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Work Samples

1. Périphérique of Paris: An Urban Study of Challenges and Opportunities
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7. Beyond Infrastructure: From Surge Barriers to Linear Parks

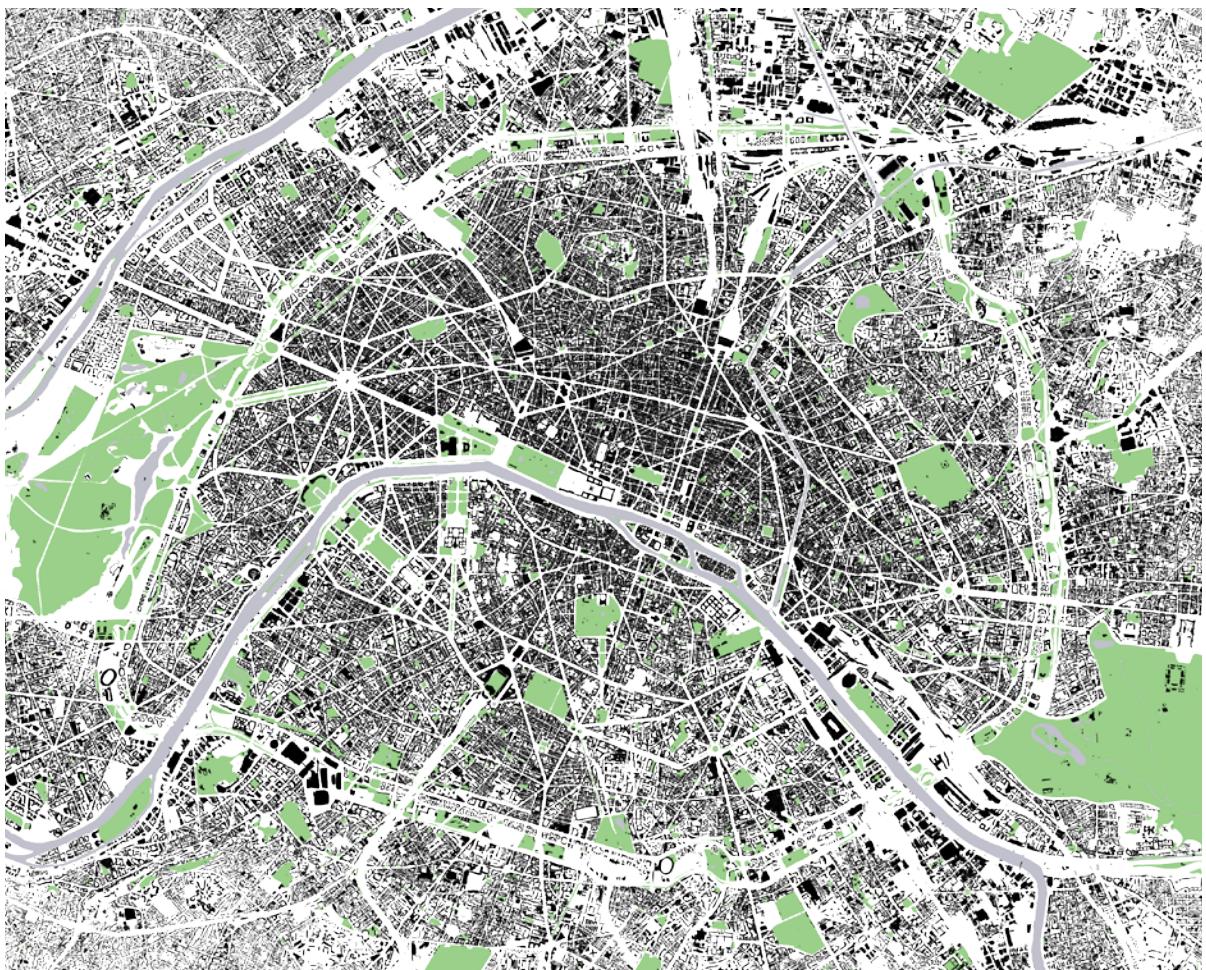
I. The Périphérique of Paris: a Study of Challenges and Opportunities

Parisian Cityscapes (Graduate level French seminar, conducted in French)

