Best Practices in Parking Pricing

• **Audio:**
  – Via Computer - No action needed
  – Via Telephone – Mute computer speakers, call 1-866-863-9293 passcode 47214728

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• **Audience Q&A** – addressed after each presentation, please type your questions into the chat area on the right side of the screen


• **Upcoming Webinars:**

• **Recordings and Materials from Previous Webinars:**
<table>
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<th>Webinar Title</th>
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<tbody>
<tr>
<td>November 10, 2011</td>
<td>Best Practices in Parking Pricing</td>
</tr>
<tr>
<td>December 15, 2011</td>
<td>Results of the Urban Partnership and Congestion Reduction Demonstration Programs</td>
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</tbody>
</table>
Best Practices in Parking Pricing

Federal Highway Administration (FHWA) Webinar Series:
Overcoming the Challenges of Congestion Pricing

Allen Greenberg
FHWA Office of Operations
February 23, 2012
Overview

• Many dimensions of underpriced parking and its consequences
• Broad range of parking pricing strategies available
• Value Pricing Pilot Program support of different parking pricing strategies
• Focus on “performance pricing” for on-street parking in this Webinar
Problem

Parking costs are typically hidden from drivers, who therefore see few if any opportunities to save on such costs. Subsidized and hidden parking costs lead to increased driving, more vehicle ownership, and substantially higher housing costs.
Problem Manifestation

• Minimum parking requirements for housing substantially increase costs and reduce supply

• Minimum use-based commercial and office parking requirements hinder redevelopment and raise costs

• Over 90% of private employers subsidize employee parking, while only 6% subsidize transit
Solution (1)

Eliminate parking requirements, enabled by pricing on-street parking (differently for visitors and residents) to ensure appropriate availability, thereby eradicating the “parking spillover” rationale for such requirements.
Solution (2)

Enact state laws or local ordinances to require employers who choose to subsidize employee car parking to offer a similar “cash out” subsidy to employees using alternative transportation.
SAFETEA-LU Pricing

• The Value Pricing Pilot (VPP) Program sets aside $3 million of the $12 million annual program budget “only for congestion pricing pilot projects that do not involve highway tolls,” including parking pricing among other strategies.
VPP Program Support:

• Parking cash-out and “right sizing parking” in King County
• On-street parking pricing in New York City
• “Flexible” monthly parking in Minneapolis
• University parking pricing at Stanford and Cal Berkeley
• Combining “unbundling of parking” with carsharing in residential buildings in San Francisco
• SF park “performance parking” pilot
VPP Program Newly Funded:

• Delivery vehicle real-time parking availability information and reservations and occupancy-based pricing in Seattle

• Evaluation of comprehensive, area-wide parking pricing strategies as a form of “cordon pricing” in San Francisco
VPP Program Parking Future:

• Considering nine parking applications out of a total of 23 applications for FY 2012 funding

• Current applications cover a broad range of parking strategies, including employer commute benefits, multimodal on-street parking management, priced park-and-ride parking, and parking pricing modeling and evaluation using new tools

• Program funding announcement is expected in June 2012
The High Cost of Free Parking

DONALD SHOUP
Cruising for Cheap Curb Parking
Central Parking System
55 West 26th St
License No: 1096744
Capacity: 140
Hours of operation
24 hours/7 days

Day & Night Rates
Up to 1 hour 16.90
Up to 2 hrs 18.59
Up to 10 hrs 25.34
Max to 24 hrs 42.24
O'sized/vans/SUV's/4x4's addl 8.45

Monthly Rates
Regular 464.64
Main floor addl 84.47
O'sized/vans/SUV's/4x4's addl 84.47
Motorcycles 211.20
18.375% Parking tax extra

