# Prioritizing Streets for Complete Streets Upgrades

## Everett, MA

## Project Overview

For decades across the U.S. the built environment and street networks in most municipalities have been built to prioritize the automobile. This legacy has left many communities without any viable transportation alternatives to driving. The approach of "Complete Streets" planning seeks to provide streets that are safe, comfortable, and accessible for all users (including pedestrians, bicyclists, transit riders, as well as drivers). [1] While designs will vary based on context, Complete Streets generally feature elements such as wider sidewalks, curbs & ramps, crosswalks, bike facilities, bus lanes & shelters, and other traffic calming measures. [2]

Recognizing the need to provide a more multi-modal transportation network, the City of Everett tasked our field projects group with developing a plan to utilize Complete Street principles to overcome existing barriers to safe and accessible alternative transportation. GIS spatial analysis was one way to efficiently conduct an objective evaluation of Everett's current street network and provide data-driven recommendations for prioritizing road segments. The hope is this analysis will be used to focus limited government resources on streets where travel demand exists but current conditions are difficult for non-motorized users, particularly in socio-economically disadvantages communities.

## Methods & Analysis

The Seattle Pedestrian Master Plan's method for prioritizing pedestrian facility recommendations served as the analytical framework for my analysis. Their approach identified "high priority areas" for pedestrian improvements based on several factors including demand, equity, and corridor function. [3] I modified this strategy to address the needs of all non-motorized users and tailored it to work with data and contextual limitations.

The starting point for my analysis was to determine *street functionality* of the current street network for non-motorized users. I evaluated roadway criteria including functional classification (to indicate traffic volume), number of travel lanes, presence and width of sidewalks and curbs, number of non-motorized crashes, and status of bicycle facilities planning. Each criterion was scored on a scale of 1-5, with those roadway characteristics that adversely effect biking, walking, and transit access earning higher scores. The individual criteria scores were summed to create a total *street function score* reflected in the map below.

Next I wanted to visualize *potential non-motorized demand* in Everett; so I identified destinations that are likely to attract these users including bus stops, schools, health care centers, libraries, recreational facilities, businesses, major development sites, and parks. I used a density tool to calculate the number of destinations within a walkable ¼ mile radius. The darker orange colors on the map reflect areas of higher density leading to the potential to attract higher volumes of non-motorized demand. Streets were scored based on their location within areas of very high density (5) to very low density (1) of destinations.

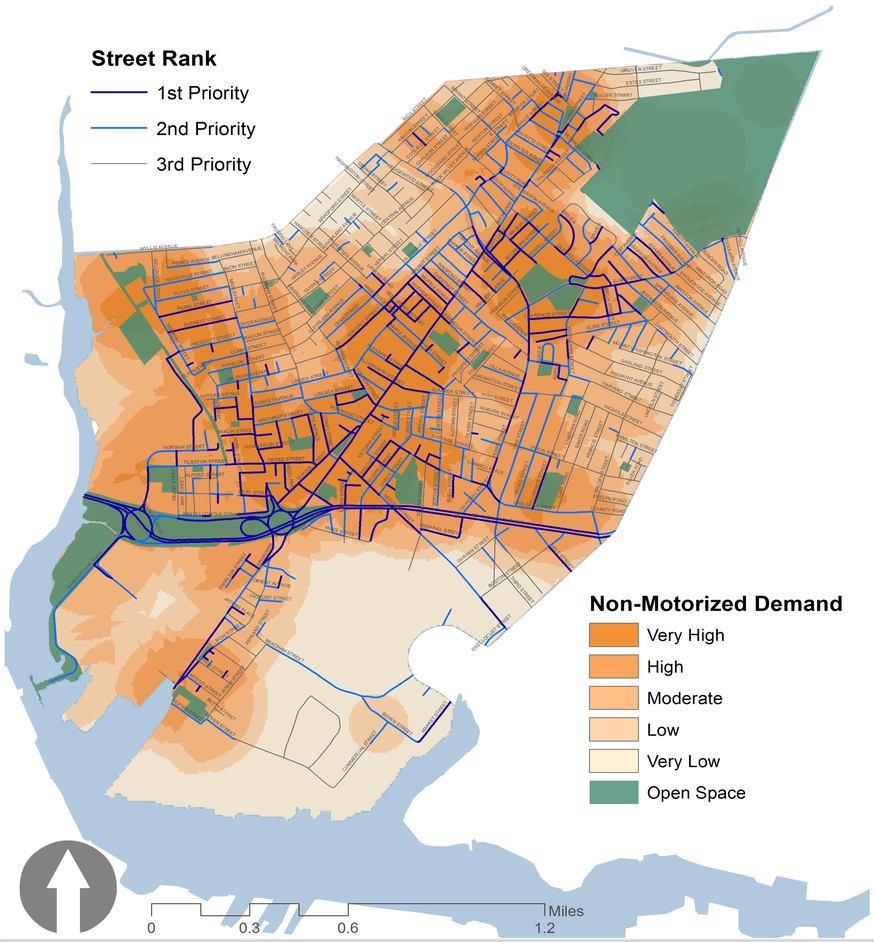
Lastly streets were scored based on whether they were located within areas of *environmental justice* concern by using three factors including the percentage minority, low-income, and non-English speaking.[4] Each road segment was scored from 1-5, with the lowest score assigned to roads within areas of only 1 environmental justice factor and the highest score given to those located within a population that reflects all 3 previously listed factors.

