

# Manchester TOD Plan

## EXISTING CONDITIONS PROFILE

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Appendix 1: **Environmental Constraints Memo**

Appendix 2: **Existing and Future Multi-Modal Transportation Memo**

# **Manchester TOD Plan: Existing Conditions Profile**

## **Manchester TOD Plan Study Area**

The Manchester TOD Plan study area, also known as the South Elm district, includes the area roughly bounded by Granite Street to the north, the South Elm corridor to the west, Queen City Avenue to the south, and Second Street to the east, across the Merrimack River. It is immediately south of Manchester's historic downtown and riverfront Millyard, now a major office employment center.

Transit-oriented development concentrates compact, high-density, and mixed-use development within one-half mile of transit service, such as Manchester's future train station, to take advantage of existing infrastructure and maximize the impact of transit investments. Transit-oriented development is multi-modal and promotes walking, biking, and other mobility strategies for an area. Existing transit service, including the public bus system and shuttles, are an important part of transit-oriented development.

There are significant assets in the study area to support transit-oriented development, including a downtown grocery store, major employment base within walking distance, the emergence of the study area and downtown as a desirable residential neighborhood with a growing inventory of multi-family housing options, range of housing types including riverfront condominiums, downtown one-bedroom apartments, and micro-units, energy and momentum around downtown marketing and placemaking, and recognition of need to invest in multimodal access and connectivity in the area as evidenced by the BUILD Grant application.

The study area also includes major entertainment destinations, including the 11,000 seat SNHU Arena and 6,500 capacity Northeast Delta Dental Stadium.

## **Existing Rail Infrastructure and Access**

The existing rail tracks are owned and operated by Pan-Am Railways. North of the study area the tracks parallel Canal Street through the Millyard. The track is currently used for freight deliveries, including rare but lengthy seasonal coal trains. There is a third spur track, currently leased to another entity, is also located in the study area and is used for storage and operations.

In the northern end of the study area, the existing tracks are a major obstacle to pedestrian and vehicular access. There are currently two vehicular at-grade crossings of the rail track in the study area at Granite Street and Depot Street; these crossings are within one short block (300 feet) of each other. A third, trespassed but well-utilized pedestrian crossing exists near the end of Auburn Street, and connects through to South Commercial Street in a walkway along the side of the WMUR property.

In the southern end of the study area, the railroad tracks are closer to riverfront; the combination of floodplain, the small width of land between the tracks and river, and limited roadway access makes development on the river side of the tracks more challenging in this area. The Queen City Avenue Bridge is above the grade of the track.

A vacated rail right-of-way extends from the study area underneath Elm Street in parallel to Willow Street; this right-of-way is now owned publicly: some portions by the State of New Hampshire and some portions by the City of Manchester. The corridor is envisioned for future improvements with a trail and/or potentially roadway infrastructure.

Additional information about connectivity, access, public transit service, and pedestrian and bicycle infrastructure can be found in the Transportation Memo. Additional information on environmental constraints on development can be found in the Environmental Constraints Memo.

**Figure 1: Manchester TOD Study Area**



## **Previous Planning Efforts**

In addition to the previous planning efforts identified in the Transportation Existing Conditions Memo, the following planning efforts are significant to the Manchester TOD Plan study area.

### **Civic Center Area and Gateway Corridor: Opportunities and Strategies (2002)**

This early plan identified opportunities to build on the success of the arena development and reconfiguration of the I-293 exit at Granite Street.

Major destinations identified for future developments as part of the plan—including the now Fishercats stadium, improvements to the trail system, and rehabilitation of the Millyard’s historic buildings—were identified.

The Gaslight District was a focus for design concepts, including improving visual appeal, pedestrian access, and landmarks. The idea of gateway arches at entrance points into the Gaslight District has since been implemented.

A future rail hub was designated near the Gaslight District.

### **2006 Downtown Strategic Plan**

The 2006 Downtown Strategic Plan identified a number of strategies to support overall revitalization of downtown Manchester that are relevant to transit-oriented development and to the Manchester TOD Plan study area. One of the primary recommendations of the Plan is to continue to support downtown as a neighborhood that sustains a high level of activity outside of working hours, through additional residential development and density in the core of downtown, increasing connections to surrounding neighborhoods, and promoting the riverfront as a lifestyle amenity and destination.

This study also identified the need for a downtown grocery store, since achieved with the development of the Market Basket on South Elm Street in the study area.

### **Manchester Connects**

Manchester Connects was a planning and engagement effort to support broader revitalization in Manchester. The effort largely focused on downtown, the Millyard, and the riverfront, all areas that are adjacent to and influence the TOD study area. The effort resulted in four action kits, focused on the Riverwalk and a proposed loop of public spaces around the Millyard and river, land use and parking, placemaking, and organization. The land use and parking action kit recommends pursuing mixed use development and developing parking management strategies to support redevelopment.

### **Citywide Master Plan (Ongoing, 2019–2020)**

The City of Manchester is currently updating its citywide Master Plan as part of an extensive community planning process. To date, the Master Plan process has identified the need for new types of housing, such as more multi-family housing development and accessory dwelling units, throughout Manchester as a top priority. The Master Plan process has also recommended continued investment in downtown, the Millyard, and the area around a future rail station in the Manchester TOD Plan study area as locations for transformation and change.

### **Market Demand to Support Transit-Oriented Development**

The primary market opportunity within the TOD is for multifamily residential development, with estimated demand for 1,000–2,000 new units over the next decade. The largest challenge to

meeting this demand is identifying adequate sites. There are several multi-family development projects under way near the study area, but passenger rail will greatly enhance the opportunity for multifamily residential development.

Office uses are also an opportunity for development, in the range of 100,000–200,000 square feet, if adequate sites are available. Passenger rail will enhance opportunity for office development. Retail, entertainment, and restaurant uses also have market support, particularly in the Gaslight District, along Elm Street, and as part of select sites on Second Street. These uses could be provided in the ground floor of mixed-use development and could emerge as multi-family residential and office development occurs. Demand is estimated for 20,000–40,000 square feet over the next decade.

There is conceptual support for new lodging uses as other uses emerge within the TOD—possibly in the range of 85–125 rooms. There is weak opportunity for further manufacturing and warehousing development, apart from existing uses, because better sites are available elsewhere in the region.

### Employment Growth

Projections for employment growth in the TOD study area and region are the most important driver of non-residential development. Consistent with state and national trends, manufacturing employment will decline, while other sectors will add jobs, resulting in a net increase. Health care and social services will dominate growth, adding 3,450 jobs. This represents one-third of the total growth in employment expected in the area. Professional and technical services, or jobs that could drive demand for office uses, will add 1,100 jobs. Retail and wholesale trade will add 1,200 jobs and accommodate and food services 1,150 jobs. Construction will add 700 jobs. Further details about each of these sectors are discussed below. Detailed projections are included in Table 2.

**Table 1: Qualitative Assessment of TOD Opportunities**

	Regional Growth	TOD Competitive Position	Appropriate Sites in TOD	Influence of Passenger Rail	Overall	Comment
Manufacturing	Red	Red	Red	Red	Red	Existing TOD multi-floor buildings can and do accommodate manufacturing, but market is not vibrant; Millyard properties moving away from traditional manufacturing; Better sites for new construction available elsewhere in region. Rail not a major factor. Conversion of existing mill buildings to residential/ office is a possibility.
Wholesale Trade	Green	Red	Red	Red	Red	Good regional growth expected. District has appropriate Interstate access, but lacks appropriate sites users are land intensive; More appropriate use of TOD sites is possible. And warehouse uses probably more likely around airport and Pettengill Road.
Office Uses	Yellow	Green	Green	Yellow	Yellow	Current market is weak, but expected to improve. Many users favor suburban sites, but proximity to Elliot, Millyard, Downtown and CMC are positive factors. Elliot once proposed major medical office presence. Needs structured parking.
Retail Trade, Food Service, Entertainment	Green	Green	Green	Yellow	Green	Regional growth is strong; Proximity to Millyard, health care, downtown are favorable. Gaslight District is an unrealized opportunity for restaurant and entertainment. Lacks conventional retail exposure. Convenient Parking will have to be addressed. Possible to combine with residential and office. Elm St. and Second Street enhance potential.
Residential	Green	Green	Green	Green	Green	Regional demand for multi-family is exceptionally strong. Nashua seeing growth around proposed station sites. Proximity to Millyard is a positive. Dual Interstate access at Granite and Queen City is very attractive. Downtown amenities (restaurants, SNHU arena, ballfield special events) are drawing cards. Demand is exceptional strong for both rental and condo. Exiting TOD developments doing well and several new project sari emerging. Fits lifestyle preferences of Millennials and empty nesters. Largest constraint is available sites. Will require convenient (on site) structure parking. Major constraint is not market, but availability of sites.

**Table 2: Long-Term Projections of Regional Employment Growth**

Southern New Hampshire Region: Manchester TOD Plan Long-term Industry Projections, 2016 to 2026					
NAICS	Industry Title	2016 Estimated	2026 Projected	Numeric Change	Percent Change
	<b>Total Employment</b>	<b>143,422</b>	<b>154,394</b>	<b>10,972</b>	<b>7.7%</b>
<b>101000</b>	<b>Goods-Producing Industries</b>	<b>17,448</b>	<b>17,545</b>	<b>97</b>	<b>0.6%</b>
11	Agriculture, Forestry, Fishing and Hunting	185	197	12	6.5%
21	Mining	161	169	8	5.0%
23	Construction	6,308	7,012	704	11.2%
31-33	Manufacturing	10,794	10,167	-627	-5.8%
<b>102000</b>	<b>Service-Providing Industries</b>	<b>117,690</b>	<b>127,763</b>	<b>10,073</b>	<b>8.6%</b>
22	Utilities	362	353	-9	-2.5%
42	Wholesale Trade	6,301	6,936	635	10.1%
44-45	Retail Trade	16,810	17,350	540	3.2%
48-49	Transportation and Warehousing	5,735	6,262	527	9.2%
51	Information	3,591	3,477	-114	-3.2%
52	Finance and Insurance	6,350	6,683	333	5.2%
53	Real Estate and Rental and Leasing	2,003	2,119	116	5.8%
54	Professional, Scientific, and Technical Services	7,772	8,870	1,098	14.1%
55	Management of Companies and Enterprises	2,443	2,551	108	4.4%
56	Administrative and Support and Waste Management Services	8,765	9,547	782	8.9%
61	Educational Services	12,697	13,335	638	5.0%
62	Health Care and Social Assistance	19,628	23,067	3,439	17.5%
71	Arts, Entertainment, and Recreation	1,765	1,908	143	8.1%
72	Accommodation and Food Services	10,961	12,121	1,160	10.6%
81	Other Services (Except Government)	6,057	6,639	582	9.6%
	Government	6,450	6,545	95	1.5%
	Self-employed Workers	8,284	9,086	802	9.7%

There is little demand for further manufacturing and warehousing use in the TOD study area. The

*Source: NH Employment Security*

*Demand for office space commonly comes from industries including Finance and Insurance; Professional, Scientific, and Technical Services; Management of Companies and Enterprises; and Health Care and Social Assistance.*

region faces declining employment in this sector and limited demand for additional manufacturing space. It is positive that existing manufacturing and warehousing uses are accommodated in existing mill buildings and the Gaslight District, and these spaces may continue to be affordable to existing users. However, across the state and region, mill buildings are continuing to convert to residential, office, and mixed uses. While the TOD study area has excellent access to the interstate, sites in the district are less attractive for new manufacturing uses than larger, more affordable, and flat sites available elsewhere in the region, such as near the Manchester Airport and along Pettengill Road. Little new development of manufacturing uses is expected, unless smaller in scale and/or accessory to an entertainment or research and development use, such as a brewery. The role of the TOD study area in the regional manufacturing market is to recognize that existing manufacturing uses within the study area may be transitioning to research/development, office and/or residential uses in parallel with the overall trajectory of the Millyard.

Overall, the office market is expected to expand over the coming decade. About one-third of the region's job growth will generate the need for office space, or 3,050 jobs. Current office market occupancy is weakened by the declining amount of space needed to accommodate job growth as telecommuting, pooled workstations, and other trends reducing space per employee. Overall occupancy of office space state-wide is 90% and rents have trended flat.

Applied Economic Research estimates that it will take about 500,000 square feet of new regional office space, or 50,000 square feet per year, to accommodate the projected growth. This demand is based on an estimate of 150 square feet per employee, in contrast to the historic estimate of 250 square feet per employee.

The TOD study area is well positioned to accommodate a share of that growth and office development because of its accessibility to downtown, Elliot Hospital, Catholic Medical Center, and the Millyard. A reasonable annual absorption of 10,000–20,000 square feet per year is an appropriate planning target for the TOD study area. Passenger rail service and improved bike and pedestrian access will be moderately helpful and will enhance the appeal of the TOD study area for office uses, but accommodating this development will also require structured parking.

There is expected to be significant growth in retail, accommodation, and food service jobs in the region over the next decade. Retail will add at least 500 jobs and accommodation/food service will add 1,100 jobs. Within the core of the TOD study area, the Gaslight District is an under-improved setting for retail and restaurant use. There are also opportunities on the edges of the TOD study areas, such as along Elm Street and the Second Street corridors, to accommodate growth. There is possibility of significant lodging opportunity to complement the current offerings in and near the District. The availability of rail service is probably not a major incentive for these uses; rather, residential and office development enabled by rail may expand demand. Applied Economic Research estimates demand at 20,000–50,000 square feet over the coming decade.

The most significant development opportunity in the TOD study area is for multi-family residential uses. Applied Economic Research estimates there is an unmet need for 15,000–20,000 new housing units to address the current state-wide housing shortage statewide. Approximately 5,000–7,500 of those units should be provided in multifamily formats. Since 2010 Hillsborough County has added 3,650 new multi-family units. Manchester has absorbed 850 new multi-family units, averaging just under 100 new multifamily units per year—a 25% capture rate. Given the extreme shortage of multifamily units, evidenced in the 1% vacancy rate in the city, the pace of new construction is increasing and is expected to continue to increase in the near future. There are over 500 new units in the approval/construction pipeline in Bedford and approximately 250 units proposed in four projects adjacent to the TOD study area and downtown.

Rail service will have a major positive influence on the TOD residential market, particularly once the plans become more concrete. Nashua, where the station location is already determined, is capturing some development in advance of rail service. The TOD study area also has excellent accessibility to the interstate and has immediate accessibility to major employment clusters—like the Elliot Hospital, Catholic Medical Center, downtown, and the Millyard. Further, the TOD study area has significant amenities for multifamily residential development. Both Millennials and Boomers are looking for multi-use amenity location; the TOD study area has accessibility to downtown venues, SNHU arena, SNHU campus, UNH-Manchester campus, the stadium, and Riverwalk.

The major constraint on TOD opportunity is the availability of significant sites for development. The largest sites in the area, such as the Liberty Utilities or MTA site, have existing infrastructure and

uses that may complicate redevelopment. All things considered, a demand range of 1,000–2,000 units within the TOD study area is reasonable, depending on availability of sites.

### **Development Trends**

The following projects, all of which have characteristics of transit-oriented development, are all adjacent or within the study area:

- 252 Willow Street renovation: 60 residential units, live-work capacity, commercial first floor
- 379–409 Elm Street redevelopment: retail/office space, 90 market-rate residential units
- 1195–125 Elm Street renovation: café/diner on first floor, 33 residential units, public storage facility in basement, includes 24 parking spaces, adjacent to Pearl Street parking lot
- S Elm Street renovation: 23 residential units (one-bedrooms and studios) to serve as workforce housing, bus service as asset
- Dunbar Street project: 160 unit multi-family project, new construction along riverfront

### **Land Use and Development Patterns**

#### *Residential Neighborhoods*

The study area includes a broad mix of uses in a variety of physical forms and character across the study area. There are three distinct residential areas: the Second Street corridor, the riverfront, and the portion of the Bakersville neighborhood near Elm Street and Queen City Avenue. In all three of these areas, parcel sizes are small, at under 20,000 square feet. These areas are shown in yellow on Figure 2.

The Second Street corridor includes smaller commercial parcels near Queen City Avenue and Granite Street, as well as some legacy industrial uses. Most of the corridor is a medium-density traditional residential neighborhood of small-scale multi-family buildings. Some parcels are vacant and covered with surface parking associated with adjacent residential uses. The larger vacant sites, particularly those located on Bass Island, are largely located within the 100-year floodplain and floodway in some instances. A map of these environmental constraints can be found in the Appendix, Environmental Constraints.

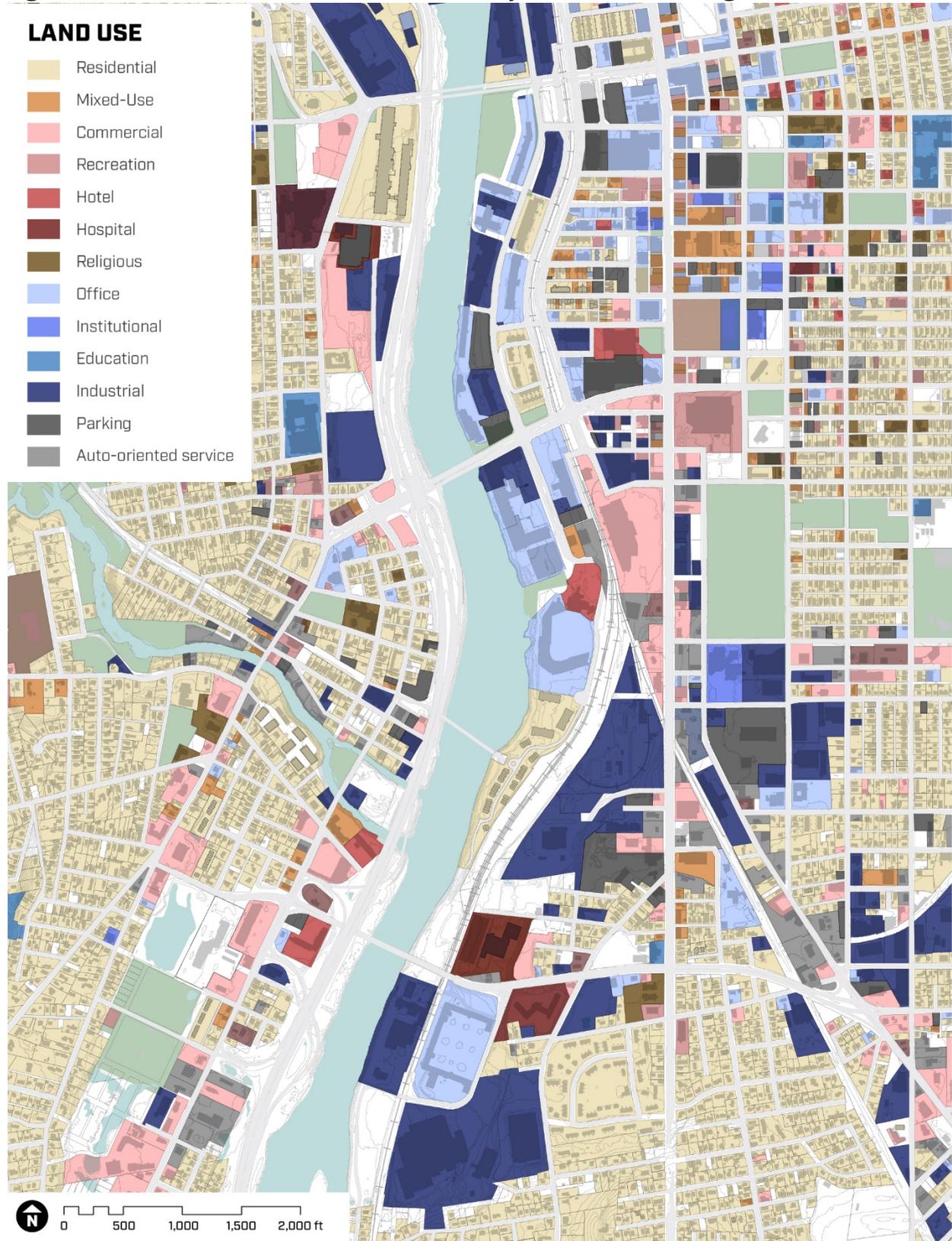
The Bakersville neighborhood area northwest of Queen City Avenue and Elm Street, neighboring the Elliot Hospital, is a mix of single-family and small-scale multi-family properties, interspersed with smaller industrial properties. The Liberty Utilities and MTA sites to the north of the neighborhood constrain this area, although it is similar in character to other neighboring residential areas to the south and east of the study area.

