

Existing Conditions

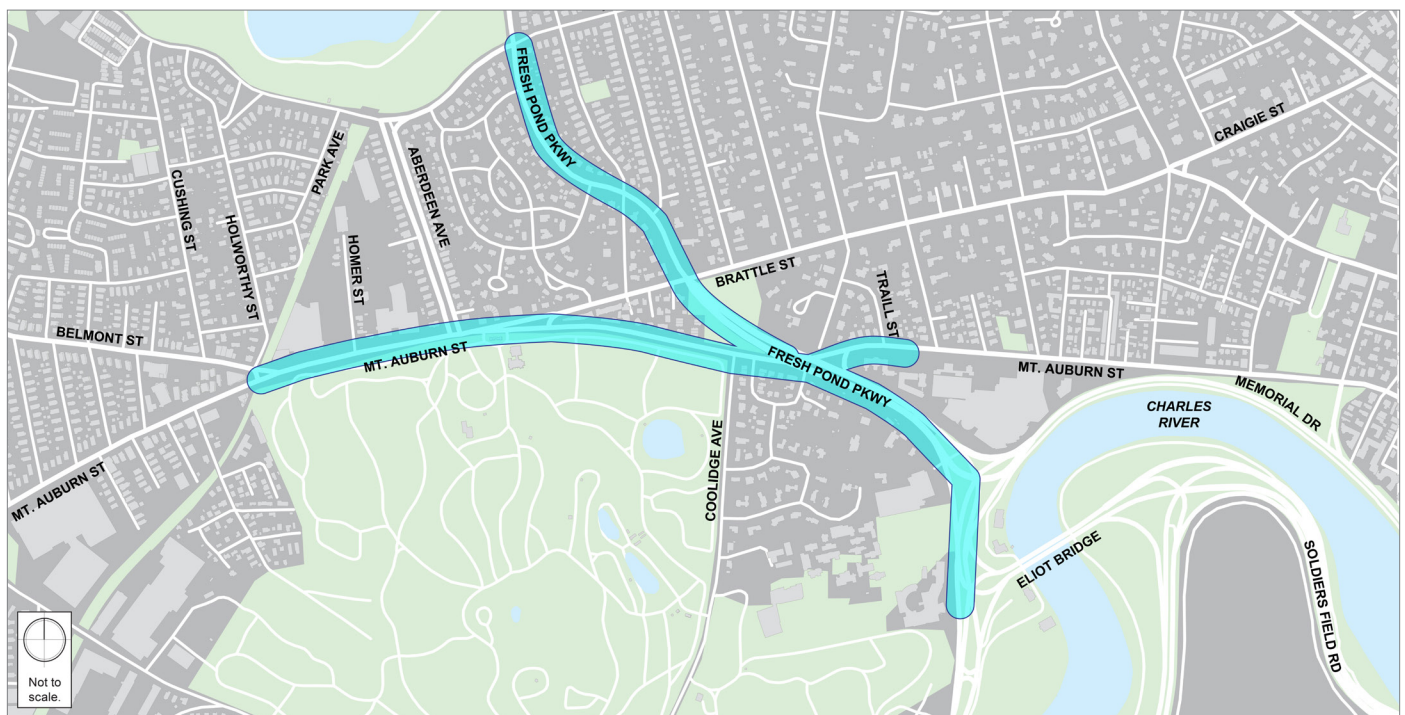
The project team's examination of existing conditions in the project area (see **Figure 4**) identified that the flow of traffic on Fresh Pond Parkway and Mount Auburn Street is very directional, based on the time of day. As people travel to work in the a.m. peak, the heaviest traffic volumes travel southbound on Fresh Pond Parkway from Huron Avenue and eastbound on Mount Auburn Street from the Cambridge City Line – they converge onto Gerrys Landing Road southbound and continue to the Eliot Bridge. As people return home in the p.m. peak, the heaviest traffic volumes travel northward along Gerrys Landing Road from the Eliot Bridge and split almost equally between turning left onto Mount Auburn Street westbound and continuing northbound on Fresh Pond Parkway.

This heavy directional flow creates significant congestion in both the a.m. and p.m. peak hours, adversely affecting the efficiency of the 71 and 73 MBTA bus routes. These bus routes face tremendous delays in the a.m. peak. Buses cannot

reach their designated stops at the scheduled time, and the congestion causes grouping of the buses. The grouping can exacerbate the already significant overcrowding on both buses, and many riders report that buses full to capacity are passing them by on a regular basis.

Another contributor to congestion is the geometry of the main intersection at Mount Auburn Street and Fresh Pond Parkway. The skew of the intersection and width of some of its approaches have required the stop bars on opposing sides to be placed far apart. On Mount Auburn Street, the opposing stop bars are 365 feet apart. On Fresh Pond Parkway, the opposing stop bars are 380 feet apart. This creates a longer-than-average clearance time for cars traveling through, as is evidenced by a common experience reported by pedestrians: seeing the walk signal come on while cars are still clearing the intersection.

Figure 4. Project Limits



Pedestrians and cyclists tend to race across the Fresh Pond Parkway/Gerrys Landing Road/Mount Auburn Street intersection's extremely long crossings as if their lives depended on it. Pedestrians need up to four minutes and four separate phases to cross Gerrys Landing Road eastbound, making the street a major barrier for seniors and those with disabilities. Cyclists have no guidance through the intersection. Thus, it is as difficult for them to determine where vehicles will be as it is for drivers to know where cyclists will be within the intersection.

While the Fresh Pond Parkway/Mount Auburn Street intersection is the keystone of this project, and improving its operations and safety will resolve many issues in the surrounding neighborhoods, the Brattle Street/Mount Auburn Street intersection was also found to have many safety issues for pedestrians, cyclists, and motorists, making its redesign a second priority for the safety of commuters. Mount Auburn Street eastbound cyclists face a very hazardous left turn, and pedestrians are asked to use a circuitous route to get across the intersection.

While the intersections of Gerrys Landing Road with Memorial Drive, the Eliot Bridge, and Greenough Boulevard are very efficient for vehicle traffic, they currently make walking, bicycling, and other forms of active transportation dangerous and uncomfortable – a condition that is incongruous with their school zone setting and park access. At the Gerrys Landing Road and Memorial Drive intersection, pedestrians and bicyclists must follow a somewhat complex network of crosswalks and paths that connect Gerrys Landing Road and/or Memorial Drive to several medians and the Charles River, and this must be done without any wayfinding guidance. At the Gerrys Landing Road/Eliot Bridge/Greenough Boulevard intersection, only the Greenough Boulevard approach provides crosswalks, making it almost impossible to cross Gerrys Landing Road and/or the Eliot Bridge if a pedestrian or bicyclist is located on the north side of Eliot Bridge or the east side of Gerrys Landing Road.

To open the process and establish common ground for the community comments that followed, the following details about existing conditions in the project area were collected.

Pedestrians and ADA Conditions

The general experience of walking down Mount Auburn Street, Fresh Pond Parkway, or Gerrys Landing Road is significantly affected either by heavy traffic volumes or by speeding. Fresh Pond Parkway and Gerrys Landing Road, where traffic volumes are highest, benefit from a row of street trees on the north side, which helps create a buffer from traffic. However, this is not present on the south side, making the experience not unlike walking along a highway. Mount Auburn Street traffic moves much slower, is of less volume, and possesses a small border of trees that helps to create a physical buffer for people (see **Figure 5**). Many of the sidewalks along Mount Auburn Street and Gerrys Landing Road are also in need of maintenance, and upgrades to ADA ramps are needed throughout the project area (see **Figure 6**).

