Right Sizing Parking

Greg Newmark | Peter Haas | Center for Neighborhood Technology
Transport Chicago | June 6, 2014
WHAT’S THE PROBLEM?

- Smart Growth requires density and continuity
- Typical parking policies undermine those goals
MULTI-UNIT RENTAL

- Gives more housing options to residents
- Increases diversity, economic activity, land intensity

Proposed Multi-Unit Residential Development for Village of Hempstead on Long Island
STAKEHOLDER CONCERNS

- Developers want to minimize off-street parking
- Neighbors want to minimize parking spillovers
- Planners want to adjudicate this tension
PARKING MINIMUMS

- Add construction cost
- Reduce density
- Reduce value

- When minimums result in excess parking supply

SHIFT IN THINKING

- FROM: Parking minimums are inherently bad
- TO: Our ability to predict parking demand is bad

http://mikeontraffic.typepad.com/my_weblog/page/18/
ITE GUIDE

- 7 Buildings
- 2 Cities
- 3 Years
- No Suburban
- 1 Predictor

Study Sites/Years
Chicago, IL (1969); Chicago, IL (1978); San Diego, CA (1996)

Land Use: 222
High-Rise Apartment

Average Peak Period Parking Demand vs. Dwelling Units
On a: Weekday
Location: Central City, Not Downtown

<table>
<thead>
<tr>
<th>Study Period</th>
<th>Number of Study Sites</th>
<th>Average Size of Study Sites</th>
<th>Average Peak Period Parking Demand</th>
<th>Standard Deviation</th>
<th>Coefficient of Variation</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7</td>
<td>435 dwelling units</td>
<td>1.37 vehicles per dwelling unit</td>
<td>0.16</td>
<td>11%</td>
<td>1.15–1.52</td>
</tr>
</tbody>
</table>

85th Percentile: 1.52 vehicles per dwelling unit
33rd Percentile: 1.38 vehicles per dwelling unit

Weekday CND Peak Period Parking Demand

\[ P = 1.04x + 130 \]
\[ R^2 = 0.85 \]
KING COUNTY
RIGHT SIZE PARKING
PROJECT

- King County, FHWA, ULI, WSDOT, CNT

Right Size Parking

Tools to balance supply.
RESEARCH OBJECTIVES

- Develop a robust data base on parking demand
- Collect data for possible predictor variables
- Estimate regression model
- Develop a website tool for stakeholders
DATA SET: RENTAL UNITS

218 surveyed facilities
- 32,760 rental units
- 10 to 735 rental units per facility (118 median)
- 37% of the facilities had low income units
- 3% had senior units
- 95% occupancy rate

Unit breakdown
- 13% studio apartments
- 43% one-bedroom apartments
- 38% two-bedroom apartments
- 6% three-bedroom apartments
DATA SET: PARKING SPOTS

All spots designated for building residents
- On-site and off-street
- Reserved on-street spots
- Off-street, off-site satellite locations

Parking availability
- 4 to 939 parking spots per facility
- 164 parking spots per facility was the median
Parking lots were substantially overbuilt

Median = 0.39
n = 218
FINDINGS

<table>
<thead>
<tr>
<th>Region</th>
<th>Utilization (Observed Vehicles/Occupied Residential Units)</th>
<th>Supply (Total Spaces/Total Residential Units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>0.96</td>
<td>1.33</td>
</tr>
<tr>
<td>CBD</td>
<td>0.51</td>
<td>0.73</td>
</tr>
<tr>
<td>Urban</td>
<td>0.90</td>
<td>1.29</td>
</tr>
<tr>
<td>Suburban</td>
<td>1.18</td>
<td>1.55</td>
</tr>
</tbody>
</table>

**Utilization:**
- **CBD:** Observed Vehicles / Occupied Residential Units
- **Urban:** Total Spaces / Total Residential Units

**Supply:**
- **CBD:** Observed Vehicles / Occupied Residential Units
- **Urban:** Total Spaces / Total Residential Units

**CNT**
NEW REGRESSION MODEL

- Predicts absolute spots rather than ratios
- Designed to better address projects discussions
- Good for unit variation, bad for overall attributes
- Requires scaling variable (i.e. facility bedrooms)
NEW REGRESSION MODEL
# MODEL COEFFICIENTS

**Dependent Variable:** Parking Spots Filled | **Estimate** | **Std. Error** | **t value** | **Pr(>|t|)**
--- | --- | --- | --- | ---
Studio Apartments | 0.852 | 0.089 | 9.599 | 0.000
One Bedrooms | 0.848 | 0.055 | 15.495 | 0.000
Two Bedrooms | 1.340 | 0.096 | 13.970 | 0.000
Three Bedrooms | 1.593 | 0.172 | 9.279 | 0.000
Affordable Units | -0.258 | 0.048 | -5.345 | 0.000
Senior Units | -0.366 | 0.177 | -2.071 | 0.040

[Square Footage per Rent Dollar] * Bedrooms | 0.080 | 0.034 | 2.342 | 0.020
[Monthly Parking Price per Spot] * Bedrooms/10^3 | -0.764 | 0.000 | -4.587 | 0.000
[Jobs in 30min Transit Commute] * Bedrooms/10^6 | -0.141 | 0.000 | -2.676 | 0.008
[Average Block Size Squared] * Bedrooms/10^3 | 0.536 | 0.000 | 4.629 | 0.000

**Multiple R-squared:** 0.979, **Adjusted R-squared:** 0.978
**F-statistic:** 948.9 on 10 and 200 DF, **p-value:** 0.000
FUTURE ENHANCEMENTS

- Travel Demand Management Variables
- Availability of Car/Bike Sharing
- Consideration of Parking Supply

TRANSFORM
GreenTrip modernizes planning by eliminating excessive parking and focusing on giving people more and better transportation choices.