Both the Second Street corridor residential neighborhood and Elm Street/Queen City Avenue area are zoned R3 Urban Multifamily, with nearby B2 General Business areas concentrated at key intersections. The R3 district largely reflects the existing character and use of the areas, allowing up to 3-story buildings with a max FAR of 0.75. Lot sizes must be at least 5,000 square feet for the first three units and 10,000 square feet to allow non-residential development. The B2 General Business district allows for mixed use buildings, with commercial uses in the first floor and dwellings above. It allows for a broad array of business uses. There are requirements for a minimum lot size of 12,500 square feet, minimum 100 feet of frontage, 4 story maximum height, and a maximum FAR of 1 in the B2 district.

The riverfront neighborhood includes recent multi-family and townhome-scale development south of the stadium at the foot of South Commercial Street, arrayed on a small bluff above the Merrimack River. There are limited connections to the trail network and only one point of vehicular access in and out of the development, which is gated. The neighborhood is on property zoned CBD Central Business District and RDV Redevelopment, which allow for multi-family housing as a conditional use.

Apart from these three predominantly residential areas, the land use and corresponding physical form of the study area varies highly on a parcel by parcel basis. Key features are discussed by topic below.

**Figure 2: Land Use Pattern in Manchester TOD Study Area and Surrounding Context**



### *Large Parcels*

Larger parcels over an acre have the capacity to accommodate large-scale transit-oriented development that can help catalyze further economic development (see Figure 3). The study area includes large parcels like the stadium, arena, and SNHU parcels that are already fully-developed and unlikely to change. The Market Basket development along S Elm Street is another large site. Redevelopment that disrupts the grocery use may be unlikely in the short-term, but over the longer term there are important opportunities to intensify use of the site, potentially through redeveloping the parking lot to take advantage of the significant grade change across the site, while retaining the grocery store use. Other large sites include the WMUR parcel on Commercial Street, the Liberty Utilities site along Gas Street, and the Manchester Transit Authority along Gas Street. Over the long term, any of these users might find benefit in relocating out of the study area, but would also require significant investment in replacement property and/or infrastructure. Vacant parcels adjacent to the Elliot Hospital were originally envisioned for medical office development. While this may still move forward in the future, these sites may also be appropriate for residential development that could share in the Elliot's parking garage. Parking associated with the NH State Liquor Store and the Market Basket on S Elm Street might also be options for infill development in the future. Redevelopment of all these sites will be explored further as part of the long-term development scenarios in the next stage of the Manchester TOD Plan.

### *Parking*

Most development in the TOD study area is served by surface parking; over 35% of the land area in the TOD study area is used for parking (see Figure 4). In the Millyard, over 50% of land area is occupied with surface parking. Surface parking can be an inefficient and unattractive land use, making it less pleasant and safe to walk through the study area. More importantly, stakeholder interviews established that current parking availability was a key limitation on expansion of existing uses and redevelopment in the Millyard and the TOD study area. SNHU recently built a parking garage with more than 1,000 spaces to serve their employees in their building on South Commercial Street.



Figure 4: Parking Areas

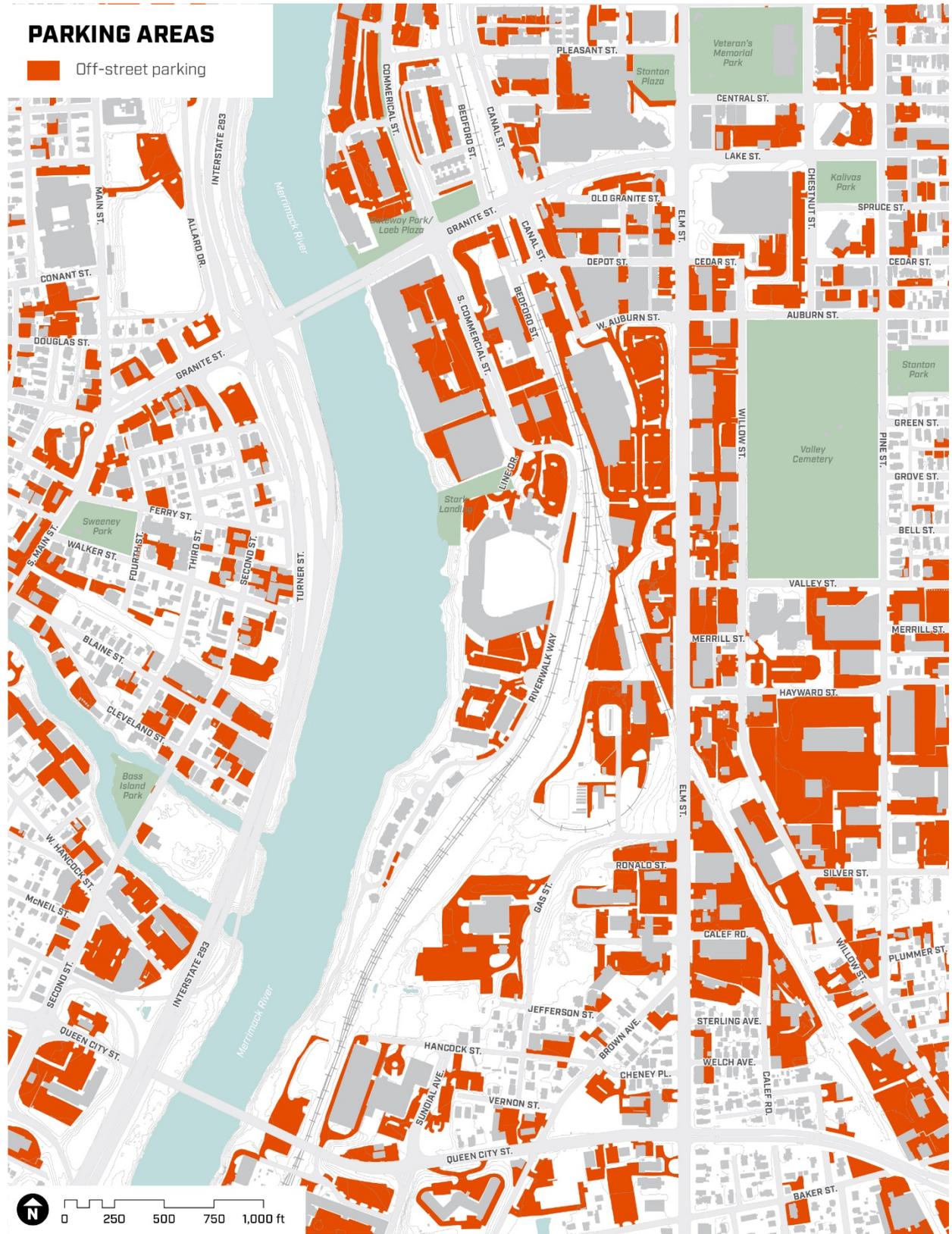
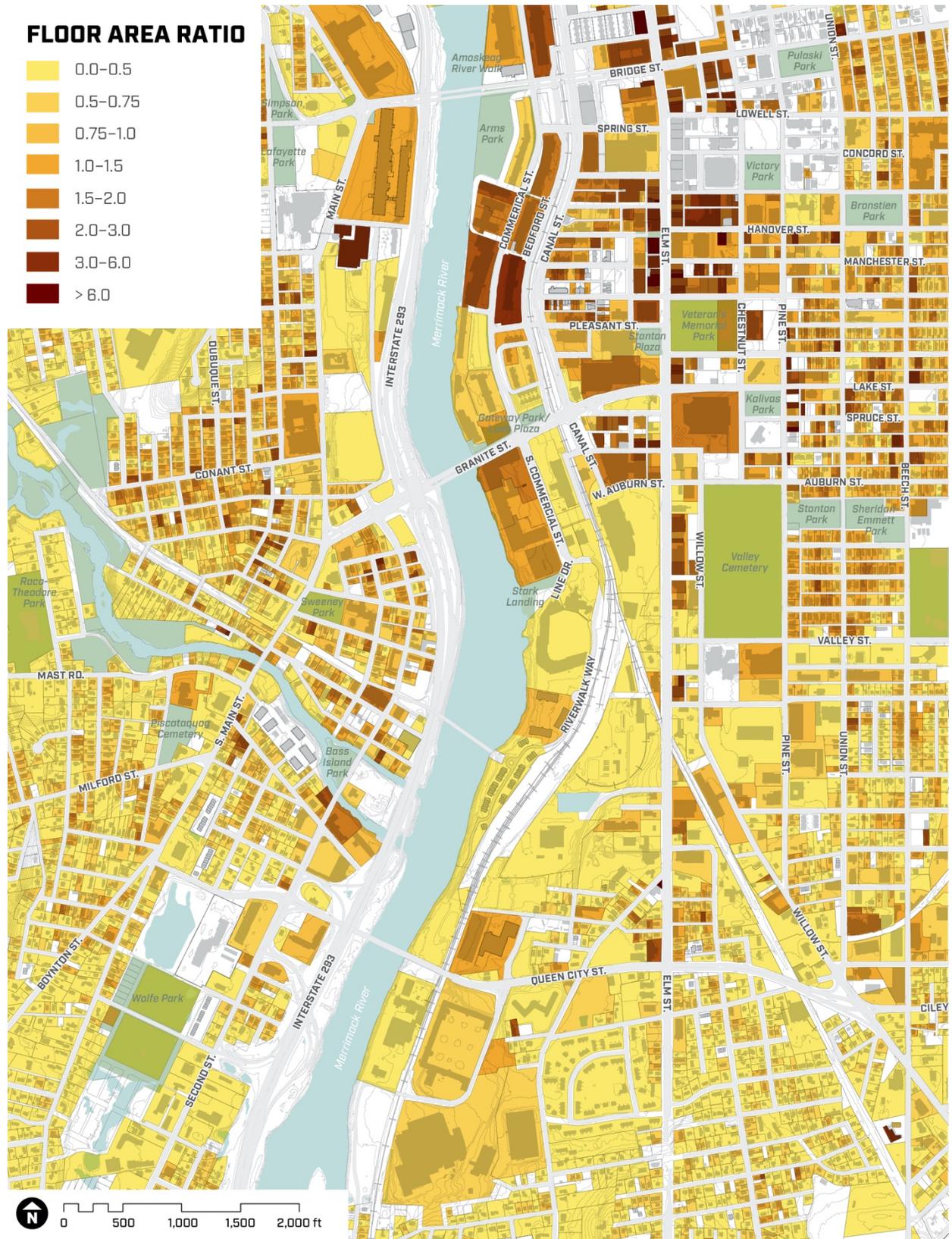
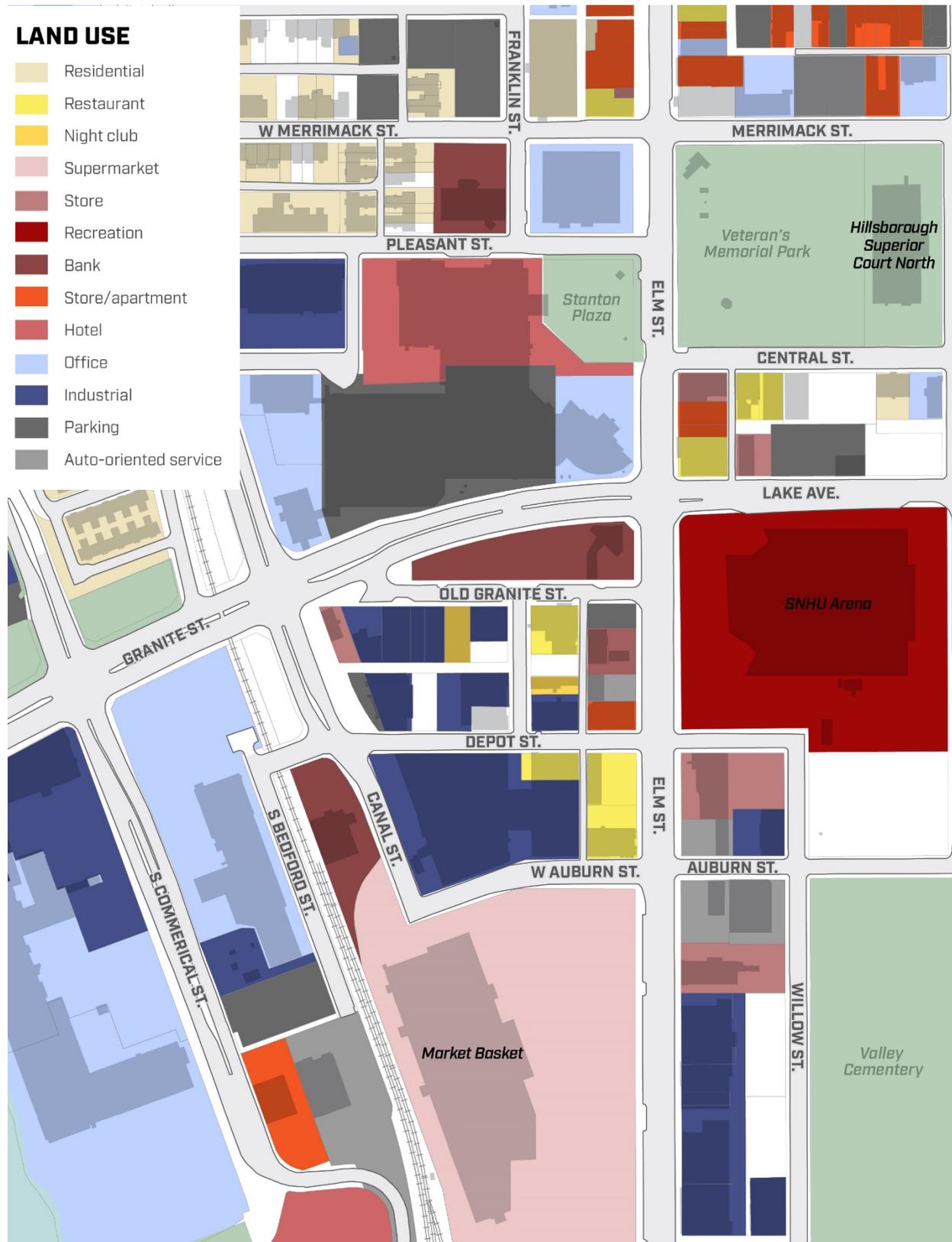


Figure 5: Floor Area Ratio



**Figure 6: Land Use Patterns in the Gaslight District**



### *Gaslight District: Land Use and Parcel Patterns*

The Gaslight District is an area of many smaller but substantially developed parcels immediately adjacent to downtown, Millyard, and SNHU Arena. Because the parcels in the Gaslight District are smaller, potential development here is likely to be smaller in scale. There are potential opportunities to fill vacant spaces, intensify existing uses, and promote infill development. The gradual slope of the district from Elm Street towards Commercial Street creates significant views across the Merrimack valley from building rooftops, creating an opportunity for rooftop use or additions that promote this amenity. The bank parcel at the southeast corner of Elm and Granite Street is a key target for infill development to support the broader district owing to its low density use and potential to enhance the pedestrian connection between the Gaslight District, downtown, and SNHU Arena. As shown in Figure 5, the Gaslight District is one of the higher density areas of the TOD study area, analogous to downtown.

The land use pattern of the Gaslight District, shown in Figure 6, is a heterogenous mix of light industrial uses and newer entertainment and smaller-scale offices. Restaurants and dining are the most frequent use. While some of these properties have since become vacant due to turnover in the businesses, spaces that have already been fitted out with commercial kitchen and other restaurant facilities are easier to re-tenant with future dining and entertainment uses. This land use pattern supports the transition of the Gaslight District into an entertainment hub, a goal cited by stakeholders as a part of interviews and established in previous planning efforts. This can be compatible with continued operation of existing light industrial businesses.

### *Elm Street Corridor*

The Elm Street Corridor is an important near-term opportunity for further mixed-use development and redevelopment. Elm Street is downtown's signature address, and can readily accommodate an extension of downtown's vibrant mix of uses south into the study area. Development here can leverage recent complete streets investments in sidewalks and bike lanes, and existing bus transit service that runs along the corridor to support transit-oriented development. While uses in the corridor are largely appropriate, redevelopment in this area could promote increased density and de-emphasize auto-oriented uses and surface parking. A proposed redevelopment project at 409 Elm Street demonstrates such an approach.

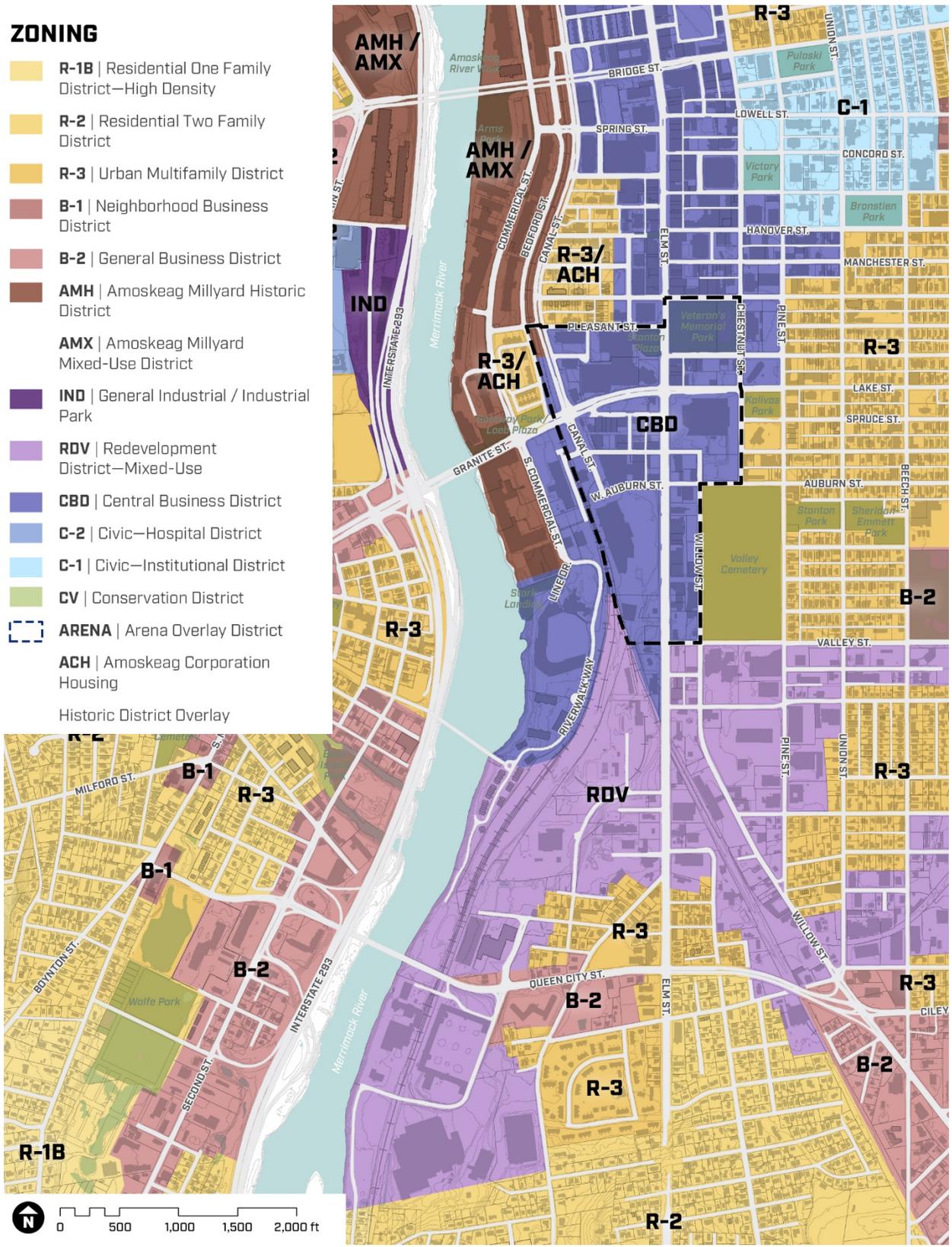
### *Willow Street Corridor*

The Willow Street Corridor, while outside the immediate study area, is an important potential location for redevelopment that can support S Elm Street and the TOD study area. The area currently lacks connectivity and direct access to S Elm Street. Investing in a multi-use trail along the existing rail right-of-way in this area could catalyze "trail-oriented development" with an easy walk, bike, or ride to jobs in the TOD study area, Millyard, and downtown, as well as connections to outlying residential neighborhoods. The adaptive reuse of 252 Willow is a catalytic project for this area.