One of the more pressing problems in the corridor was the need for improved pedestrian crossings, in particular those

at the Fresh Pond Parkway/Gerrys Landing Road/Mount Auburn Street intersection, as well as the crossings to and from the Charles River across Gerrys Landing Road. A map of pedestrian delay in the project area (**Figure 7**) indicates the signalization aspect of the problem, but the crossing distances in both examples are also very long, and the pedestrian phases shorter than the required minimums.

For the pedestrian walking westbound on Mount Auburn Street from the northeast corner, the crossing of Fresh Pond Parkway currently involves four phases, taking four minutes or more to reach the southwest corner. To avoid this longer crossing, pedestrians often ignore the lack of a crosswalk on the northern side and walk straight across the parkway to the northwest corner. This northwest corner has no sidewalk to receive them; however, a path is worn in the vegetation on the median, indicating this is a common occurrence.

For people walking eastbound on Mount Auburn Street, the crossing involves three phases, and a minute and a half walk or more; but the skew of the intersection involves walking a significant distance alongside heavy traffic from both streets to reach the entrance to the crosswalk on the southwest corner. Many people choose to run across the intersection for fear of getting hit by vehicles moving at high speeds.

Neighborhood residents and parents with children at the Shady Hill School and Buckingham Browne & Nichols School (BB&N) complain of these and other crossings along Fresh Pond Parkway, at Mount Auburn Street and Coolidge Avenue – where a fatal crash occurred in Spring 2014. DCR is employing a crossing guard at that location when the schools open and close to students for the day, and there is a community desire to add a second crossing guard at Fresh Pond Parkway and Brattle Street, which accesses the neighborhoods where a few dozen students live.

Residents in the Larchwood neighborhood have different complaints. There, peak hour drivers try to avoid congested intersections by cutting down Larchwood Drive, Fresh Pond Lane, and Meadow Way. Walking in the neighborhood – where roadways are treated as shared between all modes due to an intentional lack of sidewalks – can feel treacherous at these times. Several people have purchased their own “Slow, Children at Play” signs to display on their front lawns, as there are many children in the neighborhood. These residents, as well as neighbors in Huron Village and Coolidge Hill, express concern that this phenomenon may be increasing with the advent of GPS systems which route vehicles down previously quiet streets to avoid bottlenecks. A similar cut-through traffic problem is reported by residents of Strawberry Hill on Cushing Street.



Neighborhood residents and parents with children at the Shady Hill School and Buckingham Browne & Nichols School (BB&N) have advocated for safety improvements along the corridor.