Off-street: $20/hour
Curb: $1/hour
Cruising for cheap curb parking

Suppose you want to park for 1 hour. Curb parking costs $1. Off-street parking costs $20. How long would you be willing to cruise for curb parking rather than pay the higher price for off-street parking?
<table>
<thead>
<tr>
<th>Year</th>
<th>City</th>
<th>Share of traffic cruising (percent)</th>
<th>Average search time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1927</td>
<td>Detroit</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>1927</td>
<td>Detroit</td>
<td>34%</td>
<td></td>
</tr>
<tr>
<td>1934</td>
<td>Washington</td>
<td>8.0</td>
<td></td>
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<tr>
<td>1962</td>
<td>New Haven</td>
<td>17%</td>
<td></td>
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<tr>
<td>1965</td>
<td>London</td>
<td>6.1</td>
<td></td>
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<td>1966</td>
<td>London</td>
<td>3.5</td>
<td></td>
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<td>1966</td>
<td>London</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>1977</td>
<td>Freiburg</td>
<td>74%</td>
<td></td>
</tr>
<tr>
<td>1984</td>
<td>Jerusalem</td>
<td>9.0</td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>Cambridge</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>Cape Town</td>
<td>12.2</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>New York</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>New York</td>
<td>10.2</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>New York</td>
<td>13.9</td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>San Francisco</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>Sydney</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>Los Angeles</td>
<td>68%</td>
<td></td>
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<td>2007</td>
<td>New York</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>New York</td>
<td>45%</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>New York</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>Barcelona</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td><strong>34%</strong></td>
<td><strong>7.5</strong></td>
</tr>
</tbody>
</table>
Cruising in New York

Researchers interviewed drivers who were stopped at traffic lights.

Are you searching for curb parking?

28 percent of drivers on a street in Manhattan said they were searching for curb parking.

45 percent of drivers on a street in Brooklyn said they were searching for curb parking.
What is the right price for parking on the street?

The price is too high if many curb spaces are vacant because businesses will lose potential customers.
The price is too low if no spaces are vacant because drivers will congest traffic and pollute the air as they circle the block searching for an open space.
The price is just right if one or two curb spaces are usually open on every block because drivers can always find convenient parking at their destinations.
The Goldilocks principle of curb parking prices.
Performance Parking Prices

The right price for curb parking is the *lowest* price that will leave one or two vacant spaces on each block—performance pricing.

Performance prices adjust over time to maintain a few vacant spaces.

The goal is to keep about 85 percent of the parking spaces occupied all the time.

About one curb space is vacant on each side of each block so that everyone can see that convenient parking is available everywhere.
Get the prices right

UNDERPRICED CURB PARKING
ALL CURB SPACES OCCUPIED
CRUISING FOR PARKING
AVERAGE SEARCH TIME = 3.3 MINUTES

RIGHT-PRICED CURB PARKING
1 OF EVERY 8 SPACES VACANT
NO CRUISING
AVERAGE SEARCH TIME = 0
Before SFpark

Block A - Central Business District Location - 0 Open Spots

Block B - Nearby Location - 3 Open Spots

After SFpark

Block A - Central Business District Location - 1 Open Spot

Block B - Nearby Location - 2 Open Spots
Civic Center Pilot Area

Meter Rate Changes December 2011

- $0.25 increase
- no change
- $0.25 decrease
- $0.50 decrease
Higher prices for special events

Some areas host large, well-publicized events that greatly increase the demand for parking. Concerts, conventions, parades, street festivals, sports events.

Curb parking prices for special events can range up to $18/hour.

Curb parking prices will be based on surveys of the prices at private off-street parking for the events.
PAY BY SPACE

PAY BY:
CREDIT CARD

CASH
EXACT BILLS REQUIRED $1, $5 ONLY

REMEMBER
NO IN AND OUT PRIVILEGES
NOT TRANSFERABLE
PAY STATION TICKETS ARE ONLY VALID IN DESIGNATED PAY STATION AREAS
MUST DISPLAY PAY STATION PASS ON DASHBOARD AT ALL TIMES
VIOLATORS ARE SUBJECT TO CITATION 21134 CVC
Stall: 05769
Press Number on Keypad to Select Options:

1)  2 Hours $7.00
2)  1 Hr 30 Min $5.00
3)  1 Hour $3.00
4)  40 Minutes $2.00
5)  20 Minutes $1.00
Parking is well used but readily available.
STOP THE PARKING METER HIKE!

Make the rich pay, not the workers!
Don’t squeeze workers and small business.

An attack is underway, in San Francisco to push the burden of the economic crisis onto the workers. Transportation officials are attempting to extend metered parking to midnight and Sundays.

In Oakland, a popular movement of small business owners and workers stopped the city’s plans to raise parking rates. We can fight back and win!

With this proposal, for almost 24-hours a day your car will be subject to heavy fines. Parking tickets are already astronomical.

THIS IS A TAX ON THE PEOPLE!
It’s time to organize and defeat the parking meter robbery!

Join the campaign! Call the ANSWER Coalition at 415-821-6545
www.ANSWERsf.org • ANSWER@answersf.org

¡ALTO AL AUMENTO DE LOS PARQUIMETROS!