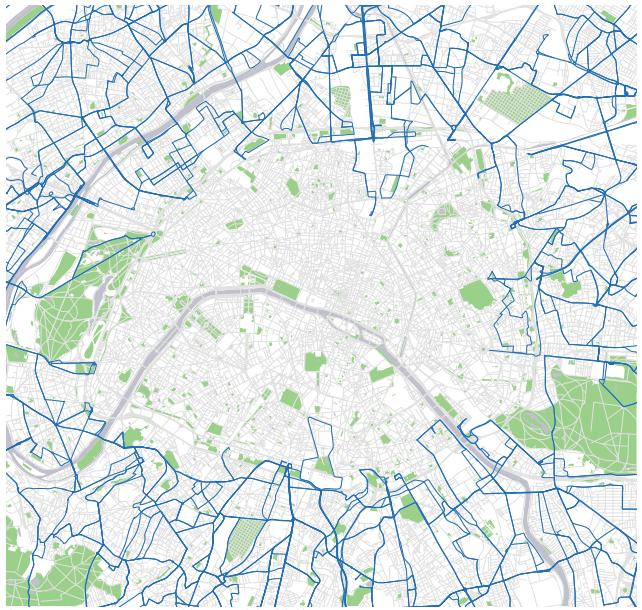
The Périphérique is a circular highway that separates Paris from the “banlieue,” the city’s suburbs. Unlike Tokyo, New York, and London, whose urban space continues outside the city limits and even across natural barriers, Paris has a clear demarcation line. Richard Rodgers, an architect commented, “I don’t know of any other city where the heart is as detached from its limb”.

This study, written in French for a graduate-level seminar in Francophone studies, was an analysis of the Périphérique, the different design typologies, its history, and how the demarcation line manifests beyond just physical space. Métro and bus lines stub-end at the Périphérique forcing those coming from the suburbs to transfer at the city limits. Only the city’s bike share system shows similar densities of docks outside and inside the city. This study featured heavy use of Paris and the wider Île de France region’s GIS and open data.

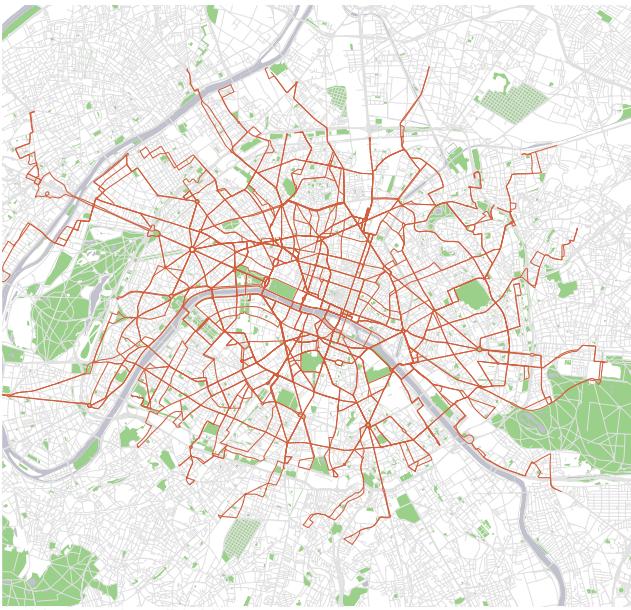
In a time when planners and politicians of the Île de France region are thinking of “Le grand Paris,” an idea of the the wider Paris region as a unified whole, the Périphérique needs to be re-imagined to stitch the heart of Paris back with its limbs. The study is also speculative, thinking about how design interventions can further connect the suburb to the core.



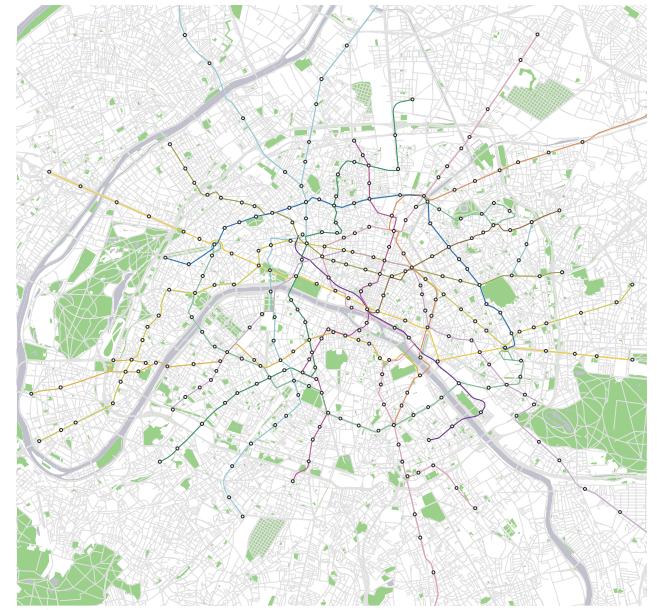
Building footprint in Paris: the Périphérique is an interruption of the urban fabric



