parkdc

Penn Quarter/Chinatown

Multimodal Value Pricing Pilot and Curbside Management - Salient Features

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Presented to:

SPOTS

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Image courtesy of Mr. T in DC

Outline

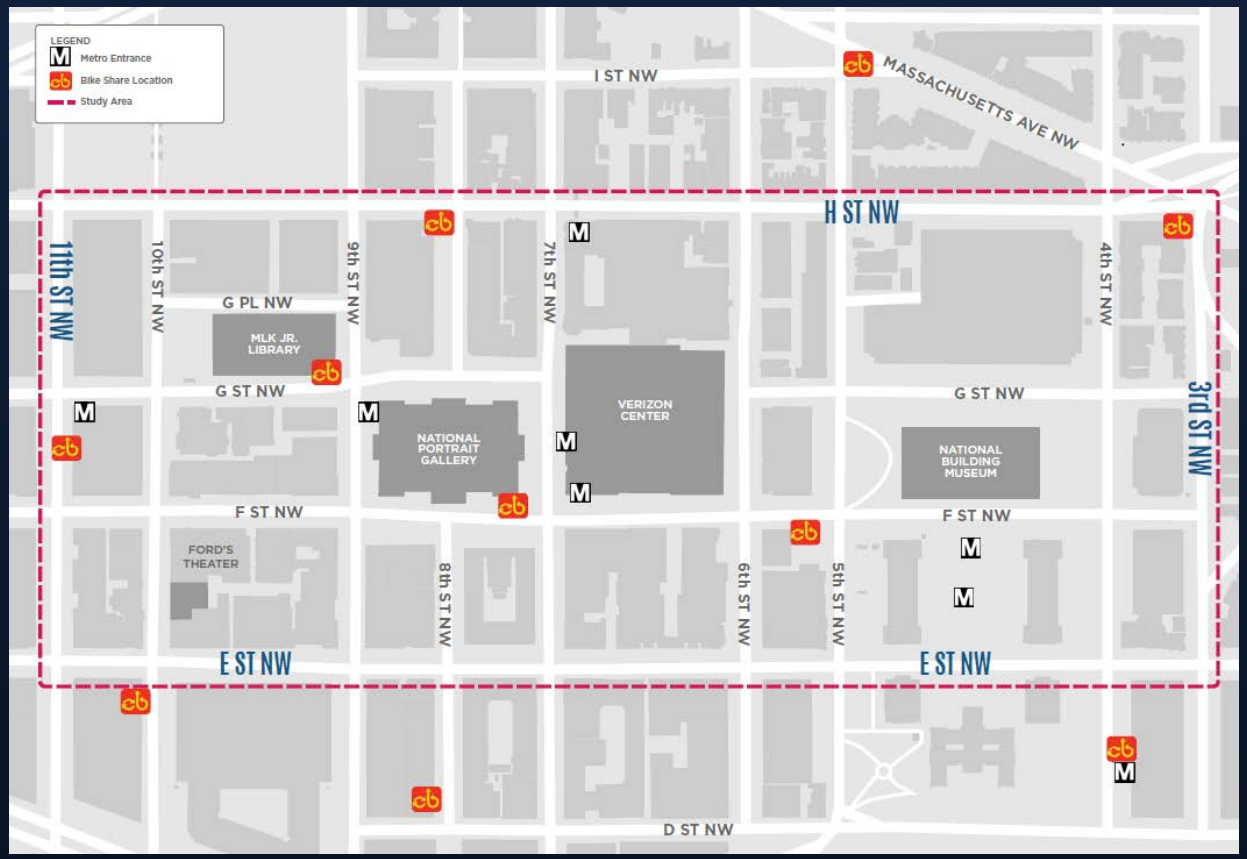
- parkDC: Penn Quarter/Chinatown program overview
- Technology Assessment/System Design
- Impacts of Price Changes
- Wrap Up

PARKDC: PENN QUARTER/ CHINATOWN PROGRAM OVERVIEW

parkDC: Penn Quarter/Chinatown Study Area

The pilot test is only being applied to this initial study area. If DDOT finds a system that works, they will consider extending to other areas of the District.

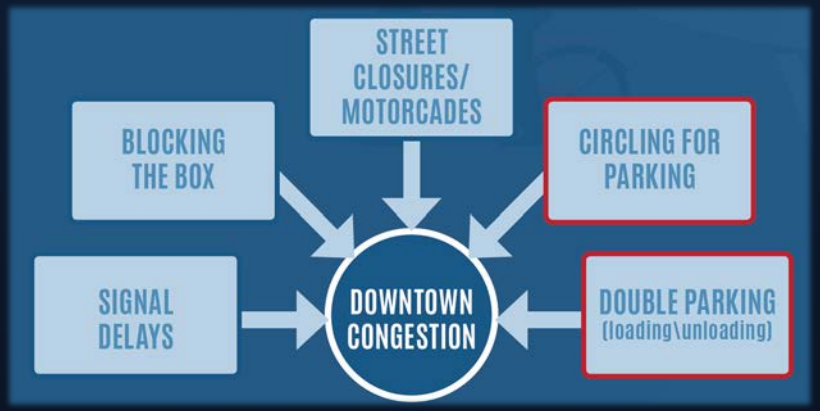
- 114 block faces
- ~1000 metered spaces
- 30 loading zones
- 6 bikeshare stations
- 2 car sharing spaces
- 3 major Metro stations
- WMATA bus stops
- Freeway-arterial Interaction
- Different land uses



parkDC: Penn Quarter/Chinatown Project Goals

- Improved customer experience
- Reduced time to find parking:
  - Increased parking availability
  - More reliable parking information for drivers
- Potential to reduce congestion, increase safety, encourage use of other modes
- Improved turnover of high-demand parking spaces
- Incentives (lower prices, longer time limits) on low-demand parking spaces

Asset lite approach
Multimodal demand pricing



Local Examples of Demand-Based Pricing

I-495 HOT Lanes
(Opened November 2012)

http://www.aaroads.com/guide.php?page=i0495oava

95 Express Lanes
(Opened December 2014)

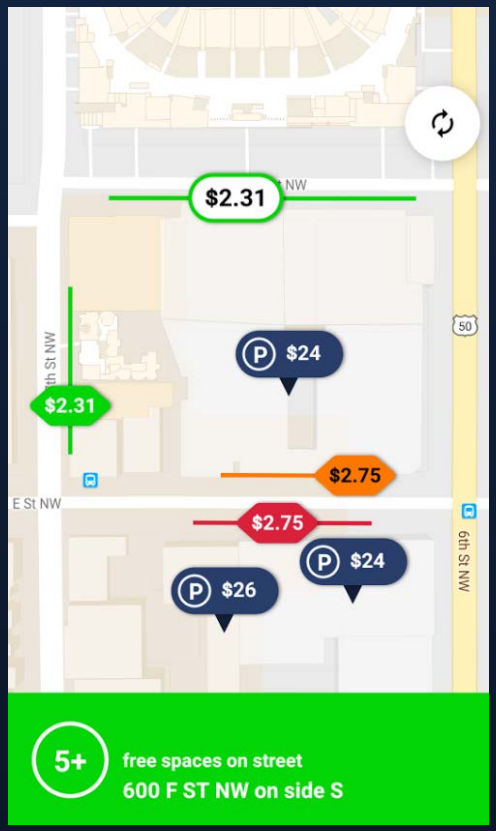
http://www.95expresslanes.com/album/50

WMATA Metrorail
Time of Day Pricing

Monday-Thursday		Friday		Saturday	
5:00 a.m. – 9:30 a.m.	Peak	5:00 a.m. – 9:30 a.m.	Peak	7:00 a.m. – Midnight	Off-Peak
9:30 a.m. – 3:00 p.m.	Off-Peak	9:30 a.m. – 3:00 p.m.	Off-Peak	Midnight – 3:00 a.m.	Peak
3:00 p.m. – 7:00 p.m.	Peak	3:00 p.m. – 7:00 p.m.	Peak		
7:00 p.m. – Midnight	Off-Peak	7:00 p.m. – Midnight	Off-Peak	**Sunday**	
		Midnight – 3:00 a.m.	Peak	7:00 a.m. – Midnight	Off-Peak

Provide parking information

- Information on real-time parking availability to customers via web and apps
  (Arrived Fall 2016!)
- Open data feed so multiple app providers can use
- Work with parking garages to share their data, too