¡Hagan que los ricos paguen, no los trabajadores!
¡No aprieten a los trabajadores y negocios familiares!

Un ataque está ocurriendo en San Francisco, para poner el peso de la crisis económica sobre los trabajadores. Oficiales de transporte están intentando extender las horas de los parquimetros hacia medianoche y los domingos.

En Oakland, un movimiento popular de las comunidades, de los trabajadores y de los negocios pequeños detuvieron gran parte de los planes de esa ciudad para aumentar las tarifas de los parquimetros. ¡Sí podemos luchar y ganar!

Con esta propuesta, por casi 24-horas al día su coche será sujeto a tarifas altísimas. Multas ya sonastronómicas.

¡ESTO ES UN IMPUESTO ILEGAL A LA GENTE!
¡Es la hora para organizarnos y derrotar el robo por los parquimetros!

¡Únete a la campaña! Llame a la Coalición ANSWER al 415.821.6545
www.ANSWERsf.org • ANSWER@answersf.org
STOP THE WAR IN AFGHANISTAN NOW!
Protest U.S./NATO War in Afghanistan on 9th Anniversary of Invasion

As the U.S./NATO war in Afghanistan enters its tenth year, casualties on both sides are at an all-time high. Spending on the war in Afghanistan alone is over $2.5 billion per week—that’s $2,500,000,000 every week—at a time when tens of millions of people have lost their jobs, housing, healthcare and pensions here, and most Afghani people live in extreme poverty.

Join us on Oct. 6 to say NO to war, racism and all bigotry, and YES to meeting the needs of the people!
2. Revenue Return
Ventura parking ordinance

A program of managing on-street and off-street parking to achieve a 15% vacancy rate. Using metered parking to achieve a vacancy rate of 15% eliminates the need for time restrictions on those metered parking spaces.

All moneys collected from parking meters in this city shall be placed in a special fund, which fund shall be devoted exclusively to purposes within the geographic boundaries of the parking district from which the revenue is collected.
All net revenue from the pay stations will be used for a cleaner and safer Downtown:

- Downtown security
- Parking lot and alley improvements
- Clean sidewalks
- Landscape beautification

See map below for Free Public Parking lots located throughout Downtown.
Downtown Merchants Support the Parking Meters!

Downtown Ventura, May 5, 2011 - The overwhelming consensus downtown is that the meters are working! Downtown business owners were interviewed and business surveys were conducted over the past two weeks along Main Street in downtown Ventura. The downtown merchants gave the managed parking system a thumbs up with 83% surveyed in support of the meters, 13% neutral, and 4% not in support the meters.

In addition, the revenue generated from the meters is being reinvested into the downtown. The funds help pay for a dedicated police officer and nine police cadets. This has resulted in an overall decrease in crime by 40% and a 15% decrease in calls for service. Funds are also used for new improvements like additional lighting for parking lots, new planters and plant materials, and a cross-the-street banner planned for installation this summer.

Free Wi-Fi is yet another benefit made possible by the meters. Residents and visitors can stay “connected” through the outdoor network provided by the Downtown Parking Management program.
As our case is new, so must we think anew, and act anew.

Abraham Lincoln
The SFMTA
What is parking like in San Francisco?
How did we get here?
What is the SFMTA doing about it?
Demonstrating a new approach to parking
Parking census

### Inner Mission Parking Supply

<table>
<thead>
<tr>
<th>Publicly Available Off-Street Parking</th>
<th>Plan Area Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paid Publicly Available</td>
<td>1,054</td>
</tr>
<tr>
<td>Free Publicly Available</td>
<td>82</td>
</tr>
<tr>
<td>Permit Holder Only</td>
<td>2,018</td>
</tr>
<tr>
<td>Customer Parking Only</td>
<td>1,931</td>
</tr>
</tbody>
</table>

**On-Street Parking**

- **Metered Area Parking**
  - < 30 mins: 34
  - 1 - 2 hrs: 735
  - Commercial Loading: 133
  - Motorcycle: 75

- **Non-Permit Parking**
  - 2 hr time limit: 101
  - No time limits: 3431

- **Permit Parking -- Areas S, I, or W**
  - Non-permitted parking restrictions: 645
  - 1 hr time limit: 454
Managing employee parking

City & County of San Francisco

OFFICIAL BUSINESS PERMIT
Expires June 30, 2011

#GB 000001

This permit is valid while performing official City and County business within San Francisco.
If properly displayed vehicle may park at parking meters without depositing payment.
Time limits on parking meters and all other parking regulations will be enforced.
Coin and card meters
Parking sensors
Real-time information
Pricing at parking meters and lots

