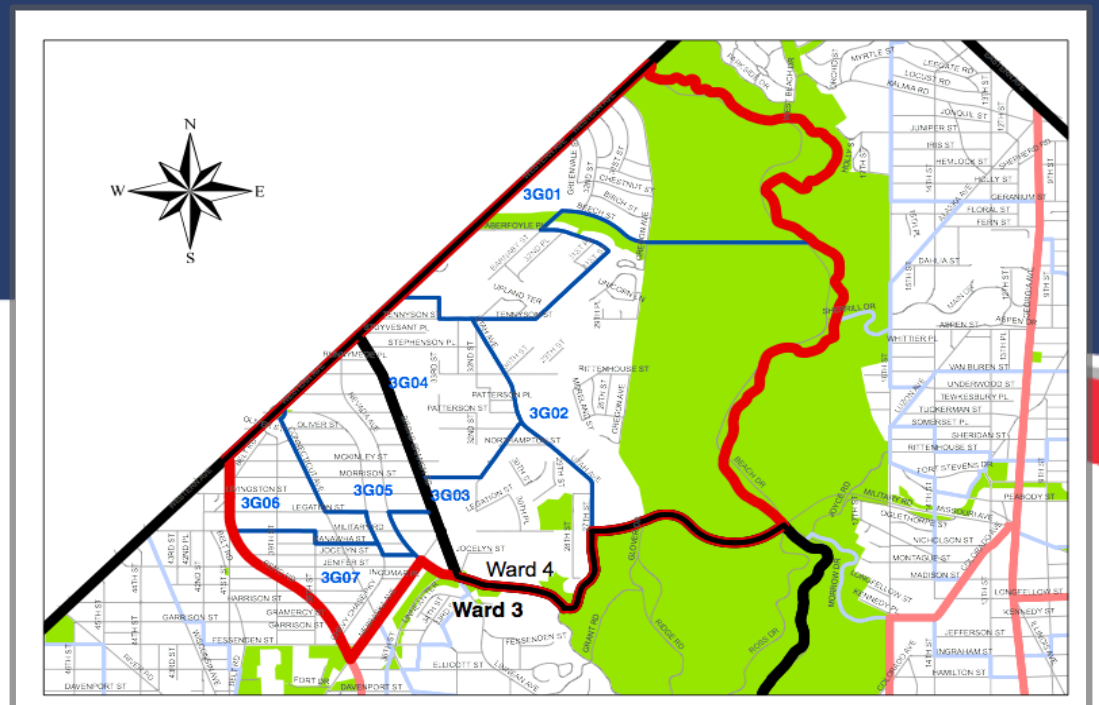
Connecticut Avenue NW
Reversible Lane Operations and Safety Study
ANC 3 /4 G

July 13, 2020



ANC 3G 2013 Boundaries

Introduction to Tonight's Presentation

Agenda Items

1. Purpose of Briefing
2. Study Purpose
3. Project Background
4. Status Report of study process
   - Project Materials/Communications
   - Highlights of Existing Conditions Report
   - Alternatives
5. Discussion

