Connecticut Avenue NW
Reversible Lane Operations and Safety Study

ANC 3-4G Presentation

February 22, 2021
PROJECT OVERVIEW
Background

- 2003 Connecticut Avenue/Cleveland Park Traffic Operations’ study
- 2011 Institute of Transportation Engineers Study
- Connecticut Avenue Pedestrian Action (CAPA) Pedestrian Safety Audit (Toole Design Group, February 2011)
- 2014 moveDC Recommendations
- Connecticut Avenue, NW
  Corridor Crosswalk Safety Project
  ANC 3/4G (February 2015) for ANC 3/4 G
- Cleveland Park Bicycle Analysis (2016)
  - Bicycle analysis - provide bicycle improvements along corridor
- 2018 ANC Resolutions for Reversible Lane Study
  - ANC 3C (May 21, 2018)
  - ANC 3F (March 20, 2018)
  - ANC 3 /4 G (October 22, 2018)
- Community involvement in shaping RFQ for this current study
Project Goals

- Reduce vehicle crashes; improve safety for all modes;
- Consider a Protected Bicycle Lane; and
- Assess the feasibility of removing reversible lane operation.

“The District Department of Transportation is studying the feasibility of removing the reversible lane system as part of the District of Columbia’s Vision Zero initiative, which aims to eliminate traffic deaths and serious injuries by 2024. The purpose of the Connecticut Avenue NW Reversible Lane Safety and Operations Study is to assess the multimodal (vehicular, transit, bicycle, and pedestrian) operational and safety impacts associated with removing or maintaining/improving the existing reversible lane system.”
Primary and Secondary Study Area and Connecticut Avenue Regional Context
Project Status: Chart 1

Data Collection and Analysis
Existing Conditions

Initial Concept Development

Round 1 Stakeholder Meetings

Modeling, Travel Demand Forecasting

Detailed Traffic Operation, Multimodal, Safety Analysis

Round 2 Stakeholder Meetings

Winter-Spring 2020
Spring-Summer 2020
Summer-Fall 2020
Summer-Fall 2020
Winter 2021
Winter 2021

Community Advisory Committee, Stakeholder Meetings, Interagency Meetings
Project Status: Chart 2

- **Public Meeting No. 1**
  - Spring 2021

- **Concept Refinement Recommend Preferred Alternative**
  - Spring 2021

- **10% Concept Design**
  - Spring 2021

- **Public Meeting No. 2**
  - Summer 2021

- **Environmental Documentation**
  - Summer 2021

Community Advisory Committee, Stakeholder Meetings, Interagency Meetings
Agency and Community Engagement Strategy

- **Community Advisory Committee (CAC)**
  - Lee Brian Reba, 3C01
  - Beau Finley, ANC 3C04
  - Tom Quinn, 3E04
  - David Cristeal, 3F01
  - Robert Deyling, Chair, ANC 3F Streets and Sidewalks Committee
  - Chris Fromboluti, 3G07
  - Randy Speck, 3G03
  - Eileen McCarthy, Chair, Pedestrian Advisory Council (PAC)
  - Josh Rising, W3BA

- **Advisory Neighborhood Commissions (ANCs)**
- **Stakeholder Meetings**
- **Interagency Meetings**
- **Public Meetings**
- **Website**
<table>
<thead>
<tr>
<th>ORGANIZATION</th>
<th>DATE</th>
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<tbody>
<tr>
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<td>03-05-2020</td>
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<td>CAC Meeting No.1</td>
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<tr>
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<tr>
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<td>06-25-2020</td>
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<tr>
<td>W3BA</td>
<td>06-29-2020</td>
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<tr>
<td>ANC 3/4G</td>
<td>07-13-2020</td>
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<tr>
<td>ANC 3E</td>
<td>07-16-2020</td>
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<tr>
<td>Van Ness Main Street</td>
<td>07-17-2020</td>
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<td>ANC 3C</td>
<td>07-20-2020</td>
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<td>07-21-2020</td>
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<td>Cleveland Park Citizens Association</td>
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<td>D.C. Office of Planning &amp; DOEE</td>
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<td>Curbside Survey Meeting-Main Streets</td>
<td>08-21-2020</td>
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<td>Smithsonian Zoo</td>
<td>09-02-2020</td>
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<td>Howard University School of Law</td>
<td>09-03-2020</td>
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<td>09-17-2020</td>
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<td>DPW</td>
<td>09-19-2020</td>
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<td>Cleveland Park Smart Growth-Alt E</td>
<td>09-28-2020</td>
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<td>Van Ness Main Street</td>
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<td>WABA-Alt D-2 Meeting</td>
<td>12-02-2020</td>
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<tr>
<td>WABA &amp; W3BA Joint Meeting (attendee only)</td>
<td>12-08-2020</td>
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**2021 STAKEHOLDER MEETINGS**

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<td>CFA</td>
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<td>01-13-2021</td>
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<td>UDC</td>
<td>02-03-2021</td>
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**UPCOMING STAKEHOLDER MEETINGS**

Interagency Meeting, 2nd Round of Stakeholder Meetings: ANC Meetings, Civic Group Meetings, Main Street Meetings, SHPO, Public Meeting #1  
1st Quarter 2021
Reversible Lane Signage

Visibility of the reversible lane signage is difficult for motorists along the corridor.

