

Metrobus Service Evaluation Study

East Capitol Street-Cardozo Line, Routes 96-97

Final Report

January 2013



Study Purpose

- *The primary study purpose is to identify the strategic needs for programs and facilities for the East Capitol Street-Cardozo Line. The study includes a review of capacity, productivity, reliability, and quality of service indicators as well as recommended changes to improve service delivery.*

Project Scope of Work

- *Transit Service Assessment*
 - Develop a detailed assessment and “snapshot” of the East Capitol Street-Cardozo Line
 - Overall service characteristics, ridership and productivity, boardings and alightings, passenger loads, bus stop spacing, on-time performance, driver and planner interviews
- *Traffic Operations Assessment*
 - Identify the full range of traffic issues on the East Capitol Street-Cardozo Line
 - Traffic signals and other traffic control devices
 - Lane widths and right-of-way
 - Turns and adequate turning radius

Project Scope of Work

- *Public Outreach*
 - Rider survey to gauge issues and needs
 - Focus group and two public meetings
 - Issues identification
 - Feedback on preliminary recommendations
 - Outreach results were key input into the study process and recommendations

Project Scope of Work

- *Recommendations*
 - Completed in two steps
 - Preliminary recommendations – relied on inputs from all previous steps
 - Final – incorporate project team comments
 - Areas covered by recommendations
 - Additional run time to trips
 - Simplification of route alignments
 - Overlapping route patterns and adding skip-stop service
 - Extending route length
 - Traffic and running way improvements
 - Improvements to bus stop locations and amenities

Line Summary

- Line Description
 - The East Capitol Street-Cardozo Line operates completely within the District of Columbia.
 - Route 96 runs generally Northwest/Southeast between McLean Gardens (and now, temporarily, Tenleytown) and Capitol Heights Metro Station. It serves East Capitol Street, New Jersey Avenue NW, U Street, Adams Morgan, Woodley Park, and Cleveland Park.
 - There is also a 96/ peak-period service between McLean Gardens and Stadium-Armory Metro.
 - Route 97 is a companion peak-only route that runs between Union Station and Capitol Heights Metro. Almost all of Route 97 runs on East Capitol Street.

Line Summary

- *Service Characteristics*
 - Days and hours of service (start of first trip to start of last trip)

	Route 96 Hours of Service	Route 97 Hours of Service
Weekday • Mon- Thu • Friday	4:46 AM – 12:43 AM 4:46 AM – 2:40 AM	6:02 AM – 9:00 AM 2:53 PM – 6:17 PM
Saturday	4:57 AM – 2:55 AM	-
Sunday	5:03 AM – 1:06 AM	-