Study Purpose

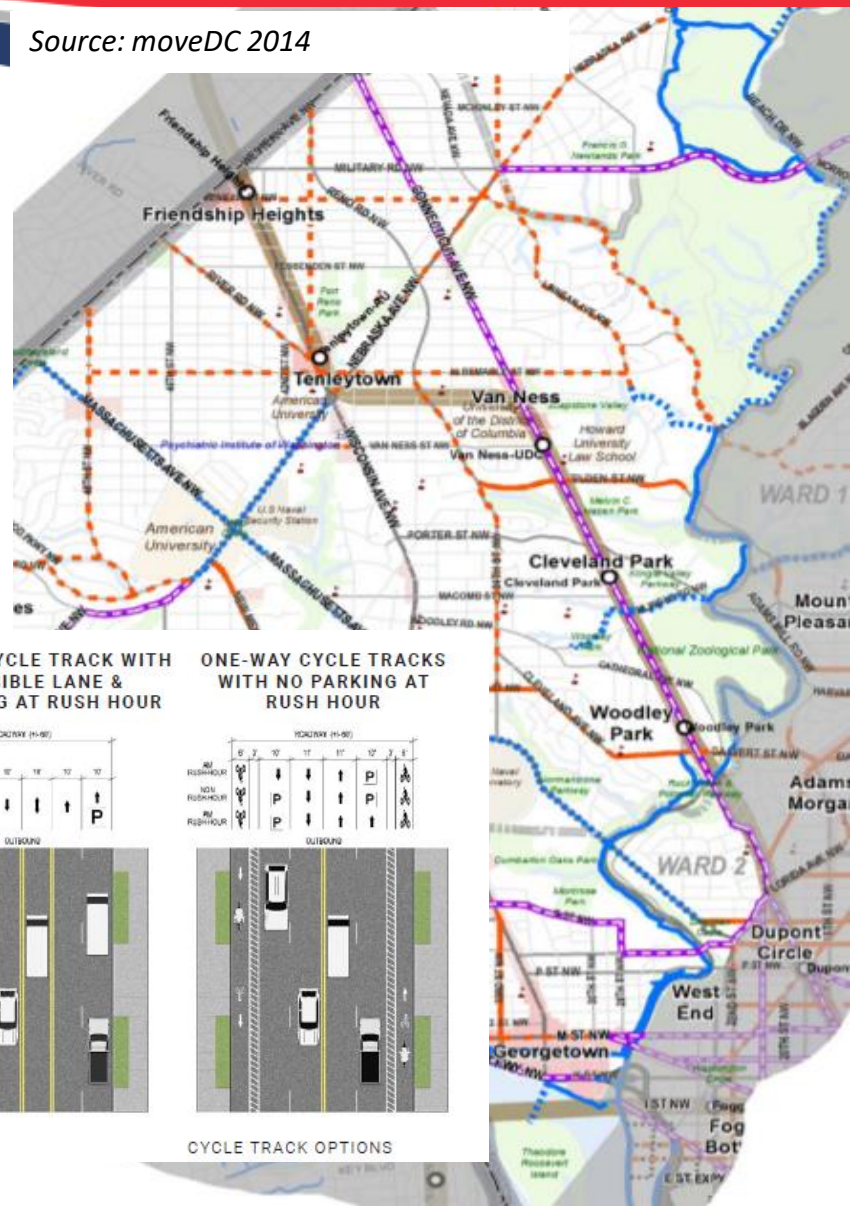
- Reduce vehicle crashes; improve safety for all modes;
- Consider a Protected Bicycle Lane; and
- Assess the feasibility of removing reversible lane operation

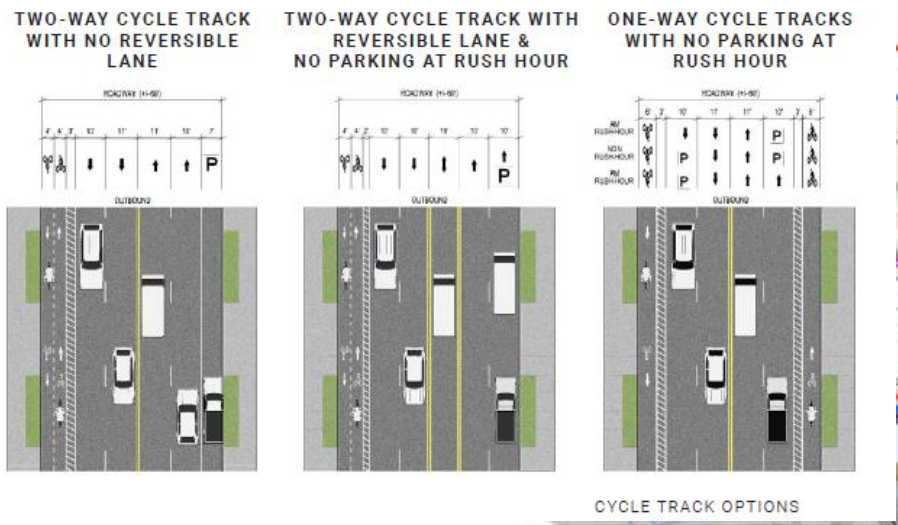
"The District Department of Transportation is studying the feasibility of removing the reversible lane system as part of the District of Columbia's Vision Zero initiative, which aims to eliminate traffic deaths and serious injuries by 2024. The purpose of the Connecticut Avenue NW Reversible Lane Safety 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."

Project Background

- **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*
- **Cleveland Park Bicycle Analysis (2016)**
  - Bicycle analysis - provide bicycle improvements along corridor
- **Connecticut Avenue, NW Corridor Crosswalk Safety Project ANC 3/4G (February 2015) for ANC 3/4 G**
- **2014 moveDC Recommendations**