Suburban bus lines (lines 100-499)



Parisian bus lines (20-99)

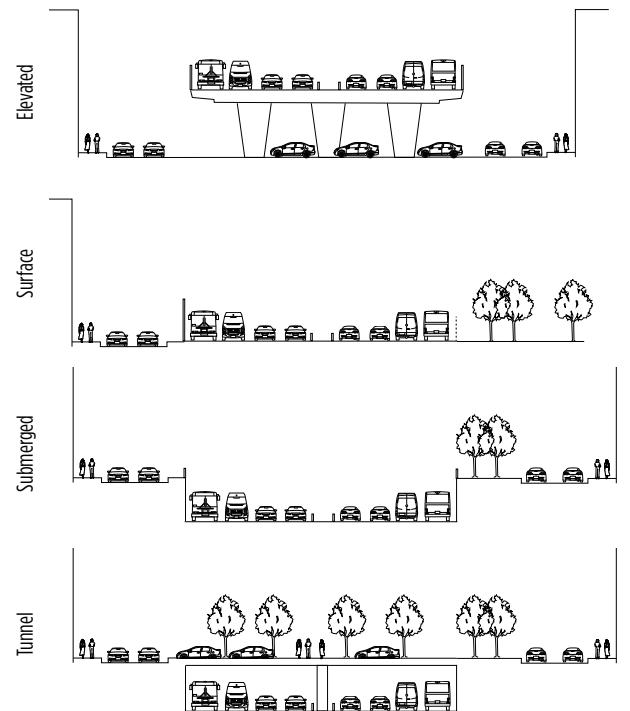


Paris Métro network



Roadway typologies of the Périphérique

- Aérien
- À Niveau
- En Tranchée
- En Tunnel



2. Rethinking the Boston Bike Map

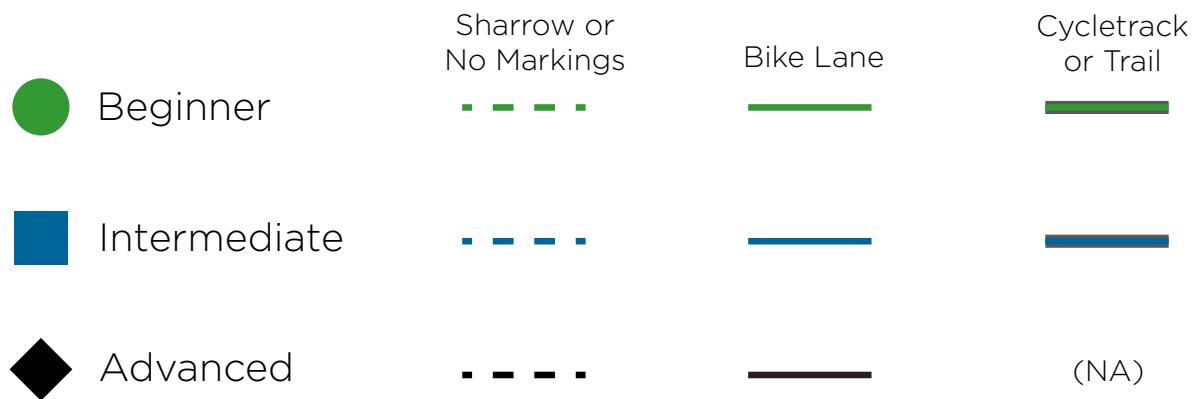
Personal Project

The underlying idea behind this map is that bicycle riders come in a variety of abilities, and while some may tolerate biking with heavy automobile traffic, others will feel very uncomfortable. This map shows Boston's bike routes based on actual ability instead of solely on the facility type, which is the common way of displaying bike routes.

While maps showing ability or comfort level is not new (Austin and Boston have for some time already), the innovation in this map is the use of the ski level rating system: green for beginner, blue for intermediate, and black for advanced. These colors are nearly universal across ski areas. With the use of the ski area symbolologies, it is immediately recognizable what streets are appropriate for the rider's ability.

