



DECEMBER 2018

Transportation Master Plan Update



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Acknowledgements

Key Contributors and Steering Committee Members

Adam Baacke - Director of Campus Planning, UMass Lowell Facilities Management

Nicolas Bosonetto - City Engineer, City of Lowell Planning and Development

Randy Brashears - Chief UMass, Lowell Campus Police

Caleb Cheng - Campus Planner, UMass Lowell Facilities Management

Christine Clancy - City Engineer, City of Lowell Public Works

Stephanie Cronin - Executive Director, Middlesex 3 Coalition

Karina Cruz - Transportation & Parking Manager, UMass Lowell Administrative Services

Christopher Curry - Transit Manager, Northern Middlesex Council of Governments

Lisa Degou - 2017-18 President, UMass Lowell Student Government

Andre DiFilippo - 2018-19 President, UMass Lowell Student Government

Brenda Evans - Dean, UMass Lowell Student Affairs

David Frechette - Sergeant, City of Lowell Police Department

Stephen Gendreau - Lieutenant, City of Lowell Police Department

Justin Howard - Transportation Program Manager, Northern Middlesex Council of Governments

Tom Miliano - Senior Director, Administrative Services, UMass Lowell Administrative Services

Peter Murray - Director of Campus Recreation, UMass Lowell Campus Recreation

Nicholas Navin - Parking Director, City of Lowell Parking and Garages

Ruairi O'Mahony - Director - Sustainability, UMass Lowell Administrative Services

Nick Piscitello - Director - Administrative Services, UMass Lowell Administrative Services

Ali Sarault - Manager, Lowell Regional Transit Authority

Aaron Smith Walter - Assistant Professor, UMass Lowell Department of Political Science

William Taylor - Superintendent, City of Lowell Police Department

Craig Thomas - Deputy Director, City of Lowell Planning and Development

Diane Tradd - Assistant City Manager/Director, City of Lowell Planning and Development

Natasha Vance - Transportation Engineer, City of Lowell Planning and Development

Jon Victorine - Director - UCAPS & Security Technology, UMass Lowell Security Technology & UCAPS

Beverly Woods - Executive Director, Northern Middlesex Council of Governments

Study Background

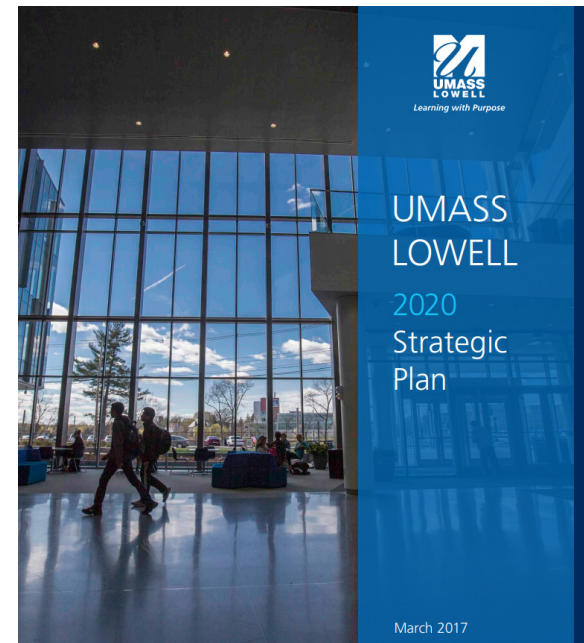
This Transportation Master Plan Update seeks to build on the successes since the last plan in 2011 and expand partnerships with the City of Lowell, MBTA, MVRTA, LRTA, NMCOG, MassDOT, and others. This shift in emphasis toward a more holistic and partnership-based approach allows for greater opportunity and mutual benefit as the City of Lowell and the Greater Lowell Region confront regional transportation challenges and congestion and profound changes in transportation and technology that are changing the way people travel. A collaborative approach, working across jurisdictions also better reflects the regional nature of transportation challenges for commuter students and a region struggling with roadway congestion and decades of infrastructure geared toward processing vehicles efficiently at the expense of those on foot, travelling by bus or on a bike.

Strategic Plan

The University's 2020 Strategic Plan is built on five (5) pillars including: I. Transformational Education, II. Global Engagement & Inclusive Culture, III. Innovative Research & Entrepreneurship and IV. Leverage Our Legacy and Our Place and V. Entrepreneurial Stewardship. Many key strategic priorities contained in the plan heavily rely on creating an inviting, comfortable, easily navigable world class campus. Below are some of those key strategic priorities that this plan supports (emphasis added):

PILLAR 1

Seeks “to create a year-round university and the infrastructure to support it that provides students with world class amenities...” and “Enhance student, faculty, and staff engagement in sustainability initiatives that promote the university as a living laboratory, locally, and globally” and “Establish UMass Lowell as an urban-focused center of excellence for climate change, sustainability, and resiliency that merges expertise in academics, research, and operations”



This Plan builds on the five pillars of UMass Lowell's strategic plan

PILLAR 2

Seeks to “Develop partnerships with the city of Lowell that encourage mutually beneficial economic development and create opportunities in the areas of entrepreneurship, education, workforce development, cultural partnerships, transportation, and infrastructure.”

PILLAR 3

Seeks to “Build recognition and support for UMass Lowell as a one campus/one academic community, in all its interactions and mix of participants.”

PILLAR 4

Seeks to “develop partnerships with the City of Lowell... in the areas of... transportation and infrastructure.” It also seeks to “create and sustain partnerships and collaborations... that provide mutual benefits to students, faculty, staff, alumni, and the community.”

PILLAR 5

Seeks to “strengthen collaboration with city and community... to identify mutually beneficial strategies to promote one campus, one city.” It also seeks “to implement sustainable practices” including “transportation initiatives.”

The 2011 Transportation Master Plan addressed a broad range of mobility challenges stemming from rapid enrollment growth. Since that time with its partners at the City and at the RTAs, the University has invested in policy, program, and infrastructure improvements including:

Parking Pricing – Parking permit prices for students, faculty, and staff have increased, better reflecting the costs to provide parking and helping to reduce demand (at the same time, UMass Lowell has provided discounts as an incentive to support carpools and vanpools)

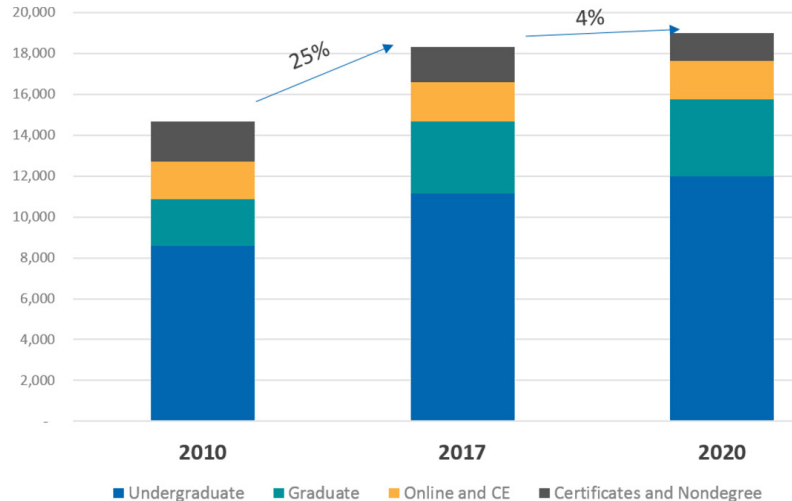


Figure 1 UMass Lowell Enrollment Trends

Source: UMass Lowell Common Data Set 2017-2020

Reduce Parking Construction – The University has built fewer parking spaces per resident bed and supported car-lite living by providing services such as Zipcar

Infrastructure and Transit – As a result of collaboration with partners at the City and Enel Green Power, TIGER grant funding was awarded to upgrade bridges, allowing improvements to bus service

Intersection Improvements – Working with MassDOT and the City of Lowell, intersection improvements such as signal re-timing and multi-modal upgrades have been implemented improving safety, access, and operations for both the University and City residents, workers, and visitors.

In addition, a comprehensive suite of Transportation Demand Management (TDM) programs has been implemented, class schedules have been adjusted to help reduce peak hour congestion on City streets, an occasional parking program has been implemented, and a new bikeshare program has been successfully launched.

These new programs support a better quality of life for staff, faculty, and students since there is now greater transportation choice, convenience, and affordability than ever before. The metrics are there to support this: drive alone mode share has declined amongst students and Roadster ridership has steadily increased. The net result is fewer single occupancy vehicle trips on local roadways and less pressure on local infrastructure.

However, in recent years, progress in reducing vehicle trips¹ has flattened and underlying challenges remain. Principally this includes a lack of clear connectedness between campuses, resulting in conflicts among walkers, cyclists, and vehicular traffic particularly at major intersections, spillover parking, continued reliance on vehicular trips for inter campus trips and especially daily commuting to campus.

¹ As measured by parking demand tracked by parking lot gate entries

Study Goals

Five key project goals were developed with the Steering Committee and with assistance from Campus Planning, the Office of Sustainability, and Administrative Services. Each goal has a specific list of objectives that will help to realize the goals.

1. Limit Adverse Impacts to the City of Lowell

- » Control spillover parking
- » Reduce intersection congestion
- » Reduce points of conflict with walking and biking students
- » Find mutually agreeable solutions to transportation network opportunities with the City

2. Reduce Inter-Campus Driving

- » Improve walk/bike safety
- » Reduce physical barriers to walking and bicycling

3. Create a Connected Campus

- » Provide new multi-modal connections and improvements
- » Identify continuous walk/bike corridors between destinations

4. Reduce Driving on Campus

- » Provide incentives to not drive or to park remotely
- » Provide new off-campus transit connections and incentives
- » Provide greater parity between the cost and convenience of driving and traveling by other modes

5. Establish Measures of Success

- » Track and measure the effectiveness of programs and improvements
- » Establish regular communication protocol and partnership with the City
- » Further role as a regional leader/test bed for sustainable transportation and model for City-University Collaboration



Plan Process

The Transportation Master Plan Update is the result of extensive outreach and participation of both UMass Lowell and its partners at the local, City, and regional level. A transportation survey and open house were promoted via traditional print media, by direct invitation, social media, and a dedicated webpage.

Whom We Heard From:

- » 3,840 transportation survey responses
- » Three meetings with a Steering Committee reflecting a broad array of local and regional stakeholders
- » A Public Workshop with 150 attendees
- » Regular Bi-Weekly Coordination calls and in-person meetings with Department of Campus Planning, the Office of Sustainability, Administrative Services
- » City of Lowell officials, LRTA, MVRTA, and NMCOG

Data Sources:

- » DEP Survey Reports/raw data
- » Prior City Plans and Policy Documents
- » UMass Lowell's 2011 Master Plan, 2016-2021 Strategic Development Plan and UMass Lowell Climate Action Plan
- » Multi-Modal Traffic Counts
- » Information on Existing UMass Lowell transportation programs and participation levels
- » Home residence zip code data for UMass Lowell affiliates
- » Parking policies, inventory, and utilization counts



Figure 2 Open House, September 2017, 150 Attendees

STEERING COMMITTEE MEMBERS

- **UMass Lowell Representation:** UMass Lowell Chief of Police, Campus Planning, Transportation and Parking, Office of Sustainability, Student Affairs, Administrative Services, Campus Recreation, and Student Government.
- **UMass Lowell Partners:** City of Lowell (City Planning and Development, City Engineer and Chief of Police), LRTA, MVRTA, and NMCOG

Transportation Survey Findings

A transportation survey was distributed campus-wide amongst staff, faculty, and students in the fall of 2017. Survey questions sought to gather information about current travel habits, test awareness of current UMass Lowell transportation programs and receptiveness to potential new programs. A summary of the key findings is provided below by mode.

Driving

- » Most employees drive alone to work
- » 64% of commuter students¹ drive alone; resident students² rarely drive
- » Among a list of primary reasons for driving alone, time and convenience rose to the forefront among SOV drivers, however approximately 1/3 of SOV drivers cited emergency or errands as their need to drive

Transportation Demand Management (TDM)

- » Low awareness of some programs such as emergency rides home (ERH)

Walking

- » Most feel safe walking on and near campus and feel drivers respect traffic laws
- » However, pedestrians are concerned with poor lighting at night
- » Intersection signal timing is considered unfavorable to walkers

Cycling

- » Biggest barriers to additional cycling: Poor bike infrastructure near and between campuses
- » Insufficient bike parking/storage on campus

1 Commuter students include both students who live off campus in local apartments and those who commute from their family homes

2 Students who live in on-campus residence halls

Campus Shuttles

- » Shuttle service good, but issues remain: travel times perceived as too long
- » Shuttles are not available to most off-campus employee and student residence locations

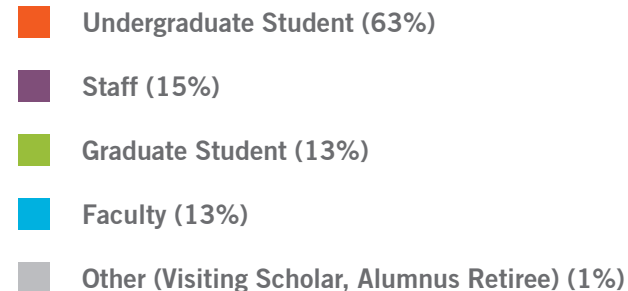
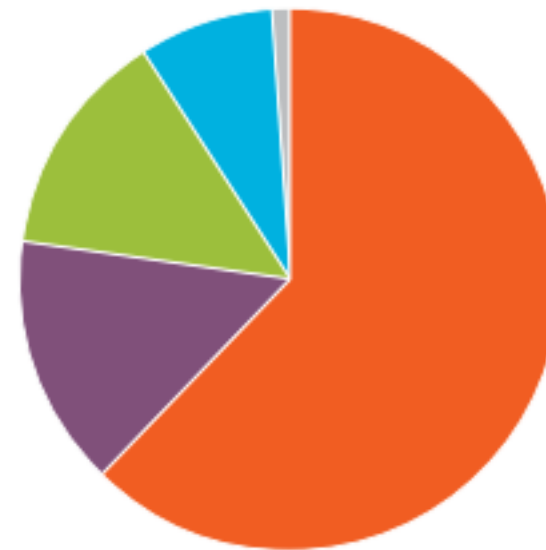


Figure 3 2017 Transportation Survey Participants

Alignment with City & Regional Needs

UMass Lowell has spent the last decade aggressively developing, improving, and implementing new transportation programs. Today it consistently ranks above its peers in TDM program offerings and has made a corresponding reduction in the numbers of staff, faculty, and students driving solo to campus. Progress has been marked, but in recent years has slowed as measured by the drive alone mode share. This presents an ongoing challenge, but also an opportunity to take stock of changes in the transportation world since the last Master Plan and to identify new ways to penetrate the University's commuting population market.

In this regard, this plan represents not only the next phase in the University's transportation programs but necessitates a broader geographic reach. This is the alignment with the City and overall regional needs. For example, both the City and UMass Lowell would benefit from enhanced regional transportation services and infrastructure. This includes expanded Park and Ride services, better and more connecting last-mile services from the Lowell Commuter Rail Station, and more one-seat rides on local buses between staff and student homes and the campus. The only way to achieve these goals is to identify and develop strategies of mutual benefit.

UMass Lowell Vehicle Trips 2011–2016

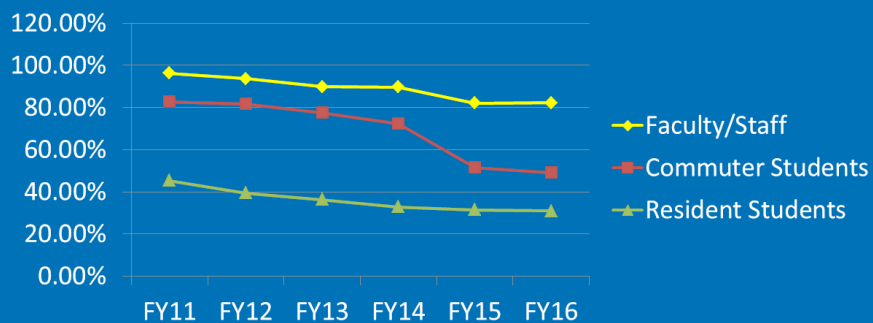


Figure 4 Trends by Campus Affiliate in UMass Lowell Vehicle Trips 2011-2016



A key strategic priority for UMass Lowell, as expressed in the strategic plan is to “Build recognition and support for UMass Lowell as a one campus/one academic community, in all its interactions and mix of participants.” – UMass Lowell 2020 Strategic Plan

Institution	Affiliates	Parking Spaces	Ratio
University of Massachusetts Lowell (UMass Lowell)	20,100	7,300	0.36
Virginia Commonwealth University (VCU)	38,000	13,000	0.34
University of Wisconsin-Milwaukee (UWM)	29,100	3,900	0.13
University of Maine (UMaine)	13,900	6,734	0.48
University of New Hampshire (UNH)	19,000	7,125	0.37

Figure 5 UMass Lowell's ratio of parking supply to campus population is slightly above average compared to its self-identified regional academic peers. This suggests little pressure to add parking.

Key Findings

Below is a summary of key findings based on the project team's review of existing data, field observations, survey information, and discussions with the Steering Committee. A more comprehensive summary of existing conditions and findings is included in a series of slides in the Appendix.

Overall Observations

- » UMass Lowell population growth is flattening
- » Progress in reducing driving to campus is slowing
- » Campuses feel disconnected

Driving & Parking

- » Despite very high rates of utilization in prime locations, even at the peak demand period, nearly 40% of the total campus parking supply is available
- » However, this is mostly in less desirable locations, further from classrooms and office space and there is variation between North, East and South campus
- » The availability of free unrestricted public parking on neighborhood streets near campus is contributing to spillover, as



- students and others seek to avoid the requirement that all users pay for on-campus parking
- » Core lots are congested during peak periods, while many remote lots, such as the 1001 Pawtucket Lot, have low utilization, suggesting there is little pricing or other incentive to park remotely
- » 64% of commuter students and 93% of employees drive alone to campus, only 10% of resident students report driving alone

Transportation Demand Management

- » UMass Lowell has implemented most of the programs recommended in the last Transportation Master Plan
- » It is generally ahead of peers in TDM offerings (see Figure 6.)
- » There is low awareness of a number of programs such as Emergency Ride Home, Reserved Carpool Parking



Walk

- » The quality, condition, and capacity of pedestrian infrastructure in key locations does not align with high levels of pedestrian demand
- » 41% of resident students and 18% of commuter students walk as their primary mode. This compares favorably to cities with more robust transit systems
- » 40% of all drivers use their cars to travel between campuses – this percentage might be reduced with better walk/bike infrastructure and amenities

Bike

- » The regional network stops short of campus
- » The city's bicycle network is limited and needs completion on key corridors, such as Pawtucket Street. Cities in Eastern Massachusetts are adding bicycle lanes to cater to growing demand.
- » Bike culture on campus is strong, outdated racks have been replaced, but there is a need for more weather-protected, secure racks

Transit

- » Lack of regional bus service directly serving campus is a significant hurdle to realizing mode shift away from Single Occupancy Vehicle (SOV) travel
- » While this is a hurdle it is also a significant opportunity to collaborate with local RTAs
- » Refreshed transit branding and improved bus stop amenities will support continuing growth of the Roadster System



Recommendations

The following section is organized around the key themes listed below:



A. Positioning for Transportation & Technology Upheaval



B. Wins for the City of Lowell and UMass Lowell



C. Regional Transportation & Leadership



D. Solutions to Address Congestion & Improve Safety



E. Removing Walking, Biking and Transit Barriers



F. Transportation Demand Management & Leveling Costs



G. Messaging & Communications Consolidation



A. Positioning for Transportation & Technology Upheaval

Mobility and more specifically how staff, students, and faculty commute and travel between destinations once at campus is changing rapidly. Information is delivered real-time to personal phones, Lyft and Uber have filled a gap between traditional regulated taxi services and fixed route transit, carpooling apps make it easier to share rides, and parking apps allow advance-planning on where to park.