Key Project Milestones

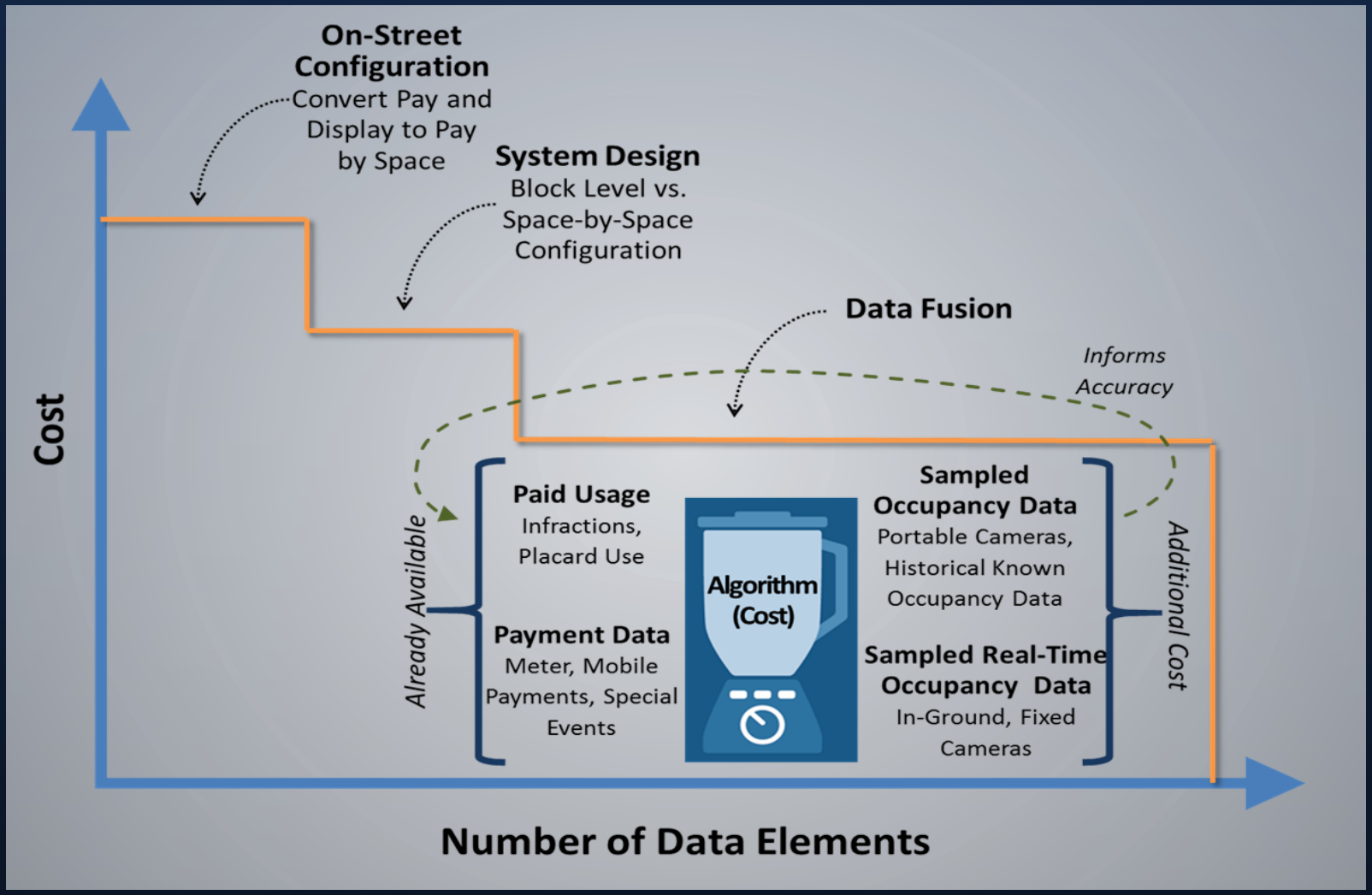
1. Transition to pay-by-space parking
2. Design system to minimize assets
3. Provide new parking communication and signage
4. Implement demand based parking pricing changes
5. Provide parking information
6. Conduct surveys and impact assessments

1. Transition to pay-by-space parking

- Completed end of October 2015
- Improves the customer experience
  No more returning to your car to display a receipt!
- DDOT collected data to determine if pay-by-space affects the number of available parking spaces
  It does not!

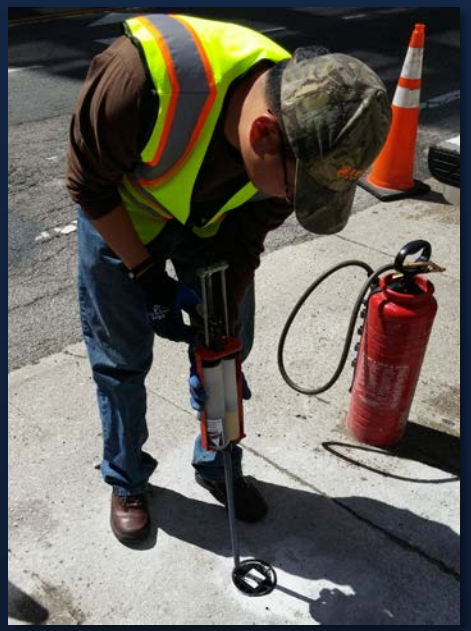
TECHNOLOGY ASSESSMENT / SYSTEM DESIGN

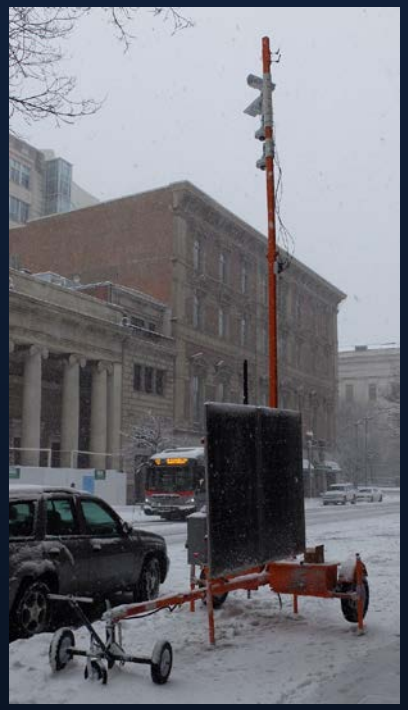
Asset Lite Concept



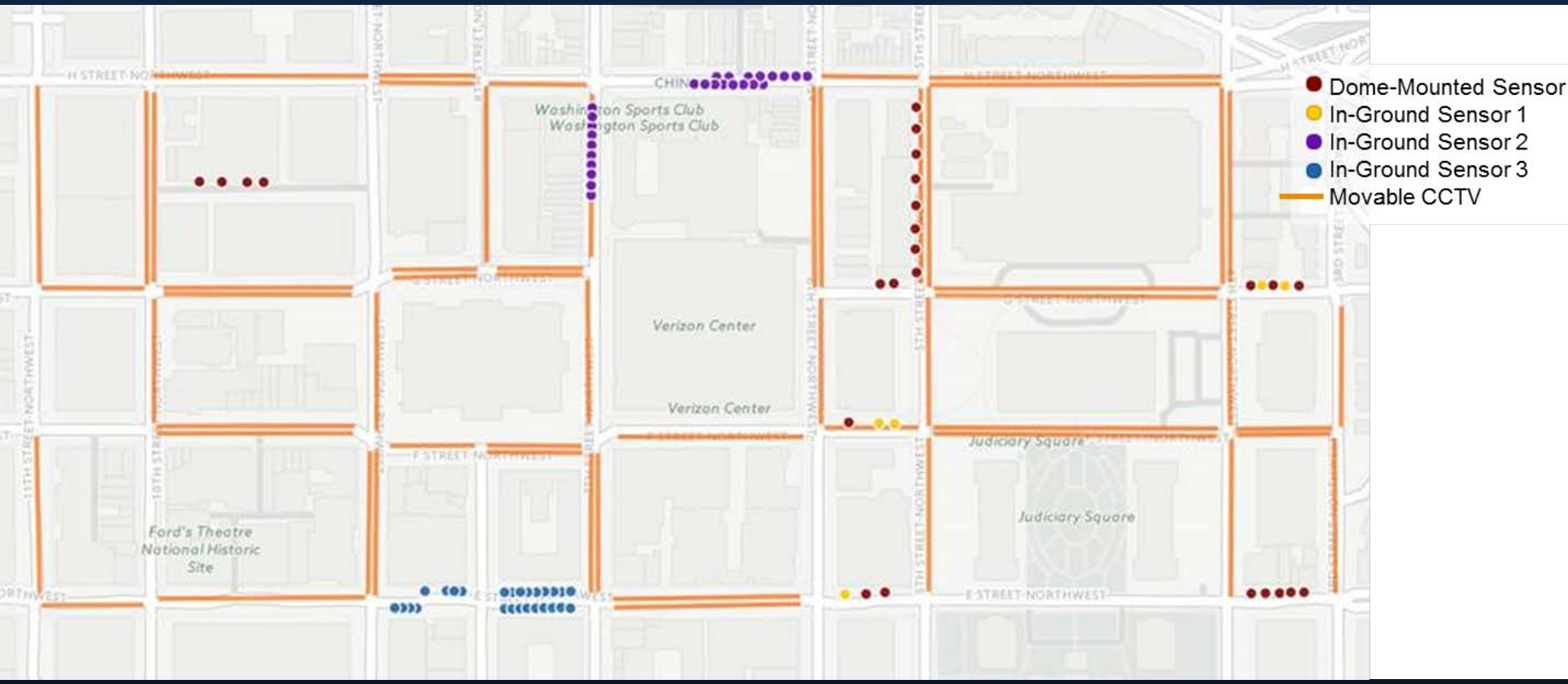
2. Design system to minimize assets

- Technology assessment:
  - Portable cameras throughout 2015
  - Different sensor technologies
- 500 sensors were installed in March of 2016
  - $2.2E^{269}$ possible combinations
- Part of the pilot test is determining the minimum number of sensors required if the program is expanded