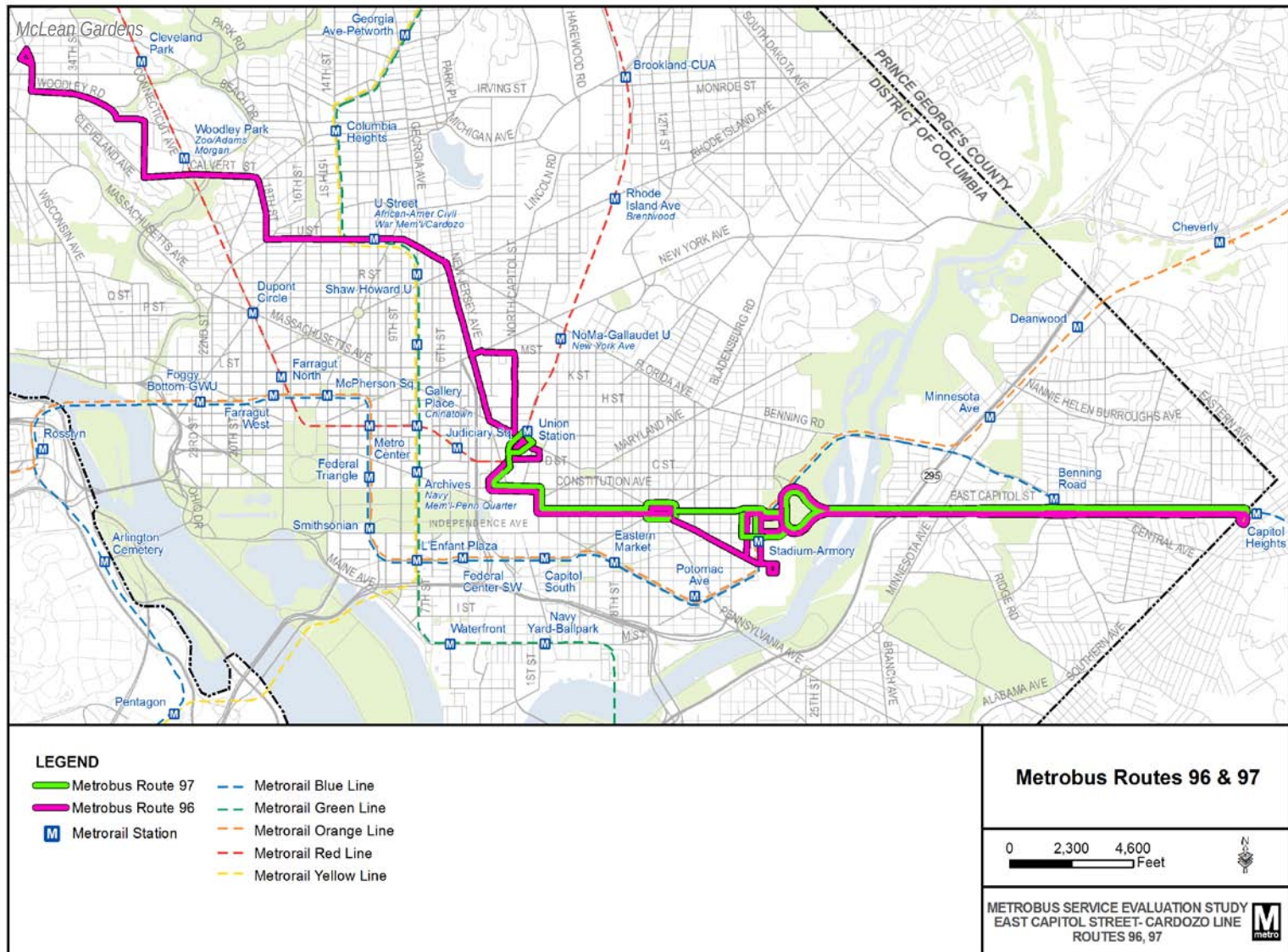
Line Summary

- Weekday Ridership and Productivity*

Route	Productivity Measure	Value	Minimum WMATA Standard
96	Average weekday ridership	3,610	> 385
	Cost recovery from fares	19.75%	>14.96%
	Boardings/trip	33	>9.49
	Subsidy/passenger	\$3.46	<\$5.90
	Boardings/revenue mile	2.73	>1.02
97	Daily ridership	705	> 385
	Cost recovery from fares	25.74%	>14.96%
	Boardings/trip	14	>9.49
	Subsidy/passenger	\$4.15	<\$5.90
	Boardings/revenue mile	2.11	>1.02

Source: WMATA Productivity Report – generated April 2012

Line Map



Study Findings

- On-Time Performance (OTP)
 - Buses on Routes 96 often do not run on schedule. OTP is poor mainly during the midday, afternoon peak and evening time periods both on weekdays and weekends. On-time performance is slightly better on Route 97.
- Insufficient Run Time
 - A review of the data indicated insufficient scheduled run time when compared to actual run times
- Passenger Facilities
 - Bus stop spacing – multiple stops are too close together based on WMATA bus stop spacing guidelines
 - Multiple stops lack basic bus stop amenities as outlined in WMATA Bus Stop Guidelines

Service Recommendations

Recommendation #1 – Begin Saturday Morning Eastbound Service Earlier

Recommendation: Adjust the Route 96 Saturday schedule so that the first eastbound trip begins at McLean Gardens at 6:07 am, which would allow the first bus to arrive at Capitol Heights Metro before 7:00 am.

- WMATA'S Service Guidelines criteria used for this evaluation showed that, for Routes 96 and 97 (an urban crosstown line), hours of service are adequate for weekdays and Sundays. However, the guidelines state that on Saturdays, the first trip of day should arrive at its final destination terminal no later than 7:00 am.
- Saturday eastbound service for Route 96 begins at McLean Gardens at 6:17 am and is scheduled to arrive at Capitol Heights Metro at 7:09 am – nine minutes past the time prescribed in the WMATA Guidelines.
- The first westbound, return trip would also be moved up 10 minutes.
- To make this recommendation possible, a trip starting U & 13th Streets NW could begin at McLean Gardens instead.
- This recommendation would not affect average headways; they would remain at 30 minutes in keeping with WMATA Guidelines for Saturday service.

