

Seattle Paid On-Street Parking: Payments Collected During No Parking Periods

DATA 512 Final Project

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Research Questions

Motivation

2009 Seattle Times article:

Seattle's confusing parking meters: Pay to 6 p.m., get towed at 3



Questions

RQ1: *How much has the city made from drivers who pay for on-street parking during Peak Hour No Parking periods?*

RQ2: *Is the city still profiting from this practice?*

Seattle Parking Data

Records from January 2012 - present made publicly available and accessible by the City of Seattle

- **Transaction data:** Date/time, duration, payment amount and method (e.g. card, cash, mobile app), meter ID, and blockface ID
- **Blockface data:** Blockface-level paid parking times and rates, Peak Hour restrictions, street capacity, neighborhood, record effective dates



Data Retrieval & Cleaning: Transaction Data

- Used R to download the data for Jan 2012 - Sep 2017:
 - API limits queries to 7 days at a time
 - 300 .csv files, ~16-18 MB each
- Used a .sh script to merge to a single file (5.21 GB, 62.3m rows)
- Cleaning in R:
 - Removed egregious values (e.g. Amount > \$3,000)
 - Data consistency edits (e.g. COINS, CASH → COINS)
 - Added Expiration Time from Transaction Time & Duration
 - Dropped empty and/or irrelevant columns

Data Retrieval & Cleaning: Blockface Data

- Manually downloaded the .csv data file (3.6 MB, 13.7k rows)
- Cleaning in R:
 - Date/Time column formatting:
 - Seconds after midnight → HH:MM:SS
 - mm/dd/yyyy → yyyy-mm-dd
 - 08AM → 08:00:00
 - Adjusted end dates/times to simplify later join operations
 - Dropped empty and/or irrelevant columns

Analysis in R

- Joined the two tables on blockface ID
- Calculated the duration of overlap between:
 - Parking sticker valid times; and
 - Peak hour parking restrictions
(e.g. NO PARKING 3-7 PM)
- Prorated the amount paid by overlap duration / total duration
- Summed the prorated amounts across all transactions



Research Question 1

From Jan 2012 - Sept 2017 Seattle made

\$88,406.22

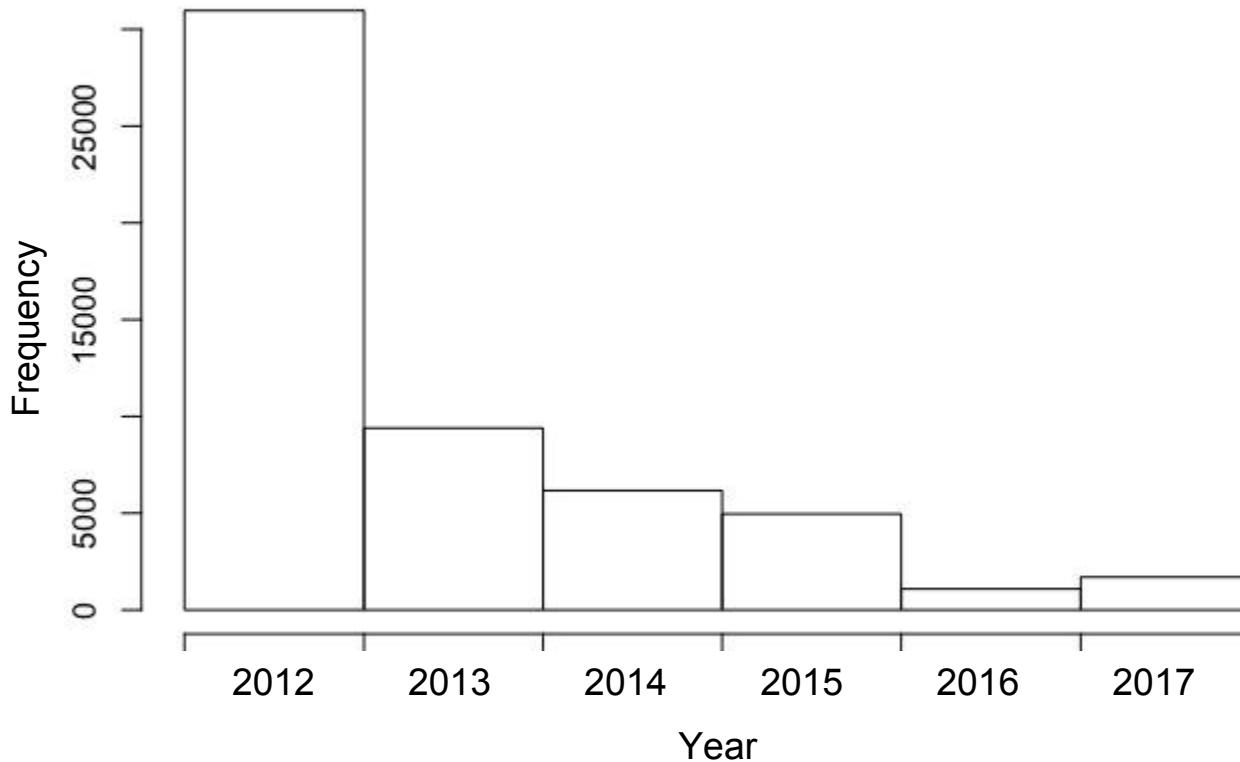
from paid on-street parking
during Peak Hour No Parking periods!