The King County Right Size Parking Calculator allows you to view estimated parking/unit ratios for multi-family developments throughout urban areas of King County, WA (Seattle area). The calculator is based on a powerful model developed from current local data of actual parking use. While it is intended to help support and guide parking supply and management decisions, it should not be viewed as a definitive answer. Rather, it should be seen as a resource to inform discussions, weigh the factors impacting parking demand, and help consider the proper provision of parking.

For any location selected, users are encouraged to develop scenarios and view the influence on parking/unit ratios by adjusting the model inputs. To help demonstrate the influence of priced parking, bundled and unbundled parking, parking options are automatically generated for the parcel(s) that are selected. In order to guide the user's decisions, bundled assumes parking costs are "free" to the tenant, but are recovered through higher rental rates. Unbundled assumes parking costs are separated from rental, granting tenants a choice in parking use and resulting in lower total tenant costs.

See below for instructions or watch our short tutorial here: Watch Tutorial.

FIND YOUR AREA

Enter a location above or use the zoom and pan tools on the map. To select parcels, you must zoom in close enough to see individual parcel boundaries. Once you're close enough, the selection tools in the upper right of the map will become active.

SELECT YOUR PARCEL(S)

Click the "Select" button and click on the parcel(s) you would like to select.
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For any location selected, users are encouraged to develop scenarios and view the influence on parking/unit ratios by adjusting the model inputs. To help demonstrate the influence of priced parking, bundled and unbundled parking preset options are automatically generated for the parcel(s) that are selected. In order to guide the user’s decisions, Bundled assumes parking costs are “free” to the tenant, but are recovered through higher rental rates. Unbundled assumes parking costs are separated from rent granting tenants a choice in parking use and resulting in lower total tenant costs.

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SELECT YOUR PARCEL(s)

Click the “Select” button and click on the parcel to select it.
The parking/unit ratio for the selected parcels is 0.79. The parking/area ratio is estimated at 0.77.

Building & Parking Specifications:

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
<th>Average Rent</th>
<th>Residential Area (sq ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studios</td>
<td>20</td>
<td>$975</td>
<td>650</td>
</tr>
<tr>
<td>1 Bedrooms</td>
<td>60</td>
<td>$1,180</td>
<td>750</td>
</tr>
<tr>
<td>2 Bedrooms</td>
<td>60</td>
<td>$1,450</td>
<td>950</td>
</tr>
<tr>
<td>3+ Bedrooms</td>
<td>10</td>
<td>$1,875</td>
<td>1200</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>$1,275</td>
<td>120,000</td>
</tr>
</tbody>
</table>

Number of Affordable Units: 20
Monthly Price per Stall: $180

This information is based on regional average values derived from field work for building and parking specifications. These are default estimates for which all parking/area ratios are assumed. See below for guidance on unassigned and affordable housing options.
WWW.RIGHTSIZEPARKING.ORG
DEMONSTRATION
WWW.RIGHTSIZEPARKING.ORG
DEMONSTRATION
WWW.RIGHTSIZEPARKING.ORG
DEMONSTRATION

The preset values below represent regional average values (from field work) for building and parking specifications. These represent the default values for which all parking ratio displays are estimated. See below the rules for guidance on unbundling and affordable housing options.

### Building & Parking Specifications

<table>
<thead>
<tr>
<th>Number of Beds</th>
<th>Number of Stalls</th>
<th>Average Rent</th>
<th>Residential Area (sq ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studios</td>
<td>30</td>
<td>$576</td>
<td>550</td>
</tr>
<tr>
<td>1 Bedroom</td>
<td>60</td>
<td>$1,150</td>
<td>750</td>
</tr>
<tr>
<td>2 Bedroom</td>
<td>60</td>
<td>$1,450</td>
<td>950</td>
</tr>
<tr>
<td>3+ Bedroom</td>
<td>0</td>
<td>$1,575</td>
<td>1200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>$1,235</strong></td>
<td><strong>118,500</strong></td>
</tr>
</tbody>
</table>

**Number of Affordable Units:** 20
**Monthly Price per Stall:** $150

### How can unbundled (priced) parking influence parking/unit ratios?

The parking/unit ratios below are calculated using preset unbundled parking prices based on parcel location and rent adjustments resulting from unbundling.

<table>
<thead>
<tr>
<th>Unbundled Parking</th>
<th>Adjusted Average Rent</th>
<th>Monthly Cost to Resident</th>
<th>Resulting Parking Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0</td>
<td>$1,349</td>
<td>$1,349</td>
<td>0.29</td>
</tr>
</tbody>
</table>

THANK YOU

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