Data for this map is from the 2013 Boston Bike Map, with some minor updates to reflect the most recent additions of protected bike lanes in the Boston Metro area. For the original 2013 map, the City of Boston surveyed over 200 bike riders to determine suitability for streets. Although suitability ratings for streets are subjective depending on the person, some common conclusions are that protected bike lanes (cycle tracks) or shared use trails are accessible to all user and that the most comfortable routes may be more circuitous. The most direct route between two points are likely on major thoroughfares and require high tolerances of automobile traffic and thus higher difficulty.

The classifications based on level clearly show the gaps in an "all ages and abilities" network. Most neighborhoods are at least accessible to people who feel moderately comfortable biking in mixed traffic, however beyond the few disconnected cycle tracks and shared use trails, there are few places that are accessible to those with low tolerance to stress while biking.



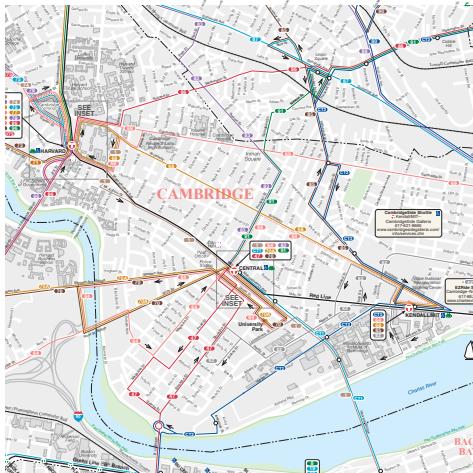


3. MBTA Map Redesign Personal Project

In 2013, the MBTA launched a campaign to redesign the system map. After being unimpressed by the results of the design competition, I decided to tackle the project on my own. The MBTA Map Redesign is a personal exploration of how maps influence travel decisions and how design of the maps impact the way people perceive space once inside the subway network.

Heavily influenced by London and Paris, my redesign of the MBTA map uses many of the principles on deciding what to show and what not to show. Key considerations were given to symbologies, line widths, and the representation of geography. This new sub way map helps to inform the user of the variety of modes within the system, such as on the Green Line where trains both operate at street level and underground. These distinctions are necessary in determining the quality of service provided throughout the system. Out of system transfers also are depicted to prevent circuitous travel patterns in the system. Therefore, Cleveland Circle and Reservoir Stations, which are adjacent to each other but shown as far apart on the existing map, are connected with a dotted line.