Reversible Lane Signs Covered During COVID-19
Roadway Geometry

- Connecticut Avenue 110 to 140-foot right-of-way
- Existing curb-to-curb roadway width is 60 feet and consists of six (6) 10-foot travel/ parking lanes.
Safety and Crash Analysis

Key Findings

- 1,507 police-reported crashes occurred during the five-year study period (2015-2019)
- Approximately 1/3 of pedestrian crashes and 1/5 bicycle crashes occurred during RL operations

<table>
<thead>
<tr>
<th>Crash Category</th>
<th>Reversible Lane Operation</th>
<th>Normal Operation</th>
<th>Total Crashes</th>
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<tbody>
<tr>
<td></td>
<td>Count</td>
<td>%</td>
<td>Count</td>
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<tr>
<td>Pedestrian</td>
<td>22</td>
<td>32%</td>
<td>46</td>
</tr>
<tr>
<td>Bicycle</td>
<td>2</td>
<td>20%</td>
<td>8</td>
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<tr>
<td>Disabling Injury</td>
<td>11</td>
<td>52%</td>
<td>10</td>
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<tr>
<td>Non-Disabling Injury</td>
<td>183</td>
<td>43%</td>
<td>239</td>
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<tr>
<td>PDO</td>
<td>470</td>
<td>44%</td>
<td>594</td>
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<tr>
<td>Total Crashes</td>
<td>664</td>
<td>44%</td>
<td>843</td>
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Number of Crashes by Category, by Reversible Lane, and Normal Time of Day Operations

Connecticut Avenue NW Injury Crashes 2015-2019
Safety and Crash Analysis

Key Findings

• Although the reversible lane (RL) is in effect 15% of the time; 44% of the total crashes occur in RLs

• Average Annual Crash Rate
  – Higher than two comparison corridors (Massachusetts Avenue and Wisconsin Avenue,
  – Lower than two other comparison corridors (Georgia Avenue and Rhode Island Avenue)

Annual Average Crash Rates per Million Vehicle Miles for Connecticut Avenue NW and Comparison Corridors
Average Daily Traffic (ADT) Volumes

Key Findings

- **Connecticut Avenue NW ADTs:**
  - South of Western Avenue to south of Tilden Street NW, 30,000 to 32,000 vehicles per day (VPD)
  - In the vicinity of Calvert Street NW, 23,600 VPD

- **Secondary Study Area ADTs:**
  - Wisconsin Avenue NW: 23,600 to 28,100 VPD
  - Reno Road NW: 12,100 VPD
  - Massachusetts Avenue NW: 28,400 VPD
  - Broad Branch Road NW: 3,200 VPD
  - Beach Drive NW: 19,900 VPD
Origins and Destinations - Select Locations along Connecticut Avenue

Source: Connecticut Avenue Streetlight Analysis

North of Military

<table>
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<th>Description</th>
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<td>From/to Study Area</td>
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<tr>
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<td>22.8%</td>
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<tr>
<td>Through Study Area (to/from Region)</td>
<td>50.6%</td>
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<tr>
<td>Total</td>
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Van Ness to Upton

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<td>From Study Area to Region</td>
<td>24.4%</td>
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<td>From Region to Study Area</td>
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<td>Through Study Area (to/from Region)</td>
<td>40.3%</td>
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<tr>
<td>Total</td>
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South of Calvert Street

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<td>From Study Area to Region</td>
<td>27.9%</td>
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<td>From Region to Study Area</td>
<td>27.0%</td>
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<tr>
<td>Through Study Area (to/from Region)</td>
<td>38.3%</td>
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<tr>
<td>Total</td>
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ALTERNATIVES DEVELOPMENT
Guiding Principles

• Quality of Life
  – Accommodate the needs of people who live, work, and recreate within the Connecticut Avenue corridor.
  – Prioritize the needs of corridor residents/businesses.
  – Provide sustainable, resilient, and equitable transportation options for all modes.

• Safety and Vision Zero
  – Reduce the number of crashes and fatalities.
  – Incorporate Complete Streets principles to reduce vehicle speeds along the corridor.

• Traffic Operations
  – Mitigate significant traffic impacts, to the extent feasible, when considering alternative concepts.
  – Understand diversion impacts and mitigate, where possible.

