AGENDA
ANC 6A Transportation & Public Space Committee Meeting
Virtual Meeting via Zoom
Call-in Number: 1 301 715 8592
***Webinar ID (access code):* 941 5811 8432**
For those attending via Zoom: https://zoom.us/j/94158118432
One tap mobile: +13017158592,,94158118432#
Public Meeting – All are welcome
July 19, 2021 at 7:00 pm

Community comment welcome; may be limited to 2 minutes to provide a chance for everyone to speak.

I. Call meeting to order.

II. Introductions & Announcements (5 minutes)

III. Old Business
   A. Discussion of 1300 block of North Carolina Avenue NE bike lane installation options by Will Handsfield, DDOT Bicycle Program Specialist. DDOT is currently considering what type of bicycle facility to add to the 1300 block of North Carolina Avenue as part of its high priority bicycle network, and to ensure continuity between the C Street project (under construction) and the rest of the city's bicycle network. This includes consideration of different options for directions of placement of car traffic and bicycle traffic lanes, including conversion to one-way vehicle traffic, as well as consideration of car parking.

IV. New Business
   A. Installation of raised crosswalk at northernmost crossing of 15th Street NE. and Tennessee Avenue NE. (adjacent to Miner Elementary).
   B. Discussion of adding a standing TPS agenda item to review pending Traffic Safety Assessments and past-due 311 sidewalk requests on a regular cycle.

V. Community Comment (time permitting).

VI. Adjourn meeting

DDOT Presentation 07/19/21

North Carolina Ave NE – 1300 Block Bike Lane Gap & Pedestrian Safety

Monday, July 19th , 2021

Agenda

- Background – DDOT Roles & Process
- Pedestrian & Bicycle Safety
- North Carolina Ave NE - Project Vehicle Circulation Overview
- Consideration of Alternatives
- Discussion

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DDOT Presentation 07/19/21

North Carolina Ave NE Schedule

- **Concept Planning**
  - MoveDC (2013)
  - MoveDC Update (2021)
- **ANC 6A TPS Meetings** (Jan, June, July 2021)
- **Circulation Study** (2020/21)
- **Community Consultation on Design and Engineering**
  - ~~Winter/Spring 2021~~ Winter - Fall 2021
- **Design**
- **Public Comment Period- 30 business days from NOI**
  - ~~March 2021~~ Fall 2021
- **Construction**
  - ~~Summer 2021~~ Spring 2022
- **C St Project – related**
  - Construction start in ~~March~~ June 2021 – 1.5 yr construction timeline
  - Opens Fall 2022

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Why is DC Installing Bicycle Lanes?

2005 Bicycle Master Plan Goals
- 2000: 1% of commute trips by bike ✓
- 2010: 3% of commute trips by bike ✓
- 2015: 5% of commute trips by bike ✓

Sustainable DC goals
- 75% of all trips by walk, bike, transit by 2032
- 150 more bike share stations
- Carbon Neutrality by 2050

Vision Zero Goals
- Zero Traffic Fatalities
- Few serious injuries
- Create safe conditions through design
- Safe & accessible streets for all users

Safe Routes to School
- Building Safe Routes

VISION ZERO
SAFE STREETS FOR WASHINGTON, DC

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DDOT Presentation 07/19/21

Why Protected Lanes?

ANC 6A FUTURE

ANC 6A TODAY

LOW STRESS TOLERANCE

HIGH STRESS TOLERANCE

BICYCLIST DESIGN USER PROFILES

Interested but Concerned

51%-56% of the total population

Often not comfortable with bike lanes, may bike on sidewalks even if bike lanes are provided; prefer off-street or separated bicycle facilities or quiet or traffic-calmed residential roads. May not bike at all if bicycle facilities do not meet needs for perceived comfort.

Somewhat Confident

5-9% of the total population

Generally prefer more separated facilities, but are comfortable riding in bicycle lanes or on paved shoulders if need be.

Highly Confident

4-7% of the total population

Comfortable riding with traffic; will use roads without bike lanes.

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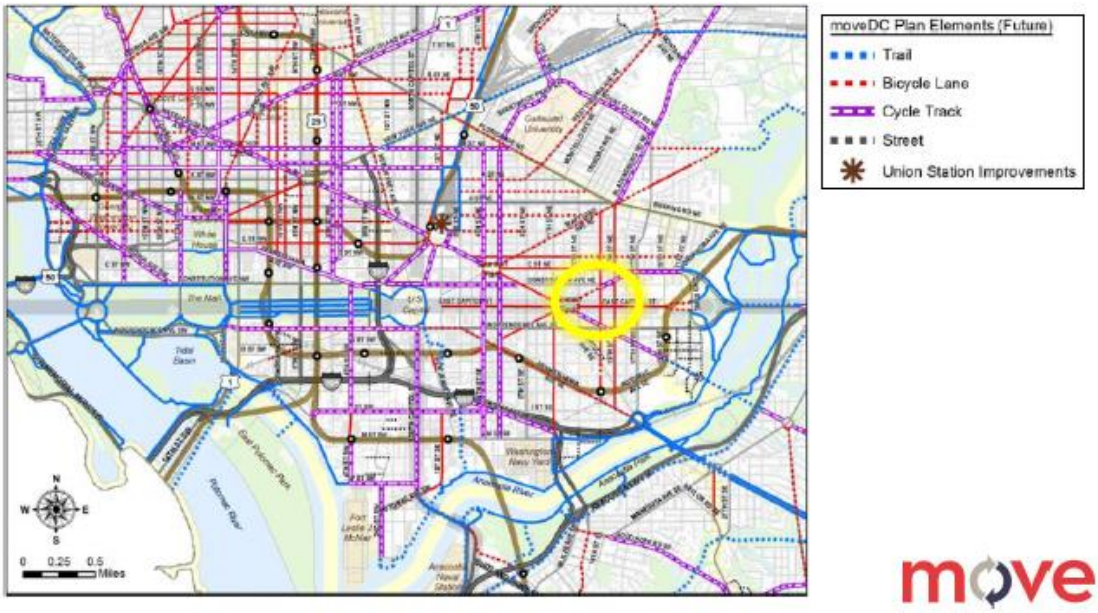
moveDC Bicycle Plan 2014



move dc

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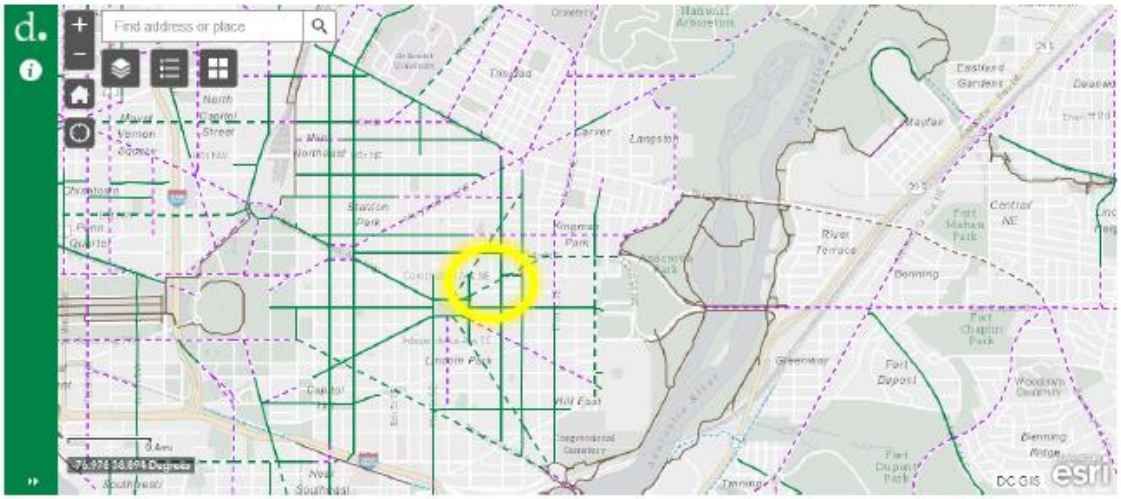
moveDC Bicycle Plan 2021

move dc Home Equity Goals, Policies & Strategies DC STIP Resources Get Involved Site Map



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C St NE Implementation

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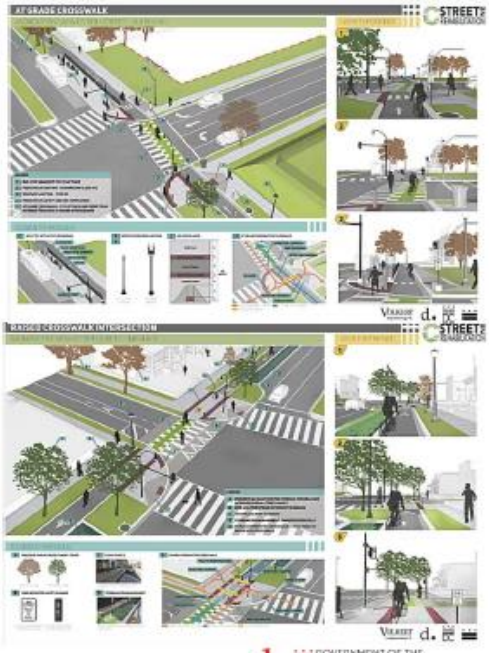
C Street NE Project –
High level of protection/quality



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DDOT Active Transportation Branch Equipment options

18" wide Concrete Delineators

Flex Posts

Planters

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Concerns DDOT Has Heard To Date

- Speeding & Traffic Safety
- Pedestrian Safety
- Desire for continuous connection between RFK Fields, Eliott Hine, and larger Hill community
- Importance of Parking
- Importance of Two-Way Vehicular Travel
- Safety Issues at Intersection of 14th/NC/Constitution + TSA for this location
- Aggressive Drivers
- Will One-Way Traffic Increase Speeding?
- Missing block in the larger C Street Project (under construction)

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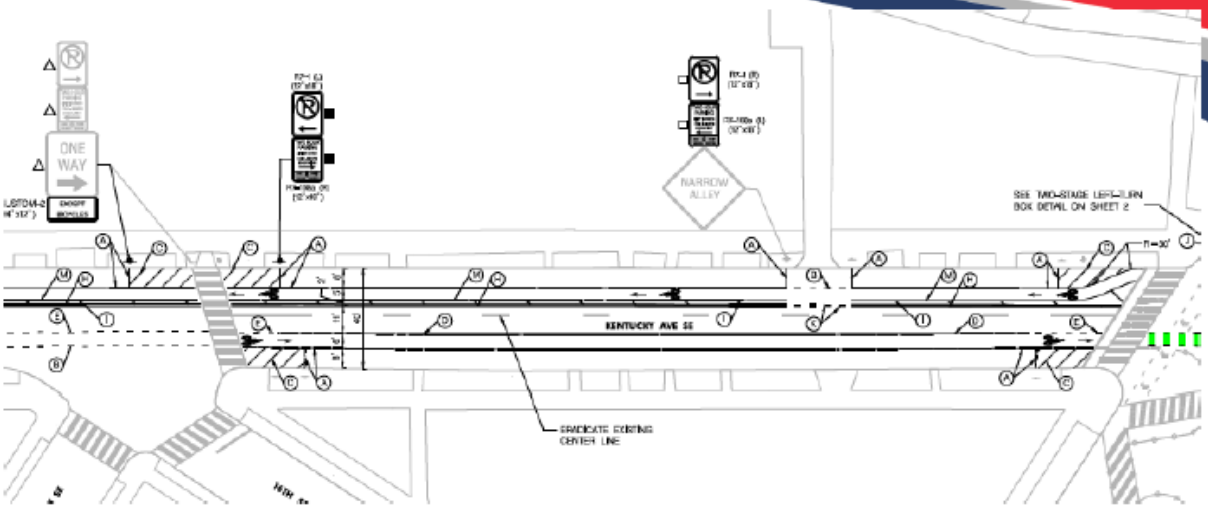
Buffered Bike Lane Example: Kentucky Ave SE



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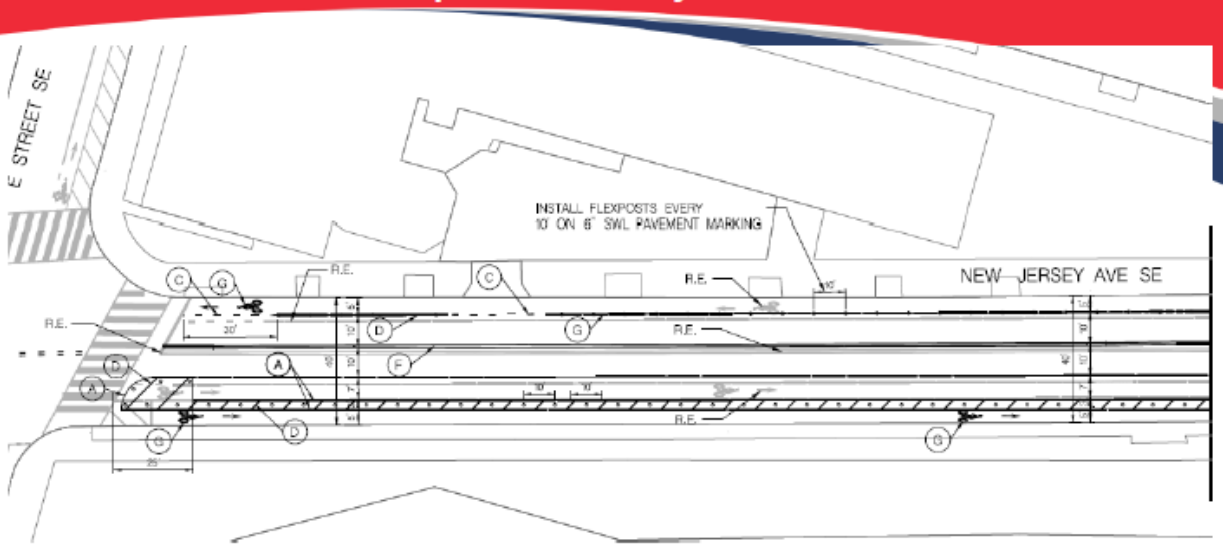
Protected Bike Lane Example: New Jersey Ave SE