Existing MBTA System Maps



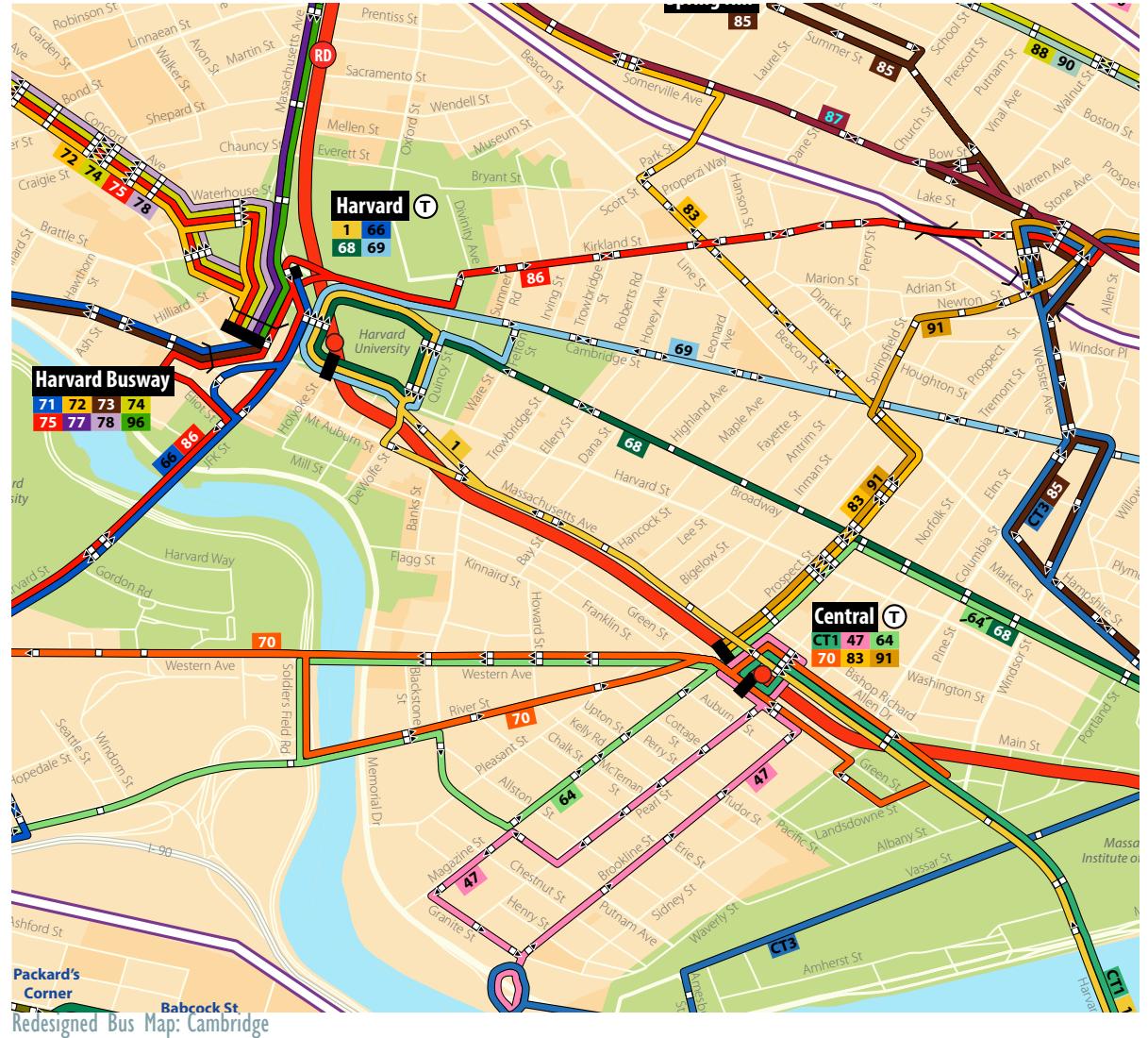
Redesigned System Map

The next iteration of the MBTA Map Redesign was the region's bus network. While redesigning the bus map, I thought about what makes bus travel more frustrating in comparison to rail. The first is that without a smart phone, the unfamiliar traveler does not know where the bus is going as there are no tracks that symbolize the alignment. The second is that on buses, it is difficult to count the number of stops between the origin and destination. The third is that the bus can turn or operate without stopping at any time. Thus, trying out a new bus system for the first time is an intimidating experience.

This new MBTA bus map seeks to tackle these frustrations. Design considerations included showing the stop locations and directions of travel on one-way streets. Recognizing that the MBTA operates a family of services that range from commuter rail to subway to bus, differences in line width help to determine the variety of options offered within the metropolitan region.

Redesigning the MBTA bus map revealed several service inefficiencies within the MBTA system and the need for a major comprehensive overhaul. A complex system requires a complex map. For nearly every MBTA bus line, a "variant" or branch exists.. Many of these variants serve only the occasional rider, but increase passenger confusion and cost the system valuable time that could be used for more productive services. The MBTA also does not have a strong database of where their stops are located. Stop locations were identified primarily through their Google Transit feed, but had to be manually confirmed with Google Streetview. In fact, the MBTA recently contracted McMahon Associates to complete a bus stop audit.

I presented these maps to service planners at the MBTA, and the design was well received.



