

# 16TH STREET NW **TRANSIT PRIORITY**



*Planning Study*

## **Citizens Advisory Group Meeting No. 2**

August 18, 2015



# Agenda

1. Introduction
2. Data Sources
3. Transit Existing Conditions
4. Next Steps
5. Discussion

# INTRODUCTION

# Study Area

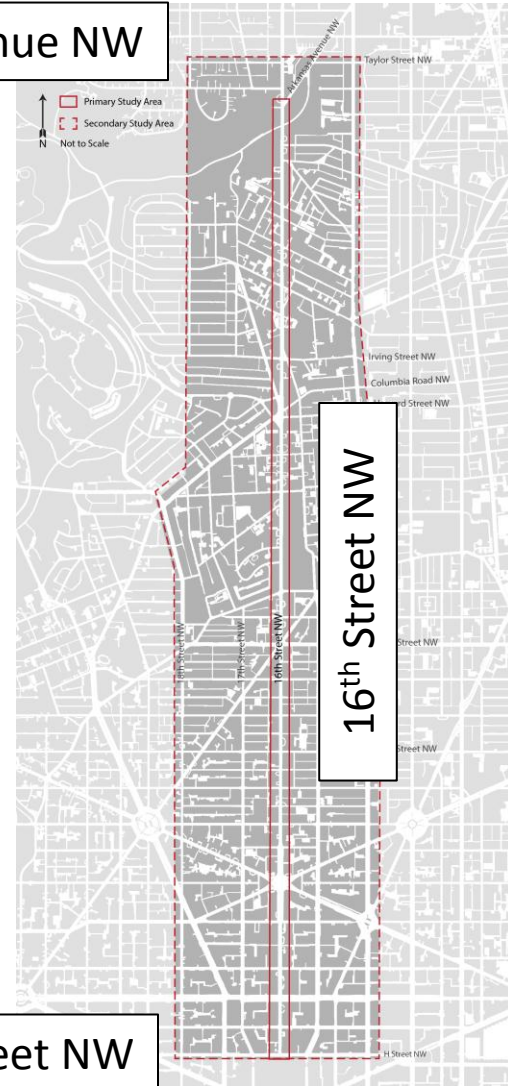
## Primary Study Area

- 16<sup>th</sup> Street NW from H Street to Arkansas Avenue

## Secondary Study Area

- Bounded by 14<sup>th</sup> Street, 18<sup>th</sup> Street, Taylor Street and H Street

Arkansas Avenue NW



H Street NW

# Project Timeline



A horizontal sequence of four blue chevron-shaped boxes pointing to the right, representing the project timeline steps.