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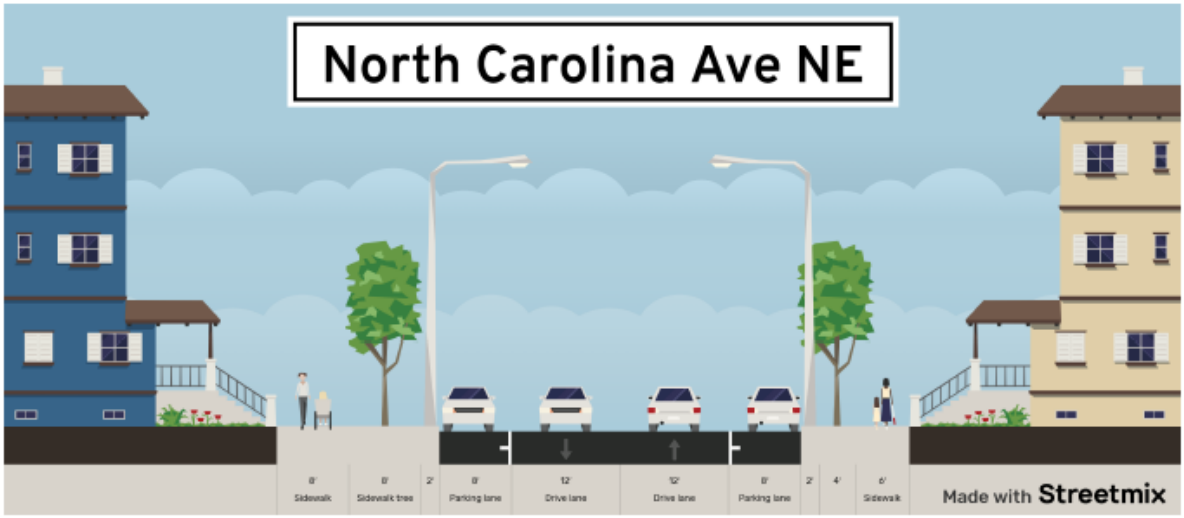
Existing Conditions



Existing Conditions Summary:

- Missing block on high-volume bike corridor
- Route to/from RFK Fields, Eliot-Hine Middle School, Eastern High School
- Wider-than recommended travel lanes – lead to speeding

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Two Way Concept 1300 blk NC Ave NE

- Retains 2-way Traffic
- Allows for protected or buffered bike lanes

Alternative A2

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Alternative A1 – Two-Way + PBL / BL

Alternative A1 Summary:

- Retains 2-way traffic
- South side parking eliminated – 25 spots
- Protected bike lane on North side, regular bike lane on South side

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Alternative A2 – Two-Way + PBL / BL

Alternative A2 Summary:

- Retains 2-way traffic
- South side parking eliminated – 25 spots
- Protected bike lane on South side, regular bike lane on North side

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One Way Concept 1300 blk NC Ave NE

- Maximizes Parking
- Allows for protected or buffered bike lanes
- Bike lane physically narrows vehicle lanes to reduce speeding
- Additional complexity and time for neighborhood vehicular circulation
- Eliminates lower volume direction (600 vehicles daily, or 20%, rerouted)
- Eliminated direction fed by NB 13th St NE and WB A St NE
- Recovers Large SE corner at NC & 14th for bumpout/ ped area

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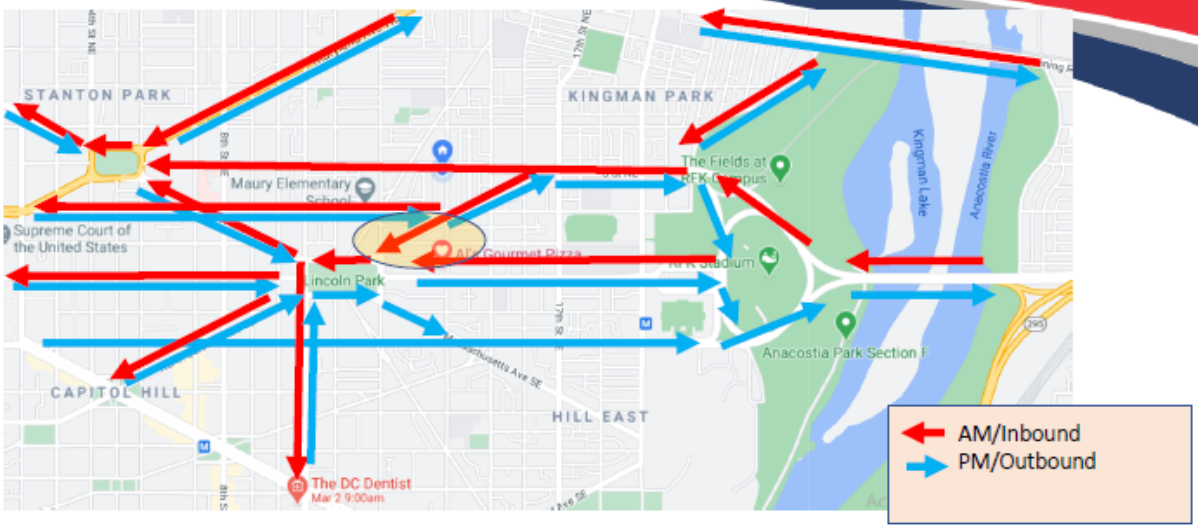
Macro Area Circulation – AM/PM Flows



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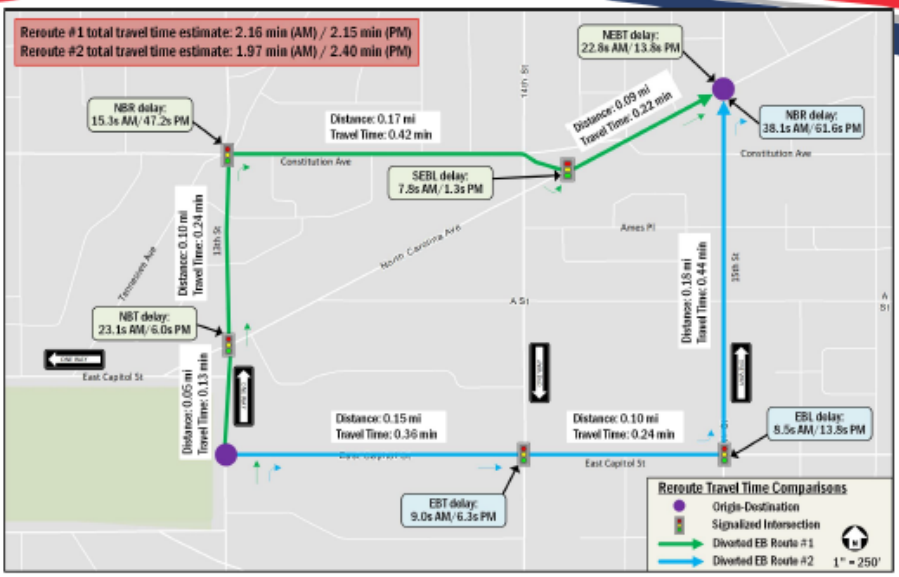
Travel Time Analysis



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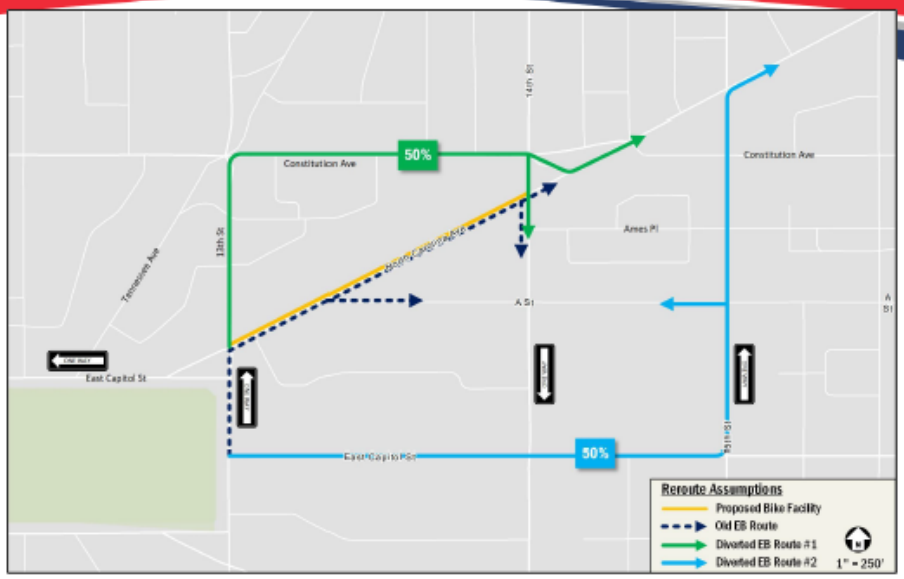
Reroute Assumptions



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Alternative B – One-Way + WB PBL + EB PBL

Alternative B Summary:

- Retains parking throughout – needs parking setback at driveway/intersection
- Provides EB & WB protected bike lane
- Matches inbound/outbound bike facilities from C St Project

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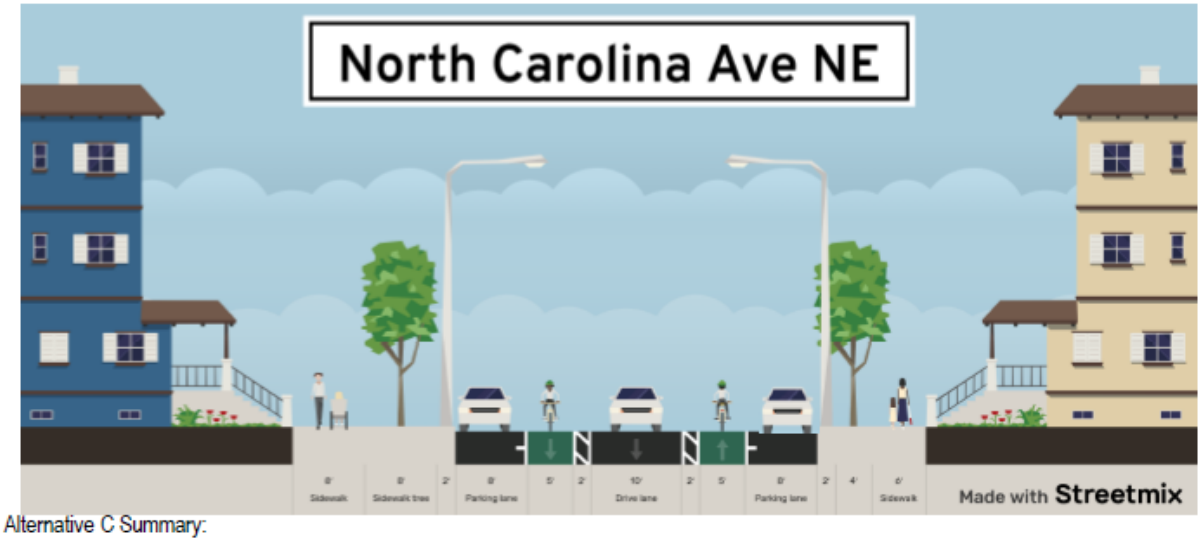
Alternative C – One-Way + Buffered Bike Lane



Alternative C Summary:

- Retains curbside parking throughout
- Provides buffered bike lanes – safer than typical bike lanes
- Retains wider unobstructed cross section – important for events like marathons/ parades/ marching bands

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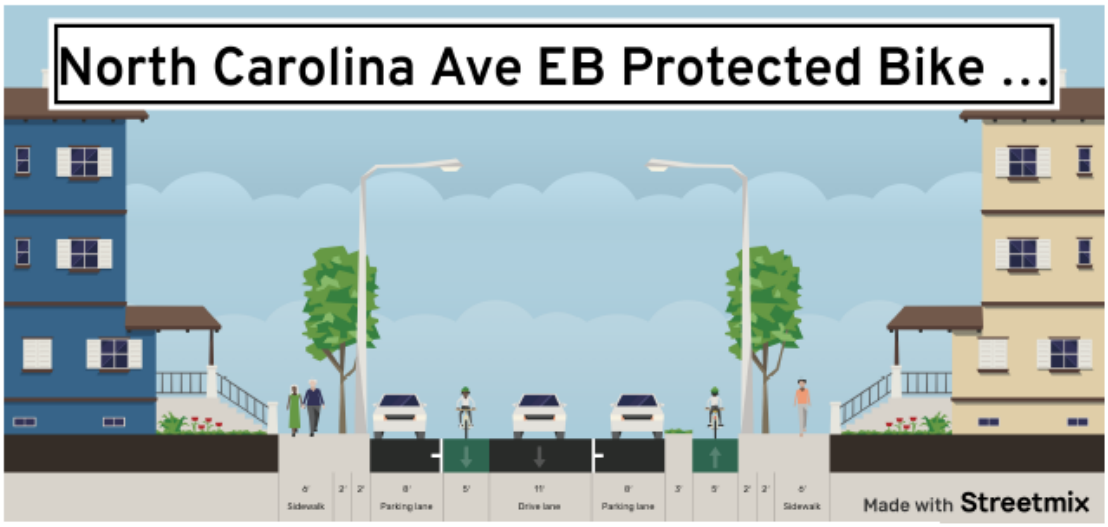
Alternative D – One-Way BL+ EB PBL



Alternative D Summary:

- Retains parking throughout
- Provides EB protected bike lane, WB bike lane
- Matches inbound/outbound bike facilities from C St Project

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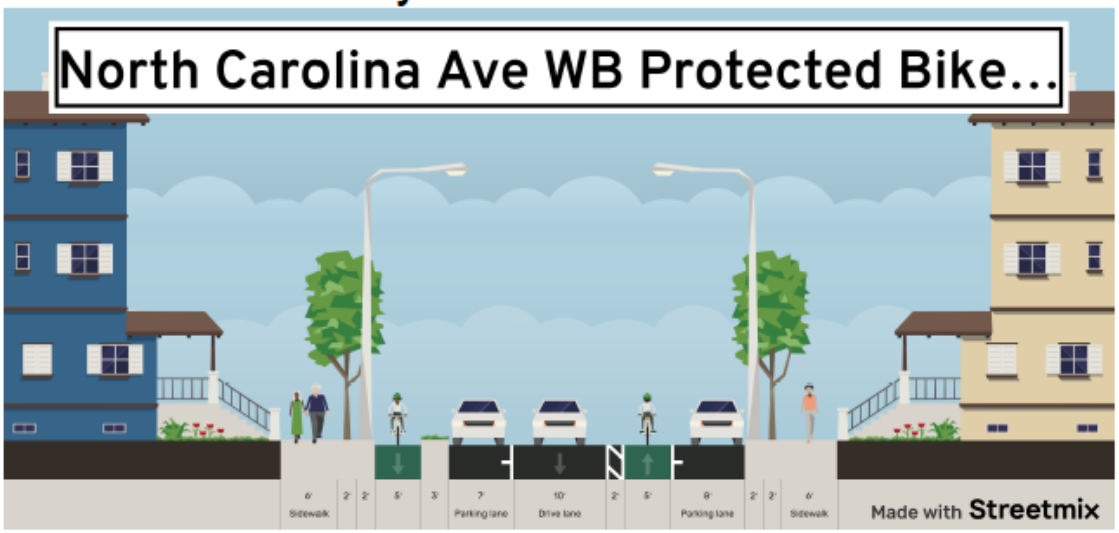
Alternative E – One-Way + WB PBL + EB Buffered BL