Testing Occupancy Detection Equipment
Establishing Occupancy

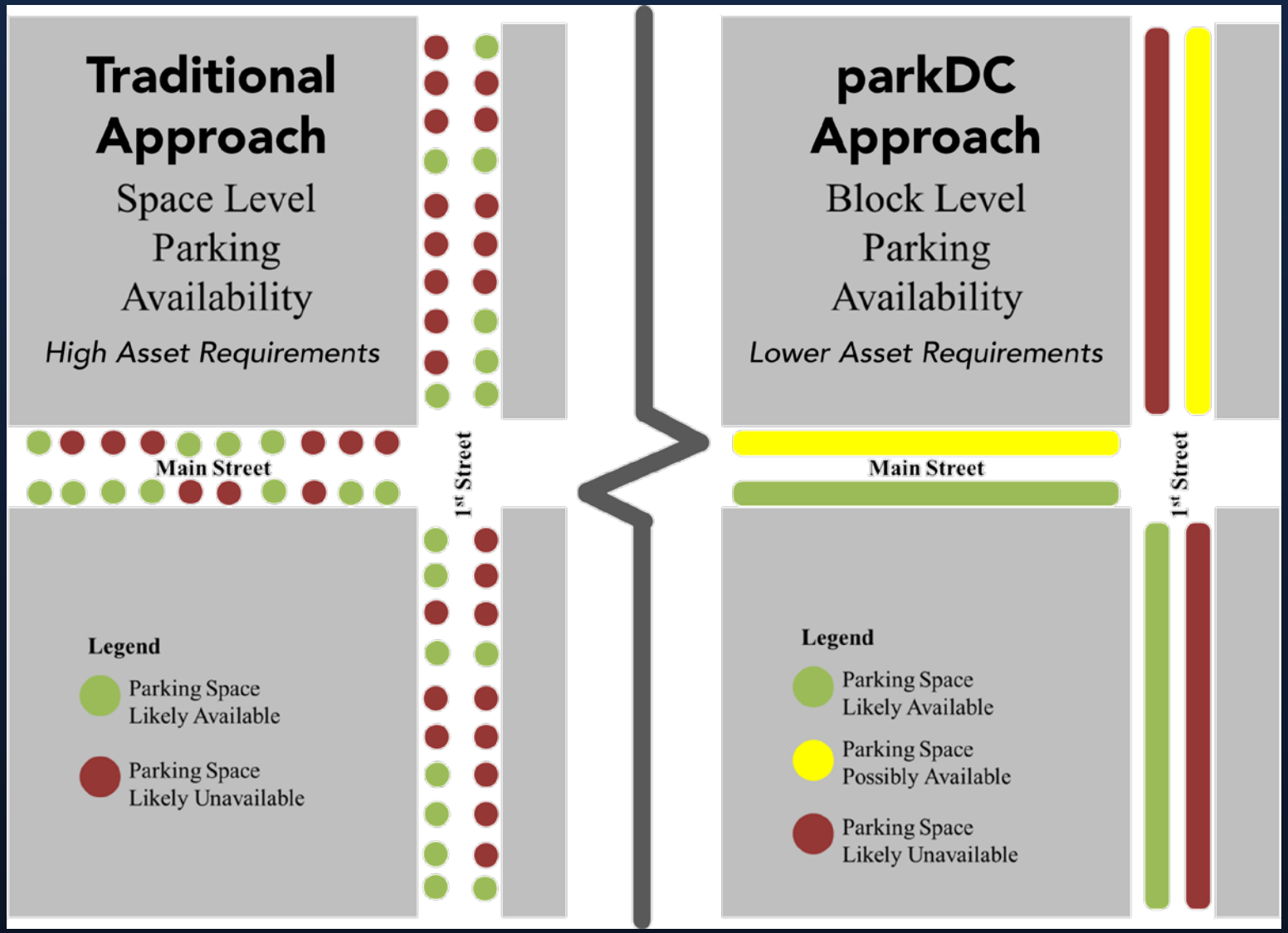


In-Ground Sensor Locations and Communication Equipment

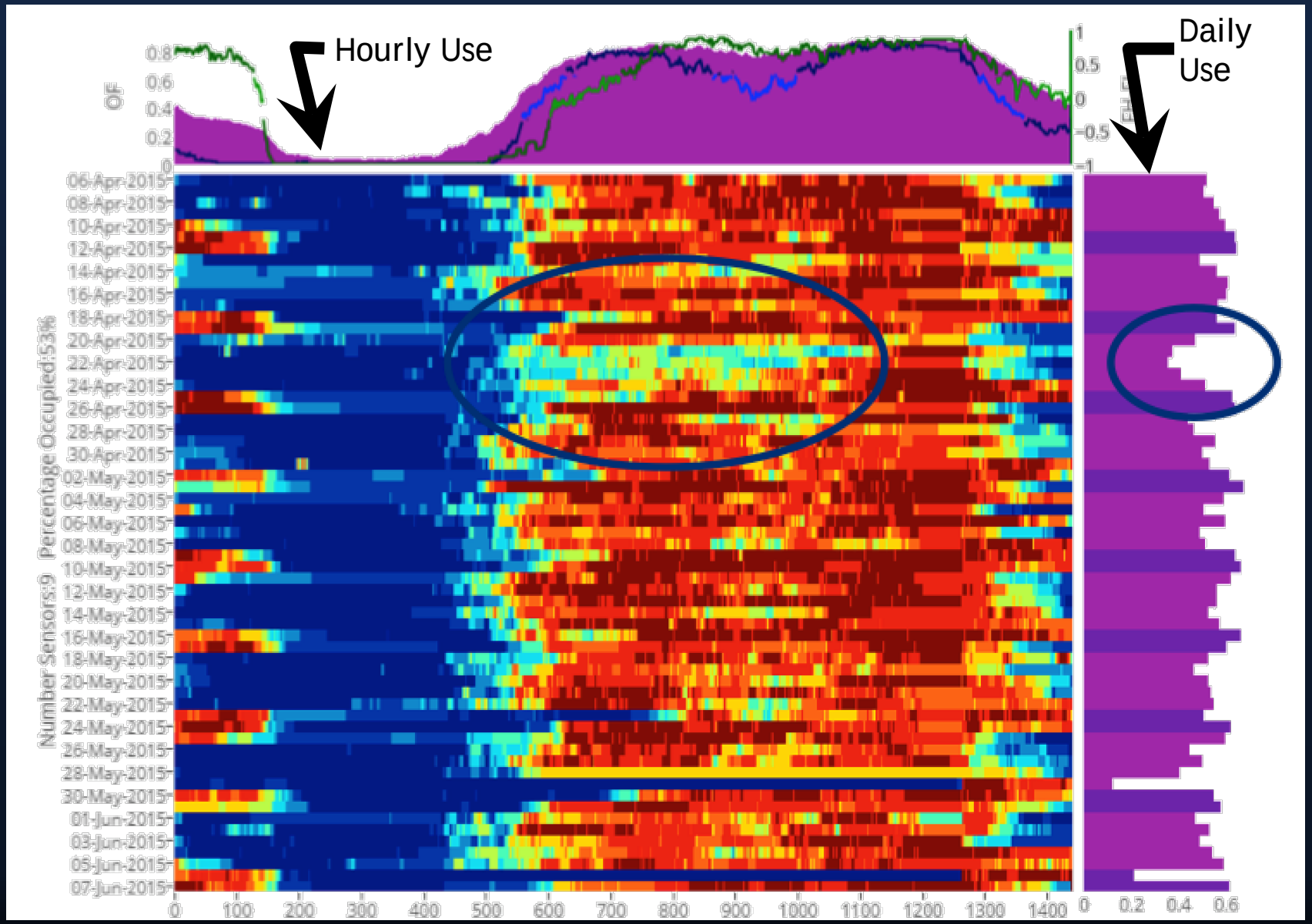
Legend

- Sensor Communication Equipment
- No Sensor Installed
- Sensor Installed

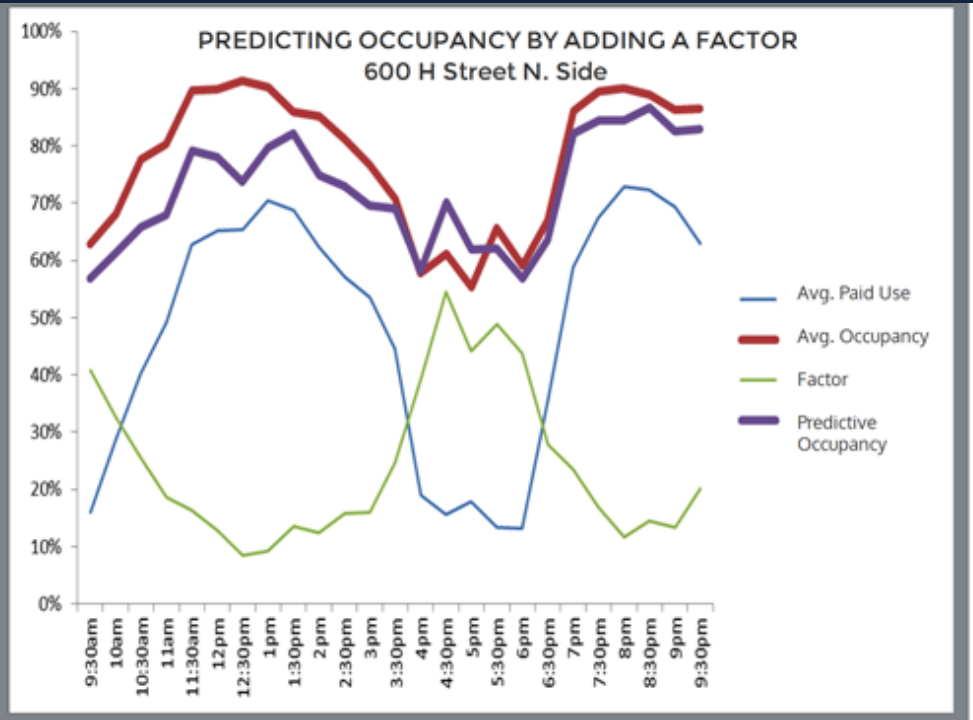
Block Level vs. Space-by-Space Configuration

