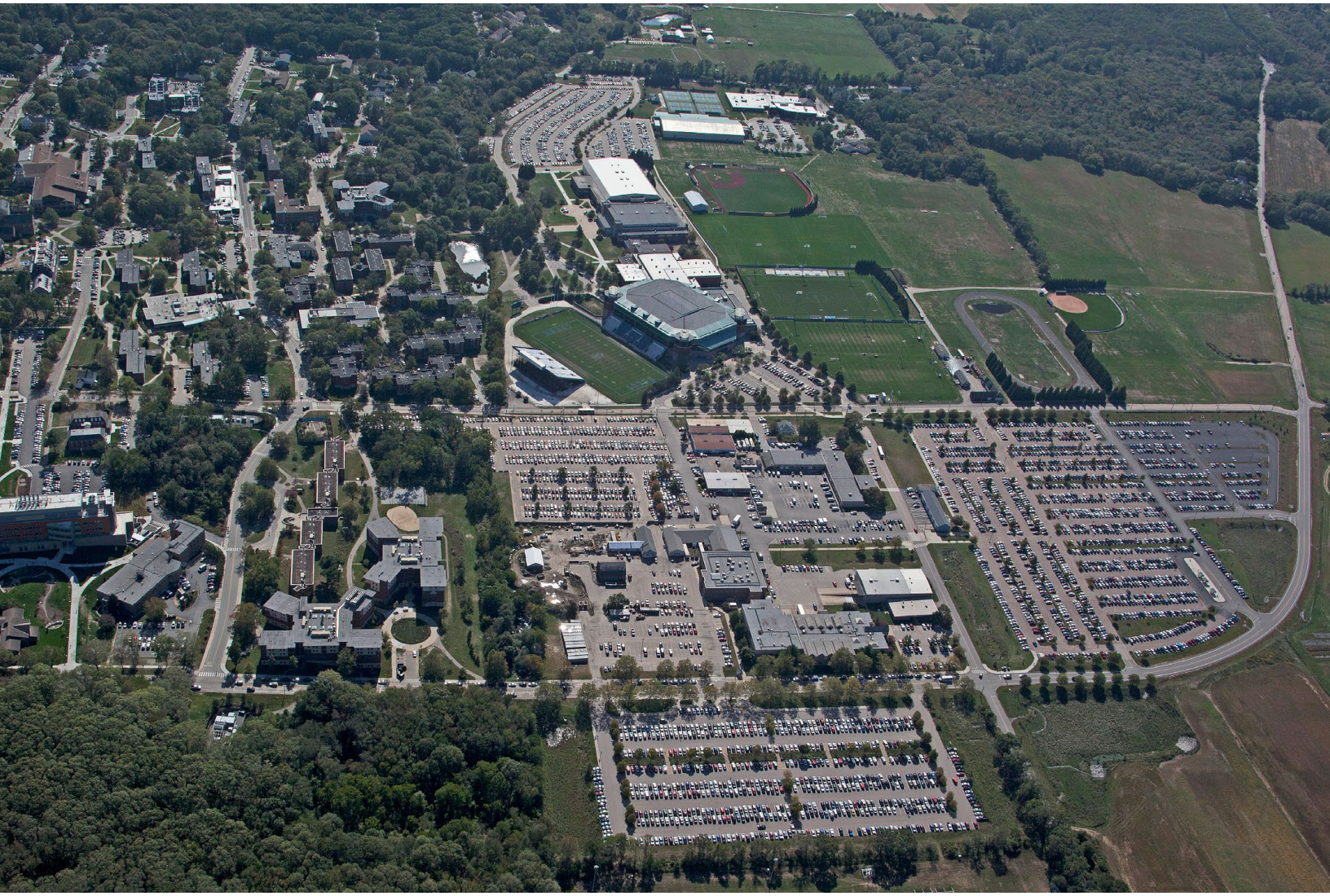
MASTER PLAN REPORT

Transportation and Parking Master Plan

University of Rhode Island, Kingston Campus



MARCH 2018

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Transportation and Parking Master Plan

University of Rhode Island, Kingston Campus

PREPARED FOR

THE UNIVERSITY OF RHODE ISLAND

PREPARED BY

vhb

March 2018

In association with:
Desman Associates
Traverse Landscape Architects

THINK BIG WE DO℠

Transportation and Parking Master Plan

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1.0 Executive Summary

"Think Big. We Do". The URI Transportation and Parking Master Plan (TPMP) establishes an implementation strategy that allows the University to grow while enhancing mobility, campus character, and aesthetics through environmentally sustainable and low impact smart growth strategies. Without a strategic approach to parking, URI would be forced to continue to add surface lots to keep pace with growth. This plan establishes short and long-term actions that provide for growth without requiring more surface parking. Many of the recommendations are simple to implement, while others will take time, funding, and determination. The parking vision established in this plan is dependent on a bold approach to providing a seamless transit system for efficient movement of the University population and visitors within the campus proper, but equally important, to regional points of interest and connections. Once implemented, the campus transportation system will be efficient, regionally connected, and sustainable.

The following key principles were identified at the outset of the plan:

1. Move parking out of the campus core to create a more pedestrian and bike friendly environment while accommodating needs for service vehicles and accessible spaces.
2. Manage demand while continuing to assess supply. Add parking supply strategically and only as a last resort.
3. Enhance shuttle service to maximize use of peripheral and remove lots.
4. Transform campus roadways into "complete streets" and create URI branded gateways at key locations so that there is a sense of arrival to campus that does not exist today.
5. Create a regionally connected bicycle network.
6. Create a parking model which can be used going forward to adapt to changing circumstances such as enrollment, test new ideas, and monitor and forecast parking supply and demand.
7. Explore potential revenue streams that will support and sustain transportation/transit infrastructure.

Using these principles as a guiding framework, the plan recommendations have been organized around the following five key transportation components:

- **Roadways** – This component encompasses the traditional transportation element of complete streets. Improvements are focused on enhanced intersection operations, traffic calming, and reducing traffic in the campus core thereby reducing conflicts with pedestrian and bicycle travel.

- **Parking** – This element requires the efficient use of available parking resources and evaluation of the parking system including management, pricing, enforcement, and assignment policies.

- **Transit/Shuttles** – The use of RIPTA bus service as a primary travel mode is steadily increasing in popularity, requiring increased fleet, more frequent service, and convenient stop locations. The parking strategy will require additional transit connections within the campus boundaries to link fringe parking areas to employment and educational centers. URI's growth is underpinned by transit enhancements, an expanded UPass program, added RIPTA engagement, and other transit incentives that reduce reliance on surface parking.

- **Pedestrians** – Safe and comfortable pedestrian circulation is critical at any campus, thus it is important to support these users through expansion of the current network and provide increased connectivity, access and safety across campus.

- **Bicycles** – The bicycle component of this plan intends to implement amenities and designated routes to create a comprehensive, safe, and regionally connected network serving the campus.

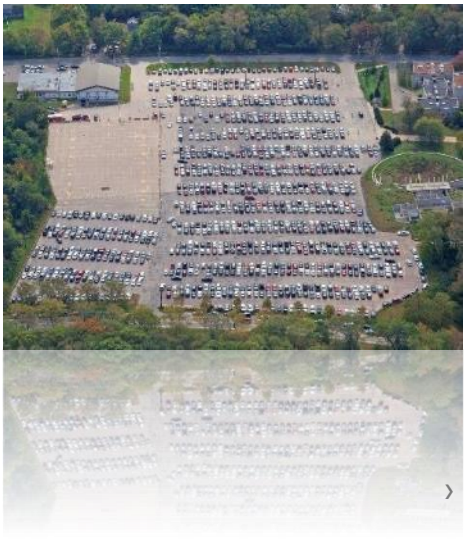
Each of these transportation elements together form an integrated and comprehensive transportation system. Only when these elements exist in concert with one another will URI maximize the effectiveness and efficiency of its transportation system in supporting the campus mission.

1.1 Observations

URI has a substantial amount of development under construction or planned. With little opportunity to expand the campus footprint, surface parking lots are the most likely sites for development. The effect of constructing new development on surface parking is two-fold: the loss of parking supply and the potential increase in parking demand.

The assessment of URI's campus shows that:

The band practice area in the Fine Arts lot takes 150 spaces off-line in the Fall semester



- **URI's current parking supply and financial model are not sustainable "as is"** – The parking system is approaching its capacity and is not adequately funded due primarily to the fact that faculty and staff do not pay for parking. Data collected in Fall 2016 show that the current parking supply has little excess capacity on a typical day and the system is near capacity during certain peak periods. New parking strategies, aggressive demand management, or more spaces will be needed in the near future to support campus growth and to replace spaces lost to development. New parking strategies that reduce the need for surface parking will help reduce impervious surface area, help the campus meet RIDEM requirements of improved stormwater quality, and improve aesthetics. In conclusion, space on the campus is at a premium and there is little to no room to continue to build surface parking, nor is there the desire to do so unless as a last resort.

- **Parking should be "market priced" and reflect the goals of the University's master plans** – URI allows all underclassmen to have a car on campus, and this is advertised as an added benefit during new student orientations. URI also does not charge faculty and staff for parking, which is unique to URI when compared to peer institutions. As URI runs out of opportunities to expand surface parking, the permit fee structure should reflect the fact that structured parking decks will be needed at some point. Compared to peer institutions, URI's parking fees are low. Basically, the permit fee structure should be revisited,

including charging everyone for a parking permit. The University needs to balance the cost tradeoff of building parking decks vs. relocating some of this parking supply to other off-site parking facilities. Before this can happen, the structure of the campus shuttle system needs to be revisited and transportation hubs need to be created. Parking decks have been identified at three potential locations: Flagg Road Lot, Fine Arts Lot, and Welcome Center Lot.

- **Many students, faculty, and staff drive alone.** Excessive SOV (single-occupancy vehicle) drivers exacerbate parking demand and is a direct result of parking being too convenient and inexpensive. The prevalence of SOV's driving to and from campus further strain the congested roadways leading to/from URI. Carpooling has the dual benefit of reducing parking needs and reducing the number of vehicle trips to/from campus. In the typically fall semester, over 10,000 students, staff, and faculty commute to campus. Approximately 90 percent of these trips are in single-occupancy vehicles. A recent greenhouse gas (GHG) emissions inventory reports that commuting to the campus accounts for more than 20 percent of URI's total GHG emissions.

- **An expanded shuttle system, both regional and local, will be needed to support the eventuality of remote parking** – RIPTA, the current transit service provider, excels at providing regional connectivity to URI and its other campuses. In the near-term, additional RIPTA regional service to the campus will be needed along with an expanded UPass program. The importance of continued RIPTA engagement and an expanded partnership to facilitate the integration of transit hubs is a critically important near-term step. In addition to expanded regional connectivity to campus through RIPTA, there will be a need for an "intramural" or on-campus shuttle system. Unlike the expanded regional service provided by RIPTA, the on-campus shuttle would ideally be dispatched locally and branded with smaller vehicle types (if possible) that circle the campus with high service frequencies. By taking this important step, URI has the opportunity to implement a URI brand to the bus or even consider a custom brand to the route names and stop on campus. This added expense could be offset in part through increased parking fees. In the future, this on-campus shuttle system would migrate over to an autonomous, or driverless system as the technology evolves. In the near-term, fine-tune operations at the Memorial Union stop to reduce or eliminate any layover activity, dwelling, and bus idling.

A campus-wide material handling plan is needed to organize service/loading circulation

- **Walkways frequently also function as service corridors -** URI Facilities and Public Safety require quick and close access to all buildings resulting in walkways that double as service/access corridors. The location of dumpsters across campus at times necessitates that pedestrian walkways double as service roadways. Moreover, many of these dumpster/service areas are located in full view and not

screened. If not properly organized and managed, there will continue to be an excessive amount of walkways that carry both vehicles and pedestrians. A Material Handling and Loading/Service Master Plan is needed for the campus to help untangle the overlapping walkways and service corridors and better organize dumpsters across the campus so they are screened from view.

› **Handicap accessible parking needs focus** – From outreach sessions with Campus Disability Services and the Student Senate, there is a strain on the availability of convenient and quality accessible parking spaces and the aesthetics of the pathway from accessible spaces to buildings could be improved.

› **The existing bicycle circulation system is lacking** – URI currently does not have a contiguous network of on-street or off-road bicycle facilities such as bike lanes or off-road multi-use paths. An important recommendation in this plan involves creating a campus-wide bicycle network, one that connects to the regional network via the South County Bike Path.

Campus roadways, such as Upper College Road, do not convey a sense of arrival and they are auto-oriented

› **Campus roadways are largely oriented to vehicles only and do not convey a sense of arrival** – Key roadways on campus, especially Upper College Road, need a "complete street" overhaul and a concerted branding effort (as recommended in the Campus Landscape Master Plan). Branding, such as gateway signage, would convey a sense of arrival and provide wayfinding opportunity. A "complete street" overhaul involves reassigning space to better accommodate pedestrians and bicycles and improve the sense of arrival on campus where drivers are more aware of their surroundings and drive slower. There are many opportunities to repurpose roadways as pedestrian, shuttle, service, and emergency vehicle corridors only, where general purpose traffic is prohibited.

› **Lack of gateways and wayfinding –** The campus needs better gateways and wayfinding. While some branding occurs on the banners attached to light poles and there are sporadic URI signs, a much stronger and cohesive branding, wayfinding, and gateway initiative is needed in order to appropriately convey a sense of arrival. For the visitor coming to campus, signage and wayfinding is critically important.

1.2 Recommendations

The URI TPMP serves as an implementation tool for the University to work towards an effective, safe and efficient transportation system on campus. The following proposed improvements are summarized for each individual transportation system. Following the summaries, Table ES-1 provides an implementation matrix with

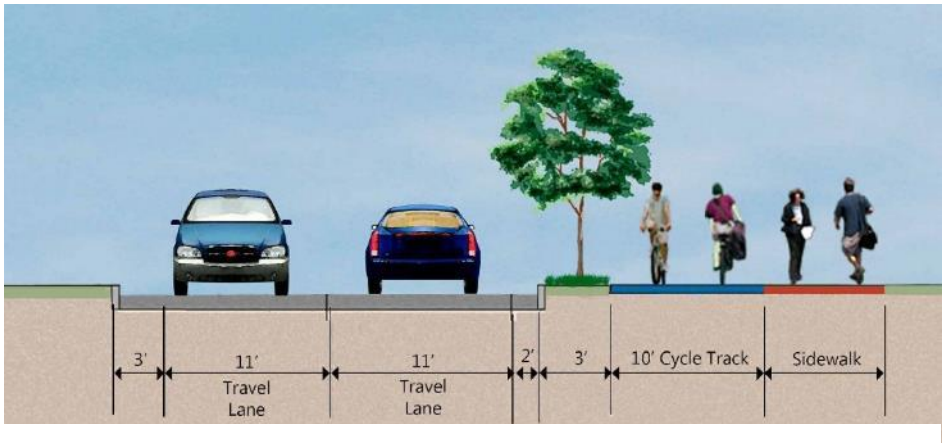
potential phasing/timing. Finally, Figure ES-1 illustrates the overall framework of recommendations highlighting several of the larger scale infrastructure improvements recommended as part of the plan.

Roadway Recommendations

- **Upper College Road –** Add on-street bicycle lanes and a landscape buffer between the roadway and sidewalk (refer to Figures 7a – 7c). Select intersections along Upper College Road through campus should be converted from two-way stop to an all-way stop condition. Consistent crosswalks should be installed, compliant with Campus Design Standards. Enhanced pavement markings, that are retroreflective and visible at night, should be installed along the corridor, especially markings in advance of crosswalks.
- **Flagg Road/Plains Road –** Implement a "road diet" on Flagg Road and widen Plains Road to Route 138 to accommodate an additional lane for egress traffic and Ryan Center event traffic. Eliminate on-street commuter student parking on Flagg Road and consider two options for rebuilding the roadway with enhanced bicycle accommodations:

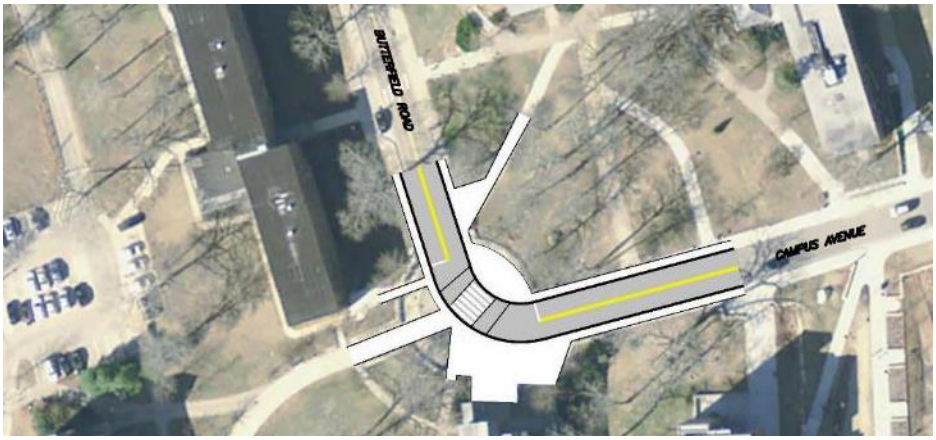
  (1) a center landscaped median with on-road bike lanes as shown on Figures 8a to 8d; or

  (2) a cycle track, or two-way separated bicycle path separated from the roadway, as illustrated on Figures 9a to 9d and in the image below. Select intersections should be converted to all-way stop condition.



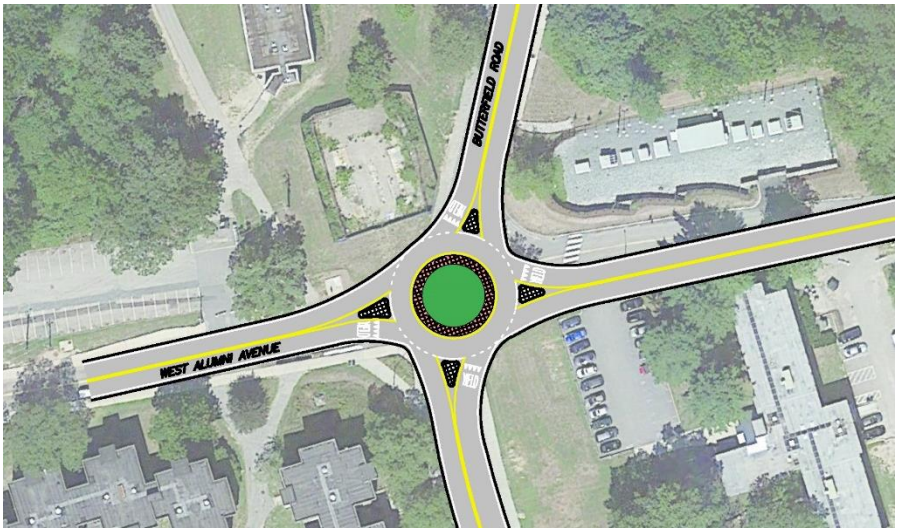
Flagg Road Enhancement with Cycle Track

- **Butterfield Road/Campus Avenue –** The intersection of Butterfield Road and Campus Avenue should be reconfigured with a raised crosswalk to improve pedestrian safety.



Reconfigure Butterfield Road/Campus Ave to Improve Pedestrian Safety

› **Butterfield Road/West Alumni Avenue –** The intersection of Butterfield Road and West Alumni Avenue should be reconfigured with consideration given for a roundabout or enhanced intersection treatment.



Consider a Roundabout at the Butterfield Road/West Alumni Avenue

› **Lower College Road –** Eliminate on-street commuter student parking and reconstruct the deteriorated roadway with narrowed travel lanes (sufficient for shuttle bus access), upgraded pedestrian-scale lighting, and a sidewalk.

Parking Recommendations

› **Identify a more appropriate space for the marching band to practice –** Having the band practice in the Fine Arts Lot is not an appropriate location and it takes 150 commuter spaces off-line during the busy Fall semester.

Parking dominates much of the campus landscape, especially within Fraternity Circle

- **Lot identification -** Develop a numbering system for the parking lots with accompanying signage and synchronize this with permit sales for clarity (refer to Figures 9a to 9d). For visitors not familiar with the campus, having a numbered system will especially help with wayfinding.
- **Reduce core campus parking and provide more remote parking -** Minimize the amount of parking within the campus core, except as necessary for accessibility, loading/service and support services. Locate major parking facilities at key locations along the periphery of the core campus to intercept traffic; create a parking district and transportation hubs on the fringe of the campus. Seek opportunities for remote commuter off-campus parking with shuttle connectivity (e.g. Schneider Electric, Wickford Junction). The State Beach parking lots would be ideal candidates as they are largely unused from September through May and are already on RIPTA bus routes (for example the Scarborough Beach lot is on a RIPTA fixed route (66).
- **Use Origin-Destination (OD) data to confirm the concentrations of off-campus housing areas** – OD data would help URI focus efforts on locating appropriate remote parking "intercept" opportunities along with areas to focus RIPTA shuttle service. URI and RIPTA have plenty of anecdotal data that can be used as a starting point. For example, many students who live "down the line" in Bonnet, Wakefield, Matunuck, and Narragansett could be enticed to park for free in a remote lot with free shuttle connectivity. In fact, this concept of remote parking is already happening informally at Schneider Electric where students park there to avoid paying for a permit. A survey should be conducted periodically for all permit holders to confirm commute origins and travel patterns/preferences.

- **Provide sufficient parking to meet future demand** - Eventually, unless there is a ban on student parking or no growth, structured parking will need to be considered. This structured parking, envisioned as 1-level decks, should be strategically located at intercept locations such as the Fine Arts Lot, the Flagg Road Lot, and the Welcome Center Lot. The structured parking at Flagg Road would support the concept of creation of a transportation hub and Intermodal Station at the intersection of Flagg Road and Plains Road if a rail spur were provided to the campus. The parking decks at the Welcome Center Lot and Fine Arts Lot would support the Upper College Road District and potentially support visitor parking.
- **Accommodate visitors -** Provide an adequate amount of visitor parking and improve the experience for visitors by allowing pre-registration before arriving to campus.
- **Update parking rate structure –** Charge more for parking and implement a permit fee for faculty and staff using a sliding scale based on salary and parking location. As an incentive, a free UPass would be provided to anyone

not obtaining a parking permit and faculty and staff would be offered a parking "cash-out" benefit.

- **Provide incentives to encourage students, faculty, and staff to leave their cars at home –** Work with RIPTA to expand the UPass program so that all students, faculty, and staff receive a free transit pass if they choose to not bring a car to campus. Implement preferential carpool parking. Implement incentives for faculty/staff who choose to not use a parking space, such as a parking "cash-out" benefit.
- **Implement technology to help manage the campus parking system** – Parking enforcement and permit management could be substantially streamlined if a license plate reader (LPR) system or other suitable system were installed on-campus. For example, rather than having an enforcement officer constantly circling lots for violations, a LPR system would automatically notify a central dispatch area if there was a violator in a certain parking lot. Section 3.6 provides a detailed discussion of potential parking management system options.
- **Provide more accessible spaces and increase enforcement** – For the lots within the campus core that are designated for removal, reserve portions of these lots for accessible spaces. Bolster ADA parking enforcement in hatched/no-parking areas adjacent to ADA spaces (enforcement and education). Implement a permit system for accessible spaces.

Transit/Shuttle Recommendations

- **Reorganize the shuttle system into a regional connector and local circulator -** Focus RIPTA service on a strengthened and expanded regional connection. A separate, smaller shuttle would provide an on-campus/ in-and-around circulator controlled by Parking and Transportation Services, branded for URI. In the future, this on-campus shuttle system would migrate over to an autonomous, or driverless system as the technology evolves. In the near-term, fine-tune operations at the Memorial Union stop to reduce or eliminate any layover activity, dwelling, and bus idling.
- **Additional RIPTA engagement -** Expand the RIPTA partnership to facilitate the integration of transit hubs, especially the potential for a designated South County Transit Hub integrated into the design and construction of the Upper College Road District and complete street retrofit.
- **Expand UPass program and better market commuter options -** Expand the UPass program so it is activated through student ID cards (students, faculty, staff). Do not market "parking" as a benefit for new students.
- **Data-driven shuttle system management -** Migrate to a more data-driven management of the shuttle system with individual bus stop utilization data/ridership provided for planning purposes.
- **Reallocate RIPTA shuttle resources -** Cancel the existing flex service and reassign the resources used for this service to augment Route 66 and 62

with expanded service lines (and smaller bus types if possible). Expand shuttle service to the south and west connecting the campus to the surrounding villages of Peace Dale, Wakefield, Matunuck, Bonnet Shores, and underserved communities of Westerly, Charlestown, Richmond and Wyoming. Provide a reliable system that would encourage students and faculty in these communities to choose transit over driving.

- **Transit Hubs -** Create transit hubs at the Welcome Center and Plains Road/Flagg Road parking district. These locations will serve as RIPTA regional service stops and link RIPTAs regional service to the on-campus shuttle circulator. These hub centers will also support bicycle parking and electric vehicle charging stations. As the University works towards an expanded UPass program for all undergraduates along with faculty and staff in support of counteracting reduced and limited parking and increased transit ridership, it is important that the University work closely with RIPTA to identify and establish new service lines for South County that can terminate at URI hub locations and service the Upper College Road District. Potential funding sources to create and service the new transit hubs could be linked to:
    - a current Transportation Improvement Program (TIP) category that is available for statewide transit hubs;
    - from Federal Transit Administration (FTA) appropriation earmarked for capital improvements; or
    - possible linkage to Transit Oriented Development (TOD) opportunities associated with a public/private development within the Upper College Road District.
- **Shuttle consolidation -** Move the Ram Van/URI's disability services to fall under control (administrative and operational) of the Parking and Transportation Office. Rebrand the Office of Parking and Transportation as the Office of Transportation Mobility and include a transportation demand management (TDM) coordinator.
- **Improve transit connectivity to South County –** Advance previous RIDOT studies of a new rail spur to campus (along Plains Road) from Kingston Station with a dedicated transit roadway into campus. In the near-term, as a lower cost and innovative alternative, seek to implement an autonomous vehicle corridor along West Alumni Avenue connecting the train station to the heart of the campus. Another near-term option that could be implemented while a rail spur is evaluated should include a transit vehicle corridor on a new roadway between Plains Road and either Route 138 or Waites Corner Road with direct access to Kingston Station. Additionally, the emergence of campus transit hubs (Inter-modal Centers) would lead to expanded service lines to support commuting patterns in South County. This would allow for the 62 which originates from campus and runs to Providence, the 66 which services the south from Galilee and the 64 which currently provides service from the east via Newport, to all utilize the

campus hub location. This approach would also support a transfer point for new route lines that could emerge from the west servicing Richmond, Wyoming and communities along the Connecticut line. A similar line could be considered from the southwest connecting Westerly, Weekapaug and Charlestown to campus. Further analysis will be required to determine student commuter patterns and faculty/staff commuting destinations. This will be critical to determining ridership levels and capacity needs.

- **Clean fuels and efficient vehicles –** Decrease GHG emissions of URI's fleet vehicles through cleaner fuels. Replace inefficient University fleet vehicles with more efficient vehicles over time.
- **Plan for future vehicle technology –** URI is an ideal environment to pilot and implement a "smart" Connected/Autonomous Vehicles (CAV) corridor, envisioned to carry a driverless shuttle vehicle, which would be the first in Rhode Island. Phase 1 implementation should be considered for Upper College Road with future phases on West Alumni Avenue and Plains Road, connecting the campus to the train station. These CAV corridors are depicted on Figure ES-1. Integration of advanced arrival and travel time systems would be invaluable in promoting benefits of transit and shuttle use. It would also enhance the reliability and overall customer experience of a connected mobility system.