Alternative E Summary:

- Retains parking throughout
- Provides WB protected bike lane, EB buffered bike lane
- Matches inbound/outbound bike facilities from C St Project

NC Corridor sketch marking plan

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13th / NC Intersection

- Curbside options along 13th
- No Right Turn at NC Ave

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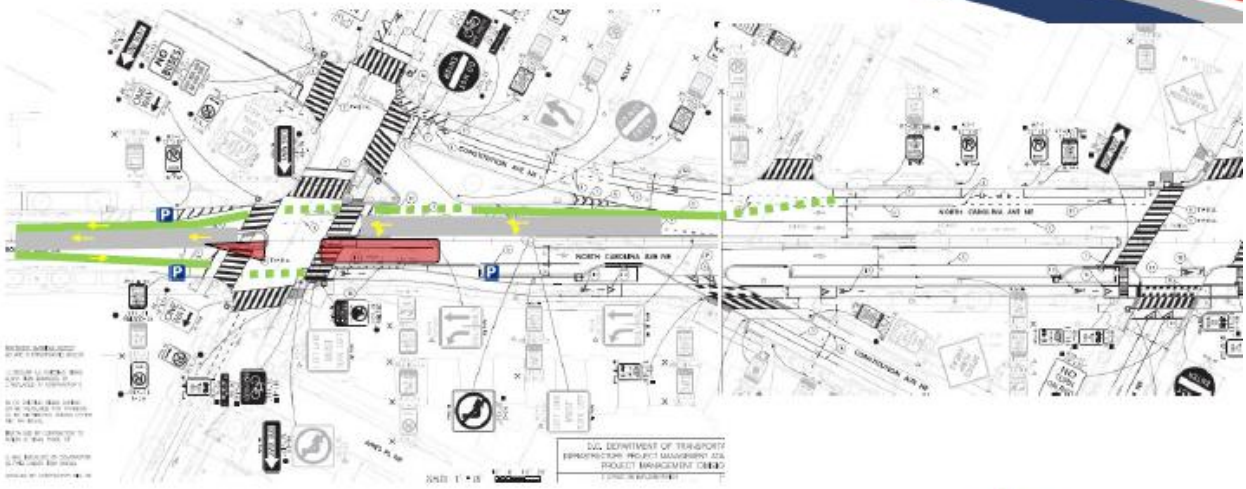
North Carolina/14th/Constitution Intersection Concept 1



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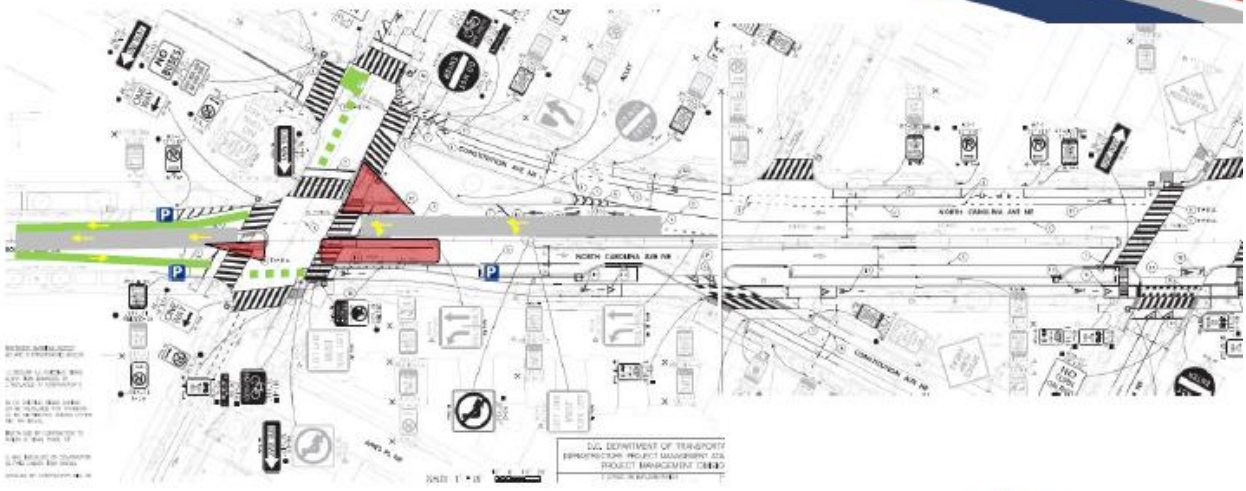
North Carolina/14th/Constitution Intersection Concept 2



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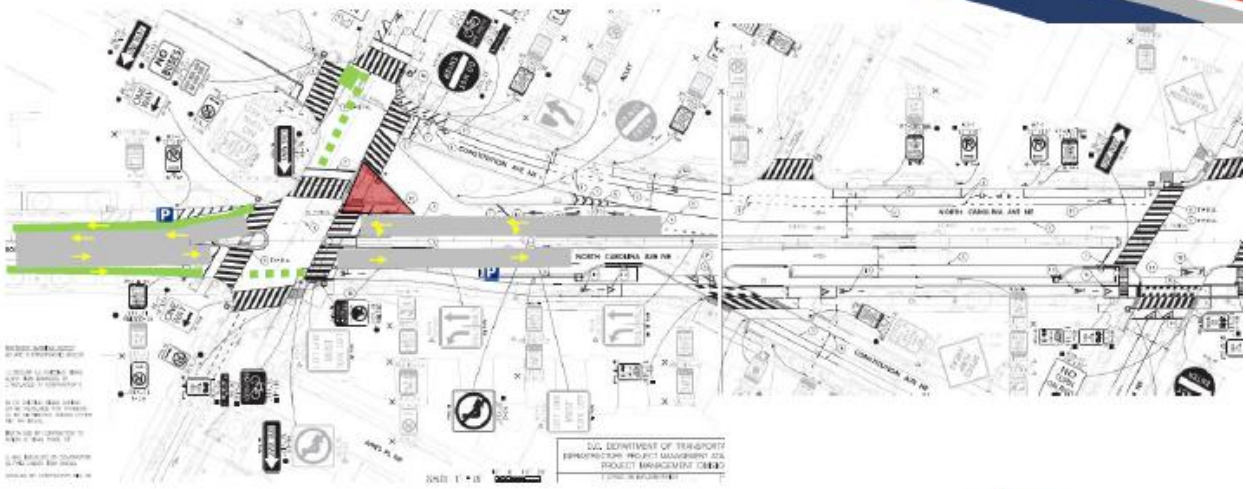
North Carolina/14th/Constitution Intersection Concept 3



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Alternatives A, B, C, D, E Trade-Offs to Consider

Neighborhood Considerations

- Relative need for parking
- Micro-area circulation
- Comfort level with vehicle setbacks
- Speeding

Big Picture

- Contribution to Sustainable DC / MoveDC / Climate Adaptation plans
- Contribution to Vision Zero (eliminating traffic injuries/fatalities citywide)
- Macro-area traffic circulation

Did We Miss Anything?

- What else is important to consider here?
- What is the right balance of tradeoffs between the goals the city is committed to achieving and issues on the ground?

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Wrap-Up

What next?

DDOT is committed to completing this missing section of the bike network, improving pedestrian safety, and reducing vehicular speeds.

Please help by providing feedback on which option to fully design and install.

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DDOT Presentation 07/19/21

Contact Information

Please reach out with any comments or questions:

Will Handsfield, AICP
DDOT Bicycle Program Specialist
Will.Handsfield@dc.gov

George Branyan
Manager – Active Transportation
George.Branyan@dc.gov

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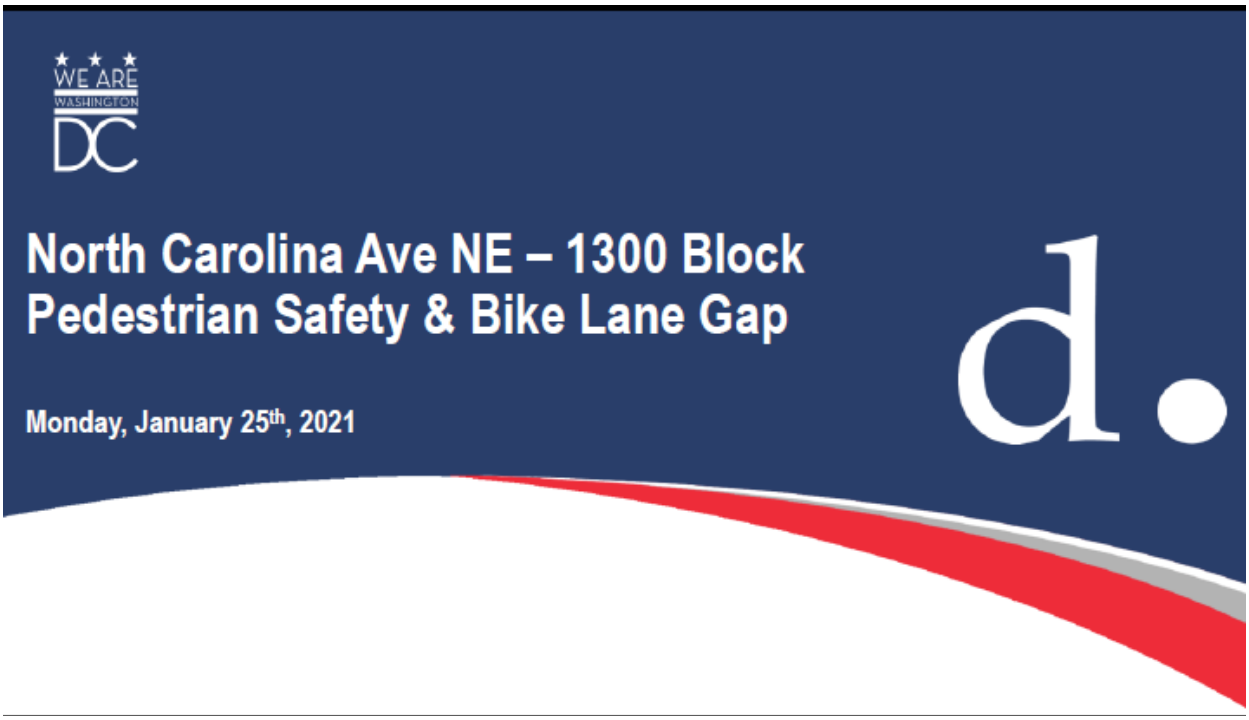
d.
District Department of Transportation

DDOT Presentation included in original 07/19/21 Agenda



Agenda

- Background
- North Carolina Ave NE - Project Vehicle Circulation Overview
- Consideration of Alternatives
- Discussion

d. GOVERNMENT OF THE DISTRICT OF COLUMBIA
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DDOT Presentation included in original 07/19/21 Agenda

Benefits of a Bikeway Network

- **Individual Benefits**
  - Safety
  - Reduced transportation costs
  - Exercise and health
- **Economic Development**
  - Tourism
  - Increases foot traffic/local spending
- **Environmental Benefits**
  - Reduced CO_2 emissions
- **System Management Benefits**
  - Reduced wear and tear
  - Fewer cars on road
- **Resiliency**
  - Bikes keep people & goods moving when other options & systems fail





MAYOR

Why is DC Installing Bicycle Lanes?

2005 Bicycle Master Plan Goals
- 2000: 1% of commute trips by bike ✓
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- 2015: 5% of commute trips by bike ✓

Sustainable DC goals
- 75% of all trips by walk, bike, transit by 2032
- 150 more bike share stations
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Vision Zero Goals
- Zero Traffic Fatalities
- Create safe conditions through design
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VISION ZERO
SAFE STREETS FOR WASHINGTON, DC

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Why Protected Lanes?

ANC 6A FUTURE

ANC 6A TODAY

LOW STRESS TOLERANCE

HIGH STRESS TOLERANCE

BICYCLIST DESIGN USER PROFILES

Interested but Concerned

51%-56% of the total population

Often not comfortable with bike lanes, may bike on sidewalks even if bike lanes are provided; prefer off-street or separated bicycle facilities or quiet or traffic-calmed residential roads. May not bike at all if bicycle facilities do not meet needs for perceived comfort.

Somewhat Confident

5-9% of the total population

Generally prefer more separated facilities, but are comfortable riding in bicycle lanes or on paved shoulders if need be.

Highly Confident

4-7% of the total population

Comfortable riding with traffic; will use roads without bike lanes.

