

WHO WILL PAY FOR PARKING?

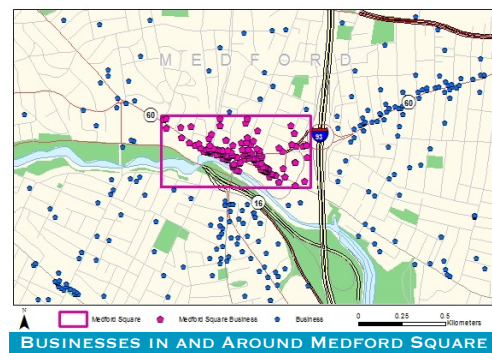
MEDFORD'S NEW PAID PARKING INITIATIVE: RETREAT OR EXPAND?

BACKGROUND

The City of Medford is located 5 miles from downtown Boston, connected most directly by way of I-93. Closest and adjacent to the highway is Medford Square, with the highest concentration of businesses in the city; an active business center since its beginnings in shipbuilding in the 1600s. Part of the accessibility of businesses to customers has been reliant on ground transportation as no rapid transit connects directly to this part of the city. As such, ample parking availability has been the focus of business owners, even uprooting a once pedestrian way to provide additional parking in the mid 90s.

In 2015, with the support of the mayor, parking in Medford Square was controversially outsourced to a private parking firm, charging parking fees for the first time in the near 400-year history of Medford square and stirring backlash from area businesses concerned about the loss of customers.

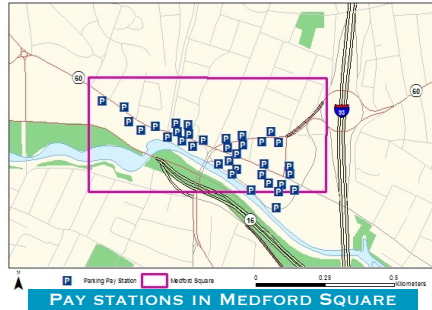
Examining the number of businesses that may be experiencing the effects of the new parking program, and developing a model for projecting expansion may be helpful to glean what the future of parking may look like if Medford continues to expand a paid parking initiative, or if the number of opposed business owners reverses the program's implementation.



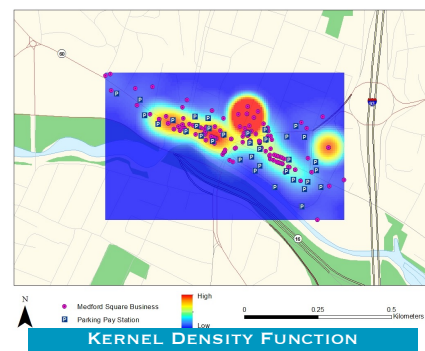
The above map depicts Medford Square, which is among the first sites where parking pay stations have been installed, replacing all the free parking options on the public way in the area depicted. It is also illustrative of the greater concentration of businesses, serving as reference for the city's paid parking system.



METHODOLOGY

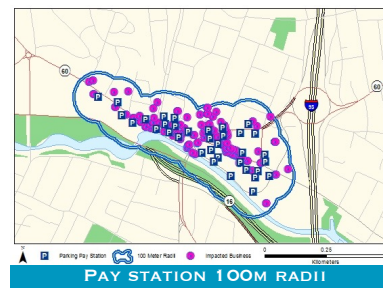


To model the potential extent of impact to business by the parking pay stations, a buffer of 100 meters was created around each pay station. From a direct survey of the area, no alternate parking options were available on the public way other than paying at one of the new stations in this buffer range. Business data was added to the model, and while it is reliant on data from 2010, it is indicative of approximately 350 businesses in the area operating without free parking within range.

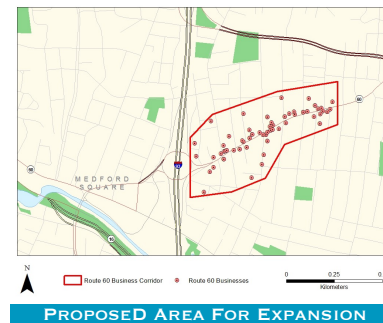


Proposing expansion: An area yet to see the installation of parking pay stations is found on the other side of I-93 along the Route 60 business corridor. Here, a likely critical mass of businesses exists. The area is proposed to consider the creation and application of a model to predict both the number and placement of parking pay stations should the program seek expansion.

First, data were collected on the placement of the parking pay stations from the publicly-available, privately-managed, 'Park Medford' website. These sites were georeferenced to the Medford Square area as depicted; the intent is to show the spread of the pay stations in this part of the city.



A kernel density function was performed to indicate the probability of an area having a business and to point to likely "hot spots," where parking pay stations might best be suited, if the intent were to capture the greatest demand for use of parking based on the concentration of businesses. Judging by the placement of pay stations alongside Medford Square 'hotspots,' there exists great overlap.



RESULTS



The above was created in ArcGIS to consider the application of existing data in favor of a potential model for new parking pay stations as related to business density. The model considers identifying hotspots and placing pay stations within hotspots at a pre-determined ratio relative to businesses.

If the model were to be applied to a potential area of expansion for Medford, and a similar pay-station-to-business ratio were used as Medford Square (35 pay stations/ 351 businesses) then one might project that given the 75 businesses in this area, and the "hotspots" from the kernel density function that approximately 8 pay stations could be placed as per above, spread across the "hotspots."



Given the similarities that may exist across some Medford neighborhoods, using the proposed model could be a good predictor for pay station placement relative to business concentration in the city.

APPLICATION & LIMITATIONS

The proposed model considers the context of Medford Square, which may be very unique and may have a different vehicle usage pattern than other areas with greater pedestrian traffic. As such, the model would be missing variables in order to expand applicability, but still can offer a base for potential pay station modeling relative to business density elsewhere, adding other variables as may be necessary to the context.

Business data herein used may be 5 years old, however, it is likely within the same city, that an increase or decrease in the number of businesses would likely be similar across adjacent areas. Finally, some businesses may attract more pedestrian customers or driving customers than others (e.g. corner store vs. specialty shop).



NUTR 231 Fundamentals of GIS, The Friedman School of Nutrition Cartographer: Yanni Poulakos May 2015 Projection: MA State Plane Mainland Zone

Data Sources: Town Boundaries Polygon, February 2014, Office of Geographic Information (MassGIS), Published by MassGIS Towns, POLY, Date Accessed: April 8, 2015 • Hydrography Polygon, March 2010, Massachusetts Department of Environmental Protection (DEP) GIS, Published by the Office of Geographic Information (MassGIS) Hydro POLY, Date Accessed: April 8, 2015 • Roads Arc File, June 2014, Massachusetts Department of Transportation (MassDOT; formerly Executive Office of Transportation [EOT]), Published by the Office of Geographic Information (MassGIS) Roads ARC, Date Accessed: April 8, 2015 • ESRI Business Analyst Vector File (Infogroup Business Locations), May 2010, Infogroup, Inc., Published by Environment Systems Research Institute (ESRI) ESRI, Provided by Paul B. Cote for the purpose of use in NUTR 231, March 2015 • Medford Parking Pay Station Data, 2015, Park Medford, www.parkmedford.org Medford Square Parking Pay Stations, Date Accessed: April 8, 2015