

Multifamily Residential Parking Study



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Why Study Parking?

- Parking availability and pricing affects travel behavior
- Up to 30% of local congestion in urban cores attributed to searching for (on-street) parking
- Parking construction costs impact affordability
 - affects our ability to invest in activity centers and meet equity goals

Research Need

- Residential parking demand is changing rapidly
- Lack of quantifiable parking demand data results in ambiguity about the “right” level of parking
- ITE *Parking Generation* rates are unreliable in urban areas
- Parking demand is extremely sensitive to local context and building characteristics
- Ambiguity leads to uncertainty in many aspects of the development process

Project Overview

Goal: To develop an interactive web-based tool based on real, defensible data to help determine expected parking demand in the District.

- Easy-to-use, public facing, and transparent
- Built on analysis of context variables and actual parking utilization rates from existing buildings
- Provide customized predictions of off-street parking demand for multi-family projects based on a variety of building and location characteristics

Project History

- TPB TLC grant for data collection in 2014
- Leveraged additional funding from DDOT for:
 - More data
 - Analysis and model development
 - Web tool development
 - Paper for publication

Precedent: King County Right Size Parking Tool

Enter a location...



Parking/Unit Ratio (Number of Stalls)

< .5 Stalls > 1.5 Stalls

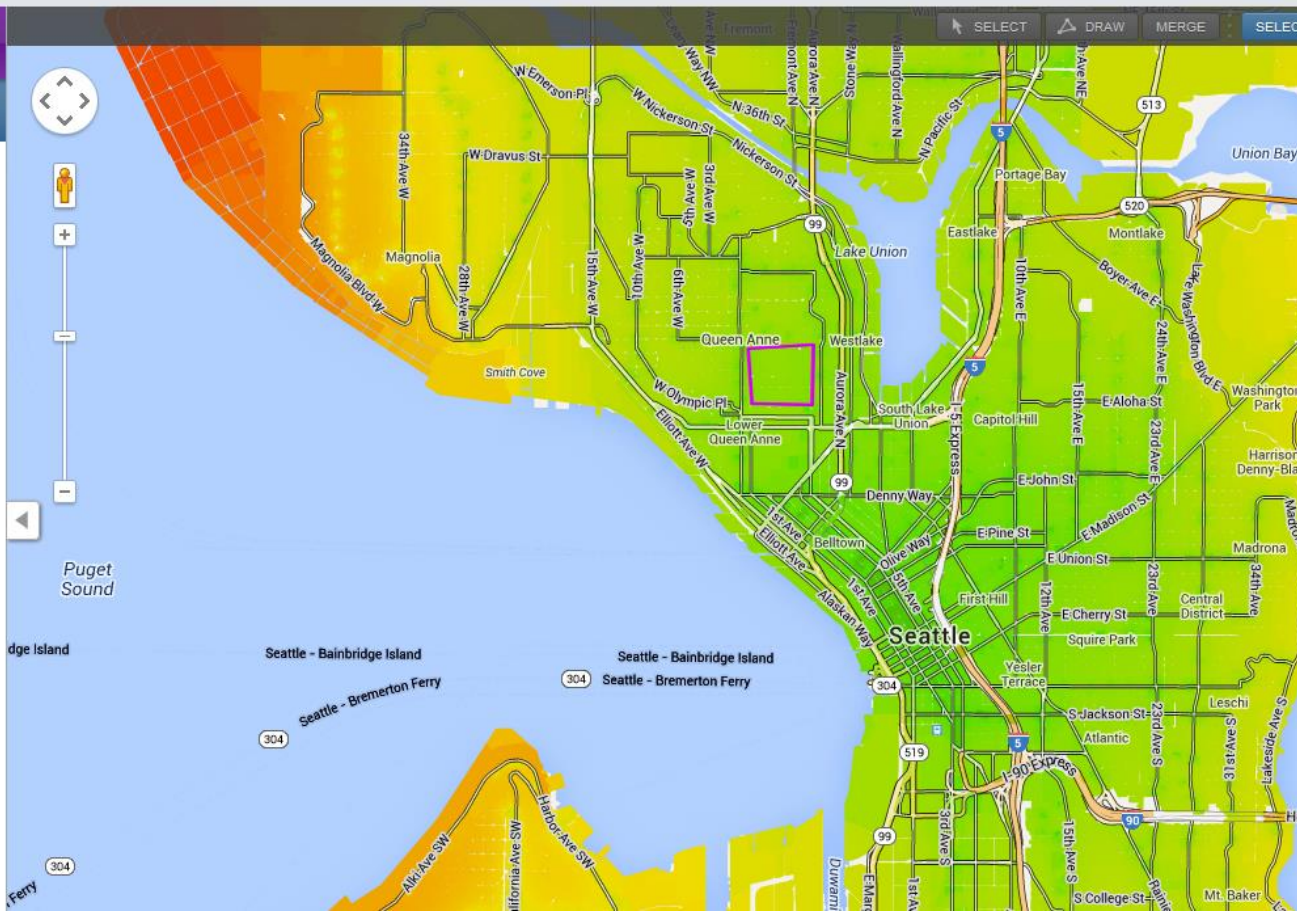
433 Parcels in Drawn Area

Parking/Unit Ratio **0.79**

Building & Parking Specifications | Location Characteristics | **Parking Impacts**

Impact	Estimated Utilization (From Model)	Compared To (User Input)
Estimated Parking Use Ratio:	0.79	.5
Total Stalls:	50,998	32,475
Surface Parking		
Total Capital Costs (Land & Construction):	\$1,359,856,438	\$865,945,875
Monthly Costs per Residential Unit (including O&M):	\$185	\$118
Annual GHG Emissions from Construction and Maintenance (kg CO2e):	3,620,844	2,305,725
Structure Parking		
Total Capital Costs (Land & Construction):	\$1,286,266,607	\$819,084,450
Monthly Costs per Residential Unit (including O&M):	\$183	\$117
Annual GHG Emissions from Construction and Maintenance (kg CO2e):	8,822,620	5,618,175
Estimated Annual VMT of Building Residents:	541,819,168	345,026,233
GHG Emissions from Vehicle Use of Residents (kg CO2):	220,239,458	140,246,816