Figure 6 Mobility Choices are Expanding

RECOMMENDATIONS

- A.1. Planning for a Shared Transportation Future
- A.2. Perform Feasibility Study to Identify Benefits of Shared Transportation Services
- A.3. Identify Curbside Areas for Potential Rideshare Drop-off Locations
- A.4. Promote UMass Lowell and City as a Local Laboratory for Existing and New Transportation Programs
- A.5. Further mine In-house Expertise and Academic Excellence.

A.1. PLANNING FOR A SHARED AUTONOMOUS TRANSPORTATION FUTURE

The automobile revolution went from the first Benz in 1885 to ubiquitous Model A technology in 45 years; we are already 25 years into the next mobility revolution, which has fundamentally changed how a generation of Millennials travels, but the importance of thinking ahead for the next 10 years cannot be overstated. Otherwise the decades of private automobile-oriented infrastructure, disproportionate infrastructure spending, and deleterious environmental impacts will embark on a new phase.

College campuses are actively embracing a future of shared autonomous transportation services. This fall, small, autonomous shuttles will carry students between the University of Florida and Downtown Gainesville. The University of Michigan is also piloting two vehicles on a section of campus this spring. This is indicative of a nationwide trend toward shared, vehicle autonomy.

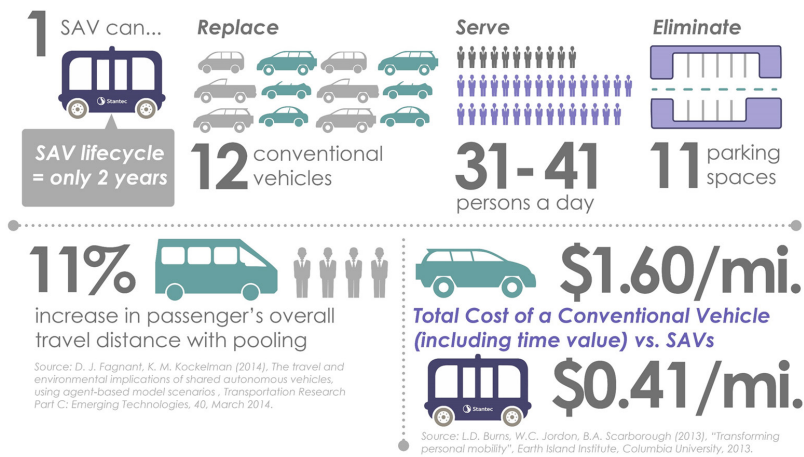


Figure 7 The economics and convenience of smaller, shared autonomous vehicles (SAVs) is compelling and is already causing a shift away from conventional modes of motorized travel. Institutions that position themselves for these changes now, will be in a stronger position to benefit from rapid advances in technology.

Source: Stantec

While vehicle autonomy at UMass Lowell and within the City of Lowell may be beyond the lifetime of this Plan, shared, on-demand services are already present. And this presents an opportunity to get ahead of the curve and partner with service providers. For example, Uber Express POOL provides discounted shared rides in cities with large numbers of students, including Boston. These services present an affordable, often more convenient alternative to traditional fixed-route transit services.

In fact, many schools, such as University of Colorado at Boulder have seen declines in ridership on certain routes and late-night shuttles as students are preferring to pay a premium for the convenience and availability of on-demand services. This has implications for college parking and transportation departments seeking to reduce inefficiencies and cut costs. Numerous questions remain however. For example, the MBTA recently reported that on-demand services have eaten into transit ridership levels and added

to roadway congestion.¹ Those that plan today will have a head-start on solving some of these challenges and are more likely to arrive ahead of the competition in providing more cost-effective, space-efficient and demand-responsive transportation.

Reflecting the integrated nature of today's travel across different modes, transportation services and jurisdictions, the following key recommendations depend upon close collaboration both with the City of Lowell and local public and private service providers. Universities and especially students are early adopters, so while AV technology may seem far away, it is likely to emerge earlier on the UMass Lowell campus than elsewhere in the region.

1 <https://www.bostonglobe.com/business/2018/05/01/there-were-nearly-uber-and-lyft-rides-day-boston-streets-last-year/yzOWJ9PdVg8KKQMKSFS2K/story.html>

Benefits	Individual	Shared
Traffic safety	✓	✓
Time for productivity or leisure	✓	✓
Expanded mobility for those unable to drive	✓	✓
Fluidity of traffic flow	Unlikely	Enhanced
Reduced emissions	Possible	Enhanced
Reduced vehicle congestion	Unlikely	Enhanced
Increased land availability (less need for land-hungry parking)	Possible	Enhanced

Figure 8 Benefits of individual versus shared autonomous vehicles (AVs)

Source: Nelson\Nygaard

A.1.a. Plan for Comprehensive Mobility: This means planning for and making improvements that address the entirety of a trip and not just one leg of a journey. For example, improvements that focus both on transit service and how people can get to transit stops will be more successful than the traditional approach of addressing improvements based purely on traditional metrics of service frequency and ridership levels. This also means identifying opportunities for more seamless travel between ride-hailing services, local transit, and the Roadster system. At a basic level this means providing staff, faculty, and students with better information about non-UMass Lowell services. An umbrella-based approach to transportation, that embraces all legs of a journey and is gaining traction includes:

A.1.b. Mobility as a Service (MaaS): MaaS is the integration of various forms of transportation services (public and private) into a single mobility service accessible on demand. This could combine trip planning and fare payment functionality. Private-sector MaaS tools may also add trip booking and creative partnerships and incentives, and some are creating subscription payment models. At its core, MaaS relies on a digital platform that integrates end-to-end trip planning, booking, electronic ticketing, and payment services across all modes of transportation, public or private. It is a marked departure from where most service providers are today, and from how mobility has been delivered until now. Building a platform that allows someone to move among multiple modes for a single payment is a challenging task for both transit networks and technology firms. Transit providers such as UMass Lowell and the RTAs can start by improving access to their own high-quality, real-time information, and looking for opportunities to push private providers to do the same when opportunities arise.

A.1.c. Build Parking Decks to Accommodate Planned Adaptive Reuse: Shared Automotive Vehicles (SAVs) are anticipated to drive down demand for parking as vendors provide shared vehicles replacing private vehicle demand. Longer-term as the campus is further built-out and surface parking lots are re-developed to meet campus program needs, as an alternative to a single-purpose standalone structure that will likely lay empty during off-peak periods, an adaptive reuse garage could be constructed. This would be a sufficiently flexible structure that would allow a transition from parking to a variety of

other uses as parking demands decline. This both nationwide and local precedent: Dana Farber Cancer Institute recently backfilled a building constructed in the 1970s that was deliberately designed to accommodate parking in its first phase of life, while allowing for conversion to office space in the future.

A.1.d. Build Advanced Technology into Every Project (Public Realm + Private Buildings): Trends are moving away from gas and diesel-powered vehicles and traditional higher-capacity transit buses toward smaller, electric-powered vehicles. Where feasible, in any new projects, opportunities should be explored to add amenities that support current and future consumer choice. This means accommodating a broader range of users by providing EV-charging infrastructure and also bike corrals, car-share, and drop-off areas instead of static parking catering to a handful of drivers. Examples of opportunities at UMass Lowell include:

- » Dedicating and signing curbside space at the University Suites on Aiken Street for ride-hailing services and car share
- » Providing residence hall travel information including not just UMass Lowell services but also the RTAs, MBTA, and private vendors

A.1.e. Create Adaptable Streetscapes: Excessively long turning-lanes, travel lanes more than 10-feet wide and curbside parking all present opportunities to re-assign right-of-way to better match current and future diverse travel modes. Specifically, UMass Lowell should work with the City to identify pilot areas to support current and future mobility needs. Roadways with high-levels of demand and from different modes, such as those at North Campus at University Crossing should be prioritized for streetscape improvements.

A.1.f. Mobility Hub: The southern section of the commuter student parking lot at north campus adjacent to the carpool lot, where observed parking demand is highest and there is a high-degree of congestion could be re-configured and designated as a site for a mobility hub including a designated ride-hailing area, bikeshare, carshare, and information totem including real-time bus information. The north campus bus hub is also a potential candidate for microtransit pick-up and drop-off discussed below.

MOBILITY HUBS

Mobility Hubs provide multiple transportation choices all in one site. They offer a variety of services and amenities such as ride-hailing loading zones, commuter shuttle stops, real-time transit information, electric vehicle charging stations, transit pass sales kiosks, bike and car share parking, and secure bike lockers. Mobility hubs can encourage riders to try more sustainable commute modes by improving access and connectivity.

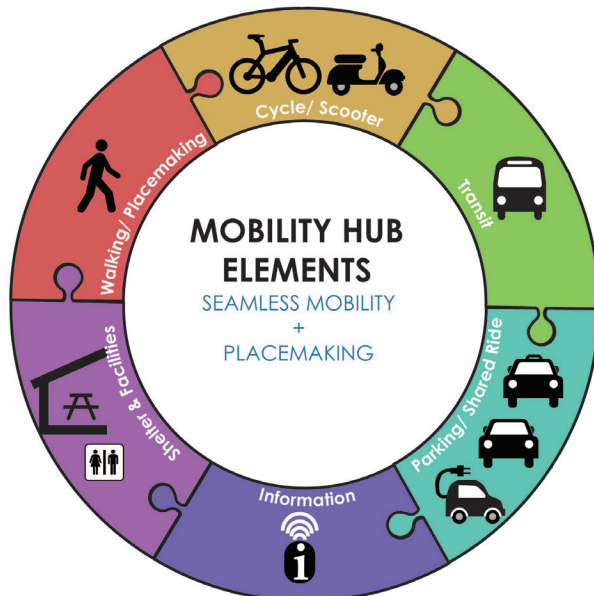


Figure 9 EsyMile is a global provider of last mile solutions and one of a number of potential partners for UMass Lowell

A.1.g. Last Mile AV Pilot: Many public transit agencies and university campuses including those with robust ridership on core, trunk lines are struggling to justify the expense of providing low-ridership feeder routes, off-peak services, and last-mile solutions. So-called “microtransit” – operated with smaller, more flexible electric vehicles – is filling this gap and may provide a useful solution to address some of UMass Lowell’s last mile challenges particularly as regards providing access to remote parking facilities and connections to Lowell Commuter Rail and the Gallagher bus terminal. With this in mind, UMass Lowell should work with private vendors, the City, RTAs, and MBTA to pilot 1) A new microtransit service providing a last mile connection between Lowell Commuter rail station/the Gallagher Transportation Terminal and campus; and 2) Longer-term this could be supplemented and even replaced with an autonomous, on-demand service, similar to that pictured in Figure 9.

- » Potential routing could include stops at University Crossing and North Campus transit hubs

A.1.h. City of Lowell/Municipal Solutions:

Eliminate Minimum Parking, Enforce Maximum Parking, and Utilize it as a Shared Resource: This is a strategy necessary at the municipal level. Like most municipalities, the City of Lowell currently requires parking minimums, without regard to a) whether this meets actual, observed demand and b) whether current parking supply may be excessive to existing and future needs. At UMass Lowell, with space at a premium and in a landlocked setting it will be essential to identify opportunities to use available parking resources efficiently and with enrolment flattening there is an opportunity to re-evaluate how existing surface lots are used.

Smart City Solutions: The City should pursue opportunities to employ “smart city” solutions that use technology to better manage traffic flows and communications between different modes and provide data to help better plan for investments. For example, next-generation smart traffic signals synchronize more efficiently during peak traffic periods by altering phasing and timings to meet real-time traffic flow needs. Lights stay green on high-volume roads for longer periods, rather than using pre-set color phase timings that contribute to congestion and inefficiency.

A.2. PERFORM FEASIBILITY STUDY TO IDENTIFY BENEFITS OF SHARED TRANSPORTATION SERVICES AND PROGRAMS

As discussed above, transportation and technology are changing the way we travel and at college campuses and especially amongst students where price is a prime consideration, there is less car ownership and openness to the “sharing culture”. At a minimum this Plan recommends:

- » Identifying levels of shared-ride and on-demand usage amongst staff, faculty, and students
- » Determine overlap with existing UMass Lowell-funded services and whether coordination with a service provider could save costs and/or enhance UMass Lowell’s transportation programs



Figure 10 Shared, Autonomous Shuttle Service at University of Michigan

Source: <https://www.caranddriver.com/news/driverless-shuttle-buses-will-transport-students-on-michigan-campus-video>

A.3. IDENTIFY CURBSIDE AREAS FOR POTENTIAL RIDESHARE DROP-OFF LOCATIONS

UMass Lowell currently offers a discounted Zipcar program. This satisfies staff, faculty, and student needs for short, daytime trips between local destinations. However, there are additional, unmet demands such as trips between campus and the commuter rail station and even commuting needs that are not satisfied by car share or existing traditional services and that are increasingly served by on-demand services. This reflects nationwide trends and especially student needs for cheaper and more convenient transportation alternatives. A number of colleges such as LSU and Temple University have formed partnerships with ridesharing companies to help solve transportation challenges. This plan recommends:

- » Identifying pick-up and drop-off locations with the highest strategic and operational value¹, while balancing safety needs

¹ This means harnessing both the data through tools such as “shared streets” to understand where drop-off activity is highest and then re-thinking how curbside space is prioritized and designed.

- potential conflicts with transit, walk, and bicycle operations
- » Priority locations include high-demand, high-visibility parking lots at the North Campus such as Riverside A, and either employee parking lots at University Crossing, and/or a section of the visitor parking lot either on Pawtucket Street or Salem Street
- » Rideshare areas are typically marked with signage and if curbside, paint. It is recommended that initial locations are piloted to test effectiveness

A.4. PROMOTE CITY AND REGION AS A “LOCAL LABORATORY”

The ability to implement new transportation programs is both a direct benefit to UMass Lowell and the City and also an opportunity to promote UMass Lowell, Lowell, and the region as a hub of innovation and technology. As much as possible, UMass Lowell and its partners should promote joint transportation initiatives to help UMass Lowell’s and the City’s competitiveness in attracting new residents, students, staff, and faculty. Some examples of this are provided below:

- » Share successes such as the Regional Transit Pass program, TIGER application
- » Benchmark progress such as increases in ridership, grant monies jointly won
- » Formalize communications with partners at City, MassDOT, MPO, LRTA and others: including hosting quarterly meetings to review program performance, shared goals, and help forward new initiatives

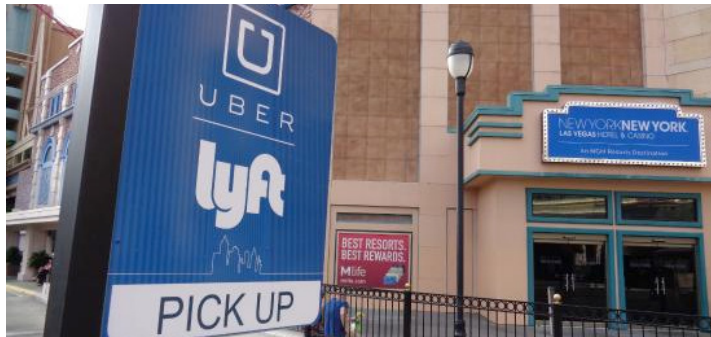


Figure 11 Transportation Network Companies (TNC) Pick-up Signage

Source: New York Hotel and Casino

A.5. FURTHER MINE IN-HOUSE ACADEMIC EXPERTISE & EXCELLENCE

As with many college towns, UMass Lowell, the City, and region provide both a test-bed for new transportation initiatives and an opportunity to mine in-house expertise. This is truer than ever as the world of transportation planning expands to include multiple disciplines and expertise including, and not limited to: IT, big data, vehicle autonomy, climate change, sustainability, engineering, infrastructure, health and wellness, and environmental studies. Opportunities internally include:

- » Identifying Transportation Master Plan projects that could count toward UMass Lowell’s Sustainable Infrastructure Certificate
- » Working with the Francis College of Engineering and specifically candidates for the M.S. in Transportation Engineering to brainstorm and research campus transportation improvement projects
- » Developing a technology and transportation class to address the coming autonomous, shared vehicle revolution

A.6 EXPAND EV INFRASTRUCTURE

Data from the State Department of Environmental Protection (DEP) shows that number of electric vehicles in the state has grown from 780 in 2013, to 3,770 in 2017. The number of plug-in hybrids, which can also utilize gasoline, has also increased: from 1,030 to 5,700 in the same timeframe. Consistent with these statewide trends, use of on-campus Electric Vehicle charging stations at UMass Lowell has also grown and is anticipated to grow. To cater to this growing demand, it is recommended further EV charging stations are added. There are numerous benefits including reduced transportation-related GHG emissions,² better matching growing market demand for EV infrastructure, and providing high-visibility, sustainable infrastructure that can help influence consumer behavior.

2 The number one goal of UMass Lowell’s Climate Action Plan

SCHOOLS WITH IN-HOUSE TRANSPORTATION RESOURCES

New York University City Urban Mobility and Intelligent Transportation Systems Laboratory (UrbanMITS) - a collaborative effort between the university, state, federal governments, and industry.

University of Florida Transportation Institute – located in the College of Engineering, UFTI brings together faculty, staff, and students from diverse backgrounds to provide solutions to a variety of transportation problems.

EV infrastructure can also cater to growing use of electric scooters. These are an efficient and increasingly affordable option for shorter trips and perfect for travel between campuses. Bike lanes also accommodate electric scooters providing an additional reason for the City to work with UMass Lowell to improve bicycle infrastructure on key corridors such as Pawtucket Street.

“UMass Lowell’s commitment to EV charging infrastructure 100% influenced my decision to buy an EV as my daily driver for whenever I am not commuting by bicycle or bus. It changes the whole equation to know I can charge at work and that it isn’t just one symbolic “keeping up appearances” charger but an ongoing commitment to adding EV infra as new lots and opportunities open up. Without that, I probably buy a hybrid instead.” - UMass Lowell Staff



Electric scooters are gaining popularity as an ideal way to travel shorter distances such as “last mile” journeys. At the same time, cities such as Boston and MassDOT are auditing existing services such as Bird to determine whether they violate existing laws and how to better accommodate demand for the scooters

Source: [bostonherald.com](https://www.bostonherald.com)

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B. Wins for the City of Lowell & UMass Lowell

The core recommendations in this plan recognize the mutual benefits to both City and University of taking a holistic approach to transportation. Unlike many campuses that function as one, independent self-contained jurisdiction, UMass Lowell is fully integrated into the City of Lowell. And by the same token, unlike other schools that have an internal campus transportation network, a transportation win for UMass Lowell is a win for the City of Lowell.