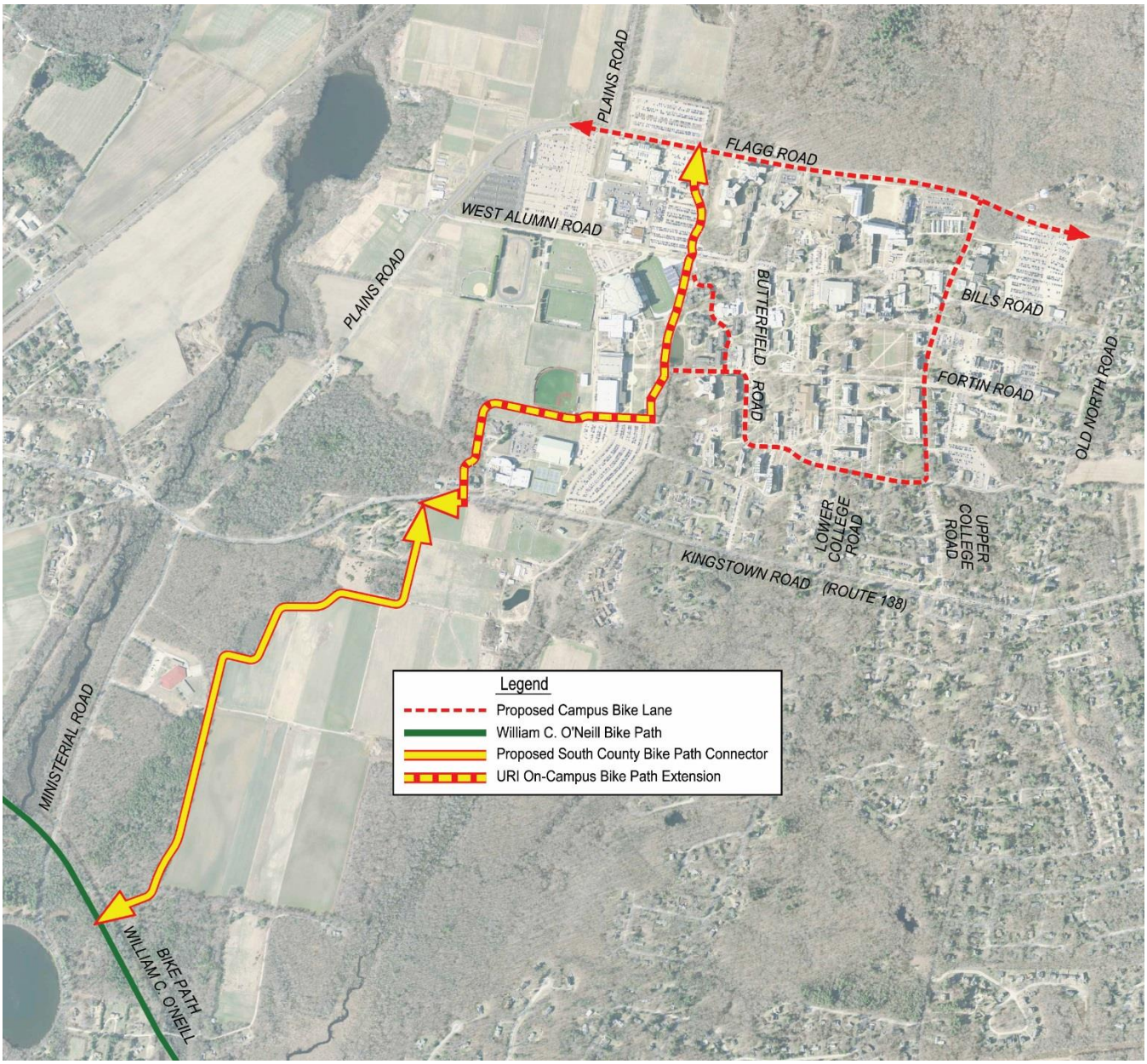
Pedestrian Recommendations

- Implement standardized walkway improvements (width, material) and hierarchy (consistent with RIDOT specifications and the Campus Landscape Master Plan recommendations).
- Provide a buffer between roadways and sidewalks where possible.
- Add a sidewalk to Lower College Road.
- Better separation and designation of pedestrian routes vs loading/service routes.
- Repurpose select campus roadways so they are limited to use by pedestrians, bicycles, and shuttle/service vehicles only.
- Improve safety of pedestrian circulation through parking lots via parking lot design that considers buffer areas and aisles that are car-free for pedestrians.

Bicycle Recommendations

- Provide a seamless system of on-road bike lanes and off-road bike paths throughout campus (consistent with the Campus Landscape Master Plan).
- On-road bike lanes are recommended on Upper College Road, Flagg Road, Campus Avenue and portions of Butterfield Road. Before on-road bike lanes are implemented on Flagg Road, a "road diet" is needed in order to calm traffic.

- Connect regionally to South County Bike Path through a new off-road bike path that begins near Ministerial Road/Route 110 and the existing South County Bike Path, skirts Peckham Farm, crosses Route 138 and parallels the White Horn Brook up to Flagg Road (refer to concept plan on following page).
- Implement a formalized bike share program once the connection to the South County Bike Path is made (or sooner if demand warrants).
- Add bike racks across campus as demand warrants.
- Connect Grad Village, Fraternity Circle and all residence halls to the bike path through an internal network of paths and corridors to the official dedicated bike path.



Synergy between the potential alignment for the South County Bike Path Connector with on-campus Bike Paths

Table ES-1 Summary of Phased Recommendations

	PHASE 1 – Short-term Actions (UNDER 2 years)	PHASE 2 – Intermediate Actions (2 – 5 years)	PHASE 3 -Long-term actions (Over 5 years)
Policy & Enforcement	1. Parking: a. Revise policy for freshman resident parking/implement restrictions; assess the price elasticity of parking fees in comparison to other tuition/housing/meal costs from competing universities b. Identify a more appropriate permanent space for the band to practice c. Bolster ADA parking enforcement in hatched/no-parking areas adjacent to ADA spaces (enforcement and education) d. Update parking rate so EVERY parking permit generates revenue (charge faculty/staff for parking) e. Provide incentives for faculty/staff who do NOT bring a car to campus f. Reduce (or cap) parking permit sales to be better aligned with space inventory g. Improve marketing of transportation commuter options (less focus on cars) h. Designate a Parking District (Plains Road Lot) with Transportation Hubs 2. Transit/shuttle/fleet: a. Consolidate existing URI-hosted shuttle services under Parking & Transportation (Disability Services, Athletics) b. Advance the rail and road connectivity concepts developed by RIDOT and other reasonable connectivity alternatives between Kingston Station and URI c. Transition fleet vehicles to ultra-low sulfur biodiesel fuel	6. Parking: a. Restructure Transportation and Parking Department into TRANSPORTATION MOBILITY OFFICE b. Implement revised policy for freshman parking c. Implement permit system for ADA spaces 7. Transit/shuttle/fleet: a. Increase transit subsidy b. Migrate URI's vehicle fleet to clean fuels and electric vehicles c. Expand UPass program by activating IDs (students, faculty, staff) as bus passes	11. Transit/shuttle/fleet: a. Increase the number of University fleet vehicles with higher-than-average fuel efficiency/use cleaner fuels by 2025 b. Decrease URI's vehicle fleet size
Planning & Implementation	3. Parking: a. Relocate the band to permanent space b. Develop a numbering system for the parking lots for ease of wayfinding and permit allocation c. Begin design of 1-level parking decks at Flagg Road Lot, Fine Arts Lot, and Welcome Center Lot d. Obtain accurate origin-destination data for parking facility users tied to permit applications (data field entry) e. Prepare an Accessible/Material Handling Campus action plan; conduct a campus accessibility/material handling audit (parking, pathways, buildings) f. Implement technology-based parking management system g. Identify priority parking areas for carpoolers and electric vehicle charging stations h. Identify off-campus locations for remote parking for commuters 4. Transit/shuttle/fleet: a. Modify existing shuttle system in order to enable future parking changes: • **Regional connector**. Focus RIPTA service on a strengthened and expanded regional connection to campus fringe parking lots, high density off-campus residential areas, remote lots, Providence, RINEC, and NBC campuses. • **Local circulator**. A separate, smaller shuttle operator provides an on-campus/ in-and-around circulator controlled by Parking and Transportation Services, branded for URI b. Obtain more robust shuttle utilization and tracking data using latest GPS and handheld technology (i.e. apps for smartphones) c. Added service frequency between Kingston campus and Providence (including new RINEC) d. Expand UPass program (free transit pass) to all students, faculty, and staff e. Pilot a Connected Vehicle/Automated Vehicle Corridor on-campus (along Upper College Road) 5. Roadway/Pedestrian/Bicycle: a. Implement uniform pavement markings and branding and standardized walkway improvements and hierarchy. All pavement markings and signage need to meet basic MUTCD requirements.	8. Parking: a. Construct parking decks at Flagg Road Lot and Fine Arts Lot b. Convert initial select parking lots in the campus core to be accessible lots or loading/service only c. Implement carpool parking and electric vehicle charging stations 9. Transit/shuttle/fleet: a. Migrate shuttle system to private on-campus circulator synchronized with existing RIPTA service to/from campus regionally b. Add service that connects to off-campus student living areas (to encourage shuttle use vs. driving and parking) 10. Roadway/Pedestrian/Bicycle: a. Reconfigure general campus vehicular circulation b. Create a full campus regionally connected bicycle network to South County Bike Path c. Implement Complete Streets on select roadways d. Implement actions from the Phase 1 Accessible/MH Campus action plan e. Implement formalized bike share program f. Add bicycle racks across campus; plan for new bike share operator on campus	13. Parking: a. Convert remaining select parking lots in the campus core to be accessible lots or loading/service only 14. Transit/shuttle/fleet: a. Expand the Connected Vehicle/Automated Vehicle corridor from Upper College Road to include West Alumni Road and Plains Road to the train station

Recommendation aligned with URI's Strategic Plan for Campus Sustainability and Climate Action Plan

2

2.0 Existing Conditions

Founded in 1892, this year (2017) marks URI's 125th anniversary. The University has transformed from its origins as an agricultural land-grant institution to today's Colleges of Nursing, Pharmacy, Business, Engineering, Arts and Sciences, Environment and Life Sciences, Health Sciences, Education, and Graduate School of Oceanography…all signature centers of scholarship and research.

With a population of 20,000 students, faculty and staff, URI is a small city and a major economic node in Rhode Island. URI is one of the state's largest employers. A world-class institution deserves a world-class, integrated transportation system that connects seamlessly across the state.

2.1 Study Purpose

URI's strategic goals require a long-term plan with emphasis on all modes of travel and expansion of alternative transportation. Improved vehicular access to and between campus locations is needed, and an improved environment for pedestrians and cyclists is essential.

The purpose of this plan is to recommend a range of short-term and long-term improvements that in total will yield an efficient and well-managed transportation and parking system. The following are the key framework principles:

1. Move parking out of the campus core to accommodate needs for service vehicles and accessible spaces.
2. Manage demand while continuing to assess supply. Add parking supply strategically and only as a last resort.
3. Enhance shuttle service to maximize best use of peripheral and remote lots.
4. Transform campus roadways into "complete streets" and create URI branded gateways at key locations so that there is a sense of arrival to campus that does not exist today.
5. Create a regionally connected bicycle network.
6. Create a parking model which can be used going forward to adapt to changing circumstances such as enrollment, test new ideas, and monitor and forecast parking supply and demand.
7. Explore potential revenue streams that will support and sustain transportation/transit infrastructure.

2.2 Study Process

To effectively assess and address the overall transportation needs of such a diverse, complex, and changing campus, it is necessary to define the study process. First, it was critical to have a stakeholder kick-off with the TPMP steering committee. Next, and most important step was to reach out to students, faculty, and staff to gather information and solicit ideas on the larger vision of the campus as related to transportation. From this outreach, emerging recommendations were developed, evaluated, and prioritized. As time progresses, the recommendations that are implemented can be evaluated for updates and revisions.

2.3 Existing Circulation

As an initial step in the TPMP, a circulation map was prepared for all roadways, sidewalks, and paths, as shown on Figure 1. All modes of transportation interact with the roadway network in some form during each trip. For the roadways, sidewalks, and paths, the primary goals were to:

- Reduce traffic volumes in the core areas of campus by intercepting vehicles on the fringe of the campus;
- Minimize and untangle vehicle conflicts with pedestrian and bicycle movements to the extent possible;
- Maintain accessibility and clarity of campus road network; and
- Provide safe and efficient movement to and from the campus as well as within the campus.

As depicted on Figure 1, there are nine key roadways in the campus network that work together to provide the main connections for vehicular travel. Those roadways are Upper College Road, Flagg Road, Plains Road, West Alumni Avenue, Route 138, Lower College Road, Tootell Road, Butterfield Road, and Campus Avenue. Upper College Road is the only contiguous north-south roadway on the campus. During peak times, recurring congestion is prevalent on the campus perimeter roads - Route 138, Plains Road, Flagg Road, and Upper College Road. Upper College Road is particularly congested during class change periods.

A safety review was conducted by mapping crashes over a 5-year period (2011 to 2015). Figure 2 highlights the occurrence of crashes on campus, illustrating where potential hot spots are.

Crashes highlighted in maroon, red, and orange indicate varying levels of injury crashes. The majority of the crashes occur on Route 138 and Upper College Road. The "hot spot" corridors that experience 3 or more crashes are all along the campus perimeter roadways and Upper College Road:

- Route 138 – the majority of crashes occur on Route 138, and these are typically higher severity crashes that occur at key intersections (Plains Road, Keaney Road, Lower College Road, Upper College Road, Old North Road, and Route 108);
- Plains Road – the high crash intersections are at West Alumni Avenue and Flagg Road;
- Upper College Road – frequent crashes occurring at Route 138, Campus Avenue, Ranger Road, and Flagg Road; and
- Flagg Road.

The highest crash locations are all along Route 138, specifically at intersection with Plains Road, Lower College Road, Upper College Road, and Kingstown Road.

The safety review of the campus infrastructure included considerations for pedestrians and bicyclists. While there is a well-established network of sidewalks and pathways for pedestrians, there is a lack of connected bicycle infrastructure on the campus, but this is changing. There are no bicycle lanes or paths and while the number of bicycle storage racks on-campus has been growing recently, there are still many areas of the campus without bicycle storage.

The approximate locations of bicycle storage on campus is shown on Figure 3. The majority of bike activity on campus is at Graduate Village - just off campus. Buildings that do not have an associated bicycle rack at a major entry are highlighted in yellow. As a matter of policy, every occupied building of a reasonable size should provide some form of bicycle accommodations.

2.4 URI Commuter Patterns

During each fall semester, approximately 10,600 students, staff, and faculty commute to URI with an average of 90 percent traveling in single-occupancy vehicles (SOV). This translates to roughly 2,700 staff and faculty vehicles driven on and off campus throughout the calendar year, and 9,600 staff, faculty, and student vehicles driven during the academic year (8 months).

A URI survey conducted in April 2015 indicated that over half (55 percent) of students who drive to campus were coming from nearby areas. Recent RIPTA surveys indicate that the three most popular student rental communities from the south include:

- Central Narragansett (6 miles, 15 minutes)
- Scarborough Beach (8 miles, 20 minutes)
- Point Judith (9 miles, 21 minutes)

A review of parking permit data from Fall 2017 has been assessed to confirm the origin points for commuters.

2.5 Shuttle System

Figure 4 depicts URI's on-campus shuttle system, operated by RIPTA and provided free for all URI students, faculty, staff, and visitors. The Hill Climber (Route 69) operates on a continuous a loop along Flagg Road/West Alumni Avenue/Alumni Avenue. Other shuttles access the Memorial Union loop via Lower College Road. URI contracts with RIPTA to provide shuttle bus services. RIPTA operates six principal routes serving the University: the Route 70 Engineering Line, the 210 Flex Service, the 69 Hill Climber, the 211 Ram Line, Route 64, and Route 66. Real time bus location data is available at bus.apps.uri.edu.

- The **211 URI Ram Line** operates in a continuous loop between the Keaney Road Parking lot and the Memorial Union, with intermittent stops along Fraternity Circle, Campus Avenue, Ranger Road, Upper College Road, East Alumni Avenue, Butterfield Road, Quarry Road and Keaney Road. Route 211 operates as an on-campus circulator covering the heart of the central campus. The 211 Ram Line is a smaller vehicle compared to the other routes which use RIPTA typical 40- passenger bus types.

- The **69 Hill Climber** operates on a continuous loop between the Plains Road Parking lot and the corner of Upper College Road and East Alumni Avenue, with intermittent stops along the Flagg Road and West Alumni Avenue legs of the route. The route travels a loop around Flagg Road and West Alumni Avenue. The Hill Climber operates as an on-campus circulator covering the northern portion of campus.

- The **210 Kingston Flex Service** is an on-demand shuttle which operates within a defined geographic area in and around Kingston. The shuttle makes regular stops at the University Gateway, Graduate Village and Memorial Union, but can pick-up and drop students anywhere within the zone. If a rider needs service outside the normally scheduled stops, they must call and request special service 24 hours in advance or board the bus at one of the regular stops and make the request directly to the driver.

- The **Route 70 College of Engineering Line** operates between the Schneider Electric Building in West Kingston and the Memorial Union starting at 8:00 AM and concluding service at 8:00 PM, Monday through Friday. There is no service on weekends, holidays, or during the summer months. The Route 70 line is a highly successful line from a ridership

perspective and is a key to strengthening the connectivity between Kingston Station and URI.

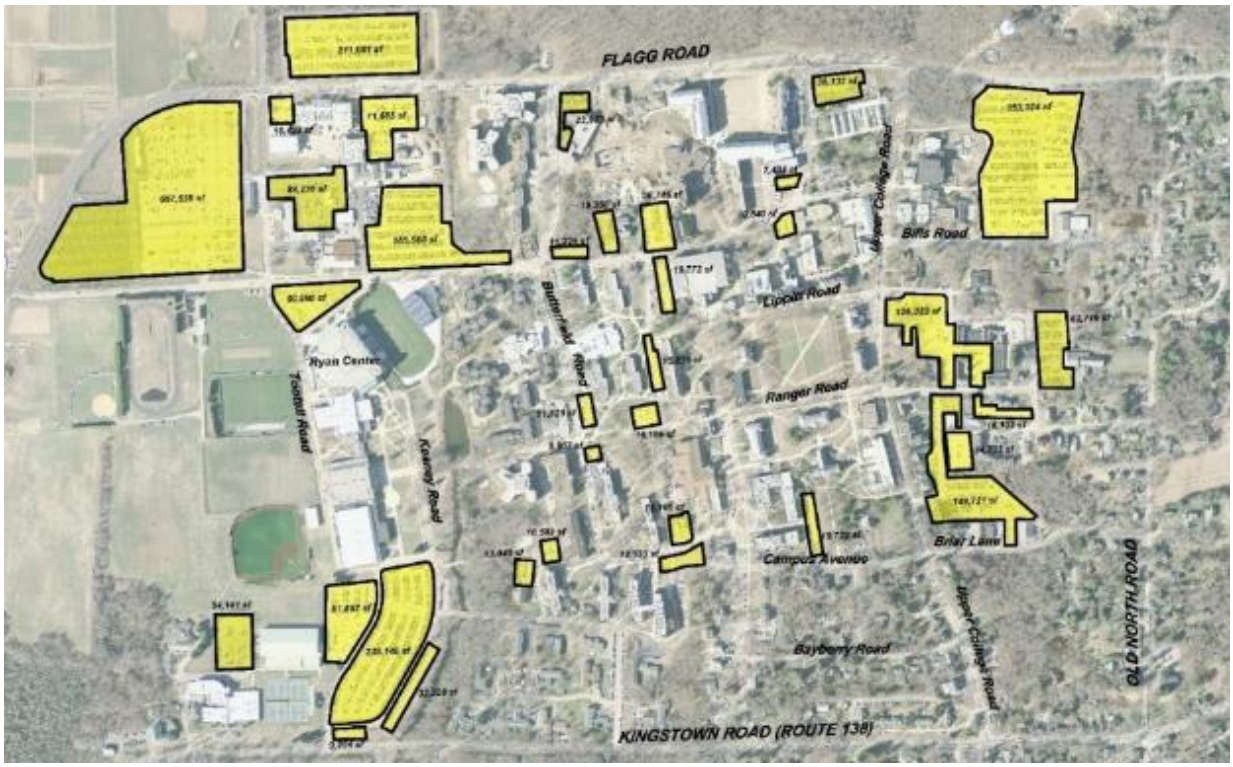
- The **64 Newport/URI Kingston Route** operates between Kingston Station and Newport, stopping at the URI campus from 6:30 AM to 5:30 PM, Monday through Friday. There is reduced service on weekends.

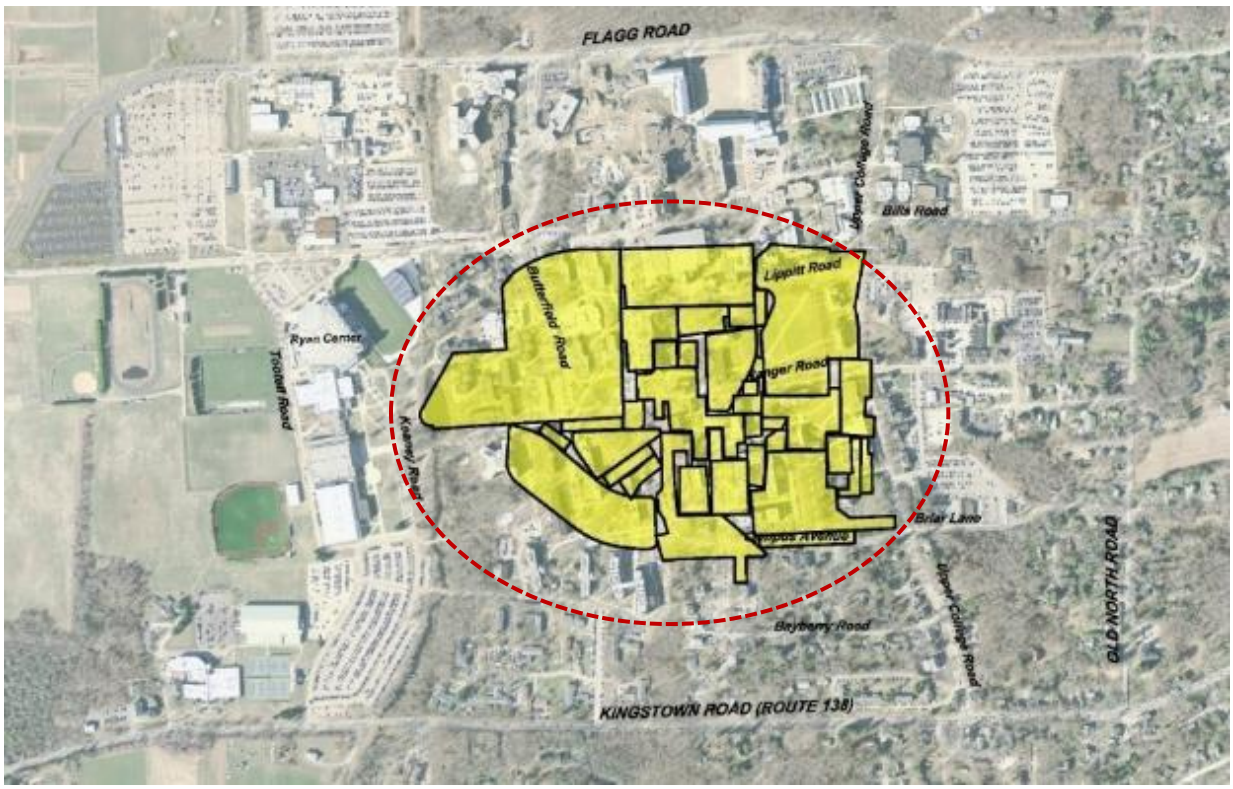
- The **62/66 URI/Galilee Route** operates between Galilee and Kennedy Plaza, stopping at the URI campus from 6:00 AM to 10:30 PM, Monday through Friday. There is reduced service on weekends.

Figure 5 depicts approximate 2-minute and 5-minute walking distances from each shuttle stop, illustrating that the majority of the campus is within a 2 minute walk to a shuttle stop with two notable gaps in the vicinity of the Ryan Center and north of the Dairy Barn Lot.

2.6 Parking Supply

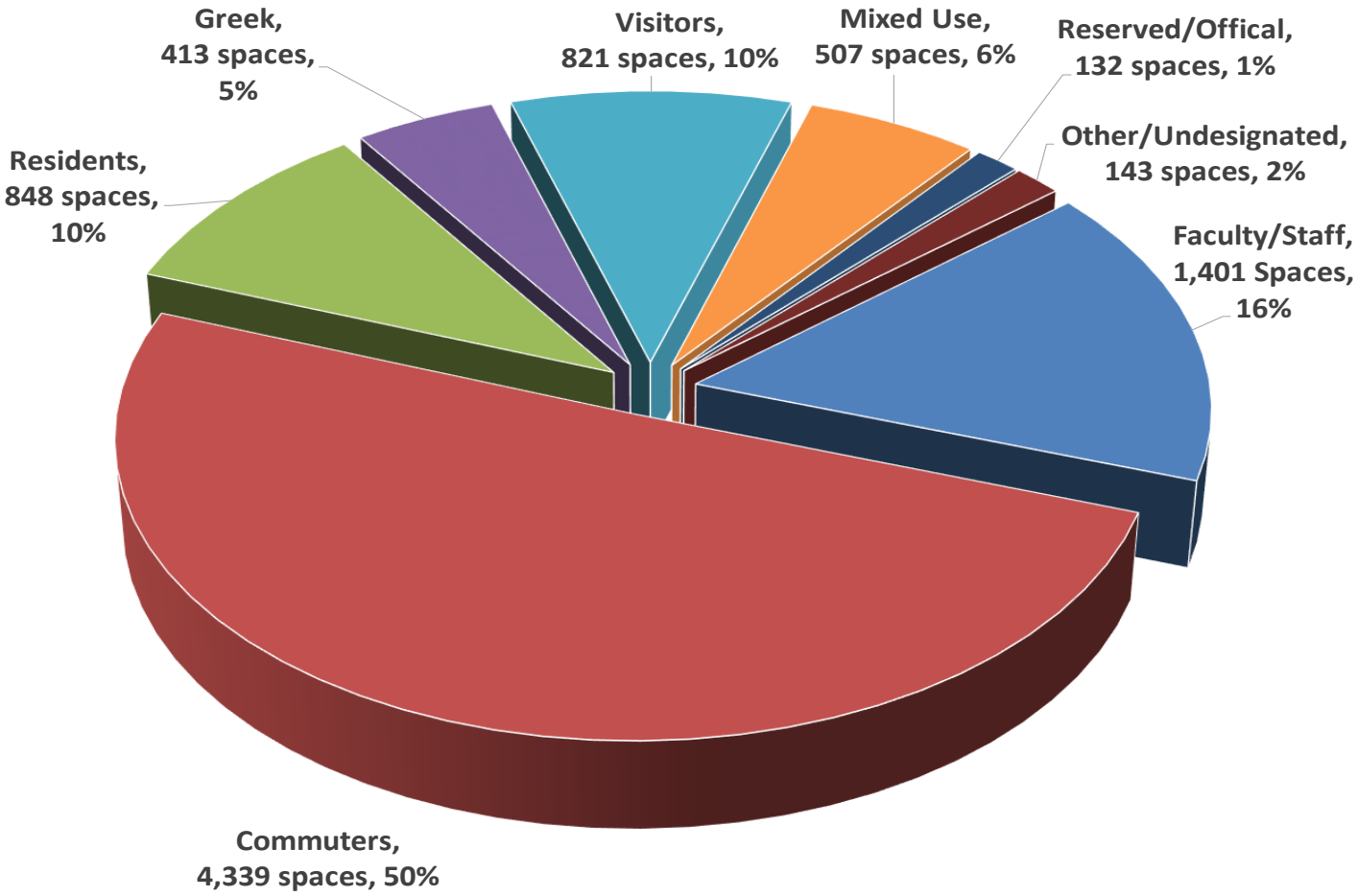
URI has over 8,000 parking spaces on campus for commuter students, resident students, faculty/staff, visitors, and others. Surface parking consumes a substantial portion of the campus footprint, over 60 acres. If EVERY surface parking lot were moved and organized into the center of campus, as shown on the following images, surface parking would consume the majority of the campus core.





