RECOMMENDED ALTERNATIVE

The Recommended Alternative is a combination of improvements from each of the three alternatives, refined based on public and stakeholder input. Implementation of the Recommended Alternative has been broken down into three phases: (1) less than 18 months, (2) 2 to 4 years, and (3) 4 or more years. DDOT and WMATA are both leading elements of the implementation and will coordinate with other agencies, including the Metropolitan Police Department and Department of Public Works. DDOT anticipates that the bus lanes will be open and operational in 2 to 4 years, coinciding with the start of off-board fare payment and all-door boarding.

IMPROVEMENT	RECOMMENDED ALTERNATIVE
PHYSICAL IMPROVEMENTS	
Bus stop consolidation: - 3 southbound locations (Newton, Lamont, and V Streets) - 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 stops to WMATA zone lengths	✓
Bus lanes	Full length, extended peak period peak direction: 7 - 10 AM southbound 4 - 7:30 PM northbound
Extension of center reversible lane from Arkansas Avenue to K Street	✓
Install fifth lane W Street to O Street and K Street to H Street	✓
Intersection reconfiguration at Harvard/Columbia/Mount Pleasant	Future Project
TRANSIT SERVICE IMPROVEMENTS (Any service changes would require a future public involvement process led by WMATA)	
Headway-based service	✓
Increase limited stop service (may include converting some local bus trips to limited stops)	✓
Transition to simpler patterns	✓
Running and recovery time added to schedule	✓
Fleet mix upgraded with low-floor and articulated buses	✓
Off-board fare payment	All buses, all stops
All-door boarding	All buses, all stops
TRAFFIC OPERATIONS IMPROVEMENTS	
Transit signal priority (TSP) at 18 locations configured for headway-based service	✓
Peak period parking restrictions extended to 7 - 10 AM (from 9:30 AM) and 4 - 7:30 PM (from 6:30 PM). No parking from Arkansas Avenue to M Street during AM and PM peak periods.	✓
Pedestrian safety improvements, including at Arkansas Avenue, Sacred Heart Way, and Mount Pleasant Street	✓
Bus stop amenity and access improvements	✓
Automated enforcement	Enforcement of driving and parking in bus lanes
PM peak period southbound left turn restriction at W Street	✓

QUESTIONS OR COMMENTS?

Contact Megan Megan Kanagy at megan.kanagy@dc.gov
or visit our website at bit.ly/16thStreetBus

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16TH STREET NW TRANSIT PRIORITY

Planning Study

January 21, 2016

STUDY OVERVIEW

The 16th Street NW Transit Priority Planning Study (the Study) seeks to improve transit performance and reliability with the study area: 16th Street NW between H Street and Arkansas Avenue. The 16th Street line currently serves more than 20,000 bus riders each weekday, making it one of the highest in the region for ridership; more than half of the people traveling on 16th Street in the peak are bus riders.

However, the line suffers from reliability issues and overcrowding, resulting in bus bunching, pass-bys, and slow travel speeds. Motorists also experience significant queuing during rush hours. In addition, 16th Street often serves as a barrier between neighborhoods. Pedestrian crossings are difficult, especially at several complex intersections, and east-west connectivity is limited for vehicles.

The 16th Street line consists of the S1, S2, and S4 local routes andthe S9 MetroExtra limited stop route.

GOALS AND OBJECTIVES

Based on input from the public at the outset of the Study, the following goals and objectives were developed:

GOALS

- Improve travel for persons using public transit;
- Develop alternatives based on public and stakeholder input; and
- Evaluate alternatives in terms of their benefits to transit users, possible impacts on users of other transportation modes, and safety.

OBJECTIVES

- Improve transit service reliability and travel times by identifying and addressing sources of potential issues (e.g., traffic congestion, signal timing, passenger boarding delays, bus capacity, number and location of bus stops, and/or parking enforcement);
- Prioritize transit while maintaining operations for those traveling by other modes;
- Improve passenger comfort and safety (e.g., overcrowding, street crossings, and bus stop amenities);
- Accommodate current unmet passenger demand for public transit service; and
- Develop an implementation plan that includes cost estimates.