Service Recommendations

Recommendation #2 – Evaluate Need to add run time to schedule

Recommendation: To address potential run time issues, request that the WMATA Schedules Department complete a detailed analysis of 96-97 actual run times relative to scheduled run times to determine whether the inadequate run time issues identified using available data and driver inputs are, in fact, present. If the patterns identified in this study are confirmed, schedules should be adjusted to ensure that they fully reflect actual conditions.

- The recommendation to add time to the Route 96-97 schedules is based on two sources of information:
 - First, bus operators informed the project team that they always seem to be “pushing the bus” to meet the schedule.
 - Second, WMATA’s data on actual trip run times was compared to the current scheduled run times. Although there are trips that meet the scheduled run time, the data revealed that the actual trip run times for Route 96 and 97 buses trend longer than the scheduled run times in both directions at most times of day.

Service Recommendations

Recommendation #3 – Dedicated Supervision

Recommendation: To help buses adhere to schedule and maintain headway separation, assign one full-time equivalent (FTE) supervisor to monitor Routes 96 and 97.

- In previous Metrobus corridor studies and evaluations, one or two supervisors were assigned to a particular line. These supervisors monitor the on-time performance of buses, communicate with operators about delays and detours, and work proactively to address potential problems along the line before they happen.
- For Routes 96 and 97, a supervisor would be assigned to a location to be determined. The weakest periods in terms of on-time performance are the mid-day, PM peak and early evening periods on weekdays and on weekends, as well as the late evening periods on weekends.
- A supervisor could cover these shifts seven days per week between approximately 9:00 AM and 9:00 PM.
- Supervisors would be asked to derive actions from a “playbook” of contingencies, to be determined, and report on a monthly basis the on-time performance of the line and actions taken to improve it.

Service Recommendations

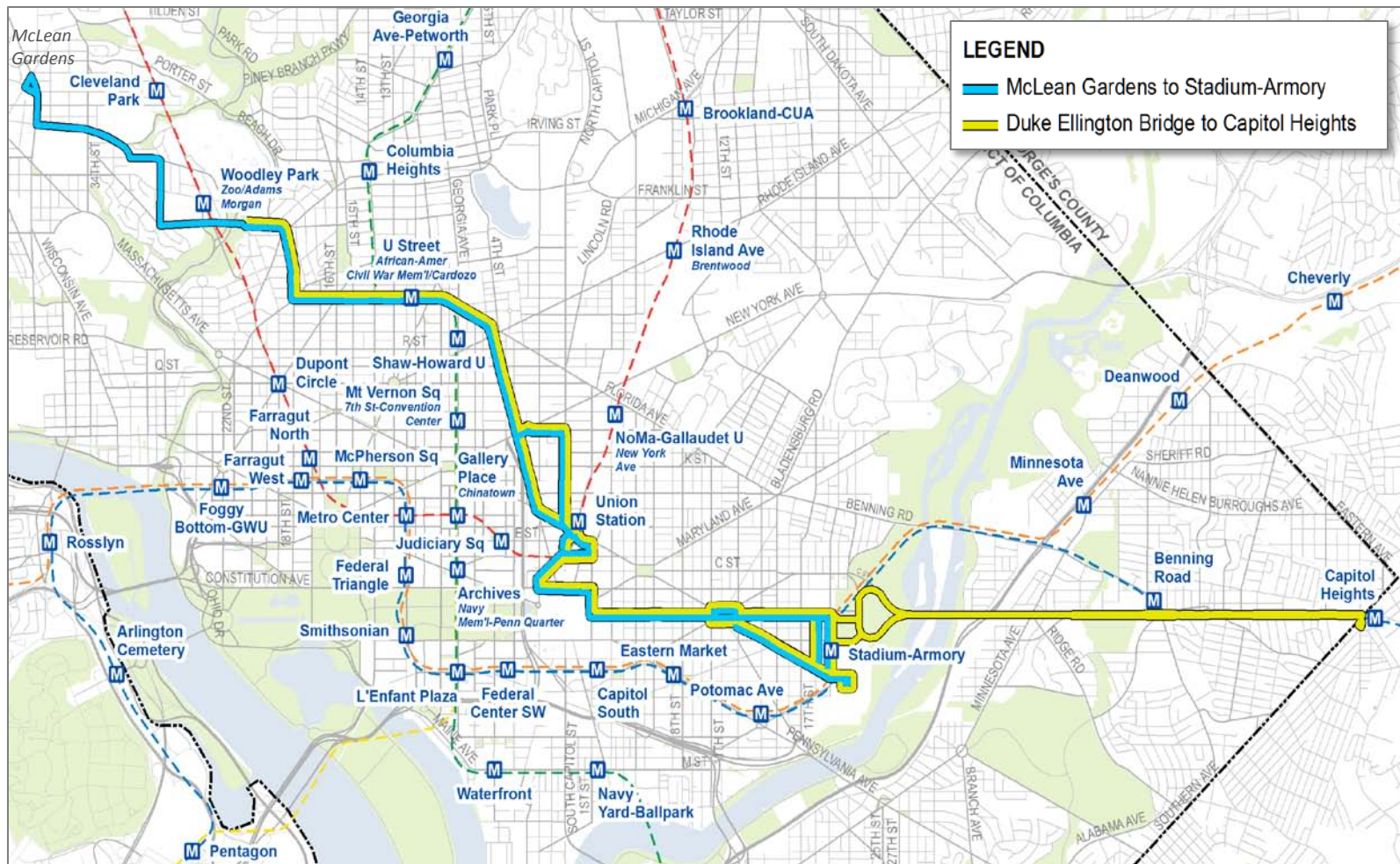
Recommendation #4 – Overlap Route 96 Patterns

