

16TH STREET NW TRANSIT PRIORITY



Planning Study

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

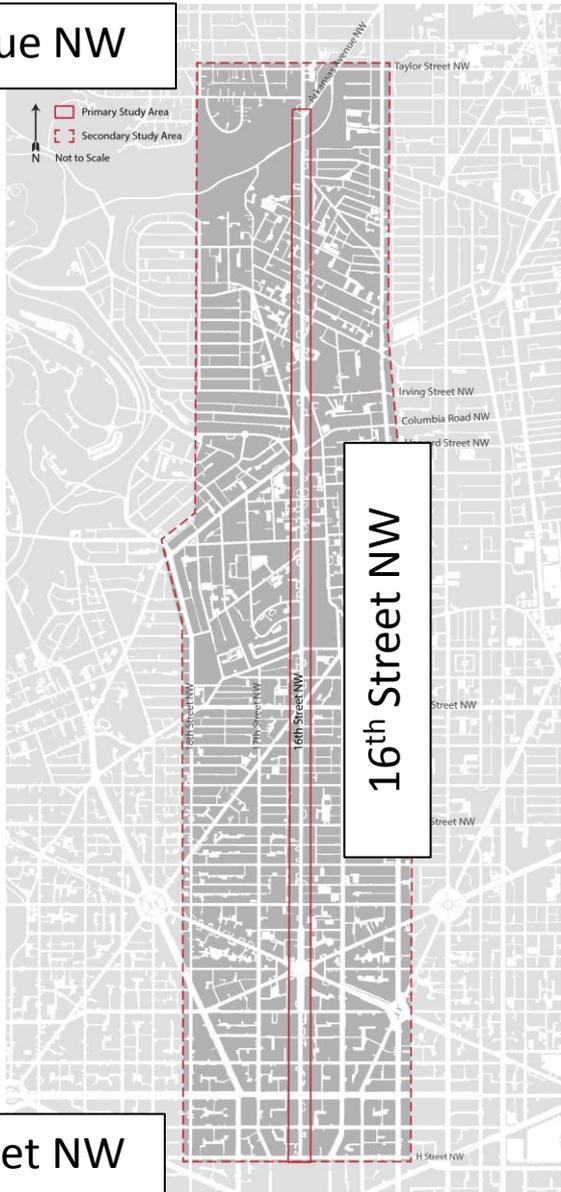
January 2016



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!

Arkansas Avenue NW



16th Street NW

H Street NW

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

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

Icon	Finding	Criteria
	Delays or operational issues caused by bus bunching.	Top three largest ranges of doors open times.
	Delays or operational issues caused by limited bus zone space available at far-side bus stop.	Proximity to intersection allows enough bus zone space for only one bus at a time.
	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.
	Delays or operational issues caused by traffic congestion and/or intersection operation.	Level of Service D or worse.
	High bus-to-bus transfer activities at stop.	Monthly bus to bus transfers greater than 1500 passengers.
	Delays caused by high doors-open times.	Average doors open time of 20 seconds or greater.
NO ICON (Blue and red lines on maps)	Slow bus operations.	Average travel speed of less than 8.0 mph.
NO ICON (Call-out on maps)	Poor headway adherence.	Levels of service E and F per the Transit Capacity and Quality of Service Manual.

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
- ...