This fact presents a great opportunity to develop transportation projects that are of mutual benefit and that improve travel choice, safety, convenience, and cost for UMass Lowell stakeholders and City residents, business owners, and visitors.

Projects of Immediate Mutual Benefit. In the short to mid-term, a number of key areas will benefit from a collaborative approach. This includes addressing spillover parking impacts areas where UMass Lowell affiliates are competing for limited curbside parking with local residents. While this is a challenge for both the City and UMass Lowell, it also represents an opportunity to capture revenue in currently unmetered and unregulated areas and to re-invest those revenues in local improvements and repairs. UMass Lowell also contributes to peak-hour vehicular traffic flows and the daily flows of parkers, pedestrians, cyclists, and others, during class changeover can create conflicts on key corridors such as University Avenue. This is

“ There are numerous areas of opportunity and mutual benefit, such as the University’s contributions to the City’s growing multi-modal culture and the opportunities to jointly pursue public transportation dollars for roadway improvements.

also an opportunity to re-think transportation infrastructure spending which has historically been focused on processing vehicles as opposed to providing walk, bike, and transit infrastructure.

Pursuing Transportation Excellence Together. Beyond immediate projects relating to the campus and its impacts on the local community, there is a host of strategies that embrace the university’s location in a historic city with a robust transit system, a network of sidewalks, a growing local and regional bicycle network, and proximity to regional commuter rail services that provides a 45-minute trip to Boston on average. These attributes give the City and University a competitive edge not only when attracting investment and new staff, students, and faculty but also when planning for an

WINS FOR THE CITY OF LOWELL & UMASS LOWELL RECOMMENDATIONS

B.1. Reduce Incentives to Park on Neighborhood Streets and Increase Parking Availability in Other Areas such as East Campus

B.2. Reduce Peak Hour Car Traffic to UMass Lowell

B.3. Work with Partners at MassDOT and City to Implement Multi-Modal Roadway Improvements

B.4. Help position City for Infrastructure Funding Opportunities such as Vision Zero, SRTS, and Complete Streets

Recommendations contained in Sections C, D and E also contain strategies that are of direct benefit to both UMass Lowell and the City of Lowell

autonomous, shared transportation future, roadway congestion, and safety challenges. The fruits of this approach have already been realized including successful application for TIGER grant funds in reconstructing and refurbishing bridges. The challenge is how to continue this progress and achieve better and further transportation wins for both the University and City.

B.1. WORK WITH CITY TO REDUCE INCENTIVES TO PARK ON NEIGHBORHOOD STREETS

Spillover parking occurs around all three campuses, adding to congestion and conflicting with local residential and business curbside needs. This affects the City both from the perspective of competition for limited curbside space and also in lost revenue. It is recommended that UMass Lowell work closely with the City to:

- » Expand Residential Parking Permit (RPP) areas in locations where University parkers are conflicting with local users
- » Use meter pricing in congested areas to discourage long-term parking
- » Reduce meter rates to encourage parking in underutilized locations, such as on-street parking along Father Morrisette Boulevard, to take advantage of existing available supply
- » Expand access to on-street parking spaces on Father Morrisette Boulevard, which has available capacity
- » Increase public parking rates in spillover areas where higher on-campus rates incent parking on the public streets surrounding North, East, and South campuses

B.2. REDUCE PEAK HOUR CAR TRAFFIC TO UMASS LOWELL

The University is actively committed to reducing peak hour traffic congestion. Where feasible, class schedules have been adjusted, office hours shifted to off-peak, and Transportation Demand Management Programs have seen increased participation. The success of continuing to reduce peak hour congestion will depend not only on the University's own, internal policies, but also the ability to shift local City culture and habits toward non-SOV modes. In this regard, reducing peak hour congestion is a multi-pronged effort that goes beyond simply shifting or reducing existing vehicular traffic levels. The following are key recommendations:

- » Implement multi-modal improvements on key roadways to incent a greater number of trips on foot, by bike, and in transit, including: Upper Merrimack Street, Pawtucket Street, the Lord Overpass, Aiken Street, and connections to Gallagher Terminal. This targeted approach builds a foundation of connected, multi-modal roadways that are currently more heavily geared toward vehicular travel. Improvements will provide a safer and more visible network for both existing cyclists and those on foot and for those interested in travelling in non-SOV modes
- » Direct-market those TDM programs that help to reduce peak hour congestion such as the Regional bus pass program, carpool, and commuter rail service
- » Relocate evening classes from North Campus to reduce impacts to bridge congestion at PM peak hour.

TUFTS UNIVERSITY EMPLOYEE ELIGIBILITY RE: TELECOMMUTING

The employee has positive performance evaluations...

The employee can work independently...

The employee has the flexibility to periodically work on campus

...The following conditions make telecommuting unsuitable:
Equipment, materials, and files necessary to the position can only be physically accessed on Tufts property

Face-to-face contact with supervisors, other employees, clients, or the public on Tufts property is a regular and integral part of the position responsibilities

Source: <https://access.tufts.edu/get-work-done/benefits-resources/work-life-balance/workplace/telecommuting-guidelines>

WHAT IS VISION ZERO?

The overarching goal of Vision Zero is to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all.

By committing to Vision Zero the priority is shifted from speed to safety, with the philosophy that crashes can be avoided if streets are designed to protect all people.

The Massachusetts Vision Zero Coalition has successfully led efforts to build public support for Vision Zero, improve proposed street designs, influence legislation, and hold city leaders accountable.

Source: <https://visionzeronetwork.org/about/what-is-vision-zero>

- » Re-visit campus-wide and Departmental policies as regards telecommuting for certain staff positions that do not require a presence on-campus
- » Explore further adjustments to class start times and official office hours

B.3. HELP POSITION CITY FOR INFRASTRUCTURE FUNDING OPPORTUNITIES SUCH AS VISION ZERO, SRTS, AND COMPLETE STREETS

Collaboration between UMass Lowell and the City will be critical to future funding success. This starts at the small scale. For example, coordinating with City DPW to understand road paving schedules and identifying opportunities to repaint lanes, crosswalks, or changes to street markings. It also means keeping an eye on private projects and opportunities to improve transportation mitigation measures such as signals improvements. Bigger-scale initiatives often start at the planning-level. Where the City is short on data and resources, opportunities should be explored to see if UMass Lowell can donate

time, expertise, and labor to help advance mutually beneficial projects. For example, the City may lack the resources to pilot Complete Streets concepts, but UMass Lowell could provide student labor and time to pilot curb extensions, parklets, and bike lanes using cones and paint. Sample program ideas include:

- » Safe Routes to School (SRTS) for Higher Ed (see Section D.)
- » Combining transportation programs with other initiatives such as education, health, and wellness
- » Working with the City and Massachusetts Vision Zero Coalition to advance Vision Zero Goals for the City
- » PARK(ing) day, an annual event to temporarily transform on-street parking spaces into parklets and public gathering places

B.4. WORK WITH PARTNERS AT MASSDOT AND CITY TO IMPLEMENT ROADWAY IMPROVEMENTS

In order to reduce congestion on shared roadways, it is essential to shift mode share toward more walk, bike, shared ride and transit. In order for this to happen, the City's roadways require safety improvements and better multi-modal accommodations. The project team recommends prioritizing a number of streets for improvement, starting with Pawtucket Street – a critical spine connecting South Campus to University Crossing, East Campus and the University Avenue Bridge, and North Campus. Specific recommendations include:

- » Implement multi-modal improvements, including lighting, geometric changes, signage, and striping solutions, on key roadways and at key intersections to encourage increases in biking, walking, and transit usage. Priority locations include: Aiken Street, Pawtucket Street, Upper Merrimack Street, the Lord Overpass, and connections to the Gallagher Terminal.

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C. Regional Transportation & Leadership

UMass Lowell is a direct beneficiary of a strong collaborative relationship with both MVRTA and LRTA. For example, since the Regional Transit Pass Program was implemented in 2017, LRTA has seen 9,000 UMass Lowell affiliated riders during peak ridership months in the academic year. This represents a significant and growing percentage of total ridership and a significant diversion of vehicular traffic removed from regional roadways.

However, the 64% of commuter students travel by car to campus each day and 93% of employees. Given that transit is made available to all university populations at no charge to the rider, the main hurdle to greater levels of bus ridership is greater convenience. Survey respondents also indicated that primary challenges to transit include the lack of nearby transit service to campus from surrounding communities and New Hampshire and Boston. The current transit system does not offer a one or even a two-seat ride for many of the commuter students, staff, and faculty. The most effective campus shuttle systems provide an on-site hub.

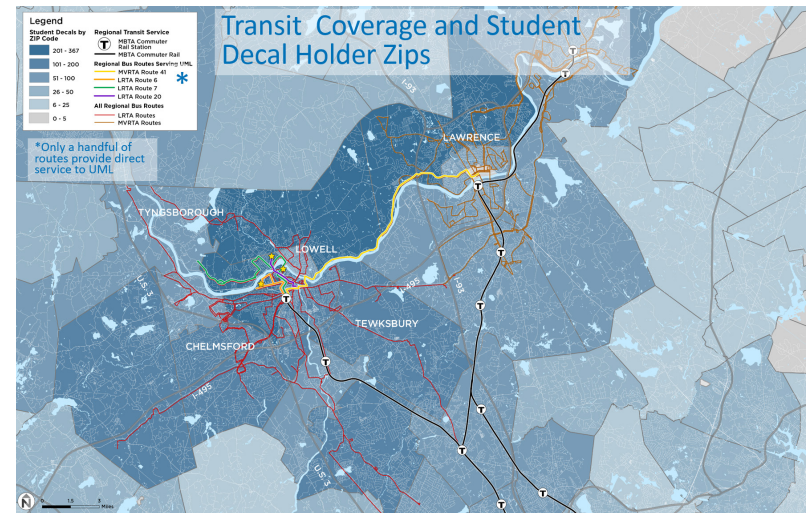


Figure 12 5% of Students Report Taking the LRTA and MVRTA Buses

REGIONAL TRANSPORTATION & LEADERSHIP RECOMMENDATIONS

- C.1. Provide more direct and one-seat ride service
- C.2. Remove Last-Mile Barriers to Campus
- C.3. Work with Partners to Identify More Regional Intercept Points
- C.4. Develop Leadership Around Regional Transportation Challenges
- C.5. Re-engage with Local Transportation Management Association (TMA), Middlesex 3 Coalition
- C.6. Coordinate with Long-Range Plans for extension of Lowell line to Nashua/Manchester, stop at UMass Lowell

C.1. PROVIDE MORE DIRECT & ONE-SEAT RIDE SERVICE

Currently only four RTA routes¹ directly serve campus. Roadster currently provides high-frequency service between campuses, but for those commuter students and staff without easy access to bus service, there are few convenient alternatives for daily commuting. With the introduction of the Regional Transit Pass, UMass Lowell has seen a significant leap in ridership on RTA services. There is significant potential to further increase ridership levels with provision of the following types of services:

- » More frequent direct service between campus and the Gallagher Transportation Terminal/Lowell Commuter Rail Station
- » New direct service between areas of high concentrations of commuter students and staff and faculty and campus
- » Service between park and ride facilities/remote parking opportunities. Based on a zip map exercise, there are high concentrations of staff, faculty, and students in Dracut and Chelmsford with few if any direct services to campus

C.2. REMOVE LAST-MILE BARRIERS TO CAMPUS

Last-mile barriers represent a very real challenge to the value of regional transportation services. Upon arrival at Lowell commuter rail station, there is limited bus service to campus and no information or signage to indicate that there is a leading State university a short bus, taxi, or bike-ride away. This is a common challenge in the Boston region and nationally. The following solutions are recommended:

Work with the RTAs to:

- » Increase frequency of RTA services serving the Lowell Commuter Rail Station
- » Better match bus schedules to commuter rail schedules
- » Identify improvements to last-mile RTA routes including amenities for waiting areas, signage, lighting, weather protection
- » Better accommodate on-demand services such as Uber and Lyft

- » at the Gallagher Terminal and Commuter Rail station
- » Work with the City and MBTA to provide better signage from Gallagher Terminal to UMass Lowell²
- » Explore potential licensing agreement with RTAs and the MBTA to add UMass Lowell branding and signage at Commuter Rail Station and the bus terminal
- » Study and report time-savings advantages of Lord Overpass bus lanes
- » Coordinate with long-range plans for extension of Lowell line to Nashua/Manchester, stop at UMass Lowell.

2 <https://www.transit.dot.gov/research-innovation/mobility-demand-mod-sandbox-program.html> - last provided in 2016 under the Obama Administration



Figure 13 Opportunity to Add Signage at Gallagher Transportation Terminal
This might include: Welcome to Lowell, Home of the Riverhawks.

Source: GoogleMaps

1 MVRTA routes 41, LRTA routes 6, 7 and 20

LAST MILE/RIDESHARE CASE STUDY

North Shore Community College (NSCC) launched the innovative transportation partnership with Uber in 2016. The program connects MBTA bus and commuter rail to the NSCC's Danvers campus, by providing discounted trips to and from the Beverly Depot or the North Shore Mall in Peabody. When a student requests the North Shore Community College option, NSCC will automatically cover the first \$10 of the ride. The ride must remain within the program boundaries to receive the discount.



NSCC-UBER RIDE

C.3. WORK WITH PARTNERS TO IDENTIFY MORE REGIONAL INTERCEPT POINTS

With 93% of staff and faculty as well as 64% of student commuters travelling by car, despite being charged for on-campus parking, there is an opportunity to reduce the shares of commuters driving alone to campus by promoting financially attractive and convenient alternatives to driving alone.

The existing Park & Ride facility at Tyngsboro is at capacity and plans are currently afoot to expand it. UMass Lowell should work with partners such as the MPO to identify additional park and ride locations. Specific actions include:

- » Promote use of Tyngsboro park and ride lot – announce expansion to UMass Lowell community
- » Work with MassDOT to identify additional park and ride locations
- » Further incent use of 1001 Pawtucket Lot

In addition, the University should support the North/South Rail Link and the extension of the Lowell commuter rail line. The Cities of Lowell and Nashua have recently agreed to join a public-private partnership designed to expand passenger rail service to Nashua, Manchester, Worcester, and Providence that would pass through UMass Lowell's South Campus. The benefits of regional rail expansion extend to both the City and the region in easing roadway congestion, reducing peak-hour through-traffic on City streets, improving access to jobs and economic opportunities, and better connecting the City and campus to airports in Boston and Manchester.

C.4. DEVELOP LEADERSHIP AROUND REGIONAL TRANSPORTATION CHALLENGES

Existing initiatives such as the Middlesex 3 Coalition are pursuing a number of programs that provide natural alignment with UMass Lowell and City of Lowell transportation goals. The Middlesex 3 Coalition provides TDM programs including:

- » Vanpools, carpools and an emergency ride home program,
- » Transit benefits and ridematching,
- » Shuttle services (between Boston, Cambridge and Route 3) and last mile connections

C.5. RE-ENGAGE WITH LOCAL TRANSPORTATION MANAGEMENT ASSOCIATION (TMA), MIDDLESEX 3 COALITION

UMass Lowell should consider more of an active role in the Middlesex 3 Coalition, which also serves as the local Transportation Management Association (TMA) and advocacy group serving communities in the route 3 north corridor. Transportation Management Associations (TMAs) serve groups of organizations with shared geographies and transportation challenges, usually funded by annual dues that go toward funding TDM programs and day-to-day operations.

Middlesex 3 provides advocacy around regional transportation challenges and jobs including:

- » Better transportation linkages between employees and existing businesses;
- » And between public transportation services (i.e., LRTA and MBTA) within the Middlesex 3 Community Compact
- » Road, infrastructure and alternative modes of transportation improvements

Since UMass Lowell already provides a robust menu of TDM programs, there may be more benefit in exploring the benefits of the advocacy functions and potentially to explore assistance in solving last-mile challenges.

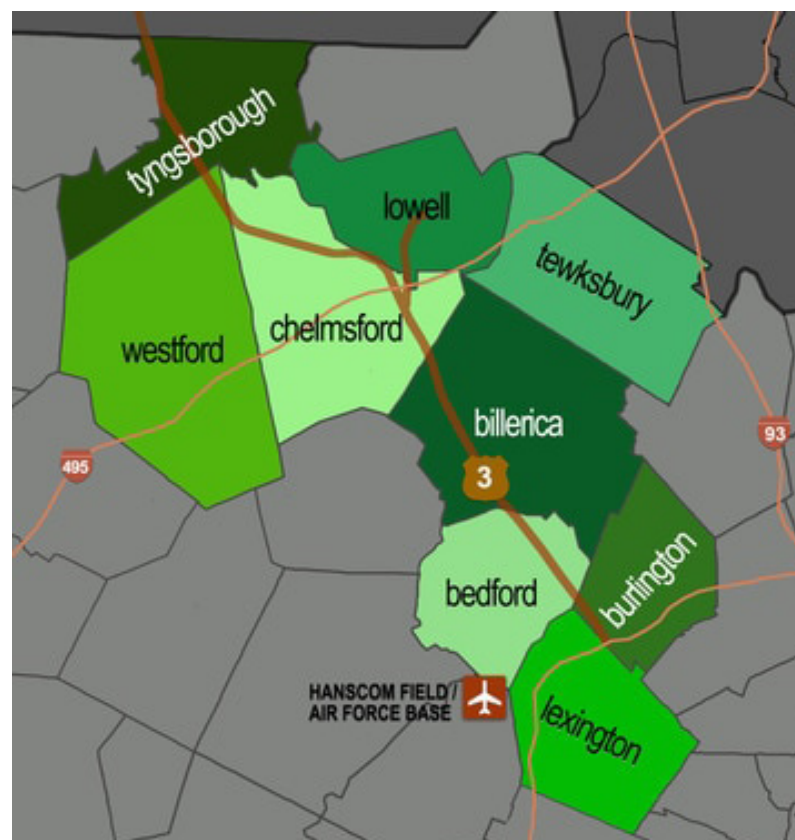


Figure 14 Middlesex 3 Coalition Membership
Source: <http://www.middlesex3.com>

“Transportation Management Associations (TMAs) are membership based, public-private partnerships of businesses, institutions & municipalities that are joined together under a legal agreement for the purpose of providing and promoting transportation solutions for commuters that reduce traffic congestion, improve air quality and increase access to economic development opportunities.”

Source: MassCommute



D. Solutions to Address Congestion & Improve Safety

Congestion levels on the streets surrounding campus are challenging especially during peak hours when schools are in session. Commuter traffic passing through Lowell to points north and south is funneled through a limited number of river crossings including University Avenue, creating conflicts between local traffic, and those crossing streets on foot. While vehicular demand reduction measures, such as improved bus service and cash incentives not to drive reduce pressure on roadways, the reality remains: in a bustling, vibrant college town with lots of foot traffic, there will always be competition for limited road space from a multitude of different users, ages, abilities, and travel modes.

The assumption can sometimes be that roadway and safety improvements for vehicles compared to improvements for those travelling on foot, by buses, or on a bicycle are at odds with one another. The reality is that the most successful roadways are public spaces that accommodate all modes and people of all ages and abilities. A more holistic and modally inclusive approach to key arterials that recognizes existing high volumes of people on foot and on bicycles, will benefit both the City of Lowell and UMass Lowell in advancing citywide goals for more equitable, affordable transportation.

