M - $22M	$11M - $22M
Station/Bus	$0	$18M - $30M	$22M - $36M
Vehicles	$0	$5M -$8 M	$5M -$8 M
Parking	$0	$19M - $26 M	$19M - $26 M
TOTALS	$0	$53M - $86M	$63M - $96M

The details of each are described and shown on the pages which follow.

Alternative 1 – No Build Scenario

Under the No Build Scenario, no significant improvements would take place at the STC. It can be anticipated that the conditions at the STC and the surrounding environment will continue to decline. This would be manifested in a number of ways.

- Further deterioration of the physical environment will lead to less use of the STC.
- With regard to vehicular congestion, drivers will continue to choose to drive over taking transit, leading to further congestion of the highways and local street network, more pollution, more lost time, etc.
- The current congestion on the platforms and the bottlenecks that exist will see further deterioration of the level of service until use of transit becomes less and less attractive to the commuter which will also lead to more vehicle congestion.
- In addition to level of service concerns at the rail station, there are also safety issues which will not be addressed. In particular, the time required to evacuate the station platforms will increase beyond NFPA 130 standards. As currently configured and based on the existing ridership, the station is marginally acceptable in providing the necessary egress capacity to meet NFPA 130. Any increase in ridership, without a commensurate increase in egress capacity will lead to an unsafe condition at the station.
- In the near term, the parking situation will remain problematic.
- As the existing older garage is already structurally deficient, continued inaction will increase liabilities and could create hazardous conditions.
- Without viable options to an already overcrowded vehicle transportation infrastructure, Stamford will suffer economically and culturally.

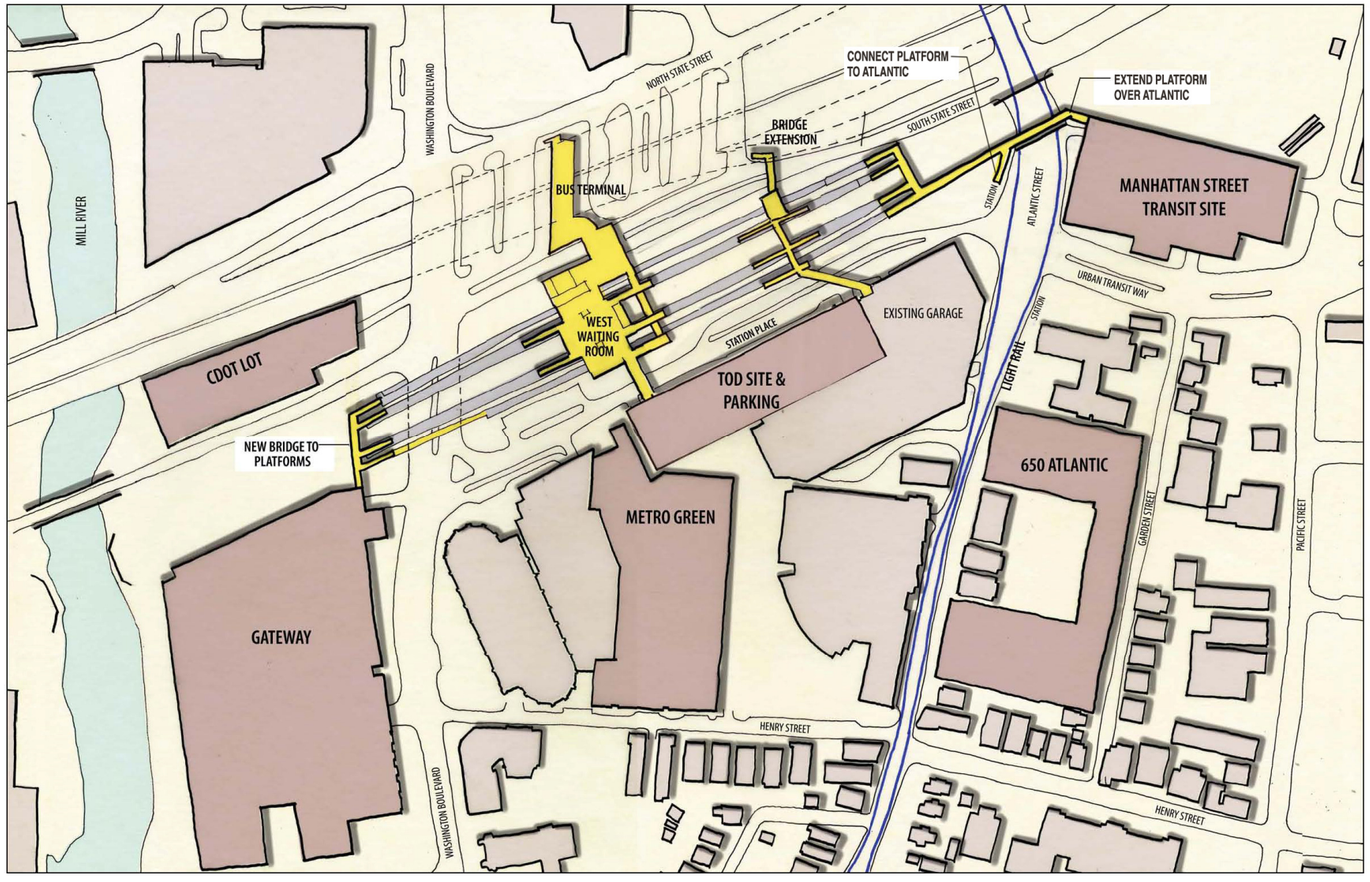

Figure 10 – Additional Access and New Pedestrian Bridges

ATERNATIVES 2 AND 3 - ADDITIONAL ACCESS AND NEW PEDESTRIAN BRIDGES

The STC study found that one of the primary concerns of the facility is pedestrian circulation and emergency access/egress within the rail station. Additionally connectivity to the various modes of transportation and the City is a problem. Each alternate includes this portion of the project and addresses this concern with the following recommendations:

- Connect the southern platform to the west side of Atlantic Street
- Extend the southern platform over Atlantic Street
- Extend the east pedestrian bridge over South State Street
- Provide additional stair access to the existing pedestrian tunnel under the island platforms
- Extend the southern platform over Washington Boulevard
- Construct a new western pedestrian bridge spanning across the tracks and over South State Street to the surface parking lot

The extension of the southern platform over Atlantic Street while shown in this alternate can be accomplished with the replacement of the Atlantic Street Bridge currently being designed by ConnDOT.

These new access locations encourage dispersion of patrons along the full length of the rail platforms. To further this goal, this alternate includes the extension of the platform canopies to provide protection from weather.

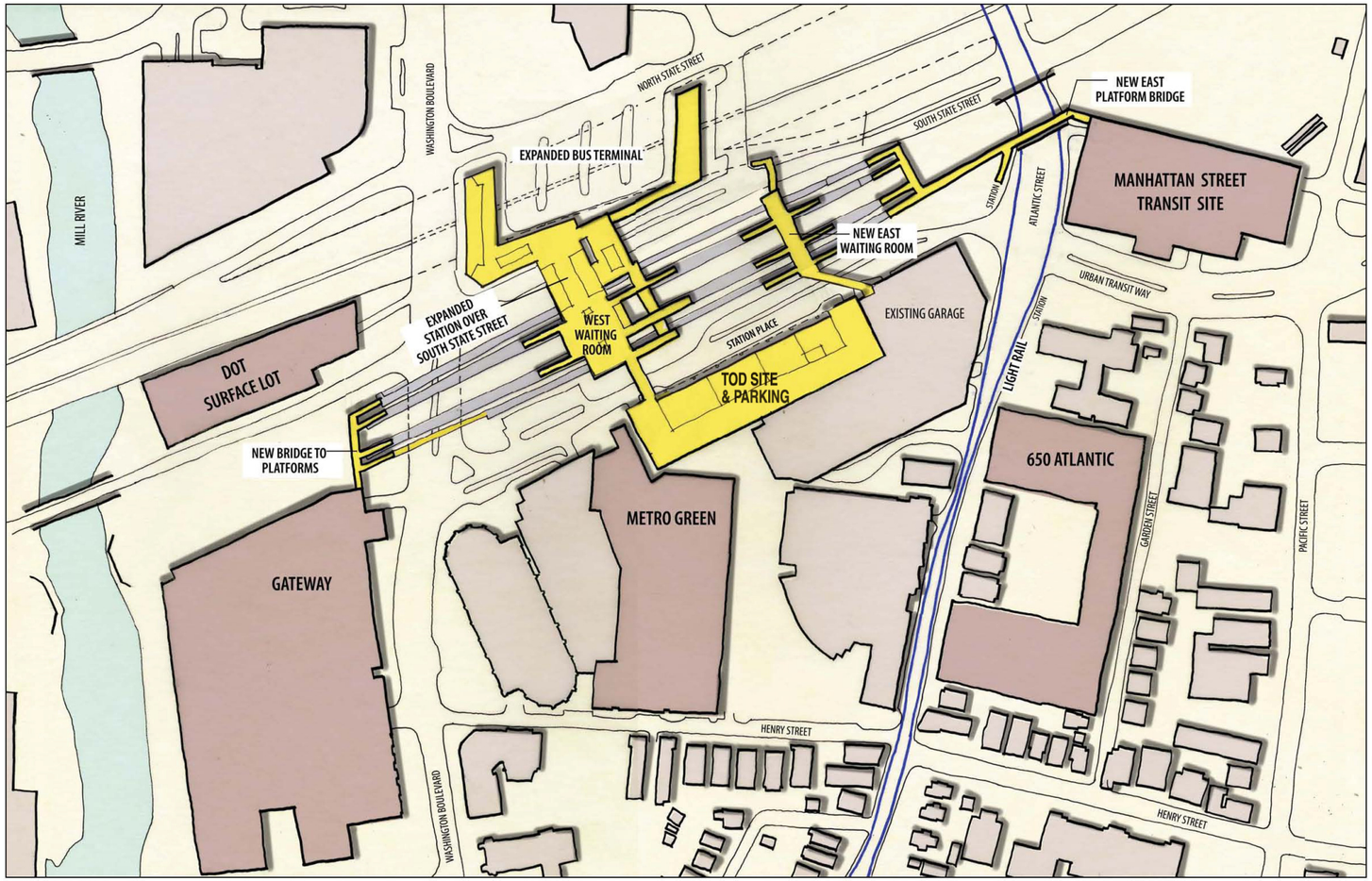

Figure 11 - Context Plan for Alternate 2

ALTERNATIVE 2 – EXPAND STATION BUILDING OVER SOUTH STATE STREET

This alternative includes all the recommendations for improved access described previously. The station building would be expanded over South State Street. The importance of the proposed station building is its ability to not only connect the intermodal transportation uses in a seamless and transparent manner, but also to serve as a civic building with entrances on multiple levels that address the street and fosters pedestrian activity around the station. The new station building also provides much improved visibility for the STC with the potential for a very contemporary multi-story building, primarily clad in glass, to offer an inviting and welcoming building for the traveling public. An expanded station building is proposed for the air rights over South State Street, between I-95 and the existing station building. It would be situated on the corner of Washington Boulevard. The building would occupy the corner of Washington and South State Street to provide an active street presence for the STC on one of Stamford's busiest thoroughfares. A new pedestrian entrance at street level would bring commuters into the station and provide access at that level to the bus terminal, or access via escalators and elevators up to the concourse level and train station waiting area. At the main level, the level of South State Street, the station building will have an entrance oriented to the east to a reconfigured drop off area. At the concourse level, the new station building will bridge over South State Street and connect to the existing elevated STC station. New program space for station offices will free up space currently occupied within the existing train station concourse level.