UPDATE



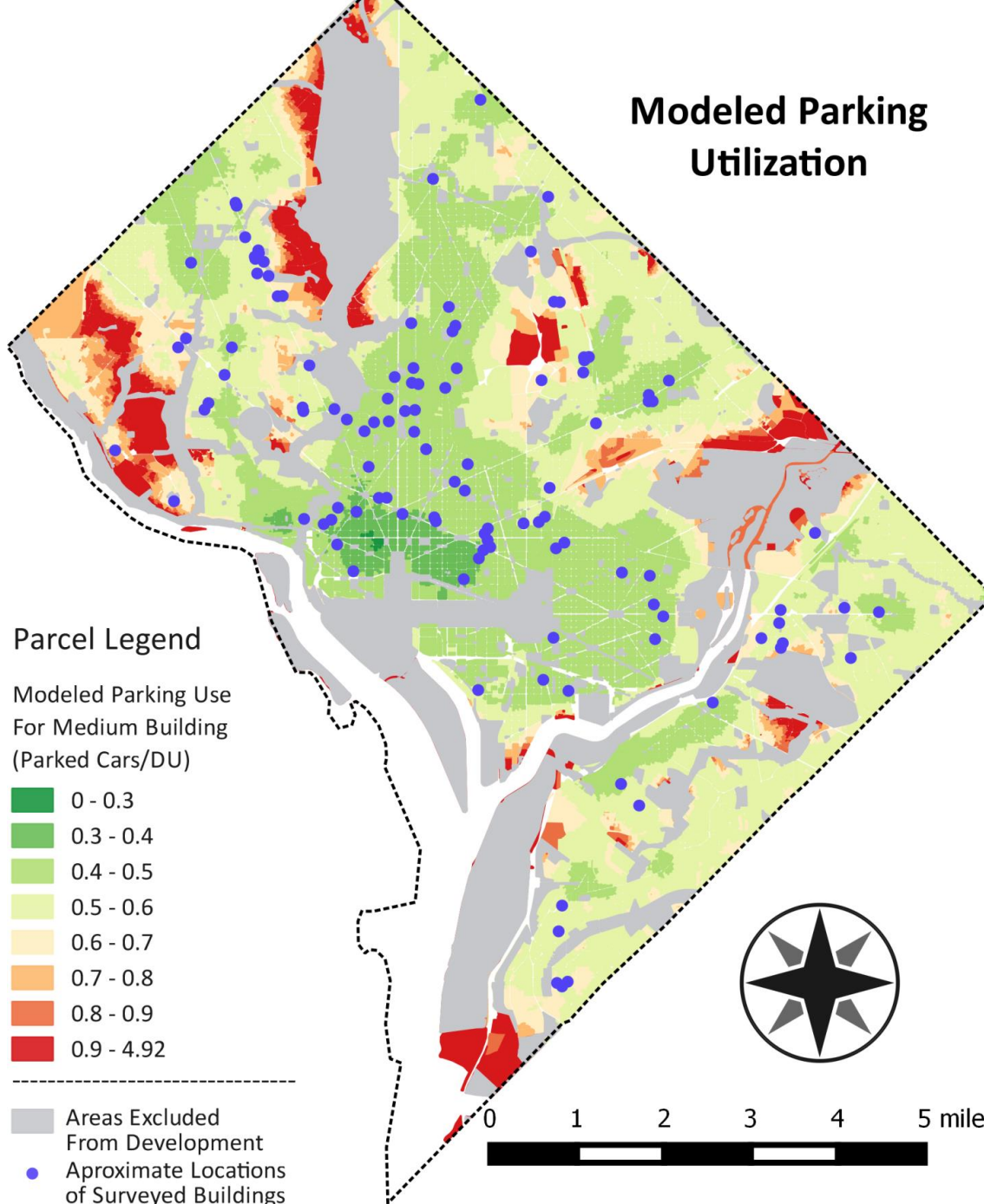
ParkRightDC

- Modeled on King County's project
- Customized for the District's local context
- Improvements include:
 - Enhanced effort to consider off-site parking availability in the analysis of parking demand
 - Provide a range for expected parking demand
 - Walkability and job accessibility measures added

Site Screening and Data Collection

- Multifamily properties with 10+ units
- Considered potential to generate spill-over (on-street) parking demand
- Timed collection of newer properties to account for lease-up
- Counts conducted 12:00 – 5:00 am, Tue-Thur
- Building characteristics captured via property manager interviews
- Total sample: 115 properties (including 13 without parking)

Modeled Parking Utilization



Parcel Legend

Modeled Parking Use
For Medium Building
(Parked Cars/DU)