Project  
Kickoff

Data  
Collection &  
Analysis

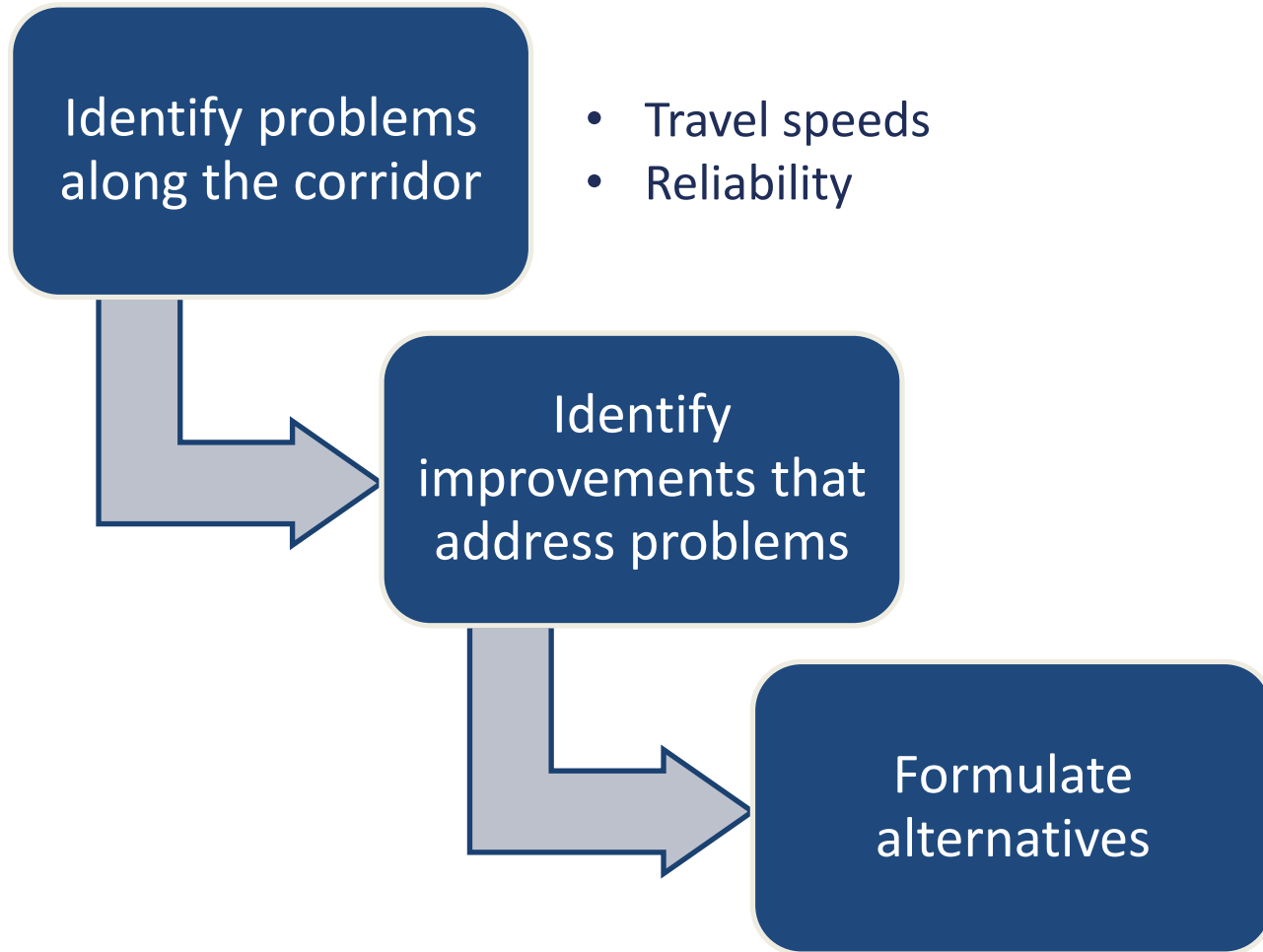
Alternatives  
Development

Selection of  
Preferred  
Alternative

# Recap from Last Meeting

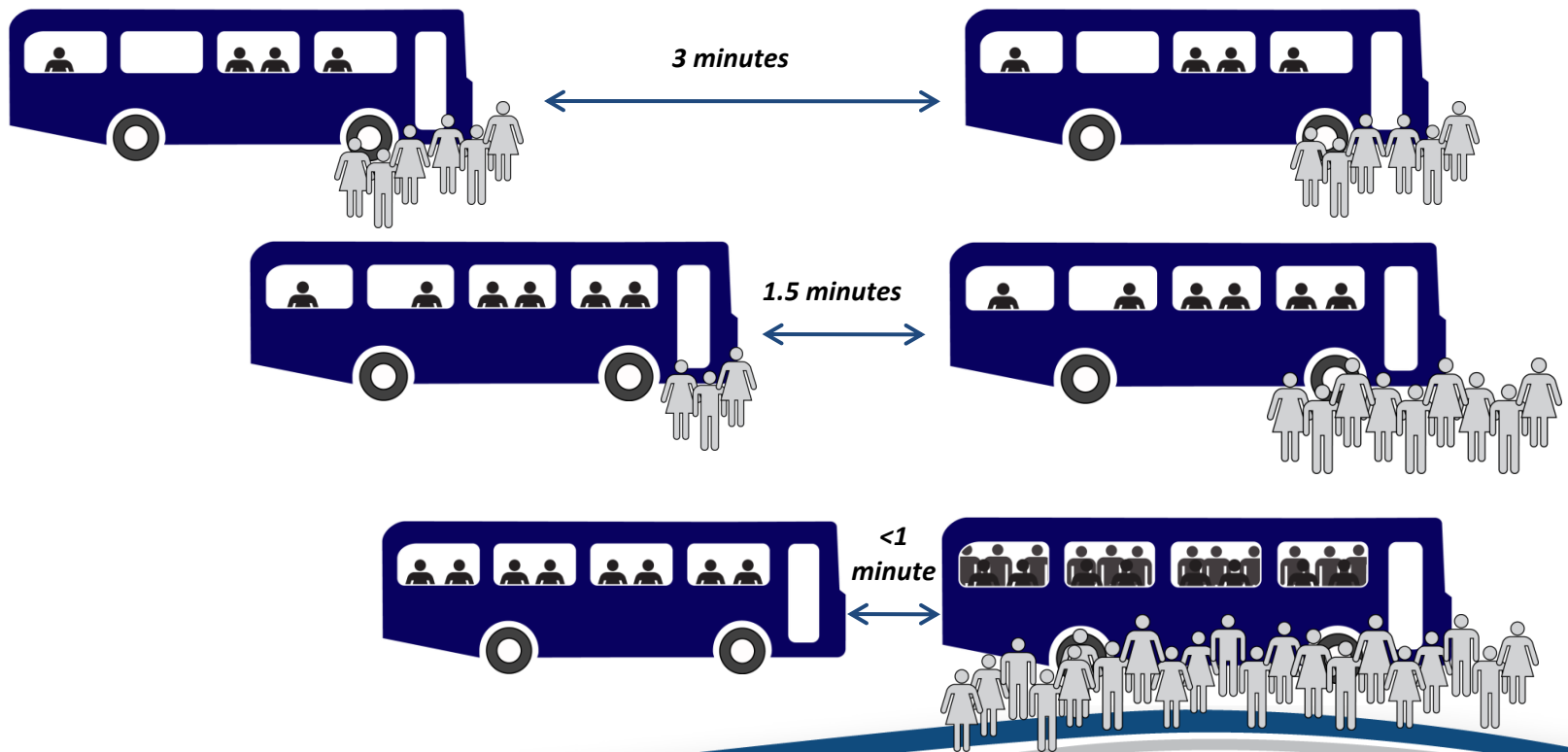
- Existing Conditions Transit Data
  - Additional data collected in June
- Multimodal Traffic Analysis
  - Updated over the summer to incorporate Downtown Signal Optimization
- Public Kick Off Meeting
- Physical Conditions Assessment

# Overall Process



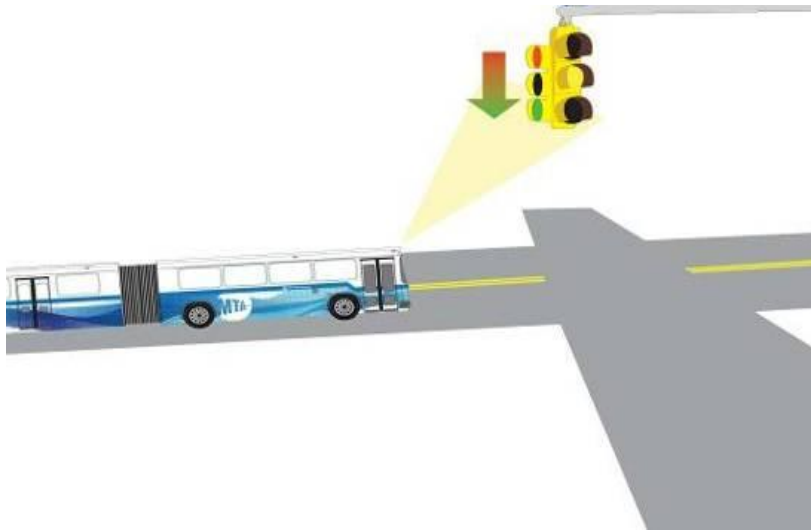
# Stop Dwell / Doors Open Time?

- Off-board fare collection
- All-door boarding



# Signal Delay?

- Signal priority
- Queue jump opportunities

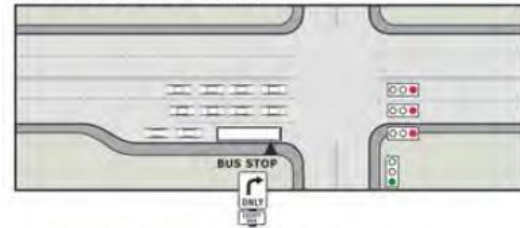


# Slow Travel?

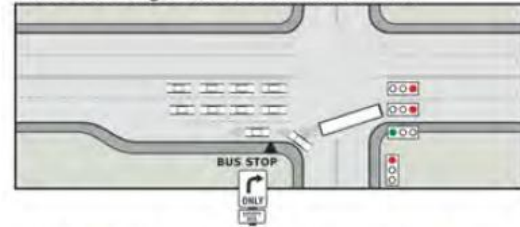
- Strategic use of bus lanes
- Queue jump opportunities



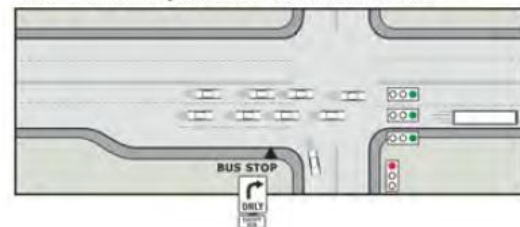
Passengers board during red



Bus receives green before other vehicles



Other vehicles proceed a few seconds later



SOURCE: Kittelson & Associates, Inc.