The key recommendations below directly align with numerous existing public policies including: The City of Lowell Complete Streets Policy,



The City of Lowell is committed to creating, maintaining, and operating a safe and efficient multimodal transportation network that accommodates all users while preserving the unique character of our neighborhoods.”

Source: City of Lowell Complete Streets Policy

the Walkability goals in the Downtown Evolution Plan, Sustainable Lowell 2025¹, and the principles contained in NMCOG’s RTP and the Healthy Transportation Compact.

1 Particularly objective 3: Prioritize land-use policies that promote walkable, well-networked neighborhoods.

SOLUTIONS TO ADDRESS CONGESTION & IMPROVE SAFETY RECOMMENDATIONS

D.1. Implement Rules of the Road/Safety Education Campaign

D.2. Conduct Road Safety Audits

D.3. Work with Partners at MassDOT and the City to target Roadway Improvements in Areas with High Volumes of Cyclists and People Walking

D.4. Help position City and Region for Safety-related Grant Funding such as Vision Zero

D.5. Pilot Safe Routes to School (SRTS) for Higher Ed at UMass Lowell

D.6. Combine Transportation Plans: Infrastructure, Education, Evaluation and Enforcement

D.1. IMPLEMENT RULES OF THE ROAD/SAFETY EDUCATION CAMPAIGN

Meetings with the Steering Committee, discussions with University and City police and field observations on University Avenue, repeatedly affirmed a high-level of conflict between people on foot, in vehicles, and on bicycles. Some people were observed walking outside crosswalks – particularly University Avenue at North Campus, there also appeared to be a level of genuine walk-signal illiteracy. A number of campus settings and municipalities have successfully implemented rules of the road and safety campaigns.

Locally this includes a “Karma Commuting” campaign (see Figure 15) implemented in the Longwood Medical and Academic area including the Colleges of the Fenway. Participants are incented to take a quiz to test their knowledge of the rules of the road and are automatically entered into a raffle to win airline tickets.

- » Work with UMass Lowell University Relations and City of Lowell to develop Rules of the Road/Safety awareness campaign aimed at raising awareness of obligations of sharing roadways in a busy, urban setting

WHAT IS A ROAD SAFETY AUDIT (RSA)?

Road Safety Audits are a formal safety performance examination of a roadway or corridor by an independent audit team. The results of an RSA include recommendations for short and long-term improvements to enhance pedestrian, bicycle and vehicular safety. Under MassDOT’s Project Development guidelines, RSA’s must be completed to qualify for Highway Safety Improvement Program (HSIP) funding for highway improvements.

D.2. CONDUCT ROAD SAFETY AUDITS (RSAs)

This Plan recommends conducting Road Safety Audits (RSAs) on key sections of roadway including University Avenue between Pawtucket Street and VFW Parkway (currently underway); and Aiken Street between Hall Street and the ballpark. These sections of roadway are commonly known to have the highest volumes of people on foot and on bicycles and with observed conflicts between modes. This recommendation requires working with MassDOT to move beyond the traditional approach of reviewing vehicular crash data to include



Figure 15 Sample Rules of the Road/Safety Campaign
Source: Medical Academic Scientific Organization (MASCO)

walking and biking safety. Key criteria in a walking and biking-oriented RSA, that are not traditionally part of the audit, include: Turning Movement Counts (TMCs) including not only vehicles but also bicycle movements.

- » Separate tabulation of pedestrian behaviors, including crossing on red signal and not activating WALK/DON'T WALK signals
- » Video recording of each intersection allowing for additional review of pedestrian/vehicle interactions and review of pedestrian desire lines

D.3. WORK WITH PARTNERS AT MASSDOT AND THE CITY TO TARGET ROADWAY IMPROVEMENTS TO SUPPORT EXISTING BIKE AND WALK VOLUMES

As stakeholders, field observations, and prior studies have observed there is a mismatch between existing roadway infrastructure which is predominantly geared toward vehicular traffic and levels of pedestrian, bicycle, and skateboard demand. This is especially true of Pawtucket Street, University Avenue between University Crossing and North Campus², and Aiken Street between Hall Street and the ballpark. Potential improvements may include:

- » Operational adjustments such as banning left-turns where justified by low vehicular volumes
- » Signal retiming to reduce conflicts between vehicular and all other movements
- » Addition of bike infrastructure such as bike boxes, bike lanes, and signage
- » Widened sidewalks, reduced pedestrian crossing distances, pedestrian countdowns, and signage explaining exclusive walk signals
- » Addition of Don't Block the Box signage, and intersection markings

² Multi-modal TMCs were gathered during May 2018 on University Avenue including at Riverside Street, VFW Highway and Pawtucket Street intersections. Please see the Appendix.

D.4. HELP POSITION CITY AND REGION FOR SAFETY-RELATED GRANT FUNDING SUCH AS VISION ZERO

Within Massachusetts, the cities of Somerville, Cambridge, and Boston have made commitments to Vision Zero. UMass Lowell should explore options for the City of Lowell to become a Vision Zero City. This means at a minimum: making a goal to eliminate traffic fatalities and severe injuries; making a public, mayoral commitment to Vision Zero; a Vision Zero plan is in place or there has been a commitment made within a specific timeframe and key city departments including police transportation and public health are engaged.

D.5. PILOT SRTS FOR HIGHER ED AT UMASS LOWELL

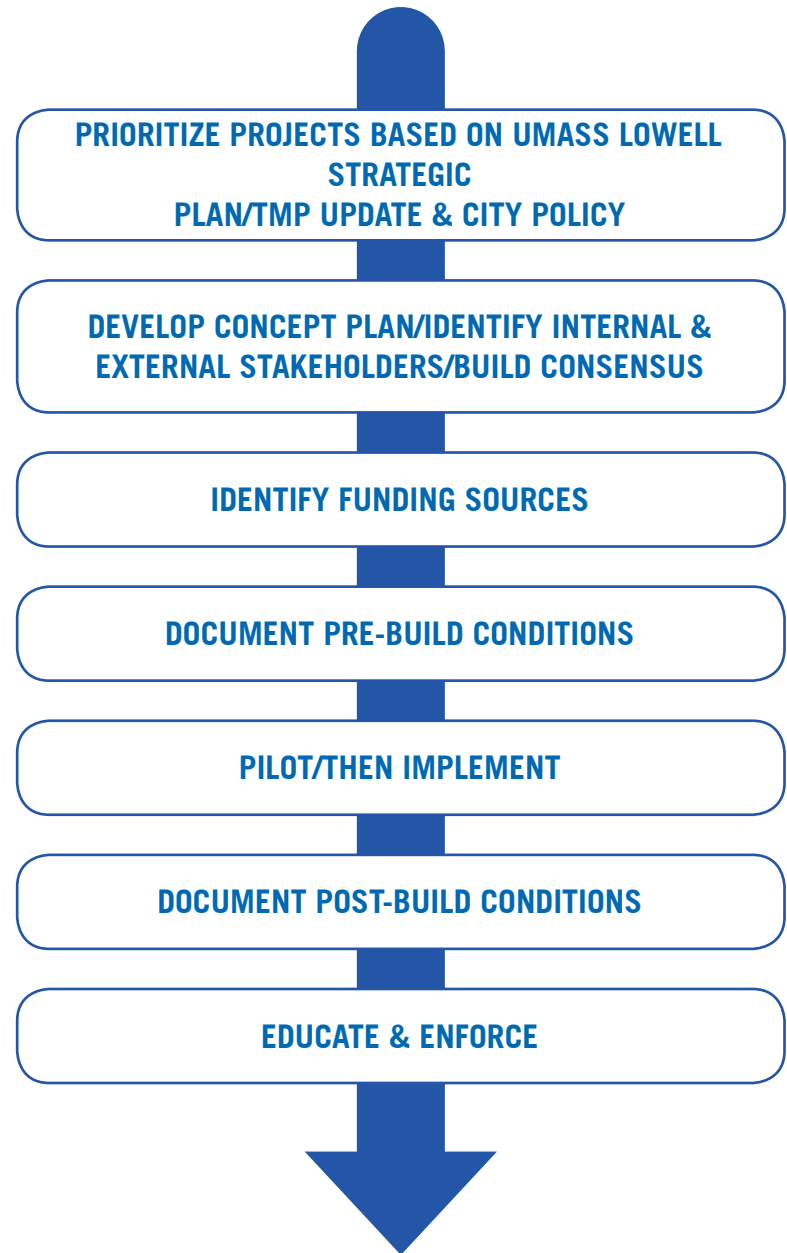
Massachusetts launched the first two Safe Routes to School pilot programs in the country, funded by the National Highway Transportation Safety Administration in 1998. The program was eventually expanded nationwide and today is present in all 50 states and overseas. To date, Safe Routes programs are exclusive to elementary and middle schools. This Plan recommends UMass Lowell work with NMCOG and MassDOT to pilot a Safe Routes to School for the UMass Lowell campus as a new initiative recognizing the need to better accommodate the walk and bike culture at college campuses in Massachusetts and across the country.

D.6. COMBINE TRANSPORTATION PLANS: INFRASTRUCTURE, EDUCATION, EVALUATION AND ENFORCEMENT

This recommendation seeks to build a foundation for a rolling, “living” Transportation Master Plan Update by recommending that transportation projects are not just conceived, funded, and realized, but that they are also part of a broader, campus-wide effort to educate, evaluate, and - where needed - enforce. For example, an education and safety campaign should be tied back to the University's strategic plan and the goals for “developing the urban fabric of one campus/one city,” the broader desire to educate the University and community about rules of the road should be communicated and resources should be invested in evaluating the effectiveness of the campaign – this might be monitoring how many vehicles block the box or how many students jaywalk before and after the campaign. A conceptual framework for integrating transportation projects is to the right:

“ Massachusetts Safe Routes to School (SRTS) is a federally-funded initiative of the Massachusetts Department of Transportation (MassDOT). Safe Routes to School works with schools, communities, students, and families to increase biking and walking among elementary and middle school students in the Commonwealth.”

Source: <https://www.massdot.state.ma.us/saferoutestoschool/AboutSafeRoutesToSchool.aspx>





E. Removing Walking, Biking & Transit Barriers

The distances between UMass Lowell's campuses are less than they seem. For example, it is only a 5-minute bike ride between University Crossing and South Campus via Pawtucket Street, compared to an unpredictable 4-10-minute car journey depending on the time of day. To prove the point, it is possible to reach any part of campus within a 10-15-minute bike ride. Despite this, a quarter of survey respondents reported using their car 1-4 times per week or multiple times a day to drive between campuses. Some of this is reflective of habit and dependency on a car. But it is also because of a lack of robust walking, biking, and transit infrastructure between campuses. This is a hurdle not only for the school in realizing greater mode shift toward non-driving modes, but also for the City which suffers from peak hour congestion – especially along key corridors such as University Avenue and a lack of robust walking and biking infrastructure.

E.1. PARTNER WITH CITY TO CONSTRUCT BIKE INFRASTRUCTURE ON KEY CORRIDORS

UMass Lowell and the City lack a unified, high-visibility bike route connecting key campus destinations. There is also a mismatch between limited roadway infrastructure for bicycles and key desire lines at at least two levels, including:

- » For intra-campus bike trips; for example, Pawtucket Street and Merrimack Street; and
- » For regional/commuting bike trips – all of the regional bike routes such as Andover Street and Varnum Avenue stop short of campus

This plan recommends targeting Pawtucket Street, Merrimack Street, and University Avenue as key intra- and regional routes that already experience high levels of bike demand but that lack sufficient in-street bike accommodation such as bike lanes, bike boxes, and bike signals.

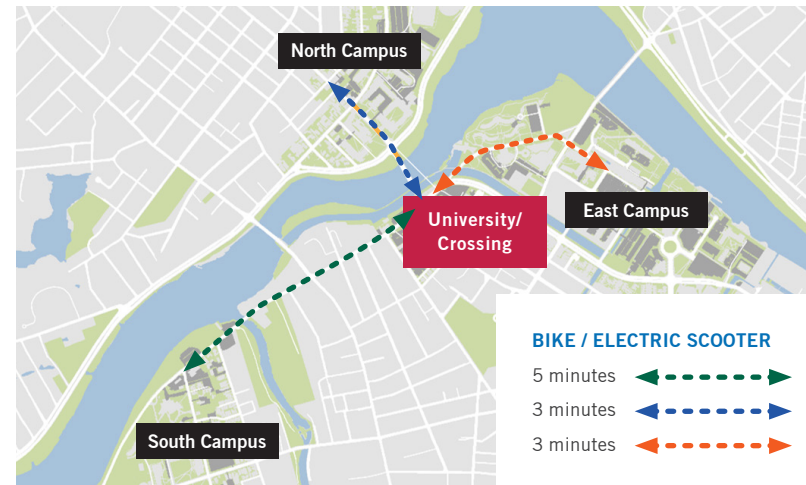


Figure 16 Intra-Campus Travel Times are convenient for those on foot, bike, or electric scooter. However, a lack of infrastructure makes these short trips feel uncomfortable and unsafe

REMOVING WALKING, BIKING & TRANSIT BARRIERS RECOMMENDATIONS

- E.1. Partner with City to construct Bike Infrastructure on Key Corridors
- E.2. Better Match UMass Lowell's Existing Bike Rental Program to Student, Faculty and Staff needs
- E.3. Collaborate with City to create UMass Lowell/City-Compatible Bikeshare System
- E.4. Further invest in On-campus Cycling Culture
- E.5. Improve Walking Conditions
- E.6. Increase Roadster Visibility and Efficiencies

UMass Lowell is committed to reducing vehicular demand on key City roadways and supports efforts to re-purpose right-of-way for all users including the elderly, people on foot, bicyclists, transit riders, carpoolers, and electric vehicle-owners (through addition of infrastructure) to name a few.

Through the plan process, Pawtucket Street has been identified as a critical travel corridor serving demand between the south, east, north campuses while accommodating significant local and through-traffic demands. Current conditions are recognized by both UMass Lowell and the City as inadequate both in terms of congestion and in terms of prioritizing vehicular throughput over travel on foot and by bicycle. Roadway capacity solutions and opportunities to improve traffic flow are limited (although there may be opportunities for signal re-timing at key intersections such as at University Avenue).

More effective moving forward and taking advantage of the fact that UMass Lowell generates (and has the ability to generate even greater) non-vehicular demand - since students frequently do not have access to private vehicles – is to provide improved bicycle and pedestrian accommodation. As previously noted in this report, the distances between campuses are well-suited to short bicycle trips, but with bicycle infrastructure limited to sharrows, only the brave of heart are currently choosing to cycle. To address this deficiency, this plan recommends a continuous Pawtucket Street bicycle track from the East Campus through to the South Campus. This can be accommodated within the existing curb-to-curb width, while maintaining standard 11-foot wide travel lanes. Based on a preliminary assessment, the preferred approach includes a two-way cycle track on the north side of Pawtucket Street. This has a number of benefits: it is a more efficient use of limited right-of-way width since it requires only one buffer between cyclists and vehicular traffic, it also aligns with the multi-use path on the north side of the reconstructed Pawtucket Street Bridge and it caters to current and future demand from resident students travelling between residence halls at the East Campus and classrooms at the North Campus.

Although phasing may be necessary to attract the necessary funding, it is critical that any individual phases sufficiently connect desired origins

and destinations to ensure utility. This plan strongly recommends that UMass Lowell work with its partners at the City to create a continuous cycle track along Pawtucket Street as priority 1 in establishing an intra-campus biking network. This corridor could be viably implemented in as many as three subsections: Perkins Street to the Northern Canal, East Campus to University Crossing, and University Crossing to South Campus. Priorities 2 and 3 are University Avenue (completing the core network) and Upper Merrimack Street.

E.2. BETTER MATCH UMASS LOWELL'S EXISTING BIKE RENTAL PROGRAM TO STUDENT, FACULTY AND STAFF NEEDS

The University's existing bikeshare program allows students to rent bicycles for the day, returning by 7 pm, or for a full semester. This program does not allow for great flexibility for shorter trips and there is no incentive to return unused bicycles back into the system for others to use. This plan recommends:

- » Introducing shorter time periods for University bike rentals
- » Adding pick-up/return locations at points across campus

E.3. COLLABORATE WITH CITY TO CREATE UMASS LOWELL/CITY-COMPATIBLE BIKESHARE SYSTEM

Many college campuses, recognizing that demand for bicycle trips extends beyond campus boundaries, are collaborating with local municipalities and implementing bikeshare systems that have a footprint across both the campus and the local community. This has a greater impact on supporting local biking culture and a greater variety of trips including errands to local supermarkets, business meetings, and any other non-university related trips. Considerations when implementing bikeshare include the following:

- 1. Cost;** dockless bikeshare has less infrastructure required and tends to be cheaper
- 2. Data;** operators should be willing to share data to help cities and universities understand bikeshare performance
- 3. Enforcement;** many cities have struggled with dockless bikeshare with bicycles obstructing the public right-of-way

Priority Bike Network (see Appendix C. for more detail)

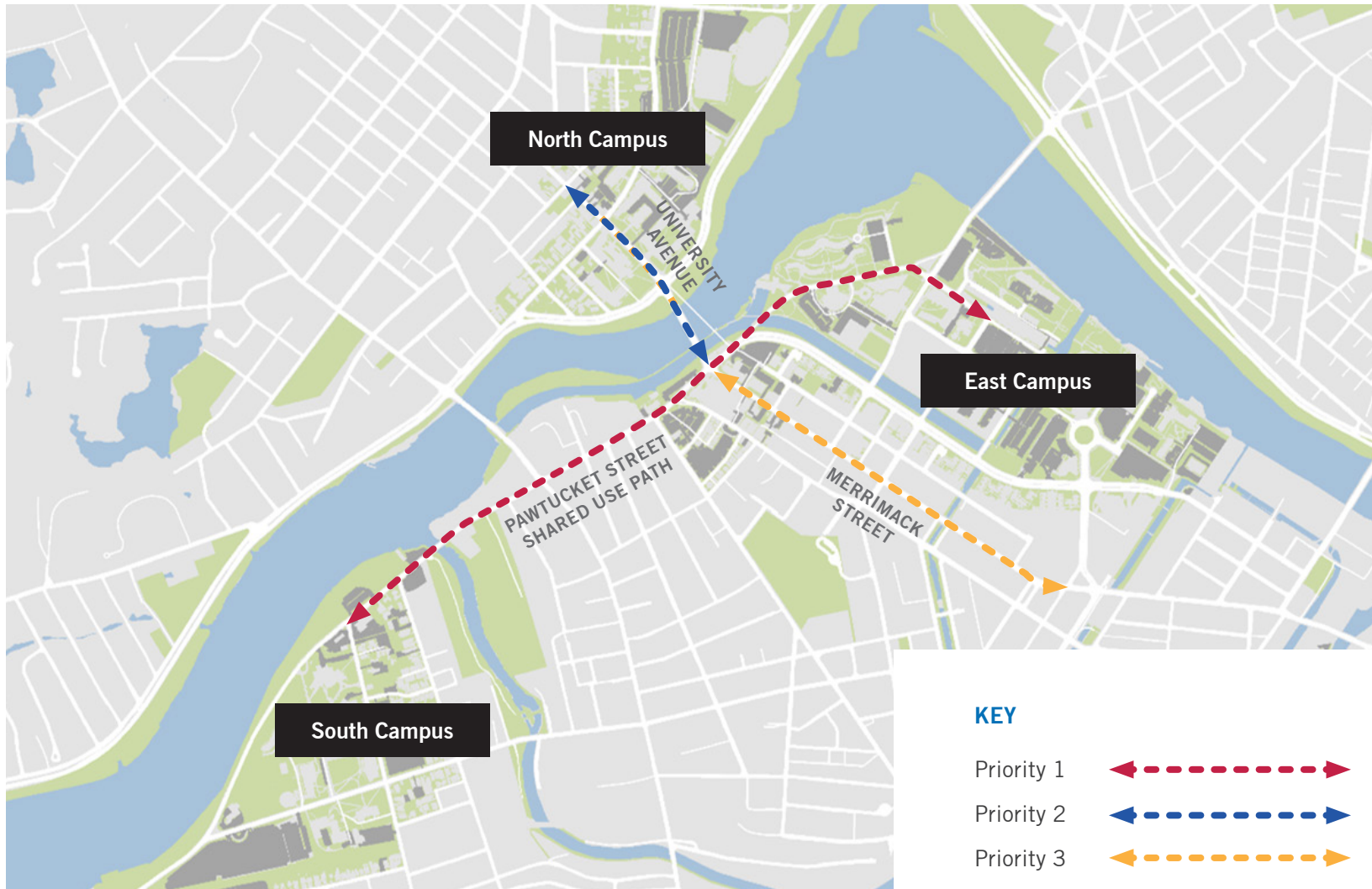


Figure 17 Pawtucket Street is the number one priority for accommodating a shared-use path, closely followed by University Avenue and Merrimack Street



