Citizens Advisory Group
Meeting No. 3
September 30, 2015
Agenda

1. Project Overview and Public Involvement
2. Quick Review of Findings
3. Overview of Improvements
4. Draft Alternatives
5. Next Steps
Purpose of Tonight’s Meeting

• Provide feedback on the three draft alternatives prior to in-depth analysis and modelling

• Are there additional improvements that we should evaluate?

• Are there proposed improvements that we should not evaluate?
PROJECT OVERVIEW AND
PUBLIC INVOLVEMENT
Goals

• Improve travel for persons using public transit

• Develop alternatives based on public and stakeholder input

• Evaluate alternatives in terms of their benefits to transit users, possible impacts on other users of the corridor, and safety
Objectives

• **Improve transit service reliability and travel times** by identifying and addressing sources of problems

• **Prioritize transit while maintaining operations** for those traveling by other modes

• Improve **rider comfort and safety**

• Accommodate current **unmet passenger demand** for public transit service

• Develop an implementation plan that includes costs estimates
Project Timeline

- **January 2015**
  - Project Kickoff
  - March: Kick-Off Mtg.
- **Data Collection & Analysis**
- **Alternatives Development**
  - August: CAG #1
  - Sept./Oct.: CAG #3 + Pop-Ups
- **Model Alternatives**
  - May: CAG #1
  - Nov./Dec.: CAG #4
- **Selection of Preferred Alternative**
  - October: CAG #2
  - January: Public Meeting
Citizens Advisory Group

• Purpose:
  – Advise DDOT in between larger public engagement events
  – Help to expand the dialogue and reach of the planning process

• Thank you for your participation!
QUICK REVIEW OF FINDINGS
Corridor-Level Findings

1. Bunching
2. Total Trip Times
3. Travel Speeds by Time of Day
4. Boardings and Loads
5. Average Bus Operations
## Segment Analysis

### Legend

<table>
<thead>
<tr>
<th>Icon</th>
<th>Finding</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Bus Bunching" /></td>
<td>Delays or operational issues caused by bus bunching.</td>
<td>Top three largest ranges of doors open times.</td>
</tr>
<tr>
<td><img src="image" alt="Limited Bus Zone Capacity" /></td>
<td>Delays or operational issues caused by limited bus zone space available at far-side bus stop.</td>
<td>Proximity to intersection allows enough bus zone space for only one bus at a time.</td>
</tr>
<tr>
<td><img src="image" alt="Close Proximity of Stops" /></td>
<td>Delays or operational issues caused by close proximity of two bus stops.</td>
<td>Located within one block of another stop.</td>
</tr>
<tr>
<td><img src="image" alt="High Boardings" /></td>
<td>Delays or operational issues caused by high boardings at stop.</td>
<td>An average of five or more boardings.</td>
</tr>
<tr>
<td><img src="image" alt="High Alightings" /></td>
<td>Delays or operational issues caused by high alightings at stop.</td>
<td>An average of five or more alightings.</td>
</tr>
<tr>
<td><img src="image" alt="Traffic Congestion" /></td>
<td>Delays or operational issues caused by traffic congestion and/or intersection operation.</td>
<td>Level of Service D or worse.</td>
</tr>
<tr>
<td><img src="image" alt="Bus-to-Bus Transfer" /></td>
<td>High bus-to-bus transfer activities at stop.</td>
<td>Monthly bus to bus transfers greater than 1500 passengers.</td>
</tr>
<tr>
<td><img src="image" alt="High Doors-Open Times" /></td>
<td>Delays caused by high doors-open times.</td>
<td>Average doors open time of 20 seconds or greater.</td>
</tr>
<tr>
<td><img src="image" alt="Slow Operations" /></td>
<td>Slow bus operations.</td>
<td>Average travel speed of less than 8.0 mph.</td>
</tr>
<tr>
<td><img src="image" alt="Poor Headway Adherence" /></td>
<td>Poor headway adherence.</td>
<td>Levels of service E and F per the Transit Capacity and Quality of Service Manual.</td>
</tr>
</tbody>
</table>

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OVERVIEW OF IMPROVEMENTS
Improvements

Infrastructure Improvements
- Bus lanes
- Queue jump lanes
- Bus stop relocation or consolidation
- Intersection configuration changes
- ...

Transit Service Improvements
- Off-board fare payment
- All-door boarding
- Simplify service patterns
- Headway-based service
- ...

Traffic Operations Improvements
- Automated enforcement
- Transit signal priority
- Turn restrictions
- Safety and access improvements
- ...