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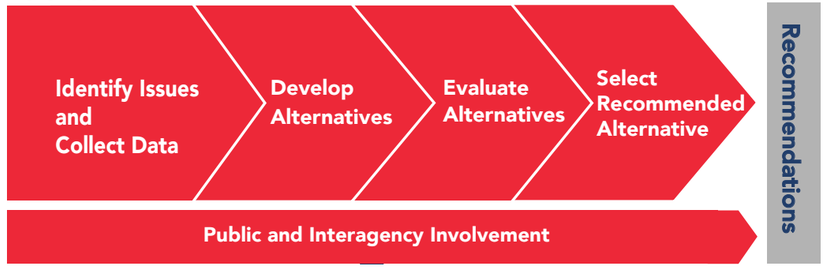
PLANNING PROCESS AND PUBLIC INVOLVEMENT

Over the course of the 12-month Study, DDOT collected and analyzed data on the existing conditions of the corridor, developed three alternatives, and selected a recommended alternative, all based on public and stakeholder involvement. DDOT held a community kick-off meeting in March 2015, followed by four Citizens Advisory Group meetings throughout the year, four "pop-up style" public engagement events at high-volume bus stops along the corridor in October 2015, and a final public meeting in January 2016.

PLANNING PROCESS



DATA COLLECTION AND ANALYSIS

In spring and summer 2015, DDOT undertook extensive data collection and analysis to better understand the existing conditions along the corridor, including transit service, traffic operations, safety, and pedestrian access. DDOT identified the following key issues regarding transit travel times and reliability:

- Buses are typically moving only about half of the total trip time. The remaining half is split between dwell time and time spent waiting at traffic signals.
- Buses arrive already bunched to the study area and buses are bunched throughout the day, including the early night period (7 to 11 PM). This is in part due to the multiple service patterns operated along the S line and because bus trip times are longer than the scheduled trip times.
- The travel speed slowdown in the AM and PM peak extends past the peak periods. Midday and early night speeds are slow too, in part because of off-peak parking along the corridor.
- The time per passenger to board the S9 route, which uses low-floor buses, is lower than for the local routes. The S4 is the most crowded route, but maximum loads are high on all routes, which contributes to longer dwell times and pass-bys.

Dwell time is the time spent loading and unloading passengers at the bus stop.

ALTERNATIVES

Three alternatives were created to directly address the issues identified through data analysis and public input. Each includes a combination of infrastructure, transit service, and traffic operations improvements. DDOT used these alternatives to test which types and combinations of improvements would best address the Study's goals and objectives.