Recommendation: Explore feasibility and benefits of giving Route 96 two overlapping patterns, one from McLean Gardens to Stadium-Armory Metro and one from Duke Ellington Bridge to Capitol Heights Metro.

- Route 96 is 14 miles long and suffers from on-time performance problems.
- Splitting Route 96, at Union Station, was analyzed; but it was determined that the number of forced transfers would be too high.
- Overlapping two Route 96 segments may be a better option, as it would likely have a positive impact on reliability without affecting as many through-riders.

Service Recommendations

Recommendation #4 continued – Overlapping Route 96 Patterns



Service Recommendations

Recommendation #5 – Simplify Route Alignments

Recommendation: To speed travel times, have Routes 96 and 97 run on Massachusetts Avenue NE and 2nd Street NE/SE instead of serving the intersection of Louisiana & Constitution.

- Routes 96 and 97 would save approximately 4 minutes of travel time in each direction by using 2nd Street and Massachusetts Avenue NE instead of the current alignment that stops at Louisiana Avenue.
- *This proposal received overwhelming support from participants of the public meetings.*



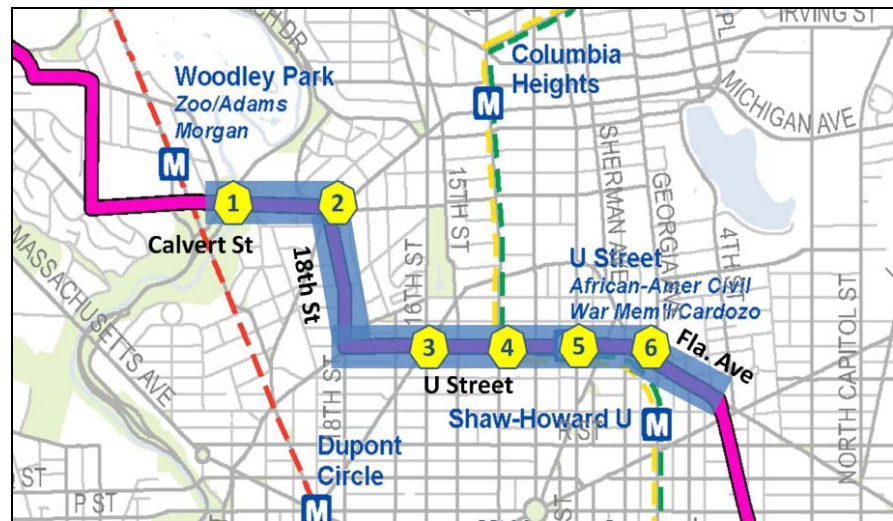
Service Recommendations

Recommendation #6 – Create Skip-Stop Service on Route 96

Recommendation: Create skip-stop service on the segment of Route 96 between Duke Ellington Bridge and New Jersey Avenue NW. This would decrease travel time for through riders between upper Northwest DC and Union Station by more than a minute and a half in each direction.