- Demand responsive to find lowest possible prices
- Gradual and periodic changes: $0.25 up or down every 4-6 weeks
- Time of day pricing (vary by block + weekday/end)
Demand responsive rate adjustments
## Demand responsive rate adjustments

### Rate changes by metered hours

<table>
<thead>
<tr>
<th></th>
<th>1&lt;sup&gt;st&lt;/sup&gt; rate change</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; rate change</th>
<th>3&lt;sup&gt;rd&lt;/sup&gt; rate change</th>
<th>4&lt;sup&gt;th&lt;/sup&gt; rate change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up $0.25/hr</td>
<td>26%</td>
<td>25%</td>
<td>27%</td>
<td>26%</td>
</tr>
<tr>
<td>No change</td>
<td>42%</td>
<td>37%</td>
<td>38%</td>
<td>39%</td>
</tr>
<tr>
<td>Down $0.25/hr</td>
<td>28%</td>
<td>30%</td>
<td>29%</td>
<td>30%</td>
</tr>
<tr>
<td>Down $0.50/hr</td>
<td>4%</td>
<td>7%</td>
<td>6%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Pricing at SFpark parking garages
Low-tech demand-responsive pricing

Occupancy data can come from

- Parking sensors
- Parking meters
- Manual surveys
Enforcement
Initial revenue evaluation (new meters/time limits)
Garage wayfinding + advertising
Automatic data collection

• Supply data (census, asset management, street closures)
• Parking data (from sensors, meters, and citations)
• Garage data (usage by hour)
• Travel demand data (roadway sensors, highways PEMS, BART, Muni)
• Muni data (travel time data from APCs)
• Parking tax
• Sales tax
• Safety (SWITIRS collision data)
• Exogenous (fuel price, CPI, unemployment, precipitation)
Manual data collection

• Parking search time
• Double parking
• Disabled placard
• Occupancy in residential areas
• Motorcycle occupancy
• Vehicle occupancy
• Intercept surveys (professional survey firm)
Data management and analytics

Data inputs:
- Cars counted in/out at parking garages
- Parking sensors
- Roadway sensors
- Existing parking meters
- Smart parking meters

Data transfer:
- Vendor systems for garage management
- Vendor systems for sensor management
- SFMTA parking meter data management system
- Vendor systems for meter management

Data warehouse and processing:
- Data collection / transformation by SFMTA
- Parking enforcement handheld data feed
- Parking citation processor
- Data warehouse and business intelligence tool

End users:
- Variable message signs
- SFMTA operational reports and alerts
- SFpark.org
- JSON/REST Open data feed
- Mobile applications (e.g., iPhone)
- Text message
- Analysis and evaluation
What’s next

Through Spring 2012
• Roll out pay by phone (citywide)
• Continue to develop business intelligence tool
• Continue to improve and document business processes

Spring through late 2012
• Initiate variable message signs
• Accelerate sharing and dissemination of lessons learned
• Develop proposal for expanding SFpark citywide
• Release RFPs
• Evaluate pilot projects
High level lessons learned

• Focus on availability (not turnover)
• Shifting how people think about parking takes time
  – Extensive outreach
  – Branding is useful
• Having a transparent, rules-based, and data-driven approach helps
• SFpark is essentially a complex IT undertaking
• Parking equipment is not plug and play
Sharing our resources
Thank you

Jay Primus
jay.primus@sfmta.com
SFMTA
DDOT Value Pricing Initiatives

by
Damon Harvey, Actg. Citywide Program Manager
Soumya Dey, P.E., Deputy Associate Director

Webinar on Best Practices in Parking Pricing
February 23, 2012
What is Performance Based Parking?

Performance parking is a curbside management strategy DDOT began in March 2008 in the Ballpark District of Ward 6.

Performance parking works by adjusting the rates and/or the time restrictions on metered blocks while protecting the parking supply on surrounding residential and mixed used corridors through increased residential parking enforcement.
In 2011, DDOT and COG enhanced the data collection methodology and approach by generating per block occupancy and turnover rates based on actual manual counts instead of mathematical formulas measuring curbside footage. The purpose of this data collection effort was to determine the impact of performance parking in the vicinity of the Washington Nationals Ballpark in southeast and Near Southeast DC.