If EVERY surface parking lot were moved and organized into the center of campus, surface parking would consume the majority of the campus core

The majority of the parking spaces are commuter spaces (50%) as shown in the following chart.



There are approximately 160 handicap accessible spaces on campus, as shown on Figure 6. Expanding the number of, and quality of accessible spaces is an existing issue that was voiced during the outreach sessions.

2.7 Parking System Management

Parking and Transportation Services division administers the issuance and management of student, faculty, and staff parking permits; enforcement of non-life safety regulations in University parking facilities; oversight of on-campus shuttle services; and coordination of related services. Parking and Transportation Services is a division of the Department of Public Safety and shares some parking duties with University Police and Security.

The division subcontracts with a third-party vendor (Complus Data Innovations, Inc.) to: manage online sales of parking permits to students; register faculty and staff for parking permits; and issue of permit credentials (hangtags or stickers). Parking fines are paid to the Rhode Island Traffic Tribunal and appeals must be heard by that body, with the exception of fines for Failure to Register a Vehicle or Failure to Display a Permit, which can be directed to the division.

Permit credentials are primarily window decals or hangtags, although the lot adjacent to the Ryan Center uses Automatic Vehicle Identification (AVI) transponders to manage access by permit holders and a ticket system to manage access by visitors. There are also other gated facilities on campus that use card readers and/or AVI cards to manage access for authorized faculty and staff. Parking facilities designated for faculty, staff and visitors are located in the campus core for the most part, while parking for resident students and members of Greek organizations is adjacent to their residences, and commuter student parking is located on the periphery of campus.

The fund supporting the division includes collected revenues from student fees, the sales of parking permits, some parking citation fines revenue, and an allocation from the Admissions Office for providing visitor parking services at the Ryan Center. There is currently no cost for faculty or staff permits and any revenues collected for special events, such as athletic contests, is retained by the host agency, not the division.

The division is staffed by a full-time General Manager, a full-time Information Aide, and three full-time Campus Patrol officers. A Campus Patrol Officer was moved to the day shift to enforce parking regulations in FY17 and an additional Campus Patrol Officer will be moved to day shift in FY18.

2.8 Parking Enforcement

There are two agencies on campus authorized with enforcing parking policy: the University Police and Parking & Transportation Services. The University Police have two Campus Police Officers tasked with Parking Enforcement on staff and any University Police Officer can issue a parking citation when they encounter a violation. Parking & Transportation Services has one Campus Patrol Office also tasked with enforcing policy on campus.

As shown in Table 1, a total of 7,661 parking citations were issued in Fiscal Year 2016. Roughly 65 percent of these tickets were for failure to register a vehicle and/or display a registered permit when parking in a URI facility. Approximately 14 percent of the violations were for parking in a lot the permit holder was not authorized for and 13 percent were for parking in a URI facility outside a designated (or defined) parking space. The remaining 8 percent of tickets were issued for other offenses such as impeding a travel lane, parking on grass, or parking in an electric vehicle (EV) only space.

Table 1 FY 2016 Violations Issued

Violation	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Total	Fine	Citation Revenue
No Permit	---	3	1,532	716	694	168	463	805	614	12	---	---	5,007	$50.00	$250,350
Failure to Display	---	---	3	1	21	---	---	---	---	2	2	---	29	$20.00	$580
Parking Outside Designated Lot	---	34	312	109	90	66	85	72	249	8	12	---	1,037	$85.00	$88,145
Parking in a Reserved Space	---	6	22	8	4	50	71	8	6	---	---	---	175	$85.00	$14,875
Parking Outside Designated Space	---	53	375	113	48	58	104	192	71	6	---	---	1,020	$85.00	$86,700
Parking in Grass	---	5	53	26	38	1	3	8	23	6	3	---	166	$85.00	$14,110
Parking in Driveway/ Walkway	---	---	3	---	---	---	---	1	3	---	---	---	7	$85.00	$595
Impeding Travel Lane	---	3	1	---	4	---	---	---	---	---	2	---	10	$85.00	$850
Parking in No Parking Area	---	28	113	13	14	15	2	5	2	1	---	---	193	$85.00	$16,405
Exceeding Time Limit	---	---	---	---	---	---	---	---	---	---	---	---	---	$85.00	$ ---
Parked in a EV Only Space	---	---	---	---	---	---	3	3	---	2	---	---	8	$85.00	$680
Snow Ban Violation	---	---	---	---	---	---	---	---	---	---	---	---	---	$85.00	$ ---
Use of an Unauthorized Permit	---	---	---	1			1	3	3		1	---	9	$85.00	$765
TOTAL	**---**	**132**	**2,414**	**987**	**913**	**358**	**732**	**1,097**	**971**	**37**	**20**	**---**	**7,661**		**$474,055**

All parking violations are directed to the Rhode Island Traffic Tribunal for processing. The total citations issued in 2016 represented approximately $474,000 in total fines, a portion of which come back to URI.

Table 2 presents a comparison of URI fine structure with other peer institutions. In general, URI's fine structure is in-line with peer institutions, at times higher.

Table 2 Peer Comparison of Fines for Violations

Violation Type	URI	UCONN	UNH	JMU	UVM	UVA	UMASS	UMAINE
Improper Display of Permit/ Failure to Display Permit	$20.00	$25.00	$5.00	$5.00	$30.00	Warning	$20.00	$10.00
No University Permit	$50.00	$30.00	$50.00		$50.00			$25.00
Parking in a Service Vehicle Space	$85.00	$30.00		$25.00		$50.00	$45.00	$25.00
No Parking Area	$85.00	$30.00	$50.00				$40.00	$25.00
Out of Marked Space	$85.00	$30.00				$50.00	$30.00	
In or Blocking Lot Aisle/Entrance	$85.00	$30.00				$50.00	$45.00	
Parking in Violation of Permit Issued (Improper Lot)	$85.00	$30.00				$50.00		$25.00
On a Sidewalk, Lawn, Unpaved Area	$85.00	$50.00	$100.00	$40.00		$50.00		$50.00
In a Restricted Area	$85.00	$50.00	$100.00	$25.00		$50.00	$75.00	$25.00
Blocking Entrance/Exit to Building	$85.00	$50.00				$50.00		
In a Fire Lane	$85.00	$50.00	$100.00	$75.00	$80.00	$200.00	$45.00	$100.00
Within 8-12 Feet of a Fire Hydrant	$85.00	$50.00	$100.00	$75.00	$80.00	$50.00	$45.00	$100.00
Parking Permit Revoked	$85.00	$50.00		$100.00				
Winter Storm Parking Violation	$85.00	$50.00	$75.00				$20.00	$25.00
Parking After Revocation	$85.00		$200.00					
Altered/Falsified Permit	$85.00		$300.00	$100.00	$80.00	$200.00		$50.00
Illegal Obtaining/Use of Permit	$85.00		$400.00			$200.00	$150.00	$50.00
Violation of Posted Sign	$85.00	$30.00						
Load Zone Violation	$85.00	$30.00		$25.00		$50.00	$45.00	$25.00
Double Parked/More than One Space	$85.00	$30.00	$25.00			$50.00	$30.00	
Time Zone Over Limit	$85.00		$50.00	$25.00		$40.00	$40.00	$25.00
In a Handicap Space	State Limit	$150.00	$200.00	$150.00	$80.00	$200.00	$150.00	State Limit
Misuse of Handicap Permit	State Limit	$150.00	State Limit	$150.00	State Limit	State Limit	State Limit	State Limit
Unauthorized Removal from Impound	n/a		$500.00					
Unauthorized Removal of Auto Boot	n/a		$500.00					
Chronic Offender Fine	n/a		$50.00					$50.00
Expired Meter	n/a	$25.00	$20.00	$25.00	$25.00	$40.00	$25.00	$25.00
Wrong Side of the Street	n/a		$25.00			$50.00	$30.00	
Parking in a Reserved Game Day Lot	n/a			$100.00				

Parking & Transportation Services Campus officers are authorized to ticket for Failure to Register a Vehicle and/or Failure to Display a Permit only, while University Police officers are authorized to issue citations for the other violations carrying the higher fine rate. In Fiscal Year 2016, the lower fine tickets accounted for 66 percent of all tickets issued on campus and the combined fine revenues accounted for 53 percent of all parking fine revenues for the year.

2.9 Parking Fees

The cost to maintain the surface parking is supported primarily from student fees charged directly to every URI undergraduate and graduate student annually to help support the parking and transportation system, and parking permit sales. Parking permits are currently subject to universal pricing, which means there is a single price for a Commuter Permit, a Resident Permit, etc. regardless of where that individual parks. This runs counter to parking industry best practice, which calls for pricing parking according to utilization, which is often dictated by the proximity of the facility to major demand generators. Competing universities use this pricing strategy to manage demand across different facilities to positive effect, as shown in Table 3.

Table 3 Parking Fee Peer Comparison

Institution	Commuter Students	Visitor	Faculty/Staff	Resident Students
University of Rhode Island	$190.00	No Charge	No Charge	$265.00
University of Connecticut	$122.00-$536.00	Max $12/day	$121.50-$754.00	$121.50-$428.00
University of New Hampshire	$75.00	Pay & Display $1.25/hour	$50.00-$75.00	$225.00-$375.00
James Madison University	$260.00	No Charge	$26.00-$592.00	n/a
University of Vermont	$115.00-$329.00	Metered	0.32%-0.64% of base salary	$330.00
University of Virginia	$240.00	Daily Permit/Metered	$240.00	$528.00-$1,140.00
UMass at Amherst	$131.00-$350.00	$6 daily pass/Metered	$63.00-$1,223.00	n/a
University of Maine	$50.00	$50.00 Annually	$35.00	$50.00

As the table shows, pricing at URI is at the lower end of the scale for both Commuter and Resident students. Conversion to a sliding rate scale or upwards adjustment of rates could generate additional income for the fund, allowing for improvements in current operations. URI is the only institution of its peers that does not charge faculty and staff for parking.

As shown in Table 4, URI is also in the minority of peer institutions that allows freshman to have cars on campus, comparing similar campus settings (rural, suburban). Only the University of Massachusetts at Amherst and the University of Maine also allow freshman parking on campus; however this parking is extremely remote. Both campuses, while allowing freshman parking, assign underclassmen to the most remote spaces to further discourage them from bringing cars to campus.

Table 4 Parking Policy Peer Comparison

Institution	Undergrad Enrollment	Setting	In-State vs. Out-of-State	Fees (Res/Non-Res)	Freshman Car ?	% in Housing (Freshman/UG)	Housing Cost
URI	13,641	Rural	57% vs. 43%	$12,884/$28,874	Yes	74%/44%	$12,022
UCONN	18,826	Rural	77% vs. 23%	$14,066/$35,858	No Cars	97%/70%	$12,436
UNH	10,973	Rural	47% vs. 53%	$17,624/$31,424	No Cars	94%/56%	$10,938
JMU	19,396	Rural	76% vs. 24%	$10,342/$26,116	No Cars	91%/13%	$9,334
UNM	10,973	Suburban	29% vs. 71%	$17,300/$40,364	No Cars	98%/49%	$11,578
UVA	16,736	Suburban	72% vs. 28%	$15,714/$45,058	No Cars	100%/40%	$10,726
UMass	22,718	Suburban	80% vs. 20%	$15,156/$32,389	Yes	99%/58%	$12,441
UMaine	9,927	Rural	73% vs. 27%	$10,628/$29,498	Yes	92%/39%	$10,164

Based on a review of permit sales, there were 912 annual permits issued to freshman during FY2016 and 91 semester permits. Roughly 74 percent of annual permits (675) and 80 percent of semester permits (73) were issued to freshmen Resident students; these permits represent at least 600 parking spaces the University could recover to accommodate future growth and development, if they were not already in use. URI could elect to effect this change by restricting Resident Student freshmen from having cars or campus, which would free up parking spaces. Doing so would have the negative effect of reducing gross income from permit sales coming into the fund by roughly **$190,000 per year**.

URI is also the only school among its peers which does not currently charge faculty or staff for parking. With the exception of Maine and Virginia, every other institution charges faculty and staff on a sliding scale based on either the location of the facility they seek to park in or their annual salary. Assuming parking for 700 administrative staff and approximately 700 faculty, and a nominal average rate of $100.00 per permit, charging for faculty and staff parking could generate at least **$140,000 annually**. So URI can fairly easily offset the financial impact of fewer permit sales by charging faculty and staff for parking.

2.10 Parking Demand

All-day field observations on a consecutive Tuesday and Wednesday in late September 2016 were conducted to quantify parking demand. The campus was organized into 21 'blocks' with observers recording lot occupancy on an hourly basis over the entire day.

The 2-day observations confirmed that the most desirable/closest parking spaces for Commuters and Resident students are taken, and in fact some lots are over capacity with students parking in drive aisles (for example, the Fine Arts North Commuter Lot, the Flagg Road lot, and the Dairy Barn Resident Lot). There are approximately 630 available parking spaces. The majority are reserved for visitors, faculty, staff, or are very remote spaces for students:

- Plains Road Lot - 260 remote commuter spaces;
- Briar Lane Lot – 170 faculty/staff/visitor spaces;
- Fine Arts South Lot – 50 faculty/staff/visitor spaces;
- Boss Lot - 30 visitor spaces;
- Independence Square Lot – 70 faculty/staff spaces; and
- Flagg Road Lot – 50 visitor spaces.

2.11 TDM Best Practices

As a final step, URI was compared to peer institutions for parking and transportation demand management (TDM) "best practices", including the most innovative approaches to parking and transportation management, such as online bus and shuttle tracking, dynamic permit pricing, carpool programs and permit systems, Zipcar rental services, and guaranteed/safe ride home programs. Table 5 presents a summary of this best practices benchmarking assessment.

Table 5 TDM Best Practices Peer Comparison

Institution	Charge for Faculty/Staff Permits	Real Time Parking Information	Online Shuttle Tracking	Special Carpool Permits	Dynamic Parking Pricing	Carpooling Initiatives	Guaranteed Ride Home Program	Free Shuttle/ Bus Pass	Metered Parking	Zip Car
URI			☒			☒		☒		☒
UCONN	☒			☒		☒		☒	☒	☒
UNH	☒		☒	☒		☒	☒	☒	☒	☒
James Madison Univ.	☒	☒	☒	☒		☒		☒	☒	☒
UVM	☒		☒		☒	☒	☒	☒	☒	
University of Virginia	☒	☒		☒	☒	☒	☒	☒	☒	☒
UMass at Amherst	☒		☒	☒	☒	☒	☒	☒	☒	☒
University of Maine	☒	☒		☒		☒	☒	☒	☒	☒

Due to the increasing student and faculty body and large volumes of visitors, all of the surveyed universities encourage transportation alternatives available for each parking user group. The most common TDM efforts include the following services:

- University Transit Services (buses/ shuttles) with real-time shuttle stacking;
- Van services in the evening hours;
- Charge-a-ride on demand taxi service available for students at a discount;
- Carpooling and Rideshare;
- Bicycle Commute Program;
- Zip Car partnerships and Clean Vehicle Permits; and
- Charter Services to the airports and downtown locations.

One of the most common transportation initiatives on campuses is carpooling, also known as ride share. Most universities highly encourage its students, guests and employees to obtain carpool permits, offered at a lower price than regular permits. The survey showed that URI appears to be the only University without a carpooling system in place on campus. All other researched Universities actively promote carpooling on their websites, providing additional ride-matching resources and initiatives for the students and staff/faculty members. For example, UVA encourages carpooling by providing 25%-100% parking permit price discount depending on the number of the riders registered for a carpool. UMass Amherst also offers the service that allows searching for a carpool partner based on the rider's travel route. Benefits of ridesharing and carpooling also extend to the location of the reserved parking spaces, reduced maintenance cost and guaranteed ride home for emergency situations when the partners cannot coordinate their commuting schedules.

Carpooling programs are often supported by the "Guaranteed Ride Programs", that offer a free ride home in an emergency situation or when the carpooler's schedules change unexpectedly. The University of Maine has successfully adopted a similar program – if a carpooler lives within 20 miles of campus, he or she will be able to get a free taxi ride from a designated company in case of emergency or schedule changes.

Similar to URI, most of the universities surveyed offer a free campus shuttle that circulates between the university's main buildings and the distant parking facilities and is open to everyone free of charge. Most of the surveyed peer institutions are located in rural settings, which makes off-campus transportation efforts a priority. Some popular public transportation incentives offer the passengers rides to the train stations and closest airport as well as off-campus scheduled or on-demand services that are usually discounted for students. For example, UVA students, faculty and staff can ride local transportation services, including Charlottesville Area Transit, free of charge using their university ID cards.

Like URI, most universities provide much-needed transportation for their students and faculty between the University and the adjacent communities. University of Vermont also assists its guests and students in getting to the major transportation hubs by running regular shuttles to the closest Amtrak stations and the Airport. It is not uncommon for the universities to develop a partnership with the City's Department of Transportation or the local transit system. All surveyed universities, where the transportation demand incentives had been successfully implemented, reported to have reduced congested traffic and improved circulation in parking lots.

Other schools have a stronger and more diverse TDM program than URI. While recognizing key facilities are full by 9AM, there is little to no direction for its students seeking parking at other lots. The rear of the Plains Road Lot is empty during the day, while Keaney and Flagg Road lots are full and at times overparked by 9AM.

In order to incentivize parkers to seek spaces in other facilities, URI should adopt a TDM strategy that would provide real-time information on the available parking capacity around the campus at all times. For example, James Madison University Parking Department provides real-time tracking service for some of the commuter parking facilities in addition to the ability to use a lot search engine to filter the list of all parking facilities by permit type, day and time to visit the campus.

Dynamic pricing is another tool used by the surveyed schools to transfer parking demand from the most convenient locations to those that require walks or use of the shuttle. Currently, URI permit pricing policy does not distinguish between the parking facilities of the same user group, so the most and the least popular lots are priced the same. UMass Amherst has developed a detailed pricing schedule for all user groups permits, depending on the proximity and exclusive use of the lots. As a rule, the Universities are usually unable to guarantee parking spaces for permit holders in smaller facilities due to high demand. As a result, larger facilities such as garages, that can accommodate more parkers and guarantee available capacity at all times, are priced well above the average permit price point. Such types of permits are equivalent to the "reserved" permits at other universities like UMaine and UVA.

3

3.0 Recommendations

The recommendations from this URI Transportation and Parking Master Plan will help achieve a safe, efficient, and integrated transportation system on campus. The following key principles were identified:

1. Move parking out of the campus core to create a more pedestrian and bike friendly environment while accommodating needs for service vehicles and accessible spaces.
2. Manage demand while continuing to assess supply. Add supply strategically and only as a last resort.
3. Enhance shuttle service to maximize use of peripheral and remote lots.
4. Transform campus roadways into complete streets. Create URI branded gateways so that there is a sense of arrival to campus that does not exist today.
5. Create a regionally connected bicycle network.
6. Create a parking model to forecast supply and demand.
7. Explore potential revenue streams that help sustain infrastructure.

3.1 Roadway Recommendations

Over time, vehicle traffic will grow slightly each year with the gradual addition of new students, faculty and staff on campus. The roadway enhancements are critical as they integrate a number of various modes and often are the most visible improvements to a system. The roadway recommendations are as follows:

Transform Upper College Road into a "complete street" with bicycle lanes, landscape buffers, and branding that conveys a sense of arrival to campus

- **Upper College Road –** Add on-street bicycle lanes and a landscape buffer between the roadway and sidewalk. Select intersections along Upper

College Road through campus should be an all-way stop condition. Consistent crosswalks should be installed, compliant with Campus Design Standards. This complete street treatment should require a slight widening of the curbline by approximately 2 feet. The cross-section should be flexible in areas where needed to protect the street trees that line the roadway through campus. This is illustrated in the photo-simulations and in concept on Figures 7a to 7c. A gateway treatment is recommended at the intersections of Upper College Road/Campus Avenue and Upper College Road/Flagg Road: either enhanced/raised intersections or roundabouts.

Diagonal crosswalk lines are <u>not</u> recommended because they are not as visible

"Ladder" style crosswalk marking are recommended and consistent with Campus Design Standards

Create Gateways on Upper College Road at Campus Avenue and Flagg Road

› **Flagg Road/Plains Road –** Implement an aggressive "road diet" on Flagg Road that will slow vehicle speeds and improve the sense of arrival to campus. Eliminate on-street commuter student parking on Flagg Road and consider two options for rebuilding the 40 foot wide roadway with enhanced bicycle accommodations: (1) a center landscaped median with on-road bike lanes as shown on Figures 8a to 8d; or (2) a cycle track, or two-way separated bicycle path separated from the roadway, as illustrated on Figures 9a to 9d. Select intersections should be converted to all-way stop condition. Create a gateway at the intersection of Plains Road and West Alumni Avenue. The state TIP currently has $900,000 allocated for Flagg Road which would cover a portion of the roadway upgrade. The creation of a center median, which is currently the preferred alternative for Flagg Road, would require additional funding above the $900,000 allocated in the TIP.

On Plains Road, from West Alumni Avenue to Route 138, added capacity is needed to accommodate the surge of traffic leaving the campus as well as Ryan Center event traffic. An additional travel lane should be considered.

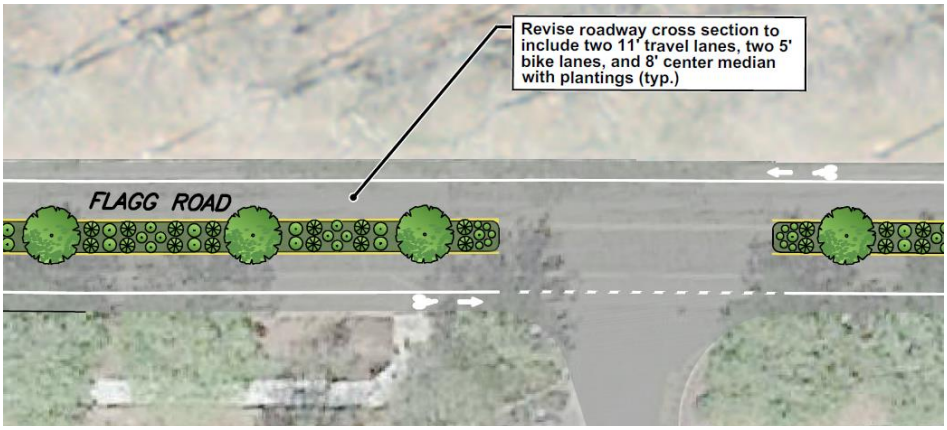


Figure 8 Flagg Road Enhancement with center median

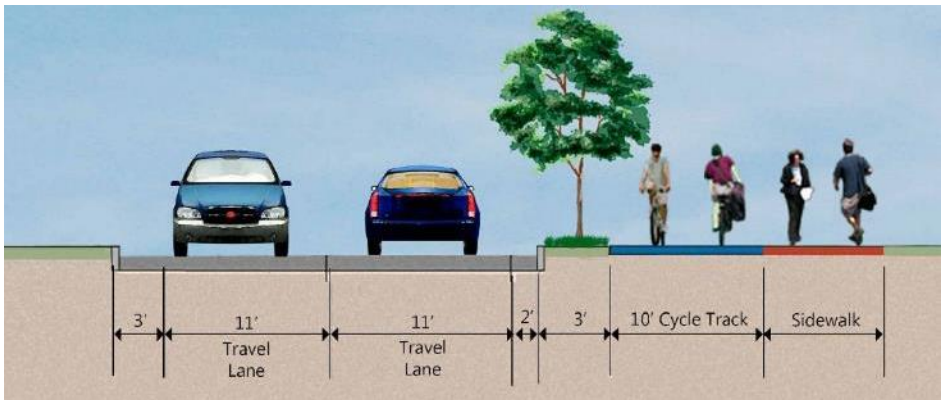
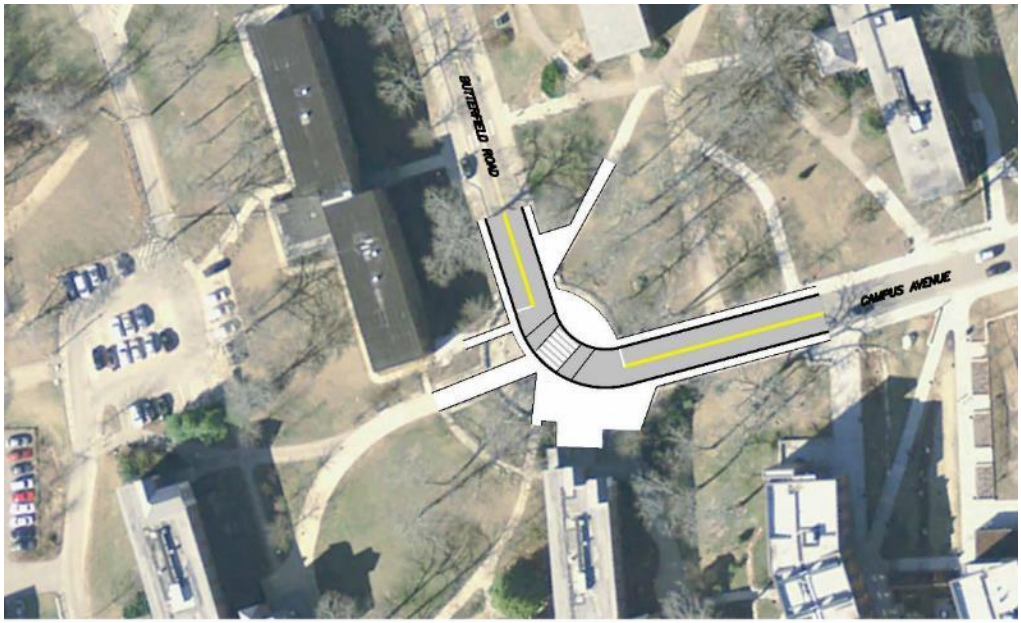


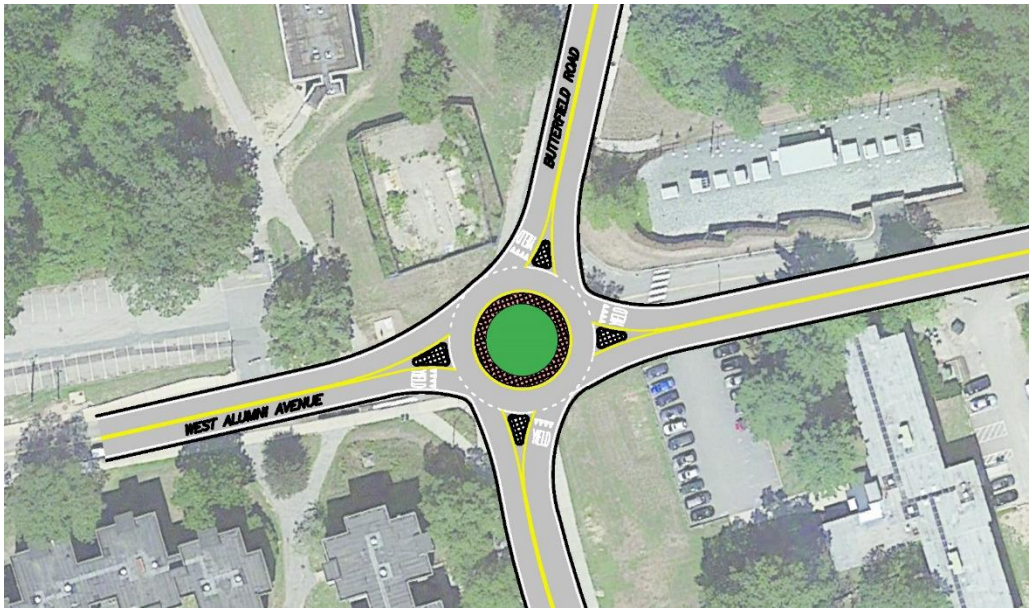
Figure 9 Flagg Road Enhancement with cycletrack

› **Butterfield Road/Campus Avenue –** The width of Butterfield Road is already sufficiently narrow and vehicles generally drive slow along this roadway. The intersection of Butterfield Road and Campus Avenue should be reconfigured with a raised crosswalk to improve pedestrian safety.