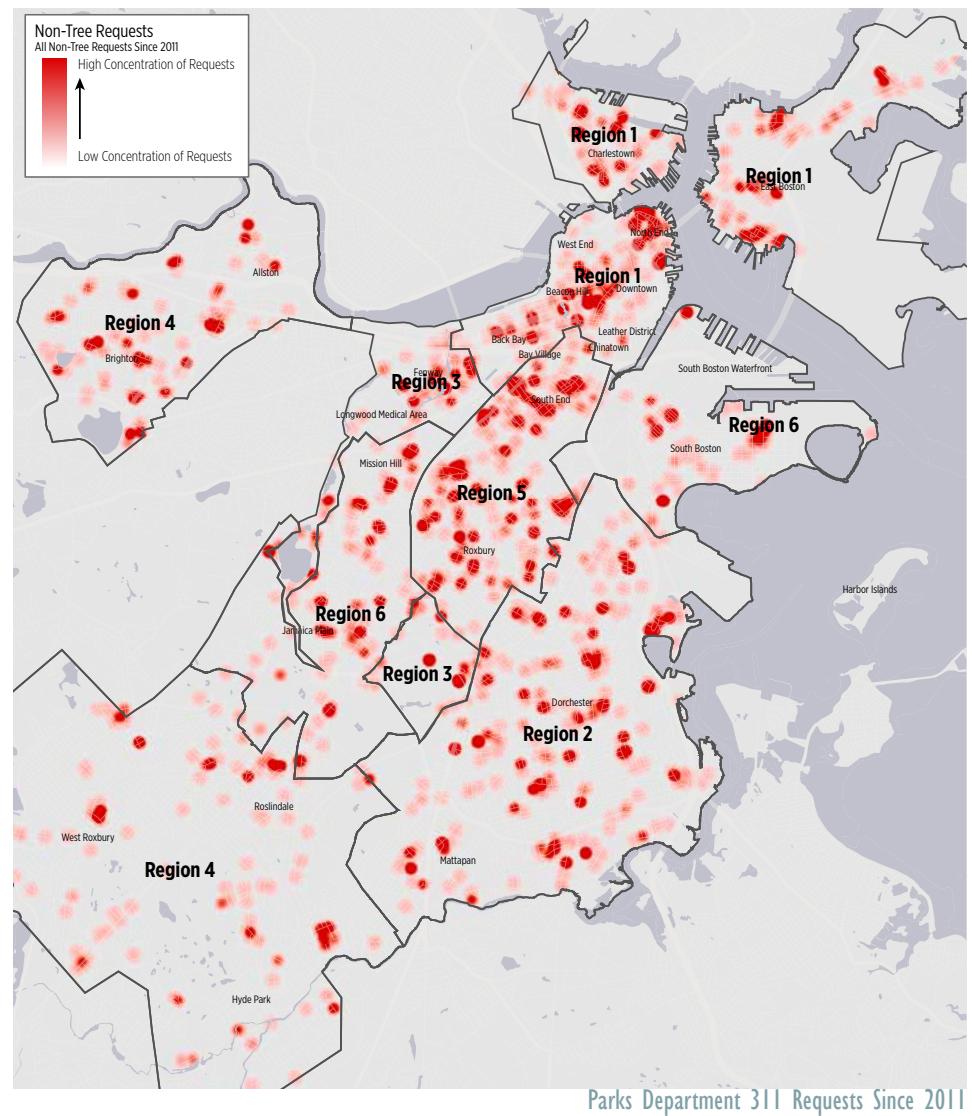
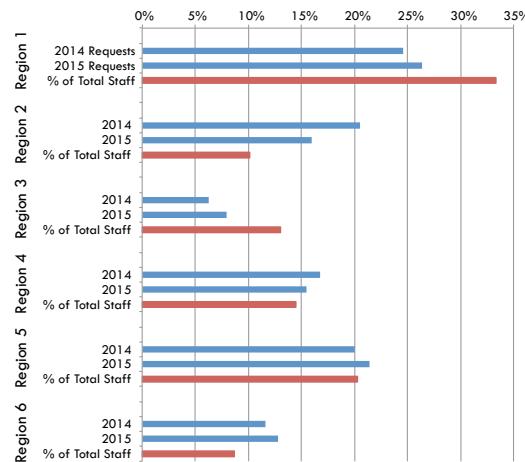
4. Optimizing 311 Requests for Boston's Parks Department Operations Management

Optimizing 311 Requests for Boston's Parks Department intended to identify inefficiencies in the department's process to fulfilling service requests. The Parks Department scope of work is beyond just the recreational facilities in the city. Any tree-related request, such as a tree falling on a street, is within the domain of the department. Thus the services offered by the Parks Department are diverse both in geography and scope. Although the Parks Department completes several thousand requests per year, the number of unfulfilled 311 requests continues to stack. This project using data analysis, interviews, and a literature helped identify some key process improvements.

The 311 request data when mapped spatially in GIS showed inequalities across maintenance regions with some areas receiving larger allocations of requests compared to the number of staff assigned to such region. Therefore, a major part of the project considered how current maintenance boundaries are proposed, what criteria and framework the department should consider to adjust the boundaries, and a conceptual proposed map using such framework.

This project heavily used GIS to filter, clean, and process over 36,000 data records. In addition to redesigning the maintenance regions to balance service requests evenly across staff, other recommendations included service level agreements and better data collection techniques.