Stops to be retained:

1. Duke Ellington Bridge
2. 18th & Columbia NW
3. 16th & U Streets NW
4. 14th & U Streets NW
5. 11th & U Streets NW
6. 7th & Florida NW



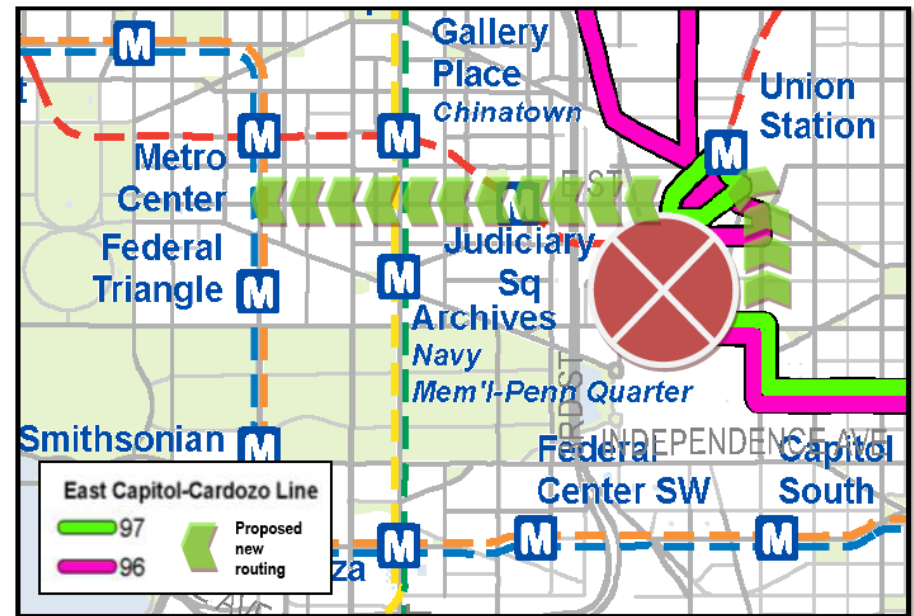
- Given that the number of stops would be decreasing from 11 to 6, and assuming a dwell time of 20 seconds per stop, approximately 100 seconds would be saved in run time per trip.
- Impacts to existing riders would be minimal, as the segment is served by other routes (including the Metrobus X3, 90, 92, and 93) and the majority of boardings take place at the six stops that would be retained as part of this recommendation.

Service Recommendations

Recommendation #7 – Extend Route 97 to Downtown DC

Recommendation: Extend Route 97 west from Union Station along E Street to a new terminal at Metro Center.

- Would provide a one-seat ride for Metrobus riders along East Capitol Street to Downtown.
- Analysis of COG data estimates a maximum of 500 additional riders on Route 97 per day.
- Creates the potential for future branding of Route 97 as a MetroExtra limited-stop service.



Facility Recommendations

Recommendation #8: Consolidate Bus Stops

To speed travel times along Routes 96 and 97, WMATA should consider the elimination or consolidation of bus stops that are under-used or too close to each other.

Based on an analysis of the data and WMATA's standards, 43 stops along Routes 96 and 97 were identified that could be considered for consolidation.

Further analysis and coordination with DDOT is also recommended, to determine potential physical or political barriers to removing bus stops in the corridor.