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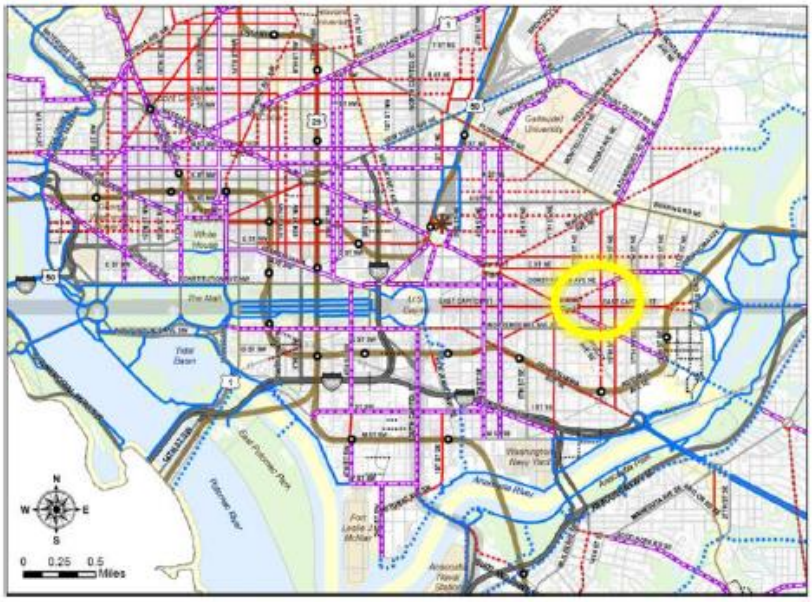
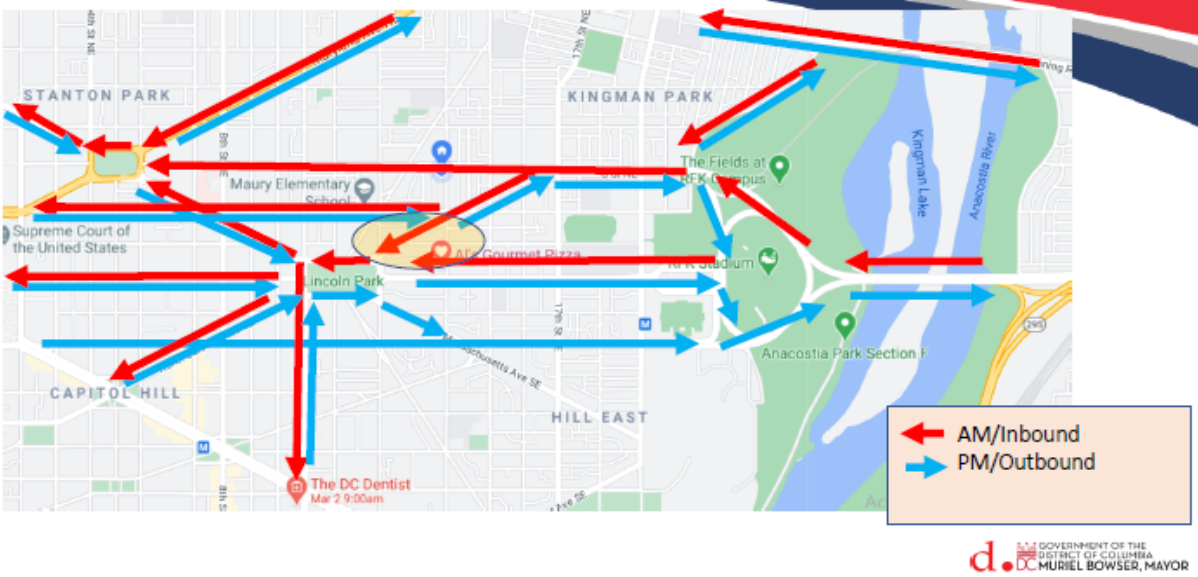
moveDC Bicycle Plan



move dc

DDOT Presentation included in original 07/19/21 Agenda

Macro Area Circulation – AM/PM Flows



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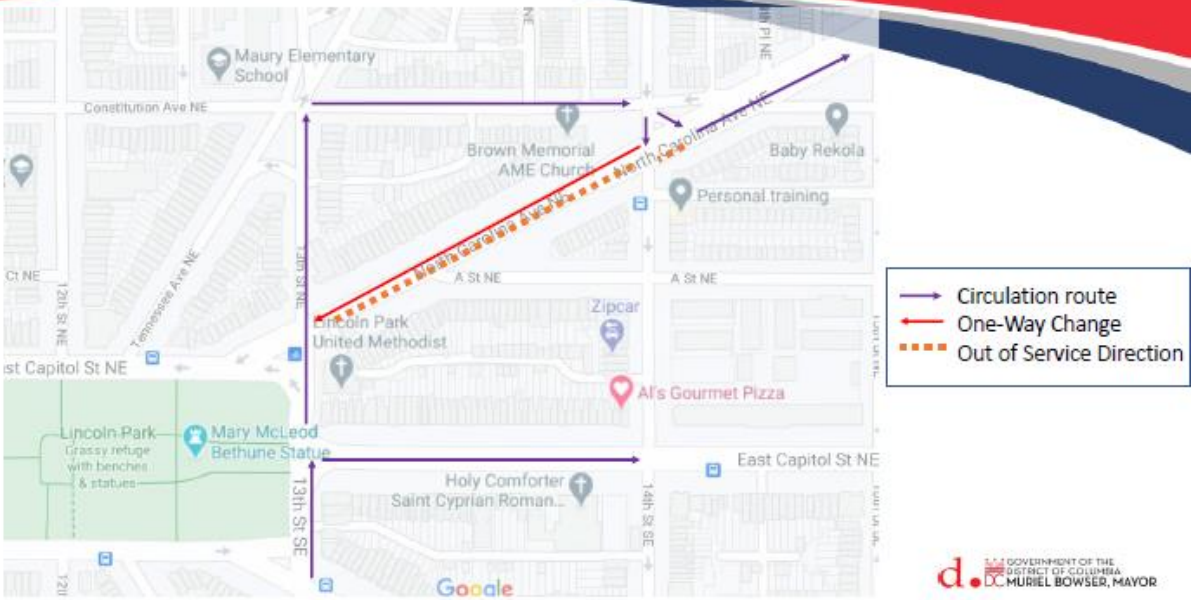
Micro Area Circulation – One-Way WB Option



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One-Way Concept Circulation – after installation

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One Way Concept 1300 blk NC Ave NE

- Maximizes Parking
- Allows for protected or buffered bike lanes
- Some additional complexity for neighborhood circulation
- Eliminates low volume direction
- Eliminated direction fed by NB 13th St NE and WB A St NE
- Recovers Large SE corner at NC & 14th for bumpout/ ped area

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North Carolina Ave NE Schedule

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  - MoveDC (2013)
  - MoveDC Update (2021)
- **Circulation Study** (2020)
- **Preferred Alternatives Design and Engineering**
  - Winter/Spring 2021
- **Public Comment Period- 30 business days from NOI**
  - March 2021
- **Construction**
  - Summer 2021
- **C St Project – related**
  - Construction start in March 2021 – 1.5 yr construction timeline (estimated)

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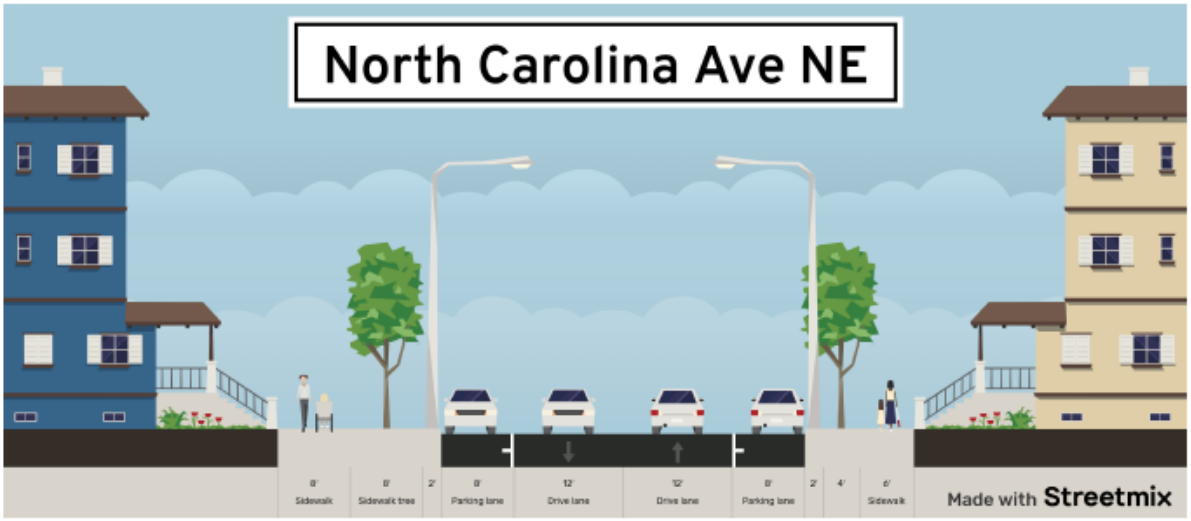
Existing Conditions



Existing Conditions Summary:

- Missing block on high-volume bike corridor
- Route to/from RFK Fields
- Wider-than recommended travel lanes

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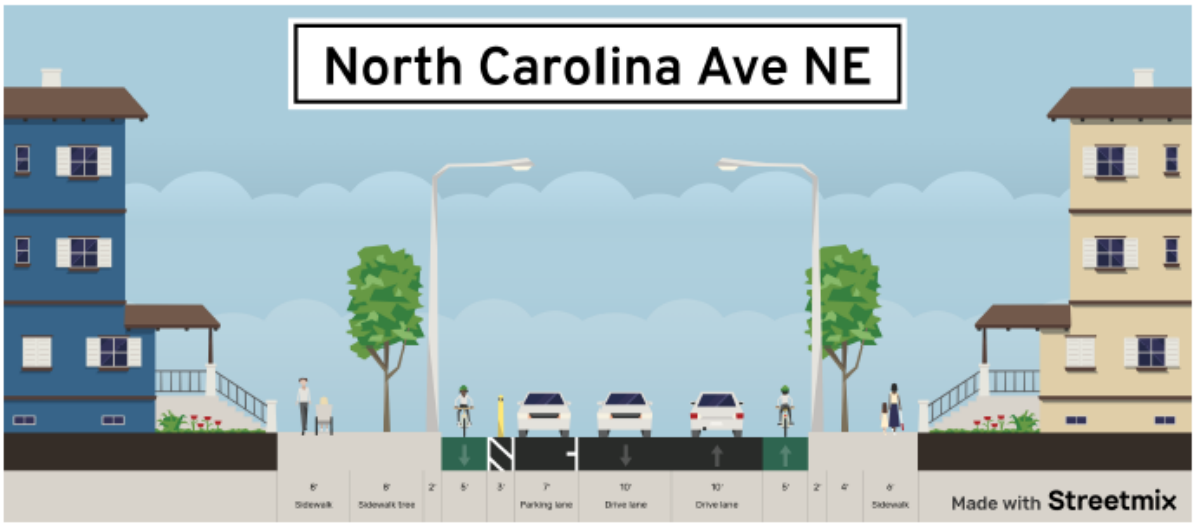
DDOT Presentation included in original 07/19/21 Agenda

Alternative A – 2-Way + PBL / BL



Alternative A Summary:

- Retains 2-way traffic
- South side parking eliminated
- Protected bike lane on North side, regular bike lane on South side

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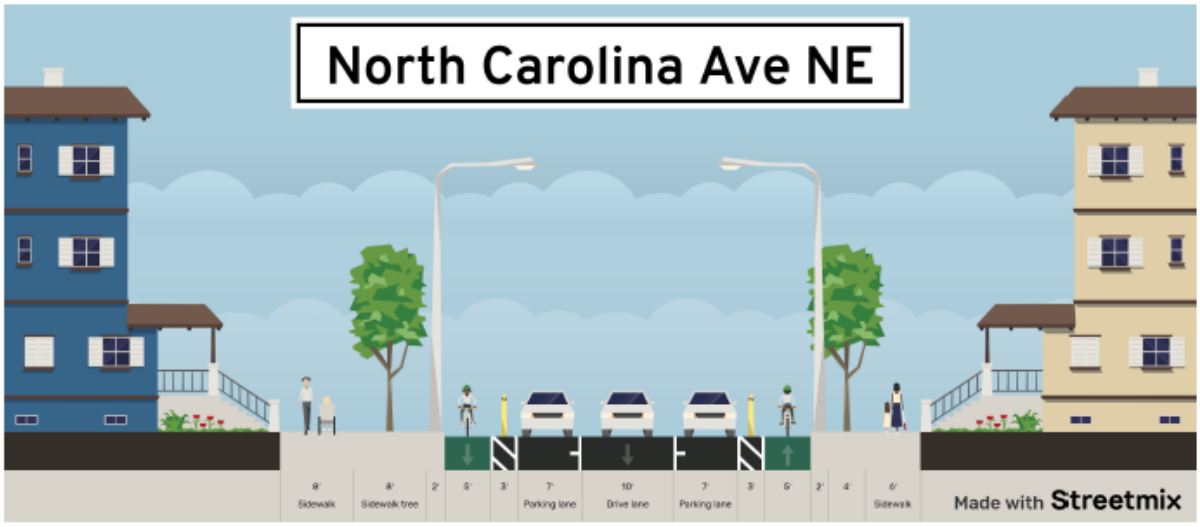
Alternative B – One-Way + PBL



Alternative B Summary:

- Bikeway protected by parked cars - safest
- Additional parking setback at driveways/intersections

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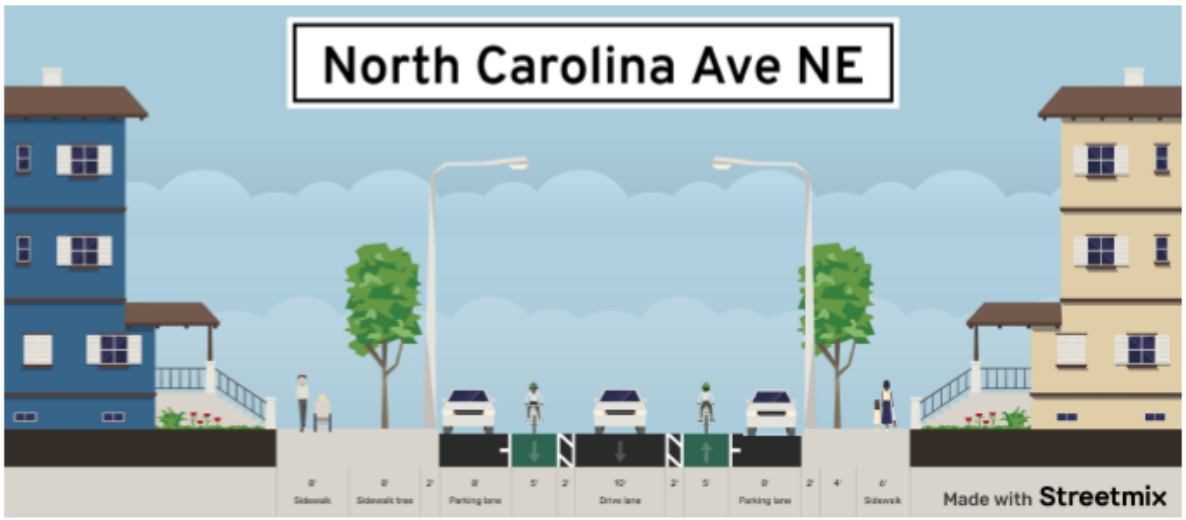
Alternative C – One-Way + Buffered Bike Lane



Alternative C Summary:

- Retains curbside parking throughout – adds a bit more on 13th St.
- Provides buffered bike lanes – safer than typical bike lanes
- Retains wider unobstructed cross section – important for events like marathons/ parades/ marching bands