The total scores from the composite maps for functionality, demand, and equity were summed to obtain a final "*priority score*" for all roadway segments in Everett's street network. The final map (on the right) reflects the priority scores categorized by 1st, 2nd, and 3rd priority for Complete Streets upgrades. The darkest blue color represents streets that currently pose the most difficulty for non-motorized users, are located in highest demand areas, and if upgraded would support the most underserved populations in Everett.

Street Function Score → Potential Demand Score → Environmental Justice Score → Final Priority Score

### Top 10 Priorities for Complete Streets Upgrades

| Street Name | From Street | To Street | Priority Score |
|---|---|---|---|
| Sweetser Circle | Broadway | Broadway | 45 |
| Broadway | Sweetser Circle | Boston City Line | 44 |
| Revere Beach Parkway | Chelsea City Lane | Medford City Line | 44 |
| Ramp Rt. 16 WB to Rt. 99 | Revere Beach Parkway | Sweetser Circle | 43 |
| Newbury Street | Kenilworth Street | Hancock Street | 42 |
| Ramp Rt. 99 NB to Rt. 16 EB | Broadway | Revere Beach Parkway | 41 |
| Ferry Street | Chelsea Street | Malden City Line | 40 |
| Broadway | Malden City Line | Sweetser Circle | 40 |
| Santilli Circle Connector | Santilli Circle | Sweetser Circle | 39 |
| Main Street | Sweetser Circle | Malden City Line | 38 |

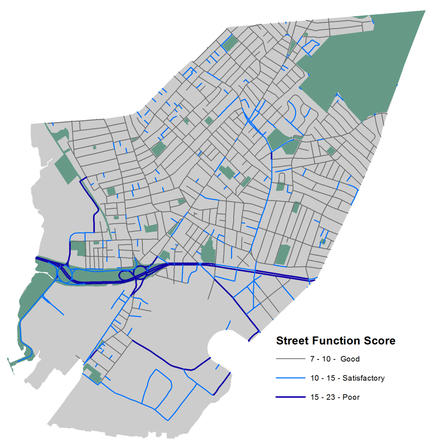



## Conclusions

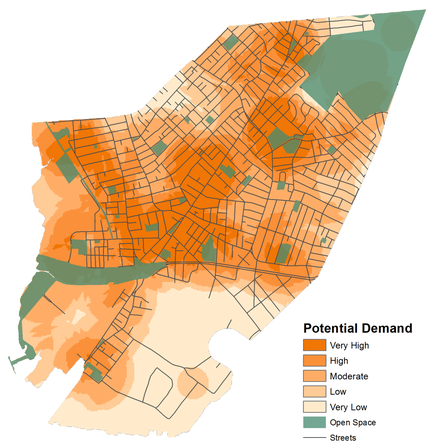
The most noticeable result is the horizontal dark blue line dividing the northern and southern sections of Everett, which reaffirms the need to reduce the barrier effect that Route 16 (Revere Beach Parkway) poses to non-motorized transportation. Generally the methods employed here did a good job at prioritizing streets that are needed to make important connections for non-motorized users reflected in the longer, more continuous dark blue routes. This analysis also helped to inform the selection of Second Street as a focus area for our field project, which is a needed connection between Everett's downtown business district and neighboring Chelsea.

In addition to the final map, a spreadsheet containing a complete list of street segments and their priority scores were provided to the City of Everett. It is my hope that planners and policy makers will utilize this analysis to identify key connections and systematically build out a safe, comfortable,

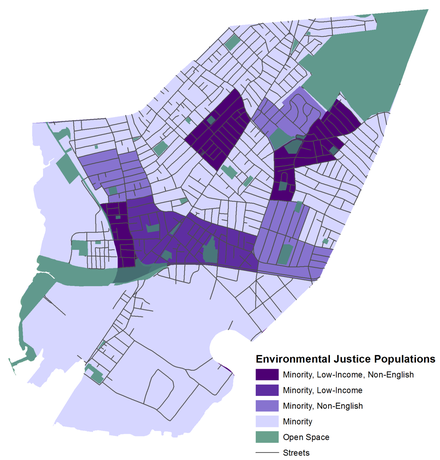
## Street Functionality




## Potential Non-Motorized Demand




## Environmental Justice Concerns




## References


[1] Safe Routes to School National Partnership. (2013). Complete streets: Making roads safe and accessible for all users focus: Underserved communities.

[2] Litman, T. (2013). Evaluating Complete Streets. Victoria, British Columbia: Victoria Transport Policy Institute

[3] City of Seattle. (2011). Appendix A: Methodology and analysis. (Seattle Pedestrian Master Plan). Seattle, WA.

[4] MassGIS. (2012). Environmental Justice Populations layer. Data



Cartography by Kristine Keeney

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Data sources: MassGIS, MassDOT, MassTrac: Ex. Office of Public Safety & Security, Tufts GIS Center

Projection: NAD_1983_StatePLane_Massachusetts_Mainland_FIPS_2001_Meter

Tufts