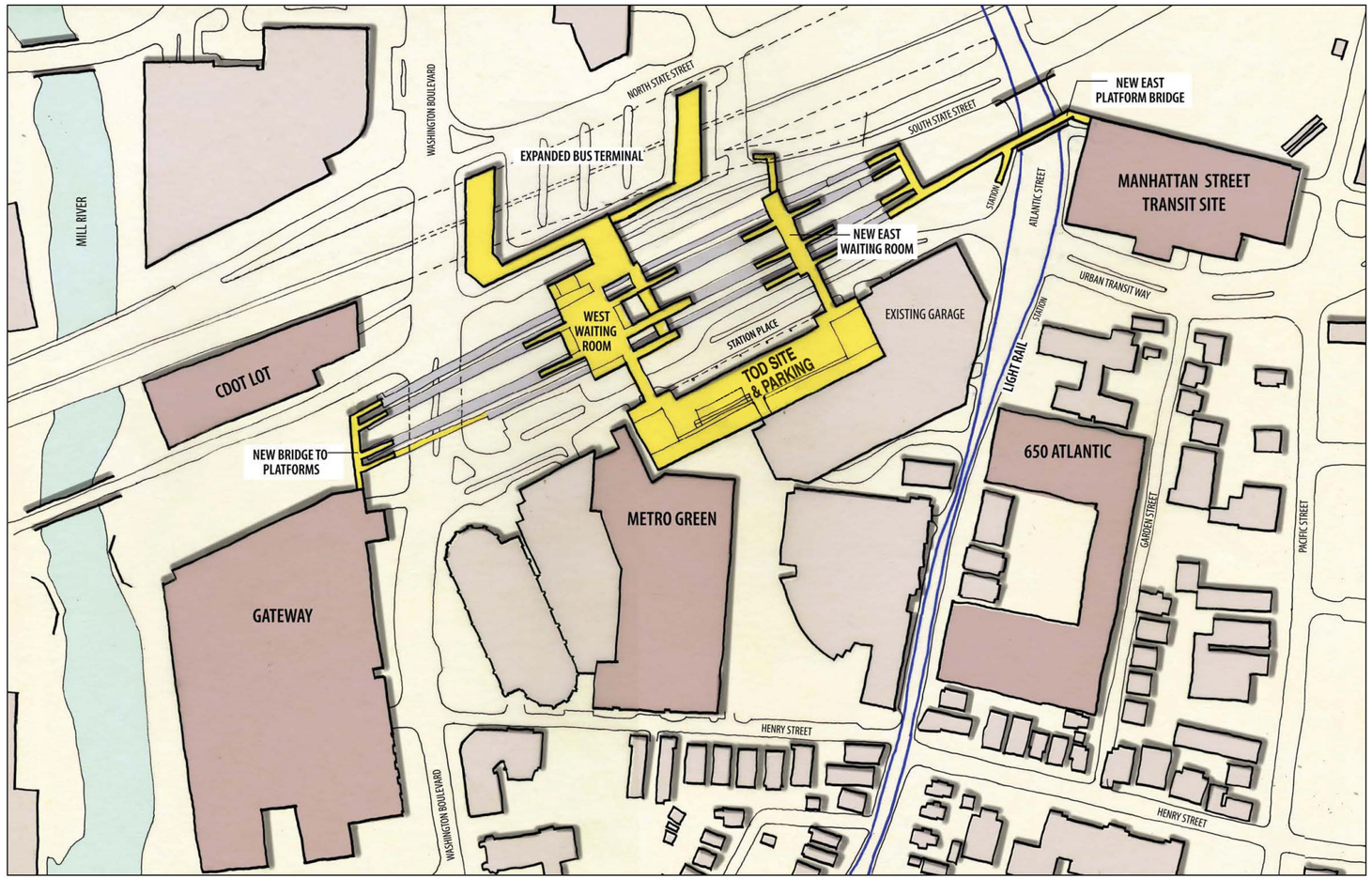

Figure 12 - Context Plan for Alternate 3

ALTERNATIVE 3 – NEW STATION BUILDING ON STATION PLACE

Similar to alternative 2, this alternate includes all the recommendations for improved access. However, instead of expanding the station over South State Street, a new station building with parking facilities is proposed at the existing, older garage on Station Place. Constructing a new station on the site of the existing garage will allow the existing station operation to continue with minimal disruption. The new building will allow a fresh start to address the needs of the commuting public in a more comprehensive way, not perpetuating the mistakes that were made in the current station building. The new station building will provide additional waiting space, retail and support services in a new location. An expanded and reconfigured bus depot is included in this plan along with a new east waiting room over the tracks.

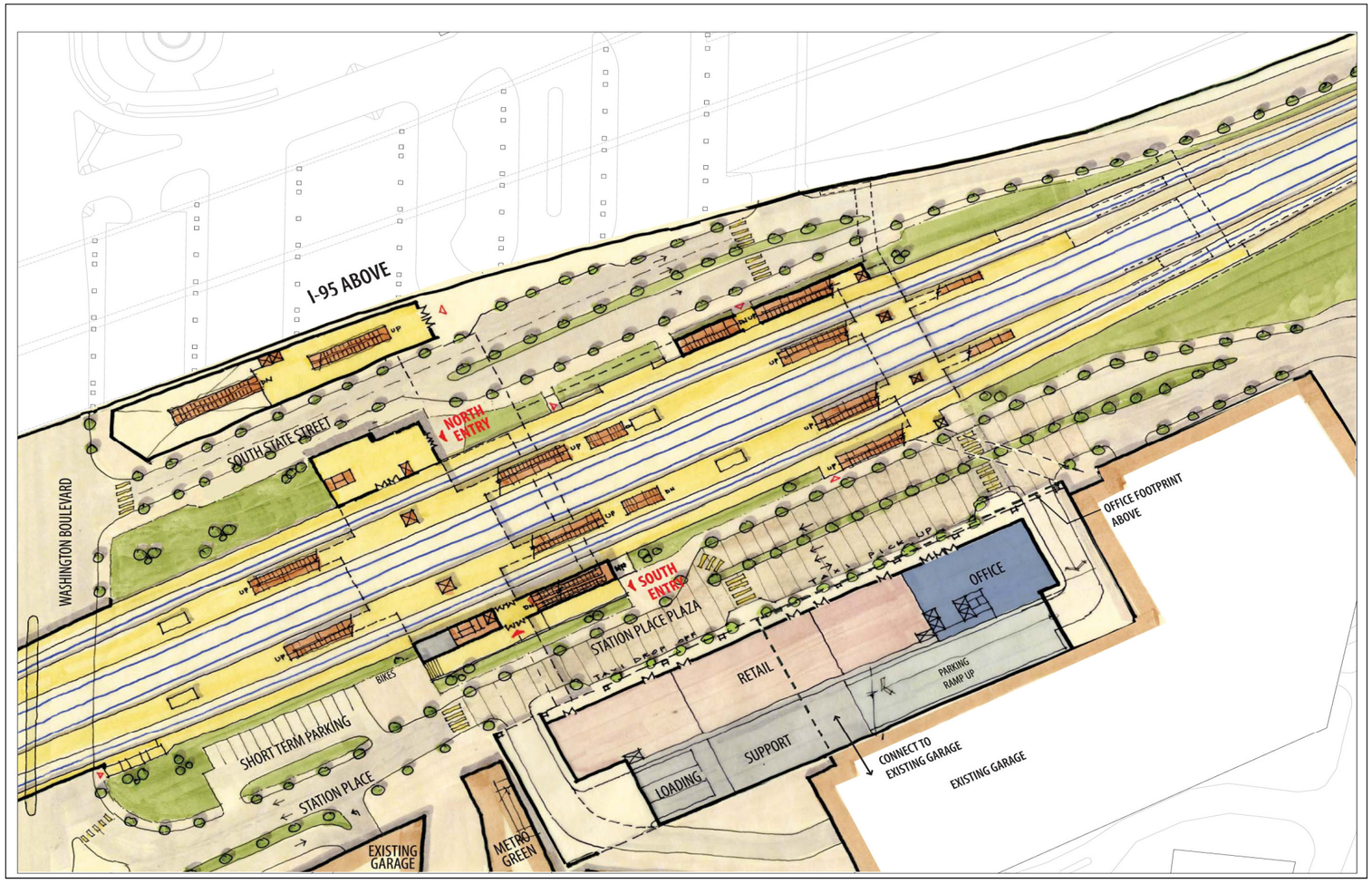

Figure 13 - Street Level Plan for Alternate 2

ALTERNATE 2 – STREET LEVEL PLAN

At the street level, the significant difference between the existing station building and the proposed is the connection lobby on the north side of South State Street. This will connect the concourse level and the bus and shuttle operations. It will provide an alternate means of crossing South State Street in addition to the existing tunnel under the street.

This alternative allows for development of the existing, older garage into a Transit Oriented Development. (T.O.D.) At the ground floor, this building should have a retail component and provide lobby space for the development which could occur above the street level. A portion of the street level will be occupied by a ramp to access parking above to minimize its impact on the activity on the ground floor. Located at the rear of the space, adjacent to the garage which is to remain, this will help minimize its visual impact of the ramp on Station Place.

This plan includes the expansion of the loading area on the south side of the station on Station Place. This will provide additional pick up length for commuters and the taxi queue.