Figure 5. Curb Use and Edge Character

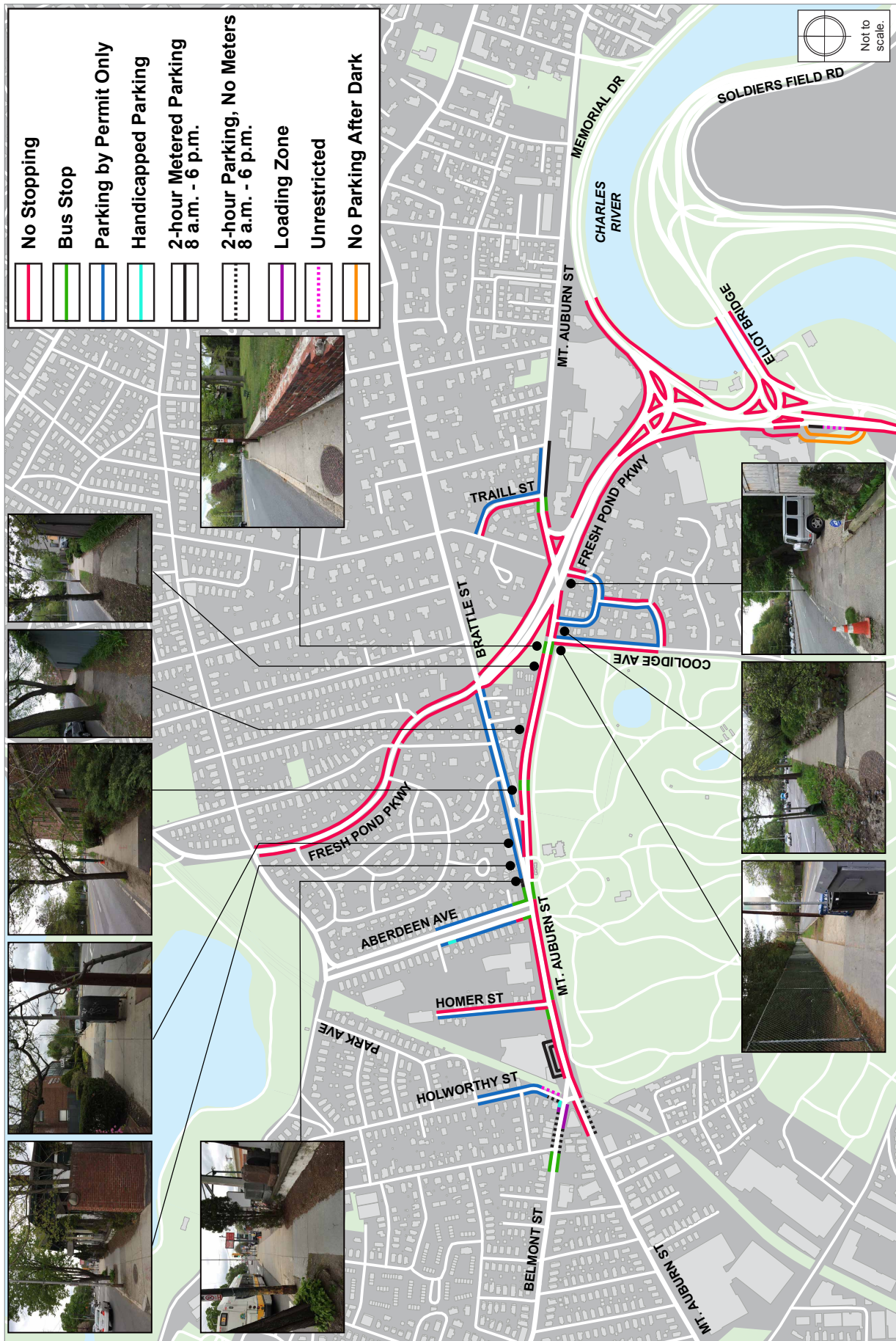


Figure 6. Pedestrian and ADA Conditions

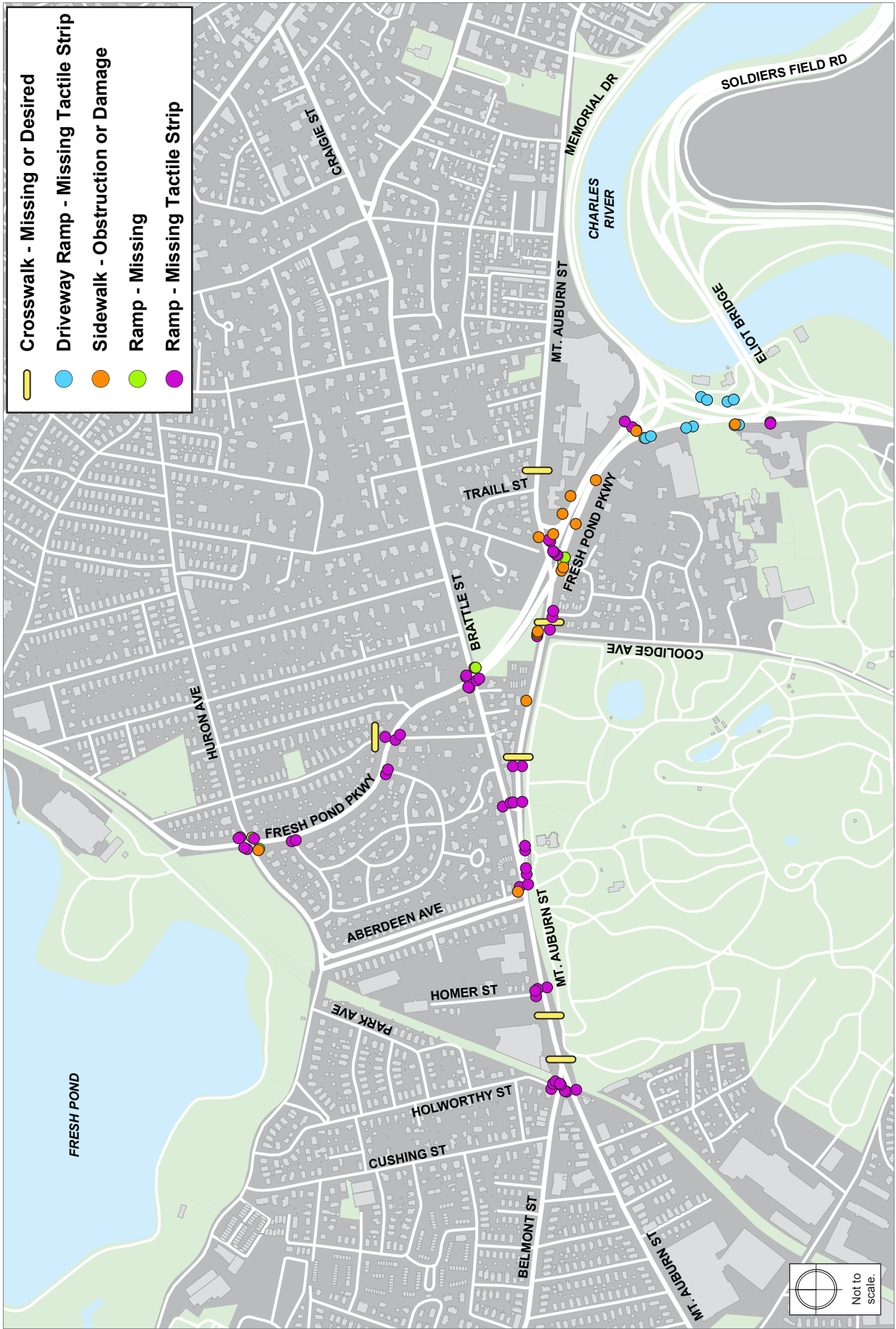
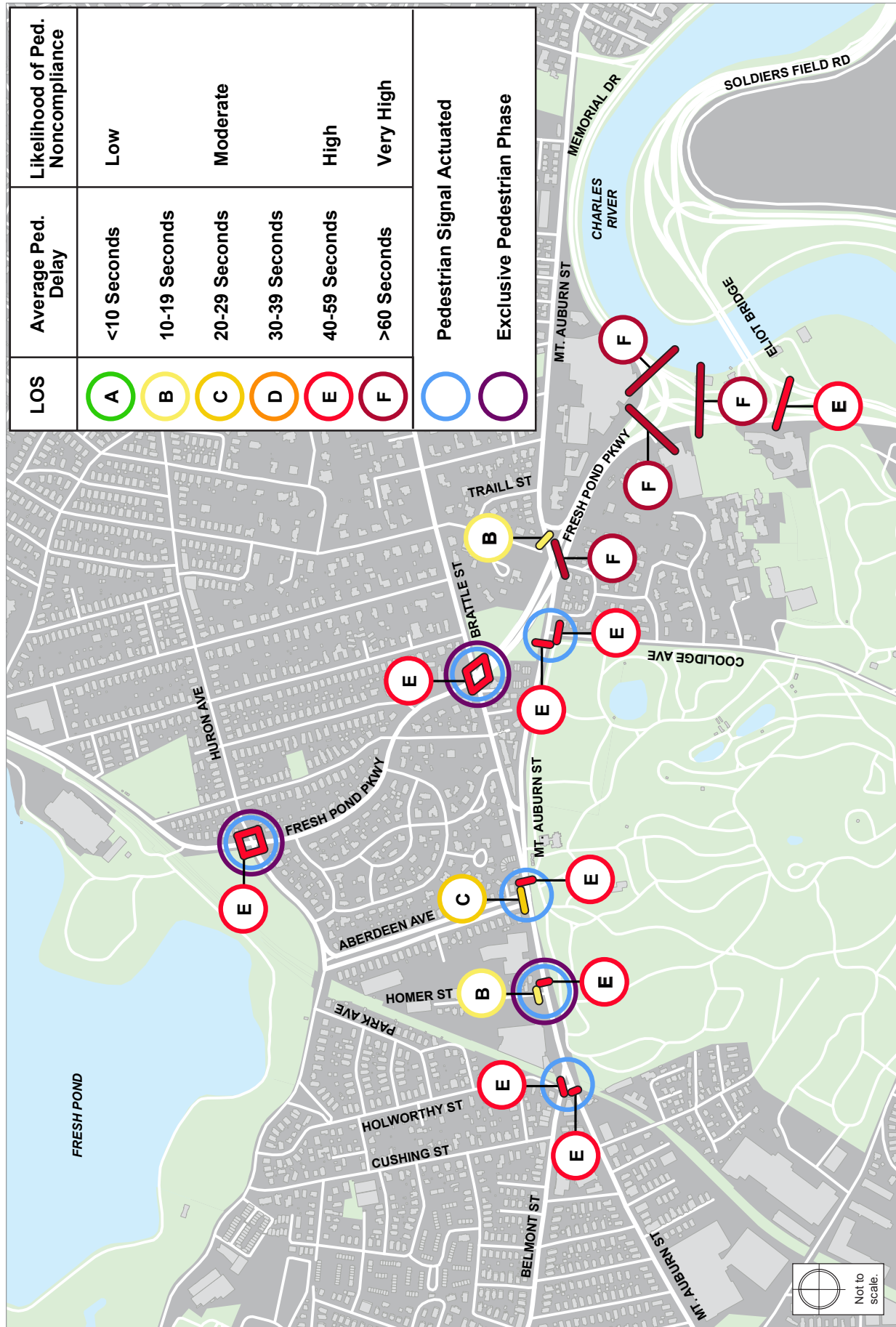


Figure 7. Average Pedestrian Delay Times



Bicycle Conditions

Mount Auburn Street and Fresh Pond Parkway both represent gaps in Cambridge's current bike network. Adding low-stress bicycle accommodations to either or both would have significant impact on local bike ridership, contributing to a healthier community more able to access their local parks. Despite a relatively hostile environment for people on bikes, many people do pedal through the area, indicating considerable demand for safe bicycle infrastructure.

Observations indicate a wide diversity of cyclists are using or crossing these roadways, from middle school children heading to and from the Shady Hill and BB&N Schools, to commuters headed to work along Mount Auburn Street, to recreational riders headed to the Charles River along Fresh Pond Parkway. On either side of the project area along Mount Auburn Street, there are small cafés that typically have multiple bikes parked on every available pole or parking meter, indicating that there may be even more latent demand for the route. For all these users, riding in the project area can be stressful.

On Mount Auburn Street through the project area, there are no bike lanes, sharrows, or other facilities; motor vehicle traffic lanes are not wide enough for passing and have no adjacent parking. These conditions may contribute to vehicle travel speeds that are relatively high compared to other parts of Cambridge, which increases the potential risk and severity of injury for cyclists. In some areas, there is no pavement marking guidance indicating the travel lanes of any kind, such as the westbound approach to Fresh Pond Parkway, making motorist behavior particularly unpredictable.