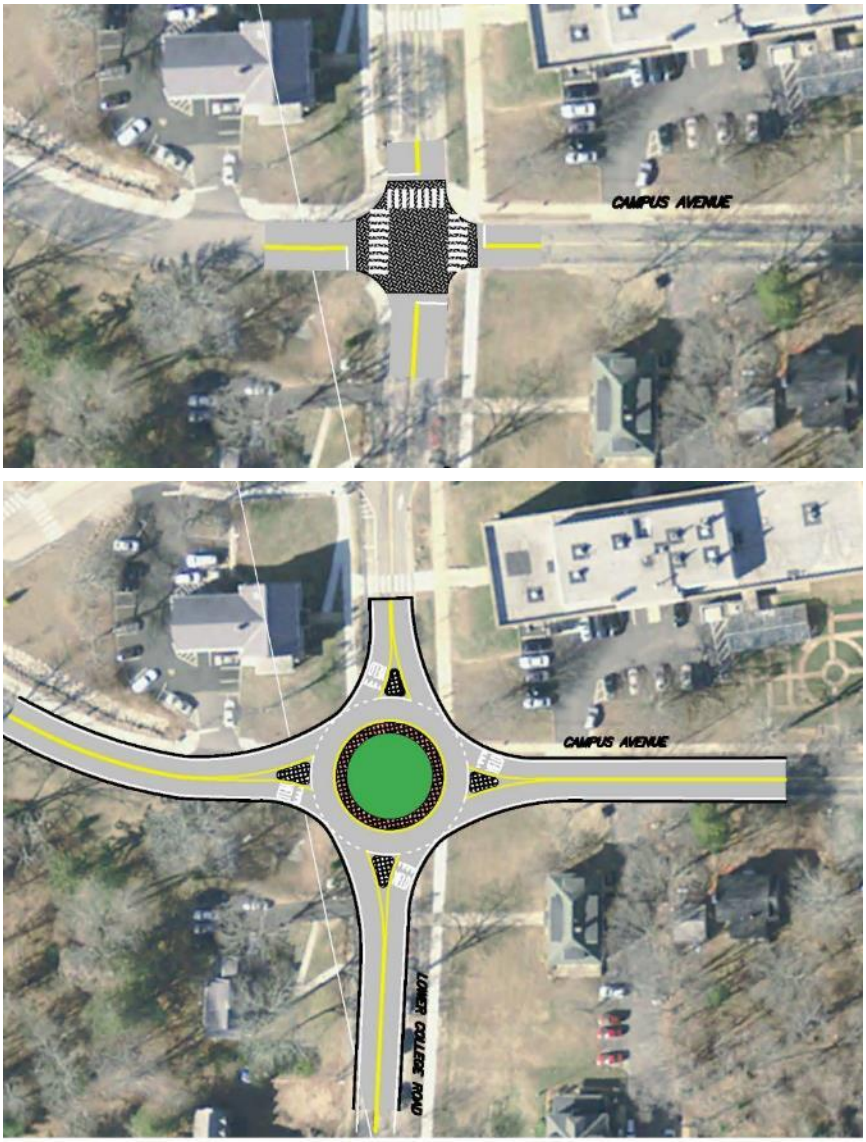
Reconfigure Butterfield Road/Campus Ave to Improve Pedestrian Safety

› **Butterfield Road/West Alumni Avenue** – The intersection of Butterfield Road and West Alumni Avenue should be reconfigured with consideration given for a roundabout.



Consider a Roundabout at the Butterfield Road/West Alumni Avenue

› **Lower College Road/Memorial Union Loop –** Eliminate on-street commuter student parking and provide gateway/wayfinding signage at Route 138. Reconstruct the deteriorated roadway with 11-foot travel lanes (sufficient for shuttle bus access), upgraded pedestrian-scale lighting, and a sidewalk. Consider alternate pavement surface (such as pavers) on portion of Lower College Road from Campus Avenue to loop to emphasize authorized vehicles only (shuttle, service, emergency vehicles). Reconstruct the Memorial Union shuttle loop so it is more pedestrian friendly. Consider a gateway treatment, such as a roundabout or enhanced/raised intersection at Lower College Road and Campus Avenue. › In the near-term, fine-tune operations at the Memorial Union stop to reduce or eliminate any layover activity, dwelling, and bus idling



Create a Gateway at Campus Avenue/Lower College Road

- **Complex Road** - Consider enhancing the pedestrian experience with respect to future bike path spur and need for service vehicles on the roadway.

3.2 Parking Recommendations

The current parking situation is not sustainable. All students, even underclassmen, are allowed to have cars on-campus. The marching band takes up to 150 commuter spaces off-line in the Fine Arts lot during the Fall semester. Parking is relatively inexpensive for students and free for faculty/staff. Inevitably, with the loss of parking due to campus projects and the need to reduce impervious parking areas that encroach into stream and wetland buffer zones, there will be a need to address these parking issues in the very near-term, including the need for a technology-based management system (such as a license plate reader) to aid in enforcement. The parking system recommendations are as follows:

- **Identify a more appropriate space for the marching band to practice –** Having the band practice in the Fine Arts Lot is not an appropriate location and it takes up to 150 commuter spaces off-line during the busy Fall semester.
- **Update parking rate structure –** Structure parking rates to be in-line with peer institutions to better fund parking lot repairs/upgrades. Essentially, charge more for parking and implement a permit fee for faculty and staff using a sliding scale based on salary and parking location (closer spaces cost more). As a near-term trial, URI should proceed with the conversion of the former TEP House to a priority faculty/staff lot that requires a fee to park there.
- **Lot identification -** Develop a numbering system for the parking lots with accompanying signage (as shown in Figures 10 and 11 for the upcoming fall and Spring semesters).
- **Reduce core campus parking and provide more remote parking -** Minimize the amount of parking within the campus core, except as necessary for accessibility, loading/service and support services. Locate major parking facilities at key locations along the periphery of the core campus to intercept traffic. Create a parking district and transportation hubs on the fringe of the campus. Seek opportunities for remote commuter off-campus parking with shuttle connectivity (e.g. Schneider Electric, Wickford Junction). The State Beach parking lots would be ideal candidates as they are largely unused from September through May and are already on RIPTA bus routes (for example the Scarborough Beach lot is on a RIPTA fixed route (66). The potential "end state" of this recommendation is shown on Figure 12 where there is potential for to repurpose 270 spaces (98,200 square feet of area) in the campus core.

- **Use existing available Origin-Destination (OD) data to confirm the concentrations of off-campus housing areas** – OD data would help URI focus efforts on locating appropriate remote parking "intercept" opportunities along with areas to focus RIPTA shuttle service. URI and RIPTA have plenty of anecdotal data that can be used as a starting point. For example, many students who live "down the line" in Bonnet, Wakefield, Matunuck, and Narragansett could be enticed to park for free in a remote lot with free shuttle connectivity. In fact, this concept of remote parking is already happening informally at Schneider Electric where students park there to avoid paying for a permit.

- **Provide sufficient parking to meet future demand** - As part of this TPMP, a parking supply-demand model has been created that can forecast parking demands based on a number of scenarios. Eventually, unless there is a ban on student parking or no growth, structured parking will need to be considered. This structured parking, in the form of 1-level decks, should be ideally located at intercept locations such as the Fine Arts Lot and the Flagg Road Lot. The structured parking at Flagg Road would support the concept of creation of a transportation hub and Intermodal Station at the intersection of Flagg Road and Plains Road if a rail spur were provided to the campus. URI should be able to charge a premium for use of these spaces. Based on the moderate growth scenario, it is expected that the need for these 1-level parking decks should occur in the year 2022 timeframe.
- **Accommodate visitors -** Provide an adequate amount of visitor parking and improve the experience for visitors by allowing pre-registration before arriving to campus. Several campuses have implemented a fee for visitor parking and URI should follow suit and charge visitors.
- **Provide incentives to encourage students, faculty, and staff to leave their cars at home –** Work with RIPTA to expand the UPass program so that all students, faculty, and staff receive a free transit pass if they choose to not bring a car to campus. Implement preferential carpool parking. Implement incentives for faculty/staff who choose to not use a parking space, such as a parking "cash-out" benefit.
- **Implement technology to help manage the campus parking system** – Parking enforcement and permit management could be substantially streamlined if a license plate reader (LPR) system or other suitable system were installed on-campus. For example, rather than having an enforcement officer constantly circling lots for violations, a LPR system would automatically notify a central dispatch area if there was a violator in a certain parking lot. Detailed recommendations are provided later in Section 3.6.
- **Provide more accessible spaces and increase enforcement** – For the lots within the campus core that are designated for removal, reserve portions of these lots for accessible spaces. Bolster ADA parking enforcement in

hatched/no-parking areas adjacent to ADA spaces (enforcement and education). Implement a permit system for accessible spaces.

3.3 Transit/Shuttle Recommendations

An expanded shuttle system, both regional and local, will be needed to support the eventuality of remote parking. There is also a need for a stronger connection to the Kingston Train Station. The transit/shuttle recommendations are as follows:

- **Reorganize the shuttle system into a regional connector and local circulator -** Modify existing shuttle system in order to enable future parking changes as follows:
  - **Regional connector**. Focus RIPTA service on a strengthened and expanded regional connection to campus fringe parking lots, high density off-campus residential areas, remote lots, Providence, RINEC, and NBC campuses.
  - **Local circulator**. A separate, smaller shuttle should provide an on-campus/ in-and-around circulator controlled by Parking and Transportation Services, branded for URI. The shuttle branding should apply to the buses, shuttle route names, and bus stop names.
- **Additional RIPTA engagement -** Expand the RIPTA partnership to facilitate the integration of transit hubs, especially the potential for a designated South County Transportation Hub integrated into the design and construction of the Upper College Road District and complete street retrofit.
- **Expand UPass program and better market commuter options -** As other schools in Rhode Island have done with RIPTA, enhance the UPass program by activating IDs (students, faculty, staff) as a bus pass at no cost to the user. Do no market "parking" as a benefit for new students.
- **Data-driven shuttle system management -** Migrate to a more data-driven management of the shuttle system with individual bus stop utilization data/ridership provided for planning purposes. Enhance the existing real-time shuttle location tracker.
- **Reallocate RIPTA shuttle resources -** Cancel the existing flex service and reassign the resources used for this service to augment Route 66 and 62 with expanded service lines (and smaller bus types if possible). Expand shuttle service to the south and west connecting the campus to the surrounding villages of Peace Dale, Wakefield, Matunuck, Bonnet Shores, and underserved communities of Westerly, Charlestown, Richmond and Wyoming . Provide a reliable system that would encourage students and faculty in these communities to choose transit over driving.
- **Transit Hubs –** Create transit hubs at the Welcome Center and Plains Road/Flagg Road parking district that would be serviced by RIPTA. These locations will serve as RIPTA regional service stops and link RIPTAs regional

service to the on-campus shuttle local circulator. These hub centers will also support bicycle parking and electric vehicle charging stations. As the University works towards an expanded UPass program for all undergraduates along with faculty and staff in support of counteracting reduced and limited parking and increased transit ridership, the University should work with RIPTA to identify and establish new service lines for South County that can terminate at URI hub locations. Potential funding sources to create and service the new transit hubs could be linked to:

- a current Transportation Improvement Program (TIP) category that is available for statewide transit hubs;
- from Federal Transit Administration (FTA) appropriation earmarked for capital improvements; or
- possible linkage to Transit Oriented Development (TOD) opportunities associated with a public/private development within the Upper College Road District.

› **Shuttle consolidation -** Move the Ram Van/URI's disability services to fall under control (administrative and operational) of the Parking and Transportation Office. Needs for transportation services (Disability Services, Athletics, and Health Services) would be coordinated and consolidated under the Office of Parking and Transportation and not separately operated services as they are currently handled. Rebrand the Office of Parking and Transportation as the Office of Transportation Mobility and include a transportation demand management (TDM) coordinator.

› **Improve transit connectivity to South County –** Advance previous RIDOT studies of the potential for a rail spur to campus (along Plains Road) from Kingston Station along with a dedicated transit roadway into campus. In the near-term, as a lower cost and innovative alternative, seek to implement an autonomous vehicle corridor along West Alumni Avenue connecting the train station to the heart of the campus. This autonomous vehicle corridor should be served by a driverless transit vehicle that could augment or replace shuttle service in this area of campus. Another near-term option that could be implemented while a rail spur is evaluated should include a transit vehicle corridor on a new roadway between Plains Road and either Route 138 or Waites Corner Road with direct access to Kingston Station. Additionally, the emergence of campus transit hubs (Inter-modal Centers) would lead to expanded service lines to support commuting patterns in South County. This would allow for the 62 which originates from campus and runs to Providence, the 66 which services the south from Galilee and the 64 which currently provides service from the east via Newport, to all utilize the campus hub location. This approach would also support a transfer point for new route lines that could emerge from the west servicing Richmond, Wyoming and communities along the Connecticut line. A similar line could be considered from the southwest connecting Westerly, Weekapaug and Charlestown to campus. Further analysis will be required to determine

student commuter patterns and faculty/staff commuting destinations. This will be critical to determining ridership levels and capacity needs.

- **Clean fuels and efficient vehicles –** Decrease GHG emissions of URI's fleet vehicles through cleaner fuels. Replace inefficient University fleet vehicles with more efficient vehicles over time, consistent with URI's Strategic Plan for Campus Sustainability and Climate Action Plan.
- **Plan for future vehicle technology –** URI is an ideal environment to pilot and implement a "smart" Connected/Autonomous Vehicles (CAV) corridor, envisioned to carry a driverless shuttle vehicle, which would be the first in Rhode Island. Phase 1 implementation should be considered for Upper College Road with future phases on West Alumni Avenue and Plains Road, connecting the campus to the train station. Integration of advanced arrival and travel time systems would be invaluable in promoting benefits of transit and shuttle use. It would also enhance the reliability and overall customer experience of a connected mobility system.

3.4 Pedestrian Recommendations

At some point, every commuter regardless of mode, is a pedestrian. Pedestrians are a major component of any university setting, and URI is no exception. Providing effective and safe pedestrian amenities and delineations is very important to the wellbeing of the transportation system as a whole. The proposed improvements for the pedestrian network are as follows:

- Implement standardized walkway improvements (width, material) and hierarchy (consistent with RIDOT specifications and the Campus Landscape Master Plan recommendations).
- Provide a buffer between roadways and sidewalks where possible.
- Add a sidewalk to Lower College Road.
- Better separation and designation of pedestrian routes vs loading/service routes.
- Repurpose select campus roadways so they are limited to use by pedestrians, bicycles, and shuttle/service vehicles only.
- Improve safety of pedestrian circulation through parking lots via parking lot design that considers buffer areas and aisles that are car-free for pedestrians.

3.5 Bicycle Recommendations

The campus currently does not have a connected on-street or off-road bicycle facilities such as bike lanes or off-road multi-use paths. An important recommendation in the TPMP involves creating a campus-wide bicycle network,

one that connects to the regional network via the South County Bike Path. The proposed improvements for the bicycle network are as follows:

- Provide a seamless system of on-road bike lanes and off-road bike paths throughout campus (consistent with the Campus Landscape Master Plan)
- On-road bike lanes are recommended on Upper College Road, Flagg Road, Campus Avenue and portions of Butterfield Road. Before on-road bike lanes are implemented on Flagg Road, a "road diet" is needed in order to calm traffic.
- Connect regionally to South County Bike Path through a new off-road bike path that begins near Ministerial Road/Route 110 and the existing South County Bike Path, skirts Peckham Farm, crosses Route 138 and parallels the White Horn Brook up to Flagg Road.
- Implement a formalized bike share program once the connection to the South County Bike Path is made (or sooner if demand warrants).
- Add bike racks across campus as demand warrants.
- Connect Grad Village, Fraternity Circle and all residence halls to the bike path through an internal network of paths and corridors to the official dedicated bike path.

3.6 Parking Management System Recommendations

At the outset of this engagement, a total of 78 distinct parking facilities or areas on the URI campus were inventoried, encompassing over 8,000 parking spaces. Of all these facilities, only six parking lots possessed active gate controls to manage access and potentially provide data on utilization. The remainder of these facilities were ungated and had no mechanism to manage access or track usage.

Many college and university campuses operate as an ungated environment, reliant on parking permits to identify scofflaws from authorized users and parking enforcement officers to ensure compliance with official policies. This operating format provides tremendous flexibility for the parking system at very low cost; facilities can be designated or reassigned as needed and quickly by simply changing signage and other identifiers for the authorized user groups.

The downside of ungated systems is, in addition to being labor intensive to administer and enforce, there is no data feed on how many vehicles have entered, parked or exited from access control equipment and thus no mechanism for delivering real-time occupancy data to the managing agency or the end user. This information can be critical for commuting students arriving on campus with little time to spare to hunt for an open parking space. It is also an important consideration for special event attendees, especially during events which start on a fixed schedule. Finally, the data feed from these systems can also inform smart policy development and decision-making by providing historical information on how

a particular facility is being used at different times of day, days of week, and/or times of the year.

There are roughly 170 individual lanes feeding in and out of the ungated facilities on campus which would require equipment if URI were to move to a gated system. Such an installation would require construction of curbing to support the equipment and installation of bollards to protect it, as well as acquisition and installation of:

- Induction loops to detect the change in magnetic field caused by a vehicle entering an entry or exit lane;
- Loop detectors to receive the signal from the induction loop and activate access control equipment;
- Credential readers to verify that the driver in the lane is authorized to enter or exit a particular facility;
- Automated gates to manage ingress and egress from each facility;
- Intercoms which allow end users to communicate to a central agency when there are issues in the lane;
- System servers to administer the operation of the system.

All of this would need to be supported by the provision of conduit carrying power and communications line to each piece of equipment, connecting back to the system server.

Based on similar installations, it is estimated that URI would spend up to $25,000 per lane for such a system, with a potential total project cost of up to $4.25M for equipment with a lifespan of 7-10 years, when properly maintained and periodically updated. This would appear to be an investment counter to URI's commitments to fiscal sustainability, at the very least. In addition, converting to a gated system would not be the most advantageous course for URI compared to the advantages of an LRP system.

Based on our review of current parking operations, URI would benefit from the introduction of mechanisms which would:

- Improve the efficiency of parking enforcement efforts;
- Provide historic data on how each facility is being utilized to inform policy formation;
- Generate real-time utilization data which can be used to help end users find available parking;
- Communicate availability and other information to end users on campus to provide better service to all constituents and better manage vehicular traffic flow;
- Automate simple duties, allowing Parking and Transportation Services staff to focus on higher, better matters.

There are a number of emerging products and technologies which could address some or all of these objectives, as described in this section:

Automated License Plate Recognition

Automated License Plate Recognition (ALPR) has been employed by law enforcement for over 35 years. The first ALPR systems consisted of two vehicle-mounted cameras which were connected to an on-board computer. The cameras were aimed at an angle such that license plates of parked or passing vehicles would pass through the camera's field of vision as the police cruiser travelled. These cameras would capture images of the license plates, digitize these images into an alpha-numeric sequence, and then check that sequence against alpha-numeric plate listings in a database that had been uploaded to the on-board computer.

License Plate Recognition has been employed by law enforcement for over 35 years

These early databases included listings of stolen vehicles, vehicles belonging to persons of interest or persons with outstanding warrants, and/or vehicles used in the commission of a crime. As ALPR technology grew more sophisticated and widely-used, applications became common in managing access to secure or sensitive facilities, administering roadway tolling, speed monitoring and limit enforcement on public roads, and traffic management systems.

In the parking industry, ALPR was initially used for enforcement, particularly in ungated environments. These early ALPR systems were vehicle mounted and the uploaded database for comparison in the on-board computer was populated with the plate information for vehicles with multiple outstanding unpaid parking tickets. As an officer drove along a public street, the cameras would scan the plates of the vehicles parked curbside on either side of the car and run each plate number against the database. When a match between a scanned image and the database was found, the system would alert the driver, who would pull over, confirm the scan was accurate, and perform the appropriate action (e.g. write a citation, immobilize the vehicle, call for a tow, etc.).

ALPR became popular on college and university campuses when technicians successfully inverted the traditional operating model. Now, databases were populated with the plate numbers of authorized users and the system would only

alert when it read a plate number it could NOT match to something in the database. In the earlier iterations of these systems, the patrolling officer would have to manually queue the system to check against the proper database, depending on the facility. Newer systems are mated with GPS technology which can automatically determine where a vehicle is located and whether the system should be checking for reads against databases of approved students, staff, faculty and/or visitors. Modern systems also integrate with Pay-by-Cell (PbC) systems so that visitors or event attendees can register their vehicles on campus and acquire a 'digital' or 'virtual' permit which adds their plate information to the on-board database, often in real-time.

ALPR is a force multiplier because it automates the data entry aspect of patrolling and performs it far quicker than a human entering in plate data on a keyboard or other device. Vehicle-mounted ALPR systems also allow for reading and detection at higher velocity than a foot- or even bicycle-mounted patrol officer can achieve. A vehicle with ALPR can cover between three and ten times the parking spaces a patrol officer on foot or a bike can in the same amount of time, and at a 90%+ read accuracy rate.

In addition to enforcement capabilities, some vehicle-mounted ALPR systems do have the capacity to translate the number of plates read in a given area into car counts. This data can be stored for later analysis and reference and/or sent in real-time to another program for distribution for other uses. Depending on how rigid and standardized the patrol schedule is, this data can provide a good measure of utilization at different times of day, days of the week, and times of the year. Alternately, when real-time occupancy counts are transmitted, this information can be fed to a website or application which can provide an end user with a clear picture of where capacity exists within the system.

The cost of a vehicle-mounted ALPR systems can vary from as low as $35,000 to as high as $65,000 for two cameras, the central processor, software and installation. At this time, the University's needs a system of roughly $40,000 per vehicle to meet URI's needs and two equipped vehicles would be adequate to cover the campus, for a potential cost of $80,000.

Fixed mounted ALPR systems, which monitor entering and exiting vehicles in and out of facility, cost between $15,000 and $25,000 for each installed camera. At the lower end of the scale, it would cost roughly $2.6M to install this kind of system on the URI campus without gates, which is still roughly half the cost of a traditional, gated system.

These fixed mounted systems can send alerts to roving patrols when an unauthorized vehicle enters an ungated facility, transmitting the time of entry, location and plate number. Or it can be integrated with automated gates to manage access. Systems using plate numbers as the primary credential for registering and monitoring access rights (often referred to as 'digital' or 'virtual' permits) can work off existing standard self-registration programs, which require permit applicants to enter vehicle data – including plate numbers – as part of the basic process.

The return on investment with ALPR is favorable for purchasing agencies. A vehicle-mounted ALPR system can provide the same coverage as an area normally requiring two foot-mounted officer to perform regular 'sweeps'. If each of these officers is paid an annual salary of $35,000, the agency can recoup its investment in operational cost savings within two years by discharging one officer and tasking the remaining one with operating the vehicle.

ALPR systems can capture plate images, but not real-time video feeds nor quality wider image data; potential purchasers are warned not to consider an ALPR system as replacement for security video technology. And only fixed-mounted ALPR installations at the entry and exit of each facility will be able to provide real-time data feeds on occupancy to websites, handheld applications, or dynamic signage systems. Vehicle mounted ALPR systems can provide periodic data on occupancy, but cannot give real-time data on every facility within the system, simultaneously.

Image Processing

Image processing technology is similar to ALPR, but rather than capturing an image and digitizing it into an alpha-numeric sequence, the system digitizes the image of an area and compares it to a digitized image of the same area taken when no cars were present. Using methodology similar to facial recognition technology, the system can measure the dimensions of a new object in the field and compare that with specifications for dimensions of an automobile, as opposed to a dumpster, a person, or some other object. If an automobile is detected, the system tallies that vehicle and records its presence within the field. These systems can retain this data for analytical purposes and/or send it in real-time to other applications. These systems rely on pole-mounted cameras with a wide angle of vision over a parking field.

Image processing technology applications for parking are relatively new and not widely used in the United States, but employed extensively in Europe. Installation costs vary depending on the size and dimension of each facility; manufacturers claim a single camera can monitor occupancy in facilities up to 300 spaces, although examples of this magnitude of installation are limited. In addition, costs can vary depending on the communications infrastructure required to connect the system to server and power requirements; some systems already installed are wireless and solar-powered, while others require more traditional support systems. Cleverciti

Systems (https://www.cleverciti.com/), one of the more successful European developers, claims they can install for as little as $1,000 per camera, but would need to study the campus to provide an accurate estimate of cost.

Image processing systems are good for monitoring and reporting occupancy, but poor for enforcement. An image processing system cannot provide ALPR reads, although the image feed from these systems can capture the color, size and shape of vehicles, as well as images of individuals passing through the facility. Also, it should be noted that standard installations capture still images every few seconds, not continuous video feeds. If a system is specified for continuous video feed, the cost of installation and maintenance is increased geometrically due to the data storage and processing requirements associated with continuous video feeds. Many image processing systems do come with smart phone applications which will facilitate registration of a vehicle in a facility and even payment for services, but the vehicle identifier in these instances is the vehicle's GPS coordinates and/or image as measured by the system, not plate data unless the facility is also being patrolled by personnel on the ground.

Radio Frequency Identification Systems

Radio Frequency Identification (RFID) systems, also commonly known as Automated Vehicle Identification (AVI) systems, are an established technology in the US and ubiquitous. The most common example in the northeastern US is the EZ Pass system which uses vehicle mounted transponders to communicate with overhead mounted antennas at toll points along a roadway. The transponder is coded with a unique identifier which the antenna reads and sends to the system server for reference. In the case of a toll road, the system looks up the corresponding account associated with that transponder and executes a prescribed action. In some cases, this action may be to check the account status and send a notice whether the vehicle is authorized to continue travel on the roadway. More commonly, the system records the vehicle's passage and applies a charge against the driver's credit card on file for the toll to pass along a particular length of roadway.