Source: moveDC 2014



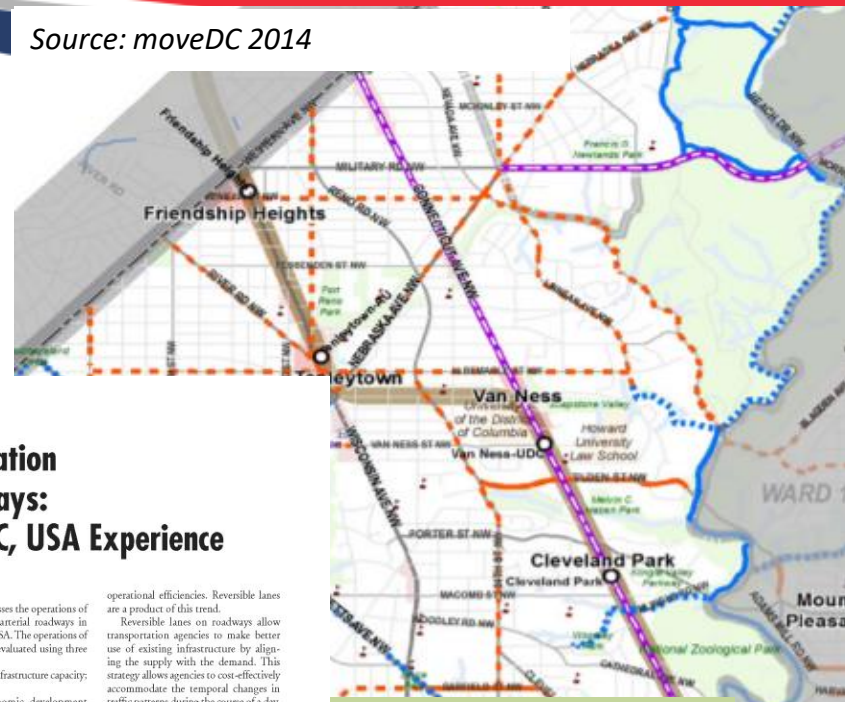


Source: Cleveland Park Streetscape Bicycle Analysis Memo 2016

Project Background

- **Connecticut Avenue Pedestrian Action (CAPA) Pedestrian Safety Audit (Toole Design Group, February 2011)**
- **2011 Institute of Transportation Engineers Study**
- **2003 Connecticut Avenue/Cleveland Park Traffic Operations' study**

Source: moveDC 2014



Reversible Lane Operation for Arterial Roadways: The Washington, DC, USA Experience

THIS PAPER DISCUSSES THE OPERATIONS OF REVERSIBLE LANES IN THE DISTRICT OF COLUMBIA. THE OPERATIONS ARE EVALUATED USING THREE CRITERIA—UTILIZATION OF INFRASTRUCTURE CAPACITY, SAFETY, AND ECONOMIC DEVELOPMENT.

BY SOUMYA DEY, P.E., JIANMING MA, PH.D., P.E. AND YUSUF ADEN

PURPOSE

This paper discusses the operations of reversible lanes on arterial roadways in Washington, DC, USA. The operations of reversible lanes are evaluated using three different criteria:

- Utilization of infrastructure capacity;
- Safety; and
- Land use/economic development impacts.

The discussion takes into account constraints inherent in a built-out urban environment and operational constraints imposed by external stakeholders. The paper discusses the status of continued operations of such facilities and draws some preliminary conclusions.

BACKGROUND

Traffic congestion has become a serious issue in metropolitan areas around the country. The annual cost of traffic congestion is estimated to be $115 billion, consisting of 4.8 billion lost hours and 3.9 billion gallons of fuel wasted.[1] Congestion-related delays are progressively getting worse. Increasing congestion and delay not only has economic and environmental impacts but also has societal impact by affecting quality of life. In major urban areas, a large portion of the population spends more time commuting than vacationing.

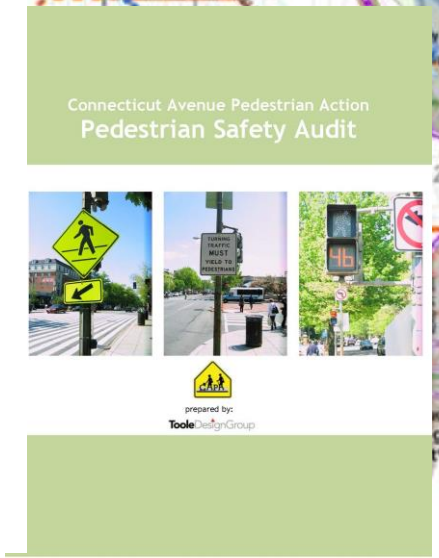
Dwindling public resources combined with environmental concerns and lack of opportunities to add new capacity in built-out urban areas have caused the transportation sector to shift its philosophy from "building out of congestion" to "more efficient operations of existing infrastructure." Consequently, jurisdictions have been trying a host of active traffic management strategies aimed at enhancing operational efficiencies. Reversible lanes are a product of this trend.

Reversible lanes on roadways allow transportation agencies to make better use of existing infrastructure by aligning the supply with the demand. This strategy allows agencies to cost-effectively accommodate the temporal changes in traffic patterns during the course of a day. The directional capacities of roadways are adjusted at different times of the day to adapt to changing traffic conditions using reversible lanes. Reversible lanes in an arterial environment can take many forms, from being certain directions during certain time periods to having different lane allocation during different time periods.