Crossing Fresh Pond Parkway on Mount Auburn Street is a harrowing experience for the majority of cyclists, and each seems to have a slightly different strategy for getting safely across. Traveling westbound, the cyclists' tendency is to take a position in the middle of the lane and race straight across the intersection at top speed, endeavoring to stay

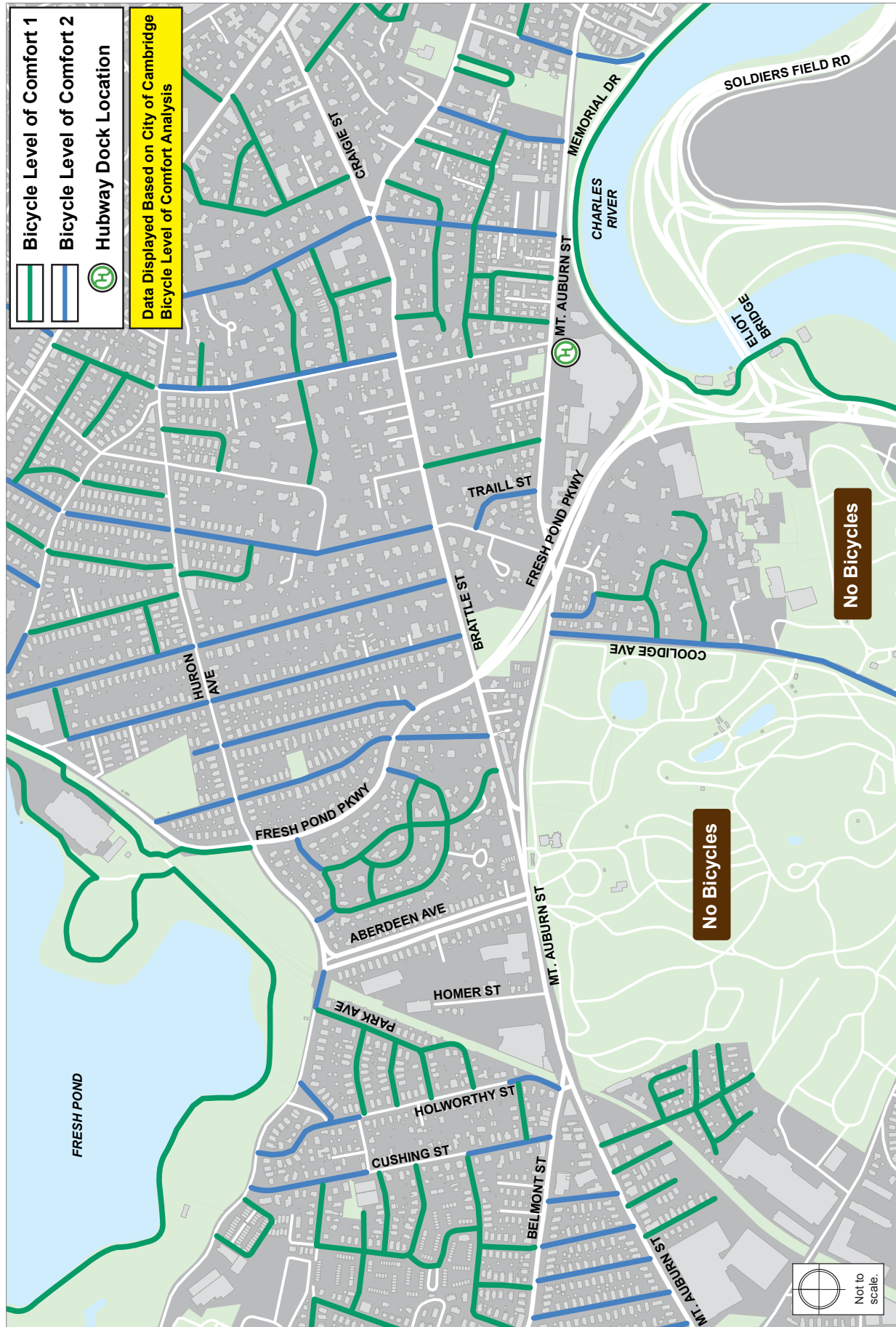
ahead of cars that may be turning right, left, or trying to pass going straight. Traveling eastbound, some cyclists employ a similar speedy tactic. Others follow the crosswalks with pedestrians, less confident as the extreme skew of the intersection puts cross traffic over their left shoulder. Only very brave cyclists ride directly on Fresh Pond Parkway. Many more take advantage of narrow sidewalks and paths on either side. That this is the more common option speaks to the high stress level of the street, because riding on the paths involves navigating potholes and uneven patching, particularly on the southbound side.



The skew of the intersection of Fresh Pond Parkway at Mount Auburn, and the wide pavement creates dangerous conditions for both pedestrians and cyclists.

In many locations, there seems to be more asphalt than existing motor vehicle traffic demands, indicating a number of potential opportunities for short- and long-term bicycle improvements. The only streets in the study area where most cyclists would currently feel comfortable in the study area are shown in **Figure 8**.

Figure 8. Bicycle Level of Comfort



Transit Conditions

Mount Auburn Street serves a critical link for MBTA bus routes 71 and 73, connecting riders from Watertown Square and Waverley Square to Harvard Square and the Red Line, which provides access to the Downtown Boston and Kendall Square, both major job centers. With 12,000 weekday daily riders, transit ridership on these two routes represents as much as one-half of people traveling on the corridor, many of whom also walk or bike to access the service. The primary motivation for this study is to improve the service for these riders.

Anecdotally, riders of the 71 and 73 buses report delays due to traffic queuing during the morning rush hour on Mount Auburn Street eastbound from Fresh Pond Parkway all the way back to Belmont Street at the edge of Watertown. Delay measured in the a.m. and p.m. peak using data from the Route 73 bus is depicted in **Figures 9 and 10**, respectively.

The MBTA's Key Bus Route Improvement Program, which focused on improving transit service along the region's busiest routes, recommended a number of changes to the 71 and 73 routes. The recommendations included consolidating and relocating bus stops to improve running times and reduce delay. The recommendations also included station access and amenity improvements. Other transit preferential treatments, such as transit signal priority and queue jump lanes, were evaluated but not recommended for the corridor at the time.

The majority of passengers on the 71 and 73 routes board and alight at the terminal stations: Watertown Square, Waverley Square, and the Harvard Square bus tunnel. However, several intermediate stations along Mount Auburn Street also accommodate hundreds of boardings and alightings per day, including stops at Homer Avenue and Mount Auburn Hospital. The 72 bus also provides service along Aberdeen Avenue and terminates/originates at Mount Auburn Street. Under the current design, buses traveling south on Aberdeen Avenue make a U-turn at the intersection with Mount Auburn Street to begin northbound service on Aberdeen Avenue. See maps of boardings and alightings for the Route 72 and 73 buses in **Figures 11 and 12**. Automated Passenger Count data was not available for Route 71.

In addition to MBTA bus service, many employee shuttles services run through this area. There is an employee shuttle service for Mount Auburn Hospital to an employee parking lot on Grove Street in Watertown on the west side of the Mount Auburn Cemetery. The shuttle also provides service to Tufts Health Plan, located west of the study area on Mount Auburn Street. According to schedules from the Mount Auburn Hospital, shuttles run every 15 minutes at rush hour, every 30 minutes off-peak, and are operated by ML Transit Systems, Inc.