Westbound Candidate Stops	Boardings/ Alightings	Eastbound Candidate Stops	Boardings/ Alightings
East Capitol & Division NE	10/7	Cathedral & Woodley NW	3/1
4250 East Capitol NE	0/11	2937 Cathedral NW	2/1
East Capitol & 14th NE	8/2	29th & Garfield NW	7/5
18th & C NE	1/8	2745 29th NW	3/2
Massachusetts & 19th NE	4/6	U & 9th NW	7/11
Massachusetts & 17th NE	8/2	Florida & 6th NW	5/10
Massachusetts & 16th NE	5/5	Florida & 5th NW	10/3
New Jersey & L NW	21/21	New Jersey & R NW	12/11
New Jersey & M NW	23/9	New Jersey & Q NW	16/11
New Jersey & N NW	19/14	New Jersey & P NW	15/18
New Jersey & O NW	6/22	New Jersey & O NW	19/14
New Jersey & P NW	16/15	New Jersey & N NW	18/9
New Jersey & Q NW	1/9	North Capitol & Pierce NW	23/15
New Jersey & R NW	16/10	East Capitol & 4th SE	18/11
New Jersey & Rhode Island NW	2/9	East Capitol & 15th SE	2/8
Florida & 6th NW	5/12	Massachusetts & 16th SE	18/11
Calvert & 29th NW	2/18	Massachusetts & 17th SE	0/11
2727 Calvert NW	1/3	Massachusetts & 18th SE	1/14
2937 Cathedral NW	1/1	Massachusetts & 19th SE	0/10
Woodley & 35th NW	0/5	East Capitol & Fort Chaplin Park	3/20
Woodley & 36th NW	0/6	East Capitol & 47th SE	3/8
		5901 East Capitol SE	3/12

Facility Recommendations

Recommendation #9: Add Shelters and Benches

WMATA guidelines mandate that stops with more than 50 boardings a day be candidates for the installation of a shelter and bench. A field visit confirmed that Routes 96 and 97 have eight stops currently without a shelter and bench that receive more than 50 boardings per day.

Westbound Stops	Boardings	Eastbound Stops	Boardings
Massachusetts Ave between North Capitol St & 1st St NW	117	Massachusetts Ave & 1st St NE	427
East Capitol & 53rd St NE	105	U & 17th St NW	62
U & 14th St NW	85		
East Capitol & 55th St NE	78		
East Capitol & 57th Place NE	58		
U & 13th St NW	54		

Recommendation #10: Bus Stop Flags

WMATA requires that all bus stops have a flag indicating which routes serve the stop. A field visit verified that two stops along Routes 96-97 were missing flags. WMATA should schedule the immediate installation of flags at the two locations.

Westbound Stop	Boardings	Eastbound Stop	Boardings
New Jersey Ave & K St NW	55	East Capitol St & 52nd St	6

Facility Recommendations

Recommendation #11: Add Information Cases

The table at right lists bus stops along Routes 96-97 that require the installation of an information case. A field visit identified the location of all information cases along the line. All stops with more than 50 boardings per day that *do not* currently have an information case were identified as candidates for immediate installation. All stops with more than 20 boardings per day that *do not* currently have an information case were identified as candidates for future (long-term) installation.

A total 36 out of 169 stops (21 percent) were missing bus information cases along the entire line, and 19 of those stops qualified for installation of an information case.

Stop	Direction	Boardings	Stop	Direction	Boardings
Immediate Installation					
Massachusetts Ave between N. Capitol & 1st	WB	117	Massachusetts Ave & 1st St	EB	427
East Capitol St & Benning Rd	WB	113	U St & 14th St	EB	223
East Capitol & 53rd St	WB	105	18th & Columbia Rd	EB	107
East Capitol & 49th St	WB	80	U St & New Hampshire Ave	EB	87
East Capitol & 57th Pl	WB	58	U St & 13th St (Stop #1)	EB	81
U St & 13th St	WB	54	East Capitol & 8th St	EB	70
			U St & 17th St	EB	62
Future (Long-Term) Installation					
East Capitol & 50th St	WB	46	U St & 11th St	EB	29
U St & 11th St	WB	28			
U St & Vermont Ave	WB	24			
Massachusetts Ave & 18th St	WB	20			
Calvert St & Biltmore St	WB	20			

Facility Recommendations

Recommendation #12: Add Bus Stop Landing Pad

WMATA requires that bus stops have a sidewalk or landing pad for passengers to stand on while waiting for the bus. A field visit verified that five stops along Routes 96-97 were missing a sidewalk or pad.

Westbound Stop	Boardings	Eastbound Stop	Boardings
Louisiana Ave & D St	4	E. Capitol St & 3rd St	4
2727 29th St NW	1	E. Capitol St & Texas Ave	0
		2745 29th St NW	3

Recommendation #13: Install Trash Receptacles

WMATA's guidelines require that bus stops have a trash receptacle if the stop has more than 25 boardings per day. A field visit verified that out of 169 stops along Routes 96-97, six require a trash receptacle based on the boarding criteria.