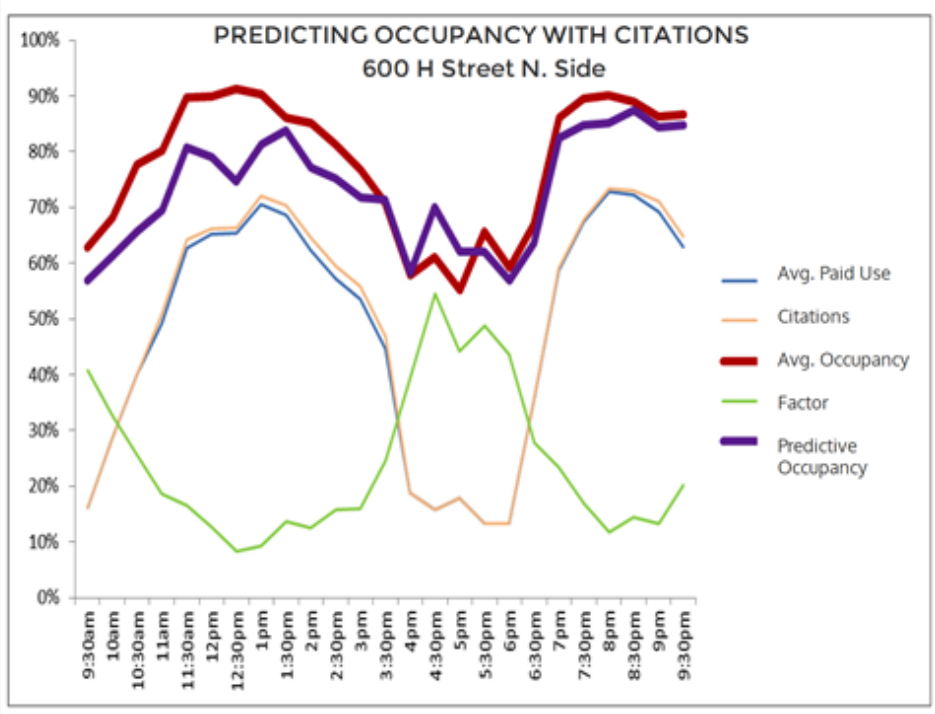


Deviations in a Parking Space

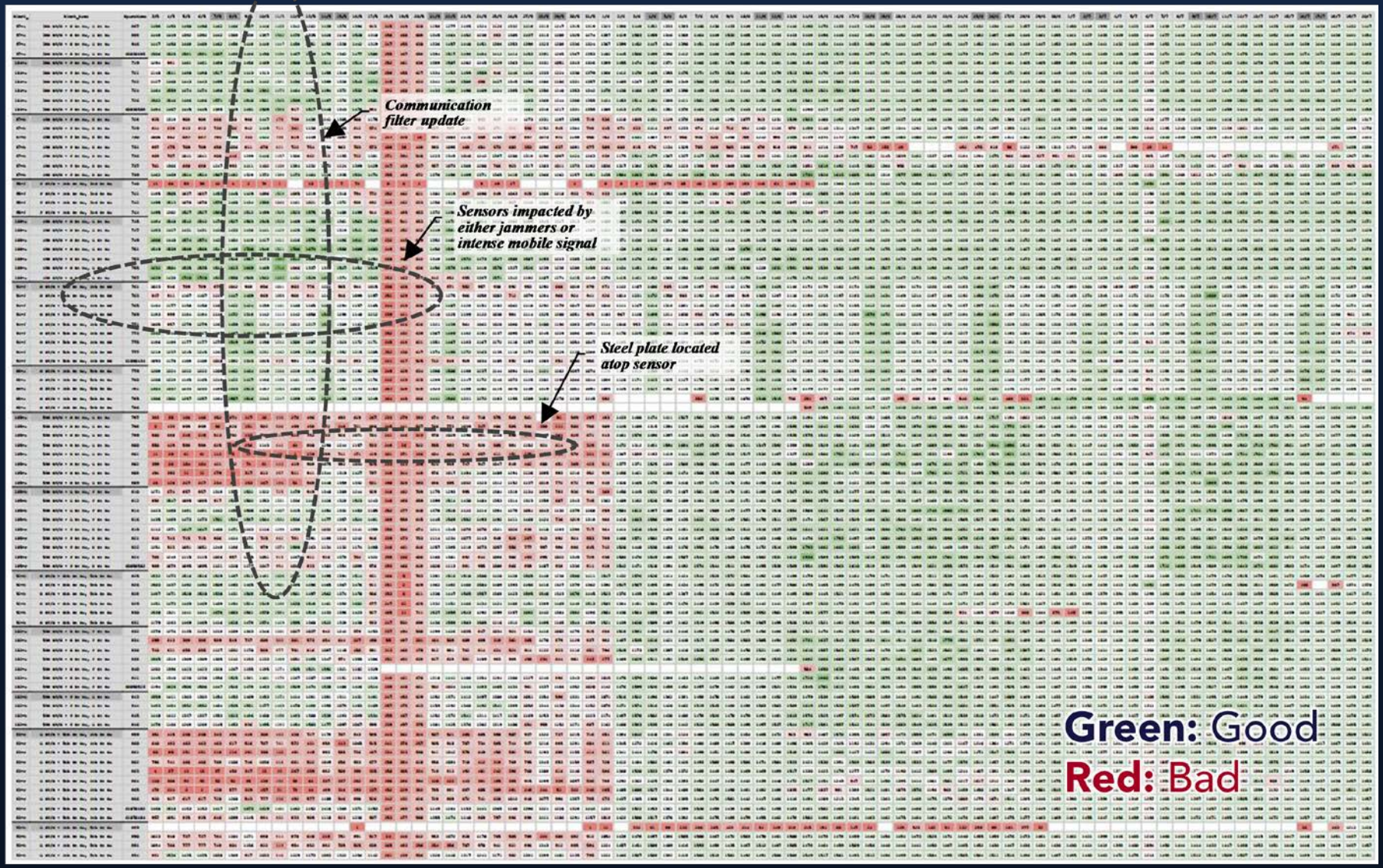


Use of Citations to Help Improve Occupancy Predictions

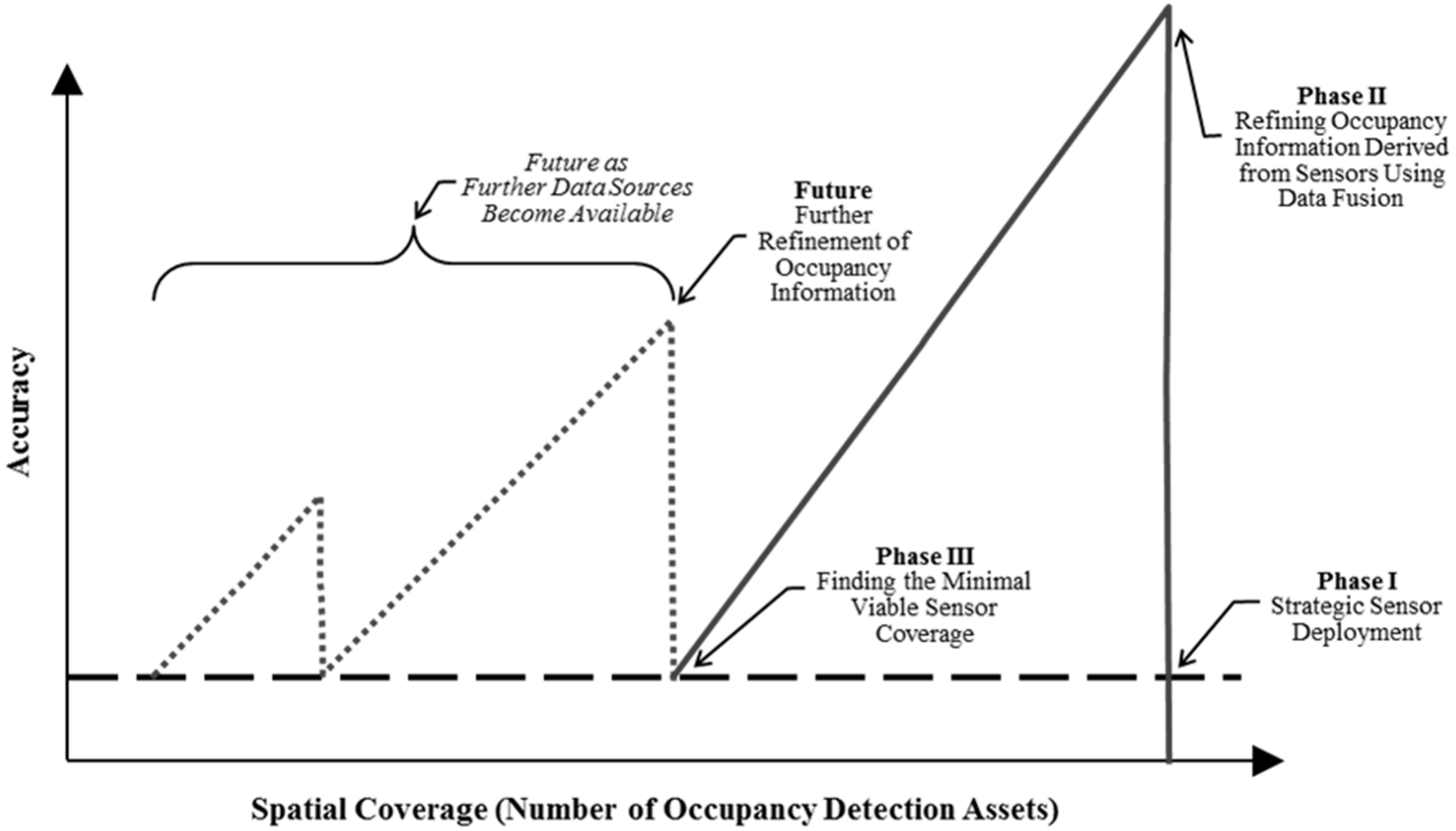




Heart beat of In-Ground Sensors



Data Fusion Framework



Business Rule Summary

Make traveling and parking easier by reducing congestion through a shift in parking demand, increasing availability, and providing drivers with tools to find available parking spaces.