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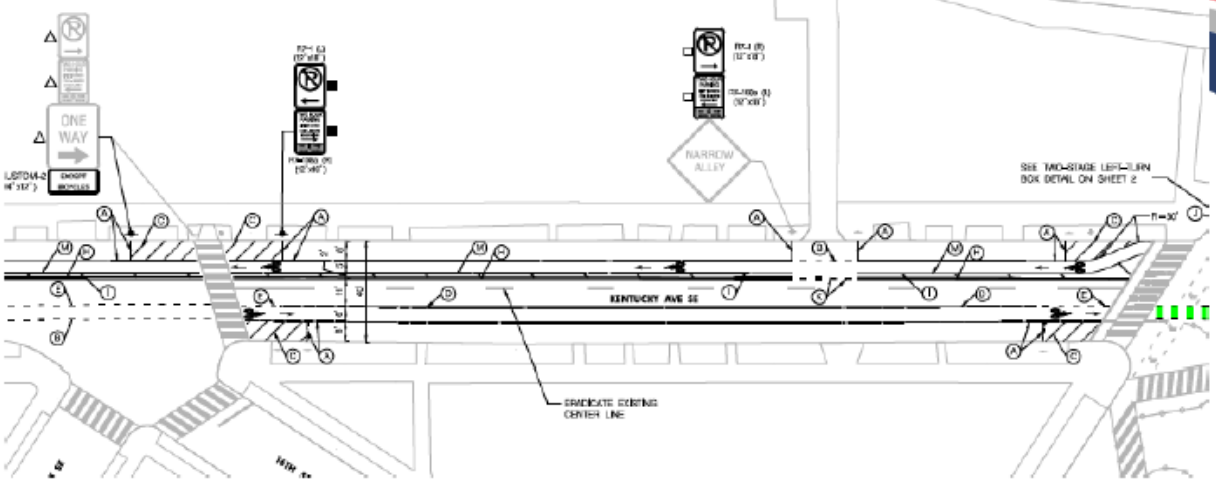
Buffered Bike Lane Example: Kentucky Ave SE



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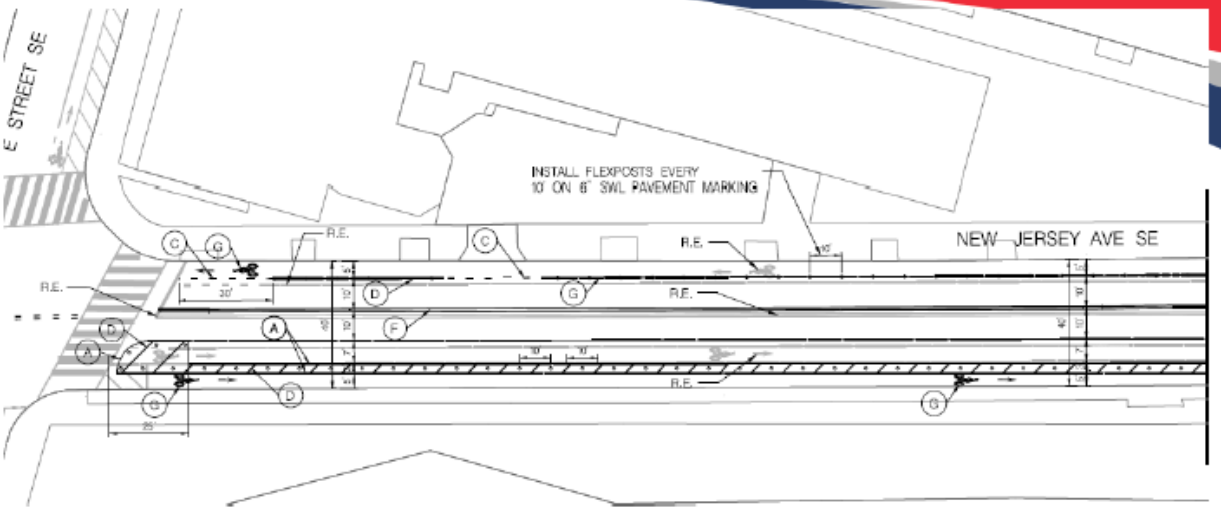
DDOT Presentation included in original 07/19/21 Agenda

Protected Bike Lane Example: New Jersey Ave SE



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NC Corridor sketch marking plan

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DDOT Presentation included in original 07/19/21 Agenda

13th / NC Intersection

- Full time parking on 13th added
- No Right Turn at NC Ave

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Alternatives A, B, C Trade-Offs to Consider

Neighborhood Considerations

- Relative need for parking
- Micro-area circulation
- Comfort level with vehicle setbacks

Big Picture

- Contribution to Sustainable DC / MoveDC / Climate Adaptation plans
- Contribution to Vision Zero (eliminating traffic injuries/fatalities citywide)
- Macro-area traffic circulation

Did We Miss Anything?

- What else is important to consider here?
- What is the right balance of tradeoffs between the goals the city is committed to achieving and issues on the ground?

GOVERNMENT OF THE DISTRICT OF COLUMBIA
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DDOT Presentation included in original 07/19/21 Agenda

Wrap-Up

DDOT is committed to completing this missing section of the bike network

Please tell us which option you prefer: A, B, or C

We will come back with a more detailed plan following this initial community input

GOVERNMENT OF THE DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

Contact Information

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GOVERNMENT OF THE DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

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GOROVE SLADE
Transportation Planners and Engineers

TECHNICAL MEMORANDUM

To:	Daniel Lovas, PE	VHB
	Bethany Turner, PE	
From:	Brandon Zhang, PhD, PE	
	Katie Wagner, PE, PTOE	
	Erwin Andres, PE	
Date:	July 2, 2021	
Subject:	North Carolina Avenue NE One-Way Conversion Evaluation	

Introduction

This memorandum presents findings of a one-way conversion analysis performed along North Carolina Avenue NE between 13th Street NE and 14th Street NE in Washington, DC. The analysis studied the effects of converting North Carolina Avenue NE to a one-way westbound roadway between 13th Street NE and 14th Street NE to accommodate proposed separate bike lanes on both sides of North Carolina Avenue NE. The impact of diverting existing eastbound vehicles on North Carolina Avenue NE was also analyzed in this memo.

Based on the vehicular analysis, the following conclusions were made:

- Approximately 55 AM and 125 PM vehicular trips are to be rerouted as a result of the proposed North Carolina Avenue NE protected bicycle facility.
- Roadways identified as reroute options included 13th Street NE, 14th Street NE, 15th Street NE, Constitution Avenue NE, and East Capital Street NE.
- Capacity analysis indicates that proposed reroutes will not create significant delays on area roadways during the morning and afternoon peak hours.

Background

DDOT continues to analyze the crosstown connectivity gaps in the 2016 *Crosstown Multimodal Transportation Study* and many different multimodal connections have been advanced as a result. The proposed bicycle facility on North Carolina Avenue NE provides additional connectivity and further improves crosstown multimodal connections. Separated bike lanes are proposed on North Carolina Avenue NE between 13th Street NE and 14th Street NE. This segment of North Carolina Avenue NE will be converted to a one-way westbound road to accommodate the proposed bicycle facility. As such, the existing vehicular trips traveling eastbound on North Carolina Avenue NE need to be diverted onto other streets in the network. The objective of this study is to evaluate the impact of diverted trips at intersections in the network.

Study Area

Figure 1 illustrates the study area under which the North Carolina Avenue NE bicycle facility will be evaluated. The North Carolina Avenue NE study corridor stretches from the intersection with 13th Street NE to the intersection of 14th Street NE. Under existing conditions, this portion of North Carolina Avenue NE generally consists of one (1) travel lane in each direction, with time-restricted metered parking on both sides of the road. The study area is well served by several Metrobus routes. Figure 2 shows the map of study intersections. Seven (7) signalized intersections in the vicinity of the study corridor were identified as the potential intersections to be impacted by the proposed project.

Figure 3 shows the existing bicycle facilities, including bike lanes along 13th Street NE, 14th Street NE, 15th Street NE, East Capitol Street NE, portion of Constitution Avenue NE, and North Carolina Avenue NE east of the study corridor, and signed route along 12th Street NE. Two (2) Capital Bikeshare stations are located near the intersection of North Carolina Avenue NE and 13th Street NE and the intersection of East Capitol Street NE and 15th Street NE, respectively.

Planned Projects

A bicycle facility project along C Street NE was reviewed and treated as a background project for the current North Carolina Avenue project. Cycle tracks are planned to replace the existing bike lanes along C Street NE between 15th Street NE and 21st Street NE, and along North Carolina Avenue between 14th Street NE and 16th Street NE. The traffic patterns under the C Street NE bicycle facility build-scenario were incorporated into the baseline conditions for the current analysis.

One-Way Conversion and Reroutes Evaluation

Directionality Assessment

A brief qualitative assessment was conducted with respect to the directionality of the one-way conversion, i.e., whether converting the North Carolina Avenue NE study corridor to one-way westbound or one-way eastbound. The traffic volumes under the C Street NE bicycle facility build-scenario, which serves as the baseline conditions of this project, show that approximately 90% and 60% of the traffic is heading westbound during the morning and the afternoon peak hours, respectively. It makes more sense to eliminate the direction with lower peak hour volumes in order to reduce the amount of rerouted traffic. Therefore, the study corridor is proposed to be converted to a one-way westbound operation.

Reroute Alternatives Evaluation

Under baseline conditions, the vehicular trips traveling eastbound on the North Carolina Avenue NE study corridor consist of the right-turn volumes from the North Carolina Avenue NE and 13th Street NE intersection. This is due to the fact 13th Street NE is one-way northbound and that the west leg of the North Carolina Avenue NE and 13th Street NE intersection is one-way westbound. A Street NE, which intersects with the study corridor in the middle, is a two-way road that allows westbound right turns onto North Carolina Avenue NE. However, available traffic volume data shows a zero (0) westbound right-turn volume from A Street NE during both the morning and afternoon peak hours. Therefore, it is assumed that A Street NE is a negligible

source of eastbound traffic on North Carolina Avenue NE and thus the existing eastbound trips are assumed to be only originating from the right turns at the North Carolina Avenue NE and 13th Street NE intersection.

Under proposed conditions, the segment of North Carolina Avenue NE between 13th Street NE and 14th Street NE will converted into a one-way westbound street to accommodate the proposed bicycle facility. The existing vehicular trips entering eastbound North Carolina Avenue NE from northbound right-turn lane on 13th Street NE will be diverted to other roads in the study area. Based on C Street NE build-scenario baseline traffic volumes, 55 vehicular trips need to be diverted during the morning peak hour and 125 vehicular trips need to be diverted during the afternoon peak hour.

In addition, based on C Street NE build-scenario baseline traffic volumes, there are eastbound right turn volumes from North Carolina Avenue NE onto A Street NE, which are 5 and 25 vehicular trips during the morning and afternoon peak hours, respectively. There are also eastbound right turn volumes from North Carolina Avenue NE onto 14th Street NE, which are 5 and 45 vehicular trips during the morning and afternoon peak hours, respectively. These existing eastbound right turn volumes will also need to be diverted to other roads in the study area.

Based on a review of the study area, two (2) routes have been identified as the most likely routes for trip diversion. They are:

- Reroute #1: Northbound 13th Street NE followed by eastbound Constitution Avenue NE; and
- Reroute #2: Eastbound East Capitol Street NE followed by northbound 15th Street NE.

On Reroute #1, the intersection of 13th Street NE and North Carolina Avenue NE is signalized. The north segment of 13th Street NE operates as one-way northbound. The intersection of 13th Street NE and Constitution Avenue NE is signalized as well. Constitution Avenue NE operates as a two-way street. Capacity exists at this intersection for additional northbound vehicles to turn right at Constitution Avenue NE. The signalized intersection at Constitution Avenue NE and North Carolina Avenue NE is expected to accommodate the rerouted trips before they travel back onto eastbound North Carolina Avenue NE or southbound 14th Street NE through this intersection.

On Reroute #2, the intersection of 13th Street NE and East Capitol Street NE is signalized. The dedicated northbound right turn lane is likely to accommodate the additional northbound right turns. East Capitol Street NE operates as a two-way street. The intersection of East Capitol Street NE and 15th Street NE is signalized with permissive eastbound left turn phase. 15th Street NE operates as one-way northbound and crosses A Street NE, Ames Place NE, and Constitution Avenue NE with east-west minor streets being stop controlled. The North Carolina Avenue NE and 15th Street NE intersection is signalized. Capacity exists at this intersection for additional northbound vehicles to turn right at North Carolina Avenue NE.

Reroute Assumptions

The reroute assumptions are primarily based on travel time estimates, travel distances, signal phasing, and available capacity. Figure 4 presents the travel time estimate comparisons between the two (2) primary reroutes. The travel time on each roadway segment was calculated based on the travel distance and posted speed limit. The turning movement delay at each signalized intersection was from the intersection capacity analysis results for the baseline scenario.

Based on Figure 4, the estimated travel time difference is minimal (approximately 13 to 15 seconds) between the two candidate routes in terms of both the morning and the afternoon peak hours. Therefore, this study assumed that the diverted trips are evenly distributed through the two candidate routes, as described below and shown in Figure 5.

Existing northbound right turning movements from 13th Street NE onto North Carolina Avenue NE:

- 50% of vehicles will travel further north along 13th Street NE to make a right turn onto Constitution Avenue NE; and
- 50% of vehicles will make a right turn earlier at the intersection 13th Street NE and East Capitol Street NE and turn left onto 15th Street NE.

Existing eastbound right turning movements from North Carolina Avenue NE onto A Street NE:

- 50% of vehicles will travel further north along 13th Street NE to make a right turn onto Constitution Avenue NE, and then turn right and travel southbound at 14th Street NE to reach the A Street NE neighborhood; and
- 50% of vehicles will make a right turn earlier at the intersection 13th Street NE and East Capitol Street NE and turn left onto 15th Street NE to reach the A Street NE neighborhood.

Existing eastbound right turning movements from North Carolina Avenue NE onto 14th Street NE:

- 50% of vehicles will travel further north along 13th Street NE to make a right turn onto Constitution Avenue NE, and then turn right and travel southbound at 14th Street NE to reach the A Street NE neighborhood; and
- 50% of vehicles will make a right turn earlier at the intersection 13th Street NE and East Capitol Street NE and turn left onto 15th Street NE to reach the A Street NE neighborhood.