District Department of Transportation
DRAFT ALTERNATIVES
Next Steps

• October:
  – Draft alternatives shared at “pop-up style” public awareness events
    • 10/7/15, 5:30 – 7:30pm: 16th Street & Spring Place NW
    • 10/14/15, 4 - 6pm: 16th & L Street NW
    • 10/15/15, 5:30 - 7:30pm: 16th & U Street NW
    • 10/17/15, Noon – 2pm: 16th & Irving Street NW
  – Existing Conditions Report posted to project website
  – October 21st: Deadline to submit comments on draft alternatives

• November / Early December: CAG Meeting #4 - Alternatives Analysis and Draft Preferred Alternative

• January: Preferred alternative selected and final public meeting
Stay Connected

Megan Kanagy, Project Manager
megan.kanagy@dc.gov

Project Website
bit.ly/16thStreetBus
# DRAFT ALTERNATIVES COMPARISON

<table>
<thead>
<tr>
<th>IMPROVEMENT</th>
<th>ALTERNATIVE 1 Service Focus</th>
<th>ALTERNATIVE 2 Infrastructure Focus</th>
<th>ALTERNATIVE 3 Mixed Service and Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHYSICAL IMPROVEMENTS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus Stop Removal/Consolidation: - 4 southbound locations (Newton, Lamont, V Streets and Riggs Place) - 5 northbound locations (L, Q, V, Lamont and Newton Streets)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Far-Side Bus Stop Expansion: 2 southbound locations (Harvard and M Streets)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Relocate southbound Spring Place bus stop north to Spring Road to improve pedestrian safety</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Upgrade bus stops to WMATA zone lengths</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Bus Lanes</td>
<td></td>
<td>Full length, both directions 7:00 am - 10:00 pm</td>
<td>Full length, extended peak period peak direction: - 7:00 am - 10:00 am southbound - 4:00 pm - 7:30 pm northbound Lane shift: - 2 lanes southbound and 1 lane northbound 7:00 am - 2 lanes northbound and 1 lane southbound 4:00 - 7:30 pm</td>
</tr>
<tr>
<td>Lane configuration changes between U and O Streets due to bus lanes</td>
<td></td>
<td>Addition of center reversible lane</td>
<td></td>
</tr>
<tr>
<td>Queue Jump Lanes</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Intersection Reconfiguration at Harvard/Columbia/Mount Pleasant</td>
<td></td>
<td></td>
<td>✓</td>
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<tr>
<td><strong>TRANSIT SERVICE IMPROVEMENTS (Any proposed service changes would require a future public involvement process led by WMATA)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headway-based service</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>S2 Route patterns reduced to two in each direction</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>S1 and S2 service eliminated along 14th Street between Northern Bus Garage and 16th Street</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Running and recovery time added to schedule</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Fleet mix upgraded with low-floor and articulated buses</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Off-Board Fare Payment</td>
<td></td>
<td>All buses, all stops</td>
<td>SmarTrip Card top off only S9 buses and stops only</td>
</tr>
<tr>
<td>All-Door Boarding</td>
<td></td>
<td>All buses, all stops</td>
<td>S9 buses and stops only</td>
</tr>
<tr>
<td>S1 converted to limited stop service using current S9 stops</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Service Patterns Truncated in Downtown - Farragut Square for S1 - McPherson Square Metro for S2/S4</td>
<td></td>
<td></td>
<td>✓</td>
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<tr>
<td>Deadhead service relocated to Arkansas Avenue from Missouri Avenue</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td><strong>TRAFFIC OPERATIONS IMPROVEMENTS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transit signal priority (TSP) at 15 planned locations and five additional locations configured for headway-based service</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Peak period parking restrictions extended to 7:00 - 10:00 am (from 9:30 am) and 4:00 - 7:30 pm (from 6:30 pm)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Southbound reversible lane extended to 7:00 - 10:00 am (from 9:30 am)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Southbound left turn lane separation and advance signage at W Street</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Pedestrian safety improvements, including at Arkansas Avenue, Sacred Heart Way, and Harvard/Columbia/Mount Pleasant</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Bus stop amenity and access improvements</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Correct parking restrictions northbound between L and M Streets to prohibit PM peak parking</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Work with Downtown hotels on taxi and loading zone relocation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Automated Parking Enforcement on Buses</td>
<td></td>
<td>Enforcement of peak hour restrictions</td>
<td>Enforcement of bus lanes Pilot program with potential extension</td>
</tr>
<tr>
<td>Dedicated Towing</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Remove Midday Parking</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Left-Turn Restrictions - Southbound at Irving Street - Northbound at Mount Pleasant Street</td>
<td></td>
<td></td>
<td>✓</td>
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<tr>
<td>Peak hour signal timing extended for north-south traffic through midday (pending further analysis as part of the ongoing citywide Traffic Signal Optimization effort)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

**PERFORMANCE METRICS**

<table>
<thead>
<tr>
<th>Metric</th>
<th>ALTERNATIVE 1</th>
<th>ALTERNATIVE 2</th>
<th>ALTERNATIVE 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary Travel Time Savings Estimate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preliminary Reliability Estimate</td>
<td>★★★</td>
<td>★</td>
<td>★★★</td>
</tr>
</tbody>
</table>
**Improvements to Traffic Operations**

- **Southbound 4:00 - 7:30pm:** 2 lanes northbound and 1 lane.
- **Northbound 7:00 - 10:00am:** from 7:00am – 10:00pm for full length.