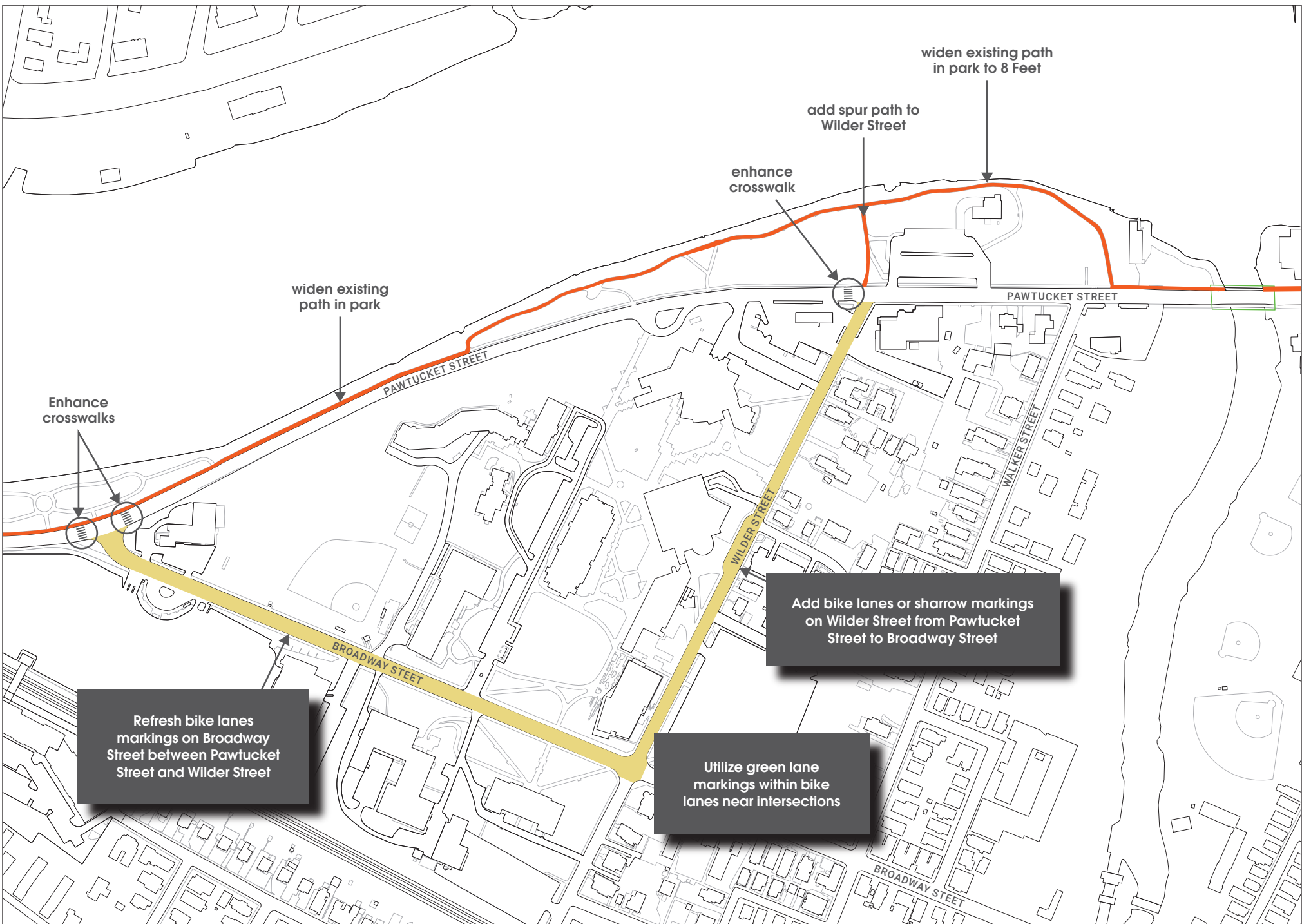
Source: WSDOT Design Manual, 2012



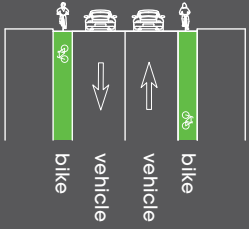
Source: Shared use path, Auckland, NZ



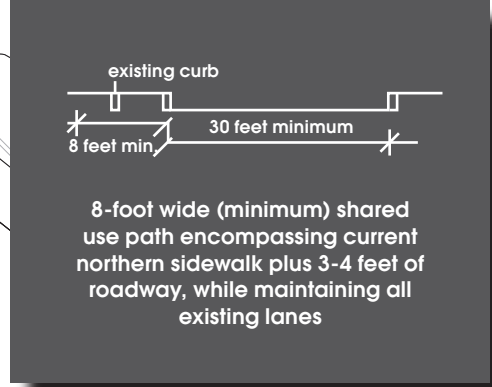
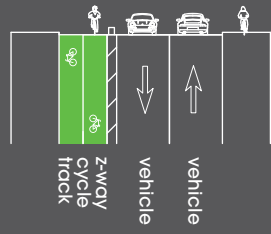
Mass Ave is a well-known location that functions as a high-volume shared-use path
 Source: Calm Streets Boston, Northeastern University



CURRENT DESIGN FOR BRIDGE

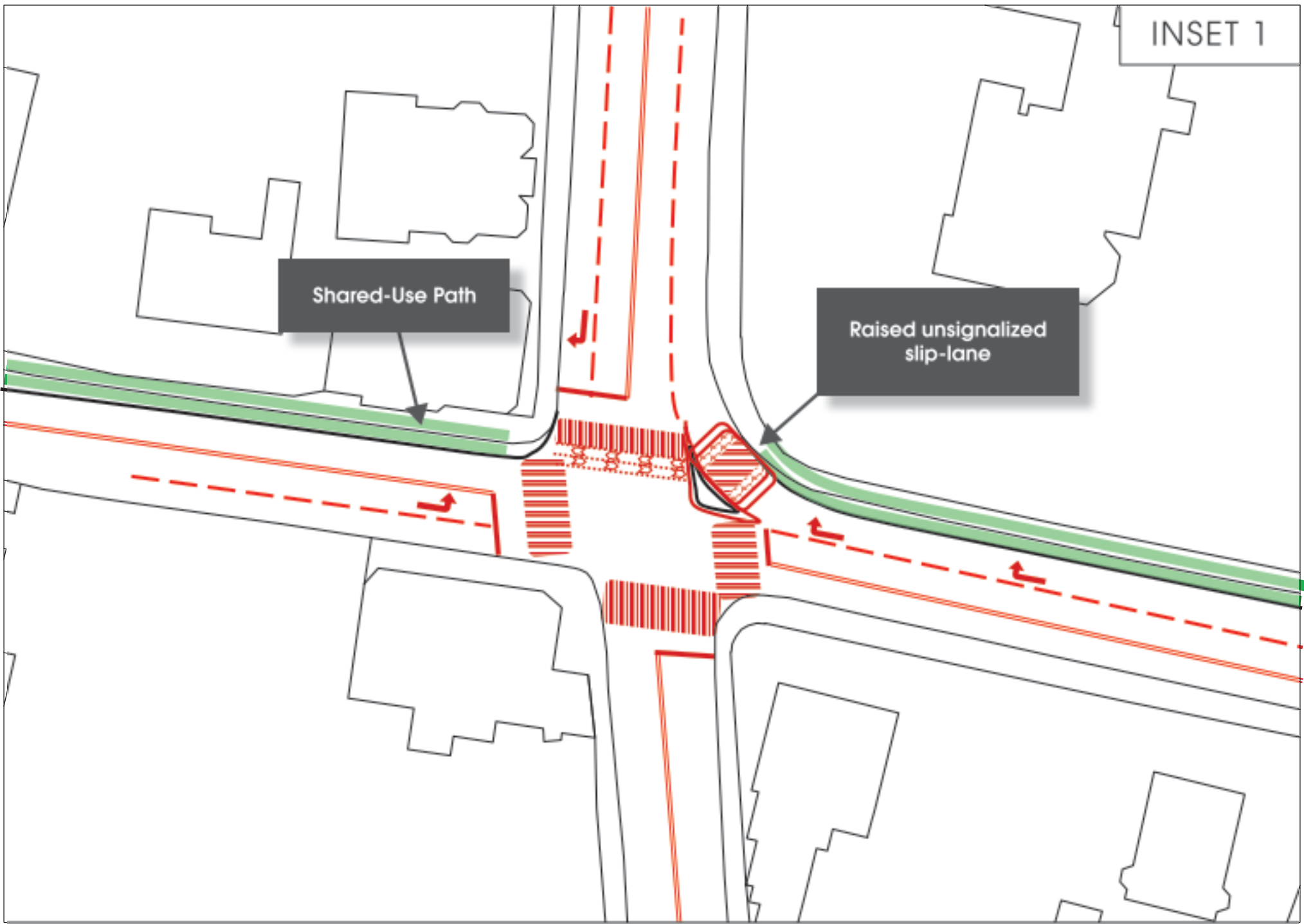


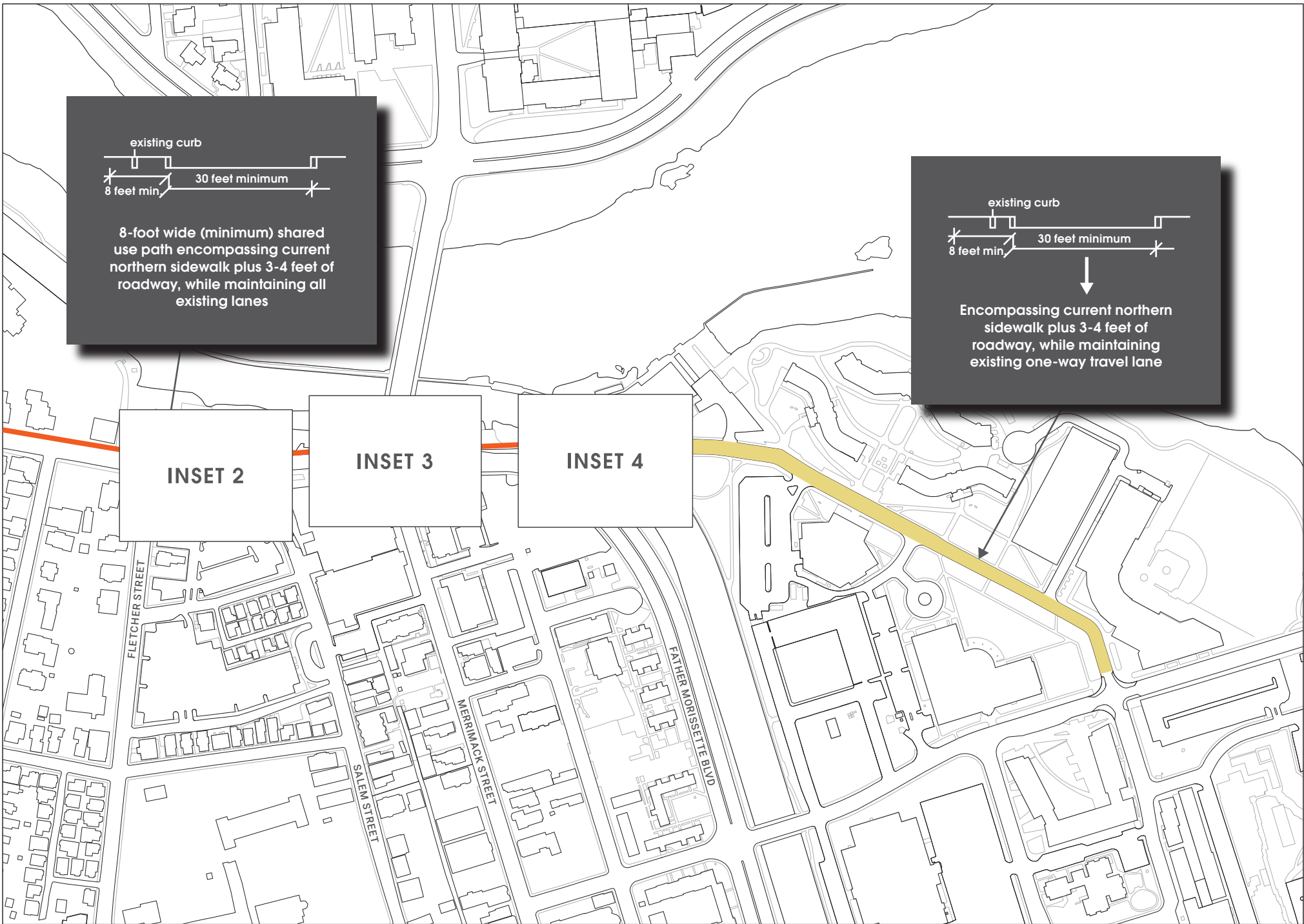
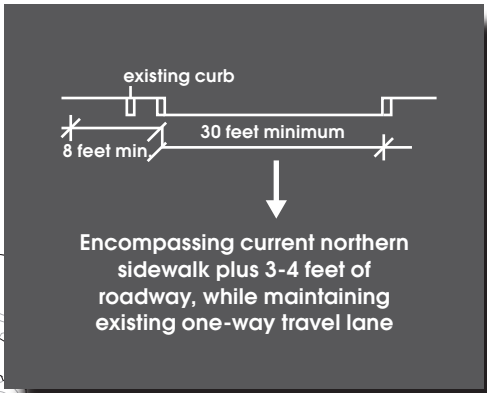
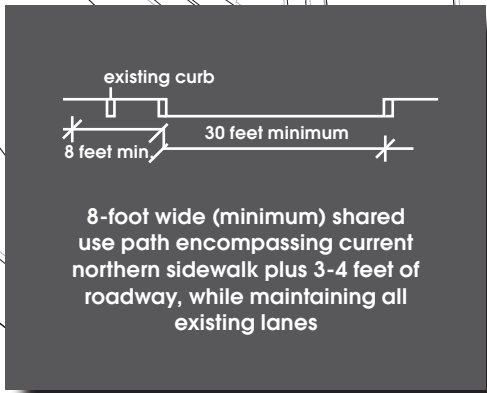
PROPOSED DESIGN FOR BRIDGE