Figure 9. Average a.m. Peak Hour Bus Delay

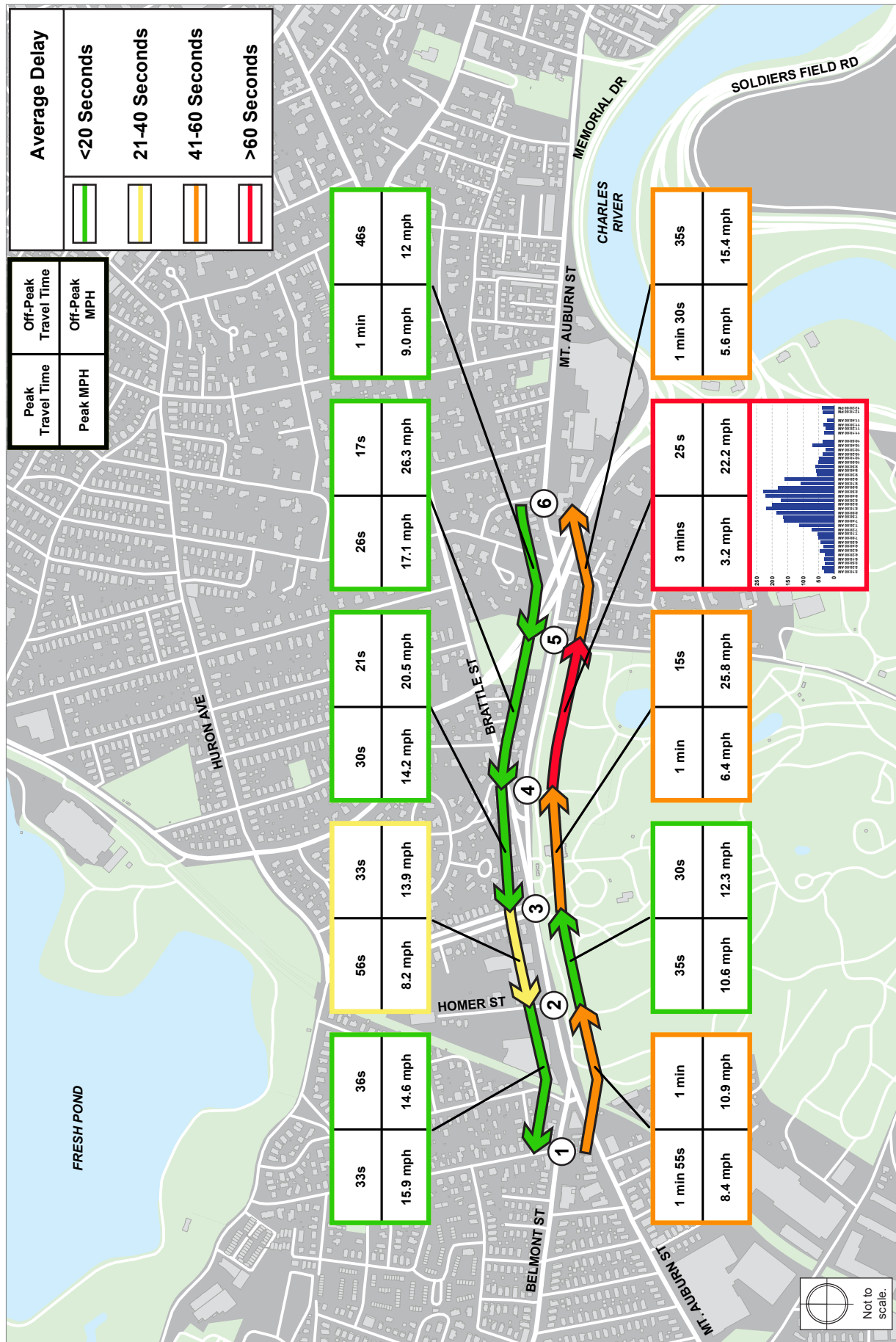


Figure 10. Average p.m. Peak Hour Bus Delay

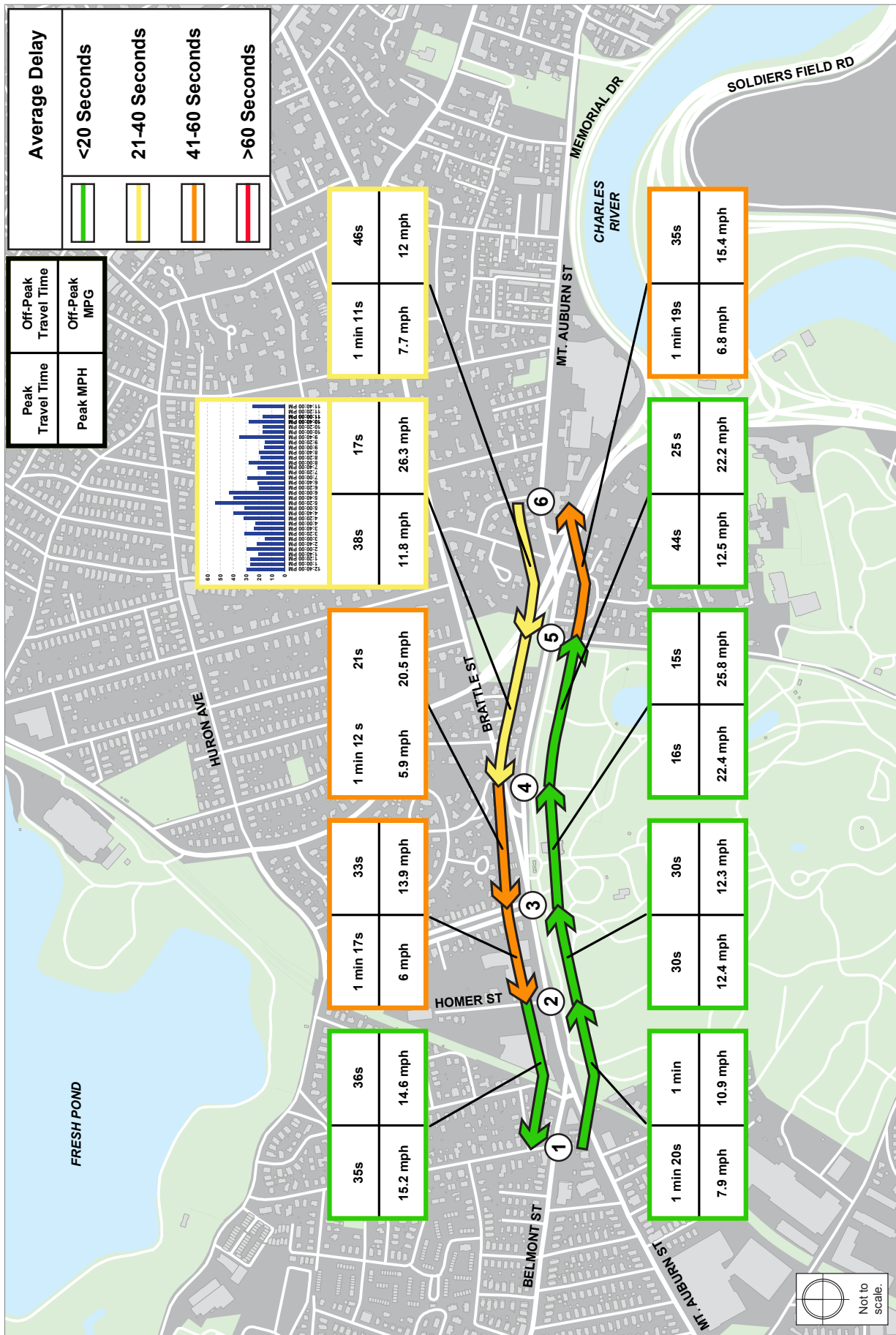


Figure 11. Daily Bus Passenger Boardings by Stop

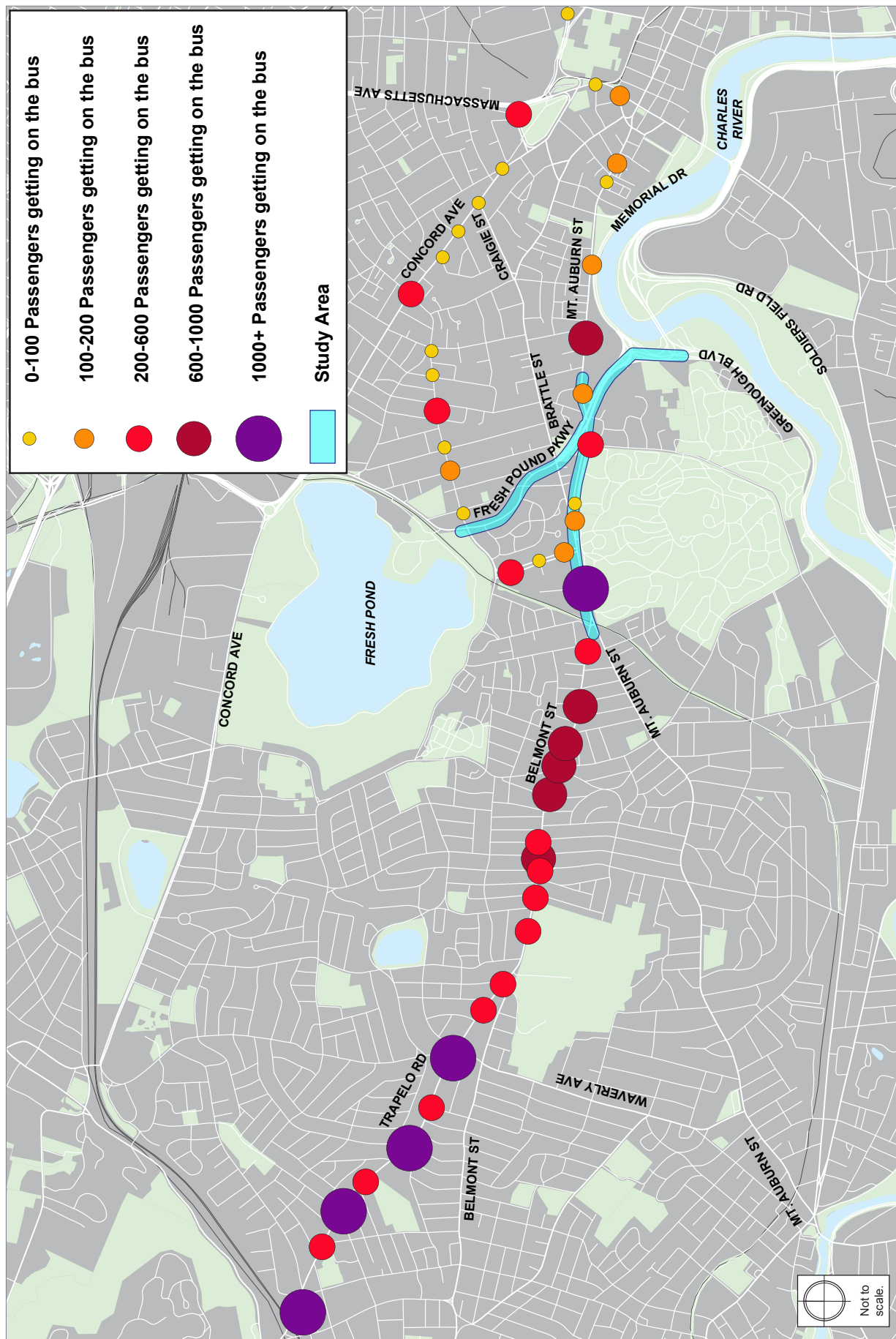
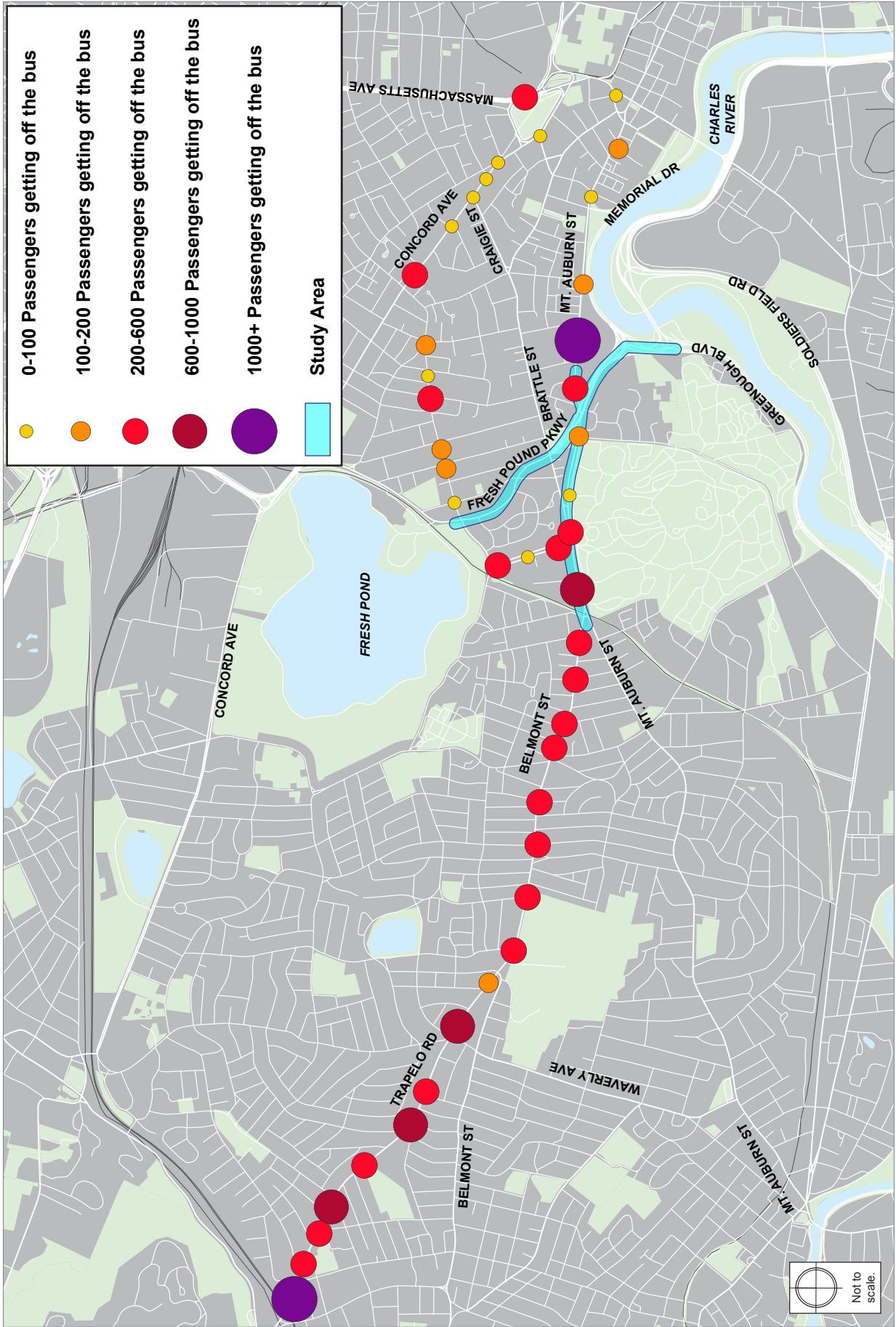


Figure 12. Daily Bus Passenger Alightings by Stop



Vehicle Conditions

One of the conditions that sparked the creation and funding of this study was the significant eastbound traffic delay in the morning peak period. Traffic queues based on counts taken for this study help explain the public perception that Mount Auburn Street eastbound morning traffic backs up from Fresh Pond Parkway to Belmont Street. Field-observed queues show backups on Mount Auburn Street eastbound just a few hundred feet short of that distance.