• Parking and Loading
  – Retain some parking and loading in Commercial areas.

• Pedestrians
  – Integrate pedestrian improvements into each alternative concept.

• Bicycles
  – Include protected bicycle lane concept(s).

• Transit
  – Include bus transit operational improvements.

• ROW/Construction
  – The alternative must be constructed within the 60-foot curb-to-curb cross-section.
Alternatives Development

• Started with four (4) DDOT Build Concepts (A, B, C and D-0) plus No-Build Concept.
• Received potential concepts from Public/CAC (Concepts D-1, D-2 and Concept E).
• Concepts No-Build, A, and D-0 would require MUTCD-compliant overhead signals; Signage not supported by Commission on Fine Arts (CFA).
• All Concepts
  – Will be carried forward to our Public Meeting scheduled in March 2021.
  – Developed an evaluation matrix that considers the attributes, pros, cons and fatal flaws.
• Focused our traffic analysis on alternatives that can distinguish impacts: No-Build, Concepts B and C.
  – Traffic models can assist in determining the impacts from reducing the number of lanes in the corridor.
• All Alternatives
  – Include elements to improve safety and mobility.
  – Potential posted speed limit reduction along Connecticut Avenue from 30 mph to 25 mph.
No-Build Management Option

• Retains two (2) lane Reversible Lane System
• No upgrades to overhead signs/signals as required by MUTCD (not supported by CFA)
• Peak Period/Non-Peak Period Lane Operations- no change from Pre-COVID conditions
  - AM four (4) lanes inbound; two (2) lanes outbound; reverse in PM
  - Off-Peak Periods: two (2) travel lanes each direction; parking lane on the east and west sides of Connecticut Avenue
• May include intersection improvements to enhance pedestrian accessibility and safety
• Traffic Forecasts for No-Build Option developed as a baseline to measure the impacts of concepts that change Corridor number of lanes.
No Build/Existing Condition – Typical Layout

AM Peak Conditions

Off-Peak Conditions

PM Peak Conditions
CONCEPT A

- Retains 2-lane Reversible Lane System.
- Requires upgrade of Reversible Lane System to include overhead lane-use signs and signals.
- Peak Hour Lane Operations:
  - Three (3) peak direction travel lanes/One (1) off-peak direction travel lane.
- Off-Peak Period Traffic Operations:
  - Two (2) northbound and two (2) southbound lanes.
- One-way Protected Bicycle Lanes:
  - Located on east and west sides of Connecticut Avenue.
  - Includes 5’ bike lane and 4’ buffers.
  - All parking along Connecticut Avenue to be removed.
• Removes Reversible Lane System
• Peak Hour Lane Operations:
  - Three (3) northbound lanes and three (3) southbound lanes during peak hours
• Off-Peak Period Traffic Operations:
  - Two (2) northbound and two (2) southbound lanes
  - Parking/loading provided on the east and west sides of Connecticut Avenue
• No Protected Bicycle Lanes
• Parking
  - No Parking removed in this Concept
  - As in Pre-Covid conditions, parking would not be permitted during peak hours.
Concept B – Typical Layout

Off-Peak Conditions

Peak Conditions
**CONCEPT C**

- **Removes Reversible Lane System**
- **Peak Period/Off-Peak Period Operations:**
  - Two (2) northbound and two (2) southbound travel lanes
- **One-way Protected Bicycle Lanes:**
  - Located on east and west sides of Connecticut Avenue
  - Includes 4’ or 5’ bike lane and 4’ or 1.5’ buffers to accommodate either mainline or left turn/parking lane requirements
- **Traffic Operations- Manageable Impacts**
- **Parking-Retains 118 spaces in Commercial Areas; removes 507 spaces in other areas of Corridor.**
Concept C – Typical Layout

Same Operations At All Times
Concept C – Segment Renderings

Concept C – Illustrative Rendering

Concept C – Illustrative Rendering
Concept C – Commercial Area All-Day Parking/Loading Lane

Concept C, Option Typical Segment

Concept C Option– Parking/Loading Lane Option
CONCEPT D-0

- Retains one (1) lane Reversible Lane System
- Requires upgrade of Reversible Lane System per MUTCD Standard (CFA does not support)

Peak Hour Lane Operations:
- Three (3) peak direction/ two (2) off-peak direction travel lanes

Off-Peak Period Traffic Operations:
- Two (2) NB and two (2) SB travel lanes with NB Parking/Loading lane
- Left-turn pockets with “protected only” phasing, as required by DDOT’s Bicycle Facility Design Guide, not constructible due to Reversible Lanes.
- Conflicting pedestrians and cyclists in two-way cycle track
- Two-way protected cycle track: Dimensions include two (2), 4’-foot bike lanes with 2’-foot buffer
CONCEPT D-1 (by others)