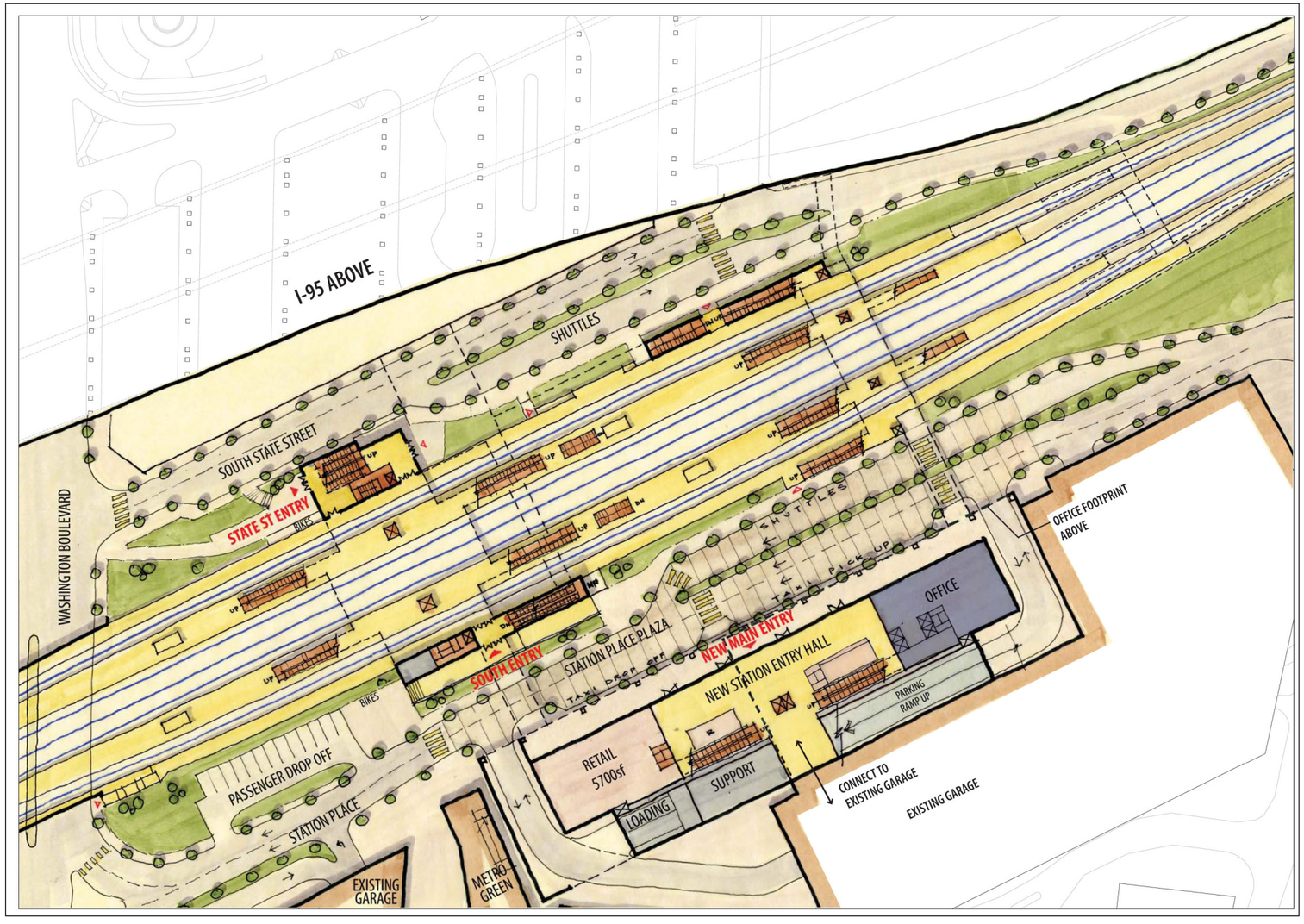

Figure 14 - Street Level Plan for Alternate 3

ALTERNATE 3 – STREET LEVEL PLAN

At the street level, the significant difference between the existing station building and the proposed is the new station entry hall on Station Place. It would provide better logistics to relocate the taxi stand in the front of this new building. The ground floor will also provide some retail to vitalize the street frontage. This alternative will allow for development and parking above the entry hall level. A portion of the street level plan will be occupied by a ramp to access the parking above.

This plan includes the expansion of the loading area on the south side of the station on Station Place. This will provide additional pick up length for commuters and the taxi queue.

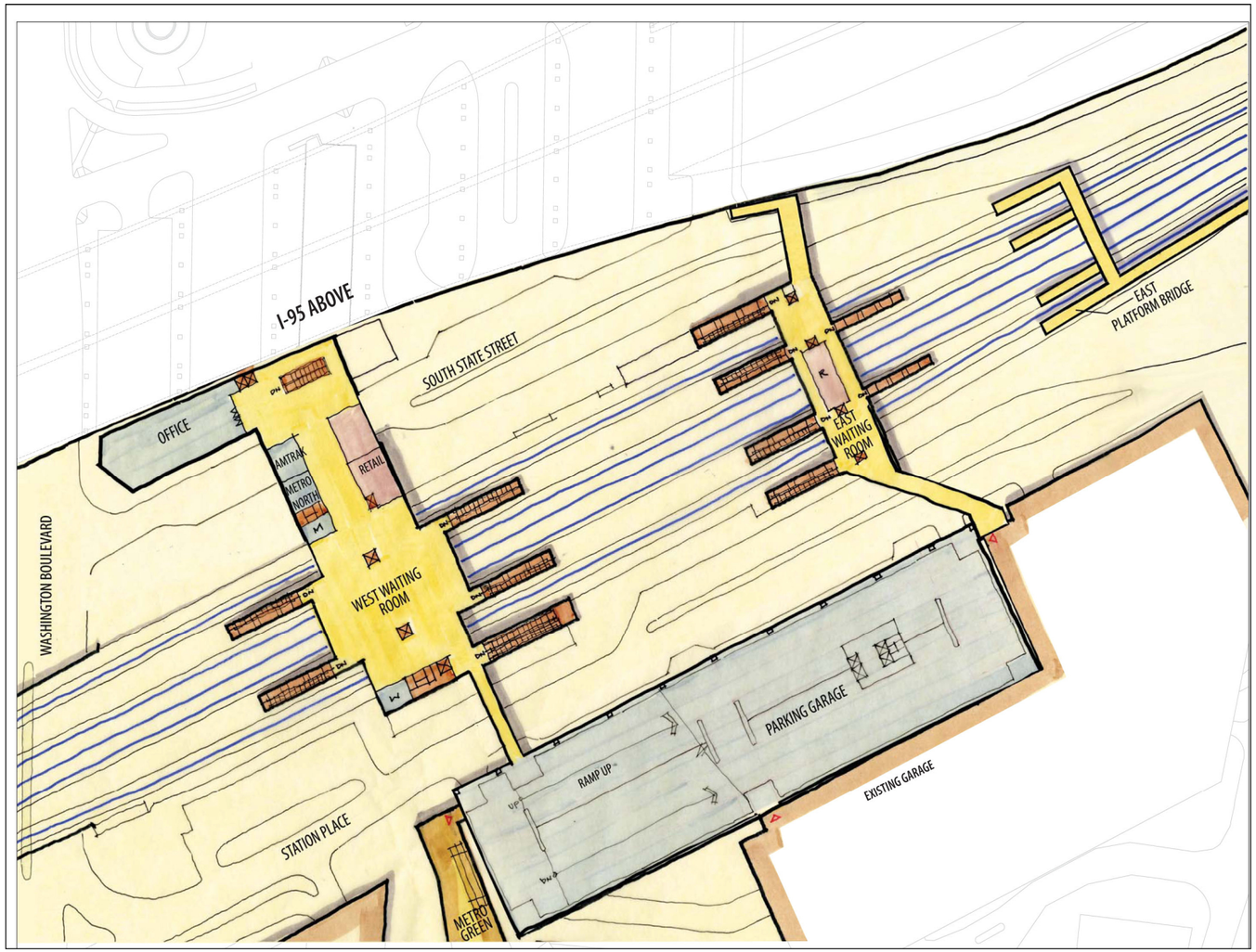

Figure 15 - Concourse Level Plan for Alternate 2

ALTERNATE 2 – CONCOURSE LEVEL PLAN

On the concourse level, the existing waiting area will be rearranged. The large ticket booth which dominates the space will be removed and ticketing will be moved to the expanded building over South State Street. The ticket booths will be placed against the exterior walls to create a more open space within the waiting area. The removal of the ticket booth and office area in the existing space will provide additional waiting space for commuters as the ridership at the station increases. Retail can be reconfigured against the outside wall of the extension over State Street. The minimizing of walls and defined spaces within the existing waiting, allows greater visibility of the tracks and train operations.

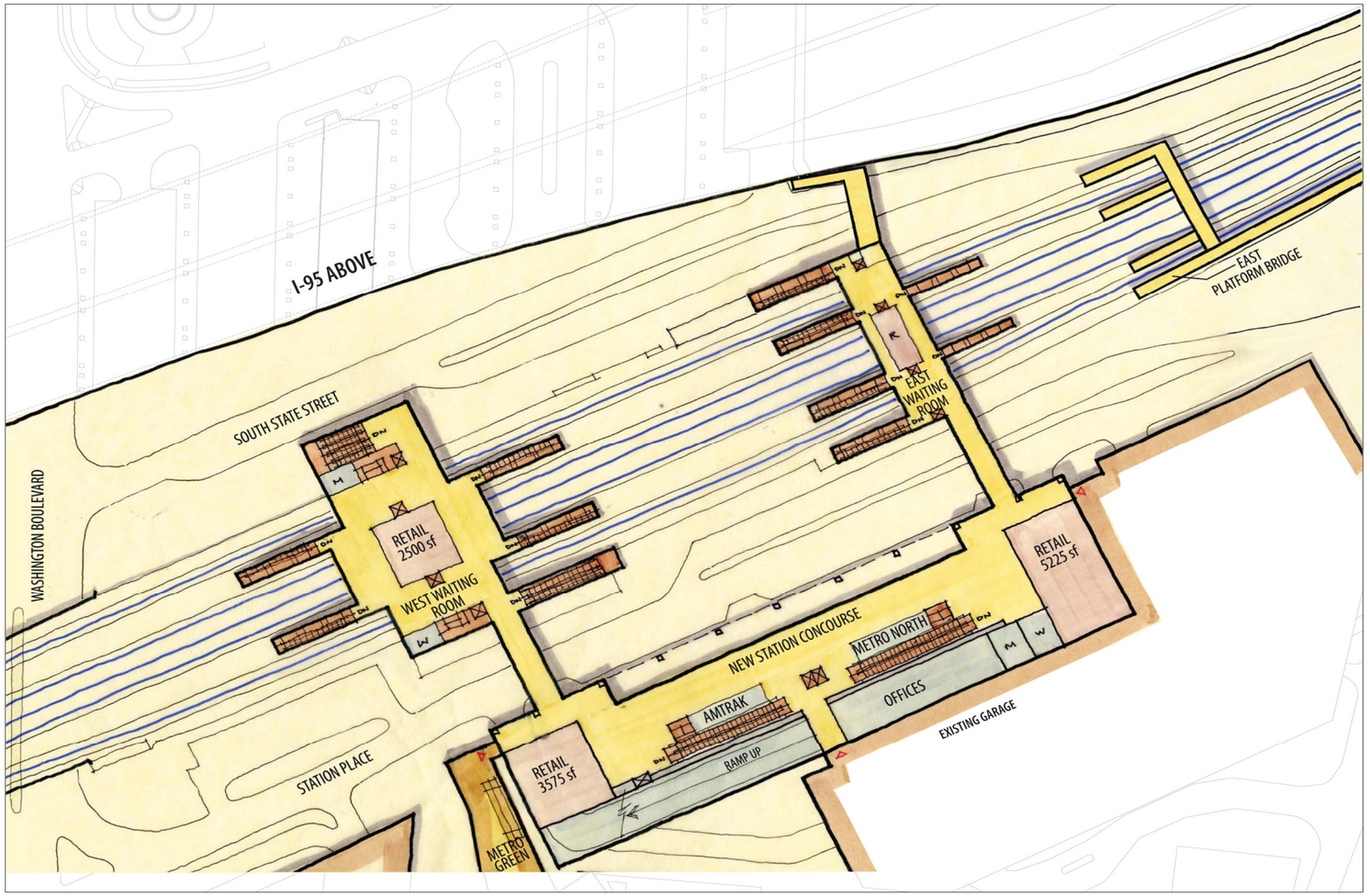

Figure 16 – Concourse Level Plan for Alternate 3

ALTERNATE 3 – CONCOURSE LEVEL PLAN

On the concourse level, the existing waiting area will be rearranged. The large ticket booth which dominates the space will be removed and ticketing will be moved to the new station building. The ticket booths will be placed against the rear walls to create a more open space within the new station concourse. Two separate booths will be provided, one for Metro North and the other for Amtrak. The new station building will provide additional space for retail and support offices for the railroad, police, management and ConnDOT. The removal of the ticket booth and office area in the existing space will provide additional waiting space for commuters and will allow the reorganization of retail spaces.