**Figure 7: Zoning Map**

**ZONING**

- R-1B** | Residential One Family District—High Density
- R-2** | Residential Two Family District
- R-3** | Urban Multifamily District
- B-1** | Neighborhood Business District
- B-2** | General Business District
- AMH** | Amoskeag Millyard Historic District
- AMX** | Amoskeag Millyard Mixed-Use District
- IND** | General Industrial / Industrial Park
- RDV** | Redevelopment District—Mixed-Use
- CBD** | Central Business District
- C-2** | Civic—Hospital District
- C-1** | Civic—Institutional District
- CV** | Conservation District
- ARENA** | Arena Overlay District
- ACH** | Amoskeag Corporation Housing
- Historic District Overlay



## **Zoning and Regulation of Mixed Use Areas**

Most of the study area outside of the residential areas is covered by one of three zoning districts that allow for larger-scale mixed-use development, the CBD Central Business District, the RDV Redevelopment District, or AMX Amoskeag Millyard Mixed Use District. The Arena District Overlay provides additional regulation beyond the underlying CBD Central Business District zoning. The boundaries of these zoning districts are shown in Figure 7.

The Arena Overlay District covers an approximately six block area surrounding the SNHU Arena. The underlying zoning is CBD Central Business District. The overlay's purpose is to encourage uses compatible with this area as a major civic center, a pedestrian-oriented character, and discourage auto-intensive uses. In addition to the underlying regulations, it allows for artisan lofts, small scale fabrication, and bed and breakfast uses. The overlay extends through the Gaslight District and along the Elm Street corridor to Valley Street. Both the AMX Amoskeag Millyard Mixed Use District and Arena Overlay District are based on specific locations and assets, and thus are less suitable to be extended throughout the study area for future transit-oriented development.

The City has established design requirements for projects within the Arena District Overlay, many of which support an active pedestrian environment and would be appropriate through the TOD study area. These requirements include:

1. Building facades along sidewalks shall include doors and windows in order to encourage pedestrian flows. No more than 20 feet of blank walls shall be allowed in these areas.
2. The primary entrance shall be fronting the street sidewalk.
3. Buildings should be a minimum of 20 feet in height.
4. Window system should not exceed 25 feet in width without being interrupted by another building material.
5. Vinyl siding products prohibited.
6. Pedestrian circulation throughout the district shall be improved as development or redevelopment occurs, in accordance with general design principles and objectives of safety, comfort, ease of movement, and convenience of access to properties

The Amoskeag Millyard Mixed Use AMX District allows for a broad range of higher-density manufacturing, office, and mixed uses while promoting the retention and reuse of the Millyard's unique architectural character. The district extends across Granite Street to the historic SNHU Millyard building and new parking garage along South Commercial Street. Multifamily housing development is a conditional use and there are limitations on new construction in the district unless for hotel, parking structure, major destinations like sports facilities or theaters, cultural and institutional uses, or retail and restaurant uses over 5,000 square feet. Larger retail over 8,000 square feet is a conditional use. Parking requirements are determined based on an analysis of expected parking demand. The Planning Board evaluates proposed parking based on compatibility, adjoining uses, parking analysis, and site design.

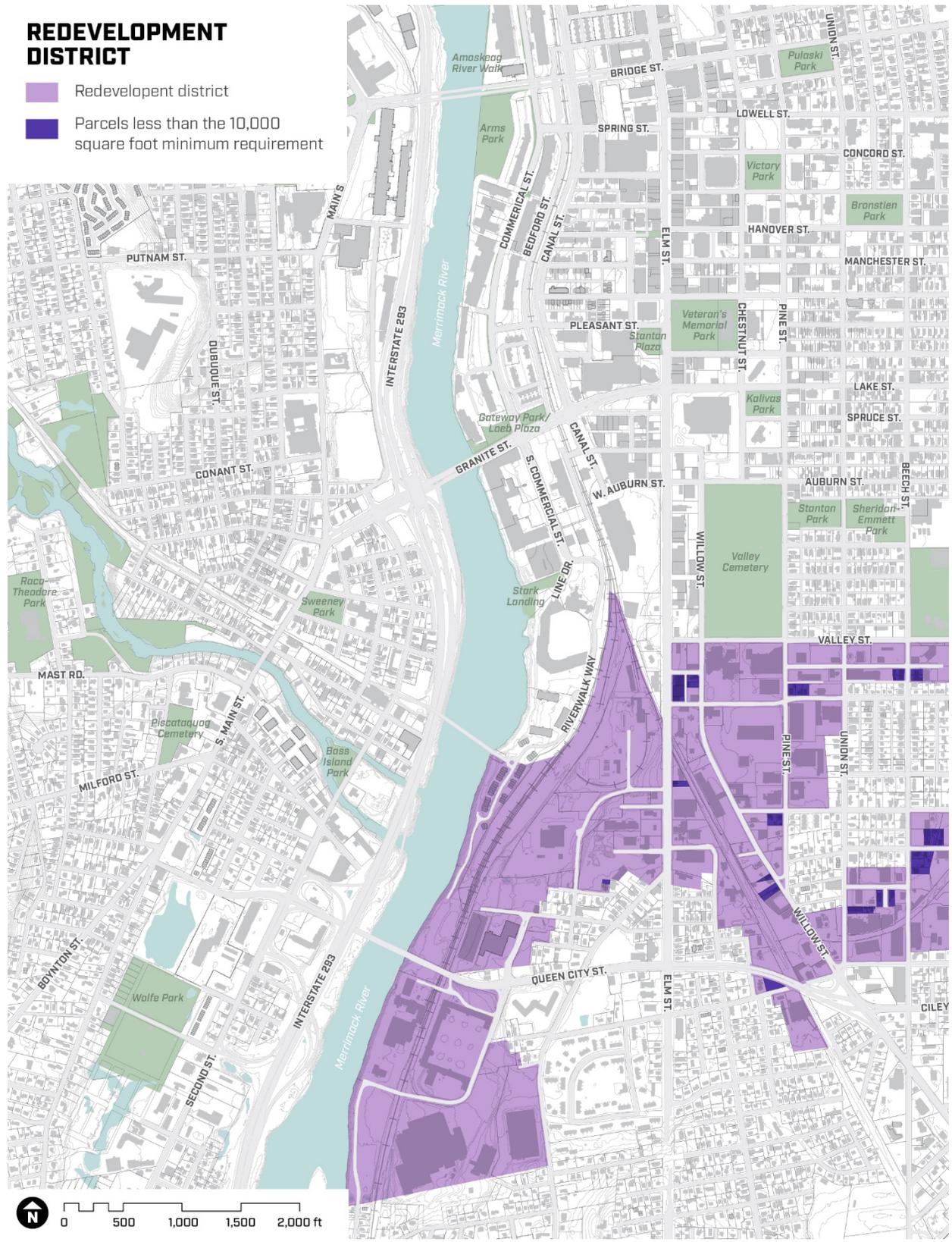
The CBD Central Business District covers a broad area of the Elm Street corridor, including most of downtown that is not already included in either the Amoskeag Mixed Use, Amoskeag MH, or R-3/ACH districts that address the reuse and promote retention of historic properties. The CBD Central Business District has been extended over time to include the northern portion of the study area, including additional properties on the eastern side of Elm Street to Hayward Street, the stadium and some of the multi-family development along the Riverwalk, and the properties between the rail right-of-way and Commercial Street east of the Gaslight District, including the WMUR building. The CBD

Central Business District allows for a wide range of uses, including multi-family residential, commercial, entertainment, and limited manufacturing. It is Manchester's highest density district, with no minimum lot size for most development and a maximum floor area ratio of 5. Multifamily residential development requires a minimum lot size of 3,000 square feet for the first three units, with 500 square feet required for each additional unit afterwards. There is no height limit or parking requirement beyond that determined by the Planning Board to be appropriate to the project.

The RDV Redevelopment District covers the southern portion of the study area and the Willow Street corridor. RDV allows larger scale development of a variety of commercial and residential uses, but does not allow nightclubs. It does allow motor vehicle-oriented uses, including repair shops and sales. Lots must be at least 10,000 square feet and residential development requires a lot size of 5,000 square feet for the first 3 units and 1,500 square feet per unit afterwards. There are a number of smaller existing parcels within the district that would not meet this minimum lot size requirement, including parcels fronting S Elm Street within the TOD study area. They are shown in Figure 3.

Off-street parking requirements stipulate a minimum of 1.5 spaces per unit, as compared to 2 spaces per unit in districts beside the CBD and AMX. The RDV district allows for off-site parking and provides credit for nearby public parking, measures that help support shared and district-based parking that may be important to TOD study area development in the future. Building height is limited to four stories and 50 feet, and density may not exceed FAR 2. There are no setback requirements, although there is a maximum of 85% lot coverage by impervious surfaces in order to avoid problems with runoff.

**Figure 8: RDV Zoning District, Parcels Under 10,000 Sq Ft Minimum Size**



## **Historic Resources**

Manchester was incorporated in 1845 as a planned mill town. The study area is adjacent to the most historic sections of the city, including downtown and the Millyard. Several properties and historic areas near the study area in downtown are listed on the National Register of Historic Places and/or the State Register of Historic Places. The riverfront, the rail line, and onetime canals through the study area helped drive the historic development of Manchester. At its height in the late 19<sup>th</sup> century, the Amoskeag Mills was the largest cotton mill in the world, employing over 17,000 workers.

Near the study area, there are several individual mill buildings on the National Register, and four areas comprising factory-built housing on both sides of Canal Street that are part of the National Register Amoskeag Manufacturing Company Housing District. These historic residential properties adjacent to the Millyard housed workers at the Amoskeag Manufacturing Company.

Two additional resources are listed on the state register. The Valley Cemetery at Pine and Auburn Streets is adjacent to the study area. The property at 344 Second Street (H.E. Netsch and Sons Blacksmithing) was listed on the state register but has since been demolished. The Gaslight District, while containing some historic properties, lacks local, state, or national historic designation.

The Amoskeag Millyard Historic District, including the SNHU Millyard building in the study area, is a local historic designation. The Manchester Heritage Commission reviews and approves all building permit applications involving exterior work within the Amoskeag Corporation Housing Historic District. It also reviews and approves all proposals to demolish buildings and other structures in either the Amoskeag Corporation Housing or the Amoskeag Millyard Historic Districts. It also advises, upon request, local agencies and other local boards in their review of requests on matters affecting cultural and historic resources, including as part of the application of Section 106 under the Federal Historic Preservation Act.

Historic resources are also protected by special zoning regulations. The Amoskeag Millyard Mixed Use District (AMX) is an overlay district to promote the retention and reuse of the Millyard's unique architectural character while allowing for a broad range of higher-density manufacturing, office, residential, and mixed uses. The district and its overlays provide for special reviews of planning and design issues, with goals including pedestrian linkages to the downtown and the Merrimack River; maintaining a balanced diversity of uses; responsiveness to changing market demands; proper design control and planned integration of uses; and the promotion of additional resident and visitor enjoyment of the Millyard and the Merrimack River.

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## Manchester TOD – Existing Environmental Conditions

**To:** Kathleen Onufer - Goody Clancy  
**FROM:** R. Gordon Leedy, Jr. – Tighe & Bond  
**DATE:** January 24, 2020

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### **Existing Environmental Constraints**

The study area is characterized by its historic relationship with the Merrimack River. Since its founding, the city of Manchester has derived its identity from the river, and development led to the establishment of what was the largest single industrial complex in the United States by the end of the 19<sup>th</sup> Century. As the area has been used for industry for over 150 years, there are significant known contaminated areas, as well as the typical environmental concerns related to proximity to the river.

### **Floodplain**

The area near the Merrimack River is subject to flooding to varying degrees. Generally, the banks of the river are quite well defined, with the 100-year floodplain (FEMA Zone AE) confined to the floodway immediately adjacent to the river channel. There is a larger 500-year flood plain that is not subject to regulatory constraints.

The latest FIRM map became effective in 2009. There have been recent studies that have modified the flood elevations in portions of the study area through the Letter of Map Revision (LOMR) process, the most recent being in 2019, and there is an on-going effort by FEMA to update flood studies based on generally accepted increases in storm intensity and frequency. Additionally, there are significant US Army Corps of Engineers flood control facilities upstream in the watershed that have the effect of mitigating very large flood events.

Within the study area there are few constraints on development posed by flood elevations with the exception of development in areas that are defined as floodway. These areas are directly associated with the river channel and are unlikely to be impacted by development.

### **Shoreland Protection**

In 2011 the State of New Hampshire enacted NH RSA 483-B, the Shoreland Water Quality Protection Act (SWQPA). This statute creates a regulated area within 250 feet from the reference line of major waterways, including the Merrimack River. Any projects within this area have enhanced regulation with regard to on-site sewage disposal, clearing, lot coverage and water quality measures required for development. A permit is required, which is currently considered concurrently with other NH Department of Environmental Services (NHDES) permitting required by the project.

There is a provision in the law allowing communities to apply for exemption from Shoreland Protection requirements if an area was previously “urbanized.” This provision in the law is a recognition that many communities in New Hampshire were developed in close association with rivers, and that existing mills, dams and other facilities would be unduly impacted if the requirements of the SWQPA were implemented in these developed areas. Manchester has applied for and was granted several exemptions to the SWQPA. These areas are shown in Figure 1.

**Wetlands**

Wetlands areas as defined by the federal government are regulated by state and local authorities under Section 404 of the Clean Water Act. This general methodology for determining wetlands subject to regulation has largely been in place since the 1980's and is well understood. The regulation of wetlands is administered by NHDES under the Programmatic General Permit, and there are local zoning provisions that include a measure of local control as well.

There do not appear to be any major wetland areas in the study area that will be of concern, except the areas immediately adjacent to the river channel. Since these areas are also otherwise constrained, wetlands will not likely be a significant constraint to projects in the study area.

**MS-4/Impaired Waters**

Manchester is subject to the requirements of the US EPA Municipal Separate Storm Sewer System (MS-4) program that regulates stormwater discharges from municipal sources. This USEPA program requires states to identify water quality impairments and create a program to mitigate impairments and improve water quality in waters of the United States. Manchester is subject to the requirements of the MS-4 program, which require that new activities do not increase discharge of factors for which the receiving waters are impaired or create any new impairments. In practice, this means that the City must adopt and enforce compliant stormwater regulations, and all development must pursue water quality measures that address impairments "to the maximum extent practicable."

Urban development, including development within the study area will need to make every reasonable effort to adopt Low Impact Development (LID) water quality measures as a part of new development proposals in order to meet antidegradation standards of the Clean Water Act.

**Brownfields/Environmental Contamination**

As a long-standing center of commerce and industry, Manchester has had its share of environmental contamination. Brownfields mitigation efforts are controlled by the USEPA, and there are several federal grant programs that fund mitigation and clean-up. Known contaminated sites within the study area are shown in Figure 2.

In addition to known contaminated sites are areas where contamination can be expected, but no data exists. It should be expected that some contamination would be expected adjacent to the rail tracks that run through the facility. It would be common to encounter herbicide residue (arsenic), coal ash and waste adjacent to the rail lines and in areas where rail lines once existed.

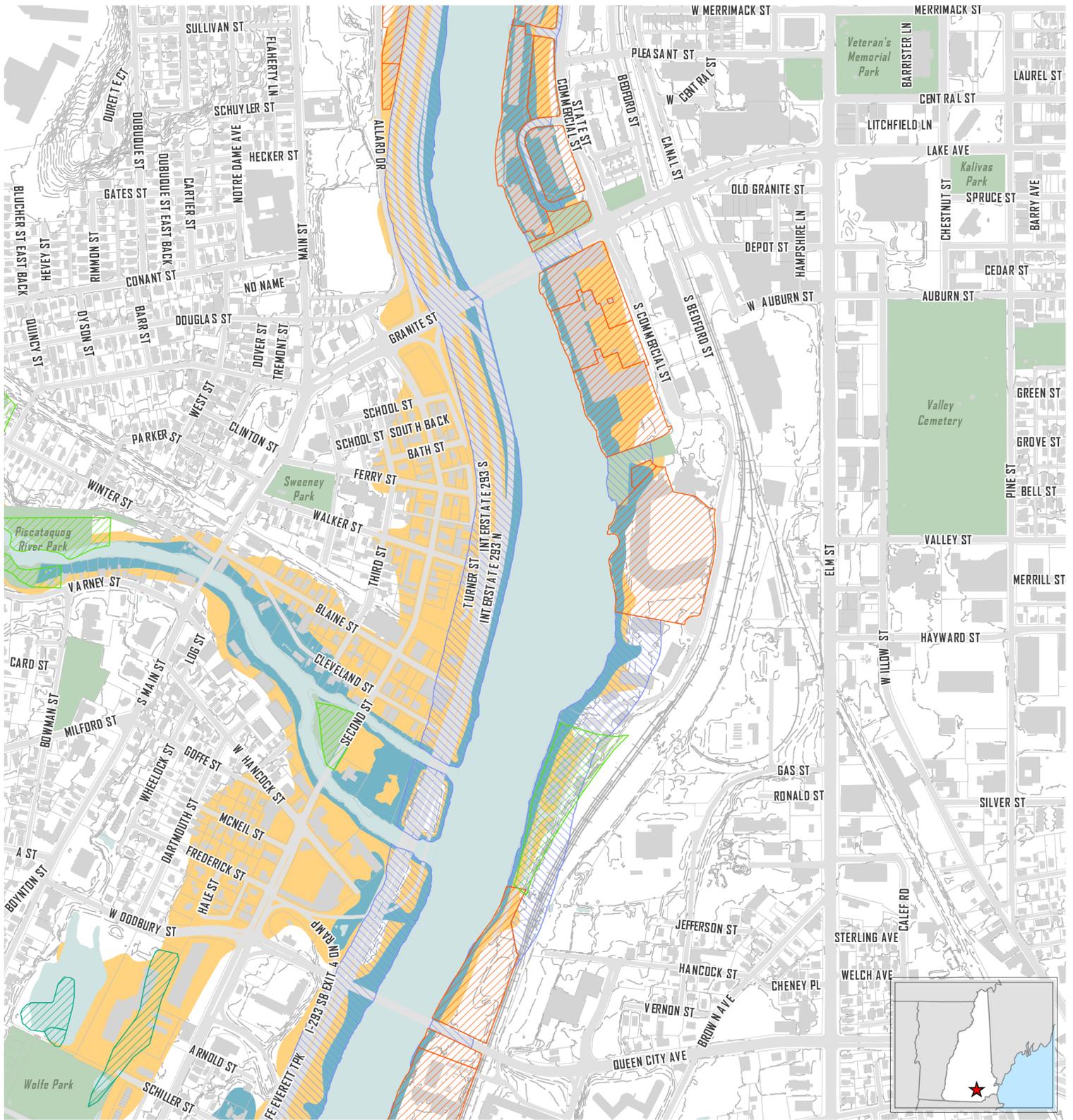
**Water/Wastewater Utilities**

The City of Manchester has been operating for decades under a Consent Decree related to the Combined Sewer Overflow (CSO) issue. The City's storm water and sanitary systems are combined, and when there is a large rain event, the treatment system is overwhelmed, and the system discharges to the Merrimack River. Over the last twenty years, a Phase I mitigation program has been implemented, with the CSOs associated with the Piscataquog River being disconnected from the River. There are remaining portions of the east side of the river that continue to discharge into the river during storm events.

Recently the City entered into a Phase II Consent Decree with USEPA and the federal government that requires the expenditure of approximately \$230 million over the next ten years to undertake a sewer separation project that will mitigate the remaining CSOs. As that project proceeds, additional capacity will be available at the treatment plant.

Manchester Water Works is currently building a second withdrawal and treatment facility up river from downtown in Hooksett. This facility will ensure that ample water will be available in the region for the foreseeable future.

As a result of the planning and foresight of these two agencies, water and sewer capacity are not anticipated to be a constraint on development in the city.