INSET 1

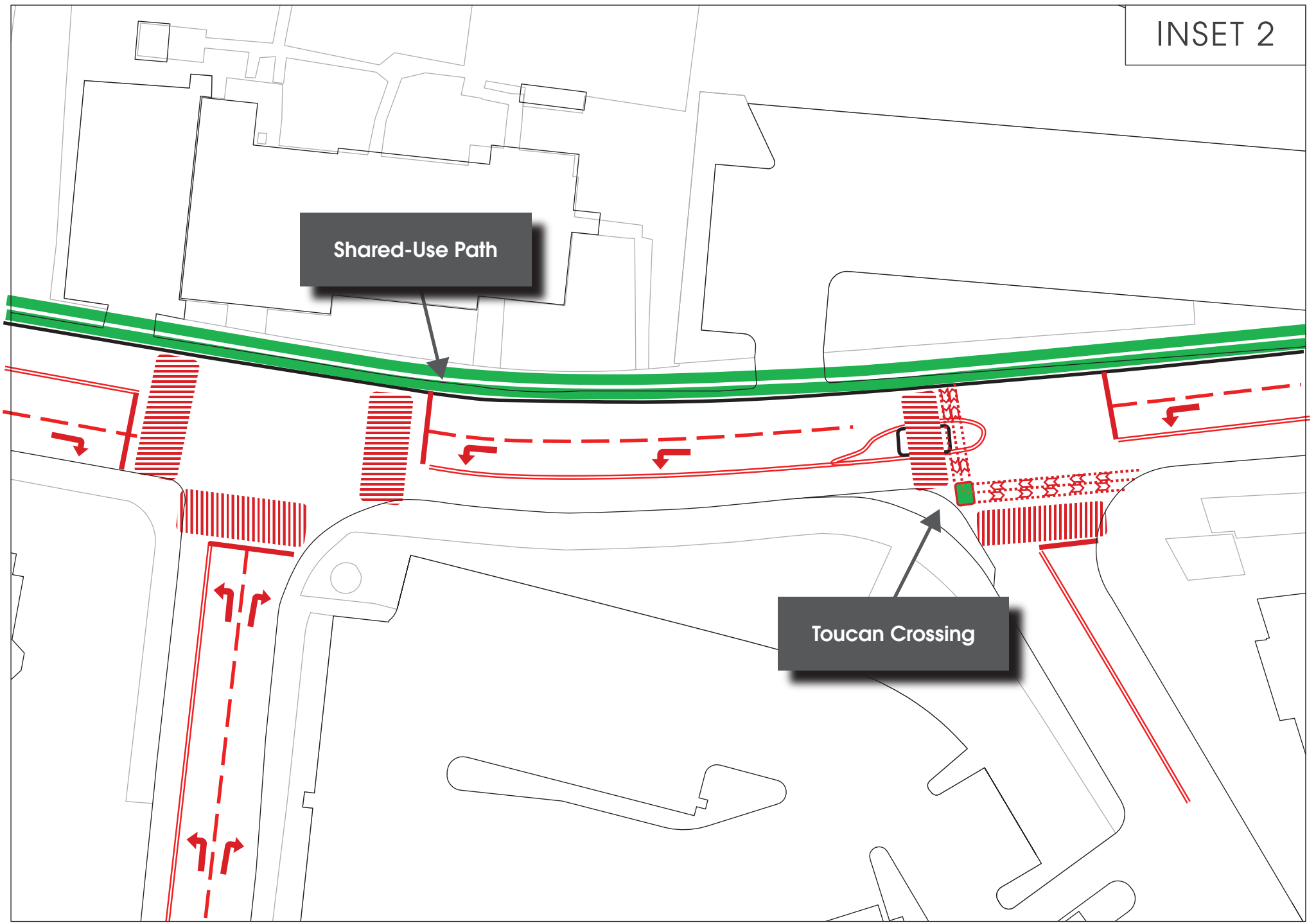
Transition shared-use path into park

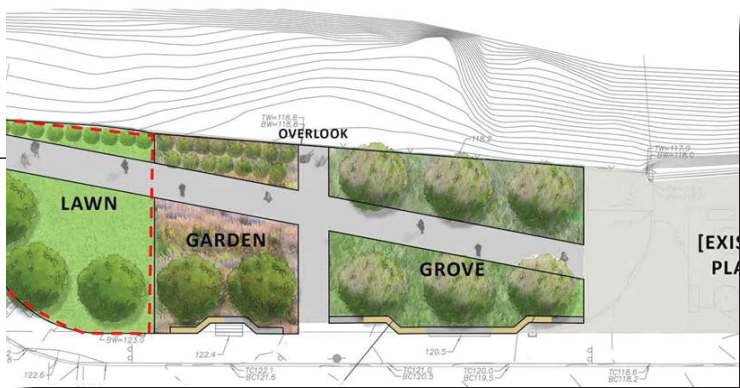




Shared-Use Path

Toucan Crossing





Shared-Use Path

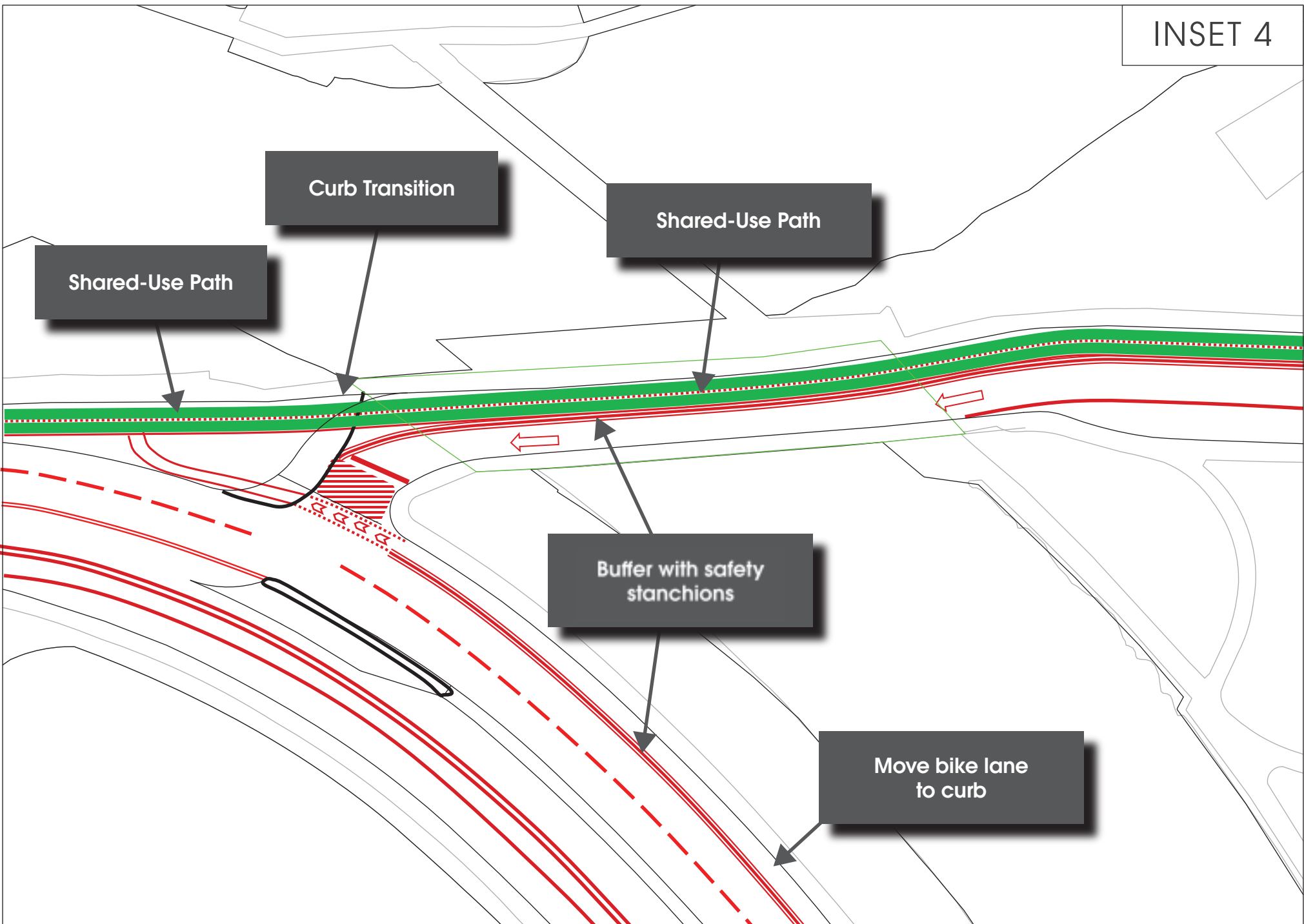
Shared use path connection through proposed open space

Bike Signal

Shared-Use Path

Bike signal with bike yield box

Raised unsignalized slip-lane



intended to be blank

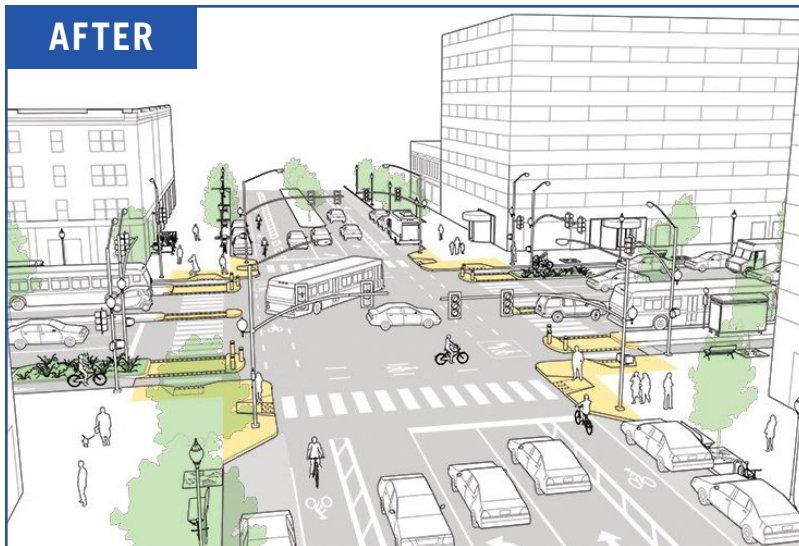
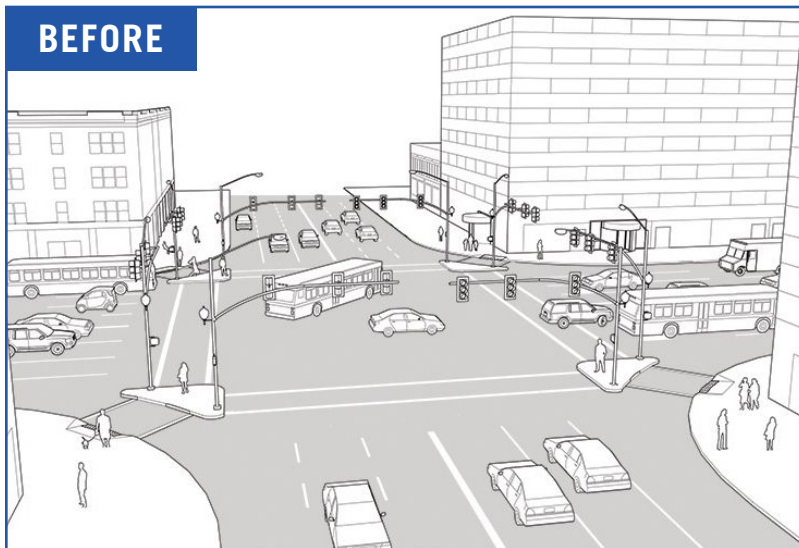


Figure 18 Major Intersection Design Guide, NACTO
 Source: <https://nacto.org/publication/urban-street-design-guide/intersections/major-intersections/>

The City of Boston, for example is currently struggling with competing dockless bikeshare systems from neighboring cities such as Cambridge and increasing numbers of dockless bikes competing for space on congested streets. This plan recommends:

- » Developing criteria for a successful citywide bikeshare model
- » Actively researching and exploring the most successful bikeshare programs that serve both City and university
- » Participating in City-led interviews of vendors
- » Preparing campus for a future that likely includes a diversity of bikeshare models including docked and dockless

E.4. FURTHER INVEST IN ON-CAMPUS CYCLING CULTURE

UMass Lowell has an established bike culture. A majority of bike racks meet best-practices, students can self-service bikes at UMass Lowell fix-it stations, and there's a centrally-located bike shop and shower and locker facilities are available. To continue and expand this culture, it is recommended that:

UMass Lowell adds more weather-protected, secure, and APBP-compliant bike cages

E.5. IMPROVE WALKING CONDITIONS

There is significant pent-up demand for more walking between campus destinations. Based on the transportation survey, more than 60% of respondents would walk more if lighting and pedestrian infrastructure was improved. This plan recommends:

- » Identifying locations where lighting improvements are needed
- » Use partnership with City to identify additional locations for City to upgrade higher lumens levels
- » Implement walking infrastructure upgrades in areas of highest walk demand

E.6. IMPROVE ROADSTER VISIBILITY AND EFFICIENCIES

The Roadster System is highly successful, supporting 738,000 rides in 2017, removing single occupancy vehicles from City Streets and providing a subsidized, affordable travel option for staff, faculty, and students. There is opportunity to build on this success by raising the visibility of the system through re-branding and enhancing the system's presence at key destinations on campus. Key recommendations include:

- » Explore the introduction of signal priority with the City and RTAs
- » Study and report time-savings advantages of bridge improvements

In addition, preliminary recommendations as regards elements of UMass Lowell's bus vendor contract are listed below:

- » Evaluate improved bus fleet with wider low-floor boarding which will both provide better ADA compliance and increase boarding efficiencies
- » Examine potential for increasing the number of hybrid and electric vehicles. For example, there may be funding available from the VW settlement
- » Develop signage/branding approach for actual routes/buses. For example, the blue route has blue buses
- » Buses themselves could also have electronic and scrolling signage, and automated announcements
- » Different types of bus models will also be recommended taking into consideration turning radii, load restrictions, ridership, cost, emissions, technologies and comfort, and amenities
- » Overall the Roadster brand can be refreshed for both the existing and potentially new buses

UNIVERSITY OF NORTH CAROLINA CASE STUDY



University of North Carolina has a simple, effective branding approach to shuttle service. This includes the “Wolfprowl” downtown service and “Red Terror,” sporting events service.

Source: <http://www2.acs.ncsu.edu/trans/wolfline/index.html>



Figure 19 High-Visibility Bus Stop/Transit Hub Branding
Source: University of Nevada, Las Vegas



F. Transportation Demand Management & Leveling Costs

Since the 2011 Master Plan, UMass Lowell has also made good on the majority of TDM implementation strategies. This includes preferential parking, Live in Lowell program, adjustments to class schedules to reduce peak hour congestion and parking pricing increases. As a result, UMass Lowell offers a competitive package of TDM programs compared to its peers. In all but one category matching or exceeding its offerings.

F.1. LEVEL COST/CONVENIENCE BETWEEN DRIVING AND NON-SOV MODES

College campuses, hospitals, employers, and especially those in denser, landlocked urban environments are recognizing the value of financial subsidies to incent non-SOV modes of travel and reduce demand and the associated costs of providing, maintaining and operating parking. UMass Lowell has itself aggressively pursued this path over the past decade, implementing a range of competitive TDM programs and supporting staff, faculty, and students that choose to carpool, bike, walk, or take transit to campus. Progress in reducing driving mode share has however, slowed in recent years and the relative cost and convenience of driving compared to other modes will require additional investment and new, targeted programs. Additional measures that should be explored include:

PARKING, TRANSPORTATION DEMAND MANAGEMENT & LEVELLING COSTS, RECOMMENDATIONS

F.1. Level cost/convenience between driving and non-SOV modes

F.2. Restructure Parking Pricing to Value High Demand Locations and Incent Use of Underutilized Lots

F.3. Further Restrict Ability to Travel between UMass Lowell Parking Lots

F.4. Reduce Need to bring Personal Vehicle to Campus for Errands

F.5. Target existing UMass Lowell TDM programs with low levels of awareness including: Nu-Ride, Pre-Tax Transit Deductions, Emergency Ride Home Program, Carpool Parking and Bikeshare

F.6. Explore an Employee Commuter Calendar to Reward Non-SOV Modes

F.7. Pilot Commuter Rail Subsidy for Staff and Faculty
E.6. Improve Roadster Visibility and Efficiencies

- » Additional financial incentives such as parking cash-out to take transit, walk, bike, and carpool
- » Explore parking permit price adjustments to promote efficient parking use
- » Expand day-parking program
- » Adjust to daily/hourly pricing to tie more closely to frequency of use

F.2. RESTRUCTURE PARKING PRICING TO VALUE HIGH DEMAND LOCATIONS AND INCENT USE OF UNDERUTILIZED LOTS

With pricing for employees ranging from \$0.21 to \$3.56 per day, the University is subsidizing parking spaces up to \$6-\$9 per day¹. At peak, more than 2,800 spaces are empty (40% of supply) including low levels of usage in the 1001 Pawtucket Street, and Riverview Lot. As UMass Lowell works to reduce parking demand and free up land to accommodate future uses that better serve the University’s core mission, restructuring parking rates can incentivize affiliates to use other modes, reduce greenhouse gas emissions, and offer greater choice on where to park and how much to pay. The management of the parking system should be closely integrated with the rest of the University transportation system.

ESTABLISH A FORMAL TIERED- RATE STRUCTURE FOR PARKING PERMITS BASED ON CAMPUS LOCATION & CAMPUS AFFILIATION

Tiered parking pricing systems are the most effective tool for managing parking demand and creating a “balanced system” where demand is evenly spread across parking lots. Increasing pricing for capacity-constrained lots and adjusting rates on underutilized parking locations will help to distribute demand across facilities, as affiliates will self-select based on their price points. Some parking locations, especially those in the North campus, are more desirable than others and as a result experience higher parking demand across affiliate groups. Establishing clear parking rate variation between these parking options will help redistribute demand more evenly across the parking system.

¹ Daily prices calculated based on annual decal cost range from adjunct to cabinet members. Daily public parking rates are \$8 in a garage and \$10/day at a bagged, on-street meter

Campus	A Permit		B Permit		C Permit	
	% Price Increase	Access Privileges	% Price Adjustment	Access Privileges	% Price Adjustment	Access Privileges
North	+30%	A, B, C	+20%	B, C	+10%	C
East	+20%	A, B, C	+10%	B, C	-10%	C
South	+10%	A, B, C	-20%	B, C	-30%	C
Remote Lot	+10%	A, B	Free	B	N/A	

Figure 20 Parking Rate Adjustments and Access Privileges by Sub-Campus

Rates should be adjusted to reflect existing demand patterns by sub-campus

- » North campus continues to show the highest utilization among all campus affiliates and therefore rates should be slightly higher in response to the high demand.
- » The hierarchy of demand for the remaining campuses is as follows: East campus, South campus, Remote Lot, and on-street (Father Morrisette). Pricing by sub-campus should reflect these demand patterns.
- » **Create a permit rate structure based on existing sub-campus and facility group utilization**
 - » Within each sub-campus, categorize parking facilities into three groups (A,B,C) based on observed utilization conditions
 - » Group A (greater than 80% utilization)
 - » Group B (60% to 80% utilization)
 - » Group C (less than 60% utilization)
 - » Create rate adjustment percentages within each of these groups that reflect facility utilization within each sub campus, as shown in Figure 20. These rate adjustments would be applied to an existing baseline affiliate permit rate.
 - » Note that 10% to 30% rate adjustments provide incremental increases that should shift demand based on cost variation. Pricing should be monitored and adjusted as needed.

- » **Permit facility access should be comprehensive across sub-campuses**
 - » Permit holders should have the ability to find parking in their designated group across different campuses. This would help to ease restrictions and allow flexibility in the parking system, in case there is a need for overflow parking options.
 - » As shown in Figure 20, a student purchasing an East Campus Group A permit would be able to park in any group facility in East Campus, South Campus, and Remote Lots. They would be restricted from parking at North Campus facilities based on their permit.
 - » This recommendation would require programming access cards and monitoring to ensure that the system works.

- » **Other Considerations**
 - » Resident students should be charged an additional nominal fee if they chose to purchase a parking permit and park on campus. This would discourage bringing a car to campus and intra-campus driving trips.
 - » Parking along Father Morissette is currently open to employee permit holders as well as upper-class commuter students. UMass should allow all commuter students and employees to park on-street. Rates for these affiliates should be priced at the new East Campus rate. Resident students should be discouraged from parking on-street
 - » All resident students parking in remote lots will be charged for a remote lot parking permit
 - » Consider pricing campus owned public parking from 10am onwards. Parking demand does not peak until after 10am
 - » Parking for visitors to Admissions and Advancement, as well as external partner guests will remain free of charge and metered visitor parking will be retained for the general public on each campus

ZONAL/PERFORMANCE-BASED PRICING AT COLLEGE CAMPUSES

Numerous university campuses across the nation and in different settings have adopted zonal parking pricing systems that create pricing tiers based on overall desirability factors such as: proximity to the core of campus and whether the parking spaces are covered or uncovered. UC Berkeley provides employees with at least three different tiers based on overall convenience including central campus, general faculty and staff locations and remote parking. Other campuses with similar zonal/performance-based systems include Simon Fraser University in the Vancouver suburbs, and the University of Rochester, NY.