<table>
<thead>
<tr>
<th></th>
<th>DISTRICT OF COLUMBIA</th>
<th>MARYLAND</th>
<th>VIRGINIA</th>
<th>OTHER STATES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TOTAL CURBSIDE OCCUPANCY BY ZONE</td>
<td>TURNOVER RATE BY STATE PER ZONE</td>
<td>TOTAL CURBSIDE OCCUPANCY BY ZONE</td>
<td>TURNOVER RATE BY STATE PER ZONE</td>
</tr>
<tr>
<td>AWAY GAMES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZONE A</td>
<td>1,553</td>
<td>31%</td>
<td>590</td>
<td>12%</td>
</tr>
<tr>
<td>ZONE B</td>
<td>811</td>
<td>32%</td>
<td>316</td>
<td>13%</td>
</tr>
<tr>
<td>ZONE C</td>
<td>2,321</td>
<td>45%</td>
<td>412</td>
<td>8%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4,685</td>
<td>37%</td>
<td>1,318</td>
<td>10%</td>
</tr>
<tr>
<td>HOME GAMES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZONE A</td>
<td>1,917</td>
<td>34%</td>
<td>714</td>
<td>12%</td>
</tr>
<tr>
<td>ZONE B</td>
<td>1,078</td>
<td>24%</td>
<td>778</td>
<td>17%</td>
</tr>
<tr>
<td>ZONE C</td>
<td>3,135</td>
<td>44%</td>
<td>568</td>
<td>8%</td>
</tr>
<tr>
<td>TOTAL OR AVG.</td>
<td>6,130</td>
<td>35%</td>
<td>2,060</td>
<td>12%</td>
</tr>
</tbody>
</table>

TABLE 1: BALLPARK DISTRICT TOTAL CURBSIDE OCCUPANCY BY STATE WITH TURNOVER RATES ON ALL BLOCKS (with duplicate registration numbers not removed)
## EXECUTIVE SUMMARY: 2010 TOP TEN HIGHEST CURBSIDE OCCUPANCY RATES BY HUNDRED BLOCK ON NATIONALS GAME DAYS

<table>
<thead>
<tr>
<th>ZONE</th>
<th>HUNDRED BLOCK</th>
<th>STREET NAME</th>
<th>PARKING SPACES PER BLOCK SEGMENT</th>
<th>AVERAGE OCCUPANCY</th>
<th>MAXIMUM OCCUPANCY</th>
<th>TURNOVER RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>900</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>M Street, SW</td>
<td>3</td>
<td>10</td>
<td>16</td>
<td>533%</td>
</tr>
<tr>
<td></td>
<td>1600</td>
<td></td>
<td>6</td>
<td>16</td>
<td>19</td>
<td>317%</td>
</tr>
<tr>
<td></td>
<td>1100</td>
<td></td>
<td>8</td>
<td>11</td>
<td>21</td>
<td>263%</td>
</tr>
<tr>
<td>B</td>
<td>900</td>
<td>Half Street, SE</td>
<td>5</td>
<td>7</td>
<td>11</td>
<td>220%</td>
</tr>
<tr>
<td>B</td>
<td>1000</td>
<td></td>
<td>24</td>
<td>14</td>
<td>67</td>
<td>279%</td>
</tr>
<tr>
<td>B</td>
<td>1200</td>
<td></td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>200%</td>
</tr>
<tr>
<td>A</td>
<td>UNIT</td>
<td></td>
<td>8</td>
<td>19</td>
<td>46</td>
<td>209%</td>
</tr>
<tr>
<td>A</td>
<td>1500</td>
<td>Half Street, SW</td>
<td>22</td>
<td>22</td>
<td>34</td>
<td>155%</td>
</tr>
</tbody>
</table>

Data collectors used two or three private vehicles outfitted with LPR systems traveling the same routes continuously for eight hour intervals for three consecutive days, including a Saturday or Sunday. This consists of a digital camera, a laptop computer, a video conversion unit (to convert images from the camera into a format acceptable for computer processing) and a global positioning system (GPS) unit.
2011 Curbside Occupancy Rate
There are 44 blocks within the Columbia Heights pilot zone

- 32 or 73% of the blocks have an occupancy rate below 85%
- 12 or 27% of the blocks have an occupancy rate at or above 85%
- 6 blocks have multi space meters (MSMs) with variable hours of operation
- 3 MSM blocks or 50% have an occupancy rate at or above 85%

There are 44 blocks within the Columbia Heights pilot zone

The average turnover in the Columbia Heights pilot zone is 2:47
- 1:58 is the average turnover on multi space meter (MSM) blocks
- 2:52 is the average turnover on non metered streets in pilot zone
Data Collection Process and Outcomes