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

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Project Website

bit.ly/16thStreetBus



DRAFT ALTERNATIVES COMPARISON

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

BASE DRAFT IMPROVEMENTS

These improvements are proposed in all 3 alternatives

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

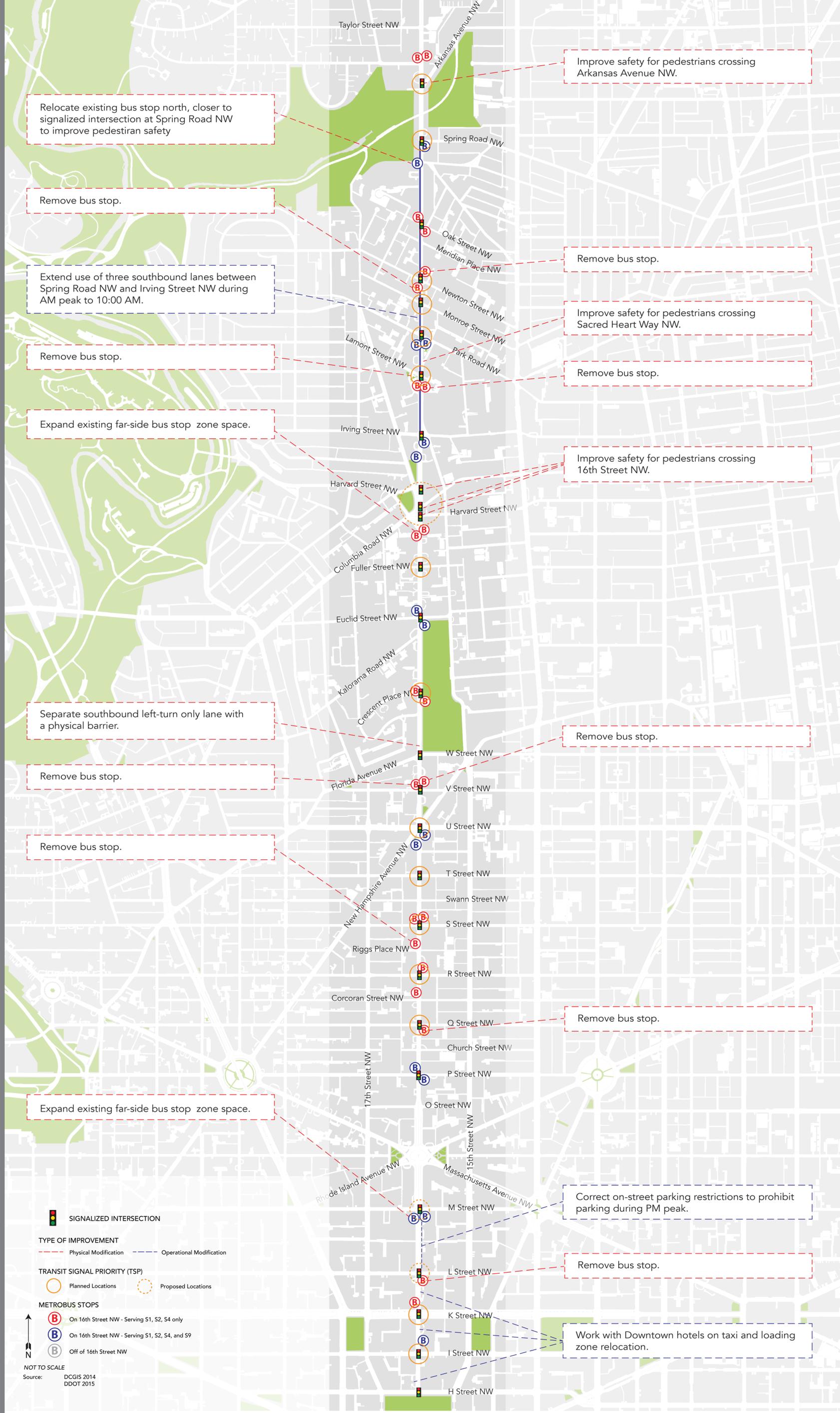
- Reduce S2 route patterns to two in each direction
- Eliminate 'In-Service' between Northern Bus Garage and 16th Street along 14th Street
- Add running and recovery time to schedule
- Upgrade bus fleet with low floor and articulated buses
- Implement headway-based service

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

SERVICE CHANGE NOTE:

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



BASE + ALTERNATIVE 1 DRAFT IMPROVEMENTS

Service Focus

PHYSICAL IMPROVEMENTS

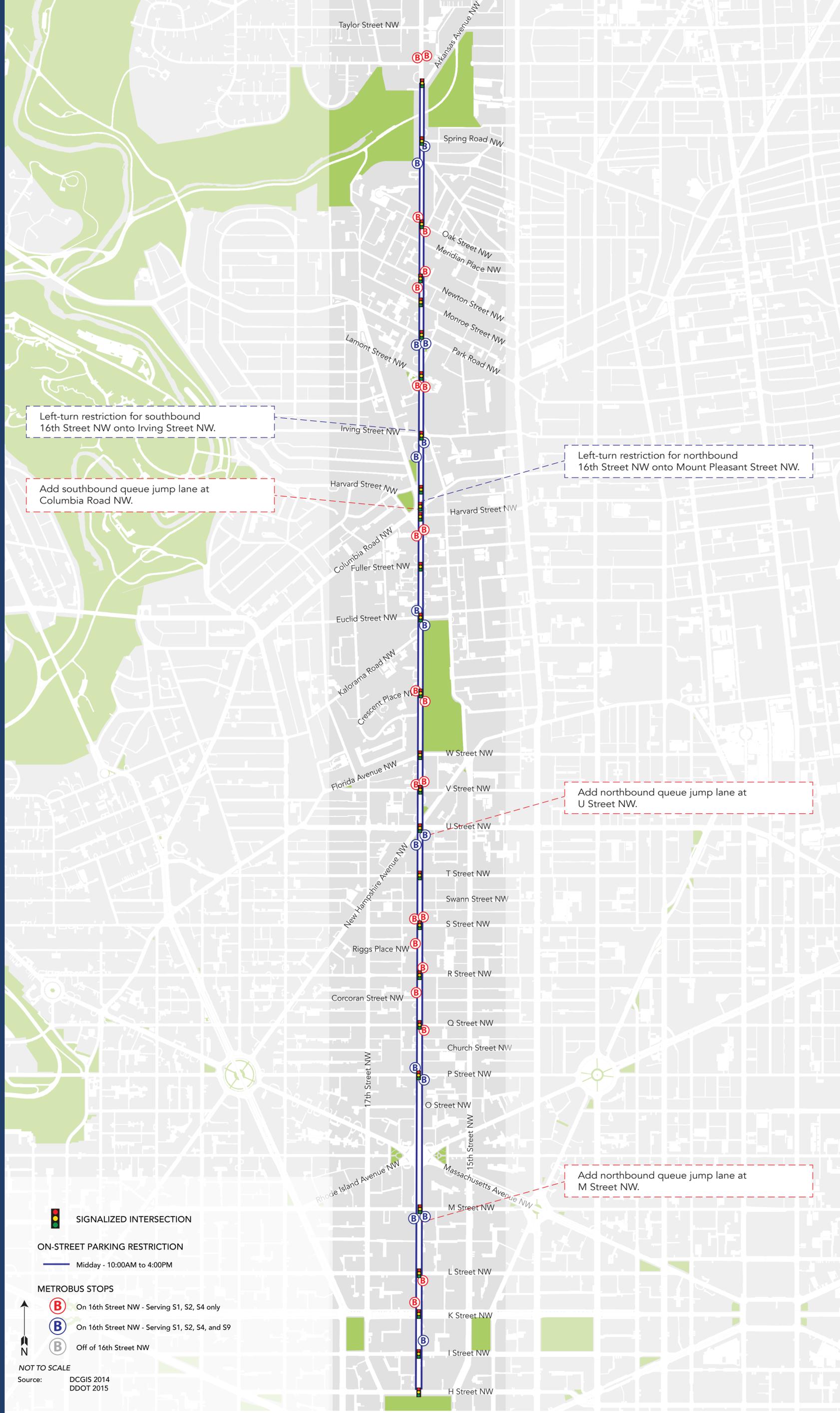
- Add queue-jump lanes at:
 - U Street - northbound
 - Columbia Road - southbound
 - M Street - northbound

TRANSIT IMPROVEMENTS

- Implement limited stop service for S1 Route using current S9 stops
- Relocate deadhead service to Arkansas Avenue from Missouri Avenue
- Truncate service patterns in Downtown
 - McPherson Square Metro for S2/S4
 - Farragut Square for S1
- Implement off-board fare payment with enforcement inspection for all stops
- Allow all-door boarding for all stops