- 0 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 4.92

- Areas Excluded From Development
- Approximate Locations of Surveyed Buildings

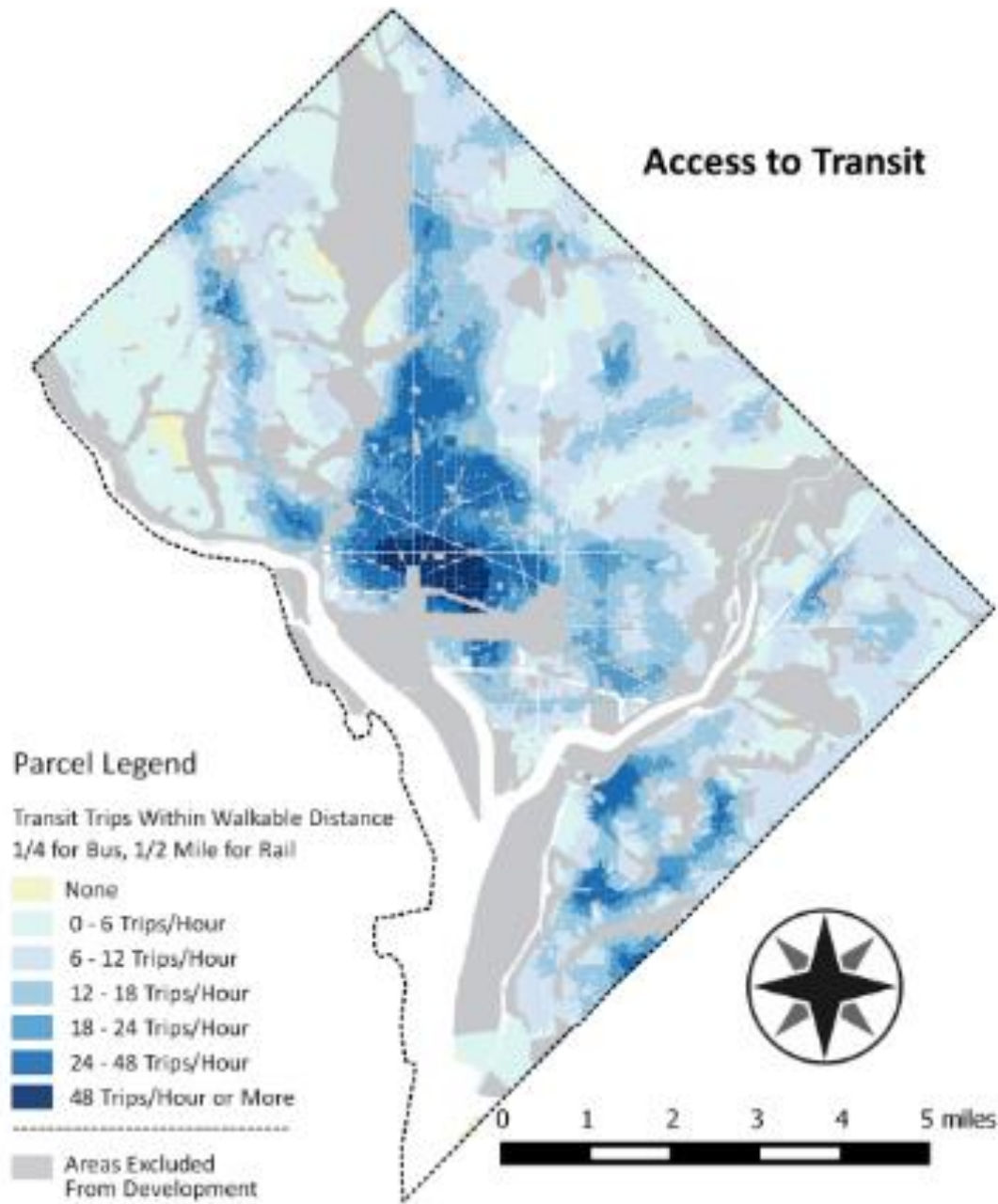
Findings

- Only 60% of parking stalls used on average.
- Parking supply correlates most with parking utilization, accounting for 66% of the variation.
- Other significant building variables include:
 - parking price
 - average rent
 - unit size
- The most significant neighborhood variable was a combination of walkability (measured by block size) and frequency of transit service within walking distance. As walkability and transit frequency increased, parking utilization decreased.