Analysis of the corridor indicated that the main contributor to the tie ups is the inefficiency of its busiest intersection at Mount Auburn Street and Fresh Pond Parkway. The extreme skew of this intersection and wide Rights of Way (ROWS) on both streets' approaches create a significant distance between stop bars, in excess of 360 feet in both directions. This distance increases clearance times and puts downward pressure on the pedestrian walk signal times. It is a common experience by pedestrians crossing Mount Auburn Street on a walk signal to still have cars crossing the crosswalk, or to feel hurried by the signal. The proximity of the Coolidge Avenue signalized (coordinated) intersection also limits the amount of storage space at the main signal and often results in a “starved” condition for Mount Auburn Street eastbound vehicles at Fresh Pond Parkway. Using data from the RSA, **Figure 13** shows Crash Severity at separate locations while **Figure 14** shows Crash Type Comparison.



Wide lanes on the southbound approach of Fresh Pond Parkway at Mount Auburn Street create unsafe conditions for drivers as they enter the intersection.

This intersection, as well as Fresh Pond Parkway at Huron Avenue, and Mount Auburn Street at Brattle Street, is a high crash cluster location. The Road Safety Audit (RSA) - Fresh Pond Parkway and Mount Auburn Street (Three Locations) performed by an independent team at Howard Stein Hudson on August 11, 2016 can be found at the following link: <http://www.massdot.state.ma.us/Portals/8/docs/traffic/SafetyAudit/District6/CambridgeMtAuburnStFreshPondPkwyRSA.pdf>.

The RSA for Mount Auburn Street at Fresh Pond Parkway identified the skewed geometry of the intersection, long distances between stop lines and crosswalks, insufficient signage to clarify which movements are prohibited through the intersection (i.e., Fresh Pond Parkway southbound to Mount Auburn Street eastbound is a prohibited movement), and Coolidge Hill Road – which provides an outlet onto the middle of the intersection – as being some of the reasons for the high number of crashes.



Many vehicles traveling the corridor towards Storrow Drive maintain high speeds through these residential neighborhoods.

At Fresh Pond Parkway and Huron Avenue, the RSA identified low visibility of traffic signals and a potentially confusing “Oncoming Vehicles May Have Extended Green” sign, and recommended overhead signals where possible and a flashing yellow left-turn arrow to replace the signage. A two-way bicycle path also enters the intersection from Fresh Pond Parkway, but it does not indicate to cyclists how to travel

through the intersections. Lighting was reported to be low, and many crashes happened after dark. An all-walk signal also negatively impacts traffic here; however, neighbors here are most concerned about the pedestrian connection to Fresh Pond itself and prefer the exclusive phasing. Some of the intersection approaches have wide lanes that could potentially be narrowed to calm traffic.

The RSA for Mount Auburn Street at Brattle Street (also including Aberdeen Street) identified the long distance between stop bars, the presence of a busy gas station at the corner of Aberdeen Street, and wide turning radii as potential contributors to crashes. The merge of Brattle Street westbound and Mount Auburn Street westbound was also noted as problematic, potentially causing several rear-end and side-swipe crashes. The Aberdeen Street traffic signal's proximity to the merge also means that motorists looking over their shoulder to merge may not notice a red signal or stopped traffic. The RSA recommended eliminating the merge, moving stop lines close together, and tightening turning radii where possible.

In addition to these high-crash locations, many neighborhood residents complained of heavy traffic volumes and speeding along Fresh Pond Parkway and Gerrys Landing Road in both directions. These concerns are magnified by frequent crashes as vehicles speeding toward Storrow Drive navigate the meandering curves of Fresh Pond Parkway, which has two travel lanes in each direction north of Mount Auburn Street and carries just over 40,000 vehicles per day. South of Brattle Street, the roadway gradually widens to three travel lanes in

each direction as it becomes Gerrys Landing Road, which carries over 48,000 vehicles per day (see **Figure 15**).

The two, large three-legged intersections that connect Gerrys Landing Road to Memorial Drive, the Eliot Bridge, and Greenough Boulevard were also noted in community comments to be confusing for drivers. The intersections are efficient for large volumes of traffic; however, they don't seem to provide the most efficient, safe pedestrian connections to the BB&N School located to the west of these intersections. Even though the Gerrys Landing Road at Memorial Drive intersection provides pedestrian crossings across all its legs, the Gerrys Landing Road at Eliot Bridge intersection provides crossings only across its southern legs. Furthermore, school buses currently drop off and pick up right from Gerrys Landing Road southbound. Finally, as Gerrys Landing Road provides three wide lanes, there is considerable local concern about speeding and driver disregard of pedestrian crossing phases.

The character of Mount Auburn Street is perceived as more in tune with the character of the neighborhood than Fresh Pond Parkway is; however, it was noted in the RSA and in community comments that there are experiential problems. The street has two travel lanes in each direction and, depending on where counts are taken, it carries between 22,800–27,800 vehicles per day. Full Traffic Counts can be found in **Appendix A**. In addition to the traffic delays and crash locations noted previously, people report unclear markings and signage at several locations.