- Retains Reversible Lane System
- Traffic Operations, All Day:
  - Two (2) northbound and two (2) southbound lanes
- Two options (based on locational needs within Corridor):
  - Northbound (NB) parking/loading lane, or NB/SB left-turn pocket
- Two-way protected cycle track:
  - Two (2) 4-foot bike lanes and a 2-foot buffer.
- Left-turn pockets with “protected only” phasing required for all intersections per DDOT’s Bicycle Facility Design Guide.
  - NB/SB left turns may block left lane leaving only one lane for through movement.
  - Left turn pockets required for two-way cycle track preclude parking

All Periods

Option: Based on need for NB/SB Left-turn pockets
CONCEPT D-2 (by others)

- Removes Reversible Lane System
- Peak Period Traffic Operations:
  - Two (2) northbound and two (2) southbound lanes; two-way center left-turn lane
- Off-Peak Period Traffic Operations:
  - One (1) northbound and two (2) southbound lanes
  - Two-way center left-turn lane
  - Northbound parking/loading lane
- Two-way protected cycle track (2- 4.5’ bike lanes and a 2’-buffer)
• Removes Reversible Lane System
• Peak Period/Off-Peak Period Traffic Operations:
  - Two (2) northbound and two (2) southbound lanes
  - East and west side Connecticut Avenue Parking/Loading Lanes
• Two-way Protected Cycle Track on the west side of Connecticut Avenue:
  - Two (2) 5’ bike lanes and a 3’ buffer
• ROW/Construction required to accommodate 67’ cross-section (60-foot existing curb-to-curb).
  
  *Does not conform to DDOT Guiding Principles*

• Cleveland Park Streetscape Project design impact.
Recent and Ongoing Improvements
Signal Timing Optimization & Cleveland Park Streetscape and Drainage

- Leading Pedestrian Interval
- Pretiming
- Extended Crossing Time
- Streetscape Project
- Updated Clearance Interval (20 MPH)
- Updated Clearance Interval (Slow Streets)
Potential Corridor Safety Improvements

**All Concepts**

### Speed Management
- Review Existing Speed Limit. Potential Reduction to 25 mph
- Dynamic Speed Feedback Signs

### Automated Enforcement
- Speed Enforcement Cameras
- Red Light Enforcement Cameras Locations (TBD)

### Pedestrian
- Pedestrian Hybrid Beacon/ HAWK Signal
- Curb Extensions

### Intersection Geometry
- Remove channelized right-turn lane
- Approach Realignment

### Signal Visibility
- Signal/HAWK Reflective Backplates
- DDOT Specific Mast Arm

### Access Management
- Left-Turn Restrictions (“No Left Turn” Signs)
- Corner Driveway / Alley Intersection Clearance
Preliminary Findings

• Difficult to meet full Purpose and Needs.
• If we remove the reversible lanes, accommodate some parking/loading, and accommodate PBLs, PBL widths/buffers have reduced dimensions.
• If we provide for only removal of the reversible lanes (Concept B), we are not accommodating multimodal safety and accessibility goals.
• No-Build Management Option:
  – Does not appear to meet Purpose and Need
  – Does not reduce crashes
  – Retains the Reversible Lanes
  – Does not meet the multimodal safety and accessibility goals
  – Requires overhead signage/signals to be MUTCD-compliant; not supported by CFA.
ALTERNATIVES EVALUATION
Alternatives Evaluation

- Developed Evaluation Matrix
  - Screen 1: Is the Alternative within 60-foot Curb-to-curb width
  - Screen 2: Considered the Attributes, Pros and Cons

- Developed relative scoring/adjectival rating
  - Desirable (+2), More Desirable (+1)
  - Neutral (0)
  - Less Desirable (-1), Not Desirable (-2)

- Criteria Evaluated
  - Traffic Safety
  - Traffic Operations
  - Bicycle Accessibility and Comfort
  - Pedestrian Accessibility and Comfort
  - Transit Accessibility and Operations
  - Parking, Loading and Pick-Up/Drop-Off
  - Constructability/Implementation

- Embedded in the Evaluation Criteria: Consistency with District of Columbia Plans
  - moveDC
  - Bicycle Master Plan
  - Vision Zero
  - Sustainable DC 2.0 Plan
  - District of Columbia Carbon Neutrality Goals
  - Bicycle and Pedestrian Safety Amendment Act of 2016
# Project Purpose
- Improve Safety and Operations along the Corridor
- Improve Multi-modal Accessibility