Figure 1: Study Area Aerial

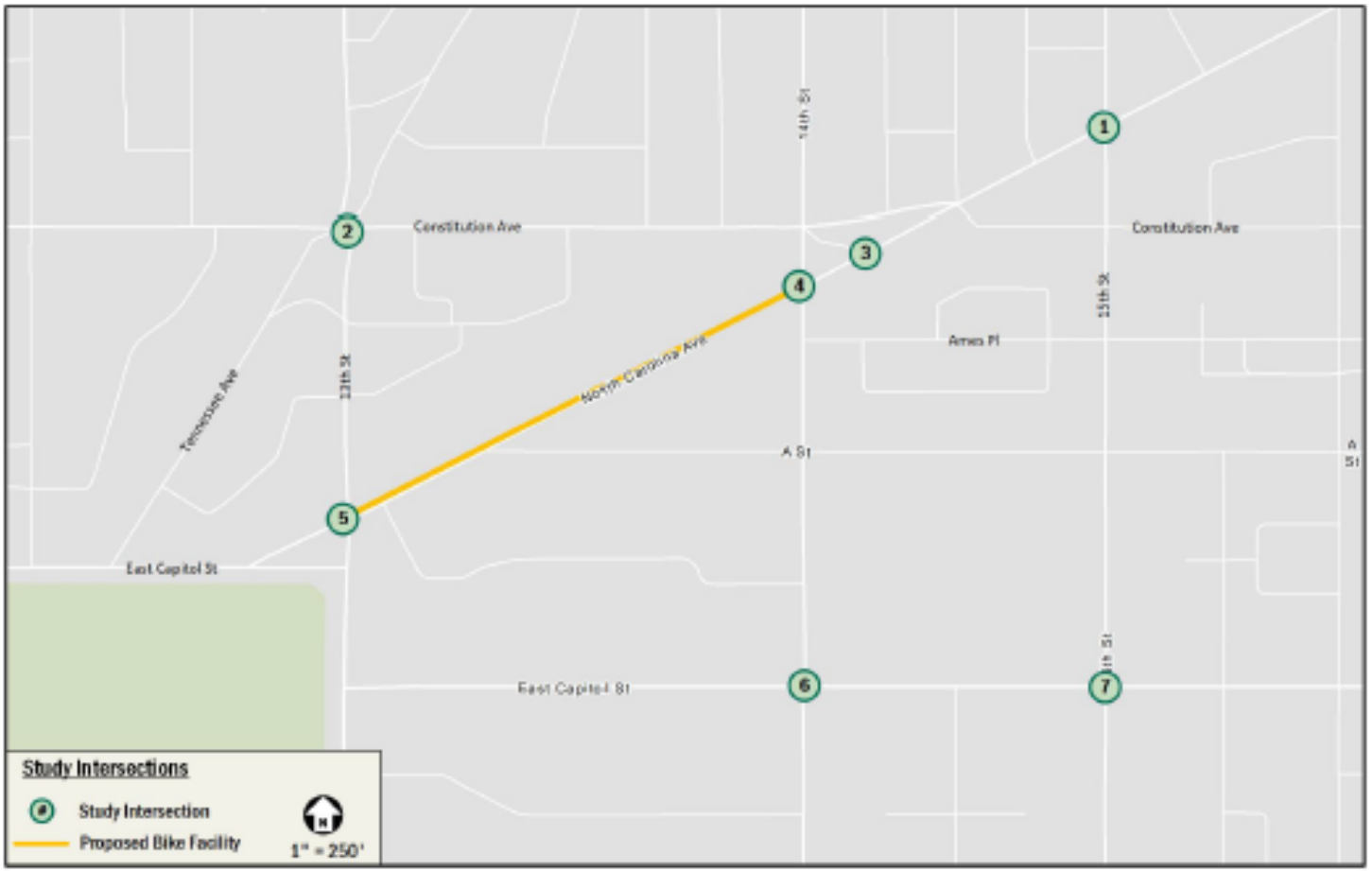

Figure 2: Study Intersections

Figure 3: Existing Bicycle Facilities

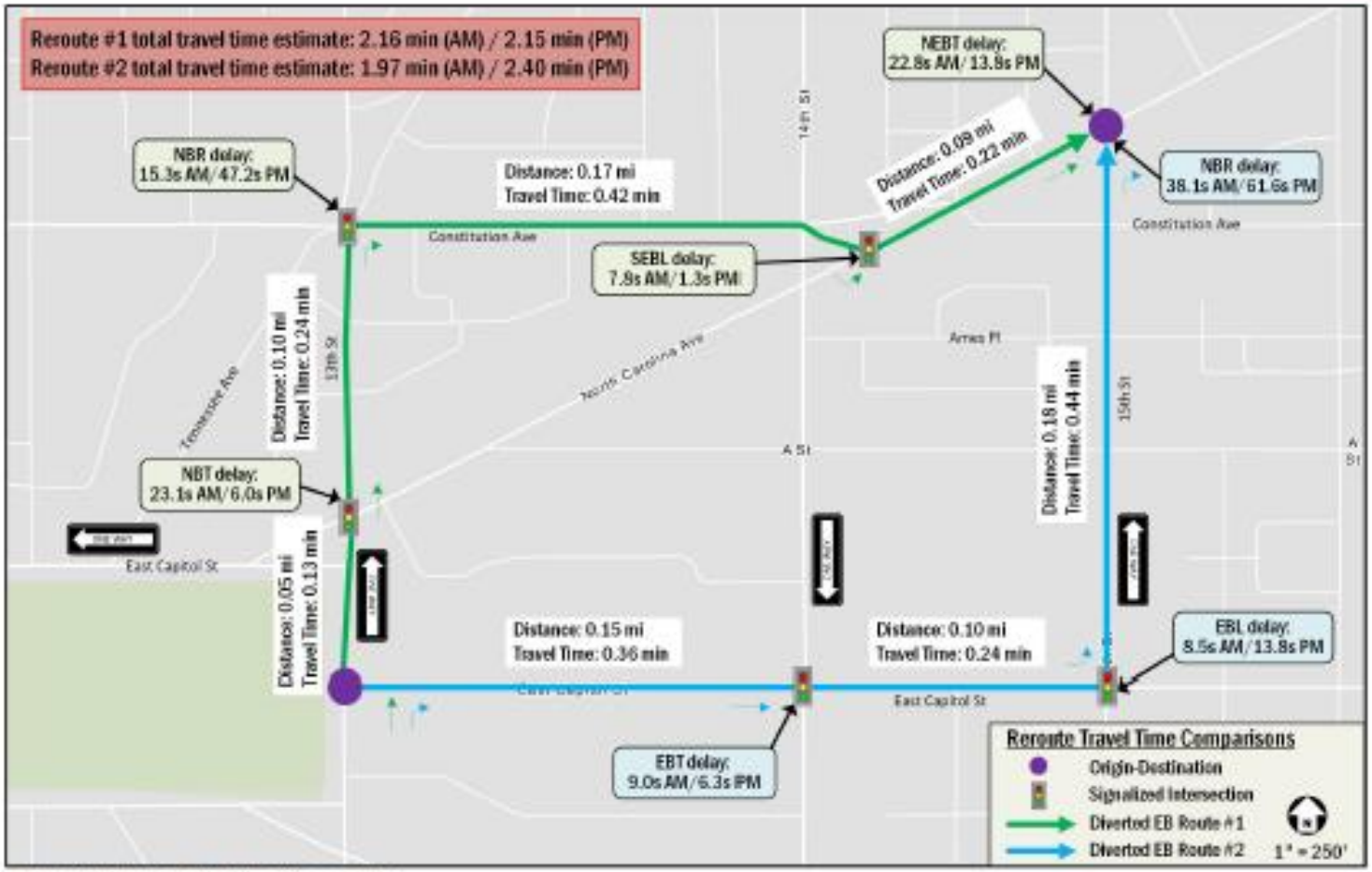

Figure 4: Rerouting Travel Time Comparisons

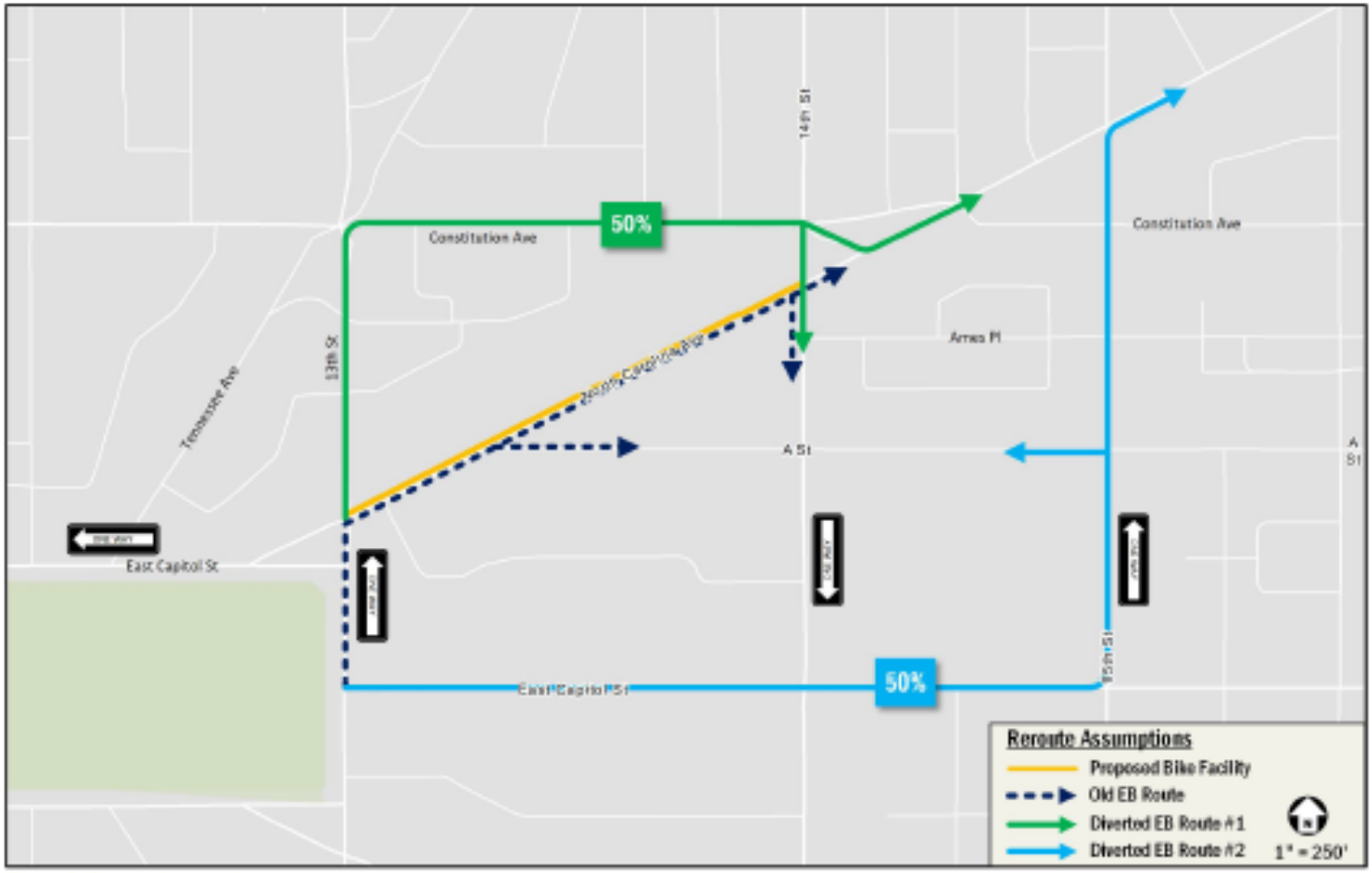

Figure 5: Reroute Assumptions

Vehicular Analysis

This section summarizes the analysis of existing and future roadway capacity surrounding the proposed North Carolina Avenue NE bicycle facility. The purpose of the capacity analysis is to:

- Determine the capacity of the study area roadways under the baseline conditions;
- Determine the overall impact of the project on the study area roadways; and
- Discuss any potential improvements and mitigation measures to accommodate the rerouted vehicular trips.

Scope of Analysis

The vehicular capacity analyses were performed to determine whether the project will lead to adverse impacts on traffic operations. This is accomplished by comparing two scenarios: (1) Baseline Conditions and (2) Future Conditions with Rerouted Vehicular Trips.

The study area of the analysis is a set of intersections where detailed capacity analyses were performed for the scenarios listed above. The intersections included are most likely to have potential impacts or require changes to traffic operations to accommodate the project. Based on the reroute assumptions, the following intersections were chosen and agreed upon by DDOT for analysis:

1. North Carolina Avenue & 15th Street, NE
2. Tennessee Avenue & Constitution Avenue & 13th Street, NE
3. North Carolina Avenue & Constitution Avenue, NE
4. North Carolina Avenue & 14th Street, NE
5. North Carolina Avenue & 13th Street, NE
6. East Capitol Street & 14th Street, NE
7. East Capitol Street & 15th Street, NE

Figure 2 shows a map of the study area intersections.

Traffic Volume Assumptions

Baseline Conditions

The traffic volume data used to establish the baseline conditions was acquired from DDOT's Traffic Engineering and Signals Division (TESD). The baseline conditions incorporated the bicycle facility project along C Street NE and part of North Carolina Avenue NE as a background project. The projected traffic volumes under the C Street NE project were used to establish the baseline conditions traffic volumes in this study.

The lane configurations and traffic controls for the Baseline Conditions are shown on Figure 6. The baseline peak hour traffic volumes are shown on Figure 7.

Future Conditions (Rerouted Trips)

The traffic volumes for the Future Conditions consist of the baseline traffic volumes with the adjustment of rerouted trips. The volumes of the rerouted trips were calculated based on the reroute assumptions discussed in the previous section. The rerouted trip assignment results are shown on Figure 9.

The future peak hour traffic volumes with the rerouted trips at each of the study intersections are presented on Figure 10.