# Enforcement?

- Automated Enforcement



# Other Improvements?

- Service Plans
- Articulated Buses
- Number & Location of Bus Stops



# Development of 3 Alternatives

## Physical Improvements

- Bus lanes
- Queue jumps
- Bus stop relocation and access improvements

## Operational Improvements

- Automated enforcement
- Transit signal priority
- Bus zone improvements
- Traffic operations
- Parking restrictions

## Service Improvements

- Simplify service patterns
- Off-board fare payment
- All-door boarding
- Stop consolidation
- Skip-stop service
- Fleet changes

# DATA SOURCES

# Primary Transit Data

- AVL/APC Data (WMATA)
  - October to December 2014
- On-Board Data
  - March and June 2015
  - Doors Open Times
  - Other Delays
  - Boardings and Alightings

# Additional Transit Data

- Study Area Bus Lines Patterns
- Frequency by Line by Hour
- Scheduled Service Spans
- Scheduled Miles Hours Trips History
- Stop by Route/Line Variation
- Average Weekday Boardings and Alightings
- Ridership by Time Period
- Transfers
- Bus Loading and Loading Duration
- On-Time Performance
- Time Distance - Typical Days and Monthly Average
- Headway Variation - Reliability
- Travel Speed By Time of Day and Segment

# Multimodal VISSIM Model Data

- Multimodal Counts and Signal Timing
  - Provided by DDOT TOA
  - Incorporated April Downtown Signal Optimization
- Bus Operations
  - Dwell times taken from on-board data
  - Frequency based on published schedule

# Additional Data

- Pedestrian access and safety
- Roadway configuration and curbside uses
- Bus stop zones and amenities

# TRANSIT EXISTING CONDITIONS

# Corridor-Level Findings

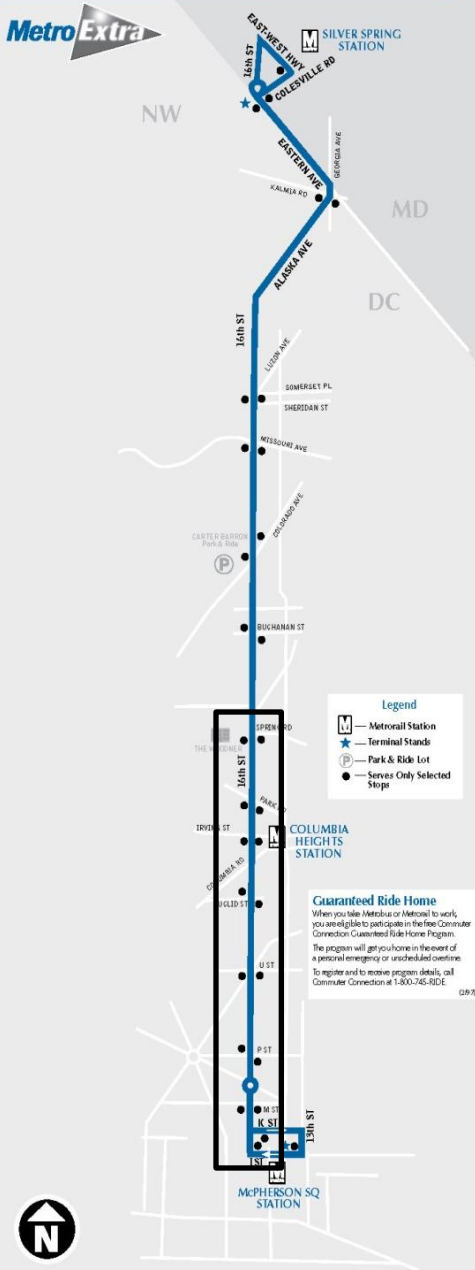
1. Bunching
2. Total Trip Times
3. Travel Speeds by Time of Day
4. Boardings and Loads
5. Average Bus Operations

# Bunching

- Buses are already bunched in the AM and PM Peak before they reach the study area
- All AM Peak, Midday, PM Peak and Early Night (7-11pm) bus routes have poor headway adherence = frequent bus bunching or most buses are bunched
- S2 performs worst of all lines in SB AM Peak and NB PM Peak

## S9 16th Street Limited Line

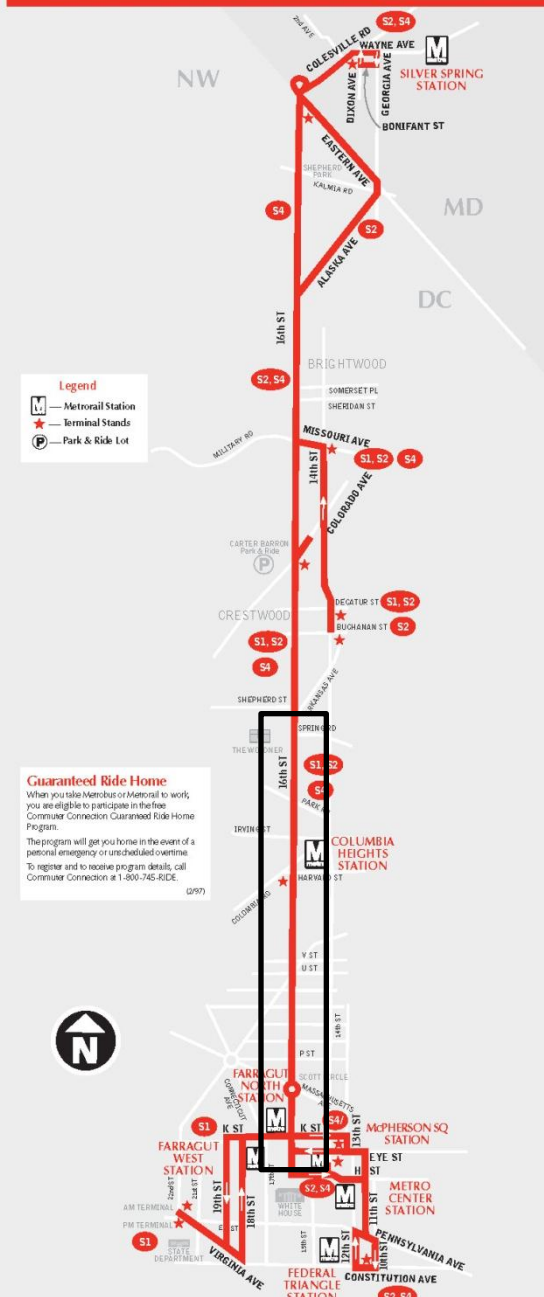
For route and schedule information  
Call 202-637-7000  
www.wmata.com