AVI has been used in parking for over a decade with great success. AVI is primarily employed to manage access for permit holders, who may pay a fixed fee for use

prior to being issued a transponder, pay a fee at the outset of a particular billing period (e.g. month, quarter, year, etc.) to maintain free access to the facility, or pay by the use via a credit card on file or other billing arrangement. The last is the least common format, but is employed in some cases where users regularly need access to a facility, but with less frequency than a normal (monthly) permit holder. AVI systems for parking tend to be less robust than the systems employed for roadway management. They have shorter read ranges and can be read only at lower speeds, but the system components also tend to cost one-half or less what they do for roadway applications.

This universality and improved performance will come at a significant cost. AVI systems used in parking typically cost $3,000-$5,000 per antenna and $10.00-$20.00 per transponder. The Mark IV system costs roughly $12,500 per antenna and $25.00-$40.00 per transponder. In either case, the University will incur additional costs to install these systems over each entry and exit lane, including the expense of running power and communications line to each location and constructing an overhead gantry to mount the antennas over each lane. An order of magnitude cost estimate for either system is approximately $3.3M.

Parking Management System Recommendations

Based on this review, URI should consider the following parking management strategies/systems:

- Transferring all parking enforcement duties over to the University Police for execution, thereby reducing duplication of effort during patrols, and negotiating a better revenue split with the Rhode Island Traffic Tribunal on collected URI parking fines to more accurately reflect the costs of enforcement to URI. Eliminating the currently filled Campus Patrol positions associated with Parking & Transportation Services would remove roughly $46,000 in annual payroll and benefits.
- Adopting a 'demand responsive' pricing program for student parking permits that reflects the relative demand, or lack thereof, on various facilities across campus and revising rates to align closer with comparable institutions.
- As stated previously, consider reducing freshman resident parking through demand responsive pricing to create more capacity on campus to support emerging development. There were 675 annual Resident Student parking permits and 73 semester Resident Student parking permits issued in the 2016-17 school year; banning parking for Resident freshman could recover over 600 parking spaces of capacity within the system. Inversely, charging freshman Residents a higher rate, perhaps $325.00 per year, could reduce demand by 25% (recovered ~ 150 parking spaces) and still net the University an additional ~$15,000 in permit fees.
- As stated previously, institute a 'fee for use' parking for all faculty and staff as part of a larger TDM initiative. At a nominal average rate of $100.00 per

permit, charging for faculty and staff parking could generate over $140,000 annually.

- Expanding TDM programs available to students, faculty and staff to mitigate parking demand on campus. Adding Parking Cash Out to the current program is likely to be revenue neutral, while adding a Guaranteed Ride Home feature is likely to cost $20.00-$35.00 per participant annually.
- Introducing ALPR technology onto campus as a parking enforcement tool, as well as a way to develop a database of historical occupancy. A mobile system would require two vehicle-mounted units at an estimated cost of roughly $80,000. A fixed camera system which covered every facility on the URI campus could cost as much as $2.6M, which would still be less than the estimated $4.25M it would cost to install a traditional, gated access control system in every facility on campus
- In combination with a conversion to ALPR technology for enforcement, phase out the use of physical permits and convert to a 'virtual permit' system. Any cost for software associated with this conversion would be offset by the cost savings from not paying a third-party vendor to prepare and send physical permits at the outset of each academic year.
- Investigate contracting with a Pay-by-Cell (PbC) vendor to provide services which allow visitors and/or special event attendees to self-register their vehicles and receive 'virtual permits' to park on campus. Typically, there is no cost to the institution for introducing PbC, although a nominal cost per transaction ($0.05-$0.35) may be borne by the end user.
- Exploring opportunities to direct data feeds from parking access equipment and ALPR systems to website, applications, or other venues which update students, faculty, staff and visitors on facility utilization and availability. The software to translate and transmit this data is typically under $10,000, but website or application development may add to this cost, depending on URI's needs and requirements.
- Investigating the expense and logistics of installing dynamic wayfinding signs around campus directing drivers to the nearest available facility. These signs can run from $1,500 per unit up to $7,500 per sign, depending on the buyers needs and specifications.
- In the longer term, consider acquiring technology which can provide real-time occupancy and utilization data on each parking facility across campus. This could be as elaborate at the $2.6M fixed-camera ALPR system previously described, the AVI-based systems estimated at between $3.3M and $3.4M, a traditional equipment package that could cost as much as $4.25M, or an emerging technology.

3.7 Validation of Recommendations Using Parking Model

As part of this TPMP, a parking analysis model was developed to enable URI to understand future campus parking needs with the ability to test various "what if" scenarios and change variables which affect the campus population, parking supply and parking demand. As part of the master planning effort, parking supply and occupancy data was gathered and serves as the basis for the parking tool. In addition, population data was gathered and used. The Appendix to this report contains a technical memorandum that explains the details on the tool development.

3.8 Summary of Overall Recommendations and Phasing

Figure 13 presents a summary of the key recommendations in this TPMP. These recommendations, along with the detailed policy and system recommendations articulated in this report, will help URI achieve a safe, efficient, and integrated transportation system on campus. The following key principles were identified at the outset of the plan and are all achieved with the recommendations:

- MOVE PARKING out of the campus core to create a more pedestrian and bike friendly environment while accommodating needs for service vehicles and accessible spaces.
- MANAGE DEMAND while continuing to assess supply. Add supply strategically and only as a last resort.
- ENHANCE SHUTTLE SERVICE to maximize use of peripheral and remote lots.
- TRANSFORM CAMPUS ROADWAYS into "complete streets" and create URI branded gateways at key locations so that there is a sense of arrival to campus that does not exist today.
- Create a REGIONALLY CONNECTED bicycle network.
- Create a parking supply/demand model.
- Explore potential revenue streams.

Phasing and prioritization of the recommendations are summarized in Table 6. The appendix to this report includes an implementation plan for each recommendation.

Table 6 Summary of Phased Recommendations

	PHASE 1 – Short-term Actions (UNDER 2 years)	PHASE 2 – Intermediate Actions (2 – 5 years)	PHASE 3 -Long-term actions (Over 5 years)
Policy & Enforcement	3. Parking: a. Revise policy for freshman resident parking/implement restrictions; assess the price elasticity of parking fees in comparison to other tuition/housing/meal costs from competing universities b. Identify a more appropriate permanent space for the band to practice c. Bolster ADA parking enforcement in hatched/no-parking areas adjacent to ADA spaces (enforcement and education) d. Update parking rate so EVERY parking permit generates revenue (charge faculty/staff for parking) e. Provide incentives for faculty/staff who do NOT bring a car to campus f. Reduce (or cap) parking permit sales to be better aligned with space inventory g. Improve marketing of transportation commuter options (less focus on cars) h. Designate a Parking District (Plains Road Lot) with Transportation Hubs 4. Transit/shuttle/fleet: a. Consolidate existing URI-hosted shuttle services under Parking & Transportation (Disability Services, Athletics) b. Advance the rail and road connectivity concepts developed by RIDOT and other reasonable connectivity alternatives between Kingston Station and URI c. Transition fleet vehicles to ultra-low sulfur biodiesel fuel	8. Parking: a. Restructure Transportation and Parking Department into TRANSPORTATION MOBILITY OFFICE b. Implement revised policy for freshman parking c. Implement permit system for ADA spaces 9. Transit/shuttle/fleet: a. Increase transit subsidy b. Migrate URI's vehicle fleet to clean fuels and electric vehicles c. Expand UPass program by activating IDs (students, faculty, staff) as bus passes	12. Transit/shuttle/fleet: a. Increase the number of University fleet vehicles with higher-than-average fuel efficiency/use cleaner fuels by 2025 b. Decrease URI's vehicle fleet size
Planning & Implementation	6. Parking: a. Relocate the band to permanent space b. Develop a numbering system for the parking lots for ease of wayfinding and permit allocation c. Begin design of 1-level parking decks at Flagg Road Lot, Fine Arts Lot, and Welcome Center Lot d. Obtain accurate origin-destination data for parking facility users tied to permit applications (data field entry) e. Prepare an Accessible/Material Handling Campus action plan; conduct a campus accessibility/material handling audit (parking, pathways, buildings) f. Implement technology-based parking management system g. Identify priority parking areas for carpoolers and electric vehicle charging stations h. Identify off-campus locations for remote parking for commuters 7. Transit/shuttle/fleet: a. Modify existing shuttle system in order to enable future parking changes: • **Regional connector**. Focus RIPTA service on a strengthened and expanded regional connection to campus fringe parking lots, high density off-campus residential areas, remote lots, Providence, RINEC, and NBC campuses. • **Local circulator**. A separate, smaller shuttle operator provides an on-campus/ in-and-around circulator controlled by Parking and Transportation Services, branded for URI b. Obtain more robust shuttle utilization and tracking data using latest GPS and handheld technology (i.e. apps for smartphones) c. Added service frequency between Kingston campus and Providence (including new RINEC) d. Pilot a UPass program for freshmen (free transit pass) e. Pilot a Connected Vehicle/Automated Vehicle Corridor on-campus (along Upper College Road) 8. Roadway/Pedestrian/Bicycle: a. Implement uniform pavement markings and branding and standardized walkway improvements and hierarchy. All pavement markings and signage need to meet basic MUTCD requirements.	11. Parking: a. Construct parking decks at Flagg Road Lot, Fine Arts Lot, and Welcome Center Lot b. Convert initial select parking lots in the campus core to be accessible lots or loading/service only c. Implement carpool parking and electric vehicle charging stations 12. Transit/shuttle/fleet: a. Migrate shuttle system to private on-campus circulator synchronized with existing RIPTA service to/from campus regionally b. Add service that connects to off-campus student living areas (to encourage shuttle use vs. driving and parking) 13. Roadway/Pedestrian/Bicycle: a. Reconfigure general campus vehicular circulation b. Create a full campus regionally connected bicycle network to South County Bike Path c. Implement Complete Streets on select roadways d. Implement actions from the Phase 1 Accessible/MH Campus action plan e. Implement formalized bike share program f. Add bicycle racks across campus; plan for new bike share operator on campus	15. Parking: a. Convert remaining select parking lots in the campus core to be accessible lots or loading/service only 16. Transit/shuttle/fleet: a. Expand the Connected Vehicle/Automated Vehicle corridor from Upper College Road to include West Alumni Road and Plains Road to the train station

Recommendation aligned with URI's Strategic Plan for Campus Sustainability and Climate Action Plan

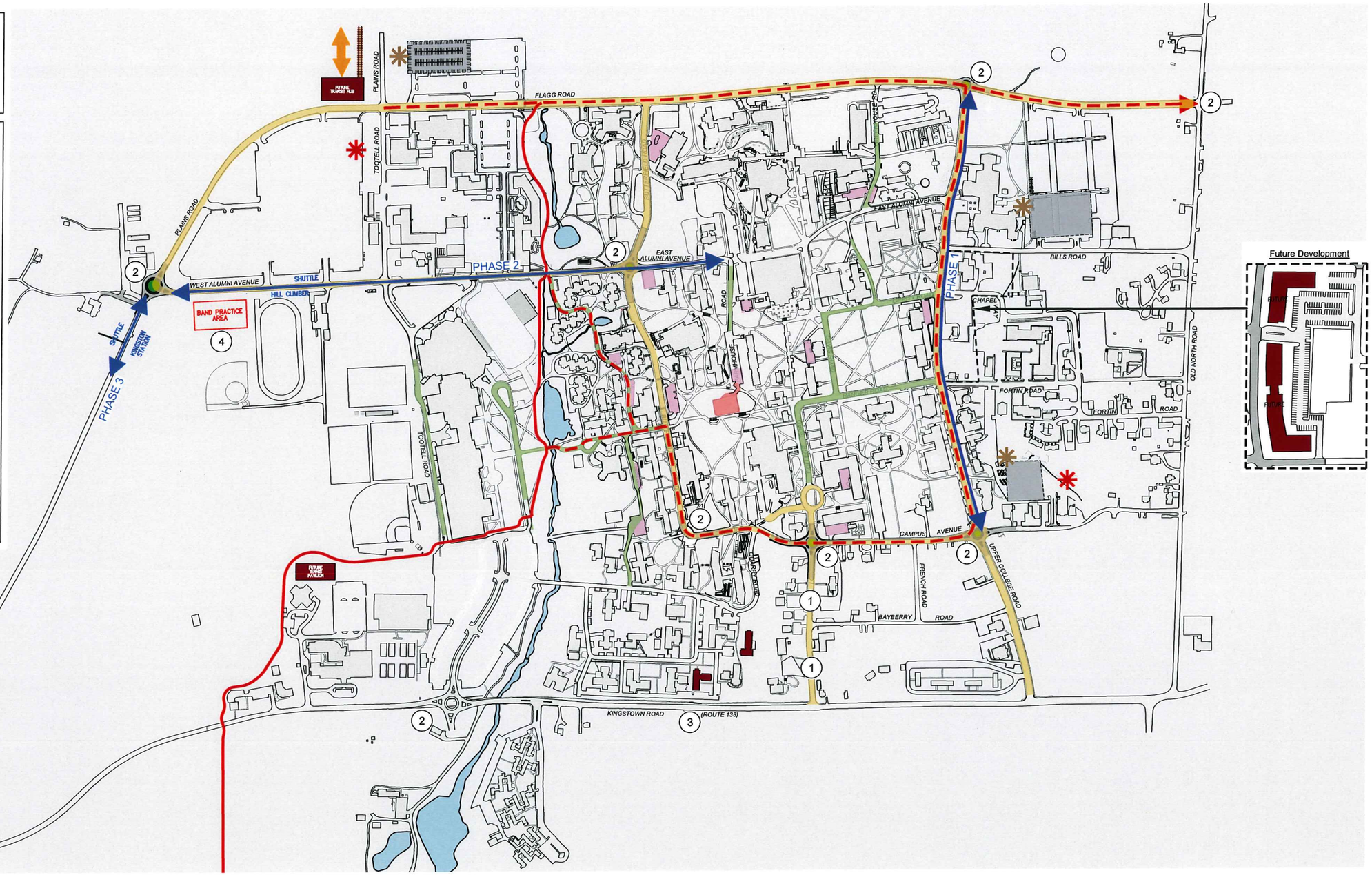
Figures and Implementation Plan

vhb | **Figure ES-1**

Other Key Recommendations:

- Provide remote parking with shuttle connection
- Split shuttle operations into a regional connector and local on-campus circulator

- Pedestrian/ Service/Shuttle/ Emergency Vehicles Only
- Complete Streets Upgrade
- Consider Lot for Reduction or Accessible Parking Only
- Eliminate Parking Lot
- Future Building
- (1) Eliminate On-Street Parking
- (2) Construct Roundabout/Gateway
- (3) Close Driveway
- (4) Identify Permanent Space for Band to Practice
- Bicycle Lanes
- Bicycle Path
- Transportation Hub
- Future Structured Parking
- Enhanced Connection to Kingston Station
- Connected Vehicle/Autonomous Vehicle Corridor (Phase 1,2,3)



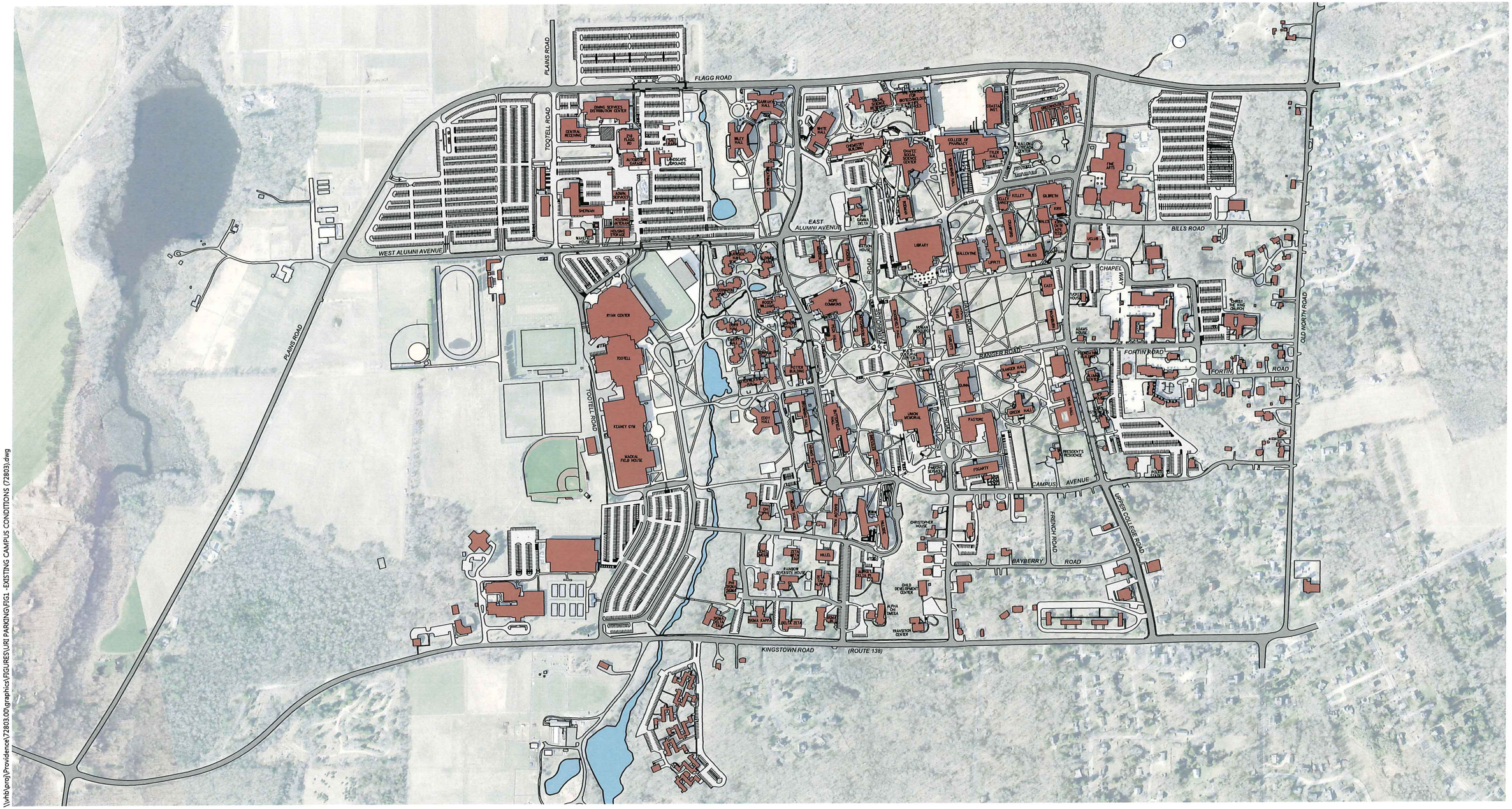
\\vhbprov\Providence\72803.00\graphics\FIGURES\URI PARKING\FIG13 - DRAFT IMPROVEMENTS (72803)_v2.dwg

URI Transportation and Parking Master Plan | Kingston, Rhode Island

Summary of Recommendations

0 300 600 Feet

vhb | **Figure 1**



\\vhb\proj\Providence\72803.00\graphics\FIGURES\URI PARKING\FIG1 - EXISTING CAMPUS CONDITIONS (72803).dwg

URI Transportation and Parking Master Plan | Kingstown, Rhode Island

Existing Conditions

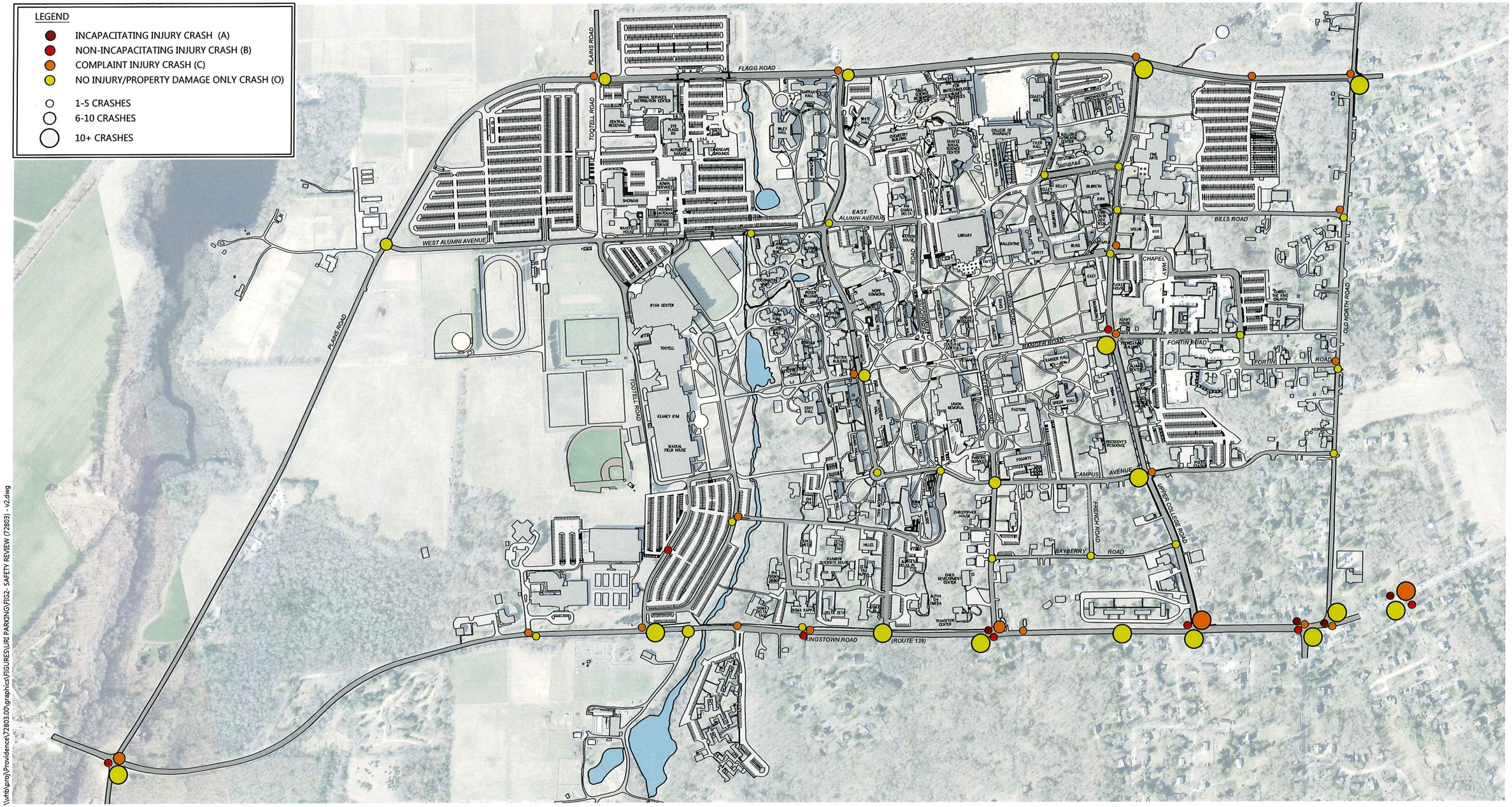
0 300 600 Feet

vhb | **Figure 2**

LEGEND

- INCAPACITATING INJURY CRASH (A)
- NON-INCAPACITATING INJURY CRASH (B)
- COMPLAINT INJURY CRASH (C)
- NO INJURY/PROPERTY DAMAGE ONLY CRASH (O)

- 1-5 CRASHES
- 6-10 CRASHES
- 10+ CRASHES



\\vhb\proj\Providence\72803.00\graphics\FIGURES\URI PARKING\FIG2- SAFETY REVIEW (72803) - v2.dwg

URI Transportation and Parking Master Plan | Kingston, Rhode Island

Safety Review
2011-2015

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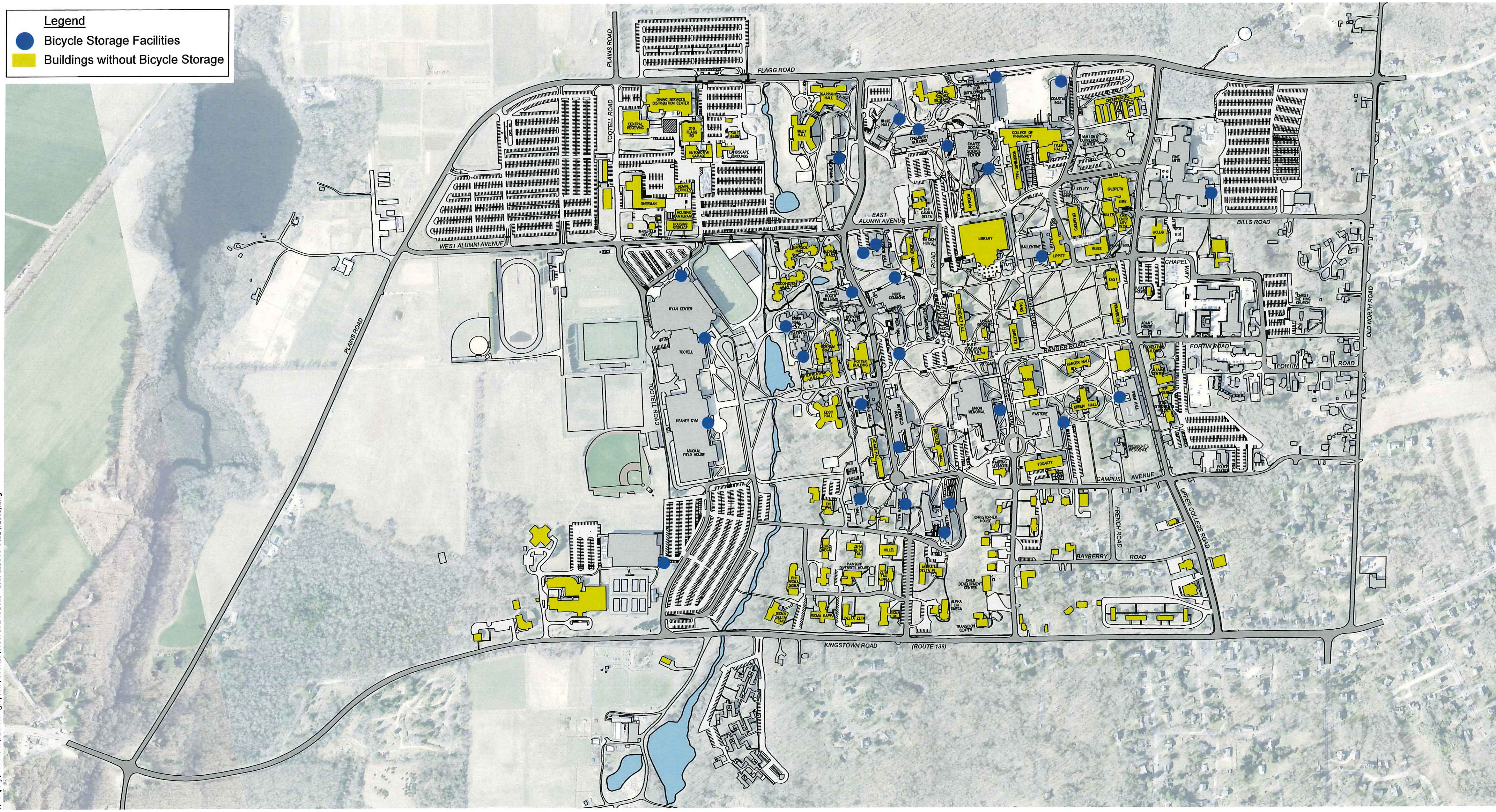
Source: RIDOT Traffic Research Unit

vhb | Figure 3



\\vhb\proj\Providence\72803.00\graphics\FIGURES\URI PARKING\FIG3 - BICYCLE STORAGE (72803).dwg