This alternate will also provide an east waiting room incorporated into an expanded east pedestrian bridge located above the tracks. Some limited amenities such as ticketing, retail kiosks and climate control will make this space a viable alternative to using the main waiting room and help to disperse patrons along the full length of the platforms.

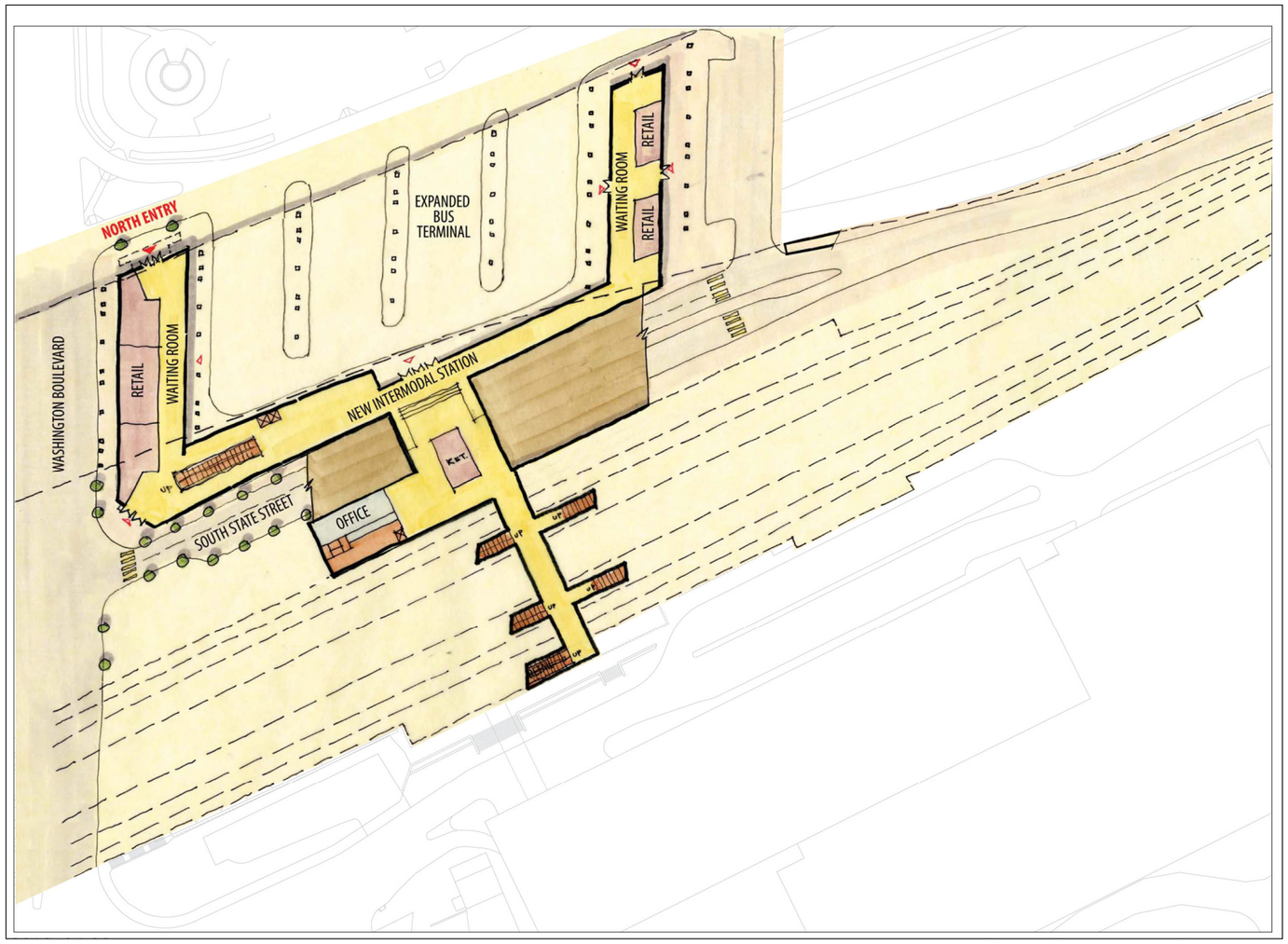

Figure 17 - Lower Level Plan for Alternate 2

ALTERNATIVE 2 – LOWER LEVEL PLAN

The lower level plan includes a major reworking of the bus and shuttle area. The existing gateway building bifurcates the bus and shuttle areas, blocking a clear view of the entire area. By pushing the waiting areas and connecting links to the outside, it opens up the central area, providing greater visibility. This greater visibility increases the sense of security and helps to make connection to the various transportation modes more intuitive. If one can see the various operations, less signage is needed to direct patrons to their destination. The relocation of the retail space to Washington Boulevard will help to vitalize the street frontage and provide potential patrons in addition to those who are accessing the station for transportation purposes. It also moves the crossing of North State Street to the intersection where it would typically be expected rather than at mid block. An additional waiting room would also be constructed at the east end of the complex, adjacent to Guernsey Street. The connecting link between the two outer rooms will use an extensive amount of glass to create an open feeling and give better visualization of the entire area.

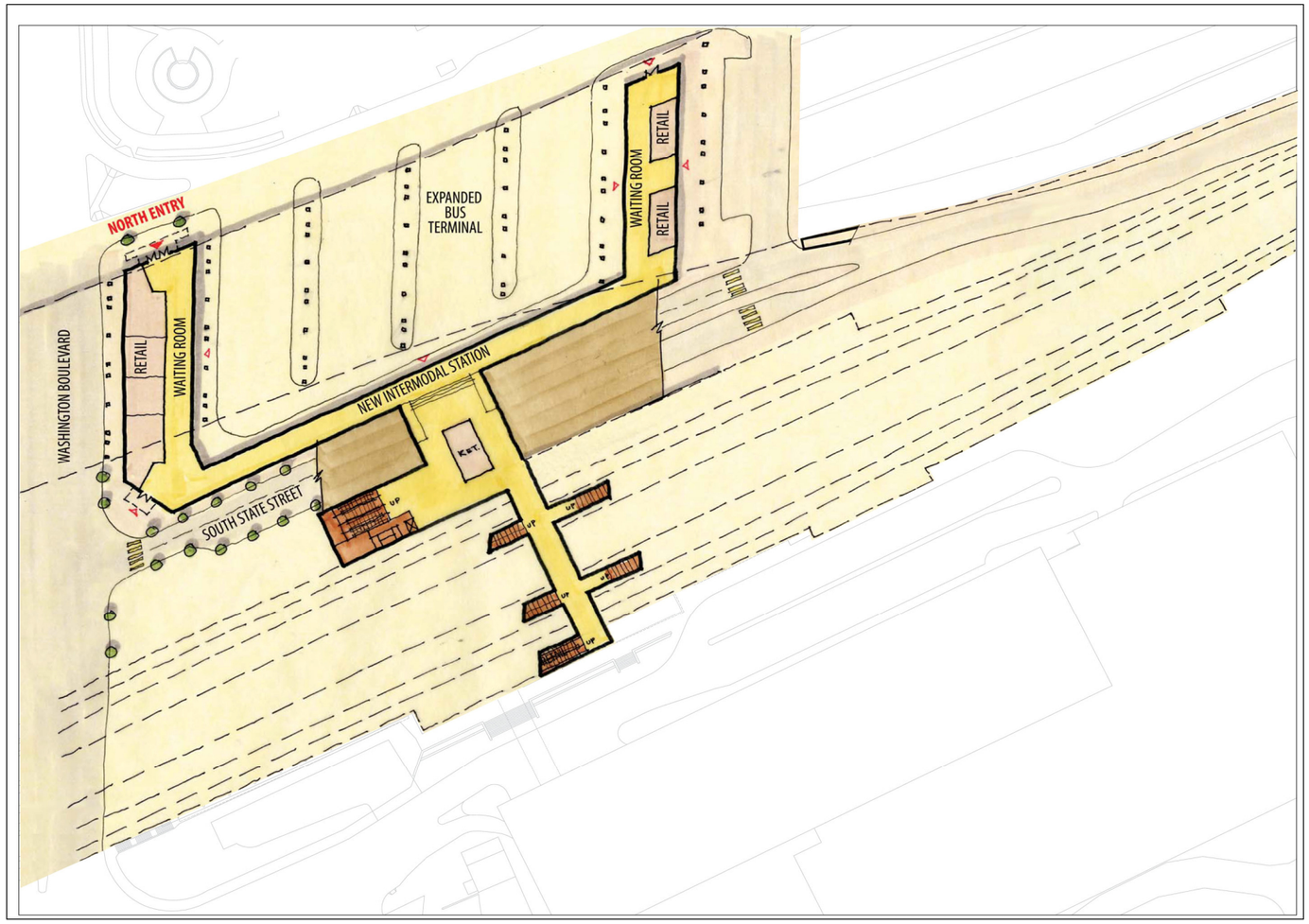

Figure 18 - Lower Level Plan for Alternative 3

ALTERNATIVE 3 – LOWER LEVEL PLAN

The lower level plan includes a major reworking of the bus and shuttle area. The existing gateway building bifurcates the bus and shuttle areas, blocking a clear view of the entire area. By pushing the waiting areas and connecting links to the outside, it opens up the central area, providing greater visibility. This greater visibility increases the sense of security and help to make the connection to the various modes of transportation more intuitive. If one can see the various operations, less signage is needed to direct patrons as to where they want to go. Additionally, the relocation of the retail space to Washington Boulevard will help to engage the street front and provide potential patrons in addition to those who are accessing the station for transportation purposes. It also moves the crossing of North State Street to the intersection where it would typically be expected, rather than at mid block. An additional waiting room would be located at the east end of the complex, adjacent to Guernsey Street. The connecting link between the two outer rooms will use an extensive amount of glass to create an open feeling and give better visualization of the entire area.