Operations

- Three weekday time bands, one Saturday time band
- Rates may vary by blockface
- Red Top pricing will adjust with blockface pricing, but meter data will not be included in analysis
- Rate changes provided to DDOT 10 days before public announcement
- Public announcement will occur 30 days prior to rate change

Pricing

- Rate changes are once per quarterly (every three months)
- Charge the hourly rate necessary to achieve the right level or parking availability
- Explore time limit increases when rate decreases alone aren't sufficient
- Rate adjustments will be no more than $1.50 up or down

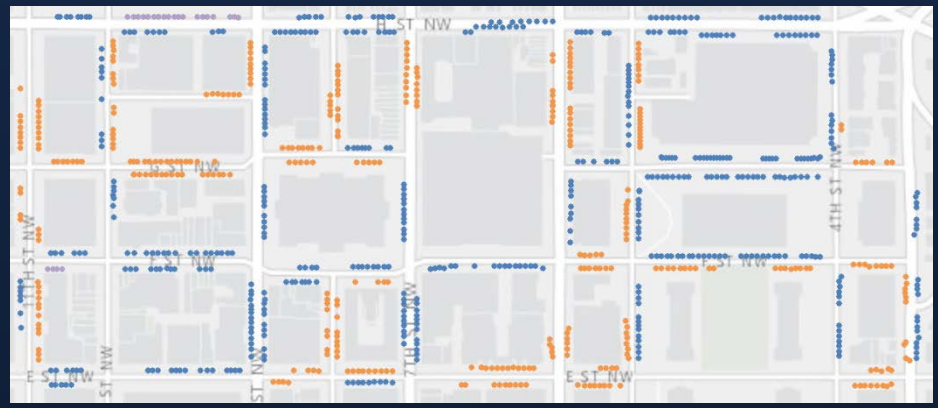
IMPACTS OF PRICING CHANGE

Round 1 Pricing Scheme

(61% same, 13% decrease & 26% increase)

AM Period
(7 AM – 11 AM)

Decrease	15
Same Rate	57
Increase	19



Mid-Day Period
(11 AM – 4 PM)

Decrease	2
Same Rate	45
Increase	44

PM Period
(4 PM – 10 PM)

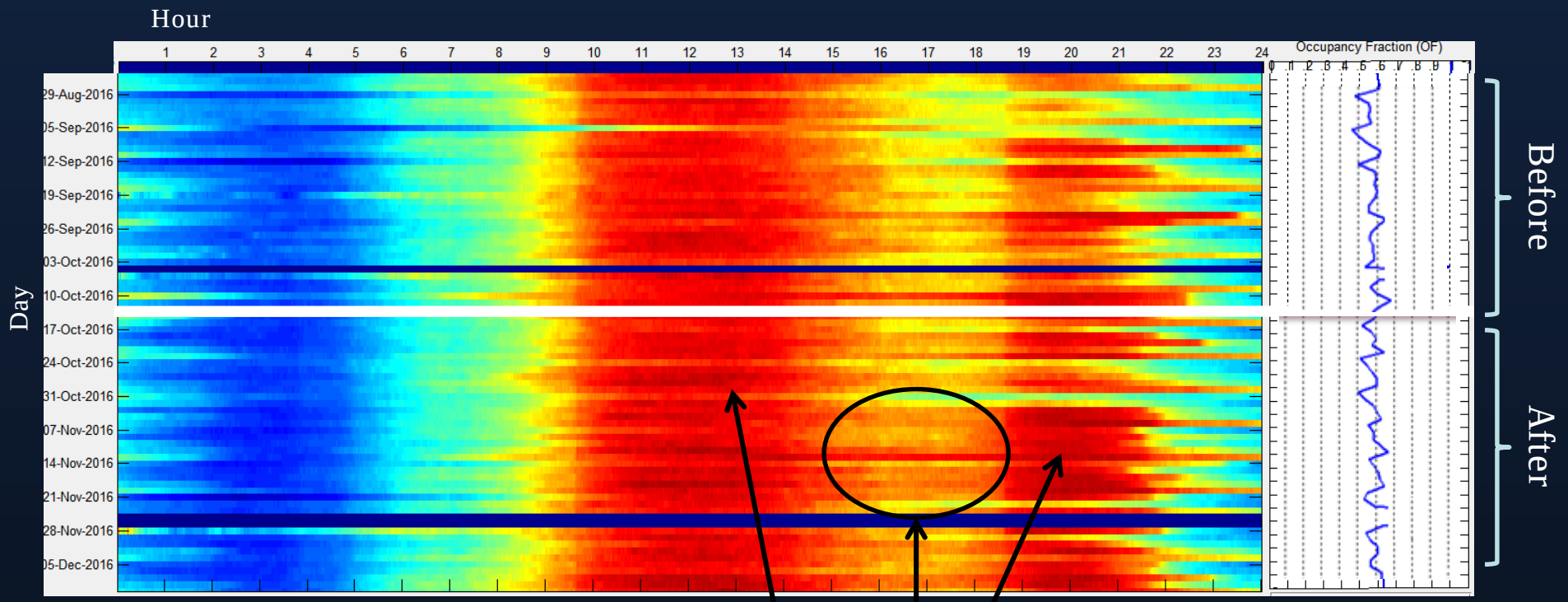
Decrease	15
Same Rate	54
Increase	22

Saturdays
(7 AM - 10 PM)

Decrease	15
Same Rate	67
Increase	9

Occupancy Overall Increased

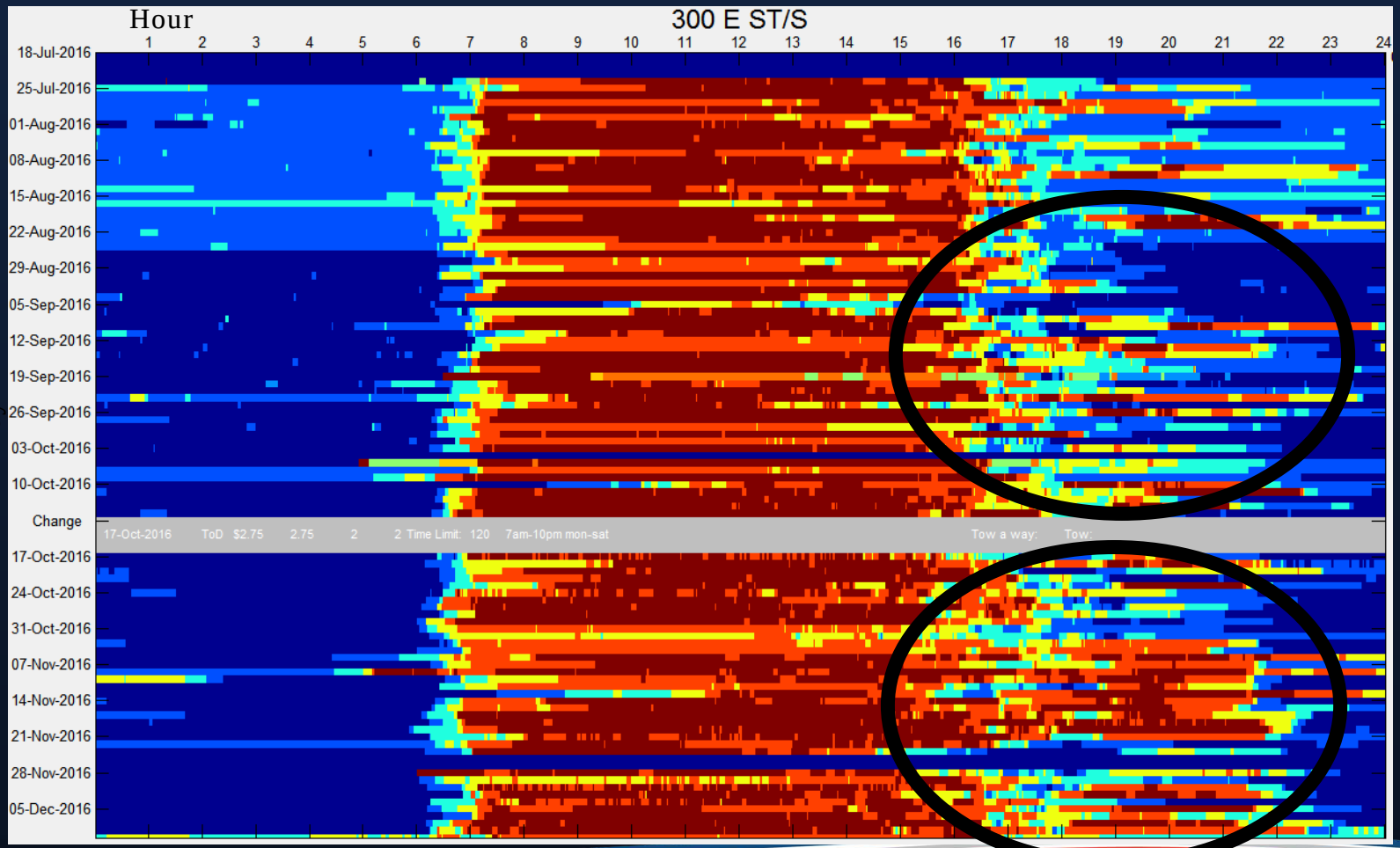
- Looking at all blocks together, see an overall increase in occupancy (more red in chart below)
- Caveats: SafeTrack and the start of the Caps season likely played a role as well



Dark blue is 0% occupancy and Dark red is 100% occupancy.