	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)	✓	✓	✓
BASE IMPROVEMENTS	Far-side bus stop expansion: 2 southbound locations (Harvard and M Streets)	✓	✓	✓
BASE IMPROVEMENTS	Relocate southbound Spring Place bus stop north to Spring Road to improve pedestrian safety	✓	✓	✓
BASE IMPROVEMENTS	Upgrade bus stops to WMATA zone lengths	✓	✓	✓
ADDITIONAL IMPROVEMENTS	Bus lanes		Full length, both directions 7 AM - 10 PM	Full length, extended peak period peak direction: - 7 - 10 AM southbound - 4 - 7:30 PM northbound
ADDITIONAL IMPROVEMENTS	Extend reversible lane to O Street		✓	✓
ADDITIONAL IMPROVEMENTS	Queue jump lanes	✓		
ADDITIONAL IMPROVEMENTS	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	✓	✓	✓
BASE IMPROVEMENTS	S2 Route patterns reduced	✓	✓	✓
BASE IMPROVEMENTS	S1 and S2 service eliminated along 14th Street between Northern Bus Garage and 16th Street	✓	✓	✓
BASE IMPROVEMENTS	Running and recovery time added to schedule	✓	✓	✓
BASE IMPROVEMENTS	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
ADDITIONAL IMPROVEMENTS	All-door boarding	All buses, all stops		S9 buses and stops only
ADDITIONAL IMPROVEMENTS	S1 converted to limited stop service using current S9 stops	✓		
ADDITIONAL IMPROVEMENTS	S2/S4 service patterns truncated in downtown to McPherson Square Metro	✓		
ADDITIONAL IMPROVEMENTS	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	✓	✓	✓
BASE IMPROVEMENTS	Peak period parking restrictions extended to 7 - 10 AM (from 9:30 AM) and 4 - 7:30 PM (from 6:30 PM)	✓	✓	✓
BASE IMPROVEMENTS	Southbound reversible lane extended to 7 - 10 AM (from 9:30 AM)	✓	✓	✓
BASE IMPROVEMENTS	Pedestrian safety improvements, including at Arkansas Avenue, Sacred Heart Way, and Harvard/Columbia/Mount Pleasant	✓	✓	✓
BASE IMPROVEMENTS	Bus stop amenity and access improvements	✓	✓	✓
BASE IMPROVEMENTS	Correct parking restrictions northbound between L and M Streets to prohibit PM peak parking	✓	✓	✓
BASE IMPROVEMENTS	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	
ADDITIONAL IMPROVEMENTS	Dedicated towing		Pilot program with potential extension	✓
ADDITIONAL IMPROVEMENTS	Remove midday parking	✓	✓	
ADDITIONAL IMPROVEMENTS	Left-turn restrictions - Southbound at Irving Street - Northbound at Mount Pleasant Street	✓		✓
ADDITIONAL IMPROVEMENTS	Southbound left turn lane separation and advance signage at W Street	✓		
ADDITIONAL IMPROVEMENTS	Peak hour signal timing extended for north-south traffic through midday (pending further analysis as part of the ongoing citywide Traffic Signal Optimization effort)			✓

WHAT ARE THE BENEFITS OF CONSOLIDATION?

With the consolidation of these stops, DDOT conservatively estimates travel time savings of 1 to 1.5 minutes per bus trip. This is about 15 to 25% of the total travel time savings estimated under the Recommended Alternative for the S1, S2, and S4 routes. Bus stop consolidations will also enable DDOT to allow other curbside uses, such as parking or loading zones, which are not possible today because of the bus stops.

WHAT ARE THE IMPACTS OF CONSOLIDATION?

DDOT recognizes that bus stop consolidation will increase the distance that some pedestrians need to walk in order to access the bus. In addition, many of the adjacent stops are already crowded with people waiting for the bus. To address these concerns, DDOT will work to improve access to the adjacent bus stops and will install additional shelters, expand waiting areas, and improve pedestrian safety at the stops. These improvements will be in place before a stop is consolidated.

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WE WANT YOUR FEEDBACK ON BUS STOP CONSOLIDATION

Please inform DDOT if there are additional bus stop or safety improvements that would assist pedestrians in accessing the next closest bus stop by emailing **Megan Kanagy** at **megan.kanagy@dc.gov**.

16TH STREET NW TRANSIT PRIORITY Planning Study

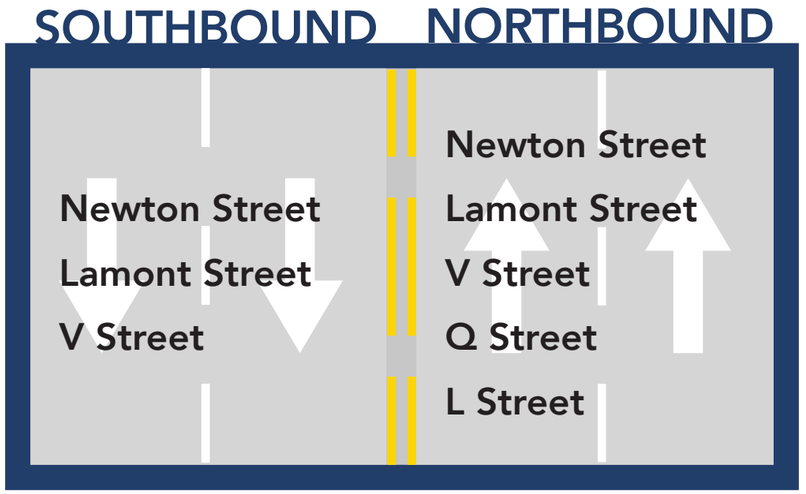
January 21, 2016

BUS STOP CONSOLIDATION

The objectives of the 16th Street Transit Priority Study include improving transit service reliability and travel times, while also improving overall passenger comfort and safety. Bus stop consolidation is one way to improve overall bus travel times, as the buses spend less time at bus stops. Currently average bus travel speeds, including time spent at bus stops, are below 10 mph for much of the day along 16th Street NW.