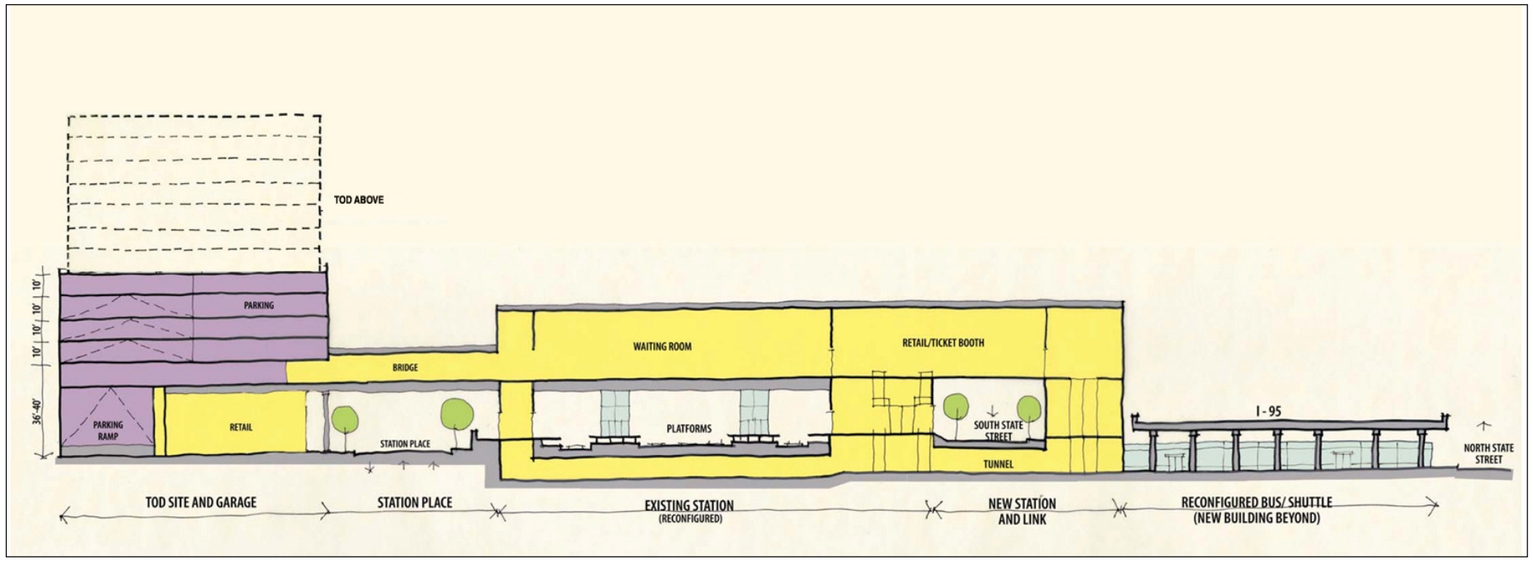

Figure 19 - Longitudinal Section for Alternative 2

ALTERNATIVE 2 – LONGITUDINAL SECTION

This longitudinal section shows how the expanded station building and the TOD development will be integrated into the existing building, track layout and adjacent I-95 viaduct. A new pedestrian bridge over the street would be needed to connect to the new TOD development. It is envisioned that there will be several floors of parking that can provide commuter spaces as well as support the proposed development which will be located above the parking.

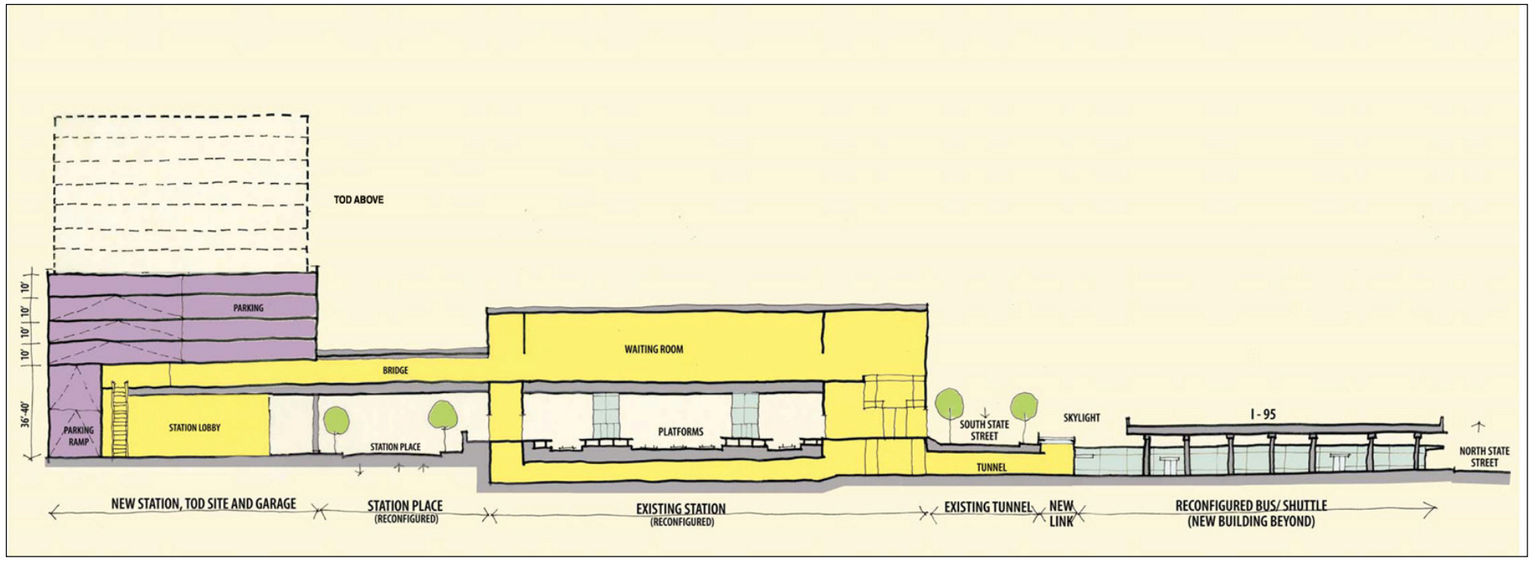

Figure 20 - Longitudinal Section for Alternative 3

ALTERNATIVE 3 – LONGITUDINAL SECTION

This longitudinal section shows how the new station building will be integrated in Station Place. A new pedestrian bridge over the street would be needed to connect to the new station concourse. It is envisioned that there will be several floors of parking that can provide commuter spaces as well as support the proposed development which will be located above the parking.

B. SCHEDULE AND PHASING

With the significant investment that is required for this Master Plan, it is necessary that the individual project components be procured over an extended period. A list of these projects and their anticipated cost ranges can be found in the table that follows. In addition, phasing plans have been prepared for the major improvements that have been planned. The sequence for the implementation of these projects will need to be prioritized based on cost benefit ratios and functionality. The following implementation plan is suggested:

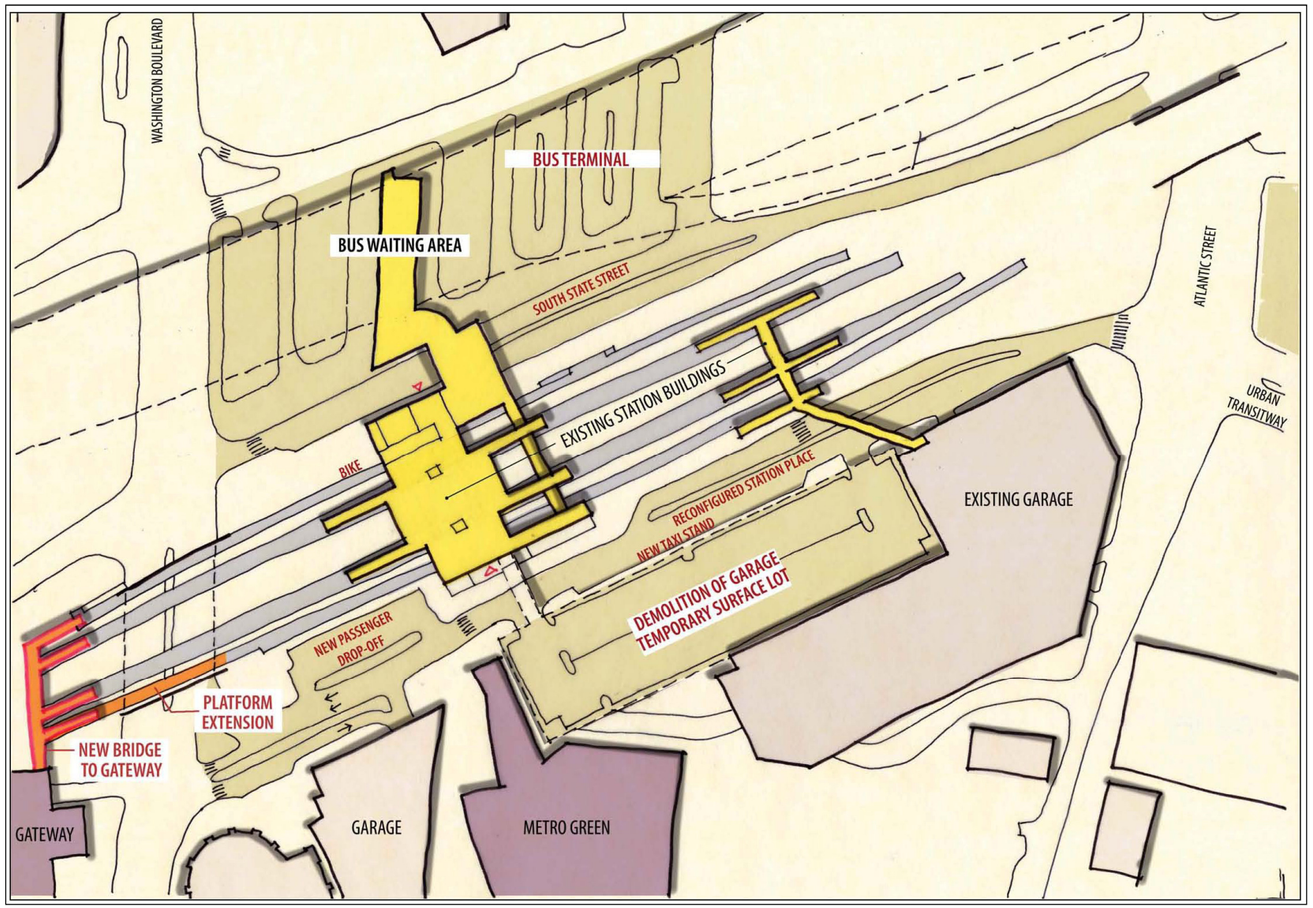

Figure 21 – Five Year Phasing Plan

0 – 2 YEAR PLAN (Quick fixes)

There are a number of short term improvements that can be made at the STC which require minimal investment and will provide immediate improvement to operations. These improvements range from a new ticket machine on the lower level, to speed tables on North and South State Street to added amenities in the bus depot. A full listing of these improvements can be found in the Summary of Improvements table.

2 – 5 YEAR PLAN

Recognizing the current fiscal constraints and the likelihood that it will take several years for the market to correct itself, the first 5 years of the plan will address the improvements that will have the least cost. These improvements will provide some meaningful improvement to the convenience and efficiency of the station without significant capital outlay.

One exception to this minimalist approach is the construction of the new west pedestrian bridge and the extension of the southern platform over Washington Boulevard. It is our understanding that the Gateway Project, which will be constructed on the west side of Washington Boulevard, just south of the railroad is currently seeking approval of their project. A goal of the project is to have a direct connection with the STC and provide some amenities to commuters within the new building. Therefore, it makes sense to provide some connecting bridge, if not the full build, at least the crossing of Washington by a platform extension.

It is anticipated that the existing, older garage will have been demolished and replaced with alternative parking elsewhere. Depending on timing, this parcel could remain as a temporary surface lot or have been developed into a TOD site with some parking and commercial development above.