## S2, S4 16th Street Line

## S1 16th Street-Potomac Park Line

For route and schedule information  
Call 202-637-7000  
www.wmata.com



# Existing S Lines

- Multiple service patterns contribute to bunching

# Total Trip Times

- Actual trip times are longer than the scheduled trip times, which contributes to bunching
- Total trip time is longer in SB AM Peak than NB PM Peak

# Travel Speed by Time of Day

- Travel speed slowdown in AM and PM extends past peak period
- Off-peak speeds are slow too
  - NB speeds are slower in Early Night (7 - 11 PM) than in PM Peak
  - Midday S1/S2/S4 speeds are not significantly faster than peak period peak direction speeds
- Off-peak parking contributes to slowdown

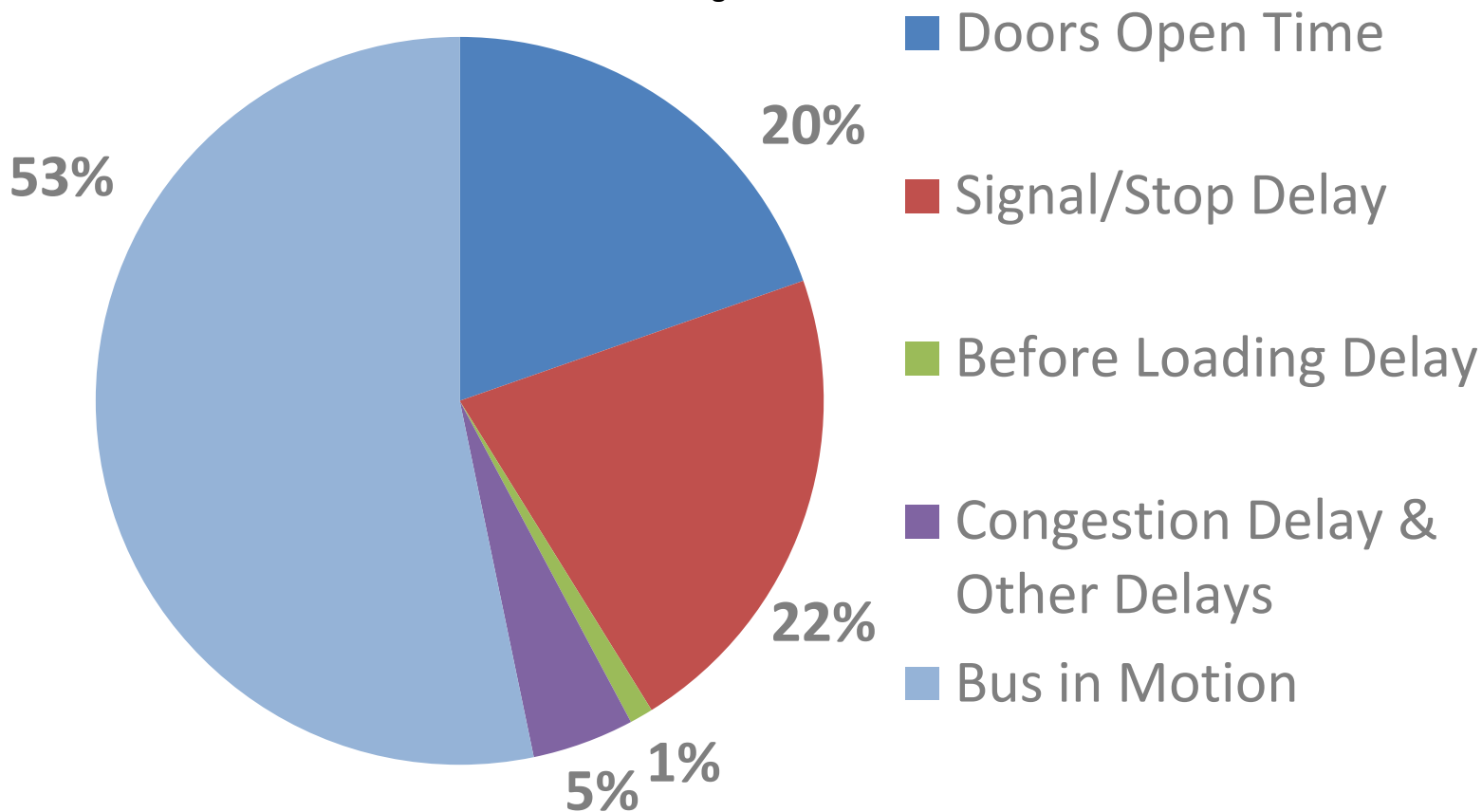
# Boardings and Loads

- Boarding and alighting time per passenger is lower for S9 compared to S1/S2/S4
  - S9 has low-floor buses for easier boarding
- Maximum loads and percent of time load exceeds seated capacity are high on all lines
  - Highest % in peak periods is S4
  - Contributes to longer doors open time and pass-bys