WHICH STOPS ARE PROPOSED FOR CONSOLIDATION?

There are currently 16 southbound bus stops and 18 northbound bus stops within the 2.7-mile study corridor, which averages to about a stop every 1/6th of a mile. As part of the Recommended Alternative, DDOT is proposing to consolidate three southbound stops and five northbound stops, which would average to about a stop every 1/5th of a mile. The stops proposed for consolidation are:



These stops were selected for two reasons:

1. They are generally located within one block of an adjacent stop; and
2. They are not S9 MetroExtra service stops (S9 stops are located at major cross streets and are classified as enhanced stops under WMATA's guidelines, indicating a higher level of customer amenities).

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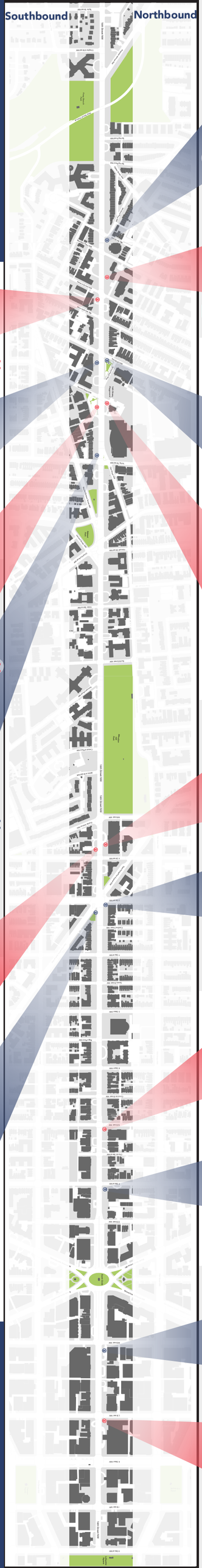
BUS STOP CONSOLIDATION

CONSOLIDATED STOPS & IMPROVEMENTS TO THE CLOSEST ADJACENT STOPS



Stop Proposed for Consolidation: Newton Street

Approximate Distance to Closest Adjacent Stop
Park Road: 1/10th of a mile

Approximate Distance Between Adjacent Stops
Park Road and Oak Street stops: 1/4th of a mile

Improvements Proposed
» Install second shelter at Park Road.
» Install shelter at Oak Street and pave planting strip to create additional waiting area.

Stop Proposed for Consolidation: Lamont Street

Approximate Distance to Closest Adjacent Stop
Irving Street: 1/15th of a mile (distance to new Irving Street stop location)

Approximate Distance Between Adjacent Stops
Irving Street and Park Road stops: 1/7th of a mile (distance to new Irving Street stop location)

Improvements Proposed
» Relocate Irving Street stop north of intersection to facilitate transfers to Columbia Heights Metro Station and to move closer to Lamont Street.
» Install second shelter at Irving Street and pave planting strip to create additional waiting area.
» Install second shelter at Park Road.

Stop Proposed for Consolidation: V Street

Approximate Distance to Closest Adjacent Stop
U Street: 1/10th of a mile

Approximate Distance Between Adjacent Stops
U Street and Crescent Place stops: 1/4th of a mile (distance to new Crescent Place stop location)

Improvements Proposed
» Relocate Crescent Place stop to just south of intersection, closer to V Street, and install a shelter.
» Install second shelter at U Street and relocate street furniture to create additional waiting area.