The remaining nine blocks with occupancy rates at or above 85% are:
- 3000 block of 13th Street: 113%
- 3300 block of 13th Street: 85%
- 1200 block of Columbia Road: 86%
- 1500 block of Columbia Road: 140%
- 1200 block of Irving Street: 113%
- 1300 block of Irving Street: 110%
- 1200 block of Monroe Street: 86%
- 1300 block of Monroe Street: 86%
- 1200 block of Park Road: 92%

<table>
<thead>
<tr>
<th>D.C.</th>
<th>Maryland</th>
<th>Virginia</th>
<th>Other or unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>42%</td>
<td>785</td>
<td>406</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16%</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1635</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>34%</td>
</tr>
</tbody>
</table>
Beginning in March 2012 DDOT will begin performance based parking on all meters along the H Street, NE corridor from 3rd Street, NE to 15th Street, NE/Benning Road, NE. Performance based parking is a curbside management strategy DDOT has used since March 2008 with the introduction of the first pilot zone in the Ballpark District of Ward 6.
DDOT is working with Council member Tommy Wells’ office to have a public kick off meeting during the first two weeks of February. At this event the department will provide an overview of performance based parking and modifications coming to the corridor.

After the kick off meeting DDOT will provide community stakeholders with approximately 30 days to review and comment on the plan before implementation.

DDOT will begin variable rate meter operations along the H Street, NE corridor on all 36 multi space meters (MSMs) as well as Resident Only RPP on blocks within the RPP database as follows:
North: I Street, NE
East: 15th Street, NE/Benning Road, NE
South: G Street, NE
West: 3rd Street, NE
DDOT’s networked MSM’s along H Street, NE have the capacity for time of day or hourly variable rate meter operations. The idea of time of day meter operations is not new to the District performance parking zones.

In March 2009, when the department began performance parking operations in Columbia Heights, DDOT implemented a similar strategy. The original meter programming in Columbia Heights provided for two hour time limits in the mornings and three hour time limits in the afternoons and evenings at the same rate.

In July of this year DDOT shifted from time of day meter operations to hourly variable rates on all performance parking meters in Columbia Heights and extended the meter hours of operations until 10pm. DDOT will use the same phased implementation approach along the H Street, NE corridor at the following rates:

- 7am to 6:30pm: $.75 per hour with a four hour limit
- 6:30pm to 10pm: $2.00 per hour with no time limit
The occupancy rate target for metered curbside parking along the H Street, NE corridor will be between 80% and 90%; just as in the Ward 6 Ballpark District pilot. An occupancy rate set between these percentages will mean that approximately one or two spaces will be available out of every ten MSM spaces.

An occupancy rate target of 80% to 90% is standard in other jurisdictions implementing congestion pricing programs but it is by no means perfect. For example, the city of Seattle has a target occupancy rate of 60% in its zones and they have a very successful program. Seattle’s target may be too low for the District, however after a year of analysis with regular updates using meter revenues the department will have a clear idea whether the target needs to be adjusted.
At the outset of pilot zone operations DDOT will provide each household on existing RPP blocks within one block of H Street, with Resident Only RPP enforcement as well as one visitor pass per household.
How “dynamic” do we need to be with our pricing strategies?

How accurate do we need to be with real-time sensor information?

Asset Lite Solutions

- Do we need meters for all spaces?
- Minimize sensor usage
Dynamic Pricing Spectrum

Pros and Cons on Real-Time Price Adjustments

<table>
<thead>
<tr>
<th>Pricing Strategy</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Price by TOD</td>
<td>Pricing structure easy to understand for consumers</td>
<td>“Average” availability will be 1 space per block face</td>
</tr>
<tr>
<td></td>
<td>Easy to communicate</td>
<td>Pricing strategy based on historical data</td>
</tr>
<tr>
<td>Purely “dynamic”</td>
<td>Price based on real-time availability – better impact on congestion?</td>
<td>Difficult to communicate for “open system” in an urban environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sophisticated data collection, analysis and algorithm</td>
</tr>
</tbody>
</table>

Similarities between fixed time vs. adaptive controllers

*Is the additional expense and effort justified by the ability of real-time pricing to affect congestion*
How accurate does occupancy information need to be?