Some Blocks are Working: 300 E St. South Side

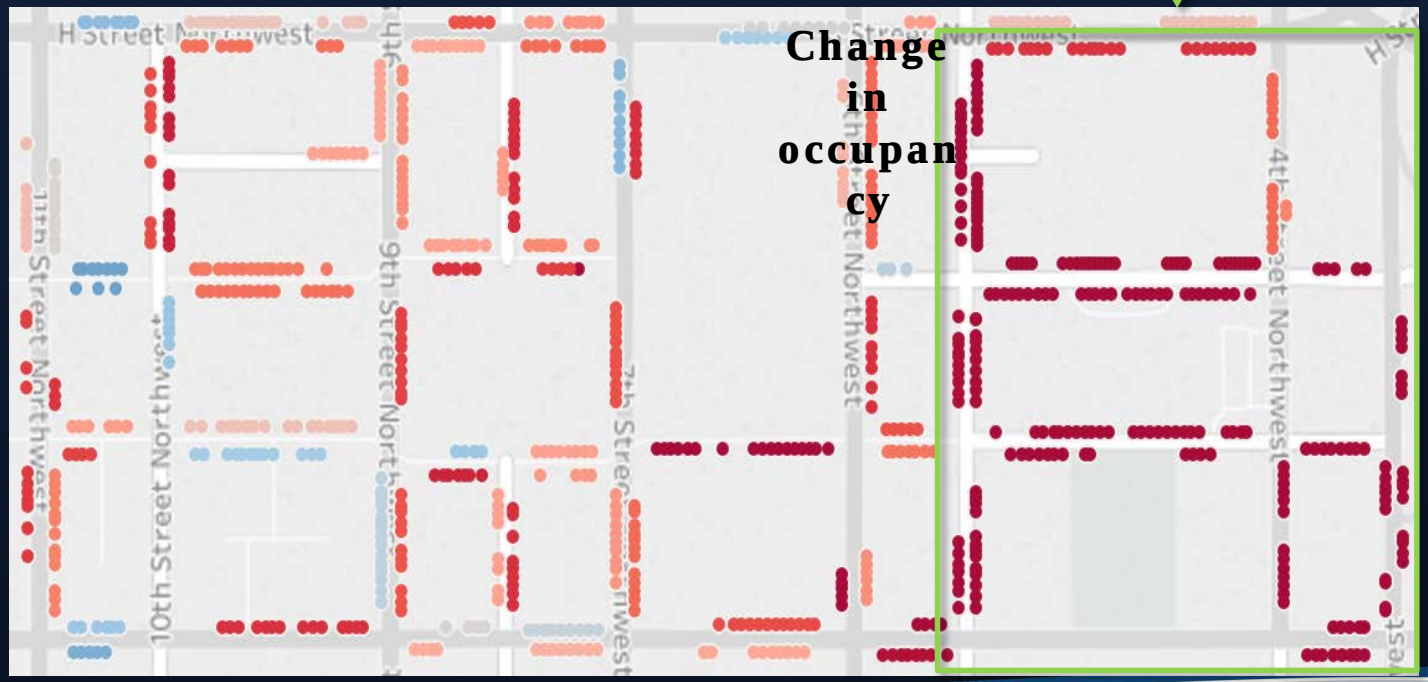
Rates were reduced during weekday PM timeband (4PM -10 PM) in Round 1; Occupancy increased (highlighted); Pricing will remain unchanged in Round 2



Some blocks are working

Round 1 prices

Occupancy increased during the evening and weekend hours in eastern area where prices were lowered



Change in occupancy

Mon-Fri, 4pm-11pm

Prices:

- Purple: $2.00
- Blue: $2.30
- Orange: $2.75

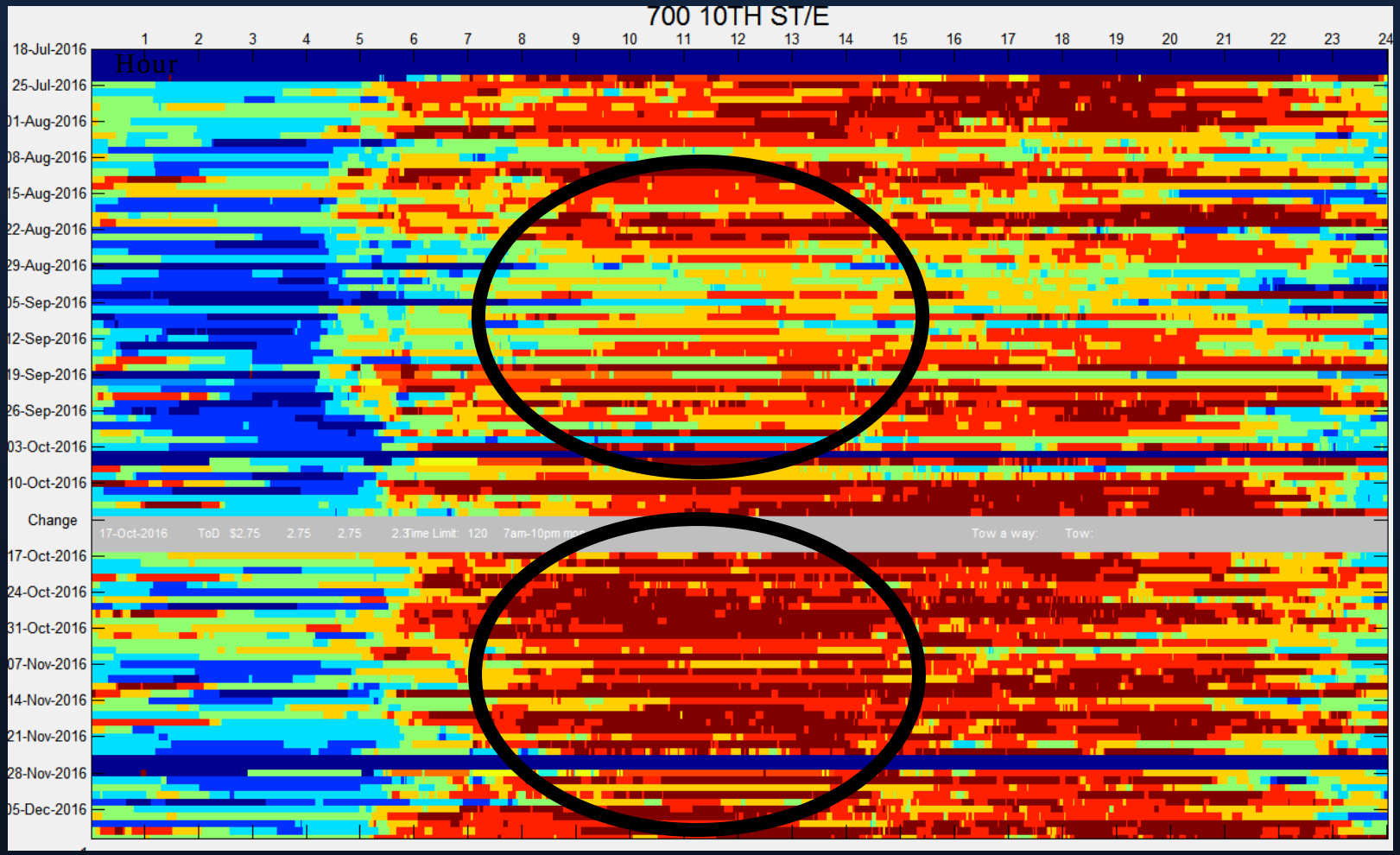
Occupancy

Dark blue: 10% or more *decrease* in occupancy

Dark red: 10% or more *increase* in occupancy

Some Still Need Work: 700 10th St. East Side

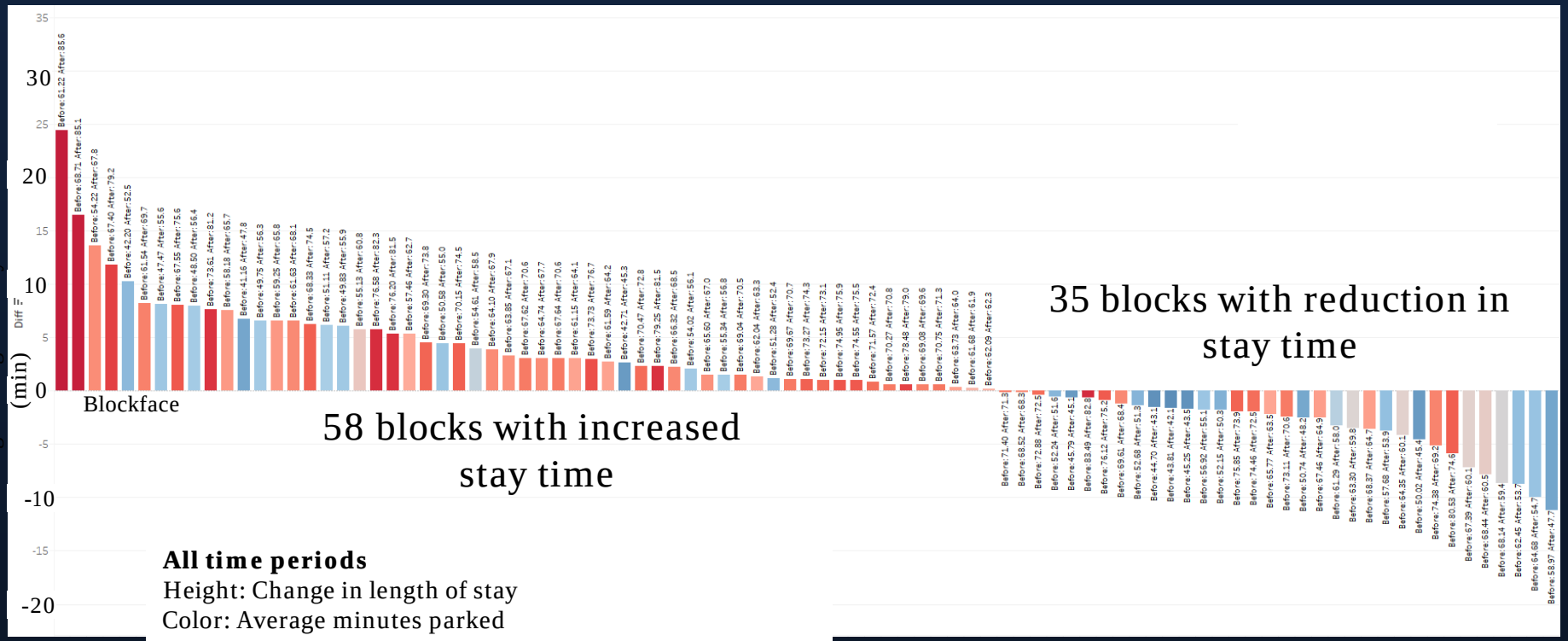
Rates were increased for weekday mid-day timeband (11 AM – 4 PM) during Round 1; Occupancy increased; Proposed price increase again in Round 2



Length of stay increased marginally overall

2 minutes change in average length of stay (comparing 7 weeks before & after change)

- Before Round 1: 63 min
- After Round 1: 65 min



Results were mixed in the higher demand periods

On weekday mornings (7-11am):

Blocks with rate increases

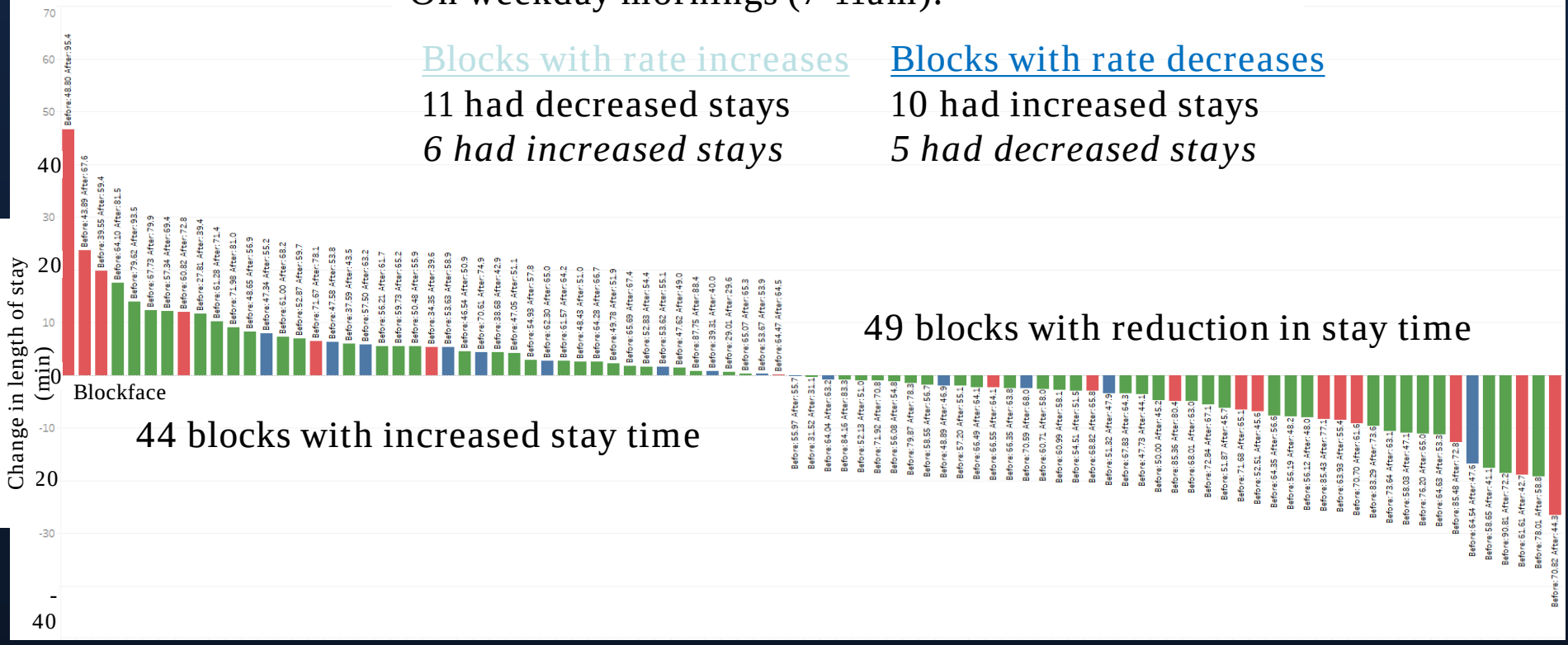
11 had decreased stays

6 had increased stays

Blocks with rate decreases

10 had increased stays

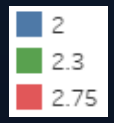
5 had decreased stays



Mon-Fri 7am-11am

Height shows change in length of stay since Round 1 price change

Color shows Round 1 price:



Round 2 Price Structure

No blocks jump two price bands – all blocks move one step up, one step down, or stay steady at their Round 1 prices.

Nearly everything moves consistent with round 1:

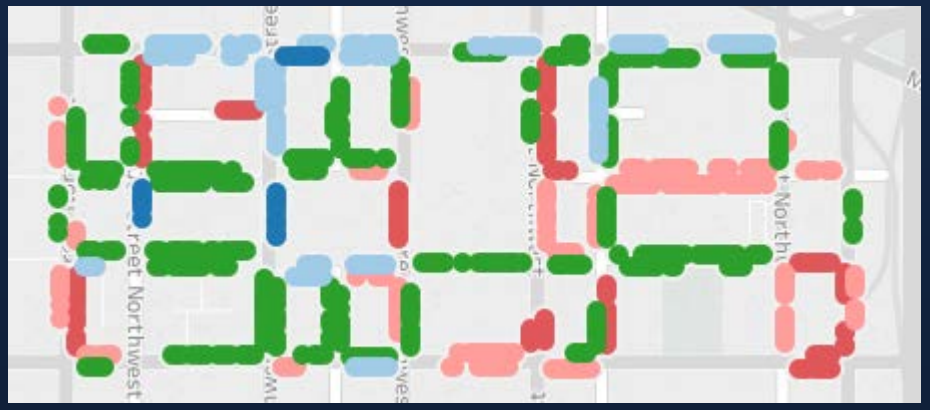
- No blocks that increased to $2.75 go back down to $2.30
- With 2 exceptions in the evening period, no blocks that decreased to $2 go back up to $2.30

Percent of block-faces at each price

Price	7am – 11am	11am – 4pm	4pm – 10pm	Saturday
$1.50	3%	0%	2%	3%
$2.00	16%	3%	12%	14%
$2.30	43%	28%	25%	51%
$2.75	23%	29%	38%	32%
$3.25	14%	40%	23%	0%

From	To	7am – 11am		11am – 4pm		4pm – 10pm		Saturday	
		Parking Spaces	Block-faces	Parking Spaces	Block-faces	Parking Spaces	Block-faces	Parking Spaces	Block-faces
$ 2.00	$ 1.50	26	3	0	0	26	2	28	3
$ 2.00	$ 2.00	100	12	20	2	134	11	163	12
$ 2.00	$ 2.30	0	0	0	0	52	2	0	0
$ 2.30	$ 2.00	44	3	20	1	0	0	22	1
$ 2.30	$ 2.30	412	40	254	26	218	21	456	47
$ 2.30	$ 2.75	155	16	231	19	289	34	172	21
$ 2.75	$ 2.30	0	0	0	0	0	0	0	0
$ 2.75	$ 2.75	39	5	69	8	9	1	58	9
$ 2.75	$ 3.25	123	13	305	37	171	21	0	0