Westbound Stop	Boardings	Eastbound Stop	Boardings
Massachusetts Ave between North Capitol & First St NW	117	Massachusetts Ave & First St NE	427
East Capitol St & 57th Place	58	U & 13th St NW (Stop #1)	81
		Newark St between Idaho & Wisconsin Aves NW	68
		M St & North Capitol St	36

Traffic Improvement Recommendations

Recommendation #15: Traffic Recommendations

Based on the analysis performed for the Traffic Assessment, 10 recommendations are made to improve traffic operations along the roadways in which Routes 96 and 97 operate. The map on the following page shows where traffic problems were found to exist along the corridor. WMATA should coordinate with DDOT to determine the feasibility, estimated costs, and potential timetable for improvements to traffic operations.

- 15.1 Bus delays were observed at several locations including the signals at East Capitol Street & Benning Road, East Capitol Street & 11th Street, New Jersey Avenue & New York Avenue, New Jersey Avenue & Florida Avenue, Florida Avenue & 7th Street, U Street & 14th Street, and North Capitol Street. **Recommendation:** Turning movements and pedestrian counts should be conducted at these intersections and cycle lengths should be optimized for all traffic movements. In some cases, the possibility of increasing the green time should also be explored. (Note: DDOT is now at 30% plans to convert New Jersey Avenue to a two-way street, which would eliminate the use of North Capitol Street for Route 96.)
- 15.2 Some signals were observed to have phases for intersection legs with minimal traffic. These intersections include East Capitol Street & 1st Street NE, 1st Street NW & Louisiana Avenue, 1st Street NE & Constitution Avenue. **Recommendation:** Traffic counts should be conducted and these signals should be optimized accordingly. (Note: the stop at Louisiana Avenue may be eliminated from service on Routes 96 and 97 as part of the recommendations.)
- 15.3 Some near-side transit stops were difficult for the bus to access, including those along East Capitol Street between 1st and 13th Street, New Jersey Avenue, Florida Avenue, and U Street. **Recommendation:** These stops should become far-side stops, wherever possible.
- 15.4 Some turning movements were difficult for the bus to complete due to on-street parking being too close to the intersection. These include turns at Louisiana Avenue & D Street and New York Avenue & M Street. **Recommendation:** On-street parking should be removed in these locations so that buses can adequately make the turn.
- 15.5 Vehicles were observed blocking traffic lanes at several locations including Massachusetts Avenue and G Street, 18th Street & Belmont Street, and Calvert Street & Woodley Place. **Recommendation:** Regulations should be properly posted and enforced. If the observed traffic blocking can't be avoided, it is recommended that adequate curb space be provided.

Traffic Improvement Recommendations

Traffic Recommendations, continued

- 15.6 Buses leaving Capitol Heights Metro Station onto Southern Avenue have to make tight turning movements to position the bus to turn left onto East Capitol Street. **Recommendation:** Buses should either use the station exit on Davey Street to access Southern Avenue, or a stop bar (with “stop here on red” signage) should be added on northbound Southern Avenue before the Metro station exit to provide adequate space for buses to exit.
- 15.7 Buses were observed laying over and blocking bus stops at Massachusetts Avenue & North Capitol Street and U Street & 13th Street. **Recommendation:** Adequate curb space should be provided for bus movements, including layovers and alighting.
- 15.8 East Capitol Street between Southern Avenue and Stoddert Place has inconsistent parking regulations, causing the buses to travel in and out of the curb lane. **Recommendation:** Consistent parking regulations should be implemented along the westbound curb lane in the AM peak and eastbound curb lane in the PM peak.
- 15.9 Several traffic and bus stop conflicts were noted along New Jersey Avenue. **Recommendation:** Bus stops and parking spaces should be adjusted to accommodate safe traffic movements.
- 15.10 At Wisconsin Avenue and Idaho Avenue, buses have to make an unprotected left turn against high volumes of traffic during the AM peak to reach the terminal station on Newark Street. **Recommendation:** Buses should make a left turn at the signalized intersection at Macomb Street, followed by a right turn onto Idaho Avenue, and a right onto Newark Street.

Traffic Improvement Recommendations