## Fatal Flaw Analysis
- Requires Additional ROW (existing 60' curb-to-curb width)

<table>
<thead>
<tr>
<th>Screen 1</th>
<th>Provided by Others</th>
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<tbody>
<tr>
<td>No-Build Option</td>
<td>Concept A</td>
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<td>NO</td>
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## Evaluation Criteria Assessment

1. Traffic Safety
2. Traffic Operations
3. Bicycle Accessibility & Comfort
4. Pedestrian Accessibility & Comfort
5. Transit Accessibility & Operations
6. Parking, Loading & Pick-up/Drop-off (PUDO)
7. Constructability & Implementation

### Scoring

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<th>Key</th>
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<th>Less Desirable</th>
<th>Neutral</th>
<th>More Desirable</th>
<th>Desirable</th>
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<tr>
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<td>-2</td>
<td>-1</td>
<td>0</td>
<td>+1</td>
<td>+2</td>
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| Screen 2 | | | | | | | | |
|----------|-------------------|
| Traffic Safety | -2 | -2 | +1 | +2 | -2 | +2 | +2 |
| Traffic Operations | +2 | -1 | +1 | +1 | -1 | -1 | -2 |
| Bicycle Accessibility & Comfort | -2 | +2 | -2 | +1 | +1 | +1 | +1 |
| Pedestrian Accessibility & Comfort | 0 | +1 | 0 | +1 | 0 | 0 | 0 |
| Transit Accessibility & Operations | +1 | -1 | +1 | 0 | 0 | 0 | -1 |
| Parking, Loading & Pick-up/Drop-off (PUDO) | +2 | -2 | +2 | -1 | +1 | -1 | +1 |
| Constructability & Implementation | -2 | -2 | +1 | 0 | -2 | -2 | -2 |

| Scoring | | | | | | |
|---------|-------------------|
| -1 | -5 | +4 | +4 | -3 | -1 | -1 | N/A |
Alternative B – Potential Safety Benefits

Remove Reversible Lanes - Estimated 36% reduction of crashes during peak hours (17% overall)

Left-Turn Calming Treatments – Slows left turning vehicles, reducing conflicts with pedestrians
### Safety Improvement Toolbox – Alternative C

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<th>Pedestrian &amp; Bicycle</th>
<th>CRF</th>
<th>#</th>
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<tr>
<td>Protected Bicycle Lane</td>
<td>-</td>
<td>26</td>
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<tr>
<td>Bicycle Lane</td>
<td>-</td>
<td>14</td>
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<tr>
<td>Pedestrian Refuge Island</td>
<td>26%</td>
<td>7</td>
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<table>
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<th>Turn Lanes and Parking</th>
<th>CRF</th>
<th>#</th>
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<tbody>
<tr>
<td>Left Turn Lane on One Major Road Approach</td>
<td>27%</td>
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</tr>
<tr>
<td>Left Turn Lane on Both Major Road Approaches</td>
<td>42%</td>
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<tr>
<td>Commercial Loading/Unloading or Parking</td>
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<tr>
<td>Parking Restrictions</td>
<td>20%</td>
<td>40</td>
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**CRF**  Crash Reduction Factor  
**#**  Number of blocks/intersections where improvement may have applicability
Alternative C – Potential Safety Benefits

Remove Reversible Lanes - Estimated 36% reduction of crashes during peak hours (17% overall)

Add Protected Bicycle Lanes – Expected decrease in vehicular crashes, protects cyclists mid-block

Add Turn Lanes at selected intersections – Estimated 27% reduction of crashes at intersections with turn lanes

Remove Parking – Estimated 20% reduction of crashes where implemented

Pedestrian Refuge Island – Estimated 26% reduction of crashes at intersections with refuge islands
Parking Summary

<table>
<thead>
<tr>
<th>Connecticut Avenue NW Parking &amp; Loading</th>
<th>Total Available Spaces</th>
<th>Concept A</th>
<th>No-Build, Concept B*</th>
<th>Concept C</th>
<th>Concept D⁰</th>
<th>Provided by Others</th>
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<td></td>
<td>Concept E</td>
</tr>
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➢ Total Parking Spaces Removed along the Corridor

- Total Parking Spaces Removed by Connecticut Avenue NW Roadway Segment
  1) Legation St to Jennifer St
  2) Jennifer St to Fessenden St
  3) Fessenden St to Chesapeake St
  4) Chesapeake St to Yuma St
  5) Yuma St to Upton St
  6) Upton St to Rodman St
  7) Rodman St to Newark St
  8) Newark St to North Rd
  9) North Rd to Woodley Rd
  10) Woodley Rd to Calvert St

➢ Total Parking Spaces Removed by Connecticut Avenue NW Roadway Segment

- Total Parking Spaces Removed by Connecticut Avenue NW Roadway Segment

- Total Parking Spaces Gained During Peak Periods along the Corridor

- Total Loading Spaces Removed along the Corridor

*No-Build Concept and Concept B does not change the lane configurations; therefore, no parking impacts.
**Concept shows parking lane; however, the requirement for Left-turn lanes will significantly reduce the area where parking can be accommodated. Design of the corridor will be required to determine the actual number of spaces to be removed.