**LEGEND**

- ▬ Roads
- ▬ Buildings
- ▬ Parcel Boundaries
- ▬ Rivers
- ▬ Cemeteries
- ▬ Parks
- ▬ Railroads
- ▬ Protected Shoreland
- ▬ Shoreland Act Urban Exemptions
- ▬ NWI Wetlands
- ▬ Conservation/Public Lands
- ▬ USFWS Critical Habitats
- ▬ 100 Year Flood Zone
- ▬ 500 Year Flood Zone

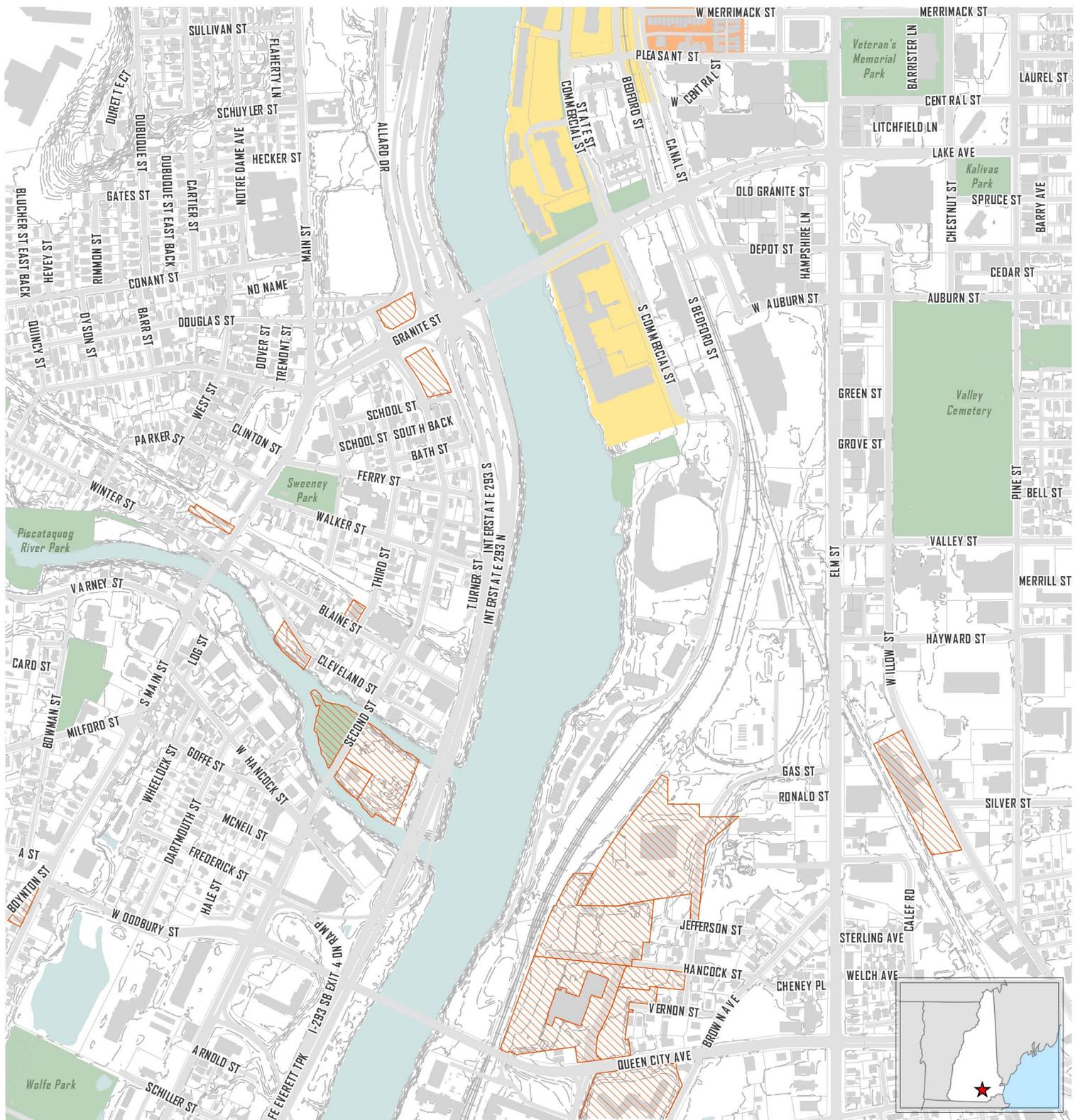
**FIGURE 1**  
**ENVIRONMENTAL CONSTRAINTS**

Manchester TOD Project  
 Manchester, New Hampshire

**Tighe & Bond**  
 Engineers | Environmental Specialists

January 2020





**LEGEND**

- Roads
- Buildings
- Parcel Boundaries
- Rivers
- Cemeteries
- Parks
- Railroads
- Amoskeag Corportation Housing Historic District Overlay
- Amoskeag Millyard Historic District
- EPA Brownfield Parcels\*

**Note:** Points from the USEPA Geospatial Data of Assessment, Cleanup and Redevelopment Exchange System Brownfields Project were used in conjunction with Manchester, NH Parcels provided by Goody Clancy to identify the parcels associated with brownfield sites.

**FIGURE 2**  
**HISTORIC CONSTRAINTS**  
 Manchester TOD Project  
 Manchester, New Hampshire

**Tighe & Bond**  
 Engineers | Environmental Specialists

January 2020





## MEMORANDUM

To: Goody Clancy

From: Nelson\Nygaard

Date: January 13, 2020

Subject: Manchester TOD – Existing Transportation Conditions, Key Issues, and Major Opportunities

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### EXISTING PLANNING IN THE AREA

Transportation planning in Manchester is shared across multiple departments including the Economic Development Office, Department of Public Works' Facilities Division and Highway Division, Parking Division, Planning and Community Development, and Manchester Transit Authority. Recent planning efforts include:

#### **Manchester Master Plan. 2009p**

##### **Key recommendations from the 2009 Master Plan included:**

- 1) Commuter Rail Service would provide improved commuting access for residents (Boston-bound), but also bring Manchester into the larger Boston Metro region to attract business and employment growth to Manchester (and airport area).
  - a. Multimodal facility should be walkable to arena, stadium and convention center
  - b. With access to intra-city bus service, intercity service, parking and access to train system.
- 2) Downtown Shuttle planned, rebranded as the Green DASH in 2011.
- 3) Coordinate bus systems – improved coordination between all providers will create more effective connections and expand the reach of transit service.
- 4) Ensure that policies promote a “Segway safe” network – this support of alternative modes would apply to emerging mobility like scooters and other e-bikes.
- 5) Enhancing bicycling was a priority strategy and was encouraged in streetscape design.
- 6) On-street parking encouraged in neighborhood business areas.
- 7) Install intelligent traffic management systems to reduce traffic congestion on key corridors, including Granite Street, Queen City Avenue, Elm Street, Valley Street, and Willow Street. The Granite Street installation is underway.
- 8) Encouraging walking as a commute mode was made a priority
  - a. Sidewalk Improvement Policy – sidewalks must be provided on both sides within the Urban Neighborhoods

- b. Pedestrian Street Crossings – improving safety through bump-outs, street diets, etc.
- 9) Encourage neighborhood mixed-use development to reduce reliance on the automobile and promote walkability.

## Manchester Bicycle Plan. 2016

The Manchester Bicycle Plan, published in 2016 and developed by the Department of Public Works, is more of a policy document about increasing bicycle connectivity than a strategic roadmap for prioritizing the implementation of bicycle facilities within the City. While the plan proposes significant investment in sharrows and bike lanes, the report does not indicate a reasoning behind their locations, nor does it include a map of proposed facilities. There is little written about demand, person counts in existing bike facilities, popular cycling routes, or a determination of unsafe areas for cyclists. In summary, there is no apparent strategy to develop an interconnected bicycle network, a key element needed to encourage mode shift towards active and alternative transportation options over the car.

For this project, the plan is not particularly relevant beyond its general endorsement of increased bicycle connectivity.

## Manchester Connects. 2017

The Manchester Connects planning strategy developed a targeted set of goals and strategies to enhance connectivity in and around Manchester's downtown and Millyard areas, just north of Granite Street. The Manchester Connects and the TOD study areas overlap along Granite Street and have interrelated stakeholders, street networks, and transportation issues. The success of each planning effort depends on the other. Many of the recommendations from Manchester Connects are relevant to this study, including:

### ***Goal 1: Create vibrant public spaces***

- Innovative and cutting-edge lighting, technology and materials.

Applicability to TOD: Lighting enhances perception of safety. Installations can attract, guide and move users (wayfinding)

### ***Goal 2: Promote Complete Streets Design and Multimodal Transportation Choices***

- Increase walkability

Applicability to TOD: Walkability is central to TOD design and success.

Applicability to TOD: Wayfinding will be critical to changing behaviors.

- Reimagining the riverfront

Applicability to TOD: Completing missing link promotes TrOD first (Trail-Oriented Development)

Applicability to TOD: Iconic Pedestrian Bridge – rethink how could apply to existing ped bridge.

- Improve bicycle access

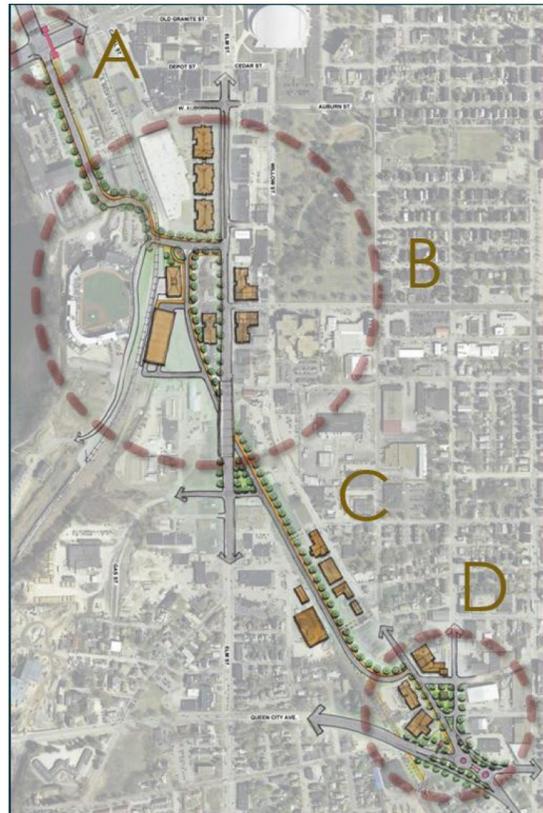
Applicability to TOD: Promotes multimodal connectivity, and support TrOD first.

## BUILD Grant Proposal. 2019

The City of Manchester requested \$19.9 million in funding from the USDOT to build roadway, bridge, bicycle, and pedestrian infrastructure improvements to enhance connectivity across the rail right-of-way south of Granite Street and mitigate congestion. The project proposed includes the following elements, each corresponding to those represented in the image to the right.

- A. Pedestrian connections across Granite Street linking the Millyard and Downtown with the project area, including a potential overhead pedestrian bridge or an extension of the Riverwalk under Granite Street
- B. South Commercial Street extended from the South Millyard to Elm Street corridor
- C. Multimodal transportation corridor on the retired railbed (including the underpass beneath Elm Street)
- D. Queen City Avenue/Cilley Road/South Willow Street intersection improvements.

*(Image Source: Reconnecting Manchester for 21<sup>st</sup> Century Innovation Project, BUILD Grant)*



## Updated Master Plan. 2019

An update to the 2009 is underway, having launched in July 2019 and hosting a week-long public workshop on September 12-19, 2019. The project is currently in the Visioning Phase to determine key goals for Manchester's future and guide growth scenarios. Public feedback envisioned a transportation network that:

- A. Is walkable
- B. Has excellent public transit with a transportation hub
- C. Has a pedestrian and bicycle access across the river and into neighborhoods
- D. Improves pedestrian connectivity to downtown
- E. Supports a diverse and inclusive community
- F. Improves the gateways into the city
- G. Develops the Riverwalk

## PEDESTRIAN NETWORK

There are two fundamental transportation modes and supporting infrastructure required within a successful downtown transit-oriented development – transit service and pedestrian connectivity. While other mode infrastructure including bicycle facilities and vehicular connections are also important, if people are not able to safely walk to and from transit and their destinations, the concept will not attract investment.

The Study Area is not yet served by rail transit but is served by the Green DASH downtown circulator bus and local bus routes and is within a block of the Manchester Transit Authority's downtown hub at Veterans Park and the regional bus depot at the Manchester Transportation Center. Convenient, safe pedestrian connections to and from these transit amenities, as well as to a future intermodal facility within the study area for rail, bus and emerging mobility options will be of paramount importance to supporting existing and new development.

As such, the Project Team conducted an assessment of pedestrian conditions within the study area. The key finding overall is that pedestrian connections and conditions are poor.

### Sidewalk Network and Conditions

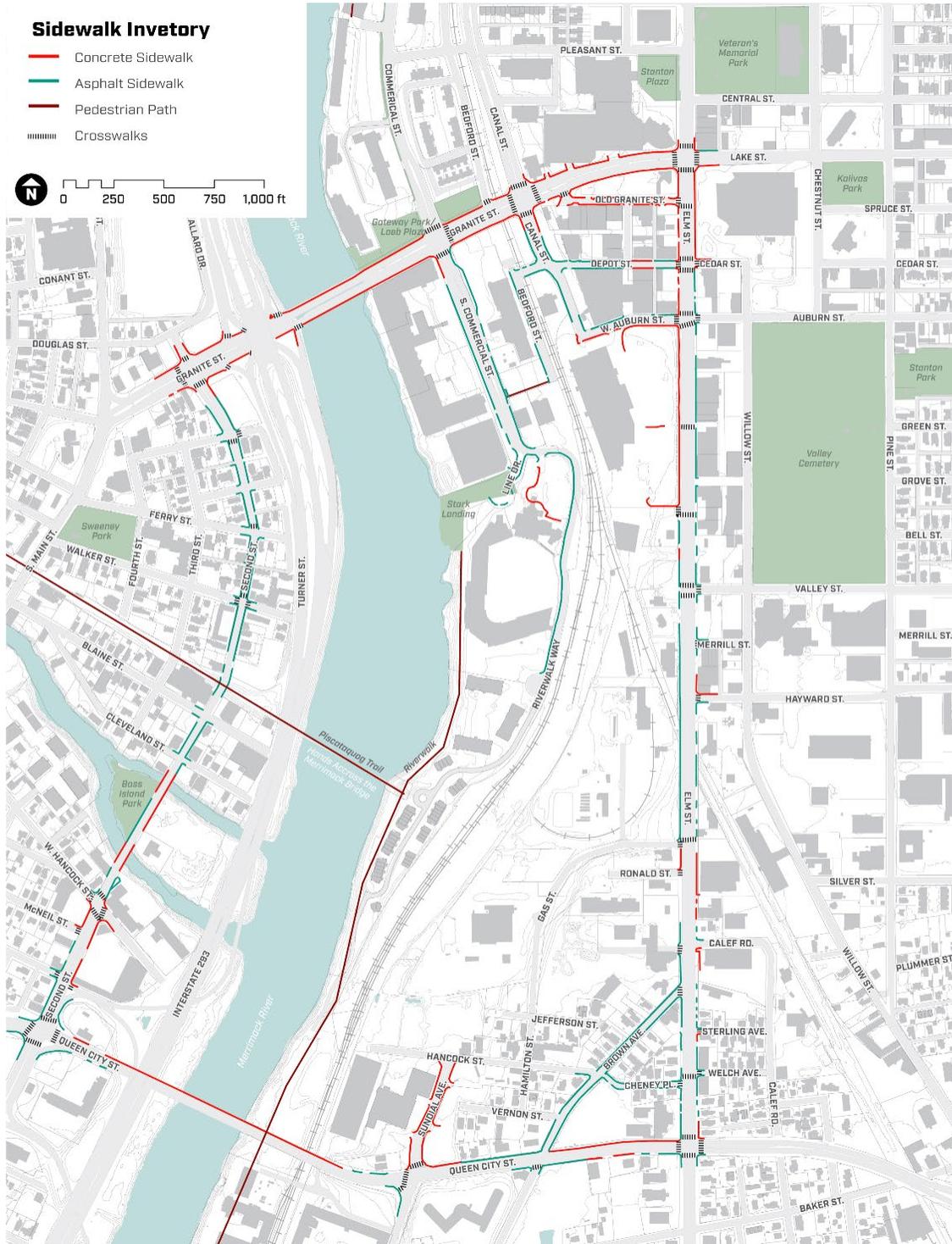
The first task was to inventory existing sidewalks within the study area. This was accomplished using aerial photography, street imaging, and site visits. As shown in Figure 1, the pedestrian network is significantly fragmented. Generally, the northern section of the study area closest to the Millyard and Downtown has better pedestrian infrastructure (e.g. sidewalks, ADA ramps and warning strips, and crosswalks), whereas the central and southern sections have few to none. Sidewalk characteristics and conditions vary widely. Generally, sidewalks around the periphery (e.g. Granite Street, Elm Street) are in better condition, are constructed of concrete and offer greater ADA accessibility and compliance. Internal sidewalks tend to be constructed of asphalt, are in poor condition, and offer limited at best ADA accessibility and compliance.

#### Gaslight District

From a connectivity perspective, the Gaslight District offers the most comprehensive sidewalk network in the study area. All streets in the subdistrict are lined with at least a 5-foot sidewalk, the minimum width to be in compliance with ADA. Additionally, since the area is organized into a block structure, with connecting alleyways between them, the opportunity exists to provide an enhanced pedestrian network with multiple options of travel. However, sidewalk conditions vary greatly even within this subarea. Those along Elm and Granite are relatively new and in good condition, offering wide, concrete, ADA accessible facilities. Internal sidewalks along Depot Street, Canal and W. Auburn Street (north side) are in poor condition, primarily constructed of asphalt that is cracked or spalling. Further, multiple curb cuts interfere with pedestrian movement, none of which offer ADA compliant ramps or tactile warning strips. It is not a comfortable environment.

Manchester Transit-Ready TOD Existing Transportation Conditions  
SNHPC

Figure 1 Sidewalk Network (Inventory)



**Manchester Transit-Ready TOD Existing Transportation Conditions**  
SNHPC

**Figure 2 (Top Image)** Although all roads within the Gaslight District are lined with sidewalks, they are generally in poor condition and visually unappealing.

**Figure 3 (Bottom Image)** A new asphalt sidewalk with granite curbing was recently reconstructed on between Granite Avenue and the new parking structure.



The pedestrian network disintegrates between the Gaslight District and remainder of the study area.

### **Commercial Street/Ballpark**

Areas adjacent to SNHU and the ballpark provide some level of pedestrian connectivity and comfort along the western side of Commercial Street. Asphalt sidewalks along this stretch were recently reconstructed between Granite Street and the ballfield as part of the parking structure project. Although in good condition, this is essentially the only way in or out for pedestrians from the Millyard and Downtown and feels very disconnected from the remainder of the study area, even the Gaslight District which is only a block away.

The only other pedestrian connection into the area is a poorly marked, and poorly maintained pedestrian path between the east side of Commercial and S. Bedford Street to the east, which itself offers poor sidewalks and connections to downtown. However, the area remains disconnected from Elm Street to the east by the rail right-of-way. The lack of connections across the tracks has resulted in a pedestrian cut through across the train tracks to Canal/West Auburn Street – a desire path – to better connect the area; to the nearby Market Basket is likely a major destination for those using the desire path. Pedestrians were observed using this cut through on multiple site visits.

### **Southern Areas**

Sidewalks in the southernmost portion of the study area (just north of Queen City Avenue) are limited at best. While sidewalks are present along Elm Street and Queen City Avenue, and along Brown Street – a heavily travelled car cut-through between the two – sidewalks are generally in poor to fair condition and lack ADA-compliant ramps and tactile warning strips. New sidewalks have been constructed – all appearing to be ADA compliant – around the Elliot River's Edge complex. Although new, they primarily serve parking facilities around the facility, and not the surrounding neighborhood roads, which for the most part lack sidewalks, including a recently reconstructed stretch of Hancock Street leading to the Elliot.

Any future development or reinvestment within these areas will require considerable pedestrian upgrades.

### **Second Street Corridor (West Side of the River)**

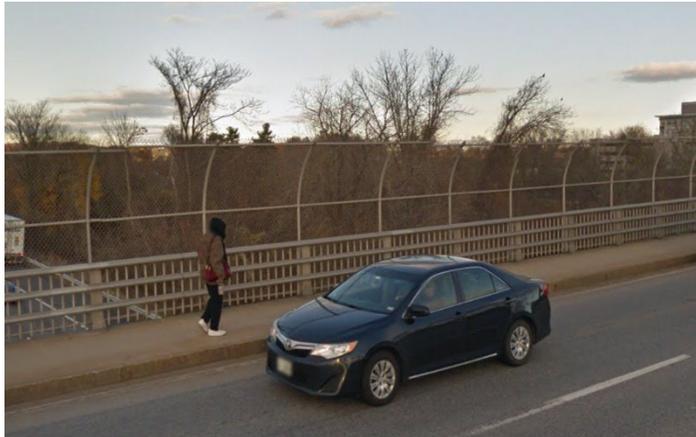
The primary corridor to the west of the Merrimack River is Second Street. Second Street provides sidewalks on both sides of the street with a combination of concrete and asphalt surfaces. Sidewalks closest to Granite Street and over the bridges are generally in the best condition, however facilities along the remainder of the corridor are in poor condition with significant cracking, degrading curbs, and few ADA ramps or warning strips.