**Implement off-board fare payment**

- Northbound - Mount Pleasant
- McPherson Square Metro
- Downtown
- U Street - northbound
- **Implement extended peak period,**
  - 16th Street NW onto Mount Pleasant Street NW.
  - Reconfiguration of the left-turn restriction for northbound 16th Street NW.
  - Improve safety for pedestrians crossing Arkansas Avenue NW.

**On-street parking restriction**

- Correct on-street parking restrictions to prohibit parking during PM peak.

**Service Change Note:**

- Any proposed service changes would require a future public involvement process led by WMATA.

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**Physical Improvements**

- Expand far-side bus stops in 2 southbound locations: (Harvard and M Streets)
- Upgrade bus stops to WMATA zone lengths
- Remove/consolidate bus stops - 4 southbound locations: (Newton, Lamont, V, and Riggs) - 5 northbound locations: (L, Q, V, Lamont, and Newton Streets)
- Relocate southbound Spring Place bus stop north to Spring Road to improve pedestrian safety

**Transit Improvements**

- Reduce S2 route patterns to two in each direction
- Eliminate ‘In-Service’ between Northern Bus Garage and 16th Street along 14th Street
- Add running and recovery time to schedule
- Upgrade bus fleet with low floor and articulated buses
- Implement headway-based service

**Traffic Operations Improvements**

- Extend parking restrictions to 10:00am (from 9:30am) and 7:30pm (from 6:30pm)
- Extend reversible lane timing to allow 3 lanes southbound until 10:00am
- Implement Transit Signal Priority (TSP) at planned locations and proposed locations (see map)
- Separate left-turn lane southbound and add advance signage at W Street
- Improve pedestrian safety and bus stops at targeted locations (e.g., Arkansas, Sacred Heart, Harvard, Columbia and Mount Pleasant)
- Correct parking restrictions northbound between L and M Streets to prohibit PM Peak parking
- Work with Downtown hotels on taxi and loading zone relocation

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**Service Change Note:**

- Any proposed service changes would require a future public involvement process led by WMATA.
SERVICE CHANGE NOTE: Any proposed service changes would require a future public involvement process led by WMATA.
Infrastructure Focus

**PHYSICAL IMPROVEMENTS**
- Implement bus lanes both directions from 7:00am – 10:00pm for full length of corridor
- Add a center reversible lane

**TRANSIT IMPROVEMENTS**
- Add off-board fare loading stations for SmarTrip cards

**TRAFFIC OPERATIONS IMPROVEMENTS**
- Reconfigure intersection of Harvard/ Columbia/Mt. Pleasant
- Incorporate automated parking enforcement on buses of bus lane
- Pilot a dedicated towing program with potential extension

*SERVICE CHANGE NOTE:* Any proposed service changes would require a future public involvement process led by WMATA.
DRAFT IMPROVEMENTS

PHYSICAL IMPROVEMENTS
• Implement extended peak period, peak direction bus lane full length of the corridor
• Lane configuration changes between U and O Streets due to bus lanes
  - 2 lanes southbound and 1 lane northbound 7:00 - 10:00am
  - 2 lanes northbound and 1 lane southbound 4:00 - 7:30pm

TRANSIT IMPROVEMENTS
• Implement off-board fare payment at S9 stops for S9 buses only
• Allow all-door boarding on S9 stops for S9 buses only

TRAFFIC OPERATIONS IMPROVEMENTS
• Eliminate midday signal timing plan
• Pilot dedicated towing service
• Restrict left-turns
  - Southbound - Irving Street
  - Northbound - Mount Pleasant Street

SERVICE CHANGE NOTE:
Any proposed service changes would require a future public involvement process led by WMATA
### Parking Spaces - Primary Study Area