Existing Conditions
- 609 Total Parking Spaces
- 209 Commercial Area Parking Spaces
- 24 Loading Spaces

Provided by Others:
- Concept D¹: 300
- Concept D²: 0
- Concept E: 0

609 Total Parking Spaces
209 Commercial Area Parking Spaces
24 Loading Spaces
TRAFFIC ANALYSIS
Traffic Analysis

• Focus on Concepts B and C since traffic model is sensitive to changes in number of lanes.
  – No Build: No changes from Pre-Covid configuration (4 lanes southbound and 2 lanes northbound in AM; reverse in PM)
  – Concept B: Reduces peak hour, peak direction lanes by one (1)
  – Concept C: Reduces peak hour, peak direction lanes by two (2)

• Modeling and analysis consisted of:
  – Preparing 2045 traffic volume forecasts consistent with land use, employment and population estimates from DC, MWCOG
  – Estimating traffic diversions (looking at design conditions)
  – Conducting level of service/capacity analyses
  – Looking at relative travel time differences between Concepts

• The study does not account for changes in traffic volumes, on a year-to-year basis, like we are experiencing during Pandemic conditions.
## Existing and Forecast AADT Volumes

<table>
<thead>
<tr>
<th>Segment</th>
<th>Existing</th>
<th>2045 No-Build</th>
<th>2045 Build Concept B</th>
<th>2045 Build Concept C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legation Street NW to Nebraska Ave NW</td>
<td>29,900</td>
<td>30,200</td>
<td>25,590</td>
<td>26,700</td>
</tr>
<tr>
<td>Albemarle Street NW to Porter Street NW</td>
<td>31,800</td>
<td>34,500</td>
<td>32,450</td>
<td>28,100</td>
</tr>
<tr>
<td>Porter Street NW to North Road NW</td>
<td>30,400</td>
<td>36,800</td>
<td>34,690</td>
<td>29,930</td>
</tr>
<tr>
<td>North Road to Calvert Street NW</td>
<td>23,600</td>
<td>25,900</td>
<td>24,040</td>
<td>19,290</td>
</tr>
</tbody>
</table>
Connecticut Avenue - A Multimodal Corridor
Order of Magnitude Existing Volumes and Forecasts

<table>
<thead>
<tr>
<th>Mode</th>
<th>Volume Range Today</th>
<th>Volume Range No Build</th>
<th>Volume Range Concept B</th>
<th>Volume Range Concept C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Today</td>
<td>23,600 to 31,800</td>
<td>25,900 to 36,800</td>
<td>24,040 to 32,450</td>
<td>19,290 to 29,930</td>
</tr>
<tr>
<td>Woodley Park 2017-2019 Entries (rounded)</td>
<td>6,000</td>
<td>3,700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleveland Park 2017-2019 Entries (rounded)</td>
<td>3,700</td>
<td>3,700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Van Ness 2017-2019 Entries (rounded)</td>
<td>5,700</td>
<td>5,700</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Today 29-91 (depending on location in corridor, peak hour)

Long-Term Peak Hour Forecast
With Protected Bicycle Lane:
- AM: 518
- PM: 483
- Daily: 3,150-3,250
PBL Infrastructure Bike Forecasts Methodology

- **Purpose:** To project bicycle demand along the Connecticut Avenue NW corridor. Develop short-term and longer-term forecasts.

- **Methodology**
  - Use of Cycle Streets Routing algorithm
  - Data Sources: CABI, historic bike count data, Connecticut Avenue Bike Counts.
  - Adjustments for: most direct route, most comfortable route, balanced route

- **Assumptions**
  - PBL forecasts are based on rerouted trips/current data and induced demand.
Connecticut Avenue Bicycle Usage Forecasts with Protected Bicycle Lane

Forecast Daily Bicycle Volumes with PBL: 3,150 to 3,250 per day
Connecticut Avenue NW Protected Bicycle Lane
Peak Hour and Daily Forecasts

<table>
<thead>
<tr>
<th>Segment</th>
<th>Peak Hour</th>
<th>Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM Existing</td>
<td>AM Short-Term</td>
</tr>
<tr>
<td>Calvert Street NW to Porter Street NW</td>
<td>52</td>
<td>255</td>
</tr>
<tr>
<td>Porter Street NW To Albemarle Street NW</td>
<td>23</td>
<td>114</td>
</tr>
<tr>
<td>Albemarle Street NW to Legation Street NW</td>
<td>16</td>
<td>78</td>
</tr>
</tbody>
</table>