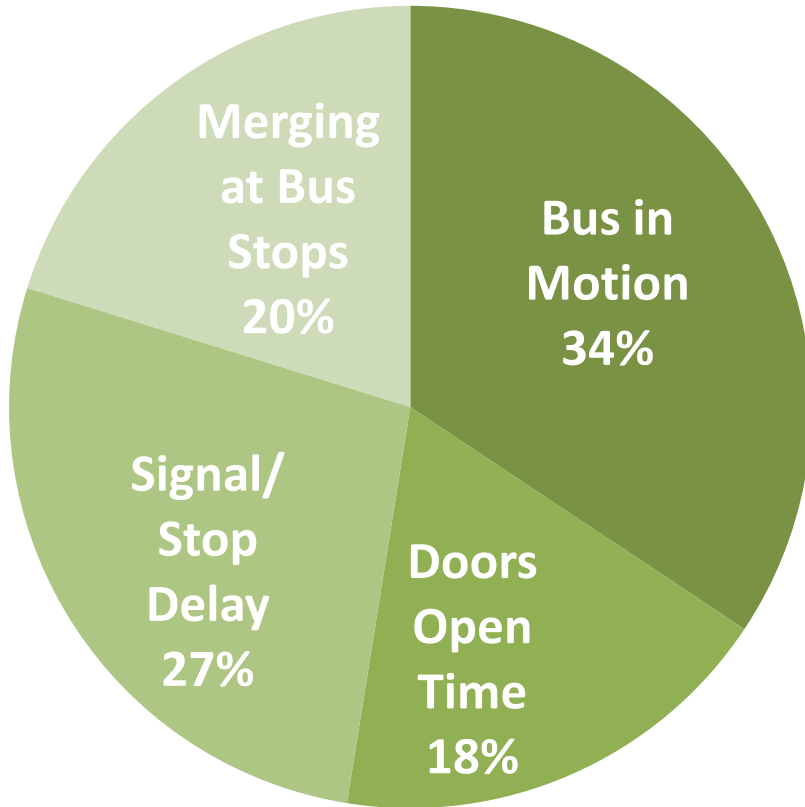
# Average Travel Operations

(Source: On-board Data Collection)

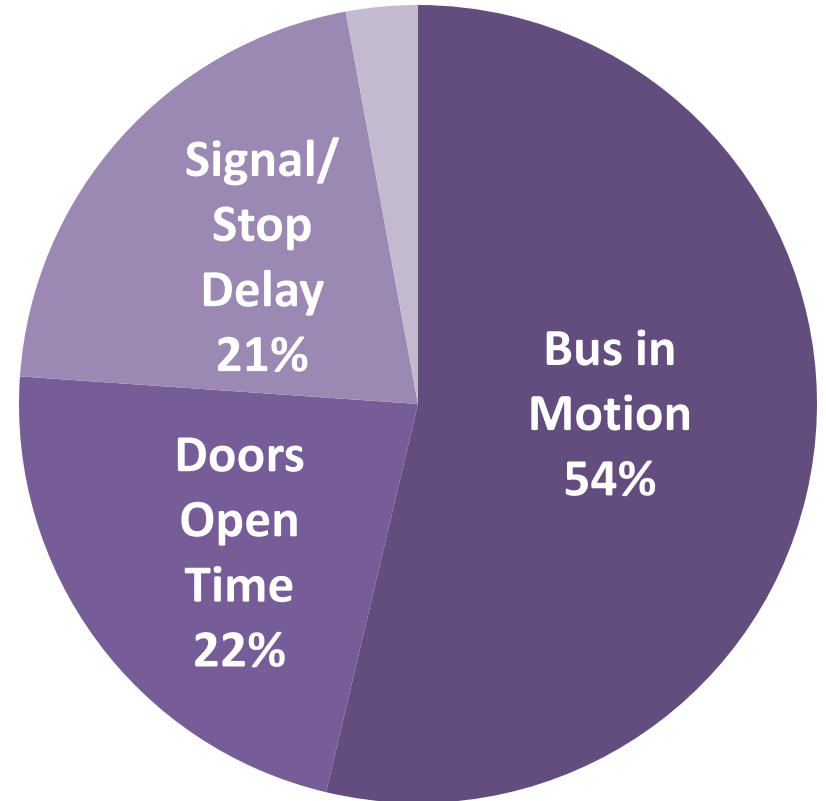
Overall Peak Period Peak Direction Averages



# Comparison



NJ TRANSIT Route 10 –  
Kennedy Boulevard



MTA NYCT M15 –  
First Avenue/Second Avenue









# Segment Analysis

## GLOSSARY - TRANSIT OPERATIONS FINDINGS

**Red Icons** ..... Findings related to Metrobus S9.

**Blue Icons** ..... Findings related to Metrobus S1, S2, and S4.

**Red + Blue Icons** ..... Findings related to Metrobus S1, S2, S4, and S9.

| Icon   | Finding   | Criteria   |
|--|---|--|
| <br>Bus-bunching              | Delays or operational issues caused by bus bunching.  | Top three largest ranges of doors open times.                              |
| <br>Limited Bus Zone Capacity | Delays or operational issues caused by limited bus zone space available at far-side bus stop. | Capacity for only one bus and bus stop is close proximity to intersection. |
| <br>Close Proximity of Stops  | Delays or operational issues caused by close proximity of two bus stops.                      | Located within one block of another stop.                                  |
|                               | Delays or operational issues caused by high boardings at stop.                                | An average of five or more boardings.                                      |
|                               | Delays or operational issues caused by high alightings at stop.                               | An average of five or more alightings.                                     |
| <br>Traffic                   | Delays or operational issues caused by traffic congestion and/or intersection operation.      | LOS D.   |
|                               | High bus-to-bus transfer activities at stop.  | Monthly bus to bus transfers greater than 1500 passengers.                 |
| <br>High Doors Open Times    | Delays caused by high doors-open times.   | Average doors open time of 20 seconds or greater.                          |
| NO ICON<br>(Blue and red lines on maps)  | Slow bus operations.  | Average travel speed of less than 8.0 mph.                                 |
| NO ICON<br>(Call-out on maps)  | Poor headway adherence.   | LOS E and F per the Transit Capacity and Quality of Service Manual.        |

# AM Peak Southbound Direction

# PM Peak Northbound Direction

Buses already bunched at entry to Study Area

Doors-Open

Bus-bunching compounded by wide range of doors-open times.

Bus-bunching compounded by wide range of doors-open times.

Center reversible lane utilization is low compared to curbside lane, compounding delay.