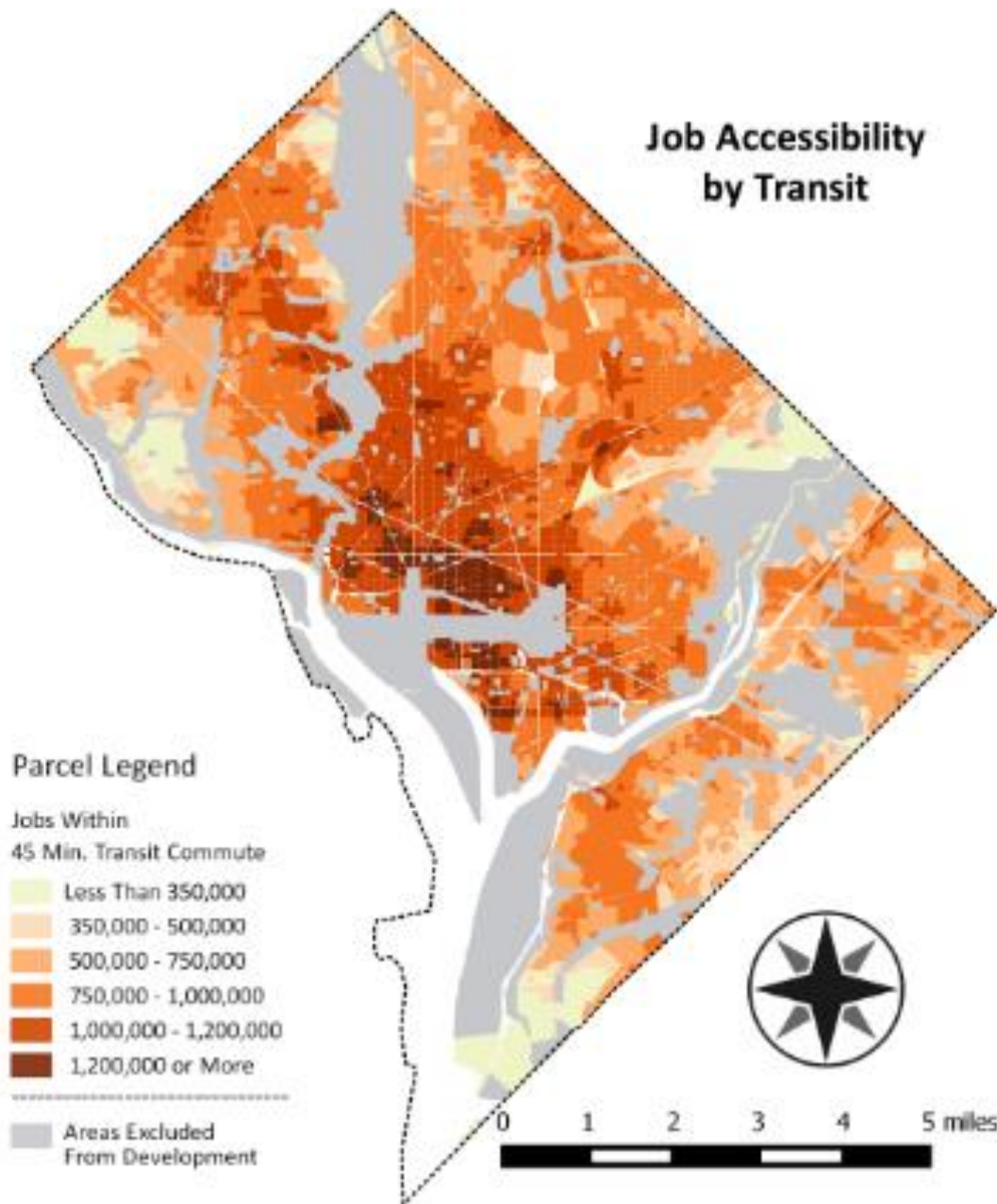
Findings

- The model achieved an R-square of 0.835 – indicating that the variables used in the model on average predict about 83.5 percent of the variance in parking utilization.