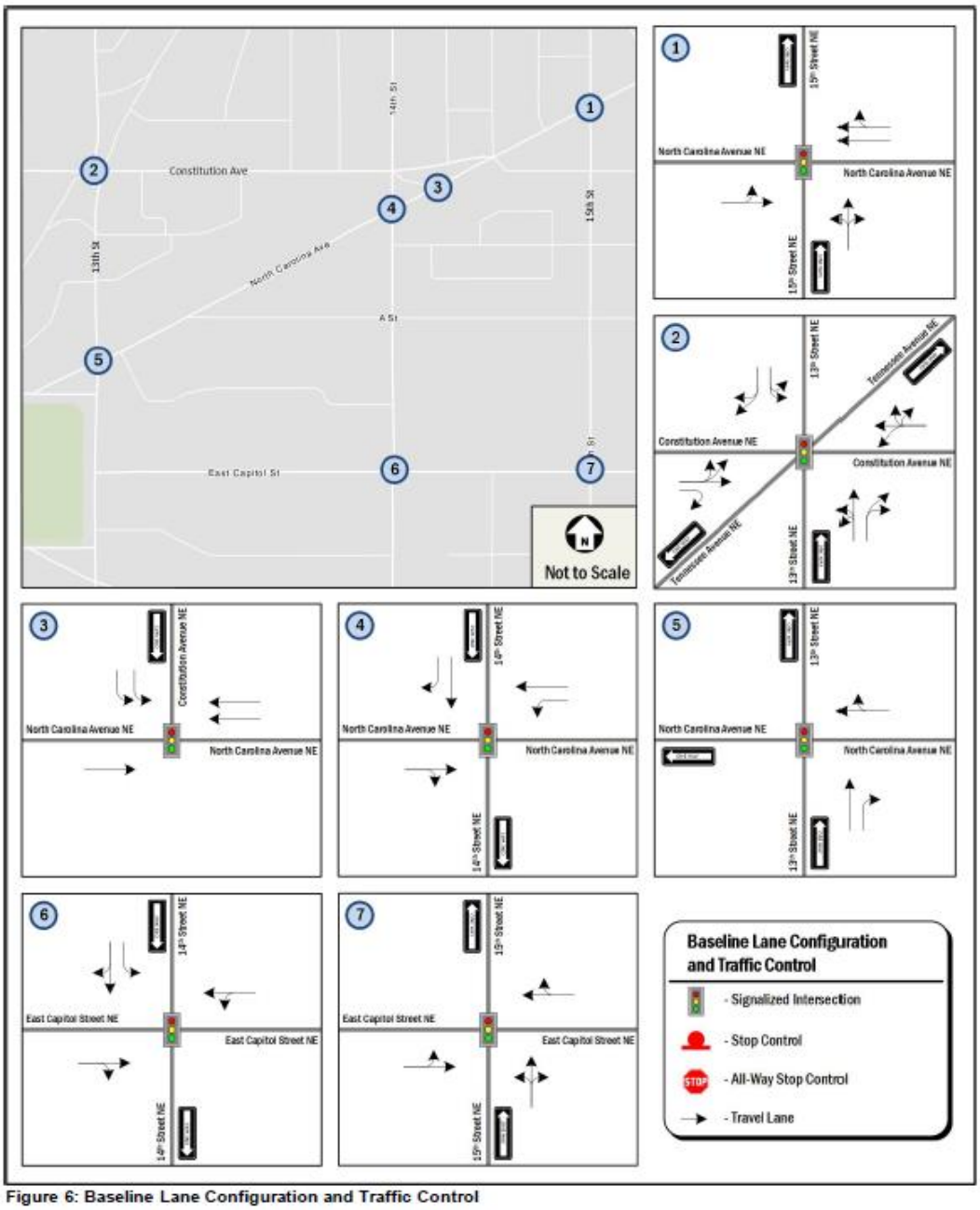

Figure 6: Baseline Lane Configuration and Traffic Control

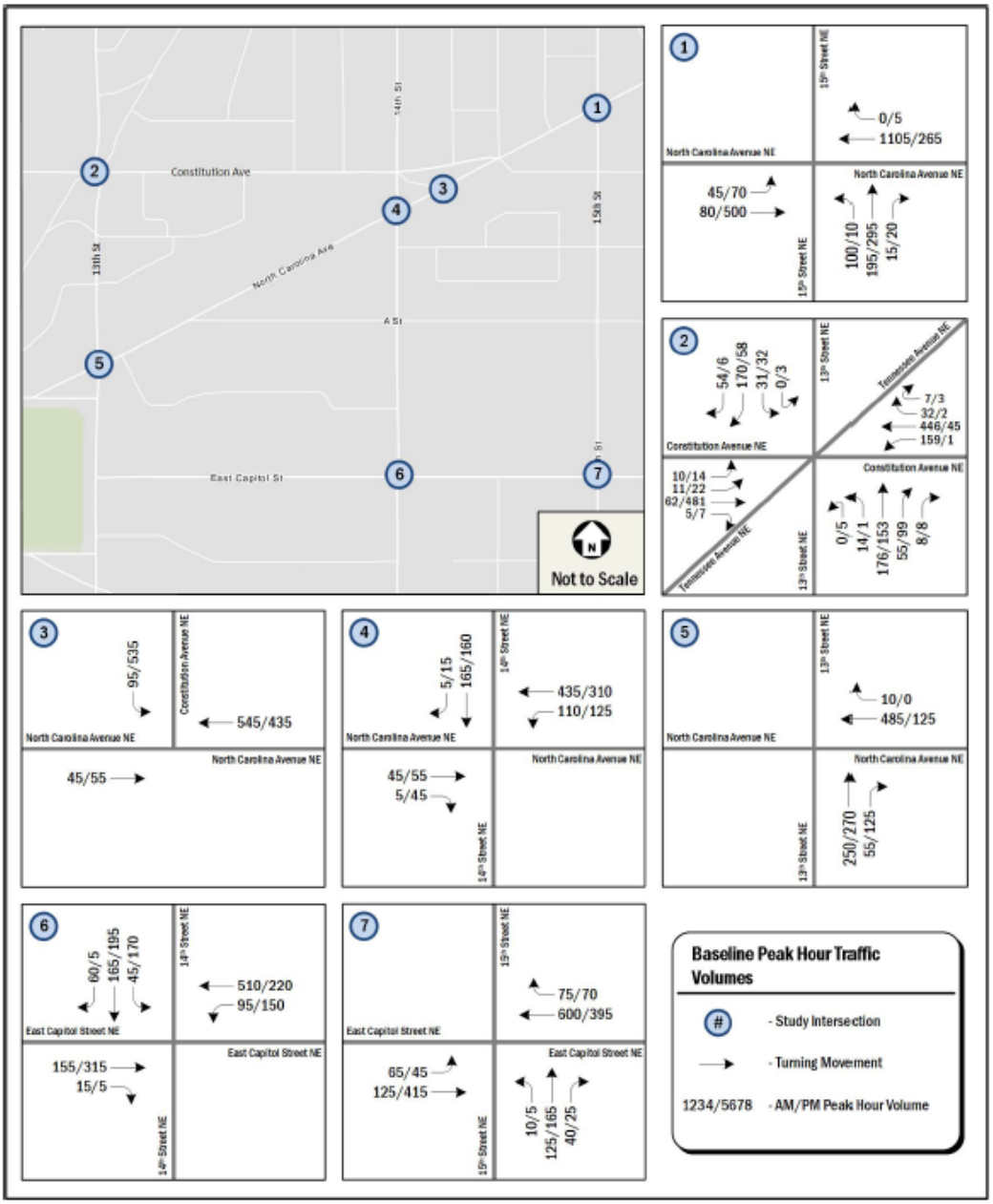

Figure 7: Baseline Peak Hour Traffic Volumes

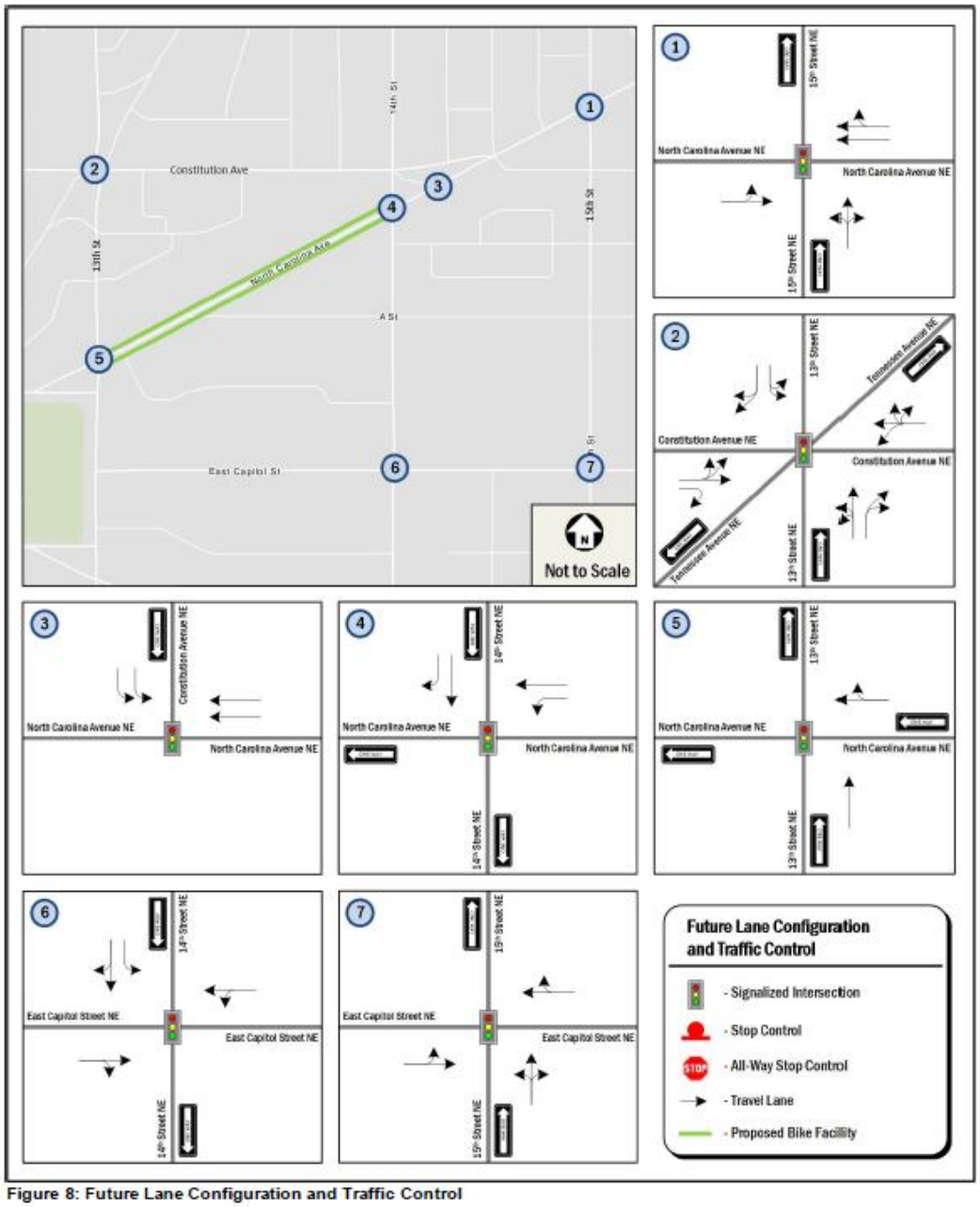

Figure 8: Future Lane Configuration and Traffic Control

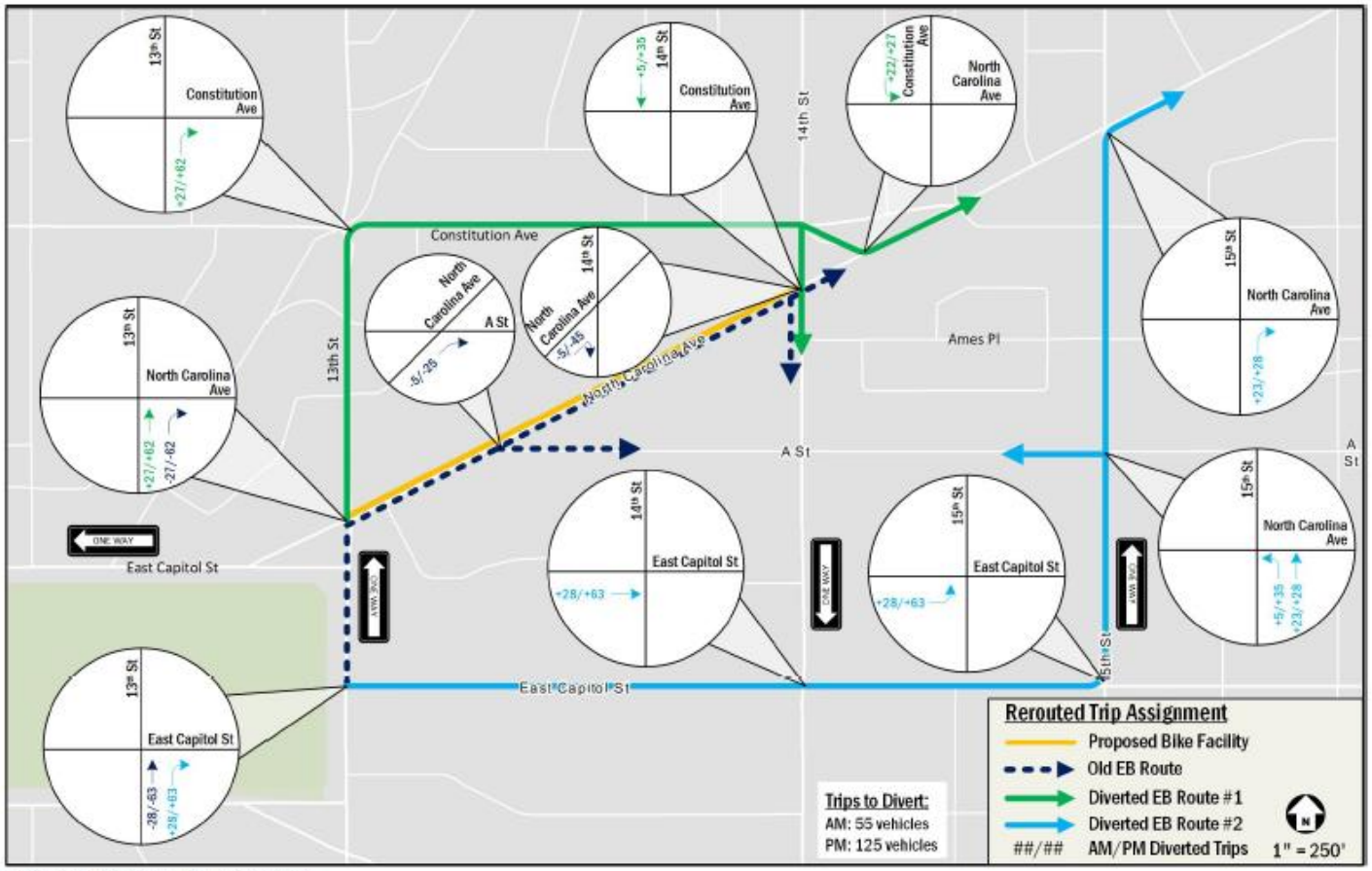

Figure 9: Rerouted Trip Assignment

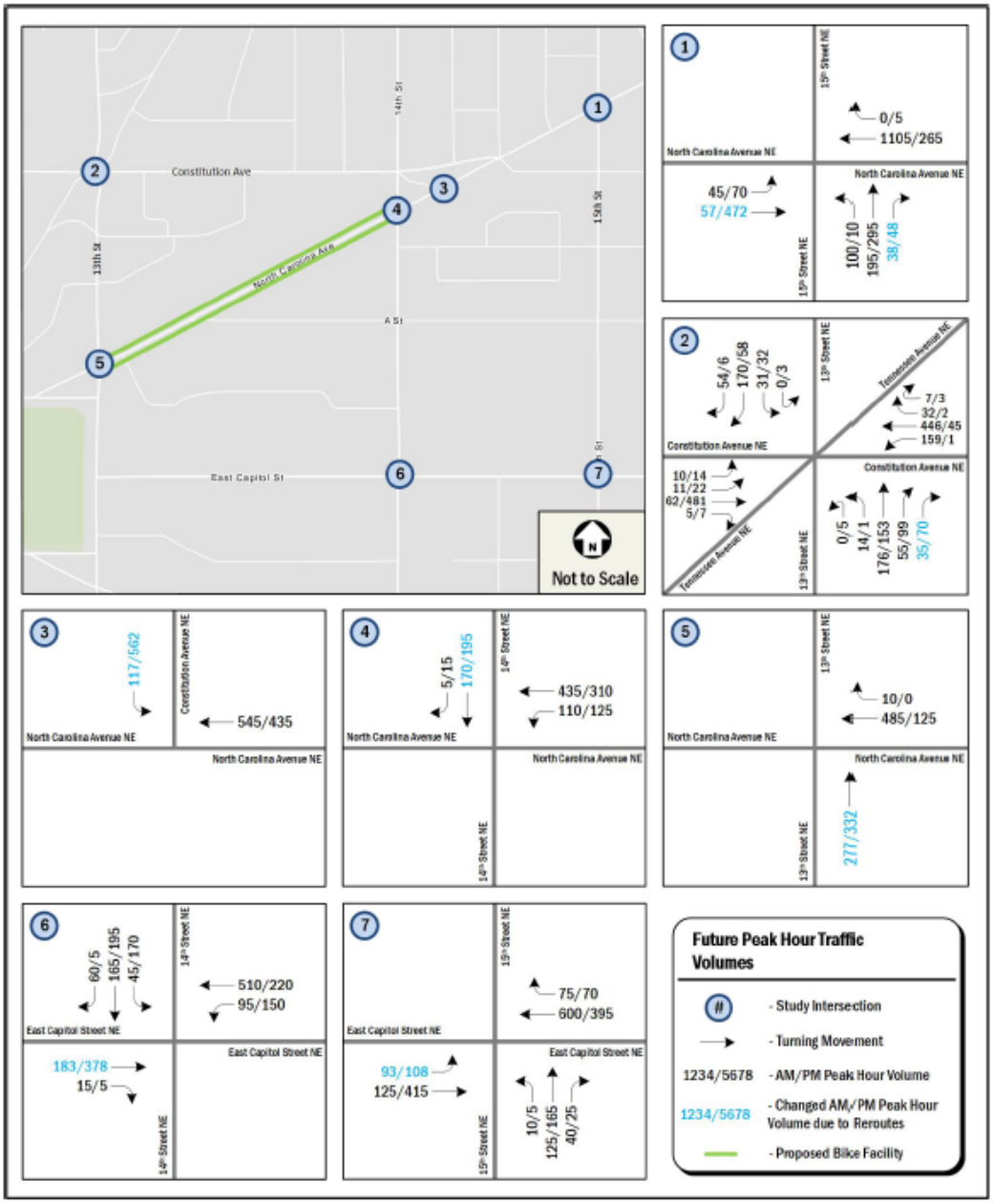

Figure 10: Future Peak Hour Traffic Volumes

Analysis Results

Intersection capacity analyses were performed for the two (2) scenarios outlined previously at the intersections contained within the study area during the morning and afternoon peak hours. *Synchro, Version 10* was used to analyze the study intersections based on the Highway Capacity Manual (HCM) 2000 methodology and *SimTraffic, Version 10* was used to conduct the queueing analysis.

The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each approach. A LOS grade is a letter grade based on the average delay (in seconds) experienced by motorists traveling through an intersection. LOS results range from "A" being the best to "F" being the worst. LOS D is typically used as the acceptable LOS threshold in the District; although LOS E or F is sometimes accepted in urbanized areas if vehicular improvements would be a detriment to safety or non-auto modes of transportation.

The LOS capacity analyses were based on: (1) the intersection peak hour traffic volumes; (2) the lane use and traffic controls; and (3) the HCM methodologies (using Synchro software). The average delay of each approach and LOS is shown for the signalized intersections in addition to the overall average delay and intersection LOS grade.

Signal timing was based on the existing conditions Synchro files acquired from DDOT's Traffic Engineering and Signals Division (TESD). The cycle lengths for all the study area intersections are 120 seconds during both the morning and afternoon peak hours, with exceptions at East Capitol Street & 14th Street NE and East Capitol Street & 15th Street NE, which will operate with half cycle (60 seconds) during the afternoon peak hour. Optimization in terms of splits and offsets was performed for both Baseline Conditions and Future Conditions.

Table 1 shows the results of the intersection capacity analyses, including LOS and average delay per vehicle (in seconds) for the Baseline and Future scenarios. Table 2 shows the queueing analysis results reported by SimTraffic microsimulation.

As shown in Table 1, all the study intersections operate at acceptable conditions under the Baseline Conditions. The introduction of the rerouted trips results in one (1) study intersection that operates at unacceptable conditions or has one or more approaches operating at unacceptable levels under the Future Conditions:

- East Capitol Street & 15th Street, NE
  - Eastbound (PM)

Project Impact and Recommendations

Based on DDOT standards, the project may be considered to have a notable impact at an intersection within the study area if any of the following conditions are met:

- The capacity analyses show a LOS E or F at an intersection or along an approach in the future with conditions with the project where one does not exist in the existing conditions; or
- There is an increase in delay at any approach or overall intersection operating under LOS E or F of greater than 5 percent when compared to the existing conditions.

Based on these criteria, the following intersection is impacted by the proposed project:

- East Capitol Street & 15th Street, NE
  - Eastbound (PM)

For the intersection of East Capitol Street and 15th Street NE, the eastbound approach operates as one lane with permissive left turns. It operates at LOS B under the Baseline Conditions while deteriorates to LOS E under the Future Conditions due to the diverted trips making eastbound left turns at this intersection.

Mitigation was attempted by adding a protected/permissive eastbound left turn phase. However, due to the limitation of number of eastbound and westbound lanes, such mitigation did not achieve to improve all three approaches to operate within acceptable LOS. Therefore, mitigation in terms of signal phasing is not being recommended at this intersection. Although the eastbound approach operates at an unacceptable LOS E, the overall intersection operates at an acceptable LOS D.

It should be noted that the analysis results were based on the assumption of 50%/50% diversion trip split on the two (2) routes. It is likely that more drivers would choose the 13th Street NE – Constitutional Avenue NE option instead of the East Capitol Street NE – 15th Street NE option, if they experience significant delay at the East Capitol Street and 15th Street NE intersection. A dynamic equilibrium is like to be eventually achieved under which the travel time on the two (2) routes are similar, and the delay for the eastbound approach at the East Capitol Street and 15th Street NE intersection is alleviated.