<table>
<thead>
<tr>
<th></th>
<th>West Side of Street</th>
<th></th>
<th></th>
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<th>East Side of Street</th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>AM Peak</td>
<td>Midday</td>
<td>PM Peak</td>
<td>Evening</td>
<td>AM Peak</td>
<td>Midday</td>
<td>PM Peak</td>
<td>Evening</td>
<td>AM Peak</td>
<td>Midday</td>
<td>PM Peak</td>
<td>Evening</td>
<td></td>
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<tr>
<td>Existing Conditions</td>
<td>0</td>
<td>235</td>
<td>120</td>
<td>235</td>
<td>120</td>
<td>300</td>
<td>10</td>
<td>300</td>
<td>120</td>
<td>535</td>
<td>130</td>
<td>535</td>
<td></td>
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<tr>
<td>Draft Base Improvements</td>
<td>0</td>
<td>230</td>
<td>115</td>
<td>230</td>
<td>115</td>
<td>295</td>
<td>0</td>
<td>295</td>
<td>115</td>
<td>525</td>
<td>115</td>
<td>525</td>
<td></td>
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<tr>
<td>Draft Alternative 1</td>
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<td>0</td>
<td>115</td>
<td>230</td>
<td>115</td>
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<td>0</td>
<td>295</td>
<td>115</td>
<td>0</td>
<td>115</td>
<td>525</td>
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<tr>
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<tr>
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<td>295</td>
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<td>295</td>
<td>0</td>
<td>525</td>
<td>0</td>
<td>525</td>
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</tbody>
</table>

**Notes:**

1. Parking figures provided are planning-level estimates and are intended to serve as a tool for comparing alternatives.

2. The actual hours that comprise each of the four time periods vary among the existing conditions, draft base improvements and draft alternatives, as shown below.

<table>
<thead>
<tr>
<th></th>
<th>AM Peak</th>
<th>Midday</th>
<th>PM Peak</th>
<th>Evening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Conditions</td>
<td>7:00 – 9:30AM</td>
<td>9:30AM – 4:00PM</td>
<td>4:00PM – 6:30PM</td>
<td>6:30PM – 7:00AM</td>
</tr>
<tr>
<td>Draft Base Improvements</td>
<td>7:00 – 10:00AM</td>
<td>10:00AM – 4:00PM</td>
<td>4:00PM – 7:30PM</td>
<td>7:30PM – 7:00AM</td>
</tr>
<tr>
<td>Draft Alternative 1</td>
<td>7:00 – 10:00AM</td>
<td>10:00AM – 4:00PM</td>
<td>4:00PM – 7:30PM</td>
<td>7:30PM – 7:00AM</td>
</tr>
<tr>
<td>Draft Alternative 2</td>
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<td>10:00AM – 4:00PM</td>
<td>4:00PM – 10:00PM</td>
<td>10:00PM – 7:00AM</td>
</tr>
<tr>
<td>Draft Alternative 3</td>
<td>7:00 – 10:00AM</td>
<td>10:00AM – 4:00PM</td>
<td>4:00PM – 7:30PM</td>
<td>7:30PM – 7:00AM</td>
</tr>
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</table>
Draft Alternative 1 - Potential Route Truncations

Note: Any proposed service changes would require a future public involvement process led by WMATA.

RIDERSHIP

<table>
<thead>
<tr>
<th>Route</th>
<th>S1</th>
<th>S2</th>
<th>S4</th>
<th>S1</th>
<th>S2</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truncated Segment*</td>
<td>903</td>
<td>574</td>
<td>297</td>
<td>379</td>
<td>774</td>
<td>200</td>
</tr>
<tr>
<td>South of Arkansas Avenue NW</td>
<td>1658</td>
<td>4527</td>
<td>2697</td>
<td>617</td>
<td>3064</td>
<td>2122</td>
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<tr>
<td>Truncated Segment as a Percentage of South of Arkansas Avenue NW</td>
<td>54.4%</td>
<td>12.7%</td>
<td>11.0%</td>
<td>61.4%</td>
<td>25.2%</td>
<td>9.4%</td>
</tr>
<tr>
<td>Truncated Segment as a Percentage of S Line Total</td>
<td>8.0%</td>
<td>5.1%</td>
<td>2.6%</td>
<td>3.4%</td>
<td>7.0%</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

*Segments between Farragut Square and Potomac Park on S1 and between McPherson Square and Federal Triangle on S2 and S4.

Source: WMATA: S Line Ridership by Route and Stop - Fall Quarter 2014

POTENTIAL ALTERNATIVE ROUTES FOR TRUNCATED SEGMENTS

**S1 Southbound and Northbound**

- 80 route (15-20 minute headways)

**S2/S4 Southbound**

- 30N, 30S, 32, 33, 36, 37, 39 routes (Transfer at Lafayette Place and H Street NW; 1-10 minute headways)
- 54 route (Transfer at 14th Street and H Street NW; 14-20 minute headways)
- 63 route (Transfer at 14th Street and H Street NW; 18 minute headways)
- D1 route (Transfer at 16th Street and K Street NW; 7-12 minute headways peak periods only)

**S2/S4 Northbound**

- 30N, 30S, 32, 33, 36, 37, 39 routes (Transfer at 14th Street and I Street; similar headways as above)
- 54 route (Transfer at 14th Street and I Street; similar headways as above)
- 63 route (Transfer at 14th Street and I Street; similar headways as above)
- D1 route (Transfer at 14th Street and I Street; similar headways as above)