URI Transportation and Parking Master Plan | Kingston, Rhode Island

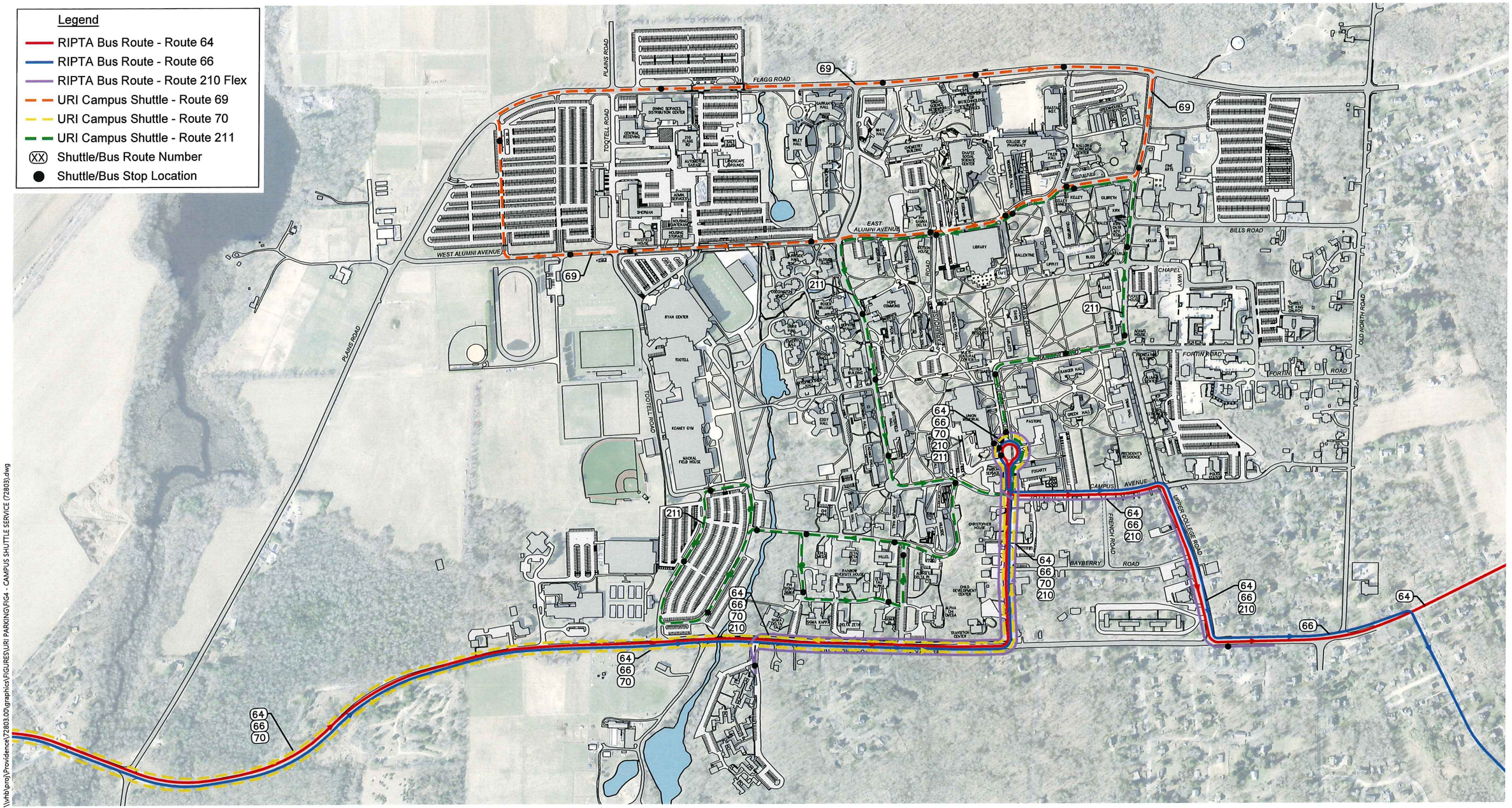
Existing Bicycle Storage Facilities

0 300 600 Feet

vhb | **Figure 4**

Legend

- RIPTA Bus Route - Route 64
- RIPTA Bus Route - Route 66
- RIPTA Bus Route - Route 210 Flex
- URI Campus Shuttle - Route 69
- URI Campus Shuttle - Route 70
- URI Campus Shuttle - Route 211
- (XX) Shuttle/Bus Route Number
- Shuttle/Bus Stop Location



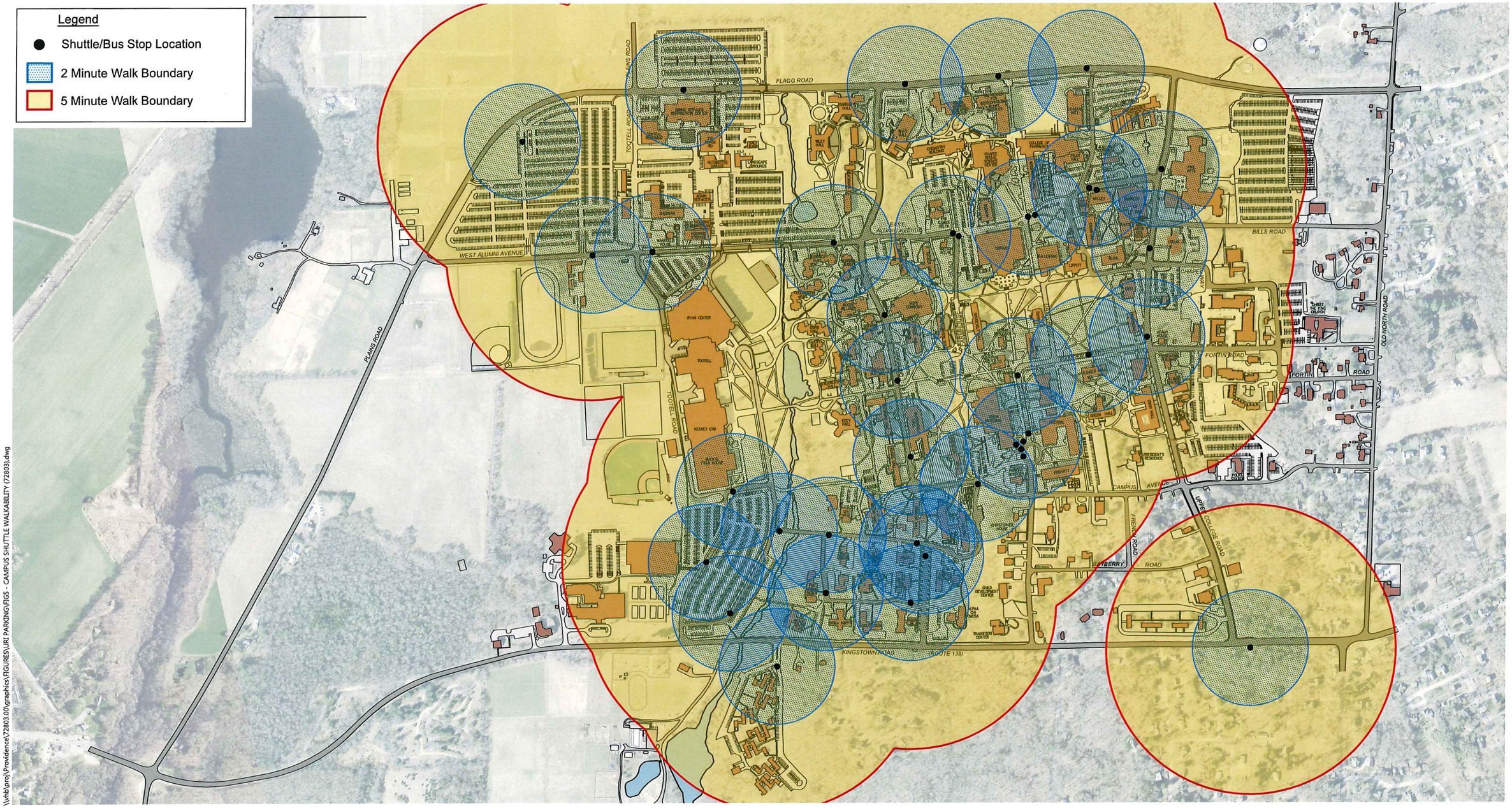
\\vhb\proj\Providence\72803.00\graphics\FIGURES\URI PARKING\FIG4 - CAMPUS SHUTTLE SERVICE (72803).dwg

URI Transportation and Parking Master Plan | Kingston, Rhode Island

Campus Shuttle Service

0 300 600 Feet

vhb | **Figure 5**



\\vhb\proj\Providence\72803.00\graphics\FIGURES\URI PARKING\FIGS - CAMPUS SHUTTLE WALKABILITY (72803).dwg

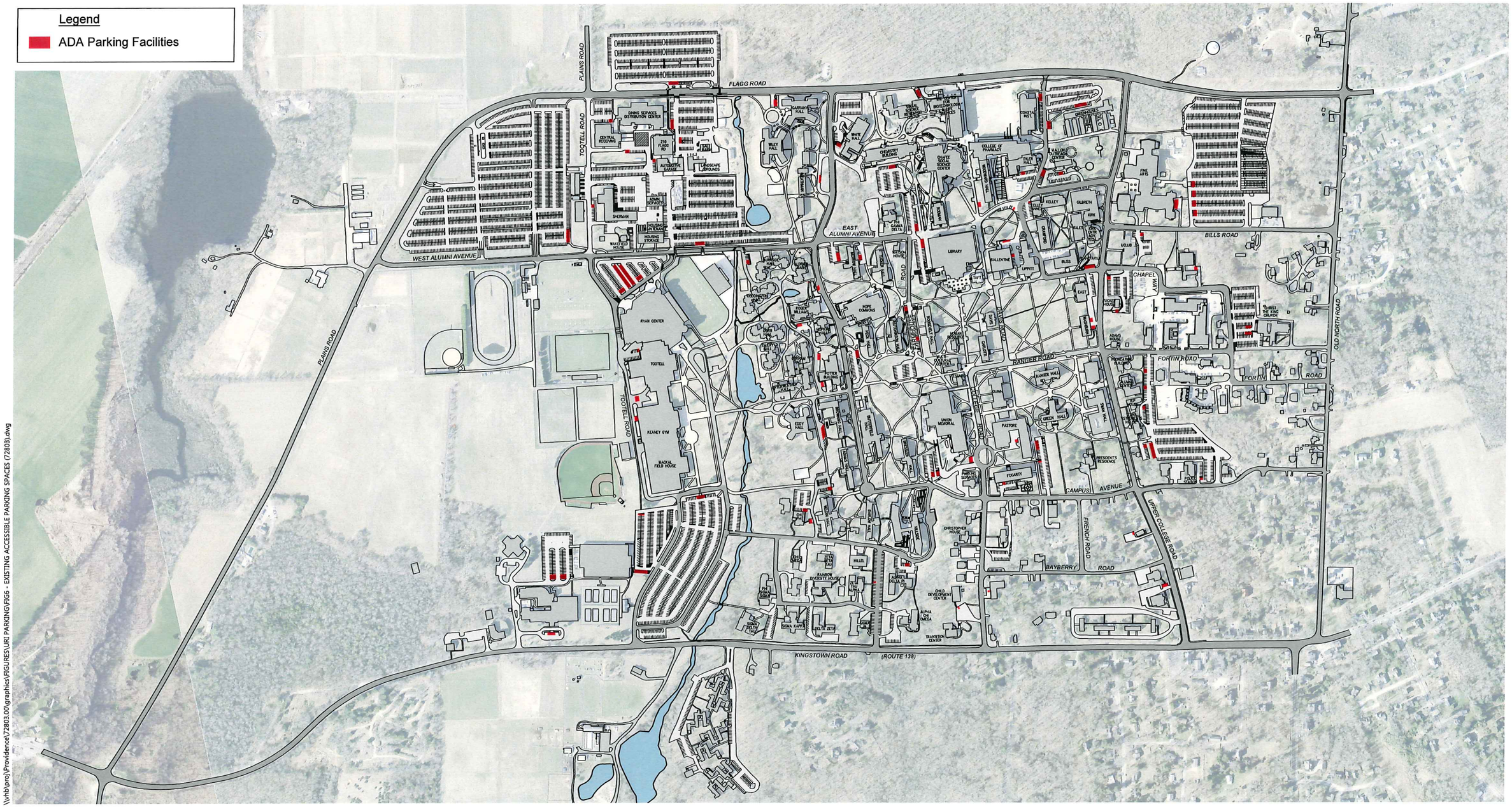
URI Transportation and Parking Master Plan | Kingston, Rhode Island

Campus Shuttle Walkability

vhb | **Figure 6**

Legend

ADA Parking Facilities



\\vhb\proj\Providence\72803.00\graphics\FIGURES\URI PARKING\FIG6 - EXISTING ACCESSIBLE PARKING SPACES (72803).dwg

URI Transportation and Parking Master Plan | Kingston, Rhode Island

Existing Accessible Parking Spaces

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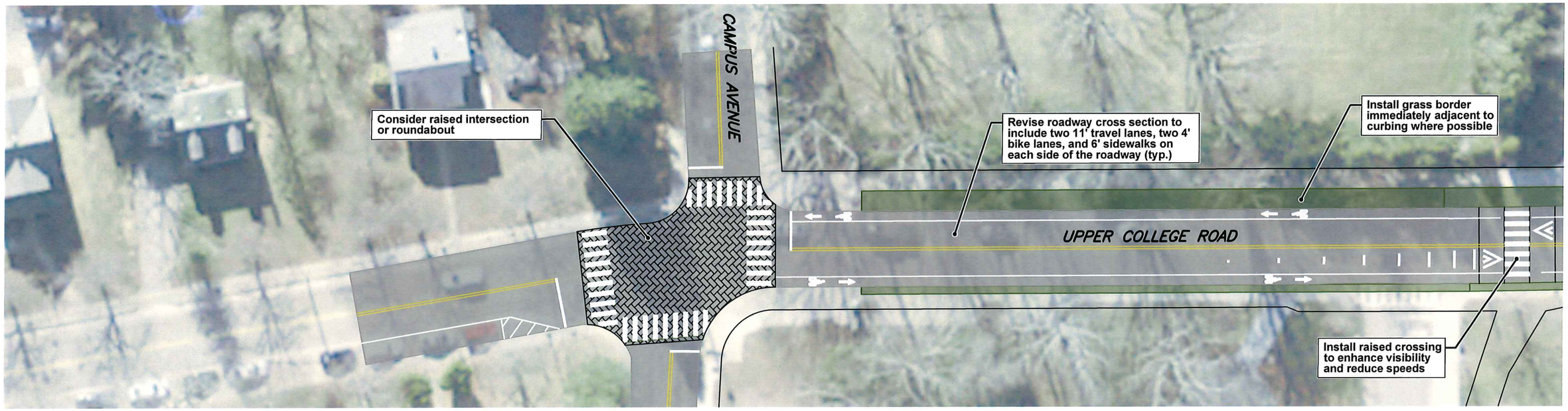

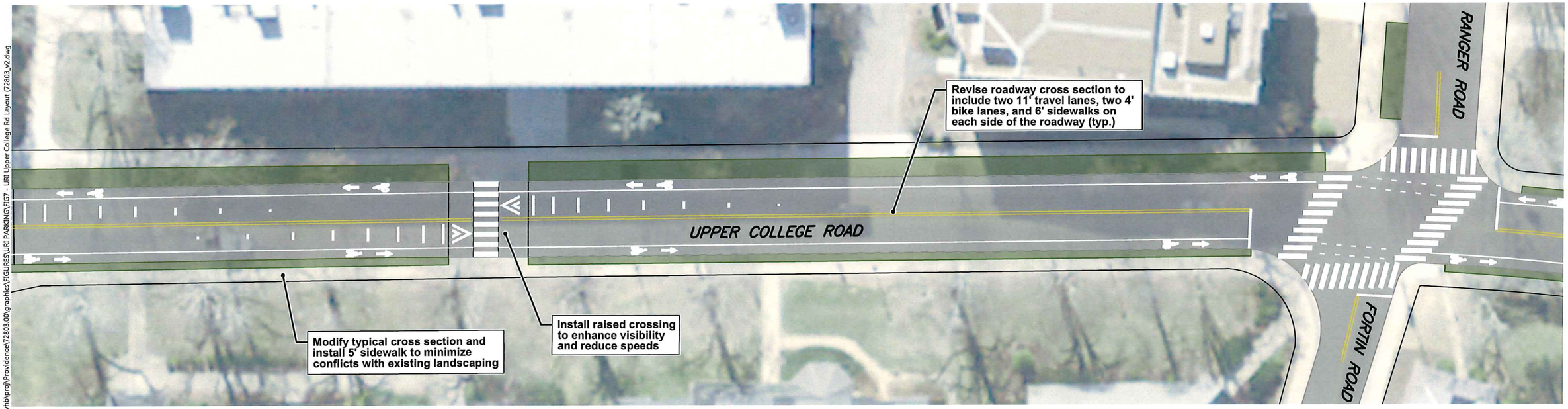

\\vhb\proj\Providence\72803.00\graphics\FIGURES\URI PARKING\FIG7 - URI Upper College Rd Layout (72803_v2.dwg

URI Transportation and Parking Master Plan | Kingston, Rhode Island

Conceptual Plan 1
Upper College Road

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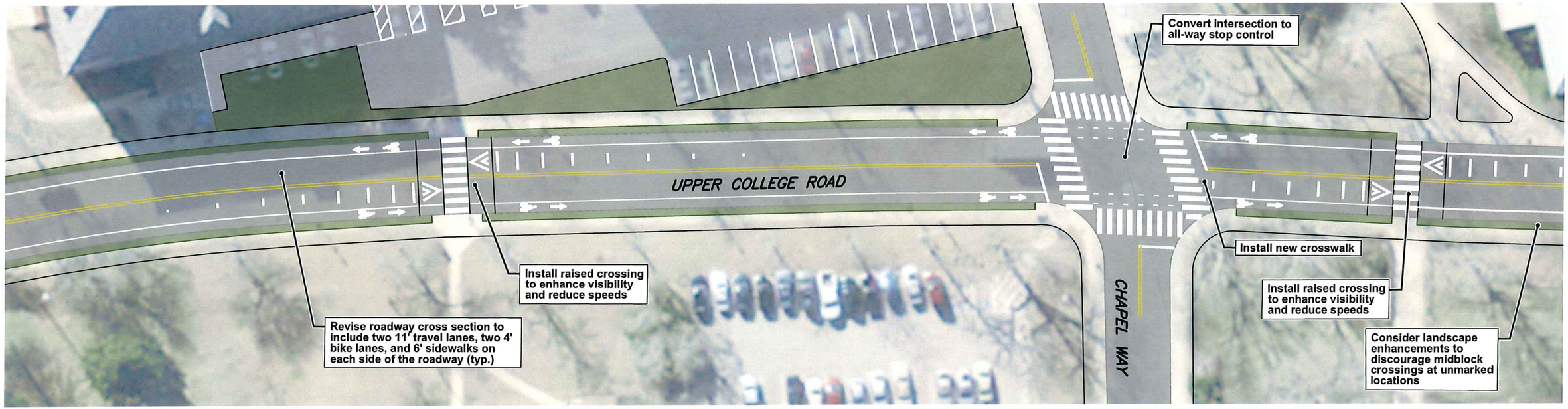

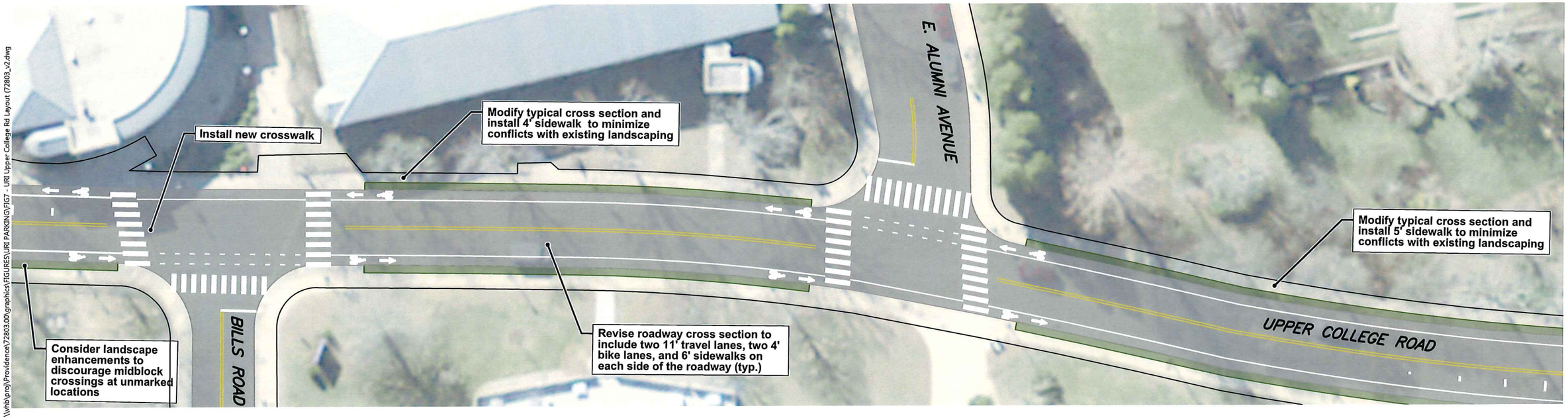

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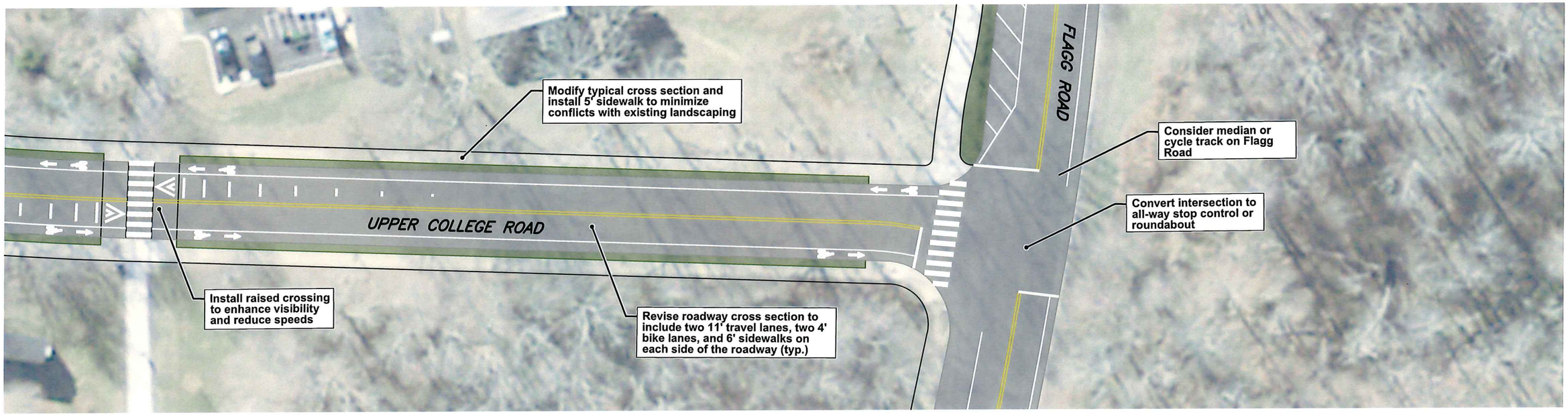
URI Transportation and Parking Master Plan | Kingston, Rhode Island

Conceptual Plan 2
Upper College Road

vhb | Figure 7c



\\vhb\proj\Providence\72803.00\graphics\FIGURES\URI PARKING\FIG7 - URI Upper College Rd Layout (72803_v2.dwg

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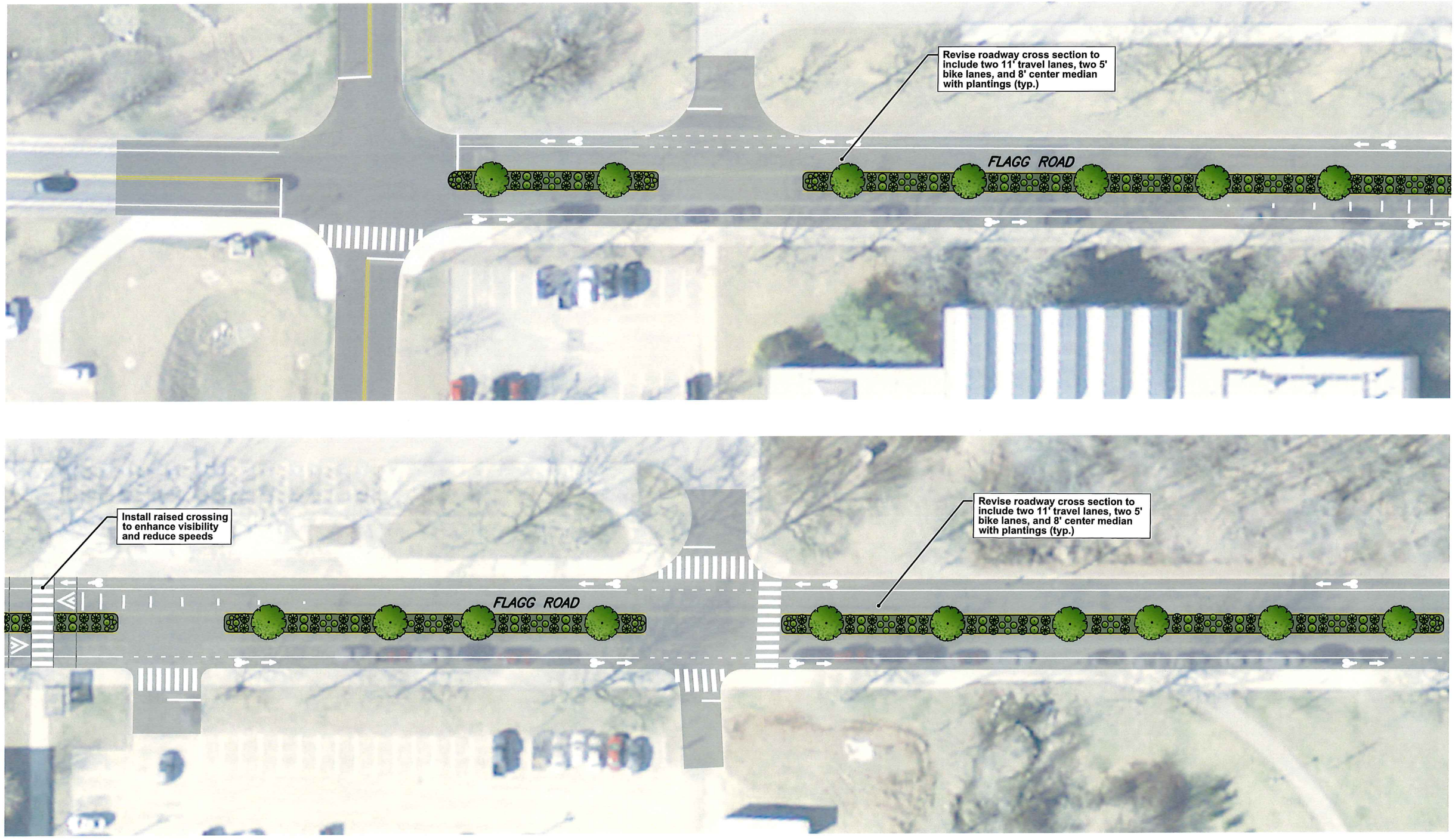
URI Transportation and Parking Master Plan | Kingston, Rhode Island