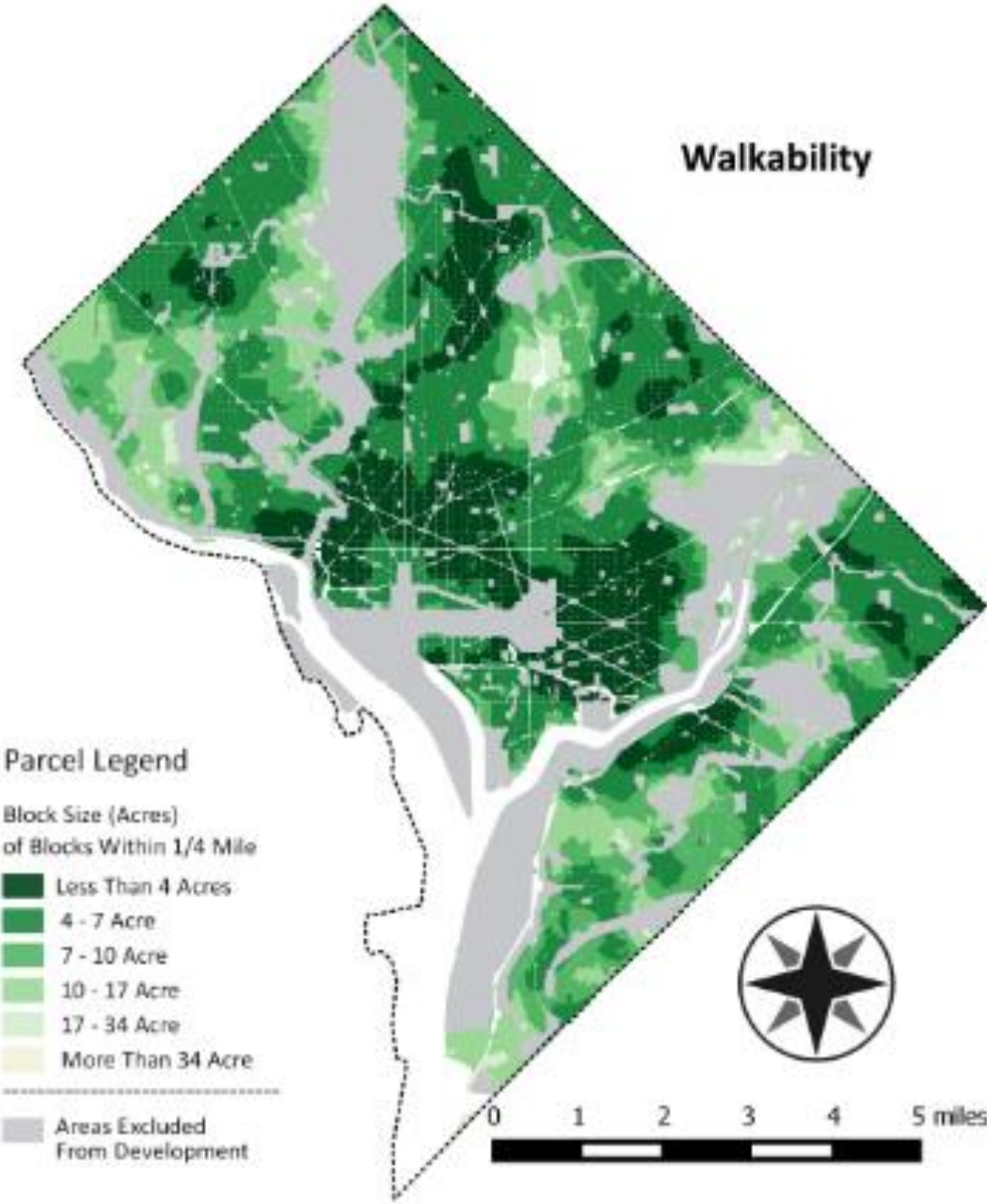
Access to Transit



Job Accessibility by Transit



Walkability



Model Application: ParkRight DC Tool

Given the complexity of the model, the web tool allows end-users to view the model results in a simpler, easier to understand form. The tool allows users to

- View estimated parking utilization for multifamily developments
- Develop a building scenario based on building characteristics
- Optimize the building supply for optimal supply and parking price
- Explore effects of altering location characteristics

The screenshot displays the Park Right DC web tool interface. At the top, it says "Park Right DC BETA Site" and includes links for "CALCULATOR" and "ABOUT THIS SITE". A search bar prompts the user to "Enter a location...". A "Parking Utilization Ratio (Occupied Stalls/Unit)" slider is set to 0.2. The main map shows a grid of streets with a color-coded overlay representing parking utilization. A purple rectangle highlights a specific parcel.

1 Parcel Selected
Total Units: 145
Total Stalls: 75

Parking Utilization Range
70 - 81
348 Stalls (2.12 occupied stalls/unit)

Parking Utilization
Modeled parking utilization is in the range of 70 - 81 stalls per building. A parking supply of 80 stalls is an **oversupply of 33%**.
Optimize parking for: **Supply** | **Market Price**

Building Type: Large Medium Small Custom