TRAFFIC OPERATIONS IMPROVEMENTS

- Incorporate automated parking enforcement on buses for peak hour restrictions
- Left-turn restrictions
 - Southbound - Irving Street
 - Northbound - Mount Pleasant Street
- Remove midday parking



 SIGNALIZED INTERSECTION

ON-STREET PARKING RESTRICTION

 Midday - 10:00AM to 4:00PM

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

SERVICE CHANGE NOTE:

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

BASE + ALTERNATIVE 2 DRAFT IMPROVEMENTS

Infrastructure Focus

PHYSICAL IMPROVEMENTS

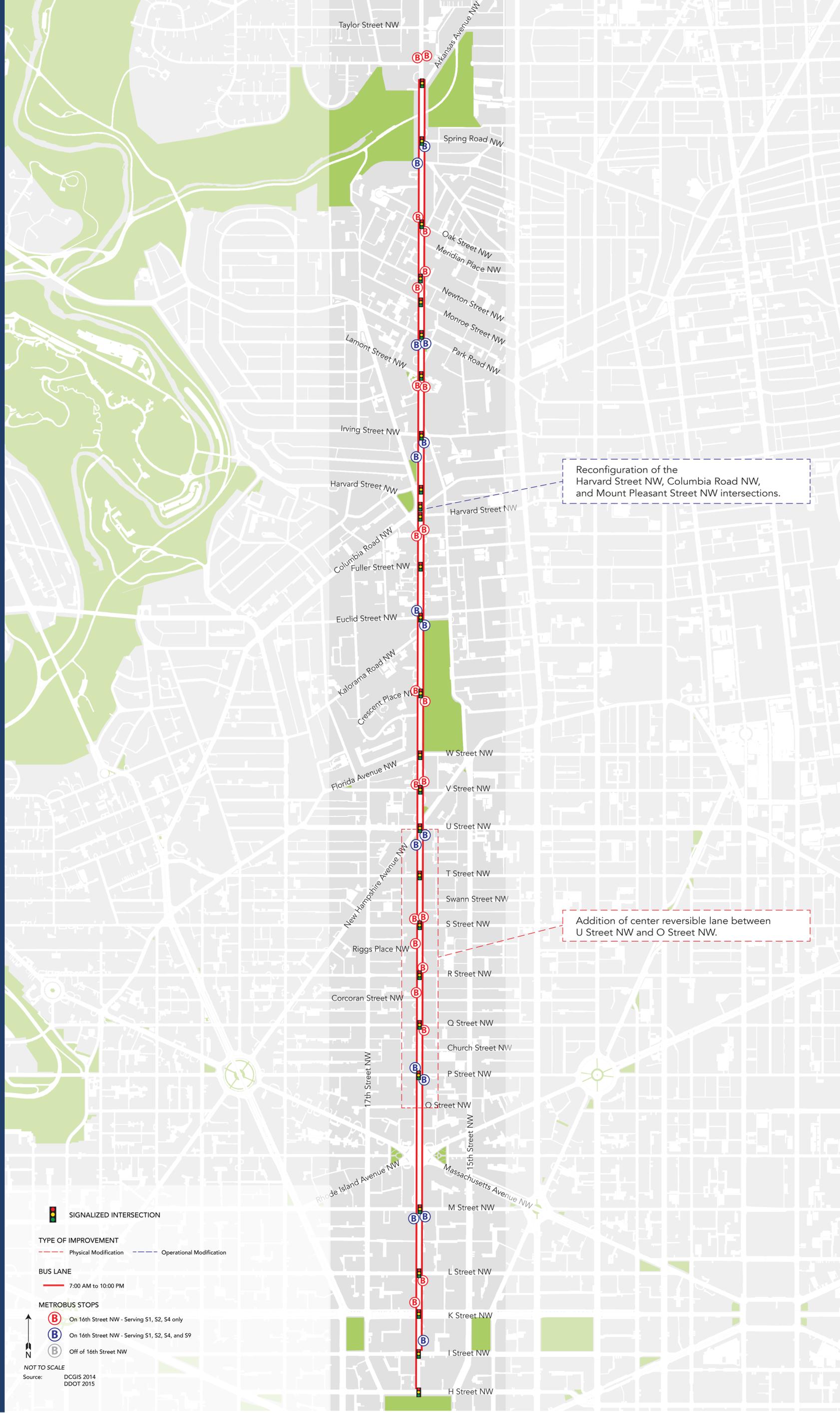
- Implement bus lanes both directions from 7:00am – 10:00pm for full length of corridor
- Add a center reversible lane