UMass Lowell – Potential Permit Pricing Approach

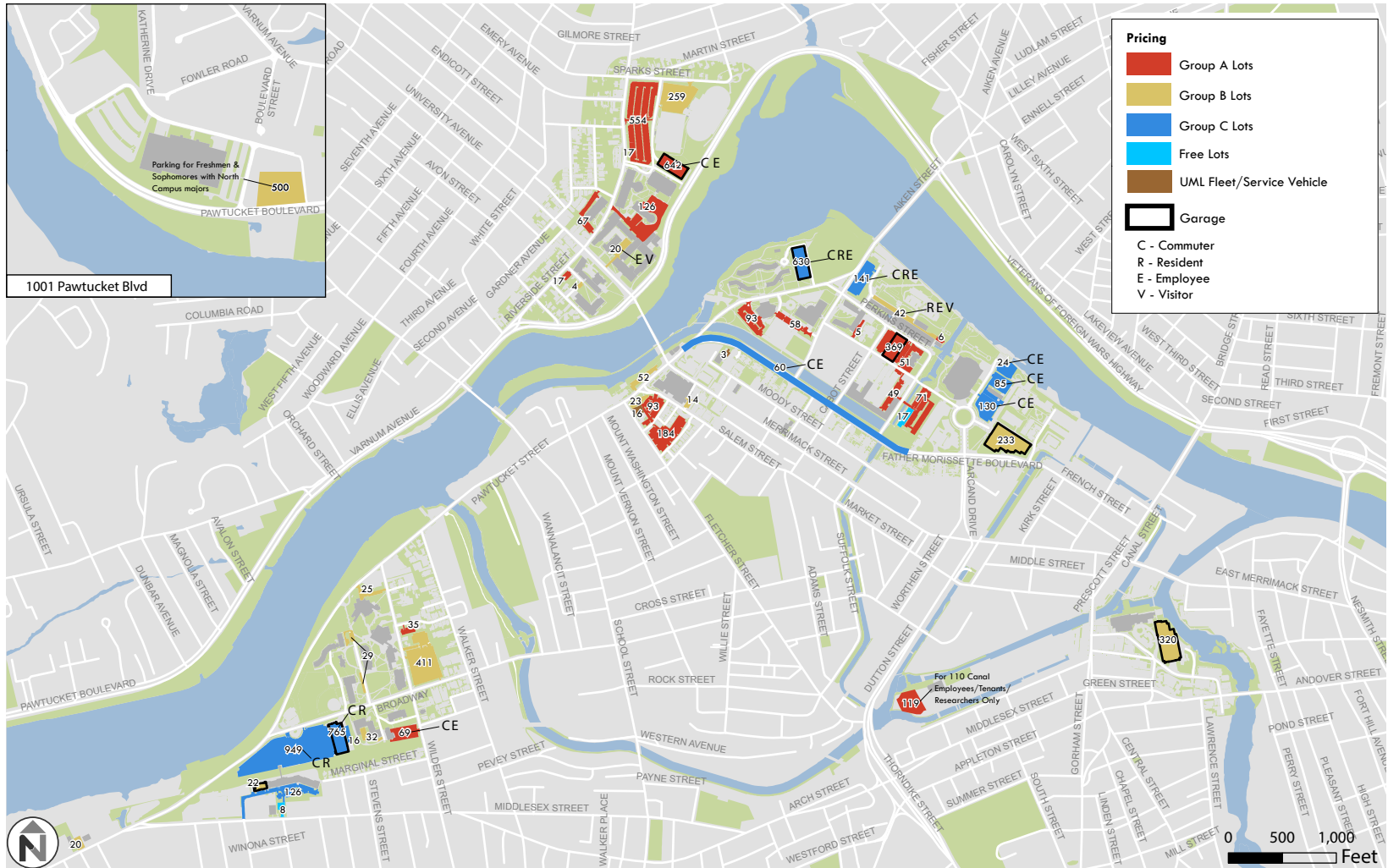


Figure 21 UMass Lowell Potential Permit Pricing

TRANSITION TOWARD MONTHLY AND EVENTUALLY DAILY PARKING AT ALL FACILITIES, ALLOWING AFFILIATES TO PAY FOR PARKING ONLY ON THE DAYS THEY DRIVE.

People are more sensitive to small recurring fees and charges than larger and less-frequent ones. Once a student or employee purchases a pass, that individual ceases to consider driving alternatives because the permit has become a sunk cost. Long-term permits actually create an incentive to drive to campus as frequently as possible in order to take advantage of the investment. Recommendations are as follows:

- » **Interim**
 - » Implement tiered-permit pricing program
- » **Mid to Long Term**
 - » Implement monthly parking permit pricing as a long-term strategy
 - » Incentivize daily parking rates, not semester permits, to promote travel to campus via different modes
 - » Daily permit systems can be enforced through the use of LPR systems, or Smart Card technologies that electronically link each registered commuter vehicle to an online account via a windshield tag
- » **Other Considerations**
 - » Use parking revenues (after operating and maintenance costs) to fund better non-SOV projects and TDM programs such as transit investments, bicycle facilities, and pedestrian infrastructure such as lighting, streetscapes, security personnel

F.3. FURTHER RESTRICT ABILITY TO TRAVEL BETWEEN UMASS LOWELL PARKING LOTS

The Transportation Survey uncovered that 40% of drivers are regularly using their cars to travel between campus locations. Some of this may be possible because of the availability of public parking and/or low levels of enforcement on local streets. However, there may be scope to cut down on the number of daytime car trips by revisiting parking privilege campus-wide. Steps include:

- » Constrain/eliminate multi-campus parking privileges
- » Offer carshare membership as a solution to those that need vehicular travel between campus locations
- » Explore provision of a Departmental Zipcar program – separate from the student program
- » Promote Freewheelers program as an alternative to driving and explore buying Departmental bikes

F.4. REDUCE NEED TO BRING PERSONAL VEHICLE TO CAMPUS FOR ERRANDS

A rental arrangement or car share plan for the entire campus can be a cost-effective alternative to owning a fleet and goes a long way to reducing the need for staff and faculty to bring personal vehicles to campus. Especially for those travelling regularly between campus destinations or even off-campus entirely. Traditional, college-owned campus fleets are increasingly being replaced by car sharing arrangements with large rental companies such as Enterprise and Avis.

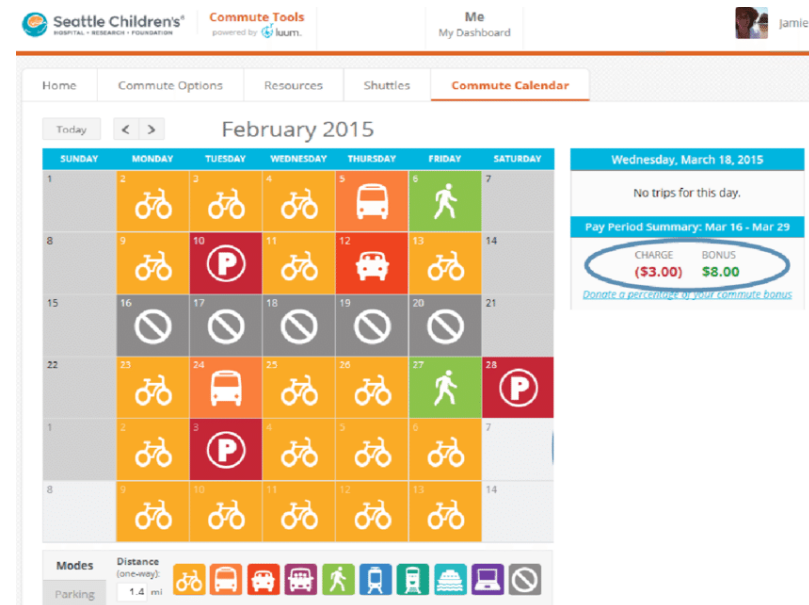


Figure 22 Daily Commuter Calendar
Source: Luum

UMass Lowell – Peak Parking Utilization

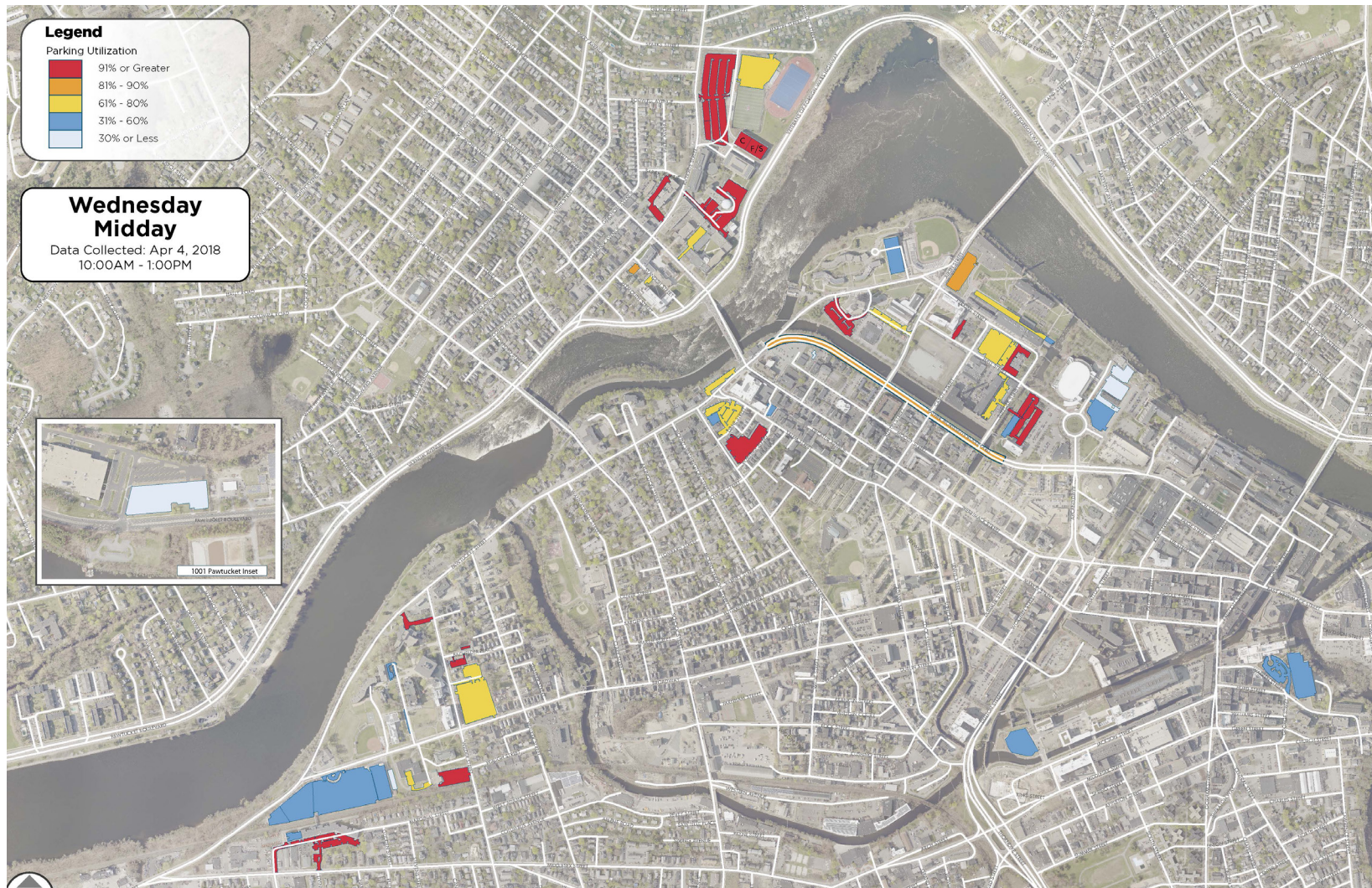


Figure 23 Peak Parking Utilization: The pricing concept described in this section closely reflects the utilization levels of parking facilities observed in the field and mapped above. Red and orange indicate the most heavily utilized parking facilities.

F.5. TARGET EXISTING UMASS LOWELL TDM PROGRAMS WITH LOW LEVELS OF AWARENESS

The Transportation Survey revealed low awareness of a number of existing TDM programs including: Nu-Ride incentive program, Pre-Tax Transit Deductions, Emergency Ride Home Program, Carpool Parking, and Bikeshare. These low levels of awareness should be benchmarked and the programs more heavily promoted and advertised. The new TDM Coordinator position can then closely track progress in increasing enrollment levels.

TDM programs help reduce peak hour traffic demand and provide benefits for those choosing non Single-Occupancy-Vehicle (SOV) modes of travel. UMass Lowell currently offers a number of best practice programs either comparable to or exceeding those offered by peers and including:

- » Nu-Ride rewards for greener trips
- » Pre-Tax transit deductions
- » Emergency Ride Home program
- » Carpool parking
- » Bikeshare

F.6. EXPLORE VIABILITY OF AN EMPLOYEE COMMUTER CALENDAR

Services such as LUUM and rideamigos provide fully-integrated hardware and software platforms that track daily commuting. For example, Seattle Children's Hospital employees receive a direct payroll benefit every time they travel on foot, by bus, or bike. A daily commuter calendar helps to daylight both the direct financial benefits to employees and also the environmental benefits.

- » Commute information and program matching to meet affiliate needs;
- » Performance tracking (transit ridership, bicycle use, etc.);
- » Central location for information, incentives, travel profiles, etc.;
- » Personal commuter calendars (links into performance

- measurement);
- » Platform for ridematching and shared parking brokerage;
- » Dynamic real-time transit and parking updates (including rider alerts for transit or shuttles);
- » Supplemental mobile phone app interface for transportation information on the fly and commuter calendars en route;
- » Trip planners;
- » Parking management and revenue collection;
- » Transportation benefit management and distribution (staff/faculty only); and
- » Environmental and health benefits tracking

F.7. IMPLEMENT STAFF & FACULTY COMMUTER RAIL SUBSIDY

The average monthly cost to park is \$40, compared to \$80.25 to \$318.50 per month for a zone 1-6 commuter rail pass. As a result, there is no financial incentive to take commuter rail. Based on a zip code analysis and mapping exercise, approximately 750 drivers live within a short distance of the Lowell Commuter Rail line. A number of schools offer employee T Pass subsidies: a) As a benefit and b) to support greater use of transit amongst staff and faculty. This is typically offered as a pre-tax payroll benefit. Many larger institutions offer \$100 per month or 50% capped at \$100. The subsidy is likely to incent mode shift away from driving, also helping to reduce pressure on UMass Lowell's parking supply. Numerous local schools offer this benefit including: the Colleges of the Fenway, Boston University, MIT, Harvard, and others. As an initial step it is recommended UMass Lowell:

- » Develop and promote a pilot program to test interest in a commuter rail subsidy
- » Determine financial feasibility and the appropriate level of subsidy which typically ranges from 35% to 75% and is often capped at a \$100 pre-tax payroll deduction

UMass Lowell – Known Drivers

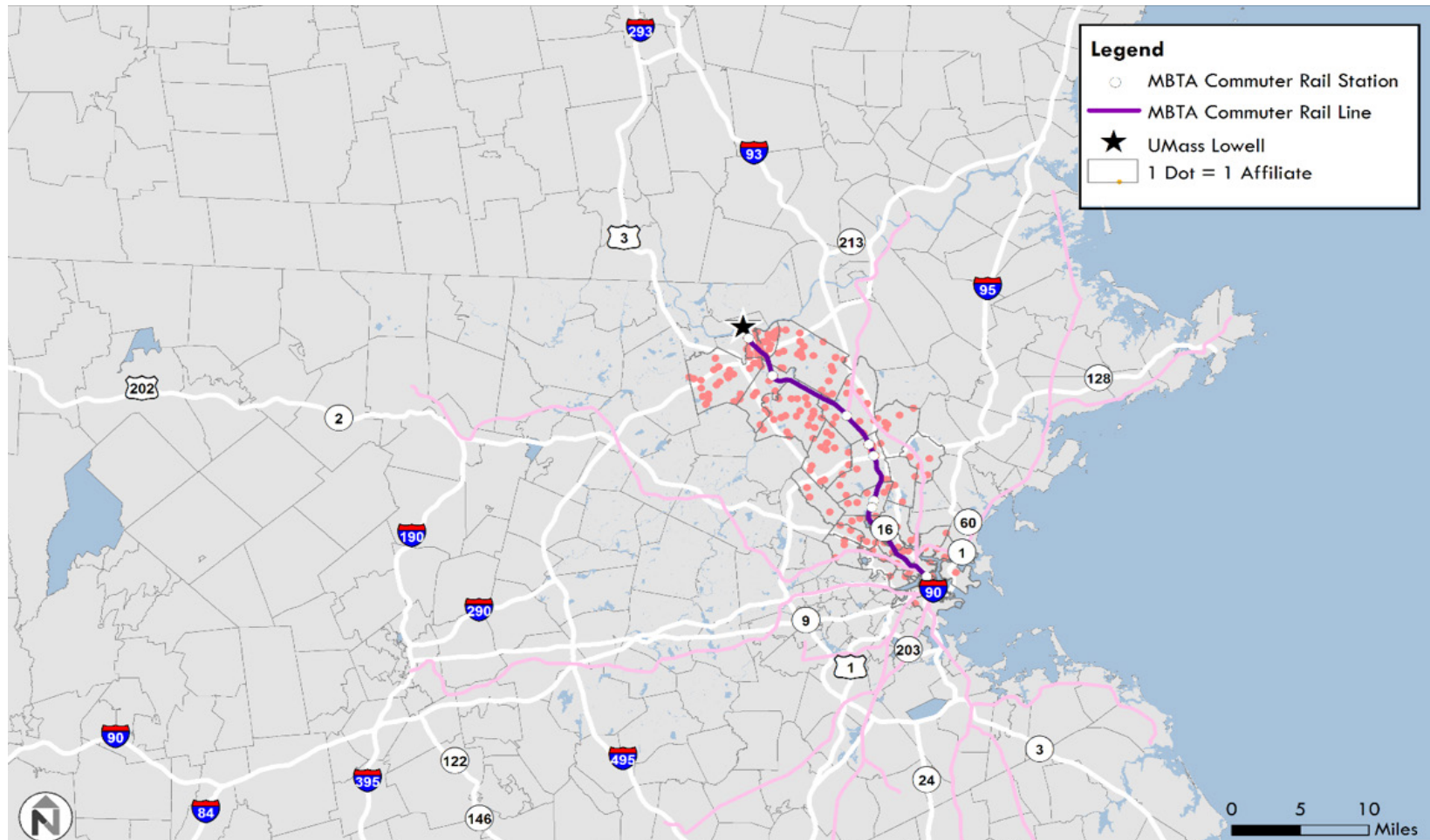


Figure 24 Lowell Commuter Rail Catchment

Source: UMass Lowell, MassGIS



G. Messaging & Communications Consolidation

The success of a university's transportation programs relies heavily on effective communication. UMass Lowell provides competitive TDM offerings, but low awareness is reported amongst a number of programs. For example, 40% of survey respondents reported being unaware of the free regional bus pass and 80% were unaware of the Emergency Ride Home program.

In addition, communications regarding existing non-parking transportation programs are splintered. For example, information regarding parking, UCard, BikeUMass Lowell, and travel updates exist on different webpages and even different platforms.

Opportunities to consolidate and simplify information are a cost-effective way to improve awareness of travel alternatives. This starts at the personal level, as staff, faculty or students make the choice of how to travel and consults information available online and continues throughout the trip both with ongoing digital information such as real-time parking information or when the next bus is arriving, right through to the conclusion of the trip and the walk to the classroom or office. A seamless flow of information, consistency in messaging and branding, and readily available and up-to-date information goes a long way to supporting all forms of travel whether it is remote parking, walking, or biking.