3,150 to 3,250 Bicycles Per Day using Protected Cycle Track
TRAFFIC ANALYSIS: DIVERSION
Traffic Diversion: General Principles

- Modeled Traffic Diversions for No-Build and Concepts B and C.
- Start out with a Daily (24-Hour Diversion volume)
- Some diversions will occur within our secondary Study Area and on regional roadways. This traffic does not disappear; however, people decide to use regional roadways.
- Distribute Daily Diversion volume to 5 Hours in the AM and 5 Hours in the PM, within our secondary study area road network
- Diversions are not expected to occur during 14 of 24 hours in day (during off-peak periods)
Secondary Study Area and Regional Diversions

• 55-60% of traffic diversions will occur within the secondary study area, while 40-45% of people will travel on regional roadways

• Regional “diversion” roadways include Georgia Avenue, NW, Clara Barton Parkway/Canal Road NW, I-495, MacArthur Boulevard and George Washington Parkway.

• Concept B
  – Total Daily Diversions: 3,160
  – Secondary Study Area Daily Diversions: 1,920
  – Regional Diversions: 1,240

• Concept C
  – Total Daily Diversions: 7,020
  – Secondary Study Area Daily Diversions: 3,980
  – Regional Daily Diversions: 3,130
Concepts B and C Traffic Diversions

- **GREEN** shows relative decreases in peak hour traffic volumes compared to 2045 No-Build condition.
- **BLUE** shows relative increases in peak hour traffic volumes compared to 2045 No-Build condition.
Concept B and C Daily and Peak Hour Traffic Diversions

- Impacts of reducing the number of lanes along Connecticut Avenue during the peak hour, peak direction, by either one or two lanes, is manageable.

- Parallel and collector roadways can accommodate these modest increases in volumes.

<table>
<thead>
<tr>
<th>Area</th>
<th>Daily Traffic</th>
<th>Peak Hour Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Daily</td>
<td>3,160/7,020</td>
<td></td>
</tr>
<tr>
<td>Secondary Study Area</td>
<td>1,920/3,890</td>
<td></td>
</tr>
<tr>
<td>Regional Daily Diversion</td>
<td>1,240/3,130</td>
<td></td>
</tr>
<tr>
<td>Secondary Study Area</td>
<td>260/460</td>
<td></td>
</tr>
<tr>
<td>Mass Avenue</td>
<td>70/170</td>
<td></td>
</tr>
<tr>
<td>Wisconsin Avenue</td>
<td>100/140</td>
<td></td>
</tr>
<tr>
<td>Reno Road</td>
<td>50/50</td>
<td></td>
</tr>
<tr>
<td>Broad Branch</td>
<td>40/100</td>
<td></td>
</tr>
</tbody>
</table>
Traffic Analysis: Level of Service/Capacity
Intersection Level of Service and Delay

- **Level of Service (LOS) and Delay**, were reported and assessed at each of the study area intersections.

- **LOS and Delay**
  - See Grading System, LOS “A” to LOS “F”
  - Overall signalized LOS:
    - Average total vehicle delay of all movements through an intersection

- **LOS and Delay reported is for the highest one peak hour in the morning and the highest one peak hour in the evening.**

- **An intersection will likely operate better than what is reported during the balance of the day (approximately 20-22 hours).**

<table>
<thead>
<tr>
<th>LOS</th>
<th>Control Delay per vehicle (seconds per vehicle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≤ 10</td>
</tr>
<tr>
<td>B</td>
<td>&gt; 10-20</td>
</tr>
<tr>
<td>C</td>
<td>&gt; 20-35</td>
</tr>
<tr>
<td>D</td>
<td>&gt; 35-55</td>
</tr>
<tr>
<td>E</td>
<td>&gt; 55-80</td>
</tr>
<tr>
<td>F</td>
<td>&gt; 80</td>
</tr>
</tbody>
</table>
AM Traffic Levels of Service
Primary Study Area
No-Build and Concepts B and C

- Nebraska Avenue /Connecticut Avenue operates at LOS F in any condition (No-Build, B or C)
AM Traffic Levels of Service Secondary Study Area
No-Build and Concepts B and C

<table>
<thead>
<tr>
<th>SECONDARY STUDY AREA - AM PEAK SUMMARY</th>
<th>2045 NO-BUILD</th>
<th>CONCEPT B</th>
<th>CONCEPT C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Intersections with Overall LOS F/Total Study Area Intersections</td>
<td>2/20</td>
<td>2/20</td>
<td>3/20</td>
</tr>
</tbody>
</table>