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



Reconfiguration of the Harvard Street NW, Columbia Road NW, and Mount Pleasant Street NW intersections.

Addition of center reversible lane between U Street NW and O Street NW.

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

SIGNALIZED INTERSECTION

TYPE OF IMPROVEMENT
--- Physical Modification --- Operational Modification

BUS LANE
— 7:00 AM to 10:00 PM

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

NOT TO SCALE
 Source: DCGIS 2014, DDOT 2015

BASE + ALTERNATIVE 3 DRAFT IMPROVEMENTS

Mixed Service and Infrastructure

PHYSICAL IMPROVEMENTS

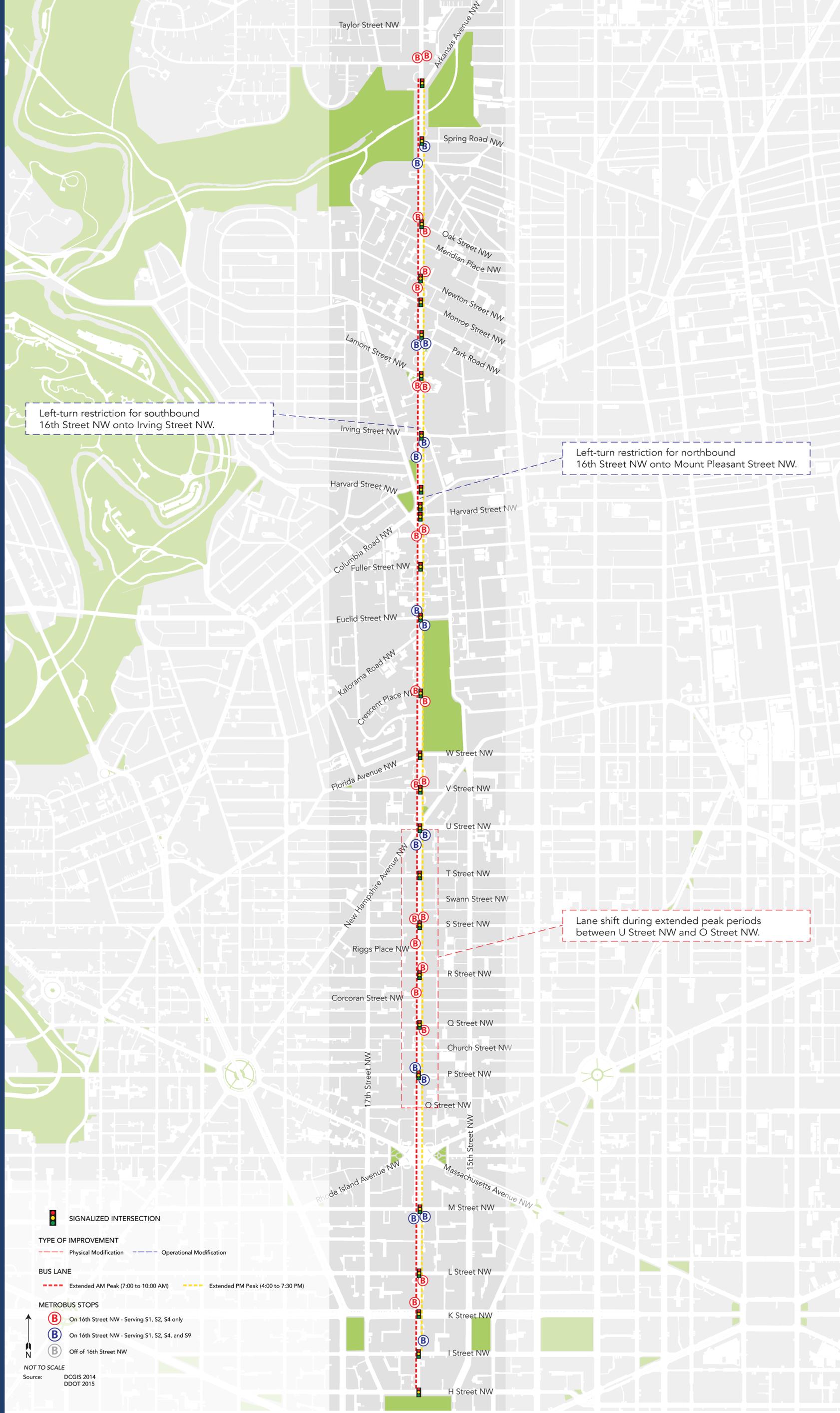
- Implement extended peak period, peak direction bus lane full length of the corridor
- Lane configuration changes between U and O Streets due to bus lanes
 - 2 lanes southbound and 1 lane northbound 7:00 - 10:00am
 - 2 lanes northbound and 1 lane southbound 4:00 - 7:30pm