KEY RECOMMENDATIONS INCLUDE

- G.1. Hire a UMass Lowell TDM Coordinator
- G.2. Consolidate campus transportation information and communications on one single, transportation homepage
- G.3. Raise Awareness of TDM Programs
- G.4. Change Messaging Around Driving versus Other Modes
- G.5. Share successes such as Regional Transit Pass program, TIGER application
- G.6. Benchmark Progress Such as Increases in Ridership, Grant monies Jointly Won

G.1. HIRE A UMASS LOWELL TDM COORDINATOR

UMass Lowell had a TDM coordinator function previously, and this role was expanded to include other functions more broadly related to sustainability. Given the importance of transportation to the University's Strategic Plan and wish to work collaboratively with the City and other partners such as the Middlesex 3 Coalition, it is recommended UMass Lowell advertise for a FTE TDM Coordinator position. TDM job functions typically include:

- » Day-to-day operations and management of all non-parking related transportation programs
- » Development of new TDM initiatives
- » Promotional events for new employees and students
- » Data collection and reporting in regard to local transportation service providers – such as bus routes needing improvements
- » Representation at regional transportation meetings and committees such as the Middlesex 3 Transportation

G.2. CONSOLIDATE CAMPUS TRANSPORTATION INFORMATION AND COMMUNICATIONS

It is recommended that UMass Lowell consolidate parking and transportation information in one place. Currently, the UCard, Access and Parking Services (UCAPs) homepage is all parking, transportation “alternatives” are found on their own webpage and travel updates are posted on Facebook. Effective communications surrounding transportation present staff, faculty, students, and visitors with travel choices all in one place. This reflects both the reality of the modern commute which one day may be via car and another day on foot or by bus. Recommendations are as follows:

- » Design new transportation website that provides equal billing to parking and other non-SOV forms of travel
- » Consolidate all transportation programs including information about parking, bus travel, TDM programs, and local transportation services in one place
- » Create a visible transportation information kiosk/counter in University Crossing

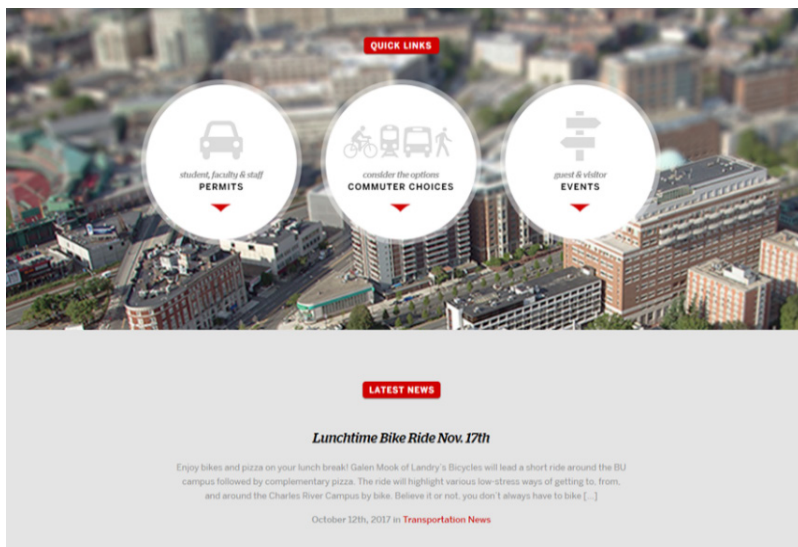


Figure 25 Best Practice Parking & Transportation Website

Source: <https://www.bu.edu/parking>

G.3. RAISE AWARENESS OF TDM PROGRAMS

The University offers a competitive and comprehensive menu of transportation and TDM programs. However, based on the transportation survey there is low awareness of a number of programs including NuRide, pre-tax transit deductions, emergency ride home, reserved carpool parking, and freewheelers bike share. It is recommended that UMass Lowell work with internal communications to launch a rolling TDM campaign with goals of increasing participation in TDM programs. This could be pushed out at the beginning of the fall and spring semesters as staff, faculty, and students are identifying preferred commute habits. Additional supportive strategies include:

- » Creating Transportation Ambassadors for each residence Hall to help provide information about how to get around campus and to promote awareness surrounding different programs offered

G.4. CHANGE MESSAGING AROUND DRIVING VERSUS OTHER MODES

Compared to other transportation programs, parking and driving tend to occupy the lion's share of campus land, resources, and administrative and operational time. For this reason, it is understandably a major focus in transportation-related communications at UMass Lowell. However, to continue UMass Lowell's progress it is recommended that other non-SOV modes are packaged together and given equal billing to driving and parking. Some strategies include:

- » Providing a commuter calculator to enable cost comparisons between driving and other modes
- » Daylighting hidden/sunk costs of driving and parking such as: insurance, wear and tear, fluctuations in gas prices
- » The subsidies supporting driving compared to other modes including: parking costs to UMass Lowell, maintenance, operations
- » Health benefits connected to other non-driving modes
- » Greenhouse gas emissions



Figure 26 Sample TDM Campaign
Source: Boston University

G.5. SHARE SUCCESSES SUCH AS REGIONAL TRANSIT PASS PROGRAM, TIGER APPLICATION

This is both a communications strategy and a way to promote regional leadership and the power of collaboration around the multiple shared transportation challenges and opportunities. With partners at the City and State level there have been significant successes including the introduction of the Regional Transit Pass program and the successful TIGER grant application to reconstruct bridges. There are many more projects, both current and underway and recommended in this report that represent further and better opportunities to promote UMass Lowell, the City of Lowell, and the region as embracing and encouraging change and the advancement of shared transportation goals. Strategies include:

- » Communicating transportation improvements campus-wide through traditional print media, at University Crossing, and through social media
- » Monitoring City and regional initiatives (this can be a function of the TDM Coordinator position) and sharing information
- » Celebrating accomplishments of UMass Lowell's transportation partners – for example when TIP funding is secured
- » More broadly articulating health, wellness, and safety benefits to UMass Lowell community

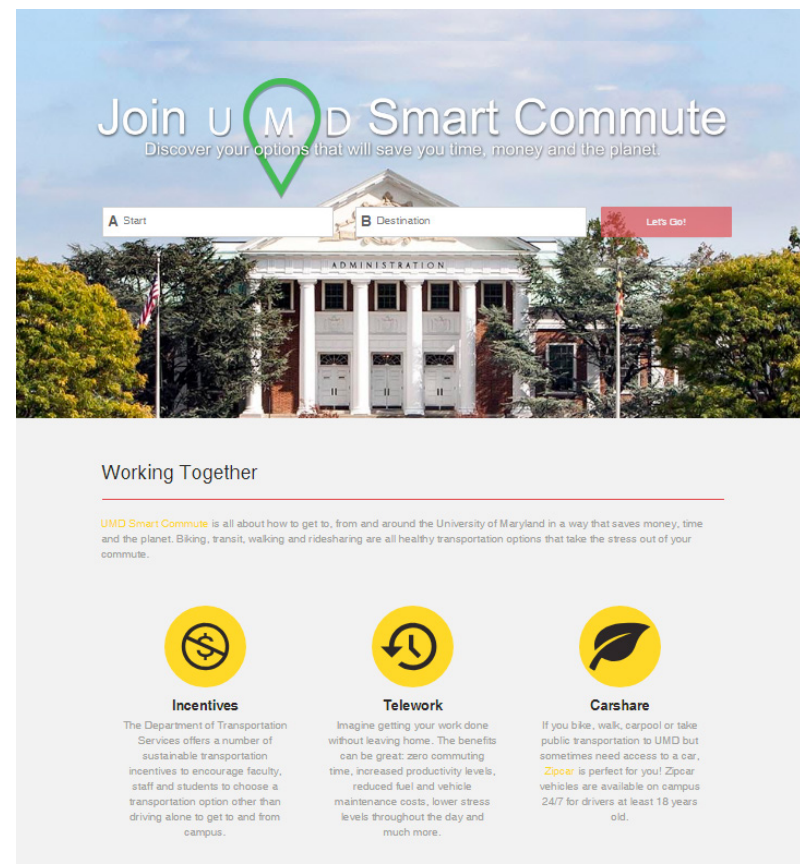


Figure 27 Smart Commute Platform at University of Maryland
Source: <http://www.dots.umd.edu/smartcommute.html>

G.6. BENCHMARK PROGRESS SUCH AS INCREASES IN RIDERSHIP, GRANT MONIES JOINTLY WON

Benchmarking both daylight areas where progress needs to be made – such as low-awareness TDM programs - and quantifies successes. As part of this Master Plan Update, the project team reviewed the 2011 Master Plan and an assessment was made of progress to date. This process should happen annually and be incorporated with the DEP Rideshare reporting; providing a means of internal and external communications. Benchmarks can include:

- » Non-SOV mode share
- » Shuttle cost/rider/day
- » Number of EV charging stations
- » Number of weather-protected bike parking spaces
- » Number of accidents involving walkers and bicyclists
- » TDM program enrollment

G.7. FORMALIZE COMMUNICATIONS WITH PARTNERS AT CITY, MASSDOT, MPO, LRTA ETC.

Formalizing communications may simply mean either making a commitment to participate in existing meetings such as the Middlesex 3 Coalition Transportation & Infrastructure meetings and/or establishing a standing meeting with local service providers. MASCO, in the Longwood Medical and Academic Area (LMA) has standing meetings with the MBTA, typically quarterly that provide an opportunity to share specific feedback about bus, train and subway service and to discuss longer-term goals for transportation improvements. Such an arrangement is beneficial for both UMass Lowell and the local RTAs in providing a formalized, constructive dialogue for sharing customer feedback and suggestions and often lays the foundation for real improvements in service.

Implementation

The following section provides a tabular summary of the recommendations in the preceding sections. This includes a summary header corresponding to overall strategies A. through G., a listing of the recommendations under each of these headers, a listing of benefits and suggested timeframe for implementation and a suggested listing of project partners. UMass Lowell is anticipated to be a partner in implementing all recommendations of this plan to varying degrees. UMass Lowell-specific action items may be implemented by a variety of departments and organizations on campus including the Executive Cabinet, various academic and research programs, Administrative Services, Facilities Management, University Relations, and Information Technology, among others. The timeframe for implementation is based on the following criteria:

SHORT TERM

Either important to initiate now, low-hanging fruit, or already underway

MID TERM

Will require more resources, is of less immediate importance and is relatively more challenging than short-term

LONG TERM

Generally, a longer-term project requiring more resources, a longer lead time and/or is dependent on commitments from others

STRATEGY	RECOMMENDATIONS	BENEFITS	TIMEFRAME			RESPONSIBILITY/ PARTNER(S)
			SHORT	MID	LONG	
A. Positioning for Transportation & Technology Upheaval	A.1 Planning for a Shared, Autonomous Transportation Future	<ul style="list-style-type: none"> » Raise UMass Lowell profile » Provide local leadership » Serve as a local mobility lab 				UMass Lowell and the City
	A.2. Perform Feasibility Study to Identify Benefits of Shared Transportation Services	<ul style="list-style-type: none"> » Provide local leadership » Address citywide need 				Uber/Lyft, UMass Lowell Difference Maker Program
	A.3. Accommodate On-Demand Services/ Develop Policy	<ul style="list-style-type: none"> » Reduce pressure on traditional, fixed route services and parking » Reduce traditional fixed route costs 				UMass Lowell
	A.4. Identify Curbside Areas for Potential Rideshare Drop-off Locations	<ul style="list-style-type: none"> » Reduce congestions/conflicts 				UMass Lowell
	A.5. Promote UMass Lowell and City as a Local Laboratory for Existing and New Transportation Programs	<ul style="list-style-type: none"> » Raise UMass Lowell profile » Capitalize on overlap between operational needs, business and academic growth 				UMass Lowell and the City
	A.6. Further mine In-house Expertise and Academic Excellence	<ul style="list-style-type: none"> » Marry internal academic and operational strengths around health, wellness, business and transportation 				UMass Lowell
B. Wins for the City of Lowell & UMass Lowell	B.1. Change ordinances as required to reduce incentives for students to park on neighborhood streets	<ul style="list-style-type: none"> » Improve community relationships » Create public revenues for sidewalk & other improvements 				City
	B.2. Reduce Peak Hour SOV Traffic to UMass Lowell	<ul style="list-style-type: none"> » Reduce impacts to City traffic while supporting in-kind improvements for biking, walking & transit 				UMass Lowell
	B.3. Work with Partners at MassDOT and City to Implement Roadway Improvements	<ul style="list-style-type: none"> » Reduce Congestion » Increase multi-modal LOS performance 				City, MassDOT
	B.4. Help position City for Infrastructure Funding Opportunities such as Vision Zero, SRTS, and Complete Streets	<ul style="list-style-type: none"> » Cost-sharing » New funding sources » Faster delivery of improvements 				City, NMCOG

STRATEGY	RECOMMENDATIONS	BENEFITS	TIMEFRAME			RESPONSIBILITY/ PARTNER(S)
			SHORT	MID	LONG	
C. Regional Transportation & Leadership	C.1. Work with RTAs to Provide More Direct, One-seat Ride Service to Campus	<ul style="list-style-type: none"> » Reduce drive alone mode share amongst commuter students » Increase RTA ridership 				LRTA, MVRTA
	C.2. Remove Last-mile Barriers to Campus	<ul style="list-style-type: none"> » Increase effectiveness of commuter rail service » Create more of an intermodal hub on campus 				LRTA, On-Demand Services, MBTA
	C.3. Work with Partners to Identify More Regional Intercept Points	<ul style="list-style-type: none"> » Improve Park and Ride bus ridership » Reduce UMass Lowell parking demand » Reduce driving costs 				NMCOG, MassDOT
	C.4. Develop Leadership Around Regional Transportation Challenges	<ul style="list-style-type: none"> » Attract new stakeholders, grant funding, and technical support » Market UMass Lowell to prospective students, staff, and faculty 				Middlesex 3 Coalition, City
	C.5. Re-engage with Local Transportation Management Association (TMA), Middlesex 3 Coalition	<ul style="list-style-type: none"> » Identify potential cost-sharing opportunities for TDM programs » Leverage for advocacy around regional transportation needs 				Middlesex 3 Coalition
	C.6. Coordinate with Long-Range Plans for extension of Lowell line to Nashua/ Manchester, stop at UMass Lowell	<ul style="list-style-type: none"> » Long-term potential for commuter rail service to accommodate UMass Lowell commuter needs 				NMCOG
D. Solutions to Address Congestion & Improve Safety	D.1. Implement Rules of the Road/Safety Education Campaign	<ul style="list-style-type: none"> » Cost-effective » Opportunity to collaborate with City 				City others such as Lowell General Hospital
	D.2. Conduct Road Safety Audits	<ul style="list-style-type: none"> » Identify safety and access improvements for campus affiliates and City residents, visitors 				City, MassDOT
	D.3. Work with Partners at MassDOT and the City to target Roadway Improvements in Areas with High Volumes of Cyclists and People Walking	<ul style="list-style-type: none"> » Minimize congestion » Increased multi-modal LOS performance » Improve safety 				City, MassDOT
	D.4. Help position City and Region for Safety-related Grant Funding such as Vision Zero	<ul style="list-style-type: none"> » Cost-sharing » New funding sources » Faster delivery of improvements that otherwise are on TIP 				City, Massachusetts Vision Zero Coalition

STRATEGY	RECOMMENDATIONS	BENEFITS	TIMEFRAME			RESPONSIBILITY/ PARTNER(S)
			SHORT	MID	LONG	
D. Solutions to Address Congestion & Improve Safety	D.5. Pilot Safe Routes to School (SRTS) for Higher Ed at UMass Lowell	» Gain recognition for initiating a new transportation programs				City, NMCOG
	D.6. Combine Transportation Plans: Infrastructure, Education, Evaluation and Enforcement	» Develops new protocol to measure transportation program effectiveness and share findings more broadly				UMass Lowell
E. Removing Walking, Biking and Transit Barriers	E.1. Partner with City to construct Bike Infrastructure on Key Corridors Such as Pawtucket, Merrimack and University Avenue	» Increase bike mode share - only 2% of resident students bike » Improve cycling safety and raise profile as a biking campus » Improve health and wellness for City and students alike				City, MassDOT, NMCOG
	E.2. Better Match UMass Lowell's Existing Bike Rental Program to Student, Faculty and Staff needs	» Increase bicycle mode share – less than 1% of employees bike » Improve convenience of bikes for errands and inter-campus travel				UMass Lowell
	E.3. Collaborate with City to Create UMass Lowell/City-Compatible Bikeshare System	» Improve mode choice for inter-campus trips » Reduce drive alone mode share				City, UMass Lowell
	E.4. Further invest in On-campus Cycling Culture	» Attracts more choice bicyclists » Creates respect for those who own bikes » Attain gold or platinum status from League of American Bicyclists				UMass Lowell
	E.5. Improve Walking Conditions	» More than 60% would walk more if lighting & pedestrian infrastructure was improved » Reduce demand for local SOV trips				City
	E.6. Improve Roadster Visibility/ Enhance Stop Amenities	» Increase ridership » Improve perception that this is a preferred mode of campus travel » Make system more legible				UMass Lowell

STRATEGY	RECOMMENDATIONS	BENEFITS	TIMEFRAME			RESPONSIBILITY/ PARTNER(S)
			SHORT	MID	LONG	
F. Parking, Transportation Demand Management & Levelling Cost	F.1. Level cost/convenience between driving and non-SOV modes	<ul style="list-style-type: none"> » Reveal cost of driving & discount of alternatives » Cash out dis-incentivizes driving 				Requires additional funding sources
	F.2. Restructure Parking Pricing to Value High Demand Locations and Incent Use of Underutilized Lots	<ul style="list-style-type: none"> » Reduce drivers' negative perceptions » Improve system efficiency » De-congest City streets near core parking lots » Reduce need for supply expansion » Highlight cost of driving & discount of alternatives 				UMass Lowell
	F.3. Further Restrict Ability to Travel between UMass Lowell Parking Lots	<ul style="list-style-type: none"> » Reduce congestion on City streets 				UMass Lowell
	F.4. Reduce Need to bring Personal Vehicle to Campus for Errands	<ul style="list-style-type: none"> » Reduce incentive to drive to campus and use personal vehicle to run errands 				
	F.5. Target existing UMass Lowell TDM programs with low levels of awareness	<ul style="list-style-type: none"> » Low-hanging fruit » Improve non-SOV mode share 				UMass Lowell
	F.6. Explore a Commuter Calendar to Reward Non-SOV Modes	<ul style="list-style-type: none"> » Add an element of reward to daily commuting » Reward non-SOV commuters 				UMass Lowell
	F.7. Pilot Commuter Rail Subsidy for Staff and Faculty	<ul style="list-style-type: none"> » Level playing field between cost and convenience of driving and taking commuter rail » Reduce drive alone mode share amongst employees on Lowell Line 				(Requires new funding stream) UMass Lowell, MBTA

STRATEGY	RECOMMENDATIONS	BENEFITS	TIMEFRAME			RESPONSIBILITY/ PARTNER(S)
			SHORT	MID	LONG	
G. Messaging and Communications Consolidation	G.1. Hire a UMass Lowell TDM Coordinator	<ul style="list-style-type: none"> » Add capacity to promote existing and new TDM programs » Raise awareness of TDM programs » Increase representation of UMass Lowell at local and regional transportation advocacy meetings 				UMass Lowell
	G.2. Consolidate campus transportation information and communications on one single, transportation homepage	<ul style="list-style-type: none"> » Create a virtual “one-stop-shop” of all you need to know about getting to and around campus » Streamline availability of non-parking related information 				UMass Lowell
	G.3. Raise Awareness of TDM Programs	<ul style="list-style-type: none"> » Build appetite for further successes 				UMass Lowell
	G.4. Change Messaging Around Driving versus Other Modes	<ul style="list-style-type: none"> » Mainstream alternatives to driving » Create a culture focused on reducing driving 				UMass Lowell
	G.5. Share Successes Such as Regional Transit Pass program, TIGER application	<ul style="list-style-type: none"> » Build appetite for further successes 				UMass Lowell
	G.6. Benchmark Progress Such as Increases in Ridership, Grant monies Jointly Won	<ul style="list-style-type: none"> » Promote successes, target weaknesses » Build momentum to help secure additional funding 				UMass Lowell
	G.7. Formalize Communications with partners at City, MassDOT, MPO, LRTA etc.	<ul style="list-style-type: none"> » Establishes expectation of a regular check-in and opportunity for information sharing 				UMass Lowell