Pedestrian access to and from study area districts east of the river, including the Millyard and Elliot Hospital at River's Edge, is provided over the Granite Street and Queen City Avenue bridges and the Hands Across the Merrimack Footbridge. Sidewalks along Granite Street are wide, and in good condition, but require multiple roadway crossings including across unsignalized on-ramps to the highway where cars travel at high speeds. This offers the most direct connection between

the east and west sides of the study area; however, given the above, can act as an impediment. Pedestrian connections across the Queen City Avenue Bridge are poor. Sidewalks are only on one side of the street, narrow for a high speed, heavy traffic corridor (roughly 5' wide), and the crossing is long.

The Hands Across the Merrimack Footbridge provides a car-free alternative. At-grade access to the footbridge from Second Street is available from Third Street, whereas pedestrians must scale a staircase from Turner Street from Second

Street. The footbridge connects on the east side to the Riverwalk behind the condominiums at the end of South Commercial Street. Although the bridge provides a connection, reaching the street network is difficult, requiring a considerable walk north or south along the Riverwalk to the nearest point. For additional details on this pedestrian barrier, see the next section.



**Sidewalks along Queen City Avenue Bridge are only on one side, narrow and can feel uncomfortable. (Source: Good StreetView)**

## Pedestrian Barriers

Strong pedestrian connectivity, both within the study area and to and from surrounding downtown areas, is critical not just to ensure the area functions successfully as a TOD area, but also as its own neighborhood, or subdistrict of larger neighborhood. Exacerbating pedestrian challenges – beyond the generally poor existing sidewalk infrastructure – are major physical barriers that impeded connectivity to, from and within the study area.

### Internal Barriers

The major internal pedestrian barrier is the railroad right of way, which essentially divides the study area in two – east of the tracks and west of the tracks. The division is further enforced by lack of connections across it. While Granite Street to the north and Queen City Avenue to the south cross the tracks, there is only one internal grade crossing along the roughly 1-mile corridor, Depot Street, which is only 300 feet south of Granite Street. There is not another crossing in the study area.

To highlight this disconnect, if a resident in the Merrimack River Park development needed to walk to the Market Basket supermarket, which is 1/4-mile away as the crow flies, they would need to walk more than double that, or over a half-mile due to the lack of crossings.

Another barrier for pedestrians moving north and south is the missing segment of the Riverwalk. The multiuse path connects the area via the pedestrian bridge to the other side of the Merrimack River, areas south of Queen City Avenue, and offers the potential for a completely separated pedestrian facility connecting the study area north to the Millyard without crossing any roadways, especially Granite Street.

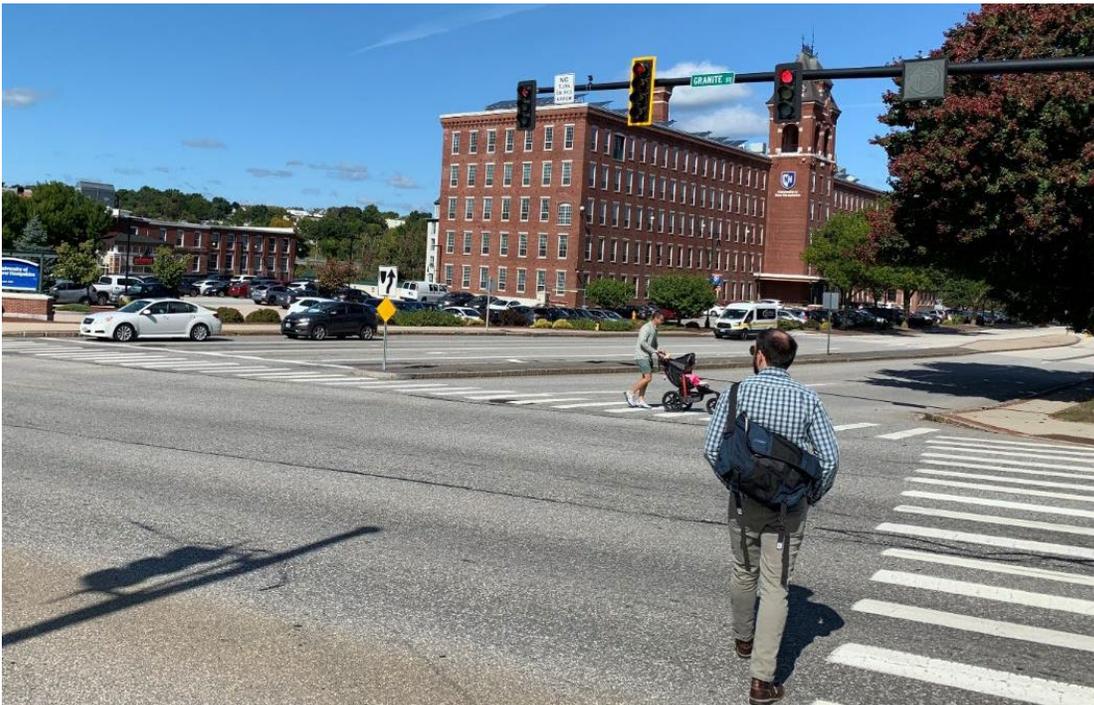
The path currently runs through the study area from Queen City Avenue north to the ballpark. At this point, the pathway ends, and does not pick up again for roughly 1/4-mile on the other side of

Granite Street. Completing the pathway – either along the riverfront, or through an alternate route (e.g. Commercial Street) would enhance connectivity. However, it is not just the missing segment that is problematic. There are few connections to and from the path within the study area. For example, residential developments along the pathway do not allow for public access and are gated prohibiting pedestrians and other users from entering or exiting the pathway. Essentially, once a pedestrian is on the path, there is no way off it for almost a mile. This not only inhibits connectivity but can feel unsafe. The city should require that all future developments provide public access through their properties to the pathway.

### External Barriers

Another major pedestrian barrier to the study area is Granite Street along the northern study boundary. Pedestrians traveling to and from the Millyard, Downtown, and intercity bus station must cross the 100-foot wide, high-volume and speed, 7-lane roadway at Commercial Street. This can be daunting for many, particularly those with any physical impairment.

**Figure 4 100+feet wide Granite Street is a major pedestrian barrier to the study area from the Millyard.**



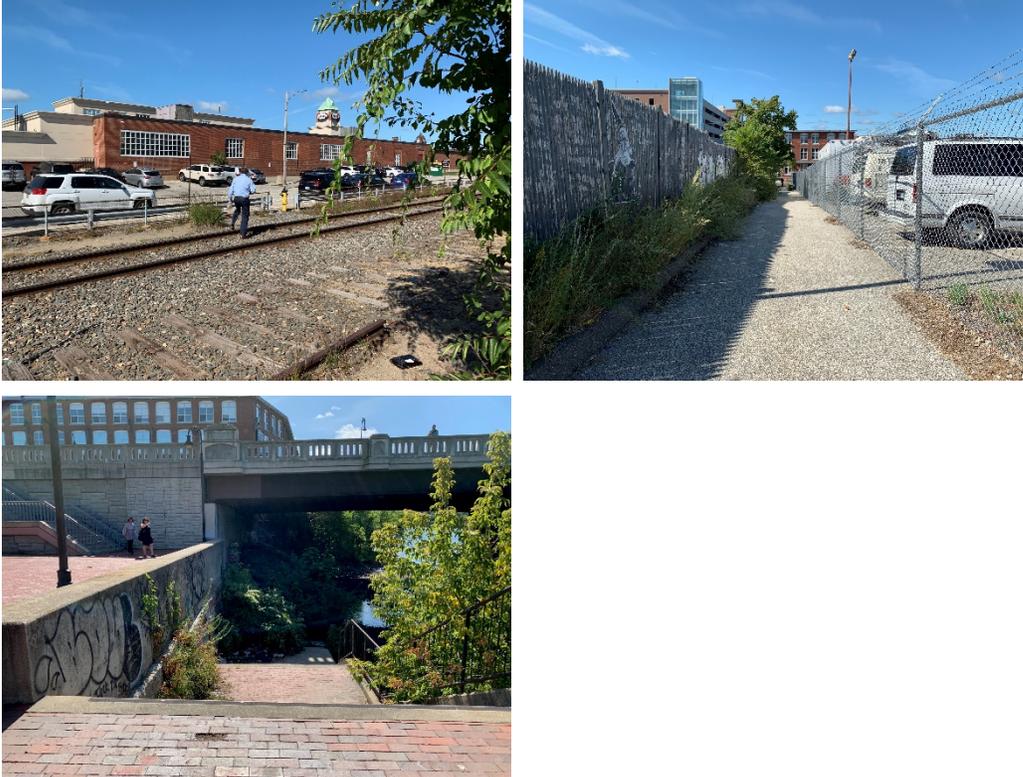
The crossing is not only wide, but the shortest path crosswalk between key destinations on the west side of Commercial Street has been removed, requiring not just crossing Granite, but also Commercial Street, twice. This often involves multiple signal cycles to complete, adding considerable time to the pedestrian trip. Simply put, it is not pedestrian friendly. The crossing is uninviting and requires walking across eight lanes of dense traffic. Further diminishing the pedestrian experience is the lack of a pedestrian refuge in the middle of Granite Street - the planted median ends before the crosswalk (See Figure 4).

Further to the east, Granite Street separates the study area from the regional bus station. While this crossing remains a daunting task for some, the intersection is slightly narrower, and

## Manchester Transit-Ready TOD Existing Transportation Conditions SNHPC

crosswalks are provided in all direction. However, similar to the intersection with Commercial Street, a pedestrian refuge would enhance the experience.

Strategies to reduce the crossing distance or perception of distance across Granite Street should be a priority. While the best option would be a road diet to narrow the roadway, high volumes at peak periods will make this challenging. However, reducing lane widths to slow speed, enhancing signal timing using smart signal technology (underway), and other techniques could improve vehicle throughput, and require fewer lanes. These road network design and operations adjustments should be pursued further in more detail. Pedestrian Connectivity Opportunities



Based on the above, several pedestrian enhancements or new connections could enhance pedestrian connectivity through, to and from the study area. Among the most important are (See Figure 9):

- Traffic calming-road diet along Granite Street to/from the Millyard.
- Opportunity to construct a pedestrian/multiuse connection under the Granite Street Bridge along the riverfront. Even if the Riverwalk path is not completed, this could provide a safe, car-free crossing of Granite Street from the study area to the Millyard.
- Improving existing or relocating at-grade crossings between the east and west side of the tracks and adding above or below grade crossings. This could include east of SNHU to Market Basket (where people currently cross the tracks on foot), a connection south of Market Basket to Commercial Street south of the ballpark as envisioned in Manchester's 2019 Build Grant.

- Develop former Manchester-Lawrence rail right-of-way under Elm Street into a multiuse path/trail to connect the area to areas north of Elm Street (for active transportation users), as envisioned in the 2019 BUILD Grant proposal.
- Enhanced connections to the Riverwalk and Hands Across the Merrimack Footbridge
- Improved connections and sidewalks between the Gaslight District, SNHU, and ballpark.

## BICYCLE NETWORK

### Existing Infrastructure

The bike network, while limited, in the City of Manchester consists of two elements: on-street bike lanes and off-street multi-use paths (See Figure 5). The City also hosts eight downtown Zagster bikeshare stations with \$10 monthly memberships and \$20 annual memberships.

#### On-Street Facilities

The bike lane network in Manchester is sparse. While many of the roads in the downtown are utilized by cyclists, only two corridors in or near the study area have dedicated bike lanes, Elm Street and Chestnut Street

##### Elm Street

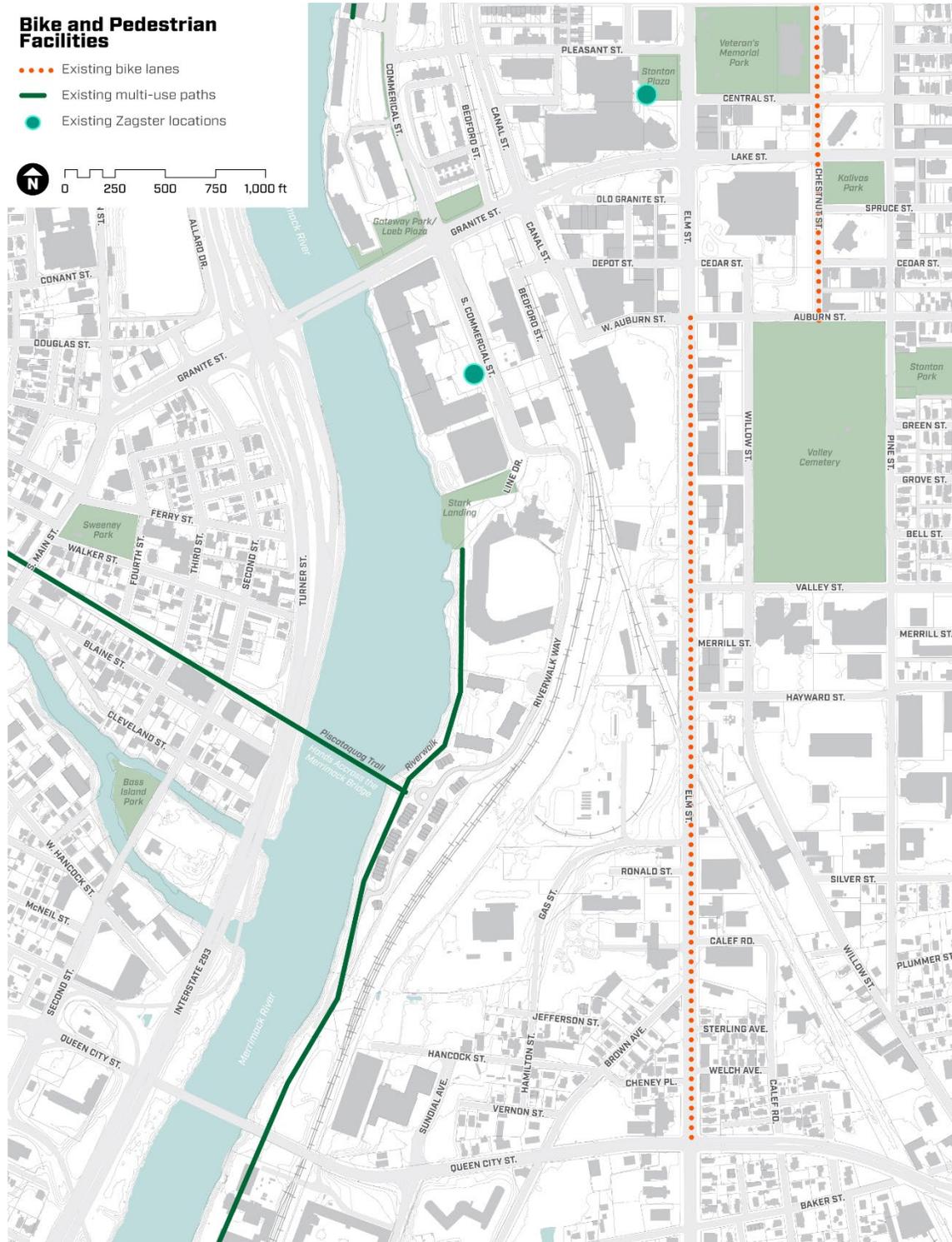
- Two-way
- Variable width of 6 to 7 feet
- From Queen City Avenue to Auburn Street (across from Market Basket), 0.8 miles
- Only pavement markings – no grade separation or barriers.
- Adjacent to right turn lane or parking lane, changes across blocks.
- Lack of pavement markings, signage, and signals at intersections
- Need for “transition” pavement markings and signage at the beginning and end of the lane. Currently, lane ends abruptly before the intersection.

##### Chestnut Street

- One-way (southbound)
- 7 feet wide
- Dedicated lane from Cedar Street to Manchester Street (0.3 mi). Sharrow north of Manchester Street until Pine Street.
- Only pavement markings – no grade separation or barriers.
- Adjacent to right turn lane or parking lane, changes across blocks.
- Lack of pavement markings, signage, and signals at intersections
- Need for “transition” pavement markings and signage at the beginning and end of the lane. Currently, lane ends abruptly before the intersection.

Manchester Transit-Ready TOD Existing Transportation Conditions  
SNHPC

Figure 5 Study Area Bicycle Facilities



## Off-Street Facilities

There are several off-street bike paths in Manchester. These include the Piscataquog Trail (which crosses the Hands Across the Merrimack Bridge), the Riverwalk, and the South Beech Street Trail (See Figure 5). While these paths provide opportunities for recreational cycling, they do not connect safely to existing bike lanes or main employment and educational destinations, limiting their use as commuter paths.

## Zagster Bikeshare

Manchester's bike share is contracted through Zagster and offers eight docking stations primarily within downtown east of the Merrimack River – one station to the west is located at Catholic Medical Center. Within the study area, there is one Zagster station located at 33 South Commercial Street between the SNHU building and the SNHU Millyard parking garage (Figure 6). It is the southern-most station in the network. The closest nearby station outside the study area is at Stanton Plaza off Elm Street, co-located near MTA's downtown transfer hub.

Figure 6 - 33 South Commercial Street Zagster Station



During 2019, there were 2,197 trips taken on Zagster bikes. Approximately one-fifth (472 Zagster trips) either began or ended at the 33 South Commercial Street Station in the study area, the second highest station in the system (but similar to Stanton Plaza and City Hall). The highest ridership station is the SNHU 1230 Elm Street station, at which nearly 700 began or ended.

## Sparse and disconnected bike network

Connecting the future commuter rail station to residents with infrastructure and programs to enhance first-and last-mile connectivity is essential to shifting modes from auto to active. Currently, the only dedicated bicycle facility in the Study Area is on Elm Street.

- There are few dedicated bike facilities either on-street or off-street in Manchester.
- The dedicated facilities that do exist are all located on north-south corridors, which do not intersect with one another, creating high stress segments on many paths between residential neighborhoods, downtown, and the study area.

- There is a disconnect between bike lane locations and the City’s activity centers, employment hubs or other community services, limiting their potential as drive-alone commute alternatives.
  - A good bike network would put four times as much of the downtown area within an appealing 10-minute lower-stress ride.
- The vision for biking in Manchester set out by the 2015 Bike Plan is mostly recreational trips, with suggested leisure routes circling the City.
- The Zagster Bike Share is small and offers limited coverage and connectivity.

Highly used bikeshare systems offer convenience to workers and residents, are connected to bicycle facilities (e.g. bike lanes, paths, etc.) and are flexible and expansive. With only eight locations, all within business districts, the current system is not likely to attract a high number of riders. Expansion into higher density neighborhoods, with docking stations adjacent to bike lanes and paths, and potential “dockless” options would likely increase ridership.

Zagster’s hybrid dock and dockless system in Salem, MA may represent a better model for Manchester. In Salem, bicycles can be parked at official docking stations or at any public bicycle rack in the city. This is possible because Zagster bicycles offer a locking mechanism on the bike itself.

## Safety

The lack of protected bike facilities, high driving speeds, and high peak period vehicle volumes threaten the safety of bicyclists every day, depressing potential bike modeshare. Between 2015 and 2017, there were ten locatable bike crashes in the study area; five of these are on Granite Street, but at different intersections. Only one resulted in a reported injury: Willow Street, south of Silver Street.

## Level of Traffic Stress

The study team conducted a Level of Traffic Stress (LTS) assessment to determine how safe and comfortable streets in the area are for bikers of all confidence levels. LTS is an approach for evaluating traffic-related stress on bicycle routes based on roadway design, traffic volumes, traffic speeds, and other factors.