Building provides market rate housing

	NUMBER OF UNITS	AVERAGE UNIT PRICE (\$)	RESIDENTIAL AREA (SQ FT)
1-BEDROOMS	66	\$1,890	680
2-BEDROOMS	59	\$2,050	850
3-BEDROOMS	5	\$2,800	1,180
TOTAL	145	\$2,037	192,690

AFFORDABLE UNITS: 12

PARKING STALLS: 106 Lock for optimal supply

PARKING PRICE: \$104 Lock for market price

CREATE **RESET**

Project Application

- Facilitate understanding of parking amongst all players involved in development projects
 - Zoning boards
 - District agencies
 - Community stakeholders
 - Development and real estate finance professionals
- Provide more transparency and predictability
- Inform DDOT and OP's review of parking variances
- Inform efforts to update the zoning regulations
- Contribute to developers' parking provision decision-making

Limitations

- A decision-support tool, not a decision-making tool
- Not a substitute for detailed building, site, and market analysis
- Unable to fully account for off-site (including on-street) parking supply
- Property marketing and management practices can significantly vary results

Implications

- Parking utilization is highly context-dependent
- Underscores difficulty of finding the “right” number for parking supply
- Argues for a more flexible approach to parking regulation
- On-site and on-street parking need to be considered as an interrelated system (but rarely regulated as such)

www.parkrightdc.org