Stop Proposed for Consolidation: Newton Street

Approximate Distance to Closest Adjacent Stop
Oak Street: 1/15th of a mile

Approximate Distance Between Adjacent Stops
Park Road and Oak Street stops: 1/5th of a mile

Improvements Proposed
» Install shelter at Oak Street and pave planting strip to create additional waiting area. Install additional lighting if needed.
» Install second shelter at Park Road and pave planting strip to create additional waiting area.

Stop Proposed for Consolidation: Lamont Street

Approximate Distance to Closest Adjacent Stop
Park Road: 1/15th of a mile

Approximate Distance Between Adjacent Stops
Irving Street and Park Road stops: 1/6th of a mile

Improvements Proposed
» Install second shelter at Park Road. Relocate street furniture and pave planting strip to create additional waiting area.
» Improve pedestrian crossing at Sacred Heart Way.
» Install second shelter at Irving Street. May require widening sidewalk to create additional waiting area.

Stop Proposed for Consolidation: V Street

Approximate Distance to Closest Adjacent Stop
U Street: 1/10th of a mile

Approximate Distance Between Adjacent Stops
U Street and Crescent Place stops: 1/4th of a mile

Improvements Proposed
» Install second shelter at U Street. Widen sidewalk to create additional waiting area.
» Install shelter at Crescent Place.

Stop Proposed for Consolidation: Q Street

Approximate Distance to Closest Adjacent Stop
P Street: 1/12th of a mile

Approximate Distance Between Adjacent Stops
P Street and R Street stops: 1/4th of a mile

Improvements Proposed
» Install second shelter at P Street. May require widening sidewalk to create additional waiting area.

Stop Proposed for Consolidation: L Street

Approximate Distance to Closest Adjacent Stop
M Street: 1/9th of a mile

Approximate Distance Between Adjacent Stops
I Street and M Street stops: 1/4th of a mile

Improvements Proposed
» Install second shelter at M Street and relocate street furniture to create additional waiting area.
» Install second shelter at I Street.

LEGEND

Bus stop proposed for consolidation

Closest adjacent bus stop

N

NOT TO SCALE

16TH STREET NW TRANSIT PRIORITY Planning Study

January 21, 2016

SPRING PLACE BUS STOP RELOCATION

As part of the 16th Street NW Transit Priority Planning Study, DDOT evaluated several options to improve pedestrian safety at 16th Street and Spring Place. Currently, the southbound bus stop is near the intersection of Spring Place, which is an unsignalized intersection and does not have a marked crosswalk across 16th Street. The northbound stop is near Spring Road, which is signalized and has a marked crosswalk across 16th Street. Pedestrians trying to access the southbound bus stop sometimes cross 16th Street at Spring Place, rather than using the marked crosswalk at Spring Road.

Unfortunately, this situation cannot be improved simply by striping a crosswalk across 16th Street at Spring Place. Doing so would create an even more unsafe situation than exists today. Based on a rigorous body of safety research, uncontrolled marked crosswalks (crosswalks without a traffic signal) on multi-lane, high volume arterial streets, like 16th Street, create a significantly higher probability of a pedestrian being struck compared with leaving it unmarked.

Given that simply striping a crosswalk at Spring Place would be unsafe, three additional options were examined, as shown below.

OPTIONS

- Preferred Option
- Considered Option
- Existing Bus Stop
- Proposed Bus Stop

Relocate the southbound bus stop about 175' north to just south of Spring Road

» The relocated bus stop would be closer to the signalized crossing at Spring Road, but could result in a longer walk to access the bus stop for some pedestrians.

» The sidewalk would need to be widened at the new location to accommodate both bus shelters at the current stop.

Install a High-Intensity Activated Crosswalk (HAWK) beacon and stripe a crosswalk

» When a pedestrian activates the HAWK beacon, the beacon would stop traffic on 16th Street to allow the pedestrian to cross.

» Spring Place is too close to Spring Road to install a HAWK beacon. Spring Place is approximately 230' from Spring Road, which is under the 300' minimum spacing.

Install a traffic signal and stripe a crosswalk

Spring Place does not meet the warrant criteria for the installation of a traffic signal. The warrant criteria include vehicle volumes, pedestrian volumes, and the number of crashes, among other factors.