Breakdown of Requests and Staff by Region



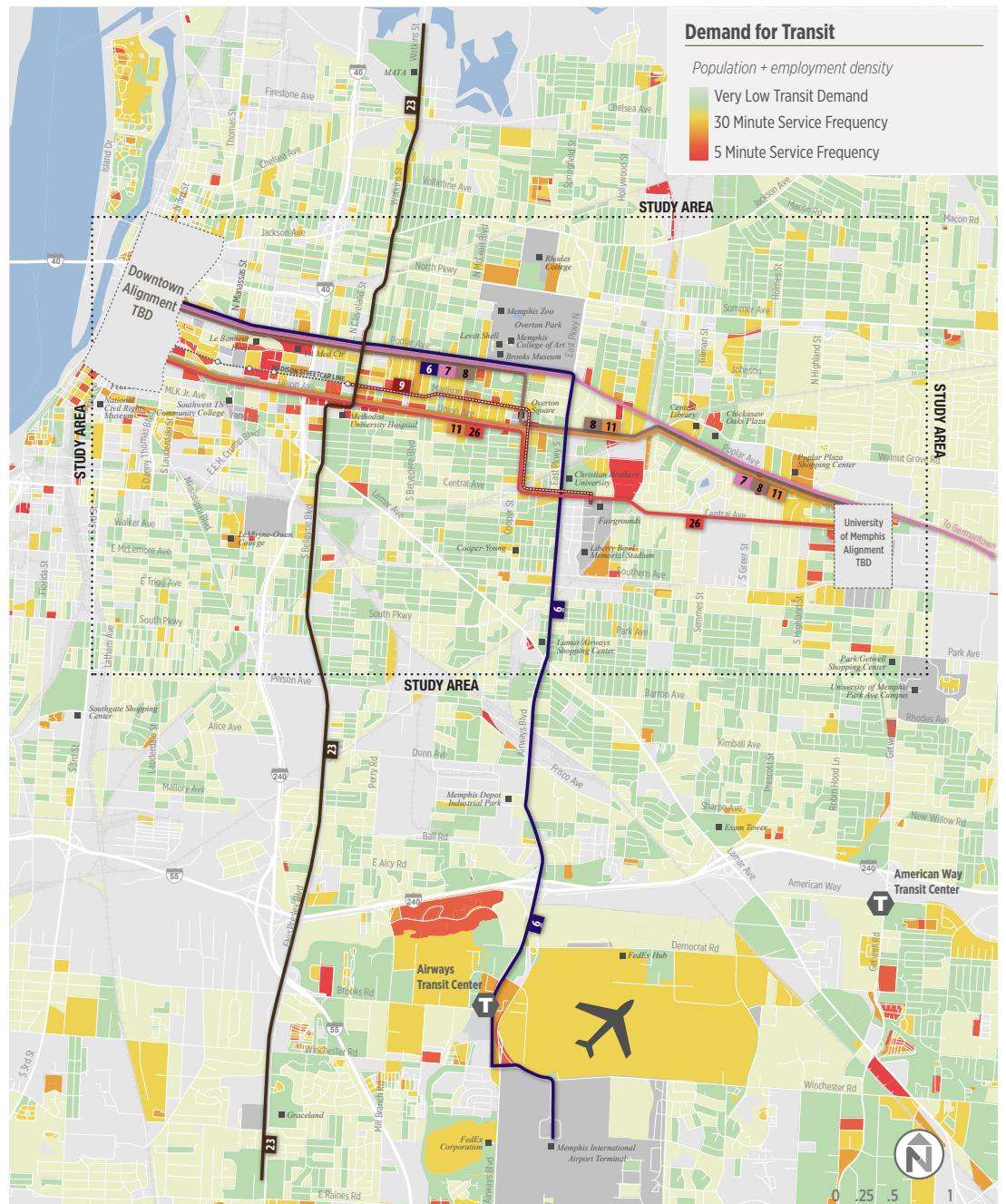
Parks Department 311 Requests Since 2011

5. Memphis BRT Alternatives Analysis

Nelson\Nygaard Consulting Associates

The Memphis BRT Alternatives Analysis is assessing the feasibility for bus rapid transit in Memphis. There are major challenges in providing BRT service in Memphis. The land use is generally unsupportive towards transit, with most areas consisting of low density sprawl. However, many neighborhoods also have high transit dependency due to economic conditions. Thus, a BRT service despite its challenge would have major impact on improving the lives of the city's most vulnerable residents. This study is part of the required documents needed to apply for FTA funding.