Summary and Conclusions

This memorandum presents findings of a one-way conversion analysis performed along North Carolina Avenue NE between 13th Street NE and 14th Street NE in Washington, DC. The analysis studied the effects of converting North Carolina Avenue NE to a one-way westbound roadway between 13th Street NE and 14th Street NE to accommodate proposed separate bike lanes on both sides of North Carolina Avenue NE. The impact of diverting existing eastbound vehicles on North Carolina Avenue NE was analyzed.

Based on the vehicular analysis, the following conclusions were made:

- Approximately 55 AM and 125 PM vehicular trips are to be rerouted as a result of the proposed North Carolina Avenue NE protected bicycle facility.
- Roadways identified as reroute options included 13th Street NE, 14th Street NE, 15th Street NE, Constitution Avenue NE, and East Capital Street NE.
- Capacity analysis indicates that proposed reroutes will not create significant delays on area roadways during the morning and afternoon peak hours.

Table 1: Intersection Delay and Level of Service

	Intersection and Approach	2040 Baseline Conditions				2040 Proposed Conditions			
		AM Peak		*PM Peak*		*AM Peak*		*PM Peak*	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1.	**15th St & North Carolina Ave NE**								
	Overall	**25.0**	**C**	**21.7**	**C**	**27.1**	**C**	**21.3**	**C**
	Eastbound	22.8	C	12.7	B	37.6	D	11.3	B
	Westbound	21.6	C	10.4	B	22.6	C	12.3	B
	Northbound	38.1	D	46.8	D	39.2	D	43.6	D
2.	**Tennessee Ave & Constitution Ave & 13th St NE**								
	Overall	**22.1**	**C**	**17.0**	**B**	**22.1**	**C**	**19.6**	**B**
	Eastbound	7.5	A	15.1	B	7.5	A	20.4	C
	Westbound	19.3	B	8.8	A	19.8	B	11.9	B
	Northbound	27.8	C	19.3	B	26.2	C	18.9	B
	Southbound L	9.4	A	7.5	A	9.4	A	6.3	A
	Southbound R	31.1	C	35.0	D	31.1	C	29.9	C
3.	**North Carolina Ave & Constitution Ave NE**								
	Overall	**20.2**	**C**	**22.3**	**C**	**20.9**	**C**	**23.5**	**C**
	Eastbound	2.1	A	8.7	A	-	-	-	-
	Westbound	23.9	C	48.0	D	23.7	C	51.0	D
	Southeastbound	7.8	A	2.9	A	7.8	A	2.3	A
4.	**North Carolina Ave & 14th St NE**								
	Overall	**9.7**	**A**	**8.8**	**A**	**8.5**	**A**	**8.1**	**A**
	Eastbound	23.5	C	14.3	B	-	-	-	-
	Westbound	9.8	A	10.4	B	9.5	A	11.4	B
	Southbound	5.4	A	1.4	A	5.5	A	1.3	A
5.	**13th St & North Carolina Ave NE**								
	Overall	**12.0**	**B**	**5.1**	**A**	**13.5**	**B**	**4.9**	**A**
	Eastbound	5.1	A	1.9	A	5.4	A	2.2	A
	Northbound	23.1	C	6.1	A	28.1	C	5.8	A
6.	**14th St SE/14th St NE & East Capitol St**								
	Overall	**17.9**	**B**	**12.1**	**B**	**17.8**	**B**	**14.3**	**B**
	Eastbound	9.3	A	6.4	A	9.3	A	7.5	A
	Westbound	7.9	A	11.2	B	8.2	A	17.6	B
	Southbound	45.8	D	18.0	B	45.8	D	18.0	B
7.	**15th St SE/15th St NE & East Capitol St**								
	Overall	**20.4**	**C**	**16.3**	**B**	**20.6**	**C**	**37.7**	**D**
	Eastbound	8.5	A	14.6	B	11.2	B	63.2	E
	Westbound	15.9	B	17.4	B	15.9	B	17.4	B
	Northbound	50.7	D	17.7	B	50.7	D	17.7	B

Table 2: SimTraffic Queueing Analysis Results

	Intersection and Lane Group	Storage Length (ft)	2040 Baseline Conditions				2040 Proposed Conditions			
			AM Peak		*PM Peak*		*AM Peak*		*PM Peak*	
			50th	95th	50th	95th	50th	95th	50th	95th
1.	**15th St & North Carolina Ave NE**									
	Eastbound LT	390	91	177	59	122	92	175	34	94
	Westbound T	380	454	468	17	63	454	466	60	237
	Westbound R	380	455	470	67	141	456	473	120	300
	Northbound LTR	70	69	90	67	78	70	90	68	80
2.	**Tennessee Ave & Constitution Ave & 13th St NE**									
	Eastbound L	160	29	71	874	902	33	80	871	936
	Eastbound T	160	3	19	6	31	3	19	6	30
	Westbound LTR	430	51	102	15	45	59	114	15	47
	Northbound LT	90	87	123	57	108	90	127	49	100
	Northbound R	90	26	74	31	77	32	86	57	113
	Southbound L	130	23	57	25	55	23	57	28	58
	Southbound R	130	77	122	29	91	77	124	41	116
3.	**North Carolina Ave & Constitution Ave NE**									
	Eastbound T	70	0	0	0	5	-	-	-	-
	Westbound T	150	42	88	100	152	40	86	96	143
	Westbound T	150	123	137	123	141	122	140	123	138
	Southeastbound L	50	2	16	1	8	1	10	1	8
	Southeastbound L	50	0	8	0	0	0	3	0	3
4.	**North Carolina Ave & 14th St NE**									
	Eastbound TR	480	15	50	35	80	-	-	-	-
	Westbound L	50	-	-	-	-	1	8	1	8
	Westbound LT	50	6	25	19	38	-	-	-	-
	Westbound T	50	-	-	-	-	0	4	0	0
	Southbound T	40	13	34	1	9	14	36	2	17
	Southbound R	40	1	6	0	3	0	3	0	6
5.	**13th St & North Carolina Ave NE**									
	Westbound TR	240	107	207	19	53	115	242	16	47
	Northbound T	50	28	44	23	42	30	45	25	47
	Northbound R	50	9	37	5	27	-	-	-	-
6.	**14th St SE/14th St NE & East Capitol St**									
	Eastbound TR	660	59	129	40	121	72	152	75	170
	Westbound LT	440	299	633	239	483	404	676	184	382
	Southbound L	340	51	163	76	127	54	175	80	136
	Southbound TR	340	164	256	86	143	179	263	81	139
7.	**15th St SE/15th St NE & East Capitol St**									
	Eastbound LT	440	74	158	196	349	84	186	260	469
	Westbound TR	330	458	948	162	330	596	1061	140	258
	Northbound LTR	330	156	295	79	132	154	304	78	134