Using Parking Meter Transaction Data to Manage Paid On-Street Parking in Seattle

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Paid On-Street Parking on 11th Ave NE in the University District
Performance Parking Program

• Codified in the Seattle Municipal Code in 2010
• Goal of the program:
  1. Help customers reliably find parking within walking distance of their destinations
  2. Reduce emissions and lessen traffic congestion from drivers circling in search of parking
  3. Increase access to businesses by ensuring turnover of parked cars
• Expanded to time of day meter rates in 2015
• Uses annual data collection effort (*Annual Parking Study*) to inform rate changes
Paid Occupancy Database

• Created by Seattle IT by using transaction data from parking meter vendors and from the SDOT parking space database
• Over 2 billion records – one record for each blockface for each minute of the day from 2012 to present day
• Estimates paid parking occupancy by counting the number of active parking meter transactions
• Provides a high level overview of on-street parking trends
• All data available on City’s open data platform
Annual Parking Study

- Each parking area surveyed hourly on a typical weekday in the Spring
- Data collectors note if vehicle has any special permit exempting payment i.e. RPZ permits, Disability Placards, Floating Car Share Vehicles
- Only shows a snapshot of on-street paid parking occupancy
  - What about scofflaws?
  - Is parking occupancy the same in other parts of the year?
Creating a Data Model

- Parking Meter Transactions
- SDOT Parking Space Database
- Physical Data Collection

- Calculated Occupancy Database
- Annual Parking Study

- Power BI Data Model
Estimating Scofflaw Occupancy

\[
\text{Scofflaw Occ.} = \frac{\text{Total Observed Occ.} - \text{DP Occupancy} - \text{RPZ Occ.} - \text{Carshare Occ.} - \text{Paid Occ.}}{\text{Parking Spaces}}
\]

- Allows city staff to prescribe payment compliance studies as needed or coordinate with SPD for targeted enforcement
- Reducing scofflaw occupancy can help increase parking meter revenue
South Lake Union South (2018)
Parking Area Scofflaw Occupancy
Non-Payment

• Some parking areas have high percentages of non-payment (i.e. Disability Placard, RPZ Permit, Floating Car Share, Scofflaw)

• Presents challenges to parking management
  • Non-paying vehicles do not respond to meter rate changes
  • Low parking turnover

• Can be used to help guide policy discussions to address non-payment which negatively impacts meter revenue
  • Disability Placard Time Limits?
  • Placing cap on RPZ permits?
First Hill (2018) Parking Area Vehicle Composition
Seasonal Variation

• Seasonal variation can be observed through paid parking occupancy database
• Only Ballard Locks has seasonal rates and is studied multiple times during annual parking study
• What about other areas with weather dependent land uses/activities?
• Provides insights as to whether or not seasonal rates are warranted for certain parking areas
Uptown Triangle Parking Area

![Graph showing parking occupancy over time for different quarters.]
Overall Parking Trends

• Overall parking trends over multiple years can be accessed through the parking occupancy database.

• Can be used to see how different neighborhoods are changing and whether additional studies are needed in fast-growing neighborhoods.

• Can be used to investigate changes to paid occupancy following parking meter rate changes.
Ballard Core and Ballard Edge Parking Area
Pioneer Square Core Parking Area

**Occupancy Change**

-9.23%
What can this tool do?

- **CANNOT fully replicate parking conditions**
- Provide a general understanding of parking occupancy in paid parking areas
- Help guide where additional studies or data collection efforts are needed
- Help start policy discussion on how to address occupancy problems in paid parking areas i.e. high DP usage, RPZ permit use
- Show how parking occupancy has changed over time in different neighborhoods
Next Steps

• Further develop the data model to incorporate other city data sets
  • Payment Transaction Data (number of transactions) to assess parking turnover
  • Seattle PD beats to assist in parking enforcement

• Understanding non-payment occupancy better
  • How does non-payment change over time?
  • How does non-payment change with rate changes?
Questions?

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Data Sets: Search for “Paid Parking Data,”
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