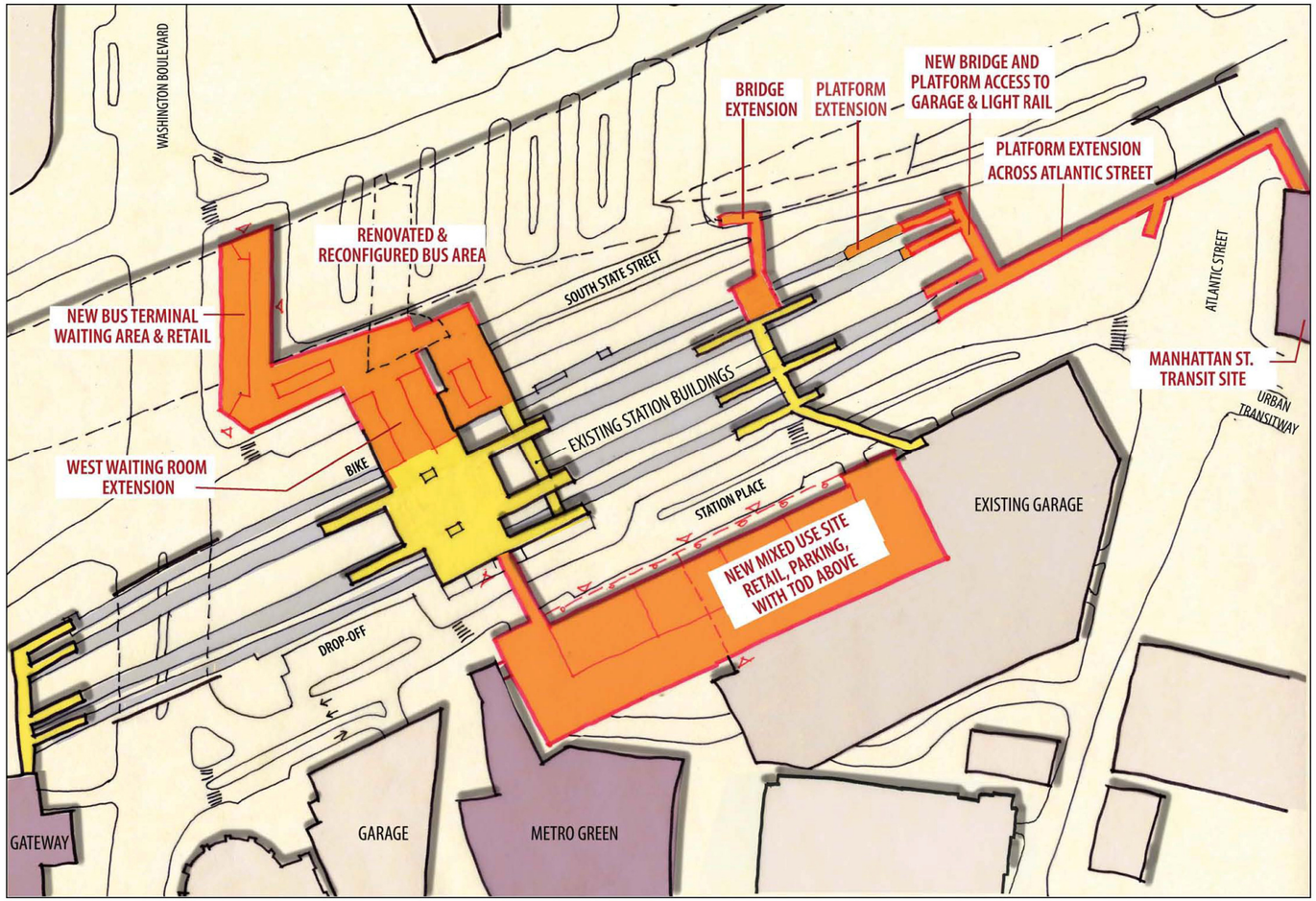

Figure 22 - Ten Year Phasing Plan

The 10 year plan reflects a more aggressive approach with respect to funding the improvements. It is hoped by this time that significant improvement has occurred in the fiscal health of all potential funding sources so that more improvements can be implemented. Furthermore, based on projections in growth, at this point, the STC may start to feel significantly constrained by its current configuration and layout.

As the 5 year plan had coordinated the new pedestrian connections on the west side of the STC with anticipated construction and development, the 10 year plan would do the same for the east side of the station. The State is currently designing the replacement of the Atlantic Street Bridge. It is anticipated that the design and construction of this bridge would be complete by this time. In conjunction with this, the reconstruction of the platform over Atlantic Street should be extended to efficiently provide pedestrian access over this street. In addition, the ends of the platforms should be fully connected with a bridge over the tracks.

The 10 year plan also calls for the extension of the east pedestrian bridge to the northern and across South State Street. This will provide additional connectivity between the various platforms, the parking garage and the downtown area. The 10 year plan also includes the extension of the station building over South State Street to complete the connection to the bus depot and provide alternate means of access to these areas in addition to the existing tunnel. The construction of the western leg of the reconfigured bus depot would also take place at this time and provide retail space on the Washington Boulevard frontage.

It is anticipated that the existing garage site will be converted into a TOD site within the 10 year plan. The site will provide mixed use development with retail on the ground floor and limited parking above.

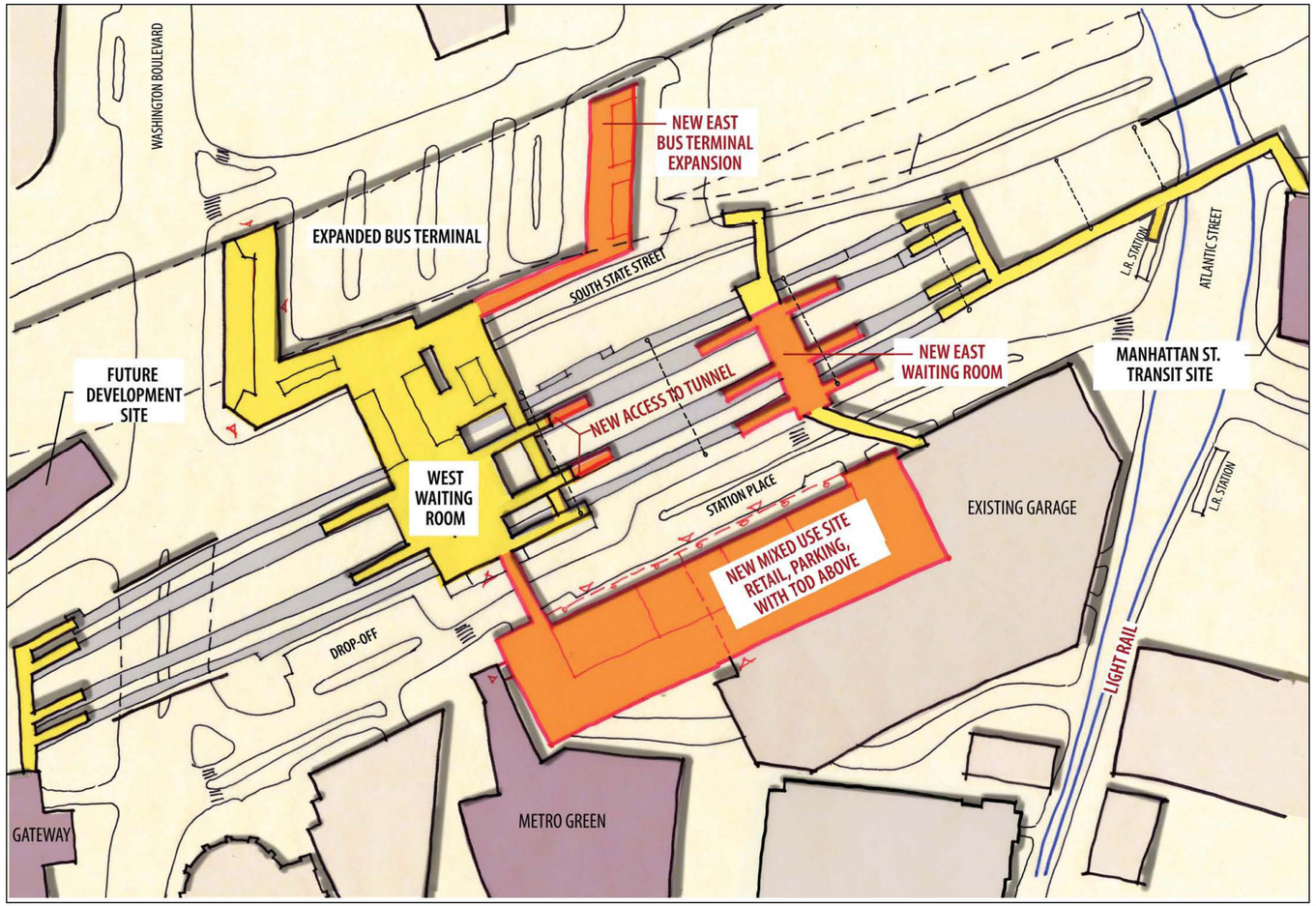

Figure 23 – Twenty Five Year Phasing Plan

25 YEAR PLAN

By the end of the 25 year period, it is anticipated that the bus depot will be completed with a new east bus terminal expansion. This provides additional waiting areas as well as retail space along Guernsey Street. A new east waiting room will be constructed over the tracks. This waiting area will provide an alternate area to wait for trains and include some amenities such as retail, restrooms and conditioned space. By providing this space, passengers will be encouraged to disperse along the entire length of the platforms. In this final phase, new access will be provided to the existing tunnel, providing an additional point of entry.

V. IMPLEMENTATION

A. ECONOMIC ANALYSIS

Impact of Proposed Improvements

The proposed improvements recommended in the master plan will have a substantial economic benefit to the State, City and the region and will positively influence the character of the community. This has been demonstrated in the past where TOD and transit improvements have had a major positive impact not only on travel patterns, but also on development and redevelopment prospects in the other US cities and in Stamford. Based on a market analysis and research of other comparable communities though out the U.S, cities are able to maintain their competitive edge and increase their economic output when their transportation facilities are brought in line with current standards. A list of economic benefits is as follows:

1. *Transportation System Cost Savings and Efficiency Gains* **-** Attracting discretionary travelers, increasing transit ridership, and providing a catalyst for more efficient land use and transit use provides various cost savings and efficiency gains, including congestion reduction, road and parking cost savings, consumer savings, reduced crash damages, reduced emissions and improved public health. These economic savings and efficiency benefits filter through the economy as savings to consumers, businesses and governments, making a region more productive, competitive and sustainable.

2. *Shifting Consumer Expenditures* - Expenditures on automobiles, fuel and roadway facilities provide relatively little regional economic activity because they are capital intensive and largely imported from other areas. A study using national input-output table data found that each 1% of regional travel shifted from automobile to public transit increases regional income about $2.9 million, resulting in 226 additional regional jobs (Miller, Robison and Lahr 1999).

3. *Property Development and Redevelopment* – Increased development density and accelerated growth and investment on redevelopment sites adjacent to the STC can be anticipated. The increased accessibility and convenience of urban sites located near transit not only drives up the value of those properties, but also makes them more attractive as development sites, particularly for dense, transit-supportive uses such as office buildings and mixed-use residential. Examples from other urban settings show an accelerated pace and density of development. The scale of private investment along the transit lines (e.g. Portland, OR is a particular example) demonstrates how development density increases as one gets nearer the transit line.