Figure 13. Crash Severity

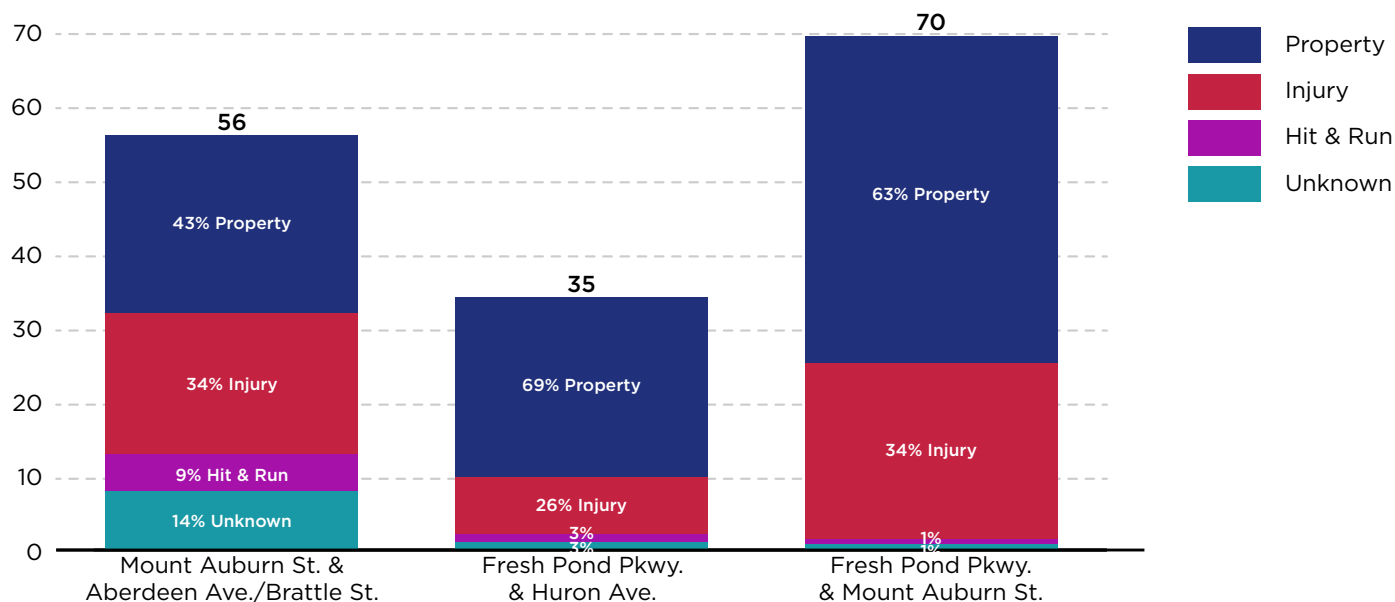


Figure 14. Crash Type Comparison

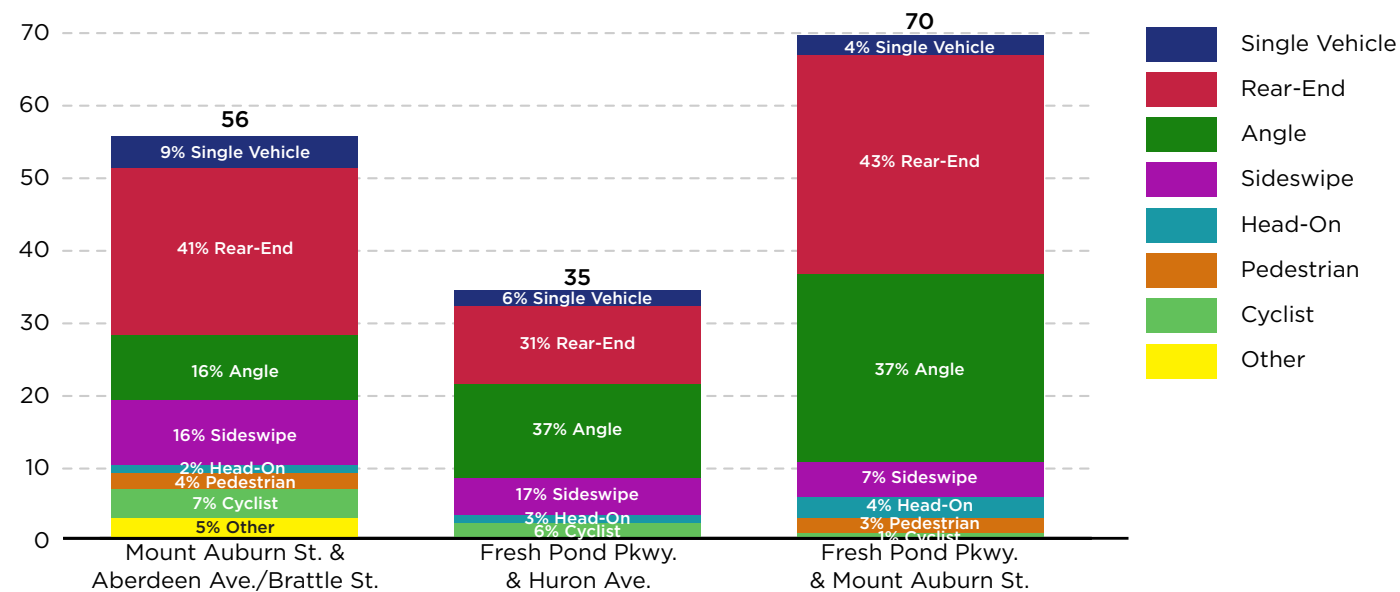
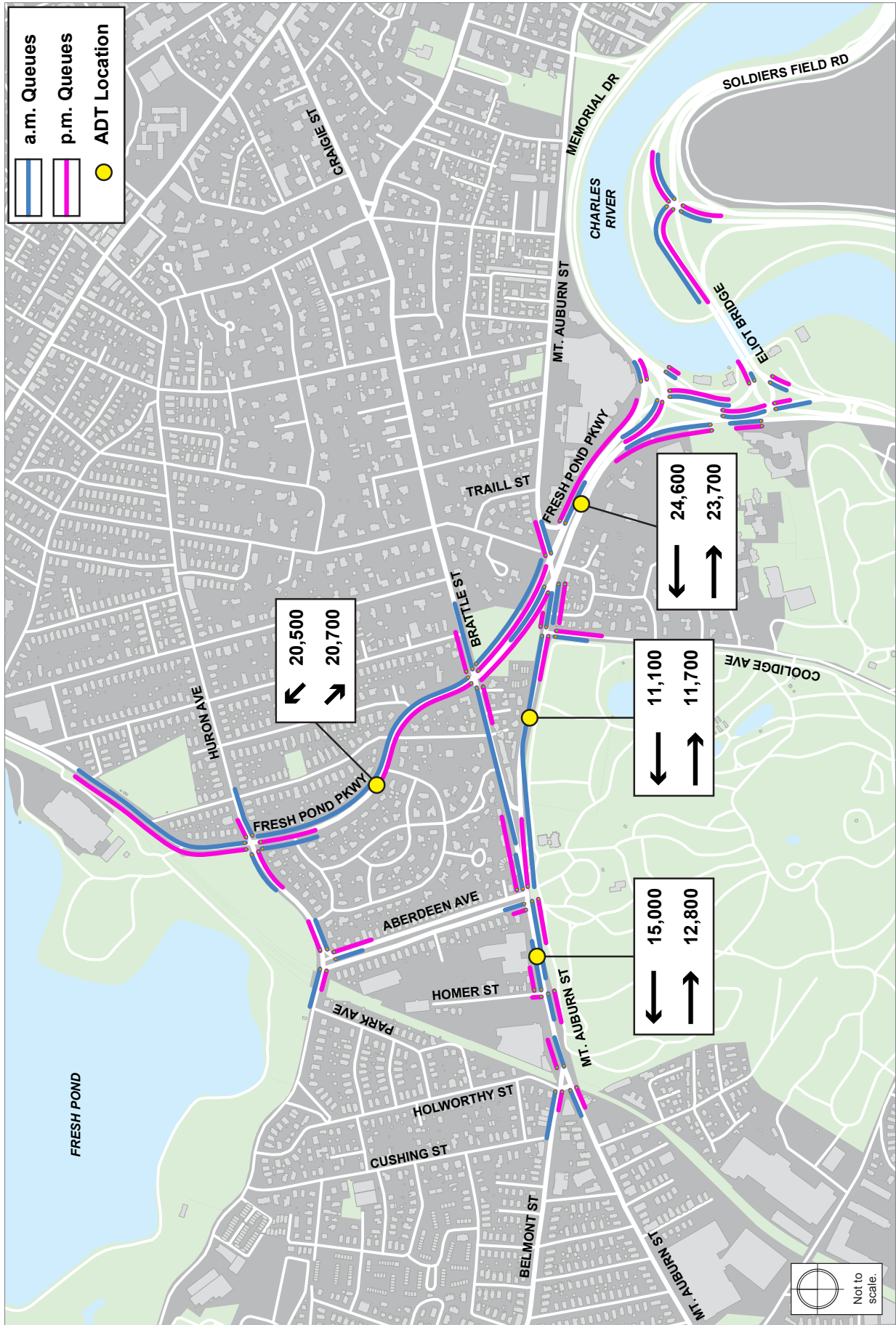


Figure 15. Average Daily Traffic (ADT) Volumes and a.m. and p.m. Peak Hour Traffic Queues



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