Conceptual Plan 3
Upper College Road



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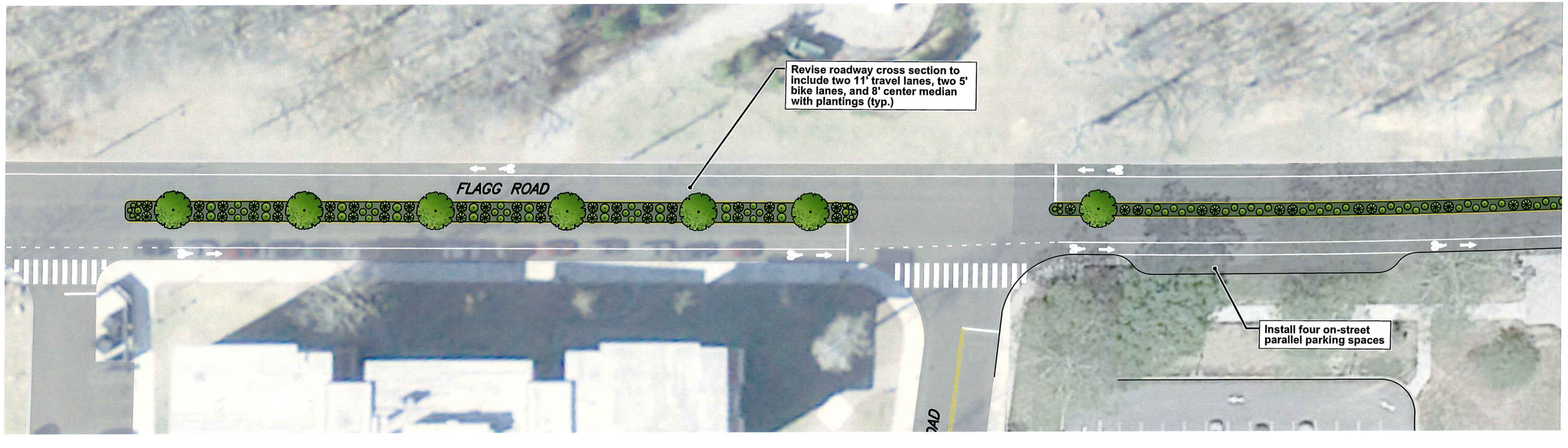
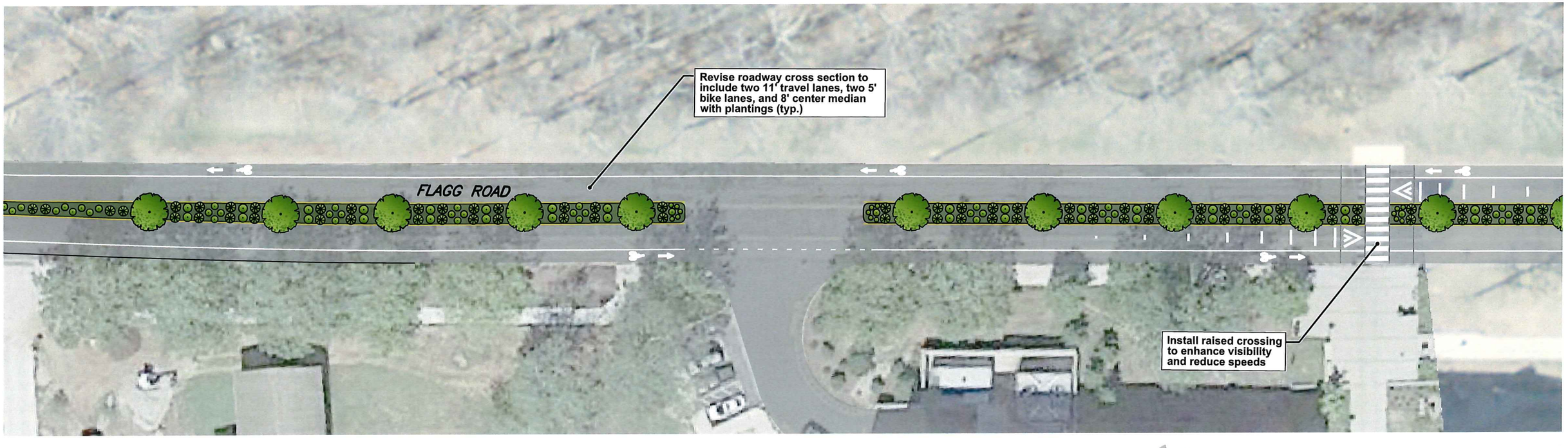
Conceptual Plan 1
URI Transportation & Parking Master Plan
Flagg Road
Kingston, RI

Figure 8a

\\vhb\proj\Providence\72803.00\cad\ts\planmisc\Complete Street Plans\FIGx - URI Flagg Rd Layout (72803).dwg





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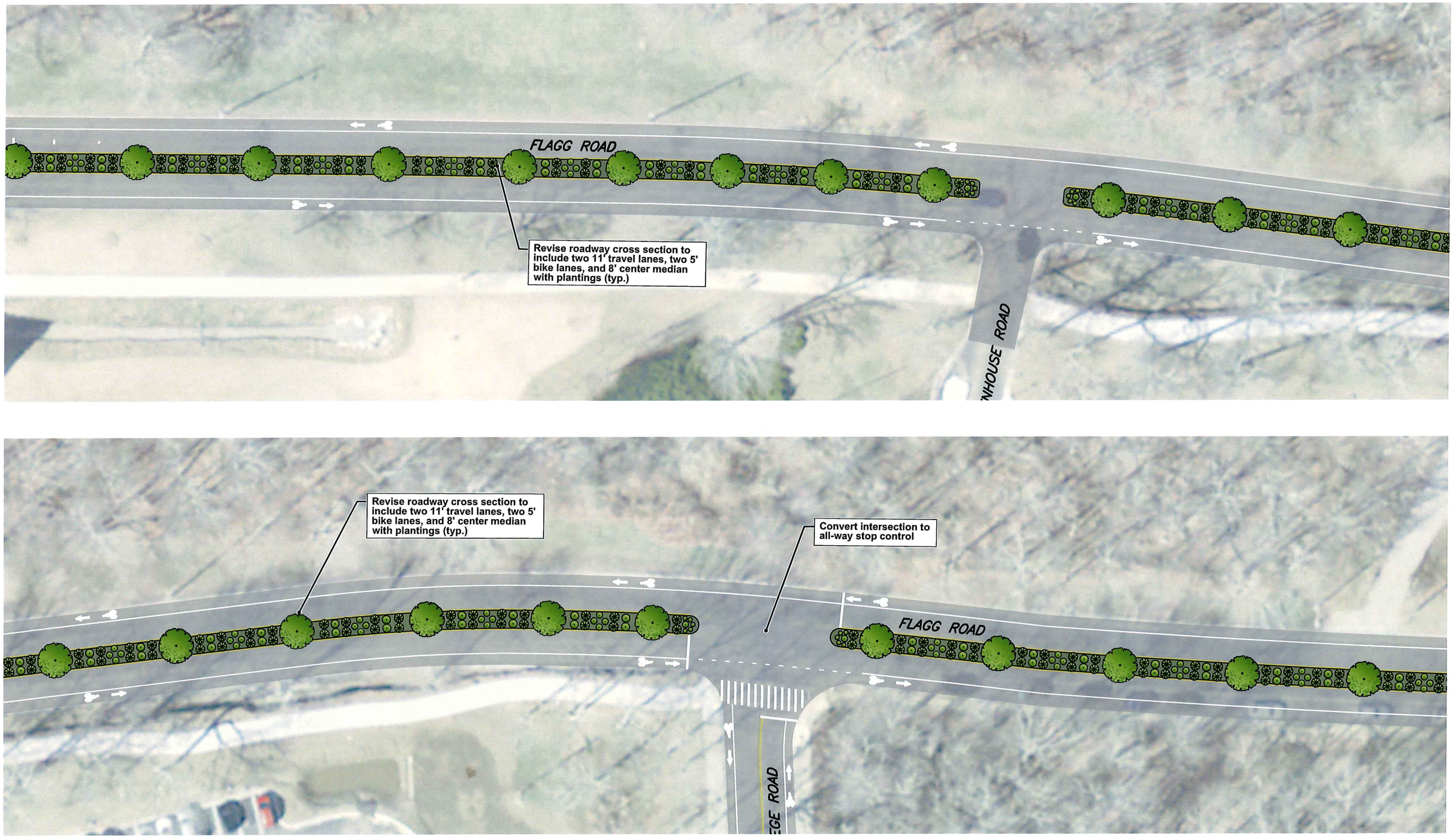
Conceptual Plan 2
URI Transportation & Parking Master Plan
Flagg Road
Kingston, RI

Figure 8b



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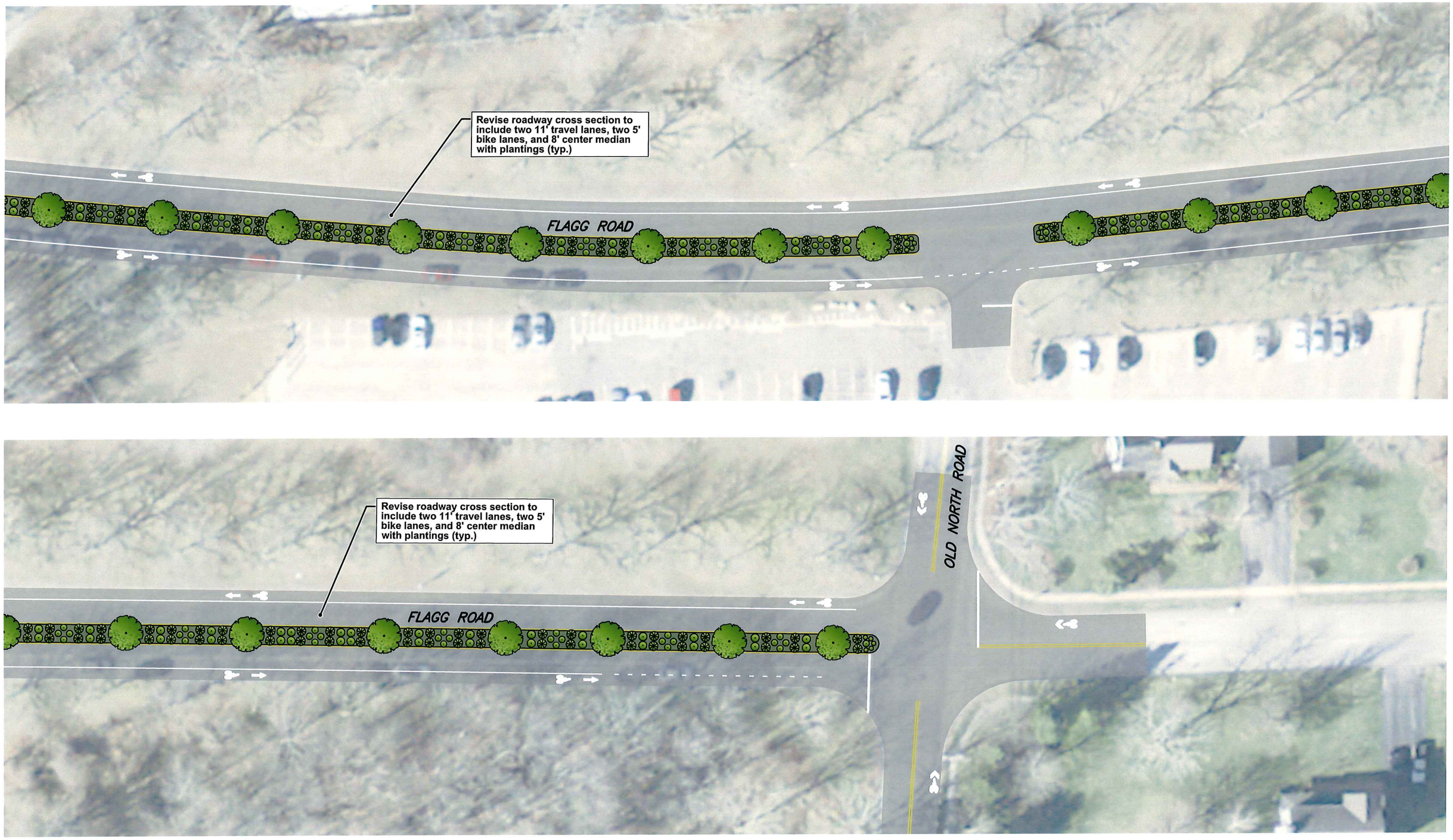
Conceptual Plan 3
URI Transportation & Parking Master Plan
Flagg Road
Kingston, RI

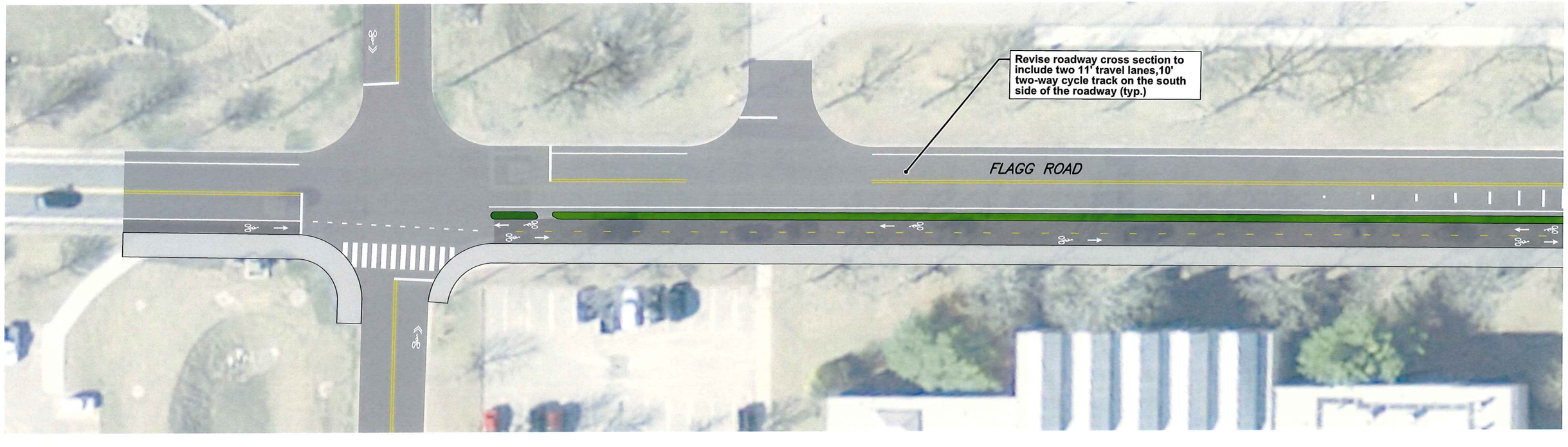
Figure 8c

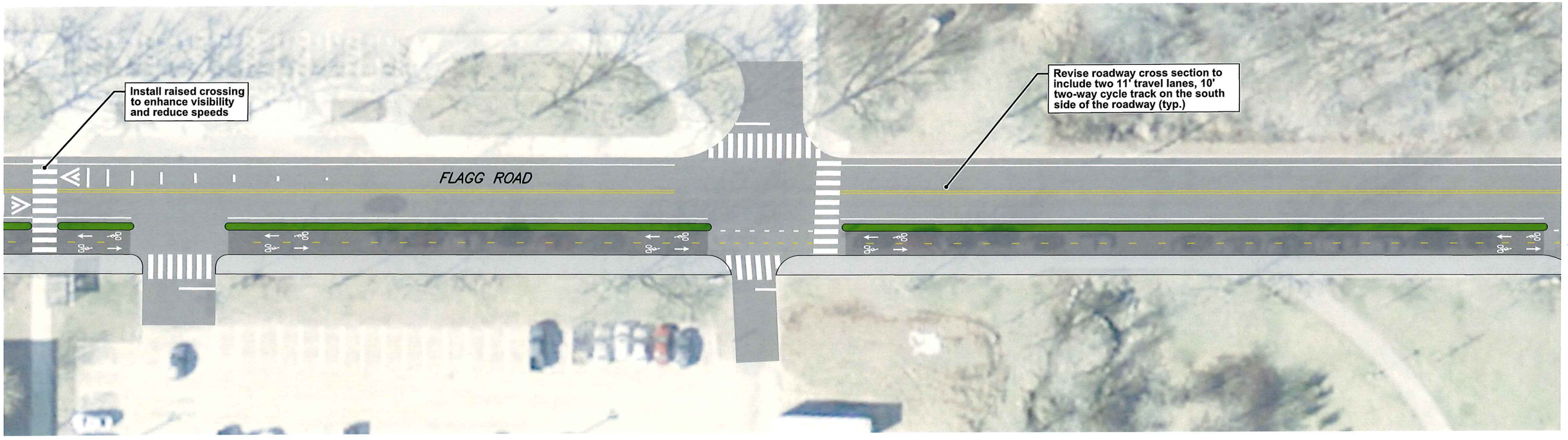


Conceptual Plan 4
URI Transportation & Parking Master Plan
Flagg Road
Kingston, RI

Figure 8d

\\vhb\proj\Providence\72803.00\cad\ts\planmisc\Complete Street Plans\FIGx - URI Flagg Rd Layout (72803)-ALT2.dwg





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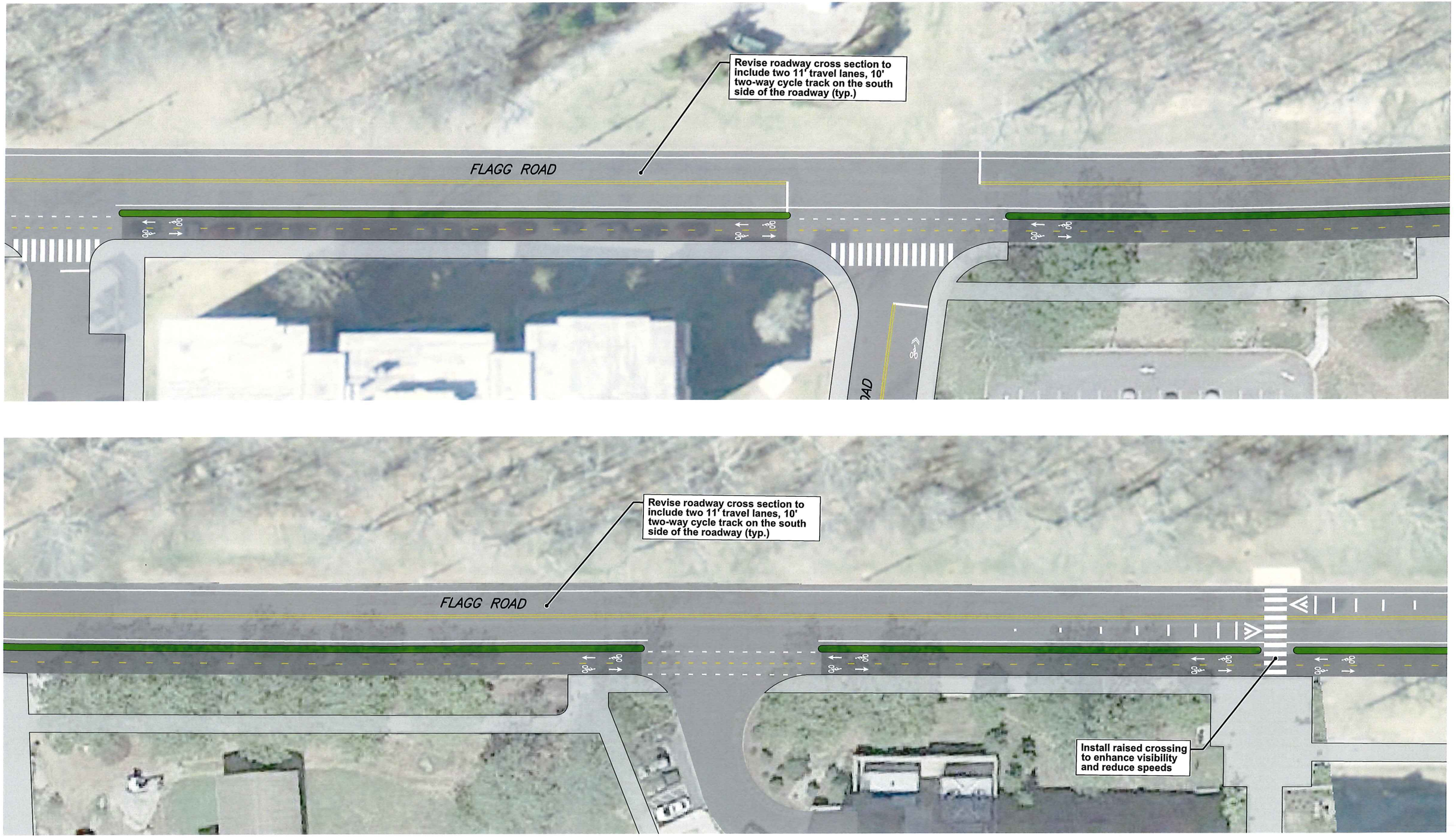
Conceptual Plan 1
URI Transportation & Parking Master Plan
Flagg Road
Kingston, RI

Figure 9a

\\vhb\proj\Providence\72803.00\cad\ts\planmisc\Complete Street Plans\FIGx - URI Flagg Rd Layout (72803)-ALT2.dwg



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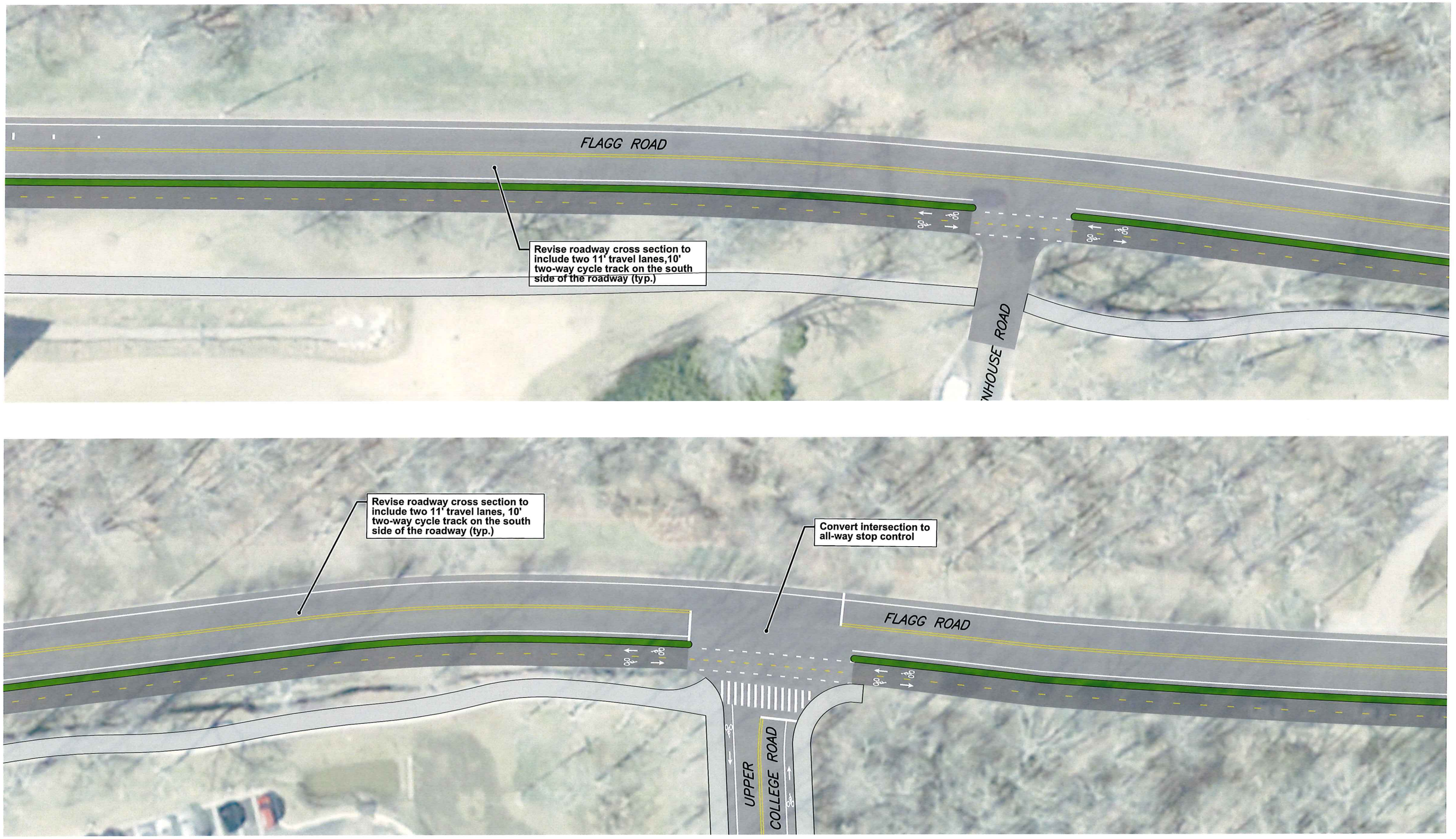
Conceptual Plan 2
URI Transportation & Parking Master Plan
Flagg Road
Kingston, RI

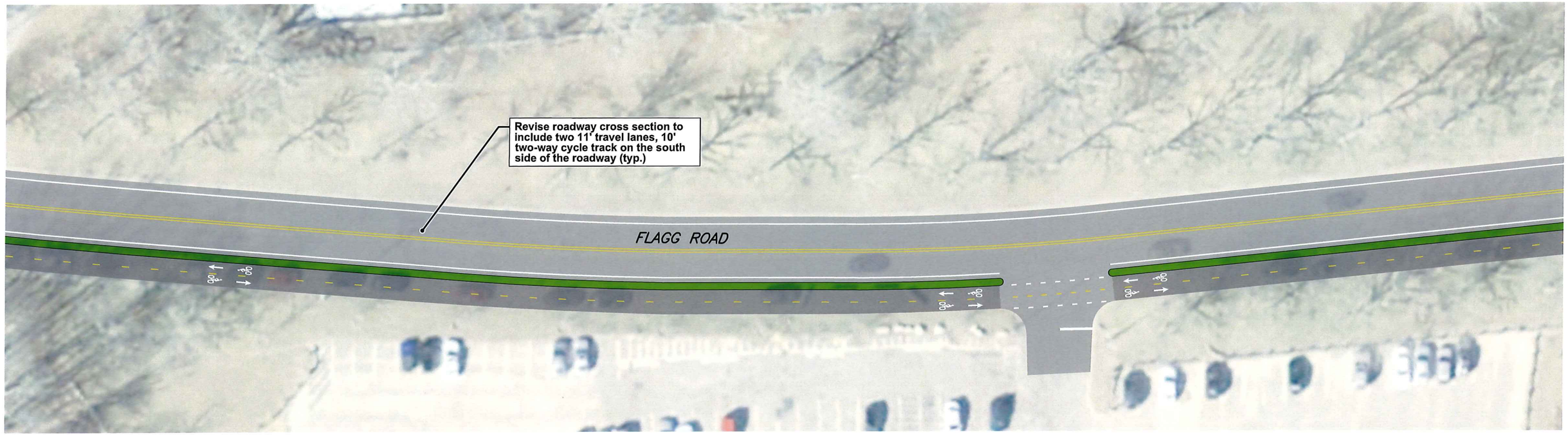
Figure 9b



Conceptual Plan 3
URI Transportation & Parking Master Plan
Flagg Road
Kingston, RI