- One sensor per space; sometimes more
- Capital + Operating Cost
- Driven by accuracy and latency needs
- Different accuracy requirements for dynamic pricing and traveler information?
- Can we derive occupancy from a sampling of real-time sensors, data-mining and real-time system information
Capture Rate Analysis

Capture rate = Max. Revenue/Actual Revenue

Capture rate can be available in real-time with networked assets

Capture rate = f(demand, meter uptime, percentage paid legal)
Getting to Occupancy

Capture Rate = $f(\text{system uptime, paid legal, occupancy})$

**System Uptime**
- Available for networked assets

**Occupancy**
- Use capture rate as surrogate
- Sampled detector data

**Paid Legal**
- Calibrate using historical data

Analogy - Speed, travel time, congestion on roadways based on sample probe data
How accurate do we need to be?
Real Time Traveler Information

Accuracy requirement higher for real-time traveler information than dynamic pricing algorithm? Branding & Credibility
201,000 customers as of end of January 2012
Most successful pay by cell launch globally
Vehicles registered in all states have used the system
More than half the customers have used the system multiple times

1,300,000 transaction since launch
Highest week 70,000; highest day 12,000
67% of transactions initiated through smart phone application
Revenue/transactions higher than coin transaction
30% of revenues through PBC program
Multimodal Dynamic Pricing Pilot

Pilot area exemplifies Multimodal curbside demand and competition.

Pilot will provide real time rates from through street sensors and real time traveler information.

Pilot has:
- 160 block faces
- 1,600 metered spaces
- 30 Loading zones
- 10 Commuter Bus Drop Off and Pick Up Locations
Asset Lite Solutions in DC in Dynamic Pricing Environment

- **For passenger cars**
  - Dynamic pricing – move-up the dynamic spectrum
  - As pay by cell penetration rates increase to above 50%, remove meters from one side of the street

- **For tour buses**
  - Pay by cell only solution
  - Rate structure based on length of stay
  - Spaces designated by pay by cell zone numbers

- **For freight/trucks**
  - Pay by cell only
  - Cost adjusted based on pre-AM rush, AM/PM rush, mid-day, post PM rush
  - Relieve congestion by trying to divert loading/unloading to off-peak
  - Real-time availability information adds value to freight industry by helping plan deliveries better
Seattle’s Performance-Based Parking Program
This presentation will cover:

Seattle’s on-street parking system

Performance-based Parking Program & Policy
## Seattle’s Parking System

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Est. on-street spaces citywide</td>
<td>500,000</td>
</tr>
<tr>
<td>Paid spaces</td>
<td>13,250</td>
</tr>
<tr>
<td>RPZ spaces</td>
<td>18,000</td>
</tr>
<tr>
<td>Time-limit spaces</td>
<td>11,500</td>
</tr>
<tr>
<td>Meters (single space)</td>
<td>100</td>
</tr>
<tr>
<td>Restricted Parking Zones</td>
<td>31 zones</td>
</tr>
<tr>
<td>Annual RPZ permits</td>
<td>21,500</td>
</tr>
<tr>
<td>Annual parking citations</td>
<td>500,000</td>
</tr>
<tr>
<td>Police - Parking Enforcement Officers</td>
<td>109 (FTE)</td>
</tr>
</tbody>
</table>
Seattle Performance-Based Parking Program

Citywide covering 13,250 spaces

Low-tech data collection

Annual management changes

Branding development
Paid Parking Rate Policy

Establish rates based on measured occupancy so that approximately 1 or 2 open spaces are available on each blockface on average throughout the day.

Meet target occupancy – “Sweet Spot”

Set rates between $1 and $4 / hour
Paid Parking Goals

Support neighborhood business districts by making on-street parking available

Maintain adequate turnover

Encourage parking availability for a variety of parking users

Reduce congestion in travel lanes caused by drivers seeking on-street parking
Data Collection

Occupancy in all paid parking areas

- November 2010
- April 2011
- June 2011
- September 2011
- June and October 2012

Typically spend between $125K - $250K on citywide manual parking studies
How We Implement the Policy

Set rates, maximum time limits and hours of operation based on data
Target Occupancy “Sweet Spot”

Area specific and tied to the average number of spaces on each blockface in that area

Example: 8 spaces on blockface
Need to meet target occupancy:
- 75% (6 spaces out of 8)
- 88% (7 spaces out of 8)
Area Peak Occupancy

Use highest three hours of daytime occupancy from parking study

Does not include evening conditions – when occupancy is well over 100% in some areas