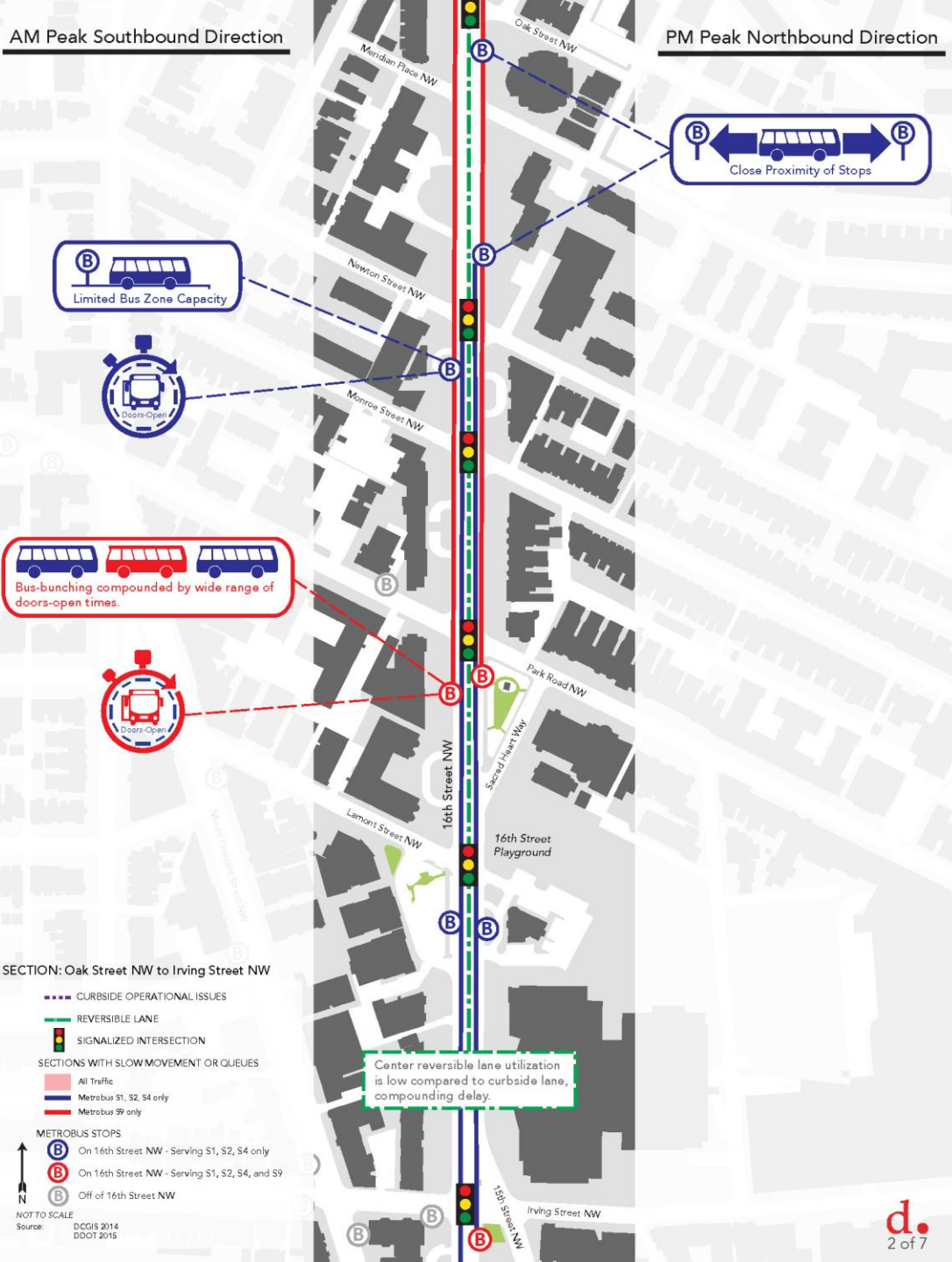
Center reversible lane utilization is low compared to curbside lane, compounding delay.

## SECTION: Taylor Street NW to Oak Street NW

- CURBSIDE OPERATIONAL ISSUES
- REVERSIBLE LANE
- SIGNALIZED INTERSECTION
- SECTIONS WITH SLOW MOVEMENT OR QUEUES
- All Traffic
- Metrobus S1, S2, S4 only
- Metrobus S9 only

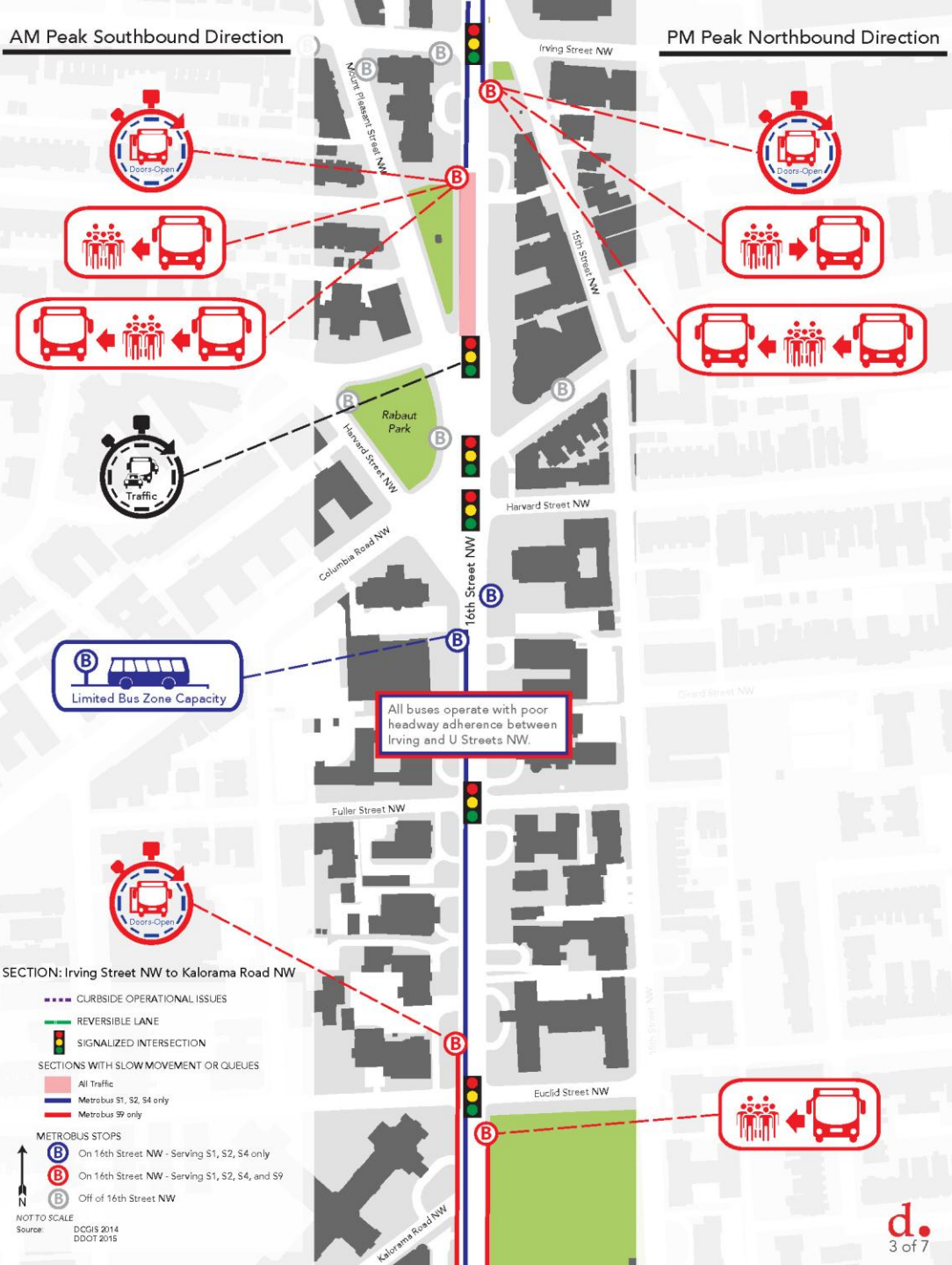
- METROBUS STOPS
- On 16th Street NW - Serving S1, S2, S4 only
  - On 16th Street NW - Serving S1, S2, S4, and S9
  - Off of 16th Street NW