Figure 9c

\\vhb\proj\Providence\72803.00\cad\ts\planmisc\Complete Street Plans\FIGx - URI Flagg Rd Layout (72803)-ALT2.dwg



0 20 40 Feet

vhb

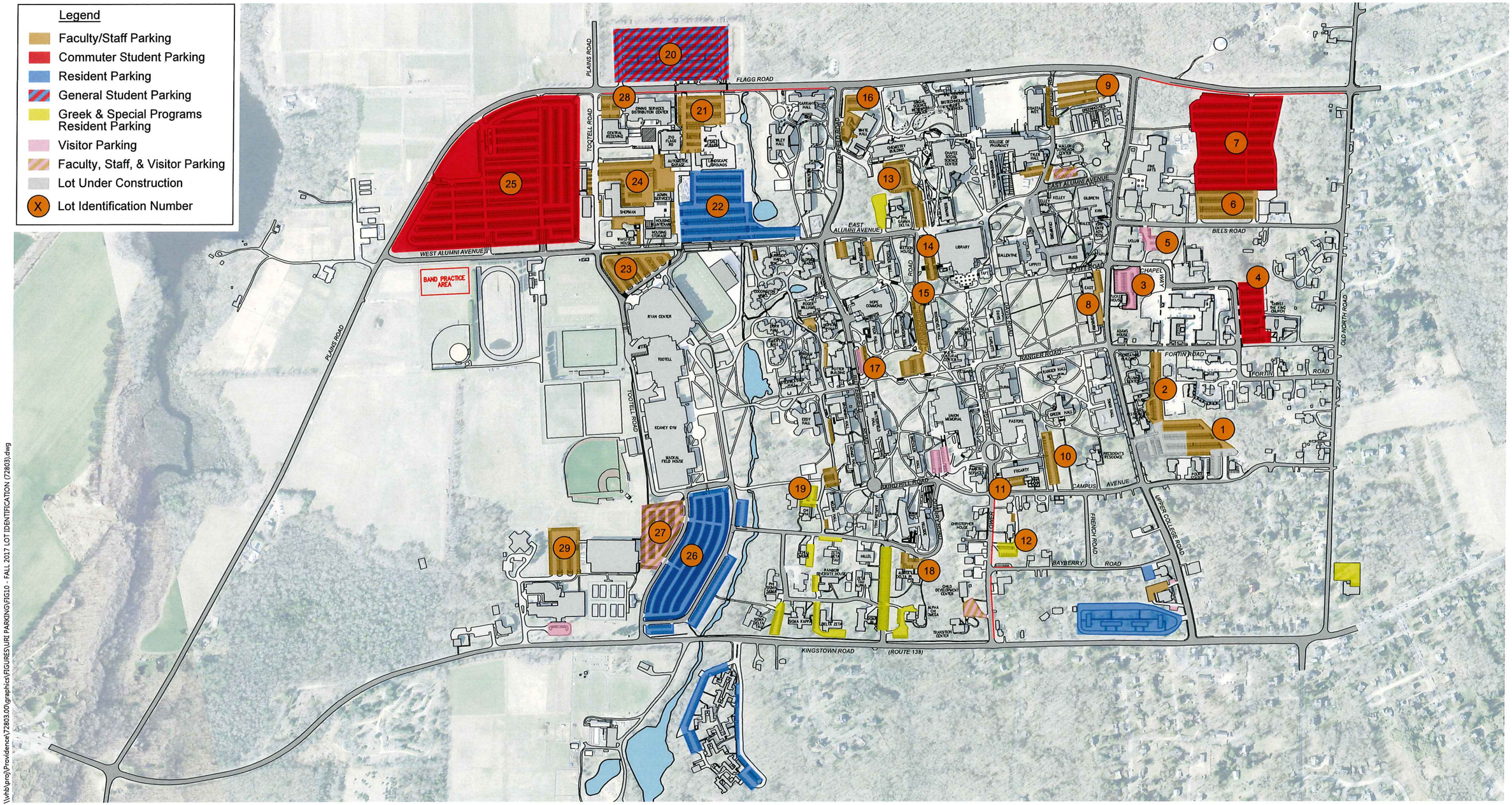
Conceptual Plan 4
URI Transportation & Parking Master Plan
Flagg Road
Kingston, RI

Figure 9d

vhb | **Figure 10**

Legend

- Faculty/Staff Parking
- Commuter Student Parking
- Resident Parking
- General Student Parking
- Greek & Special Programs Resident Parking
- Visitor Parking
- Faculty, Staff, & Visitor Parking
- Lot Under Construction
- (X) Lot Identification Number



\\vhb\proj\Providence\72803.00\graphics\FIGURES\URI PARKING\FIG10 - FALL 2017 LOT IDENTIFICATION (72803).dwg

URI Transportation and Parking Master Plan | Kingston, Rhode Island

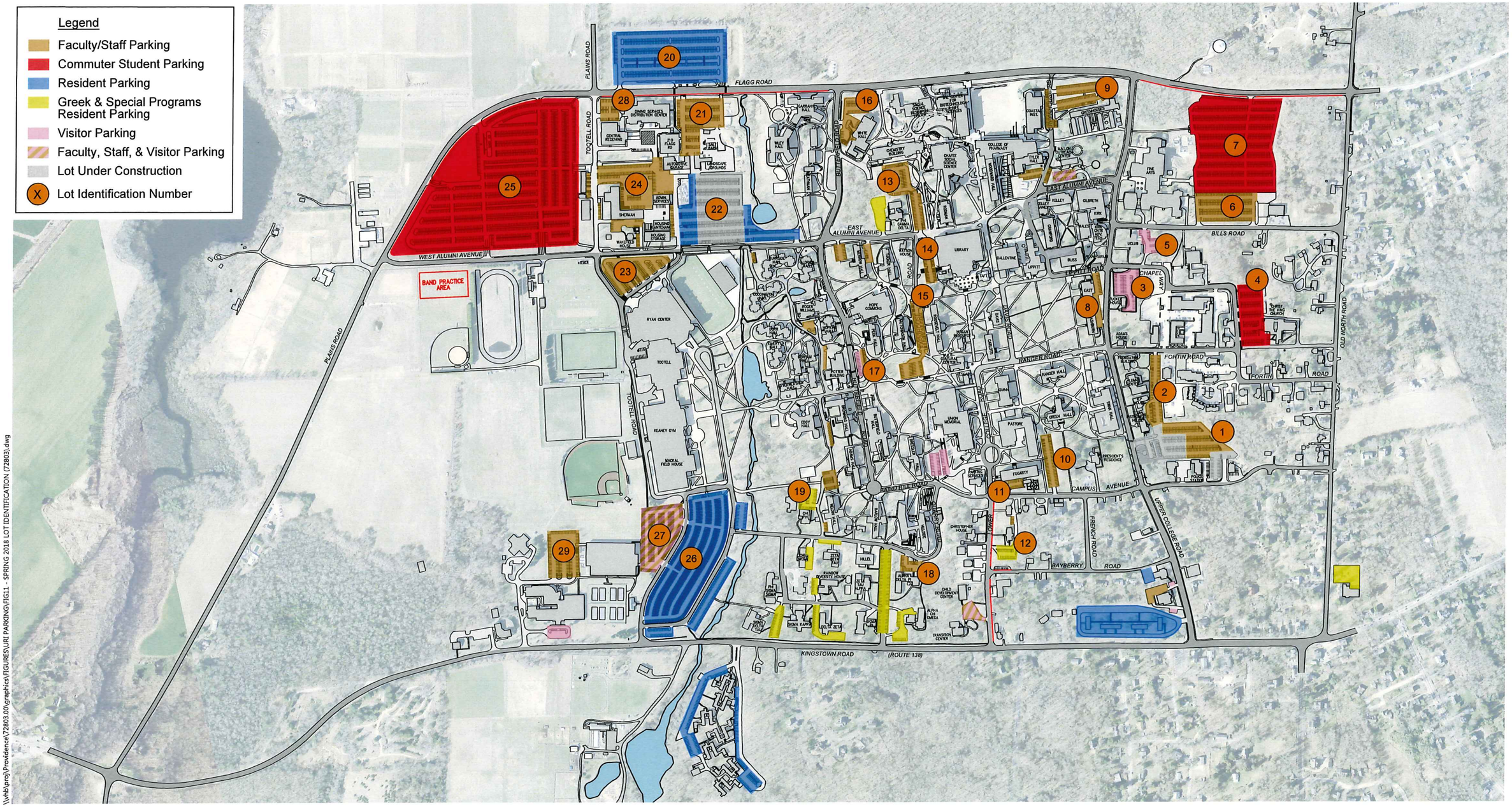
Fall 2017 Parking Lot Identification

0 300 600 Feet

vhb | **Figure 11**

Legend

- Faculty/Staff Parking
- Commuter Student Parking
- Resident Parking
- Greek & Special Programs Resident Parking
- Visitor Parking
- Faculty, Staff, & Visitor Parking
- Lot Under Construction
- (X) Lot Identification Number



\\vhb\proj\Providence\72803.00\graphics\FIGURES\URI PARKING\FIG11 - SPRING 2018 LOT IDENTIFICATION (72803).dwg

URI Transportation and Parking Master Plan | Kingston, Rhode Island

Spring 2018 Parking Lot Identification

0 300 600 Feet

Summary of Parking Improvements

Increase in Parking Spaces: +700
Decrease in Parking Spaces: -270
Decrease in Parking Area: 98,200 sf

- Consider Lot for Reduction or Accessible Parking Only
- Eliminate Parking Lot (Near-Term)
- Future Building
- Future Structured Parking
- XXX Increase in Parking Spaces
- XXX Decrease in Parking Spaces

350 Space, 1 Level Parking Deck

Area: 14,500 sf
15 Parking Spaces

Area: 6,700 sf
21 Parking Spaces

Area: 2,100 sf
10 Parking Spaces

350 Space, 1 Level Parking Deck

Area: 6,500 sf
21 Parking Spaces

Area: 3,700 sf
14 Parking Spaces

Area: 1,300 sf
7 Parking Spaces

Area: 4,000 sf
9 Parking Spaces

Area: 5,200 sf
13 Parking Spaces

Area: 3,400 sf
14 Parking Spaces

Area: 14,200 sf
36 Parking Spaces

Area: 2,000 sf
10 Parking Spaces

Area: 6,200 sf
2 Parking Spaces

Area: 9,400 sf
28 Parking Spaces

Area: 3,100 sf
8 Parking Spaces

Area: 8,700 sf
24 Parking Spaces

Area: 7,200 sf
18 Parking Spaces

FLAGG ROAD
PLAINS ROAD
TOOTELL ROAD
WEST ALUMNI AVENUE
EAST ALUMNI AVENUE
BUTTERFIELD ROAD
BILLS ROAD
CHAPEL WAY
OLD NORTH ROAD
FORTIN ROAD
RANGER ROAD
RAINS HILL ROAD
CAMPUS AVENUE
UPPER COLLEGE ROAD
FRENCH ROAD
BAYBERRY ROAD
KINGSTOWN ROAD (ROUTE 138)

\\vhb\proj\Providence\72803.00\graphics\FIGURES\URI PARKING\FIG12 - PARKING IMPROVEMENTS (72803).dwg

URI Transportation and Parking Master Plan | Kingston, Rhode Island

Long-Term Parking Supply Changes

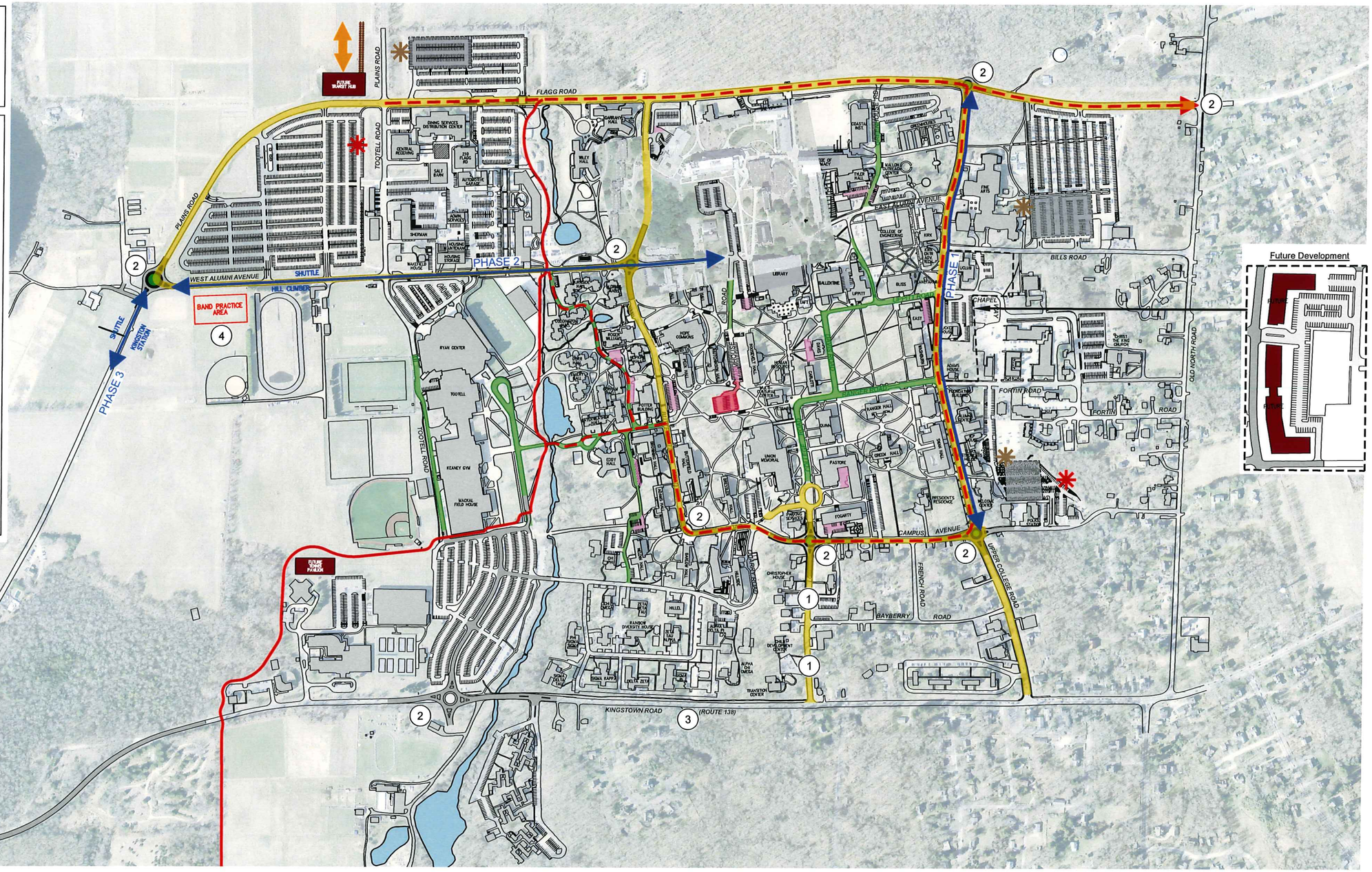
0 300 600 Feet

vhb | **Figure 13**

Other Key Recommendations:

- Provide remote parking with shuttle connection
- Split shuttle operations into a regional connector and local on-campus circulator

- Pedestrian/ Service/Shuttle/ Emergency Vehicles Only
- Complete Streets Upgrade
- Consider Lot for Reduction or Accessible Parking Only
- Eliminate Parking Lot
- Future Building
- (1) Eliminate On-Street Parking
- (2) Construct Roundabout/Gateway
- (3) Close Driveway
- (4) Identify Permanent Space for Band to Practice
- Bicycle Lanes
- Bicycle Path
- Transportation Hub
- Future Structured Parking
- Enhanced Connection to Kingston Station
- Connected Vehicle/Autonomous Vehicle Corridor (Phase 1,2,3)



\\vhbprov\Providence\72803.00\graphics\FIGURES\URI PARKING\FIG13 - DRAFT IMPROVEMENTS (72803)_v2.dwg

URI Transportation and Parking Master Plan | Kingston, Rhode Island

Summary of Recommendations

0 300 600 Feet

THE UNIVERSITY OF RHODE ISLAND

10-Year Transportation Improvement Plan

WORKING DRAFT March 2018

ITEM No.	ACTION & DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	DATE INITIATED	Status	TARGET DATE	UPDATE / REMARKS	% Complete
PHASE 1 ACTIONS (Near-term; under 2 years)																
A1	Develop a numbering system for parking lots for ease of wayfinding											Summer 2017	Closed	Fall 2017	Lots numbered. Campus map updated. Temp parking signs installed.	100
A2	Identify a more appropriate permanent space for the band to practice											Summer 2017	Closed	Fall 2017	Band relocated from Fine Arts Center parking lot in Fall 2017	100
A3	Resurface/restripe Fine Arts Lot to add spaces and improve safety											Summer 2017	Closed	Fall 2017	Complete	100
A4	Restripe Keaney Lot w/ relocated shuttle stop											Summer 2017	Closed	Fall 2017	Complete	100
A5	Restripe Boss Lot to gain spaces											Summer 2017	Closed	Fall 2017	Complete	100
A6	RINEC Transportation Accommodations- Parking in Convention Center Garage with Shuttle Service to RINEC											Summer 2017	Closed	Fall 2017	Complete	100
A7	Provide Free RIPTA Upass for URI NEC Students as pilot program											Summer 2017	Closed	Fall 2017	Complete	100
A8	Increase transit service to Providence/RINEC - Route 66/Kennedy Plaza service frequency upgrades											Summer 2017	Closed	Fall 2017	Complete	100
A9	RINEC Action - Secure limited parking in Providence and a private shuttle contract to serve RINEC											Summer 2017	Closed	Fall 2017	Complete. Parking secured in RI Convention Center (RICC). Shuttle service provider contracted Summer 2017.	100
A10	RINEC Action - Increase transit service to Providence/RINEC - New Route 62 with direct service to RINEC											Summer 2017	Closed	Fall 2017	Complete	100
A11	RINEC Action - Increase transit service to Providence/RINEC - New private shuttle from Route 66/Kennedy Plaza to RINEC											Summer 2017	Closed	Fall 2017	Complete	100
A12	RINEC Action - Increase transit service to Providence/RINEC - New private shuttle from satellite parking (RICC) to RINEC											Summer 2017	Closed	Fall 2017	Complete	100
A13	Provide letter to incoming freshmen urging them not to bring cars											Summer 2017	Closed	Fall 2017	Complete. Offer free RIPTA pass	100
A14	Identify sites for remote parking areas for commuter students and provide shuttle service											Summer 2017	Closed	Fall 2017	Complete. Candidate sites identified Schneider Electric & Wickford Junction	100
A15	Secure spaces and provide shuttle service to remote parking areas for commuter students											Summer 2017	Closed	Spring 2018	Initiate after A14. Provide spaces and shuttle service to remote parking lots	100
A16	Change use of lots to accommodate construction projects											Summer 2017	Closed	Spring 2018	Fall 2017 changes (Keaney to resident, Boss to Faculty/Staff, Briar Lane to Faculty/Staff, Tucker Lot to Visitors). Pending Spring 2018 changes (Flagg Road to Resident)	100
A17	Acquire TEP site (near Green Hall) and designate as Faculty/Staff replacement parking for a fee											Summer 2017	Open	Spring 2018	Use site as a pilot for charging faculty/staff for parking	50
A18	Revise policy for freshman resident parking											Fall 2017	Open	Fall 2019	Implement incentives (such as free Upass) to discourage freshman resident students from bringing a car to campus	10
A19	Update parking rate structure so every parking permit generates revenue (no free parking for faculty, staff, visitors)											Fall 2018	Open	Fall 2020	With A17. Charge faculty and staff for parking. Implement a rate scale based on salary and parking location. Visitors purchase pass online in advance	
A20	Improve marketing of transportation commuter options											Summer 2017	Open	Spring 2019	With A13. Provide incentives for faculty/staff who do NOT bring a car to campus (i.e. parking cash-out incentive)	25
A21	Implement technology-based parking management system												Open	Fall 2020	Deploy license plate readers (LPR) technology to enforce parking regulations	10

THE UNIVERSITY OF RHODE ISLAND

10-Year Transportation Improvement Plan

WORKING DRAFT March 2018

ITEM No.	ACTION & DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	DATE INITIATED	Status	TARGET DATE	UPDATE / REMARKS	% Complete
A22	Consolidate existing URI-run shuttle services for Disability Services under Parking & Transportation												Open	Fall 2018	All shuttle operations, except athletics, would be run through the Office of Transportation Mobility (see B19)	
A23	Pilot a Upass program for all freshmen - free transit pass; implement permanent Upass program after evaluation of pilot											Summer 2017	Closed	Fall 2018	Upass pilot program complete for RINEC students	100
A24	Initiate implementation plan to modify existing shuttle system in order to enable future parking changes												Open	Spring 2018	Organize shuttle system into a regional connector (RIPTA) and local circulator (URI controlled). Issue RFP for local circulator shuttle operator	
A25	Initiate design of 1-level parking deck structures - Fine Arts Lot & Welcome Center												Open	Fall 2019	Secure funding; initiate engineering design	
A26	Initiate design of 1-level parking deck structures - Flagg Road Lot & Boss/Keaney Lot												Open	Fall 2020	Secure funding; initiate engineering design	
A27	Obtain accurate origin-destination data for parking facility users											Fall 2017	Open	Spring 2018	Tied to permit applications. Survey questions drafted for email distribution to permit holders	25
A28	Prepare an Accessibility & Material Handling Campus Action Plan												Open	2018	Conduct a campus accessibility/material handling audit (parking, pathways, buildings)	
A29	Identify priority parking areas for carpoolers and electric vehicle charging stations												Open	2018	Consistent with draft Strategic Plan for Campus Sustainability and Climate Action	
A30	Implement campus-wide uniform pavement markings, branding, & standardized walkways											Fall 2017	Open	Fall 2019	Markings & signage to meet MUTCD requirements. Complete Street concept layout completed for Upper College Road and Flagg Road	10
A31	Advance planning phase for rail & road connectivity concepts to Kingston Station developed by RIDOT											Summer 2017	Open	Fall 2019	$43 M TIP application for URI/South County Intermodal Station/Commuter Rail Spur and Extension submitted August 2017	5
A32	Prepare implementation plan to transition URI vehicle fleet vehicles to ultra low-sulfur biodiesel fuel												Open	TBD	Consistent with draft Strategic Plan for Campus Sustainability and Climate Action	
A33	Obtain more robust data on shuttle utilization (by stop) and tracking/location information												Open	2018	Leverage GPS and smartphone connected technology (i.e. apps for smartphones); stop-by-stop utilization data is the goal	
A34	Pilot a transit-oriented Connected Vehicle/Autonomous Vehicle (CV/AV) corridor on campus											Fall 2017	Open	Fall 2019	Upper College Road identified as ideal candidate for Phase 1. Coordination initiated. URI identified as a pilot site in RIDOT's Connected/Autonomous Vehicle RFI	10
A35	Implement permit system for ADA/accessible spaces												Open	2018	Bolster ADA parking enforcement in hatched/no-parking areas adjacent to ADA spaces (enforcement, education, and permit system creation)	
A36	Implement Complete Street upgrades to Lower College Road											Summer 2017	Open	Fall 2018	Design underway	50
PHASE 2 ACTIONS (Mid-term; under 5 years)																
B1	Implement Complete Street upgrades to Upper College Road											Summer 2017	Open	TBD	$2.4 M TIP application submitted August 2017	10
B2	Implement Complete Street upgrades to Flagg Road											Summer 2017	Open	2020-2021	$900,000 approved TIP project (2020/2021)	
B3	Implement Upgrades to Plains Road (rehabilitation)											Summer 2017	Open	TBD	$1.9M TIP application submitted August 2017	10
B4	RIDOT Enhancements to Route 138											Summer 2017	Open	2020-2021	$9.5M approved TIP project (2020/2021)	10
B5	Provide rail connection to Kingston Station or suitable autonomous transit vehicle connector												Open	2020-2021	$43 M TIP application for URI/South County Intermodal Station/Commuter Rail Spur and Extension submitted August 2017	
B6	Construct parking decks at Fine Arts Lot and Welcome Center												Open	2020-2021	With A25	

10-Year Transportation Improvement Plan

ITEM No.	ACTION & DESCRIPTION	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	DATE INITIATED	Status	TARGET DATE	UPDATE / REMARKS	% Complete
B7	Construct parking decks at Flagg Road Lot and Boss/Keaney Lot												Open	2021-2022	With A26	
B8	Implement revamped shuttle system (split regional service and on-campus circulator)												Open	Fall 2018/2019	With A24	
B9	Expand Upass Program to include Sophomores												Open	Fall 2018	With A23	
B10	Expand Upass Program to include Juniors and Seniors												Open	Fall 2019/2020	With A23 and B9	
B11	Convert select parking lots in the campus core to be accessible lots or loading/service only												Open	2022	With B6 and B7. Action can be taken once the 1-level decks are constructed. Align with Campus Master Plan	
B12	Connect the South County Bike Path to campus											Fall 2017	Open	2019	$2.2 M TIP application submitted August 2017 (project selected and approved for $2.2M of Green Economy Bond funding by RIDEM under the Governor's Green Bond Initiative. Concept design in process. Summer 2018 construction with completion Spring 2019.	25
B13	Plan and build on-campus bike accommodations (on-road lanes and off-road paths)													2021	With B1 and B2	
B14	Implement carpool parking & charging stations												Open	2019-2021	Consistent with draft Strategic Plan for Campus Sustainability and Climate Action	
B15	Modify shuttle system to private on-campus circulator synchronized w/RIPTA service												Open	2019-2021	With A24. Issue RFP in early 2018	
B16	Add transit service that connects to off campus student living areas												Open	2019-2021	With A27. Initiate after obtaining accurate origin-destination data for parking facility users	
B17	Implement actions from Phase 1 Accessibility & Material Handling Campus Action Plan												Open	2019-2021	With A28. Initiate after conducting evaluation from Phase 1	
B18	Implement/install formalized bike share program, bike share operator and bike racks												Open	TBD	Initiate once substantial progress has been made on bicycle infrastructure is upgrades	
B19	Restructure Transportation & Parking Office into Transportation Mobility Office												Open	2020	With A22	
B20	Implement revised policy for Freshman parking												Open	2022	With A18	
B21	Increase transit subsidy												Open	2021	Consistent with draft Strategic Plan for Campus Sustainability and Climate Action	
PHASE 3 ACTIONS (Long-term; under 10 years)																
C1	Fleet modernization implementation - Increase number of vehicles w/higher than average fuel efficiency												Open	2025	With A32. Consistent with draft Strategic Plan for Campus Sustainability and Climate Action	
C2	Fleet minimization - Decrease fleet size												Open	2023	Consistent with draft Strategic Plan for Campus Sustainability and Climate Action	
C3	Convert remaining select parking lots in campus core to access/loading/service only												Open	2025	With B6, B7 and B11. Final phase of repurposing of campus core surface parking lots; align with Campus Master Plan	
C4	Implement a Connected Vehicle/Autonomous Vehicle (CV/AV) corridor(s) on-campus/Phase 2												Open	TBD	With A31 and A34. Primary corridor is Upper College Road (Phase 1). Phase 2 expansion on West Alumni Avenue/Flagg Road. Alternate option is Welcome Center to Route 138 to Snyder Electric (stop at train station).	