4. *Congestion Impacts* - Traffic congestion costs include incremental delay, stress, vehicle operating costs and pollution that a vehicle imposes on other road users. Congestion reduction is a primary transportation improvement objective of the City of Stamford. Traffic congestion tends to increase with city size because there are more vehicles within a given area.

5. *Employee Productivity* - Many businesses prefer to locate near rail stations to improve access for employees and customers. Some employers say that employees who commute by rail are more productive since they avoid the stress and uncertainty of driving on congested roads. Employers who locate near rail facilities also have access to a larger labor pool which also makes them more competitive.

6. *"Quality of Life" Benefits* - Aside from economic and fiscal benefits anticipated by STC improvements and transit-oriented development surrounding the station, there are intangible benefits as well. These benefits, which benefit both the public and private sector, support local and regional planning goals for the City and State, and help improve livability and the overall quality of life for residents in the area. While "livability" and "quality of life" are subjective terms and defies easy definition, they usually contain a variety of criteria that are directly or closely related to land use and transportation issues (e.g. air quality, commuting time, traffic congestion, pedestrian safety, etc.). The following are potential benefits of transit improvements and transit-oriented development as they relate to these issues and other potential intangible benefits:

    - Provides mobility choices
    - Increases transit ridership leading to increased efficiency by transit agency resulting in less cost per distance traveled
    - Reduces rate of vehicle miles traveled
    - Increases households' disposable income
    - Conserve resource lands and open space
    - Contribute to more affordable housing
    - Decrease local infrastructure costs
    - Health Benefits

In addition, TOD brings people together through casual encounters, increasing daily exchanges and sense of community. The regional implications of transit and TOD are more efficient use of public investments and infrastructure, focused growth and development (reduced suburban sprawl) reduced commuting times/traffic congestion, improved environmental quality, a more efficient use of land, and better open space preservation.

Economic Impacts on Real Estate

A potential impact on real estate property values due to improvements to the Stamford Transportation Center should be positive based on recent studies in similar urban environments. Transit oriented development tends to increase local property values due to improved accessibility and livability in that area (Eppli and Tu, 2000; Smith and Gihring, 2003). Transit stations often provide a catalyst for various neighborhood improvements such as urban redevelopment, historic preservation, improved pedestrian conditions and neo-traditional design practices. A portion of these property value gains may be economic transfers (property value increases in one area are offset by property value reductions at other locations), but increased property values resulting from agglomeration efficiencies, shifted consumer expenditures, transportation efficiency and community redevelopment are true economic gains that increase productivity.

Price premiums (values of land and buildings) are anticipated nearest the STC. Access to transit service improves the value of a site, particularly in an urban setting. This additional level of accessibility and convenience for travelers translates into higher property values for adjacent properties. Nationwide studies have shown that land values within a quarter mile from a rail station generally experience a substantial premium (average of 20 percent) over similar properties located more than three-quarters of a mile from the station. Retail and office buildings experienced lower vacancy rates and up to 50 percent increase in rental rates. A portion of the premium is due to the comparable density, but a portion is also due to the desirability of these areas, and the amenity value of transit. TOD's create a "critical mass" of activity that benefits surrounding businesses and generates significant economic activity for the community beyond the boundaries

of the TOD itself. TOD enables individuals and households to avoid excessive car ownership and its associated expenses, helping to build wealth and reducing poverty.

The general result from a review of recent research into the property value impacts of transit systems is that the property values increased for commercial and residential parcels adjacent to transit, although they demonstrate that the situation in each individual locality will be dependent on the local market, geography, type(s) of use, and distance from the rail station. Based on existing research, the *Stamford Downtown Light Rail Transit Study, November 2009* concluded that it is reasonable to estimate up to a 10% - 15% increase in property values for commercial and residential parcels near to the STC.

In addition to the macroeconomic benefits that can be realized as discussed above, there are also some microeconomic benefits that can be attributable directly to the STC. These benefits are discussed in the sections which follow.

New Revenue Streams from the STC

There are several sources of revenues that can be generated to fund improvements at the STC. Some of these sources are in effect today and can be improved and others simply need to be created. The following is a description of these sources:

- Advertising
- Shuttle Fees
- Increased Ridership
- Parking Revenues
- Retail Revenues
- TOD Development Rights

Advertising

Advertising revenues can be generated in two ways. The basic opportunity would be to generate more advertising space within the facility that can be leased and which will generate modest fees. Obviously, this approach must be carefully monitored so that the extent of advertising does not adversely affect the integrity of the facility. Additionally, as with other public facilities, naming rights of the station can be be given to a private entity in exchange for substantial fees that can be used to generate numerous improvements.

Shuttle Fees

Currently private entities are given priority access to the STC at no cost. Given that the source of some of the STC functional problems is generated by the volumes of patronage using these private shuttles, it is appropriate that fees be charged to these private entities so that the fees can help to solve these problems.

Increased Ridership

The predominant mode of transportation within the City of Stamford today is the automobile. The two primary modes of public transportation that exist in the city include bus (operated by CT Transit) and commuter rail (operated by Metro-North Railroad for Connecticut Department of Transportation) with the primary stop at the Stamford Transportation Center (STC). The potential of being served by other transportation modes has also been studied (or is under study) including Bus Rapid Transit (using the city's new Urban Transitway), ferry service, and Light rail transit (Downtown Stamford LRT Study, November 2009).

Rail, bus and shuttle ridership are all anticipated to increase in the future as gasoline prices rise, increasing employment in Stamford, greater use of the Stamford Urban Transitway and the purchase of new rail cars by the State of Connecticut.

The annual number of trips taken on Metro-North originating and terminating in Stamford is as follows:

Weekday	6,000,000 trips per year
Saturday	600,000 trips per year
Sunday	500,000 trips per year

This totals over 7 million trips per year. If under the medium growth scenario of 1.5% growth, the number of annual trips would increase by 100,000 for the first year and over 1 million additional trips by year 10. Based on the average net ticket price of $5 per trip, the additional ridership will increase revenues by $500,000 for the first year and $5 million per year by year 10. Using the high growth scenario of 4% growth, these revenue numbers would increase by $1.4 million in the first year to $17 million for year 10. Through a variety of financial instruments, these additional revenues could be used to finance the improvements to the STC.

Parking Revenues

The STC Garage generates roughly $9,500/day in weekday transient revenue, $5,000 - $6,000 per weekend (total for Saturday and Sunday) in transient revenue, and $90,000/month in monthly pass revenue. In the month of October 2009, the STC Garage generated approximately $347,000 in parking revenue. Based on the October 2009 revenue stream and assuming this income trend remains consistent throughout the year, the estimated revenue generated is approximately $4,200,000 annually. An increase in overall parking rates by 10% will yield an additional $420,000 without any additional increase in cost. Increasing rates by 20% will provide $840,000 which can be used for investment into the STC. In either case, it is important to keep the revenues generated at the STC in funds that are dedicated to the STC and not comingled with the State's general fund. This insures continual upgrade of the STC from revenues produced by users of the STC.

Retail Revenues

Retail rates in Stamford vary from $15 per square foot to $35 per square feet depending on location. In a review of current offerings there were several offerings of 800 square feet to 3500 square feet being offered at $18 per square foot. It is assumed for the purpose of this study that additional retail space could be rented at $10 to $15 per square foot. The addition of 5000 square feet of retail space could add $50,000 to $100,000 per year in additional revenue at the STC.

Market at Grand Central Terminal, New York

TOD Development Rights

The development of the existing, older garage site should be reserved for a Transit Oriented Development (TOD). This site consists of 1.3 acres and is located adjacent to Station Place. This site would be ideal for TOD and would be more appropriate for that use than exclusively a parking structure. A Request for Expression of Interest had been issued by ConnDOT for this property last year. There was little response to the request which could have been due to several factors, the most obvious being the poor state of the economy at the time. There are no real comparables for this site in the market place. However, in reviewing what is currently being offered in Stamford, one parcel in downtown Stamford consisting of 0.85 acres was being offered at $10,250,000. It is assumed that the TOD site being offered by the DOT could generate between $5,000,000 and $10,000,000. In addition to generating revenue, the development of this site for TOD captures the essence of TOD development, placing greater density development proximate to transit and reducing the need to use single occupant vehicles for transportation needs. It reduces the vehicle congestion at the center of the STC and engages the street front along it, creating a more pedestrian environment and the development of a neighborhood.

Conclusions and Recommendations

There are several potential revenue sources that are largely untapped at this time including those from Transit Oriented Development rights, additional ridership, parking and retail leases. Revenue may also be generated from shuttle fees and advertising. Collectively, potential fees may generate amortized revenue of up to $3 million annually, which may be used to offset cost for the estimated $53 to $86 million (2010 dollars) in capital improvements recommended for the STC. Specific economic benefits which could provide a return on investment in the STC include the following:

- Increased ridership will provide additional revenue of between $0.5 million and $1.4 million for the medium growth and high growth rates respectively in the first year and could add $5 million to $17 million by year 10.
- A 10% increase in parking fees could generate an additional $400,000 in annual revenue
- Additional and improved retail space could generate additional annual revenue payments between $50,000 and $100,000.
- Sale of the Transit Oriented Development rights at the existing garage site could generate between $5 million and $10 million.
- Improvement of the STC could increase the market values of properties surrounding the STC 15 to 20%.

B. GOVERNANCE

The City of Stamford transferred the ownership of the STC to the State of Connecticut in 2000. The Connecticut Department of Transportation operates the station through its management contractor Fusco Management. Fusco is responsible for the day to day operation of the facility and maintenance of the station with the exception of the platforms and the tracks, which are Metro-North's responsibility. Management of the parking garage is subcontracted to ProPark. Security within the station building is subcontracted to Allied Barton Security.

Under the current management arrangement, the City and the major employers in the area do not have any direct control over the day to day operations at the STC. There is however, a strong need for these groups to be involved in STC operations and long term planning since they are integral to obtaining funding and governmental support.
It is recommended that a regular forum be developed to allow the major stakeholders an opportunity for raising issues and providing answers. An advisory committee should also be formed with key representation from all the major stakeholders to address problems on an ongoing basis. This committee will need recognition and need to be empowered to implement action items. Also critical to the success of this committee and the whole notion of governance will be the support and cooperation from the State so the decision making process can be streamlined and coordinated with other State funded programs in the area.

C. SUMMARY

The ideas put forth in this Master Plan are comprehensive and touch upon all aspects of the STC from functionality, to conveniences, to operations, to aesthetics and as has been stated previously, affect numerous stakeholders. The total estimated cost for all of these improvement ideas is in excess of $60 million with some individual projects less than $100,000 and others in excess of $30 million The various stakeholders have disparate interests and therefore different priorities on how to best use funds that may become available to fund these improvements. To bring all the improvement ideas suggested to fruition, a single entity will need to be formed to establish one cohesive plan for implementation. This group will need to consist of members from both the private and public sectors. The private sector will need to be represented by local business owners as well as the user community. The public sector will need to have representatives from the three traditional levels; municipal, state and federal. This combined public/private group will not only

need to be an advocate for the project, but also must generate funding through a variety of sources, including public private partnerships, new revenue streams generated by the STC and the traditional government programs that are in effect at any given time such as the various stimulus packages that currently exist. In addition to its funding responsibilities, this group must also serve in an advisory role in the management and operation of the facility. This will help to address the needs of the public so that additional ridership is generated by the modal shift towards mass transit which will be inspired by the improvements made to the STC.