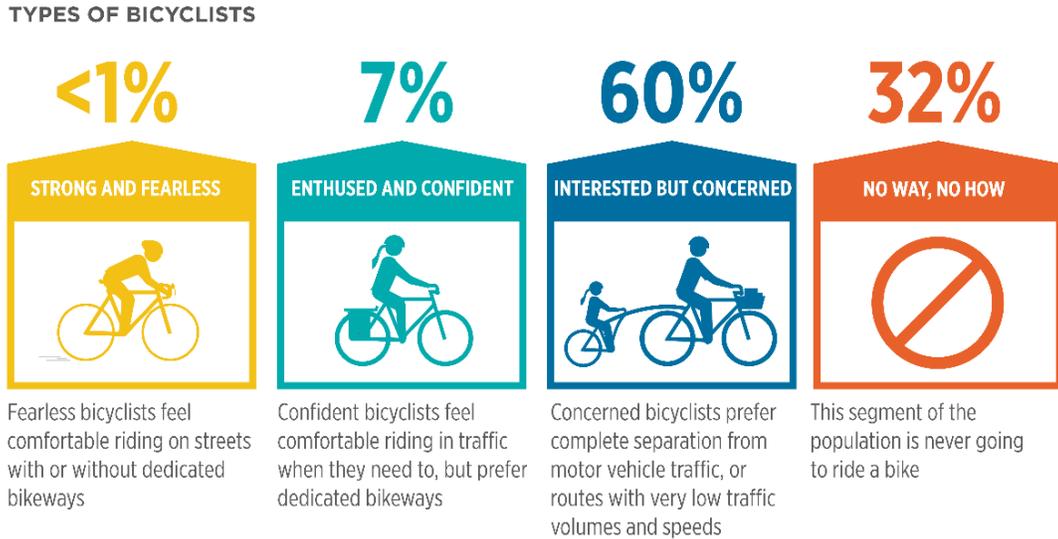
Streets and paths can be divided into four levels of traffic stress (LTS) based on automobile traffic, number of lanes, width of bicycle lanes, and other factors. LTS ranges from 1 to 4, representing the spectrum from lowest to highest stress facilities and which type of cyclist is most correspondingly likely to use that route on their commute or recreational rides.

- **LTS 1:** Strong separation from all except low speed, low volume traffic. Simple-to-use crossings. LTS 1 indicates a facility suitable for children.
- **LTS 2:** Except in low speed / low volume traffic situations, cyclists have their own place to ride that keeps them from having to interact with traffic except at formal crossings and intersections. Facilities have a physical separation from higher speed and multilane traffic. Crossings that are easy for an adult to negotiate. Limits traffic stress to what the mainstream adult population can tolerate.

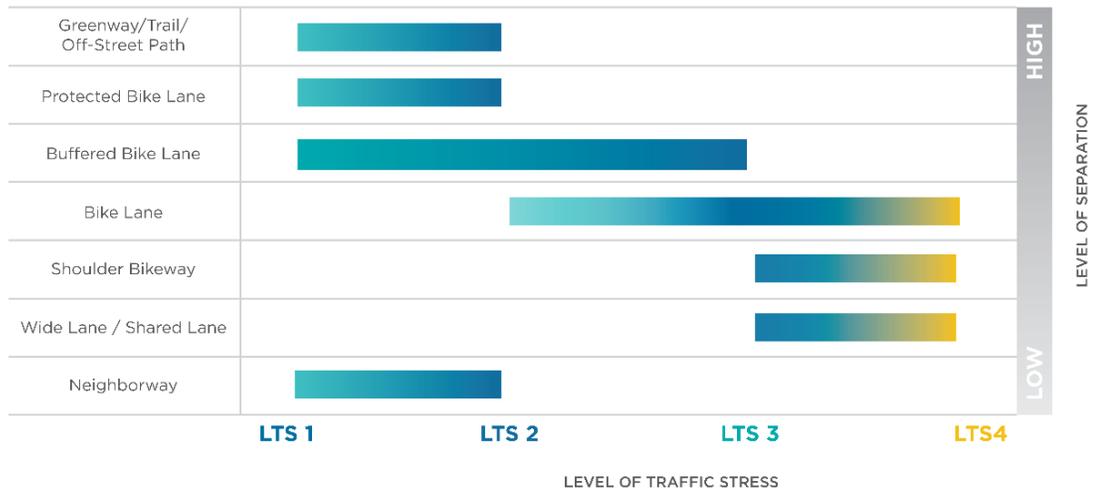
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- **LTS 3:** Involves interaction with moderate speed or multilane traffic, or proximity to higher speed traffic. A level of traffic stress acceptable to the “enthused and confident.”
- **LTS 4:** Involves being forced to mix with moderate speed traffic or proximity to high-speed traffic. A level of stress acceptable only to the “strong and fearless.”

**Figure 7. Bicycle Level of Traffic Stress**



**LEVEL OF TRAFFIC STRESS, FACILITY TYPE, AND RIDER COMFORT**



**1 Level 1 (LTS 1)**  
Level 1 is the lowest level of stress. These segments are suitable for all ages and abilities, including children.

**2 Level 2 (LTS 2)**  
Level 2 has a low level of stress. However, attention is required. Most adults will tolerate this level. The “interested but concerned” population will feel safe on these streets.

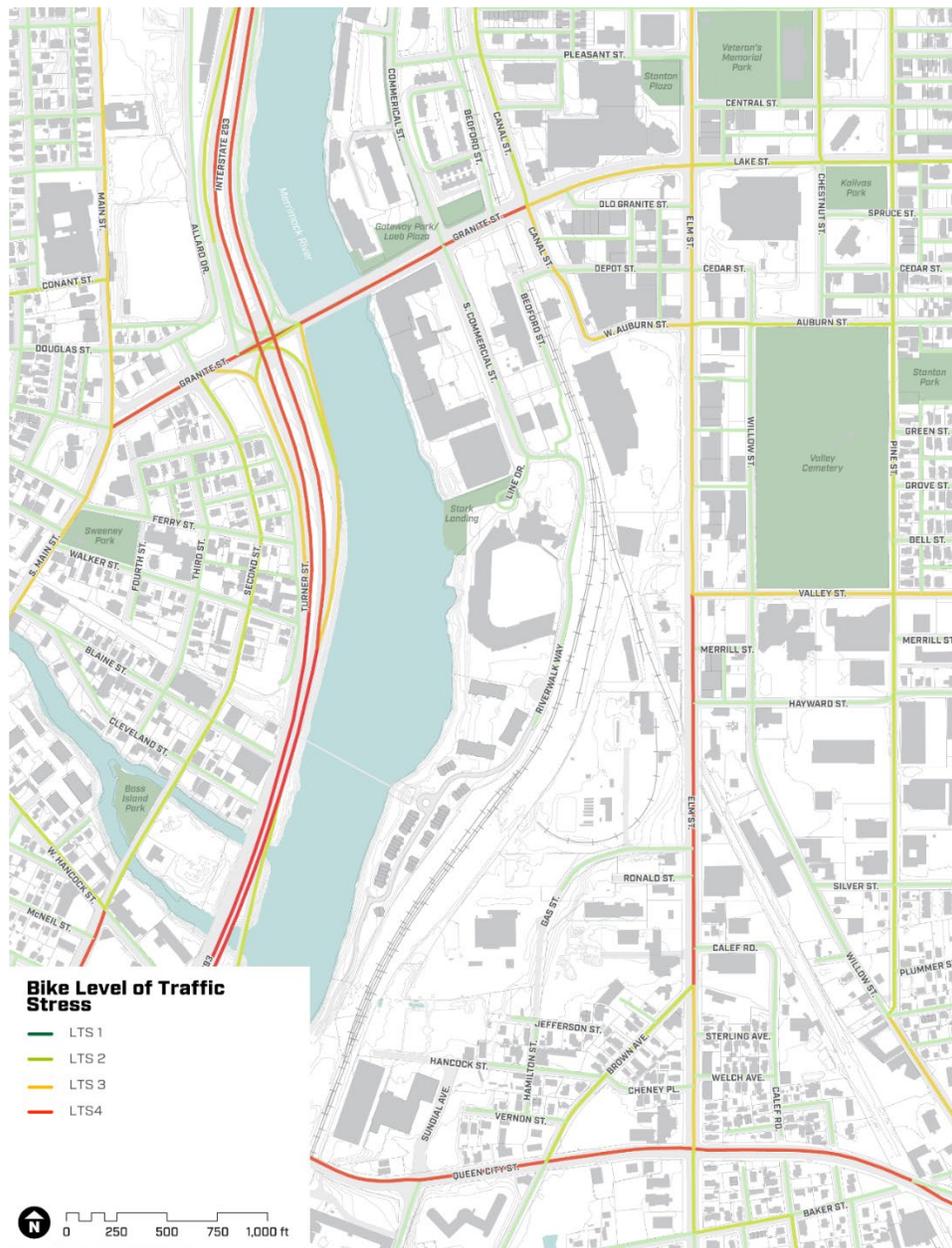
**3 Level 3 (LTS 3)**  
Level 3 requires attention and is suitable for adults who have confidence on a bicycle. These streets work for the “enthused and confident” riders who still prefer dedicated space.

**4 Level 4 (LTS 4)**  
Level 4 is the highest level of stress. It is suitable only for adults who can tolerate bicycling in traffic.

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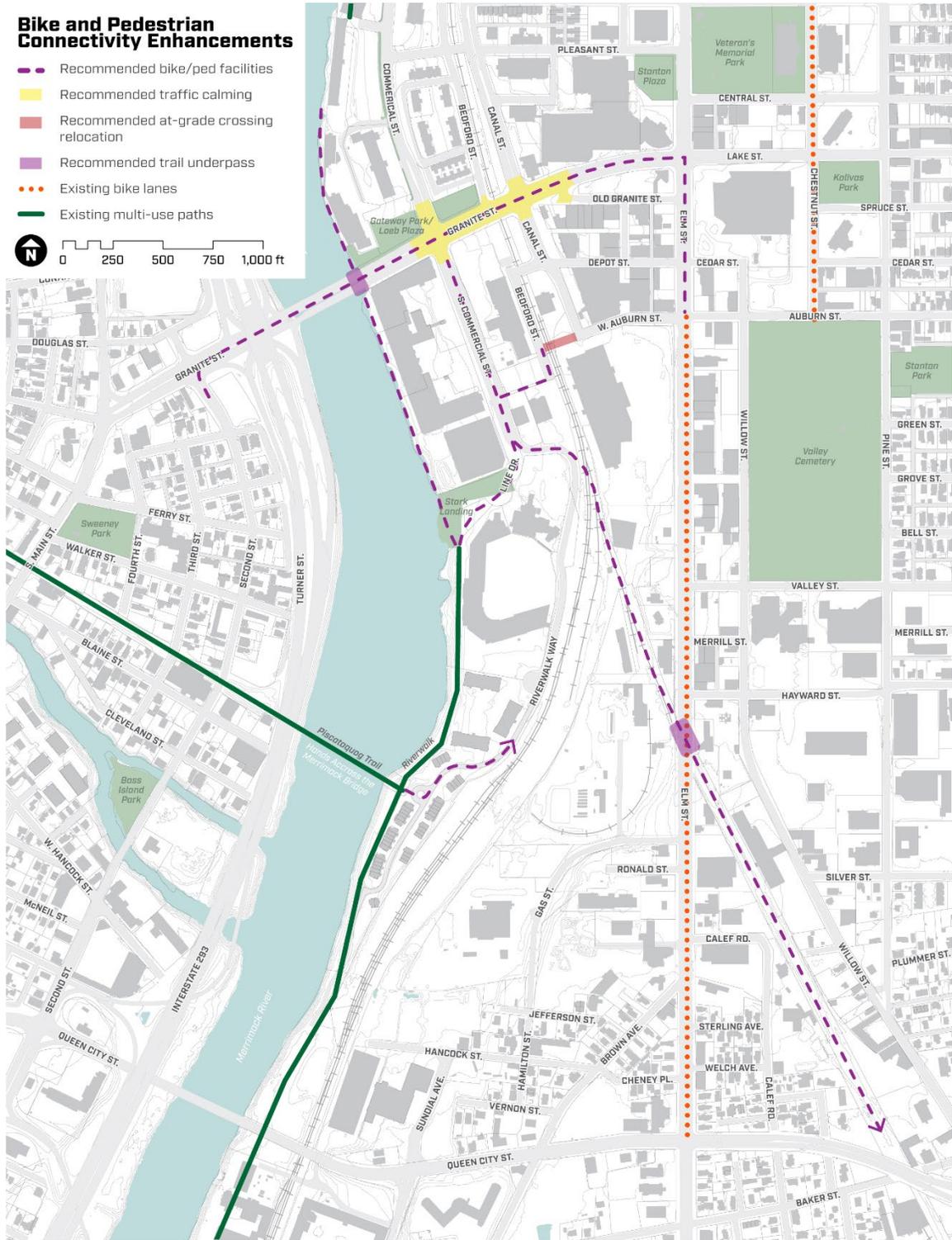
In Downtown and the Study Area, connectivity and infrastructure is not friendly to active transportation. This is in large part due to street and intersection design. Study Area streets tend to carry large number of vehicles, particularly at peak commuting hours, and lack wider sidewalks, dedicated bicycle facilities, ADA accessibility, and high profile crosswalks. Figure 8 shows the level of traffic stress in the study area's road network. Overall, most local and connector streets have an LTS of 2 of 3, with the notable exception of Granite Street and Queen City Avenue, both of which have a very high level of stress (LTS 4). Despite bike facilities, portions of Elm Street also rank as having a high level of stress. A high level of traffic stress on a roadway – even for a portion of the whole route or at an intersection along the route – can degrade the overall level of comfort for all but the strong and fearless bicyclist.

Figure 8. LTS in Study Area Roads



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**Figure 9: Bike and Pedestrian Connectivity Enhancements**



Given the high level of stress for bicyclists across these routes, the footbridge midway between the two river bridge crossings provides the most comfortable bicycle access; however, and similar to pedestrian conditions, bicycle connections to and from the Riverway on the east side are limited and neither connect to a dedicated bicycle facility.

## **Snow Removal**

Snow removal in winter months is important to keeping the transportation system moving. Snow removal in the downtown, including the study area, is handled primarily by the City's Department of Public Works (DPW). DPW plows all roadways, trails and sidewalks using a fleet of plows, bobcats and even a snow mobile. As more bike facilities – lanes, separated facilities and trails – are constructed, additional equipment and staff will be needed to enhance department capacity to ensure snow removal is carried out properly and efficiently. Additional funding will likely be needed to support such efforts.

In addition to Manchester DPW, funding from the City of Manchester is also provided for snow removal to InTown Manchester, the downtown business improvement organization. According to information on their website the organization maintains 26 miles of sidewalks – including snow removal – in downtown. Where and to what extent the group removes snow is unclear, as DPW informed the project team that they remove most snow from sidewalks throughout downtown. This was also echoed in interviews and discussions with area stakeholders.

Feedback received by the planning team suggests that snow removal of sidewalks in downtown lags that of the streets, and at times is delayed substantially. The consultant team also observed snow on the Riverwalk multiuse trail days after a storm in winter 2019. Snow removal on pedestrian and bicycle networks – equal to that of roadways – needs to be a priority in any TOD district.

## **ROADWAY NETWORK**

Roadways are classified by the volume of traffic they are anticipated to carry and whether they provide local access to properties or connections across a wider area. The roadway network is regionally focused, ringed by streets with higher order functional classifications designed to carry a large number of vehicles (See 10 and 11). Granite Street and Queen City Avenue, and Elm Street are all designated as Gateway Corridors in the 2009 Master Plan, in need of streetscape improvements, wayfinding signage, and routine maintenance.

Heavily congested roadways can feel uncomfortable for non-auto modes, particularly bicycling and walking, if comfortable, safe facilities are not provided. These roadways create an intimidating and unpleasant entry to the Study Area, especially for those on foot or on two wheels, that detract from a successful downtown transit-oriented development district.

The MTA downtown hub, where all local and express buses make stops, are on the opposite side of Granite Street from a future train station and from the Study Area. Granite Street's width and peak hour traffic reduces pedestrian safety.

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*Granite Street (Principal Arterial)*

West of Canal Street: more than 26,000 vehicles per day on average in its 120-foot right-of-way split into seven lanes

East of Canal Street: more than 11,500 vehicles per day

*Queen City Avenue (Principal Arterial)*

West of Elm Street: more than 24,500 vehicles daily in four travel lanes

East of Elm Street: more than 19,800 vehicles daily in four travel lanes

*Elm Street (Principal Arterial)*

North of Valley Street: 14,000 vehicles daily in five travel lanes.

South of Valley Street: 15,500 vehicles daily

South of Brown Street: 12,500 vehicles daily

*Brown Avenue (Major Collector)*

Between Queen City Avenue and Elm Street: 3,100 vehicles daily

*Canal Street (Minor Arterial)*

South of Granite Street: 9,600 vehicles daily

*South Commercial Street (Local Road)*

Fewer than 600 vehicles daily

*Willow Street (Local Roads)*

North of Valley Street: 1,800 vehicles daily

South of Valley Street: 2,200 vehicles daily

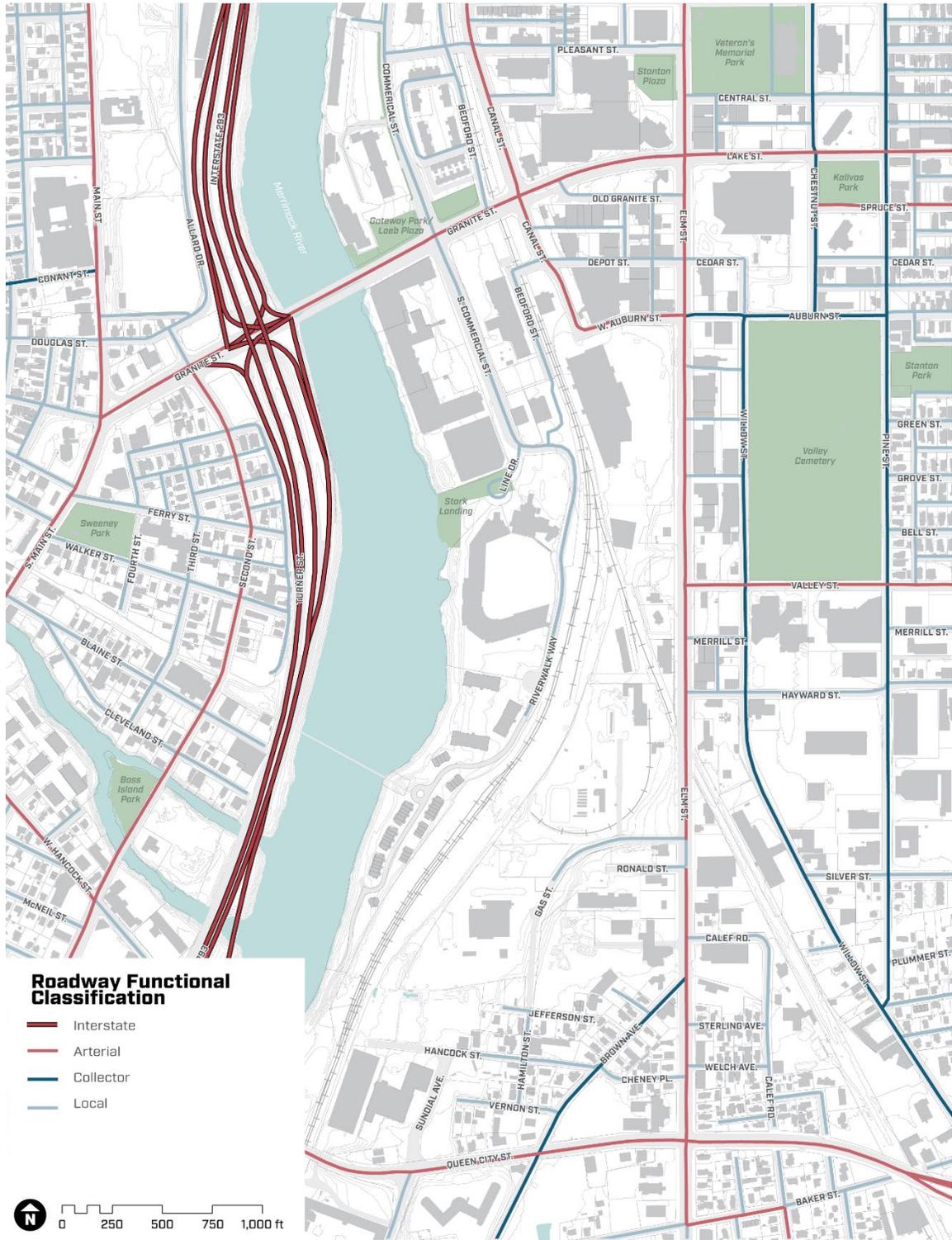
*Interstate-293*

9,700 vehicles daily exit the northbound lanes onto Granite Street heading east.

1,800 vehicles daily exit the southbound lanes onto Granite Street heading east.