NOT TO SCALE  
Source: DCGIS 2014  
DDOT 2015



## AM Peak Southbound Direction

## PM Peak Northbound Direction



All buses operate with poor headway adherence between Irving and U Streets NW.



Transition from three lanes to two lanes.



Bus-bunching compounded by wide range of doors-open times.

SECTION: Kalorama Road NW to U Street NW

- CURBSIDE OPERATIONAL ISSUES
- REVERSIBLE LANE
- SIGNALIZED INTERSECTION

SECTIONS WITH SLOW MOVEMENT OR QUEUES

- All Traffic
- Metrobus S1, S2, S4 only
- Metrobus S9 only

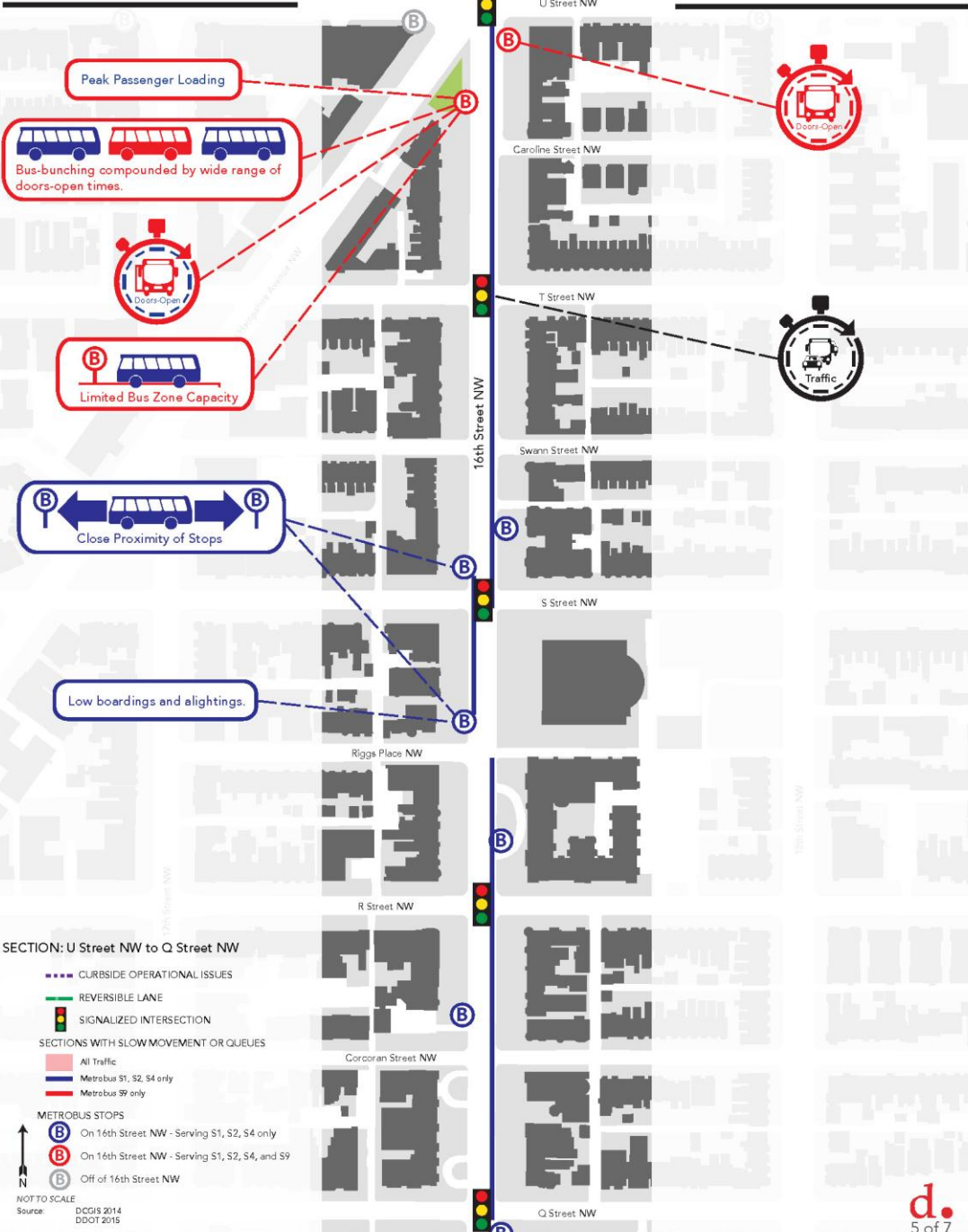
METROBUS STOPS

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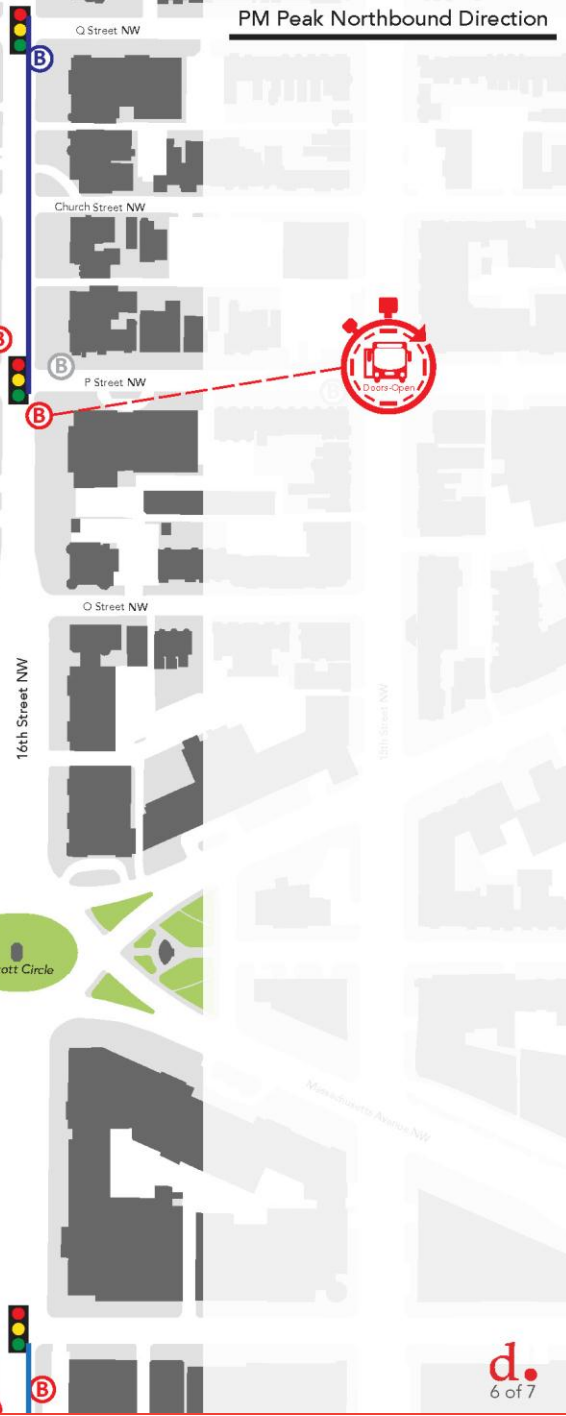
## AM Peak Southbound Direction

## PM Peak Northbound Direction



## AM Peak Southbound Direction

## PM Peak Northbound Direction



### SECTION: Q Street NW to M Street NW

- CURBSIDE OPERATIONAL ISSUES
- REVERSIBLE LANE
- SIGNALIZED INTERSECTION

#### SECTIONS WITH SLOW MOVEMENT OR QUEUES

- All Traffic
- Metrobus S1, S2, S4 only