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

SIGNALIZED INTERSECTION

TYPE OF IMPROVEMENT

Physical Modification Operational Modification

BUS LANE

Extended AM Peak (7:00 to 10:00 AM) Extended PM Peak (4:00 to 7:30 PM)

METROBUS STOPS

(B) On 16th Street NW - Serving S1, S2, S4 only

(B) On 16th Street NW - Serving S1, S2, S4, and S9

(B) Off of 16th Street NW

NOT TO SCALE

Source: DCGIS 2014, DDOT 2015

Parking Spaces - Primary Study Area

	West Side of Street				East Side of Street				Total			
	AM Peak	Midday	PM Peak	Evening	AM Peak	Midday	PM Peak	Evening	AM Peak	Midday	PM Peak	Evening
Existing Conditions	0	235	120	235	120	300	10	300	120	535	130	535
Draft Base Improvements	0	230	115	230	115	295	0	295	115	525	115	525
Draft Alternative 1	0	0	115	230	115	0	0	295	115	0	115	525
Draft Alternative 2	0	0	0	230	0	0	0	295	0	0	0	525
Draft Alternative 3	0	230	0	230	0	295	0	295	0	525	0	525

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.

	AM Peak	Midday	PM Peak	Evening
Existing Conditions	7:00 – 9:30AM	9:30AM – 4:00PM	4:00- 6:30PM	6:30PM – 7:00AM
Draft Base Improvements	7:00 – 10:00AM	10:00AM – 4:00PM	4:00- 7:30PM	7:30PM – 7:00AM
Draft Alternative 1	7:00 – 10:00AM	10:00AM – 4:00PM	4:00- 7:30PM	7:30PM – 7:00AM
Draft Alternative 2	7:00 – 10:00AM	10:00AM – 4:00PM	4:00- 10:00PM	10:00PM – 7:00AM
Draft Alternative 3	7:00 – 10:00AM	10:00AM – 4:00PM	4:00- 7:30PM	7:30PM – 7:00AM

Draft Alternative 1 - Potential Route Truncations

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

RIDERSHIP

Route	Southbound Alightings			Northbound Boardings		
	S1	S2	S4	S1	S2	S4
Truncated Segment*	903	574	297	379	774	200
South of Arkansas Avenue NW	1658	4527	2697	617	3064	2122
Truncated Segment as a Percentage of South of Arkansas Avenue NW	54.4%	12.7%	11.0%	61.4%	25.2%	9.4%
Truncated Segment as a Percentage of S Line Total	8.0%	5.1%	2.6%	3.4%	7.0%	1.8%

*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)