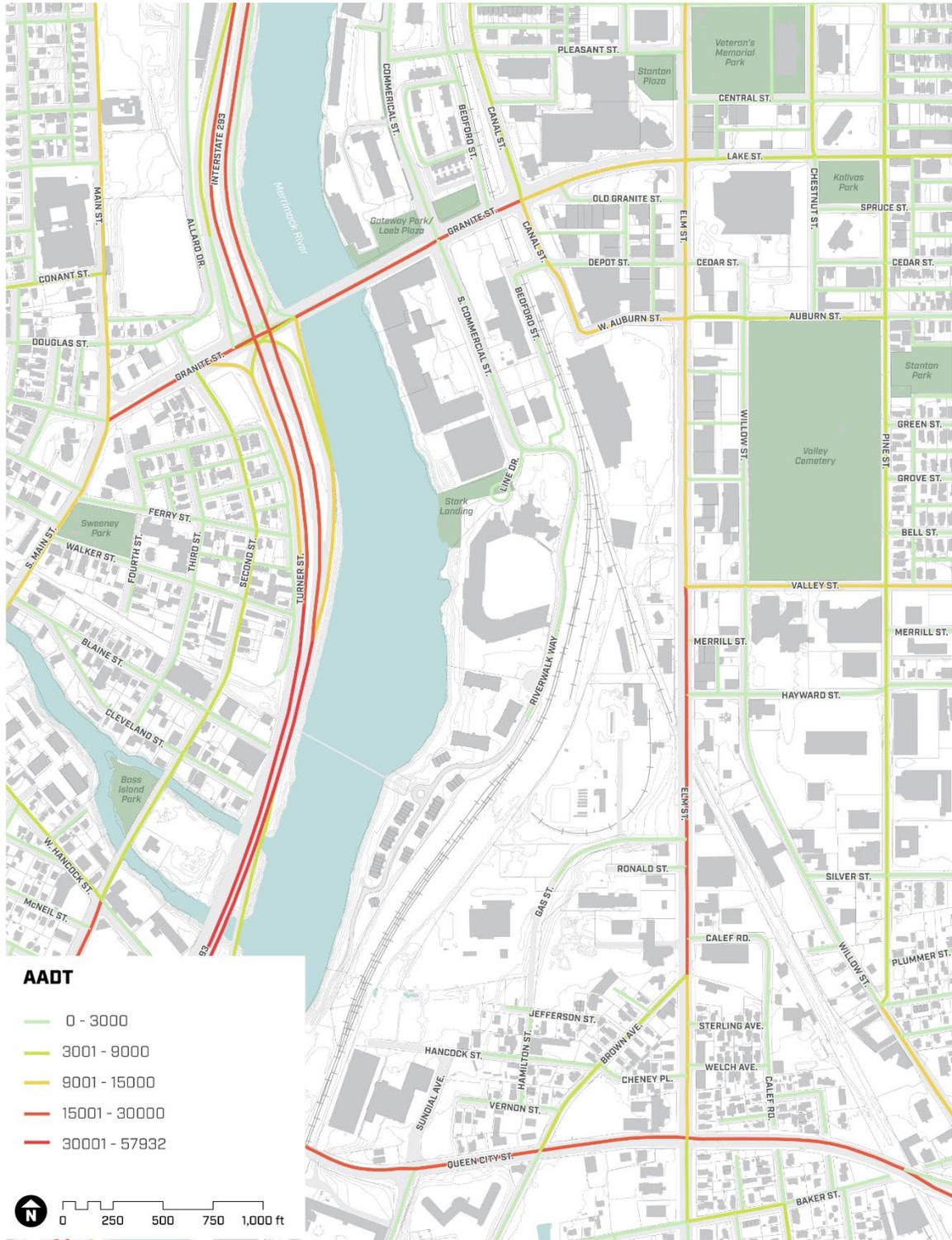
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Figure 10. Study Area Roadway Functional Classification



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Figure 11. Study Area Roadway Average Daily Vehicle Volumes



## Traffic Safety

With the presence of regional arterial roads, roadway safety remains a critical concern in the Study Area. These roadways combine to make a locally hazardous network for all users, not just those walking and biking. Crash data from the New Hampshire Department of Transportation supports this finding. In the 2016-2107 period, more than 2,000 locatable crashes occurred in the City of Manchester alone. Approximately 453 crashes (22%) resulted in injuries, while 2 crashes resulted in fatalities.

Crashes involving pedestrians and cyclists make up a small fraction of the total number of incidents but have significantly higher rates of injury and fatalities. Between 2016 and 2017, 39 crashes involving pedestrians took place and 28 of them (72%) resulted in injuries. Bridge Street and Union Street were the site of multiple pedestrian crashes. Similarly, 55% of crashes involving bicyclists resulted in injuries (6 out of 11 total crashes). Hotspots for cycling accidents include Maple Street and Beech Street (See Figure 12).

## Connectivity Issues

Only two roads (Granite Street and Queen City Avenue) cross the Merrimack River in the study area, funneling all east-west traffic into major arterials and creating congestion at intersection pinch points when drivers turn north or south on S. Commercial Street, Canal Street, or Elm Street.

Besides Granite Street and Queen City Avenue, there are very few opportunities to cross the railroad tracks through the Study Area:

- South Commercial Street does not connect to Queen City Avenue, Gas Street, or Hancock Street at its southern end. The street extends to a private road – Riverwalk Way – that also does not have an outlet.
  - Vehicles leaving the SNHU Millyard Garage or other lots serving the ballpark on gamedays must all funnel out to Granite Street.
  - The total number of parking spaces is approximately 1,700 at the garage, 200 spaces between the ballpark and Hilton hotel, and at least 210 spaces for the 150 apartments and 42 condominiums south of the ballpark.
- Bedford Street dead-ends in the WMUR News' building parking lot, with a low-visibility pedestrian walkway to South Commercial Street.

Gas Street is not a city-owned public street where it traverses the Manchester Transit Authority maintenance facility.

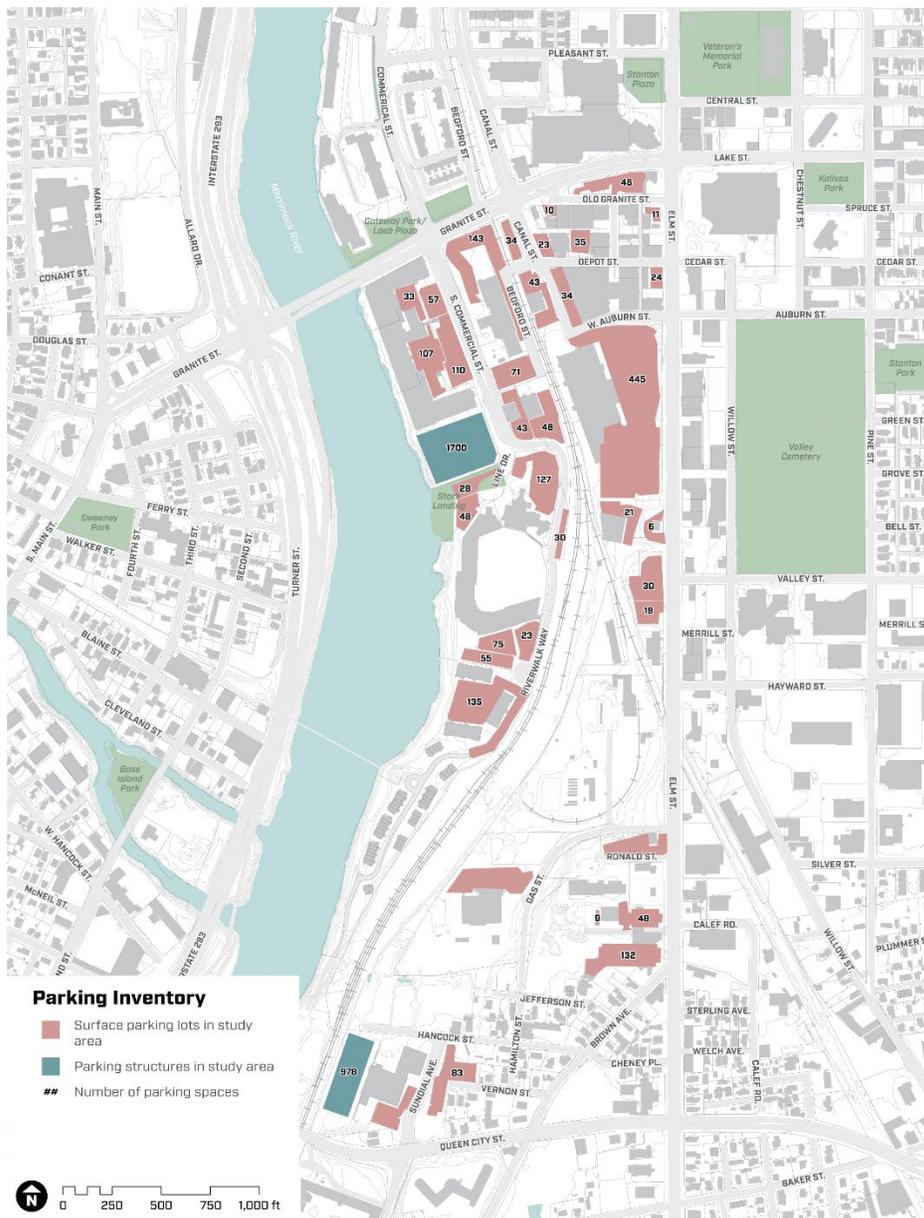


## PARKING CONDITIONS

The study area has numerous off-street parking facilities, provided in surface lots and a new parking structure. Given the auto-oriented nature of the Manchester region, parking is and will remain an important component of any redevelopment efforts, including to provide commuter parking for future rail riders.

To better understand the existing parking in the area, the project team assessed the location and total number of off-street spaces within the study area (Figure 13). Lots assessed included public and private parking facilities with over 10 spaces. Residential parking areas – except for large complexes with surface lots - were not included.

Figure 13. Surface and Structured Parking Lots



## Off-Street Parking

In total, the team estimates there are nearly 5,000 surface or structured parking spaces within the study area, all of them privately owned. Over 2,500 of these spaces are located in two garages, the new SNHU Millyard Garage and the Elliot Hospital at River's Edge. The remainder of spaces are found on surface lots, the largest of which is for Market Basket with over 400 spaces. The remainder of off-street parking lots are smaller in size, many in the 30-60 space range, and many have potential for redevelopment to other uses. They could also be used for shared parking for public use.

Based on several site visits, many of the parking lots are underutilized, particularly those in and around WMUR and the baseball stadium. While the stadium parking is used during events, opportunities to share this parking to support future uses should be explored. SNHU surface lots, on the other hand, are highly used. Total utilization of the new SNHU garage, as well as its existing surface lots should be studied further to better understand how and when they are used. These facilities, particularly the structure, could potentially support new residential development by allowing residents in future developments to park overnight and/or through a permit program, or provide additional public parking for events.

The structure at Elliot Hospital at River's Edge is large – nearly 1,000 spaces – and provides parking to patients and staff (on the lower level). Based on several visits, much of the garage is not used. This parking could be leveraged to support additional development in the area.

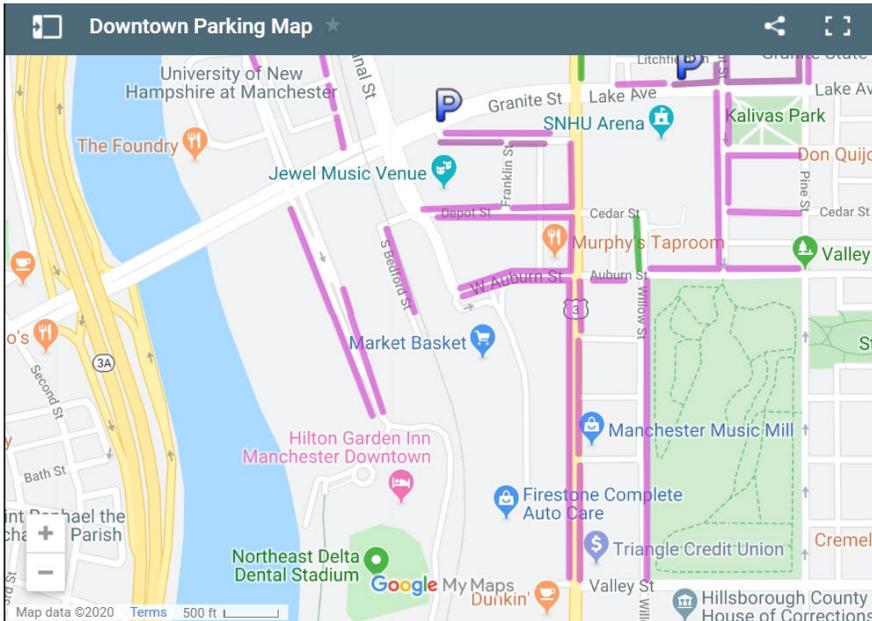
Other off-street facilities including the Center of New Hampshire parking structure provides parking nearby. Parking at the facility is provided on an hourly basis, starting at \$6 for the first hour, with a maximum 24-hour rate of \$22; monthly parking (requires an application approval) at \$120 per month, and special event parking for Monarch's Hockey (\$10) and event parking rates (see event parking for more information). The facility also provides vehicle charging stations and other services.

## On-Street Parking

There is limited on-street parking in the study area. Most public on-street parking identified is in the Gaslight District, which allows "time-limited" (10-hour), metered parking. Despite the long time allowance, these spots are not highly used during the day, but are used during events at the SNHU arena. Given the strong pedestrian connectivity of the grid in this area (if sidewalks are reconstructed and maintained), and proximity to the arena, these spaces should be regulated with shorter time limits or graduated hourly pricing to support future investment in the district (e.g. restaurants, shops, entertainment), not long term parking.

The remaining on-street parking (in northern portions of the study area) is permit only, but also regulated to 10-hours a day. See map to the right. Spaces are found along the eastern side of S. Bedford Street and along Commercial Street. These spaces are highly utilized and desired, as evidenced by the users willing to pay the \$55 monthly permit cost.

Figure 14 City of Manchester Website's On-Street Parking Map



### Event Parking

There is no formal event parking program for the Northeast Delta Dental Stadium or the SNHU Arena during ballgames, concerts, or other events. Parking on city streets surrounding the SNHU Arena are open to the public, unless otherwise designated as no parking or for handicap parking only. For evening events, meters end at 8:00pm and provide an affordable, but high-demand option.

While there are no designated lots or garages for event parking, surrounding garages such as the Center of New Hampshire Parking Garage directly across Lake Avenue, the Arms Street Parking lot, or the Victory Parking Garage offer special event parking rates. Parking at the Center of New Hampshire Parking Garage ranges from \$20 to \$40, Surface lots for office employees often have available evening spaces for those willing to walk. Follow up is required to determine official agreements or event practices of private lots during non-business hours.

### Key Findings

- Most parking in the study area is privately owned, with some available to the public.
- Many of the private lots are not highly utilized. These lots could be redeveloped or used for shared parking as new development occurs. This would require negotiating with property owners.
- Public parking is limited in the study area to street parking in the Gaslight District. Parking is not heavily used during weekday hours but is used during events.
- On-street spaces allow up to 10-hours of parking. Should reinvestment occur – e.g. local business and restaurants that require parking for customers – time-allowances or pricing structures will need to adjust accordingly to promote appropriate turnover.
- On-street parking is mostly reserved for permit parking, and likely used by employees of SNHU.

The SNHU garage is currently used for employees only but may be open for public use in off-hours in the future. This is a good opportunity to explore shared parking as the area develops.  
Transit Conditions

## Local MTA Buses

The study area is located within short walking distance of the Manchester Transit Authority's (MTA) downtown bus hubs at Veterans Park and Manchester Transportation Center. MTA covers its 63-square mile service area with 13 local fixed routes, two intercity express routes, four free shopper shuttles, two seasonal routes, and the school bus network for Manchester School District. MTA operates a largely hub-and-spoke network, with most buses running from the downtown out to more residential neighborhoods or outlying activity centers. Local routes cost \$2.00 per ride, or \$60.00 for an adult monthly pass.

Today, seven MTA routes run on streets traversing or abutting the study area, including:

**Elm Street** (Routes 3, 10, 12, and Green DASH)

**Granite Street** (Routes 4, Green DASH, 21, and 22)

**Canal Street** (Route 3)

**Queen City Avenue** (Routes 3 and 12)

**Valley Street** (Route 10).

Several local fixed routes also provide duplicative service on **Elm Street** (Route 3, 9, 10, 12, and Green DASH) in the study area, creating slightly more frequent service.

The Green DASH free shuttle loops through downtown Manchester, connecting offices, retail, restaurants, and other bus routes along Commercial Street and Elm Street (See Figure 16). Running every 30 minutes, the shuttle provides the Millyard with the most frequent bus service of the entire MTA network. However, the route alignment is indirect, adding two superfluous deviations through the Market Basket parking lot and around Hollis, Canal, and Dow Streets. These detours make the route more complicated to understand and to use.

The fewer turns a route makes, the easier it is to understand. Conversely, circuitous alignments are disorienting and difficult to remember. Routes with simpler structures better attract new and occasional riders. Many of MTA's other local routes also deviate off a direct path outside of downtown and their inbound and outbound alignments are not symmetrical between strong anchors and landmarks. This reduces the familiarity of the overall system and can lead to frustration with new or occasional riders.

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**Table 1 MTA Bus Service Schedule Information**

Route #	Route Description	Wkdy Peak Frequency	Wkdy Off-Peak Frequency	# of Wkdy Trips	Weekday Span	Weekend Span
1	Dartmouth / VA Hospital	45 min	45 min	11	7:15am - 5:55pm	10:30am - 5:55pm
2	Hanover Street / East Industrial Park	60 min	n/a	13	5:30am - 6:25pm	n/a
2S	Hanover Street / East Industrial Park	n/a	60 min	8	n/a	9:30am - 4:55pm
3	Brown Ave / Manchester-Boston Regional Airport	60 min	60 min	9	5:25am - 6:25pm	n/a
4	Commerce Drive / Target	120 min	45 min	5	7:45am - 5:55pm	n/a
5	River Road / SNHU	45 min, 75 min	45 min, 75 min	15	7:00am - 9:35pm	9:45am - 5:40pm
6	Bremer Street / Mast Road	60 min	60 min	13	5:30am - 6:25pm	9:30am - 5:25pm
7	Bedford Grove Plaza / Second St	45 min, 75 min	45 min, 75 min	11	7:00am - 5:55pm	9:40am - 4:25pm
8	South Willow Street / Mall of New Hampshire	60 min	60 min	13	5:30am - 6:25pm	9:30am - 5:25pm
9	Elliot Hospital / E. Side Plaza	120 min	120 min	5	8:00am - 4:30pm	n/a
10	Valley Street / Mall of New Hampshire	60 min	60 min	12	6:30am - 6:25pm	9:30am - 5:25pm
11	Front Street / Hackett Hill Road	60 min	60 min	15	6:30am - 9:25pm	10:30am - 5:25pm
12	South Beech Street / Mall of New Hampshire	60 min	60 min	12	6:00am - 5:55pm	10:00am - 5:55pm
21	Concord Express- Zipline	120 min	120 min	6	6:30am - 6:25pm	10:00am - 4:55pm
22	Nashua Express - Zipline	120 min	120 min	5	7:30am - 5:25pm	9:30am - 4:25pm
41	The Green DASH	30 min	30 min	27	8:20am - 9:50pm	n/a

## Transfer Hubs

MTA's major transfer hub is located on the edge of the study area on the northern side of Granite Street, putting the study area at the center of the MTA bus network (See Figure 15).

All of the 12 local routes and the Green DASH free circulator serve bus stops at Veterans Park in Downtown Manchester at Elm Street just north of the intersection with Granite Street and Lake Avenue (See MTA Ridership FY18.)

The MTA served 420,470 unlinked trips annually, with the majority of their 15 regular fixed routes. With a service area population of 135,366 people, the MTA provided 3.1 trips per capita in FY18. Compared to Nashua, whose transit system provides a similar number of demand response trips, and other Massachusetts cities on the end of the commuter rail lines, Manchester underperforms in attracting bus ridership (Table 2).

The Manchester Transportation Center at the corner of Canal Street and Granite Street is a multimodal bus loop also serving private intercity bus lines. The Manchester Transportation Center is served by MTA Routes 3 and 4 and coach buses operated by Boston Express/Concord Coach, Greyhound, and Flight Line, Inc.

However, with a small network of fixed daily routes and no bus running more frequently than every 30 minutes, MTA schedules must pulse buses arriving and departing the transfer hubs downtown so that transfer opportunities are more likely and passengers are not required to wait a long time for transfers. Extended waiting periods reduce the utility of buses for choice riders. When services run infrequently, riders must adjust their schedules to accommodate the transit schedule. Limited service combined with the risk of time-consuming waits after missing a bus can discourage potential riders from trying transit if they have other travel options.