Round 2 Pricing Scheme



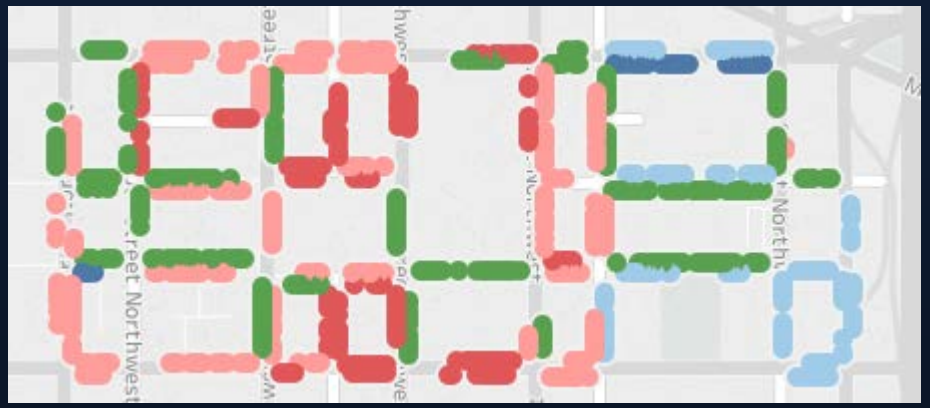
AM Period
(7 AM – 11 AM)

*500 E ST/N not operating in this period

$1.50	3
$2.00	15
$2.30	40
$2.75	21
$3.25	13

Mid-Day Period
(11 AM – 4 PM)

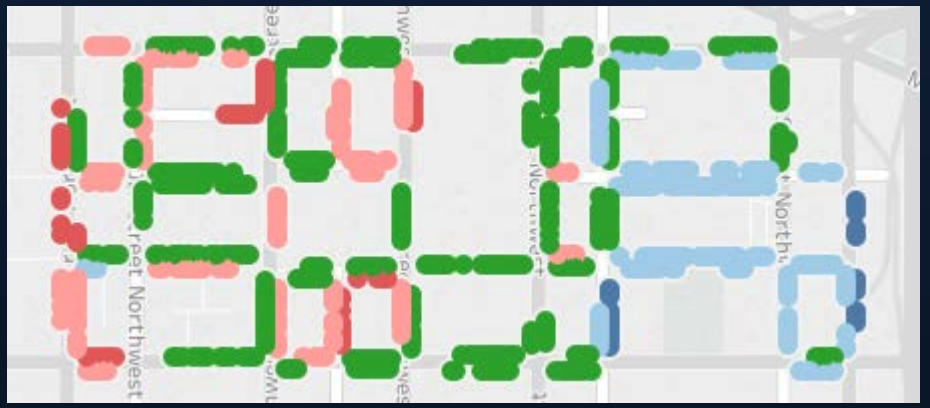
$1.50	0
$2.00	3
$2.30	26
$2.75	27
$3.25	37



PM Period
(4 PM – 10 PM)

*600 F ST/S not operating in this period

$1.50	2
$2.00	11
$2.30	23
$2.75	35
$3.25	21



Saturdays
(7 AM - 10 PM)

$1.50	3
$2.00	13
$2.30	47
$2.75	21
$3.25	9

SCHEDULE AND NEXT STEPS

Key Project Activities and Timeline...

Q3 2014	› Kick off project
Q1 2015	› Prepare project documentation › Develop new signage
Q2&3 2015	› Install “asset lite” parking occupancy detection › Test new systems › Transition to pay by space
Q4 2015	› Perform baseline conditions assessment
Q1 2016	› Install parking occupancy sensor equipment
Q2 2016	› Develop pricing algorithm
Q3 2016	› Install new signage › Implement demand-based parking pricing changes › Provide real-time parking availability information
Quarterly	› Adjust pricing
Q3 2017	› Perform “after” conditions assessment
Q4 2017	› Complete comprehensive impact assessment

QUESTIONS

Mobile Application

THE parkdc APP

CHECK BEFORE YOU GO!

REAL-TIME PARKING PRICING AND AVAILABILITY IN PENN QUARTER / CHINATOWN AREA.

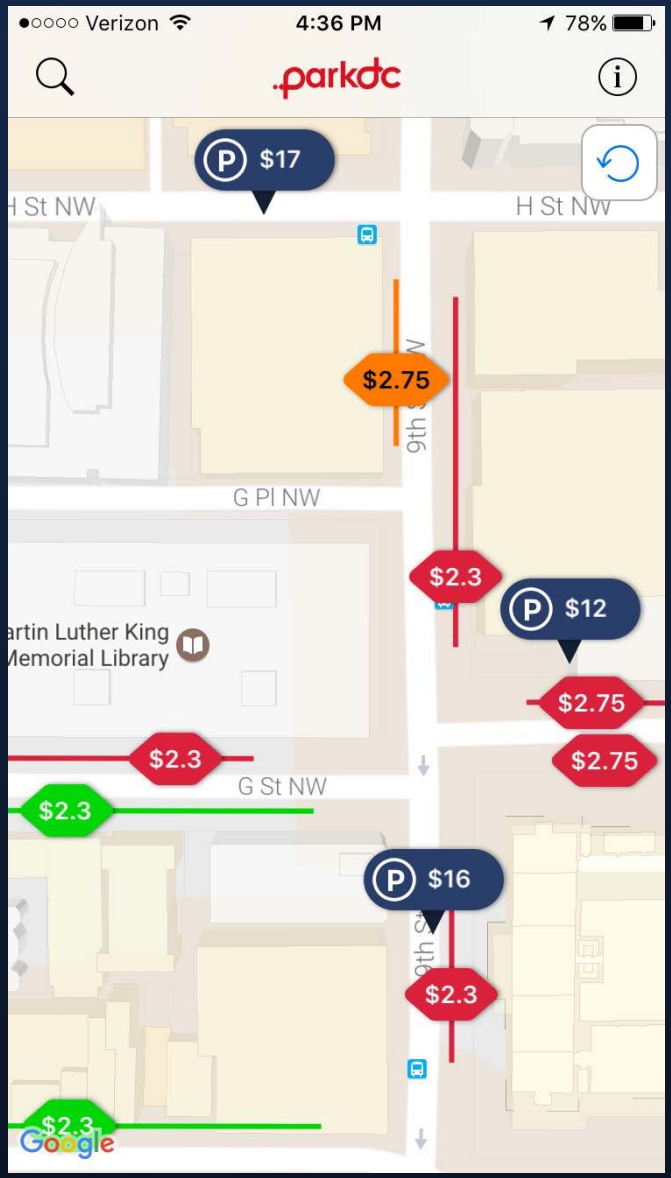
Available on the App Store | Available on the Android App Store | parkdc d. | GOVERNMENT OF THE DISTRICT OF COLUMBIA MURIEL BOWSER, MAYOR

CURRENTLY ONLY CONTAINS INFORMATION FOR PENN QUARTER/CHINATOWN.

ALSO AVAILABLE:

VoicePark Parking Guidance

ridedc trip planner

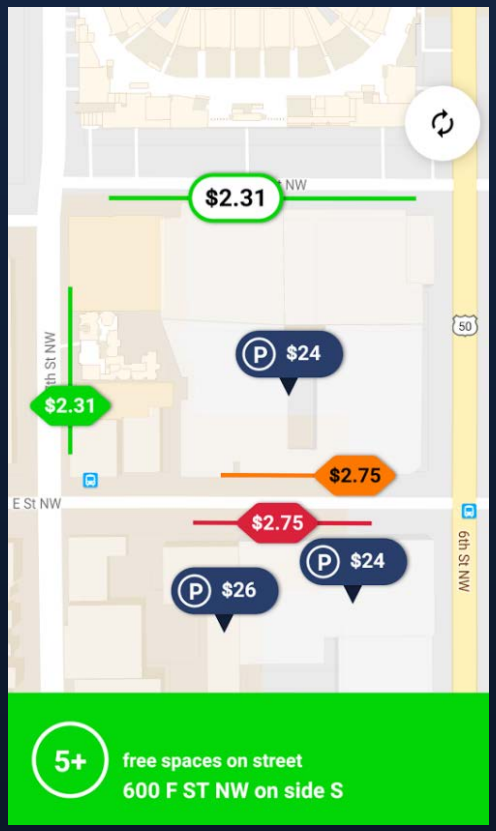


Preliminary Results after First Price Change

- Average occupancy remained similar
  - Reflective of conservative initial price change
  - Occupancy increased significantly on a number of blocks with rate increases
  - The greatest increases in occupancy were on blocks where rates were reduced or held
  - Shifts to underutilized spaces were evident during evenings and Saturdays
  - DDOT attempting to identify effects of Metro SafeTrack and Verizon Center events
- Average stay remained similar
  - Stays generally reduced on blocks with rate increases
  - Stays in eastern portion of pilot with price decreases increased significantly, offsetting reduced stays elsewhere

5. Provide parking information

- Information on real-time parking availability and pricing to customers via web and apps (Arrived Fall 2016!)



6. Conduct surveys and impact assessments

- Survey of business owners/operators, customers, and delivery drivers
- Time to find parking analysis
- Placard usage review
- Cruising for parking evaluation
- Study of traffic volumes, Capital bikeshare data, and Metro Rail and Metrobus ridership to determine effects (if any)
- Assess technology impacts

First Price Change Recommendation

- Scenario 2 recommended for first price change ($2/Hour, $2.30/Hour, $2.75/Hour)
  - Most simplistic price change
  - Easiest to communicate
  - Fewest price changes (up or down)

If close to decrease and increase remain the same rate

s1	
Decrease L..	15
Increase Le..	19
Same	57

s2	
Decrease Le..	2
Increase Lev..	44
Same	45

s3	
Decrease Le..	15
Increase Lev..	22
Same	54

sWeekend	
Decrease Le..	15
Increase Lev..	9
Same	67

Week	
Decrease Le..	5
Increase Lev..	16
Same	70

Everything that is ±0.05 to the threshold is considered close to increase or decrease.