Intersections Operating at LOS “F” in No-Build or Build conditions:
- Nebraska Avenue/Broad Branch Road
- Beach Drive/Park Road/Tilden Street
- Nebraska Avenue @ Ward Circle North operates at LOS “E” in the No-Build and Concept B condition, and LOS “F” under Concept C
PM Traffic Levels of Service
Primary Study Area
No-Build and Concepts B and C

- **Nebraska Avenue /Connecticut Avenue** operates at LOS F in any condition (No-Build, B or C)

- **Cathedral Avenue @ Connecticut Avenue** operates at LOS “F” in the No-Build and Concept B condition, and LOS “E” under Concept C.
PM Traffic Levels of Service
Secondary Study Area
No-Build and Concepts B and C

Intersections Operating at LOS “F” in No-Build or Build conditions:
- Western Avenue @ River Road
- Reno Road @ Military Road
- Nebraska Avenue @ Ward Circle North
## Connecticut Avenue Travel Time For Reversible Lane Segment

### AM Peak Hour Travel Time Comparison (Primary Study Area)

<table>
<thead>
<tr>
<th>TRAVEL TIME DIRECTION</th>
<th>NO - BUILD</th>
<th>CONCEPT B</th>
<th>CONCEPT C</th>
<th>NO-BUILD VS. CONCEPT B</th>
<th>NO-BUILD VS. CONCEPT C</th>
<th>CONCEPT B VS. CONCEPT C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northbound</td>
<td>17 min.</td>
<td>13 min.</td>
<td>14 min.</td>
<td>-4 min.</td>
<td>-3 min.</td>
<td>+1 min.</td>
</tr>
<tr>
<td>Southbound</td>
<td>13 min.</td>
<td>16 min.</td>
<td>20 min.</td>
<td>+3 min.</td>
<td>+7 min.</td>
<td>+4 min.</td>
</tr>
</tbody>
</table>

### PM Peak Hour Travel Time Comparison (Primary Study Area)

<table>
<thead>
<tr>
<th>TRAVEL TIME DIRECTION</th>
<th>NO - BUILD</th>
<th>CONCEPT B</th>
<th>CONCEPT C</th>
<th>NO-BUILD VS. CONCEPT B</th>
<th>NO-BUILD VS. CONCEPT C</th>
<th>CONCEPT B VS. CONCEPT C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northbound</td>
<td>13 min.</td>
<td>17 min.</td>
<td>21 min.</td>
<td>+4 min.</td>
<td>+8 min.</td>
<td>+4 min.</td>
</tr>
<tr>
<td>Southbound</td>
<td>15 min.</td>
<td>12 min.</td>
<td>13 min.</td>
<td>-3 min.</td>
<td>-2 min.</td>
<td>+1 min.</td>
</tr>
</tbody>
</table>

- **AM Peak Period- Southbound (Peak Direction)**
  - Compare No-Build to Concept B (+3 min)
  - Compare No-Build to Concept C (+7 min)
  - Compare Concept C to Concept B (+4 min)

- **AM Peak Period- Northbound (Off-Peak Direction)**
  - Compare No-Build to Concept B (-4 min)
  - Compare No-Build to Concept C (-3 min)
  - Compare Concept C to Concept B (+1 min)

- **PM Peak Period- Northbound (Peak Direction)**
  - Compare No-Build to Concept B (+4 min)
  - Compare No-Build to Concept C (+8 min)
  - Compare Concept C to Concept B (+4 min)

- **PM Peak Period- Southbound (Off-Peak Direction)**
  - Compare No-Build to Concept B (-3 min)
  - Compare No-Build to Concept C (-2 min)
  - Compare Concept C to Concept B (+1 min)
Next Steps

• Present major findings of traffic analysis to Stakeholder and Interagency groups in February 2021
• Begin preparation and logistics activities for a Public Meeting at end of March 2021
• Hold Public Meeting
• Develop a recommendation for moving forward on a preferred concept
• 10% design of preferred concept
• Environmental Documentation
Contact Information

Ed Stollof, Project Manager
Manager, Project Planning Branch
Planning and Sustainability Division
Email: Edward.Stollof@dc.gov

Cynthia Lin, Deputy Project Manager
Project Planning Branch
Planning and Sustainability Division
Email: Cynthia.Lin@dc.gov

Donise Jackson, DDOT Ward 3 Community Engagement Specialist
Office of the Director
Email: Donise.Jackson@dc.gov

Charlotte Ducksworth, Community Engagement Specialist
Partner and Vice President of Business Affairs, Commun-ET, LLC
Email: cducksworth@commun-et.com

Ian Swain, Community Engagement Specialist
Managing Partner, Commun-ET, LLC
Email: Ian Swain iswain@commun-et.com

Project Website-

Project Email-
Conn-Ave-revstudy@dc.gov
Project Website and Email

Project email:
• Conn-Ave-revstudy@dc.gov

Project website:
Thank You!

Questions and Comments