The first steps that must be taken by this group will need to set the tone for the entire project which will occur over a protracted time frame. The initial focus of the group should focus on improving station function and should establish a governance committee for the facility that can be sustained for an extended period. It is important that there be a continuum of improvements made to provide the incentive for the traveling public to make the switch from autos to mass transit over the extended period. After the initial functional improvements are made, the next steps will need to develop more comprehensive construction plans for all of the improvements so that accurate cost estimates can be established for the balance of the work. After these estimates are established, appropriate apportionments can be made amongst the various potential sources of funds which are as follows:

Private Sources of Funding

Since it is expected that the private sector will be the leader in the way out of the current economic recession, it can be expected that they will have first access to funds that can be utilized for improvements at the STC. These funds must be harnessed to effectuate the improvements at the STC. All private entities that will and do benefit from the STC more so than others in Stamford, need to contribute to the facility in a comparable manner to the benefit that they receive. These contributions need not necessarily be just direct financial contributions, but can instead be construction of one of the actual improvement projects projected for the STC. In other words, as part of the construction of a new development, a developer can integrate into his construction program one of the elements put forth in this Master Plan, whether it be a new stairway access into the station or a new pedestrian bridge that feeds all of the platforms. There are many precedents for this type of obligation on the private sector in many other developing cities. The following is a list of some of the programs that exist:

a) Mandatory obligations for improvement to the mass transit facility

Since a mass transit facility in close proximity to a proposed development provides some additional access benefits to that development, the concept is that development should make some contribution for the otherwise free benefit that it is receiving. In New York City, this obligation can amount up to $20-$30 per square foot of new development.

b) Bonuses for improvements made to a mass transit facility

Additional financial incentives (i.e. additional floor area above zoning regulations) can be provided to a developer of a parcel in close proximity to a mass transit facility in exchange for the developer's funding of improvements to the mass transit facility. This makes particular sense for parcels immediately adjacent to the STC that may benefit from additional means of pedestrian access to their site from across the Railroad property. In NY City the cost for these bonuses to a development parcel have been as high as $250/sf, but have dropped in recent times due to economic conditions.

If a developer is seeking approval of a particular development based on a reduced amount of parking to demonstrate a minimal impact on traffic congestion in the vicinity of the STC, than the cost reductions that the developer is realizing by not building the necessary parking spaces should be invested into the STC. It is recommended that a value of 25% less than the $25,000 per parking space that is saved be assessed as the developer's contribution. The strategy is that if the developer is required to invest in transit on a dollar for dollar basis, he may choose to build the parking spaces anyway. It needs to be more attractive to invest in transit than to build the parking spaces.

Local

Given the current economy and the financial status of Stamford, there is little in the way of monetary contribution that is expected from the City government. However, the City must remain an advocate for the project and must implement new rules and regulations to help generate additional sources of funding such as those discussed above. Typically, Cities are not able to fully fund this type of work and would be dependent on State and Federal sources to supplement their share of the cost. A city could generate revenue through municipal taxes, user taxes and permit fees. In future years, the City may be able to provide assistance on some of these projects. The City will need to provide matching funds for State and Federal funding.

State

The State will typically sell bonds, tap the transportation fund or provide funding from the State's general budget to fund the type of projects identified in this master plan. The State is also experiencing the effects of the poor economy on its revenue and so finding money to make improvements at the STC will be difficult. It is incumbent on the advocacy group to maintain awareness of this work with the State legislators that represent the City. The improvement of the Stamford Transportation Center will also have positive impacts on the region beyond the City of Stamford limits, so a coalition of region legislators is important consensus to build.

Federal

The City of Stamford has been successful in recent years in obtaining federal funding to implement new projects, most notably is the Urban Transitway. The City's lobbying group and congressional delegation need to be vigilant to trying to obtain federal monies either through the Federal Railroad Administration, Federal Highway Administration, American Resource and Recovery Act and other federal opportunities. A request for $3.5 million has already been made for this year.

Approvals

In addition to the need for funding, there are various approvals that will be required from the multitude of parties that govern various aspects of the facility. In addition to the required approvals, a general consensus for the agreed upon master plan should be generated to better facilitate the funding process. At a minimum, approvals will be required as per Table 9. Consensus approval will also be helpful to have from the Commuter Council, the Chamber of Commerce, SWRPA, Business Council of Fairfield County, operators at the STC and the local business groups.

Table 9 - Summary of Approvals

ConnDOT	ConnDOT owns the station building, the adjacent garage, the at grade lot and the area under I-95
CT Transit	Operates the public bus operations in the STC
Metro-North	Operates the New Haven line trains that pass through the STC
Amtrak	Operates the Northeast Corridor trains that pass through the facility
City of Stamford	Multiple commissions will have regulatory review of proposed improvements
Private Utility Companies	Telephone, electric and gas companies will need to approve plans of any relocation of their facilities as a result of any improvements made to the STC
Parking Management Company (ProPark)	The parking management company does not own the facility but obtaining their approval for any changes in operations will clearly help to expedite the overall process.

Conclusions and Recommendations

With the anticipated growth in ridership, if improvements are not implemented at the Stamford Transportation Center (STC) and only routine maintenance is performed, the facility will at first stagnate and then ultimately, the function of the station will decline into an unsustainable state. Therefore, change is imperative for the long term success of the facility, the City of Stamford and the region. A wide array of issues challenge the successful implementation of the recommended improvements in this Master Plan, including securing funding and obtaining approvals It will be vital for an advocacy group to be formed early, be empowered and provide strong leadership to carry this project through to fruition. The orderly succession of membership in this group is important as this project will take a number of years to complete. Innovative and creative approaches will be required to accomplish the goals of this plan. Overcoming the inertia to provide some initial improvements in a weak economy will be the first test for this group. Obtaining general acceptance from the various stakeholders will also be key.

We recommend that the improvements described in Alternative 2 be the goal for the Stamford Transportation Center. To reach this goal, a phased program is recommended as outlined in the previous sections of this report. This will provide some meaningful functional benefits in the near term from a modest investment to generate momentum for future work. Figures 2 and **3** on pages 8 and 10, outline these near- and long-term improvements respectively, which will require public and private investment over a period of time of not more than 25 years and in proportion to the benefits to be realized by each party. Successful implementation of this program will rely on achieving a balance among the disparate interests of stakeholders and the attainment of the aforementioned Master Plan goals. This balance will ensure the long term well being of the STC so that it can help support the economic growth of the City of Stamford, and in turn the economy of the State of Connecticut. This Plan does not represent a risky proposition, but rather a necessary investment into one of the greatest economic assets of the State and one of the most prominent cities in the Northeast.

Table 10 - Summary of Improvements

IMPROVEMENT	Quick Fixes (0-2 years)	Short Term (2–5 Years)	Mid Term (5-10 Years)	Long Term (10-25 Years)	Remarks (All dollar figures shown represent current construction prices without inflation projections)
PLATFORM CONGESTION					
Connect East Bound Platform to Atlantic Street	<$100k				Improves connectivity to east side and reduces some travel distances
Extend Platform Canopies			$2M to $4M		Encourages full use of platforms thereby reducing congestion at center
Construct New West Pedestrian Bridge – Extend South Platform over Washington		$5M to $10M			Improves connectivity to west side, links with new development, eliminates pedestrian – vehicle conflicts, reduces travel distances and increases safety
New Access to Pedestrian Tunnel				$1M to $3M	Reduces congestion at tunnel entrance and increases safety
Prefabricated Shelters at Ends of Island Platforms	<$100k				Encourages full use of platforms thereby reducing congestion at center
Extend East Pedestrian Bridge over South State Street			$3 M to $5M		Improves connectivity to other platforms and downtown and improves pedestrian safety
Extend East Bound Platform over Atlantic Street			See Remarks		Eliminates pedestrian- vehicle conflicts. Included in Atlantic Street Bridge Replacement Project
STATION/BUS DEPOT CONDITION					
Construct Canopy over Shuttle Bus Entrance	<$100k				Provides improved amenity for shuttle users and better interconnectivity
Station Signage		$100k to $200k			Improves information and pedestrian flow
Governance	<$100k				Provides management with feedback from users and helps to implement Master Plan
Landscape Improvements – Short Term		$300k to $500k			Enhances facility, encourages pedestrian travel and patronage
Landscape Improvements – Mid Term			$300k to $500k		Enhances facility, encourages pedestrian travel and patronage
STC Station Building Improvements – Immediate	$300k - $500k				Includes new door at the north end of the tunnel, removal of stairs replace with a ramp near North State Street entrance, new connection between the bus depot and the rotunda area and addition of a ticket machine on the lower level. These provide improved connectivity, convenience for patrons and shorter travel distances.
STC Station Building Improvements – Mid Term			$1.5 M to $2.5 M		Includes renovation of waiting areas on street level for both the north and south areas. Provides additional waiting space, reducing congestion in existing waiting area.
Shuttle Licensing and Reorganization	<$100k				Organizes existing operations and reduces congestion and provides additional revenues
STC Lighting			$400k to $800k		Improves security around STC improves aesthetics
Bus Depot Amenities (lighting, painting, bird deterrent)	$300k - $400k				Provides improved amenities for bus depot patrons and encourages patronage
Bus Depot Expansion – Phase 1			$4M to $5M		Provides an upgraded facility for bus depot patrons and encourages patronage
Bus Depot Expansion – Phase 2				$4M to $5M	Provides an upgraded facility for bus depot patrons and encourages patronage
Expanded Station Building over South State Street			$10M to $20M		Provides improve intermodal connectivity and an expanded and reorganized waiting room thereby encourage patronage
VEHICULAR TRAFFIC CONGESTION					
Widen sidewalk on South State Street	<$100k				Provides a safe pedestrian travel route to STC
Intelligent Transportation Systems with Gateways			$500k to $1M		Provides real time information for commuters to encourage patronage and alerts through drivers to facility to increase safety
Improve Station Place			$2M to $3M		Increases capacity of pick up area and adds a bypass lane around stopped vehicles.
Bikeway Route to STC and Additional Bike Amenities		$200k to $400k			Encourages bicycle use at STC and reduces reliance on automobile.
Enforcement During Peak Hours	<$100k				Reduces congestion and unsafe practices around STC.
Canopy over Drop Off on South State Street			$2M to $3M		Encourages full use of drop off area.
Speed Tables on North & South State Streets, Station Place	<$100k each				Calms traffic in vicinity of STC and encourages pedestrian travel.
PARKING CAPACITY					
Replacement Parking for Older Garage		See Remarks			Eliminates a deteriorated garage. State has already funded this project.
Demo existing garage			$1M to $2M		Provides site for potential TOD development.
Provide Additional 150 spaces			$6M to $8M		Increases parking capacity at STC.
Provide Additional 500 spaces				$12M to $16M	Increases parking capacity at STC.
TOTALS	**$1.6M to $2.5M**	**$6M to $11M**	**$33M to $55M**	**$20M to $28M**	**Cumulative Total For All Projects Over Extended Period is Approximately $60 to $100 Million**