<table>
<thead>
<tr>
<th>Example Area</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8 AM - 9 AM</td>
<td>35%</td>
</tr>
<tr>
<td>9 AM - 10 PM</td>
<td>45%</td>
</tr>
<tr>
<td>10 AM - 11 AM</td>
<td>58%</td>
</tr>
<tr>
<td>11 AM - 12 PM</td>
<td>63%</td>
</tr>
<tr>
<td>12 PM - 1 PM</td>
<td>72%</td>
</tr>
<tr>
<td>1 PM - 2 PM</td>
<td>78%</td>
</tr>
<tr>
<td>2 PM - 3 PM</td>
<td>67%</td>
</tr>
<tr>
<td>3 PM - 4 PM</td>
<td>73%</td>
</tr>
<tr>
<td>4 PM - 5 PM</td>
<td>73%</td>
</tr>
<tr>
<td>5 PM - 6 PM</td>
<td>90%</td>
</tr>
<tr>
<td>6 PM - 7 PM</td>
<td>106%</td>
</tr>
<tr>
<td>7 PM - 8 PM</td>
<td>120%</td>
</tr>
<tr>
<td>If Area Peak Occupancy is <strong>below</strong> Target Occupancy:</td>
<td>If Area Peak Occupancy is <strong>within</strong> Target Occupancy (65% - 90%):</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Look at rate decreases or parking max time changes</td>
<td>Keep rate and operating system as is</td>
</tr>
</tbody>
</table>
2011 and 2012

2011 Rate Changes
- 4 area rate increases
- 11 area rate decreases
- 7 areas kept at same rate

2012 Changes (implementation underway)
- 5 areas rate increase (core area)
- 3 areas rate decrease (edge area)
- 10 areas with maximum time limit extensions
Example – North Downtown 2012

- **Uptown**
  - $1.50 / hour
  - 2- & 4-hour time limits

- **Uptown Triangle**
  - $1.00 / hour
  - 10-hour time limits

- **South Lake Union**
  - $1.50 / hour
  - 2- & 10-hour time limits

- **Denny Triangle North**
  - $2 / hour
  - 4-hour time limits

- **Denny Triangle South**
  - $2.50 / hour
  - 8 p.m. extension

- **Belltown North**
  - $2 / hour
  - 4-hour time limits

- **Belltown South**
  - $2.50 / hour
  - 2-hour time limits

- **Commercial Core**
  - $4 / hour
  - 2-hour time limits
## Effects of 2011 Rate Changes

<table>
<thead>
<tr>
<th>Rate Increase (4 areas)</th>
<th>More availability at peak times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate Stayed Same (7 areas)</td>
<td>Results mixed, with minor fluctuations</td>
</tr>
<tr>
<td>Rate Decrease (11 areas)</td>
<td>Most areas saw no dramatic increase in occupancy</td>
</tr>
</tbody>
</table>
# Before and After Occupancy Comparison

<table>
<thead>
<tr>
<th>Area</th>
<th>Spaces</th>
<th>2010 Peak Occupancy</th>
<th>2011 Rate Change</th>
<th>2011 Rate</th>
<th>2011 Peak Occupancy</th>
<th>Occupancy Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ballard</td>
<td>320</td>
<td>68%</td>
<td>$0.50 Decrease</td>
<td>$1.50</td>
<td>49%</td>
<td>Decrease</td>
</tr>
<tr>
<td>Commercial Core</td>
<td>1,650</td>
<td>97%</td>
<td>$1.50 Increase</td>
<td>$4.00</td>
<td>79%</td>
<td>Decrease</td>
</tr>
<tr>
<td>Pike-Pine</td>
<td>700</td>
<td>85%</td>
<td>Same</td>
<td>$2.00</td>
<td>74%</td>
<td>Decrease</td>
</tr>
<tr>
<td>SLU - 10 hr</td>
<td>1,100</td>
<td>73%</td>
<td>Same</td>
<td>$1.25</td>
<td>84%</td>
<td>Increase</td>
</tr>
<tr>
<td>University District</td>
<td>700</td>
<td>64%</td>
<td>$0.50 Decrease</td>
<td>$1.50</td>
<td>63%</td>
<td>Same</td>
</tr>
<tr>
<td>Fremont</td>
<td>90</td>
<td>80%</td>
<td>Same</td>
<td>$1.50</td>
<td>77%</td>
<td>Slight decrease</td>
</tr>
</tbody>
</table>
Summary of 2012 Activities

Rate and time-limit Implementation

Pay by Phone project

- Citywide installation with RFP to be issued in next month

e-Park expansion from 6 to 10-15 facilities
Contact us!

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