Transit service that runs more often and provides more frequent trips offers riders more flexibility and predictability for all types of trips. Frequent transit service, traditionally defined as service every fifteen minutes or less during peak times, can better compete with the convenience and flexibility of the personal vehicle. Infrequent transit service may offer an unsatisfying user experience that is more disrupted by schedule disruptions or missed connections, especially in small systems like the MTA. In many cases, the ridership increases produced by frequency improvement on less frequent routes, in percentage terms, will be higher than frequency improvements on more frequent routes.

## Key Findings

Infrequent service and missed connections may deter future bus ridership connecting to the train station or may inspire predominately park-and-ride access.

- Bus connections to outlying commuter rail stations are rare for the MBTA system, according to data from the 2015-17 MBTA Systemwide Passenger Survey. On the Lowell Line, at least 56% of passengers at Lowell Station, North Billerica, and Anderson/Woburn access trains by driving alone and parking. Similarly, on the Haverhill Line, Haverhill/Bradford, Lawrence, Wilmington/North Wilmington, and Reading all have a drive alone access mode share of at least 54%. Besides Worcester, there is no commuter rail station outside of Boston proper where more than 9% of riders arrive via bus; in Lowell is at 9% and Lawrence at 7%. In some stations at the end of North Station-bound

commuter rail lines, the drop-off mode share (kiss-and-ride) is as high or higher than the walk/bike mode share.

- Bus service on Elm Street begins at 5:30am (Route 3 from the Canal Street Transportation Center) and runs until 6:25pm.
- The Green DASH helps connect the TOD study area to the bus hubs and the rest of downtown, making it an important resource to a future intermodal rail station. Fixed route service begins at 8:20am and ends at 6:15pm. Between 6:15pm and 9:45pm the bus operates a deviated route and does not stop at Veterans Park.
- The Elliot Hospital at Rivers Edge is a major destination south of downtown and at the southern end of the study area. The hospital is served Route 12 (and by Route 3 only on request), with Route 12 among the highest ridership routes in the system. The first trip Route 12 trip arrives at the hospital 6:05am and the last trip from the hospital leaves at 5:05pm.
- Connections between the west side of the river and downtown, particularly to the study area, are limited. The 2<sup>nd</sup> Street corridor north of the Piscataquog River is not served by bus at all. Route 7 operates further west on Main Street and crosses the Merrimack River on Bridge Street.

### **MTA Ridership**

In FY18, the MTA served 420,470 unlinked trips annually, with the majority on their 15 regular fixed routes. With a service area population of 135,366 people, the MTA provided 3.1 trips per capita in FY18. Compared to Nashua, whose transit system provides a similar number of demand response trips, and other Massachusetts cities on the end of commuter rail lines, Manchester underperforms in attracting bus ridership (Table 2).

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**Table 2 Peer Transit Agency Comparison**

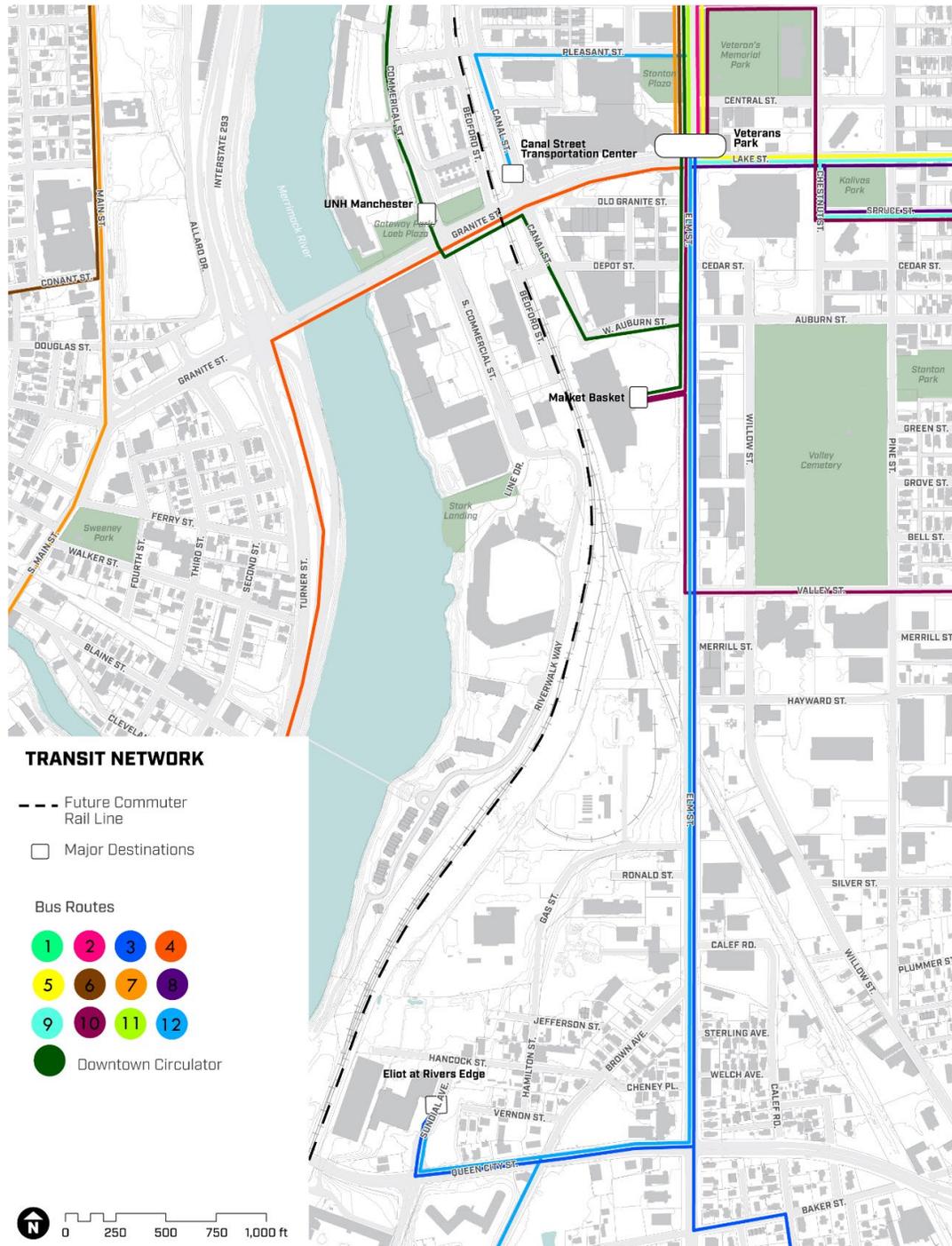
Transit Agency	Service Area Population	2018 Annual Unlinked Trips	Trips per Capita
Manchester Transit Authority		420,470	3.11
Bus	135,366	410,840	3.04
Demand Response		9,630	0.07
Nashua Transit System		463,927	5.34
Bus	86,933	447,657	5.15
Demand Response		16,270	0.19
Merrimack Valley Regional Transit Authority (Haverhill)		2,194,507	7.16
Bus	306,339	2,046,740	6.68
Demand Response		87,004	0.28
Demand Response (Taxi)		60,763	0.20
Lowell Regional Transit Authority		1,525,986	4.51
Bus	338,186	1,411,149	4.17
Demand Response		114,837	0.34
Worcester Regional Transit Authority		3,315,655	6.92
Bus	479,329	3,131,083	6.53
Demand Response		135,260	0.28
Demand Response (Taxi)		49,312	0.10

The following six MTA routes have the highest ridership, each with more than 2,575 monthly trips in June 2019. All but Routes 6 and 11 have experienced ridership loss since June 2018. No stop-level ridership is available. Routes 8, 12, and 10 directly serve the study area.

- Route 8 (Mall of NH via S. Willow Street): 4,654 monthly trips
- Route 6 (Mast Road vis Bremer Street): 3,623 monthly trips
- Route 12 (Mall of NH via S. Beech Street): 3,359 monthly trips
- Route 10 (Mall of NH via Valley Street): 3,268 monthly trips
- Route 11 (Hackett Hill via Front Street/MCC): 2,648 monthly trips
- Route 2 (E. Industrial Park via Hanover Street): 2,579 monthly trips
- The Green DASH circulator attracted 2,691 monthly trips in June 2019, a 34% growth over the same month in 2018.

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Figure 15. Local Bus and Rail Network in Study Area



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Figure 16 Downtown Circulator (Green DASH)



## Regional Bus Service

Regional and intercity bus operators (Boston Express, Greyhound, and Flight Line, Inc.) provide service from the Manchester Transportation Center to Boston, Concord, Nashua, Londonderry, and Portsmouth, with transfers to points beyond (See Table 3, Regional Bus Service at the end of this section.)

Several Boston Express trips are run on Concord Coachlines buses. No ridership information is available for these intercity services.

The New Hampshire DOT's 2019 Statewide Transit Study reported that Manchester could potentially support commuter bus routes to Portsmouth and Salem-Windham-Londonderry. The 75-minute Portsmouth route connecting from UNH Manchester is estimated to attract 100 daily riders at a \$13 per rider gross cost. The 50-minute Salem-Windham-Londonderry route will serve Tuscan Village and Woodmont Commons and is estimated to attract 164 daily riders at a \$5 per rider gross cost. The growing demand for regional bus service, above the demand for service to Boston, demonstrates potential daily passenger rail demand. Habitual use of regional bus service helps establish a transit-using culture that might accept and choose rail.

### Boston Express

Trips to and from Boston via I-93 make stops in North Londonderry, Londonderry, Salem, South Station Bus Terminal, and Logan Airport on weekdays and weekend. The four southbound trips and four northbound trips per weekday take an hour and a half. On weekends, there are three southbound trips and three northbound trips.

Trips to and from Boston via Route 3 make stops in Nashua, Tyngsboro, South Station Bus Terminal, and Logan Airport on weekdays and weekends. Trips take an hour and a half. There are seven southbound trips and ten northbound trips on weekdays. On weekends, 7 round trips run.

One early morning southbound trip between Manchester and Londonderry operates on weekdays only, leaving at 5:20am.

### Greyhound

Express buses to and from Manchester Transportation Center and Boston's South Station Bus Terminal run twice daily on weekdays. On weekends, two trips leave Manchester for South Station Bus Terminal at 3:50pm and 10:40pm. One trip runs every weekday from Manchester to Concord at 3:25pm.

### Flight Line, Inc. (East West Express)

Ten-passenger vans offer hourly trips between Manchester, the Manchester-Boston Regional Airport, and the Portsmouth Transportation Center for \$19 and between Manchester and the Epping Park and Ride on Route 125 for \$9.

The service is marketed to airport passengers and work commuters.

Operating funding is from the NHDOT and FHWA CMAQ program.

## Shuttle Services

Many employers already make arrangements for remote parking and/or provide shuttle services from these facilities to their front door. A coordinated approach could expand and streamline

these services, making better use of the SNHU Millyard parking garage or other remote parking lots.

While SNHU has operated shuttles to provide employees access to and from satellite parking lots and the main campus, the shuttles have significantly curtailed operations now that the new parking structure accommodates most employees. Shuttle service exists between the Millyard and SNHU's Main Campus north of downtown.

## **KEY FINDINGS**

In summary, several key findings from the analysis include:

- The roadway network surrounding the study area is primarily designed for regional, high volume peak hour traffic, not for neighborhood connectivity. Auto-oriented streets lessen the likelihood that residents, visitors, and employees will walk or bike the short distance within the study area or between the study area and downtown. Transit-oriented development and redevelopment that includes traffic calming measures to enhance pedestrian and bicyclist comfort will reduce the need for more parking facilities and reduce total new vehicle trips.
- Improving sidewalk quality as well as creating new connections to and filling in gaps along the lower-stress/higher-amenity sections of the Riverwalk may help facilitate development interest.
- While new bike lanes have been added to portions of Elm Street south of Granite Street/Lake Avenue, there are few bicycle facilities in and around the study area. The study area presents a unique opportunity to link at least three multiuse off-street trails into a convenient, connected network between downtown, the Millyard, the TOD study area, and adjacent neighborhoods throughout Manchester. Such a network could itself stimulate economic development through Trail-Oriented Development (TrOD). This is increasingly important as new mobility options – e.g. scooters, e-bikes – gain in popularity.
- All MTA bus routes converge just north of the study area. The opportunity to create a multimodal hub – bus, train, bike, ped and auto – could anchor the study area as the center for transportation.
- The Green DASH route is inefficient and could be redesigned to better connect the area to the Millyard and Downtown to the north.
- Internal connectivity for all modes – auto, transit, bicycle, and pedestrian – is poor and must be enhanced to support a TOD area.
- Parking strategies to accommodate future development must accommodate all users – commuters, workers, and residents. Opportunities for shared parking are strong given this mix.
- There is potential for partnerships between stakeholders in the Millyard and downtown to strengthen the Green DASH shuttle or create a separate parking shuttle to connect available spaces to jobs and activity hubs.

**Manchester Transit-Ready TOD Existing Transportation Conditions**  
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**Table 3 Regional Bus Service**

Direction	From	To	Schedule (departures, arrivals by day)	Duration Of Trip	Route Stops
<b>Boston Express</b>					
Southbound I-93	Manchester Transportation Center	Boston	<b>WEEKDAY:</b> 5:20AM-7:10AM (SS), 9:25AM- 10:50AM (SS) 11:05 (Logan), 2:10PM-3:35PM (SS) 3:50PM(Logan), 5:10PM-6:35PM(SS) 6:50 (Logan)	Approx 1hr 25mins	N. Londonderry NH, Londonderry NH, Salem NH, SS, Logan
Northbound I-93	Boston	Manchester Transportation Center	<b>WEEKDAY:</b> (SS) 8:00 AM-9:20AM, (Logan) 2:25PM-4:30PM, (Logan) 3:25PM- 5:15PM, (SS) 4:30PM- 6:00PM	Approx 1hr 30mins	Logan, SS, Salem NH, Londonderry NH, N. Londonderry NH, Manchester
Southbound I-93	Manchester Transportation Center	Boston	<b>WEEKEND:</b> 9:25AM- 10:50AM (SS) 11:05 (Logan), 2:10PM-3:35PM (SS) 3:50PM(Logan), 5:10PM- 6:35PM(SS) 6:50 (Logan)	Approx 1hr 25mins	N. Londonderry NH, Londonderry NH, Salem NH, SS, Logan
Northbound I-93	Boston	Manchester Transportation Center	<b>WEEKEND:</b> (SS) 8:00 AM-9:20AM, (Logan) 2:25PM-4:15PM, (Logan) 3:25PM- 5:15PM, (SS)	Approx 1hr 30mins	Logan, SS, Salem NH, Londonderry NH, N. Londonderry NH, Manchester
Southbound Route 3	Manchester Transportation Center	Boston	<b>WEEKDAY:</b> 5:20AM-7:10AM (South Station), 6:50AM- 9:05AM (SS) 9:20 (Logan), 8:25AM-9:30AM (SS) 9:45AM(Logan), 9:25AM-10:50AM(SS) 11:05AM(Logan), 11:30AM- 1:05PM(SS) 1:20PM (Logan), 2:10PM-3:35PM(SS) 3:50PM (Logan), 5:10PM- 6:35PM (SS) 6:50PM (Logan)	Approx 1hr 25mins	Nashua NH, Tyngsboro MA, SS, Logan
Northbound Route 3	Boston	Manchester Transportation Center	<b>WEEKDAY:</b> (SS) 8:00 AM-9:20AM , (Logan) 9:40AM-11:45AM, (Logan) 12:40PM- 2:45PM, (Logan) 2:25PM- 4:30PM, (Logan) 3:25PM- 5:15PM, (SS) 4:30PM- 6:00PM, (Logan) 5:25PM-7:40PM, (SS) 6:30PM- 8:05PM, (Logan) 7:25PM-9:30PM, (Logan) 9:25PM- 11:30 PM	Approx 1hr 25mins	Logan, SS, Nashua NH, Tyngsboro MA, Manchester

**Manchester Transit-Ready TOD Existing Transportation Conditions**  
SNHPC

Direction	From	To	Schedule (departures, arrivals by day)	Duration Of Trip	Route Stops
Southbound Route 3	Manchester Transportation Center	Boston	<b>WEEKEND:</b> 5:30AM-7:05AM (South Station) 7:20 (Logan), 7:00AM- 8:35AM (SS) 8:50 (Logan), 8:25AM-9:30AM (SS) 9:45AM(Logan), 9:25AM- 10:50AM(SS) 11:05AM(Logan), 11:30AM- 1:05PM(SS) 1:20PM (Logan), 2:10PM-3:35PM(SS) 3:50PM (Logan), 5:10PM- 6:35PM (SS) 6:50PM (Logan)	Approx 1hr 25mins	Nashua NH, Tyngsboro MA, SS, Logan
Northbound Route 3	Boston	Manchester Transportation Center	<b>WEEKEND:</b> (SS) 8:00 AM-9:20AM, (Logan) 9:40AM-11:45AM, (Logan) 12:40PM- 2:45PM, (Logan) 2:25PM- 4:15PM, (Logan) 3:25PM- 5:15PM, (Logan) 6:55PM- 9:00PM, (Logan) 9:25PM- 11:30 PM	Approx 1hr 25mins	Logan, SS, Nashua NH, Tyngsboro MA, Manchester
Northbound I-93	Manchester Transportation Center	Concord	<b>WEEKDAY:</b> 9:20AM-9:50AM, 5:15PM-5:30PM	Approx 15-20mins	Manchester, Concord NH
Southbound I-93	Concord	Manchester Transportation Center	<b>WEEKDAY:</b> 9:00AM- 9:25AM	25mins	Manchester, Concord NH
Southbound Route 3	Manchester Transportation Center	Nashua NH	<b>WEEKDAY:</b> 6:50AM-7:20AM, 11:30AM-12:01PM	30mins	Manchester, Nashua
Northbound Route 3	Nashua NH	Manchester Transportation Center	<b>WEEKDAY:</b> 11:15AM-11:45AM, 2:15PM-2:45PM, 7:10PM-7:45PM, 7:35PM-8:05PM, 9:00PM-9:35PM, 11:00PM-11:30PM	Approx. 30mins	Manchester, Nashua
Southbound Route 3	Manchester Transportation Center	Nashua NH	<b>WEEKEND:</b> 5:30AM-6:00AM, 7:00AM-7:30AM, 11:30AM-12:01PM	30mins	Manchester, Nashua
Northbound Route 3	Nashua NH	Manchester Transportation Center	<b>WEEKEND:</b> 11:15AM-11:45AM, 2:15PM-2:45PM, 8:30PM-9:00PM, 11:00PM-11:30PM	Approx. 30mins	Manchester, Nashua

**Manchester Transit-Ready TOD Existing Transportation Conditions**  
SNHPC

Direction	From	To	Schedule (departures, arrivals by day)	Duration Of Trip	Route Stops
Southbound I-93	Manchester Transportation Center	Londonderry	<b>WEEKDAY:</b> 5:20AM-5:45AM	25mins	Manchester, Londonderry NH
<b>Greyhound</b>					
Southbound	Manchester Transportation Center	Boston	<b>WEEKDAY:</b> 3:50PM- 5:10PM(SS), 10:40PM-11:40PM(SS)	Approx 1hr-1hr20mins	Manchester Transportation Center, South Station
Southbound	Manchester Transportation Center	Boston	<b>WEEKEND:</b> 3:50PM- 5:10PM(SS), 10:40PM-11:40PM(SS)	Approx 1hr-1hr20mins	Manchester Transportation Center, South Station
Northbound	Boston	Manchester Transportation Center	<b>WEEKDAY:(SS)</b> 7:00AM- 8:05AM, (SS)2:00PM-3:30PM	Approx 1hr-1hr30mins	Manchester Transportation Center, South Station
Northbound	Manchester Transportation Center	Concord	<b>WEEKDAY:</b> 3:25PM-3:50PM	25mins	
<b>EastWest Express</b>					
Eastbound	Manchester Transportation Center	(PTC) Grafton Road-Portsmouth	<b>WEEKDAY:</b> 5:35AM- 7:00AM, 10:35AM-12:00PM, 4:45PM-6:00PM, 7:35-9:00PM	Approx 1hr 25mins	MTC, MHT Airport, Epping Park & Ride, PTC
WestBound	(PTC) Grafton Road-Portsmouth	Manchester Transportation Center	<b>WEEKDAY:</b> 4:15AM-5:35AM, 7:15AM-8:35AM, 12:15AM-1:35PM, 6:15PM-7:35PM	Approx 1hr 20mins	MTC, MHT Airport, Epping Park & Ride, PTC