Research Question 2

Is the city still profiting from drivers who pay for parking during Peak Hour No Parking periods?

'No Parking' Transaction Counts by Year

Jan 2012 - Sept 2017

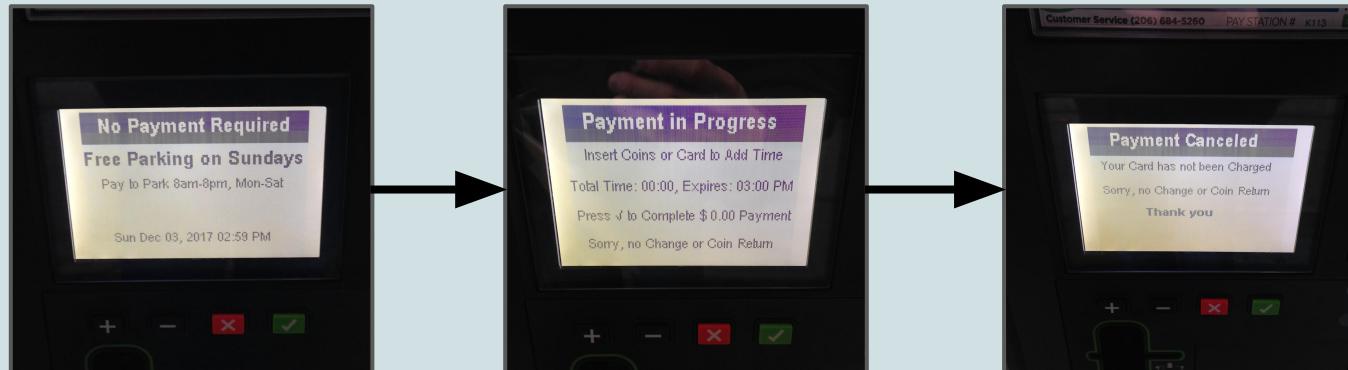


RQ2 Field Study

- Tested meters throughout Ballard, Fremont, Downtown, and the University District; three different meter types represented
- Attempted to pay for parking during the following scenarios:
 - Weekday, before but extending into a Peak Hour restriction
 - Weekday, during a Peak Hour restriction
 - Sunday (free parking day)
- Spent all my hard-earned money from the MTurk assignment...

RQ2 Field Study Results

- Able to overpay (but only slightly) when using coins to purchase parking just prior to Peak Hour restrictions
- Parking sticker expiration did not extend into Peak Hour period
- Unable to purchase parking during Peak Hour restrictions
- Unable to purchase parking on a free parking day (Sunday)



Conclusion

- Seattle made quite a bit of money on bad parking transactions from 2012-2017; probably made even more from 2004-2011
- The major issue raised in the 2009 Times article has been fixed:

Parking stickers are no longer misleading about restrictions
- Field study indicates that minor loopholes still remain; these may explain the lingering non-zero sums in recent years
- The data is quite complex and surprisingly messy; a deeper analysis would be needed to validate and expand this work

Thank you!
Questions?

Disclaimers

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