- Metrobus S9 only

#### METROBUS STOPS

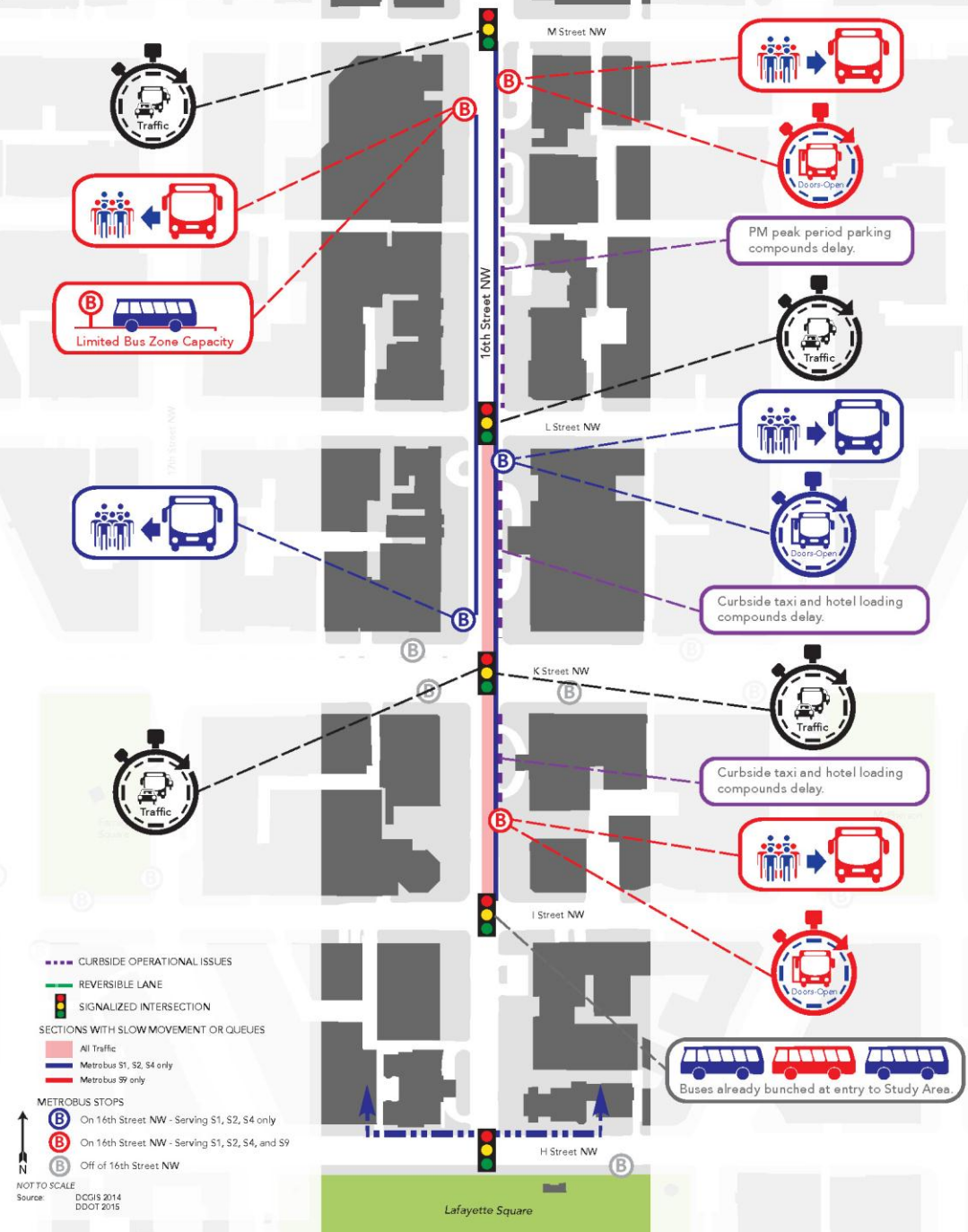
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- On 16th Street NW - Serving S1, S2, S4, and S9
- Off of 16th Street NW

NOT TO SCALE

Source: DCGIS 2014  
DDOT 2015

## AM Peak Southbound Direction

## PM Peak Northbound Direction



NOT TO SCALE  
Source: DCGIS 2014  
DDOT 2015

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## Physical Improvements

- Bus lanes
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## Operational Improvements

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## Service Improvements

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# NEXT STEPS



District Department of Transportation

# Next Steps

- Early Fall: Existing Conditions report finalized
- Early September: Alternatives development
- Late September: Interagency and CAG Meetings
- October: Alternatives shared at public awareness events
- End of Year: Preferred alternative selected

# DISCUSSION