As Nelson\Nygaard's deputy project manager on the Memphis BRT Alternatives Analysis, I am tasked with managing and performing the data analysis for a "tiered screening" of alternatives. Each potential corridor was evaluated and scored on the basis of several criteria including ridership potential, economic redevelopment, and socio-economic data. The highest scoring corridors will likely form a priority network that would be strong candidates for FTA grants.



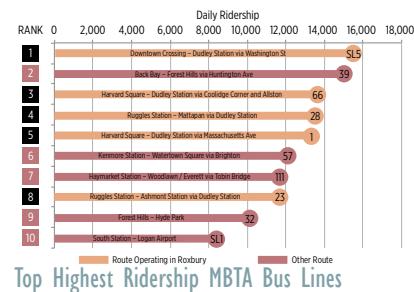
Data sources: U.S. Census, / LEHD Data, Shelby County (Memphis) Business Data

6. Reimagining Transit at Dudley Square Urban Planning Core Studio I

Reimagining Transit at Dudley Square is a vision to redefine and reimagine the relation between transportation, place, and neighborhood. Dudley Square is the nexus of bus lines serving Boston and is also the core of the Roxbury neighborhood. Five of the top 10 busiest bus lines of the city travel through Roxbury, far busier than any other bus hub in the city. Nearly half of households within the Dudley neighborhood do not own a car. Despite such high transit need, the quality of service is lacking with the majority of lines failing to meet the MBTA's established on-time performance guidelines. In addition, transportation treats the area like a transfer point instead of a destination. This project attempts to make service more attractive at the same time as restoring a sense of place into a major transportation hub.

The Dudley Station could be a gem of the neighborhood. The current bus terminal uses the original Washington Street Elevated station, but over the years, the historic building has degraded and fails to showcase the history of the building. The removal of buses from the central part of the station would allow programming for active uses within the old station building, and residents of Roxbury and Boston could fully honor the historic nature of the building.

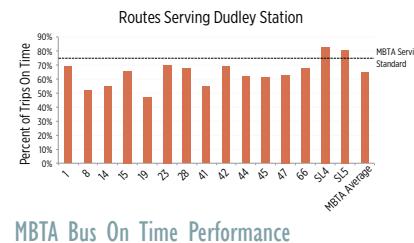
MBTA Bus Ridership by Stop



Former Dudley Elevated Railway Station



Existing Dudley Station



Proposed Re-Use of the Dudley Station Building



Crucial to achieving this goal are the following service improvements:

- Moving all southbound and Ruggles-bound services to Malcolm X Boulevard and operating on a dedicated busway on the north side of the street. Bus lanes on the north side of the street, despite operating contra-flow to car traffic, would ensure front-door service to the terminal and continue to allow easy transfers. Such contra-flow lanes have been effective in Paris to self-enforce bus priority.
- Simplification of circulation around the terminal. At present, nearly all buses must circulate around terminal, adding between six and eight minutes to travel time depending on the traffic signals. Simplifying operations would not only reduce congestion, but also improve travel times and reliability as well as reduce bus presence within the area.

The simplified operations and re-programming of space would not only benefit those within Roxbury, but also improve reliability of service of the MBTA. The reduction of travel times translate to nearly \$6 million in operational cost savings.

Proposed Redesign of Street Circulation in Roxbury



7. Beyond Infrastructure: From Surge Barrier to Linear Park

Urban Planning Core Studio 2

A Hurricane Sandy-sized storm surge could result in nearly \$35 billion worth of damages in the Boston Metropolitan regions. Even a Category II hurricane is likely to flood significant parts of the South Boston Seaport, Financial District, and Back Bay. To combat sea level rise, engineers, architects, and planners have long considered building a surge barrier spanning across the Boston Harbor, protecting the areas vulnerable to a storm surge. While a giant piece of infrastructure has utility in protecting the Boston area against the rising sea level, it has the potential to go beyond just infrastructure.

This project considered using the megalithic infrastructure as a linear park, connecting the Harbor Islands and creating a new link between Dorchester and Winthrop. The park would complete a “missing link” in Charles Eliot’s original Metropolitan Park System, creating a large greenway that circles the entire Boston region. The surge barriers would allow for multiple recreational uses, including jogging, walking, and biking, and be in an ideal location for boat and plane spotting. In addition, a stronger connection to the Harbor Islands would allow for cultural and educational institutions, such as the New England Aquarium (currently looking for a new location) to relocate to the Harbor Island and have further connection to both the sea, sea level rise, and the environment.

