Penn Quarter/Chinatown

Multimodal Value Pricing Pilot and Curbside Management - Salient Features



Presented by: Soumya S. Dey, P.E., PMP Associate Director, DDOT

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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



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

95 Express Lanes (Opened December 2014)

I-495 HOT Lanes (Opened November 2012)



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



WMATA Metrorail Time of Day Pricing

Monday-Thursday		Friday Saturday		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 realtime 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-byspace parking
- **3.** Provide new parking communication and signage
- 5. Provide parking information

- 2. Design system to minimize assets
- 4. Implement demand based parking pricing changes
- 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
 - 2.2E²⁶⁹ 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





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

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Data Fusion Framework



Spatial Coverage (Number of Occupancy Detection Assets)



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



1. What We Did

Round 1 Pricing Scheme



AM Period	Decrease	15
AM Period (7 AM – 11 AM)	Same Rate	57
(7 AM - 11 AM)	Increase	19



PM Period (4 PM – 10 PM)

Decrease	15
Same Rate	54
Increase	22

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



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)

2. What Happened

Caveats: SafeTrack and the start of the Caps season likely played a role as well



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

2. What Happened





Round 1 prices

.......



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



Mon-Fri, 4pm-11pm Prices:

- Purple: \$2.00
- Blue: \$2.30
- Orange: \$2.75
- Occupancy
 - Dark blue: 10<u>% or</u>
 - more *decrease* in

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



2. What Happened

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





2. What Happened 🤳

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



27

2. What Happened 🤚

Results were mixed in the higher demand periods



Mon-Fri 7am-11am

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





3. What Comes Next

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

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%	5)%
\$2.75	23%	29%	38%	32%
\$3.25	14%	40%	23%	0%

Percent of block-faces at each price

		7am –	11am	11am	– 4pm	4pm –	10pm	Satu	rday
From	То	Parking Spaces	Block- faces	Parking Spaces	Block- faces	Parking Spaces	Block- faces	Parking Spaces	Block- faces
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\$ 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
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3. What Comes Next Round 2 Pricing Scheme



	\$1.50
IM Period	\$2.00
7 AM – 11 AM)	\$2.30
*FOO E CT /N not on anoting in this pariod	\$2.75

*500 E ST/N not operating in this period

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



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



Mid-Day Period (11 AM – 4 PM)

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



SCHEDULE AND NEXT STEPS



Key Project Activities and Timeline...

Q3 2014	>	Kick off project
Q1 2015	>	Prepare project documentation
	>	Develop new signage
	>	Install "asset lite" parking occupancy detection
Q2&3 2015	>	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
	>	Install new signage
Q3 2016	>	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





CURRENTLY ONLY CONTAINS INFORMATION FOR PENN QUARTER/CHINATOWN.

ALSO AVAILABLE:









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 realtime 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.

Close to Decrease Level 1 Close to Increase Level 1 Decrease Level 1 Decrease Level 2 Increase Level 1 Increase Level 2 Same