OVERVIEW OF WASHINGTON, DC REVERSIBLE LANES

In the District of Columbia, reversible lanes are implemented to improve traffic flow during rush hours in corridors that accommodate predominantly commuter traffic. Some of the reversible lane facilities have been in place for several decades. Reversible lanes have been applied on several roadway segments to accommodate the imbalance in directional traffic (D-factors) associated with peak commuting periods. In addition, reversible lanes are used on an ad hoc basis for emergency evacuations, maintenance of traffic in work zones, and other special events. However, this paper focuses on reversible lanes implemented to address imbalances in peak hour commuter traffic.

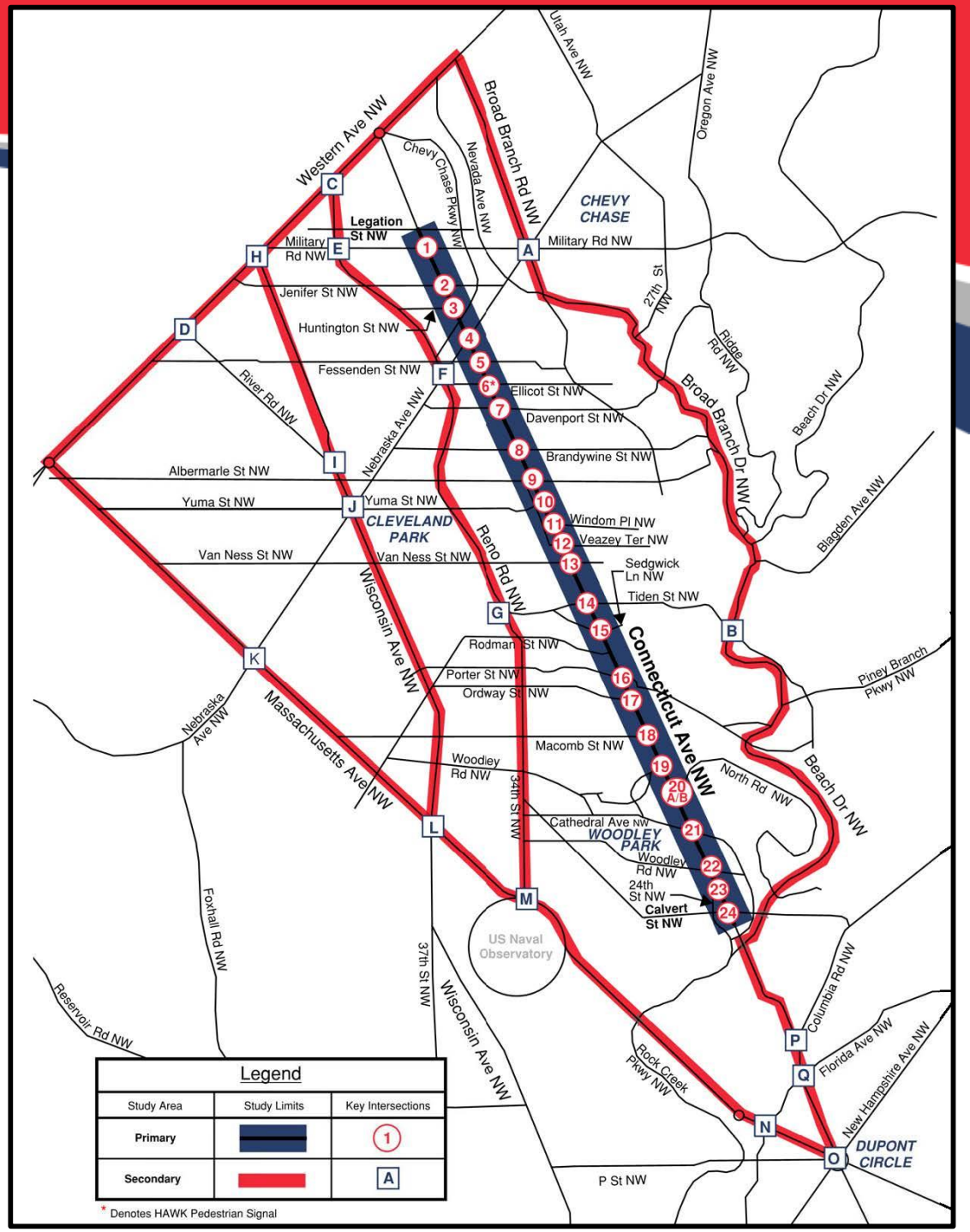
Currently, the District of Columbia operates 10 roadway segments with reversible lanes. The total length of these segments is approximately 10.6 miles, which is less than one percent of the District's roadway mileage. Figure 1 shows the reversible lane segments with specifics about starting and ending points, directional lane configuration, and operational hours.



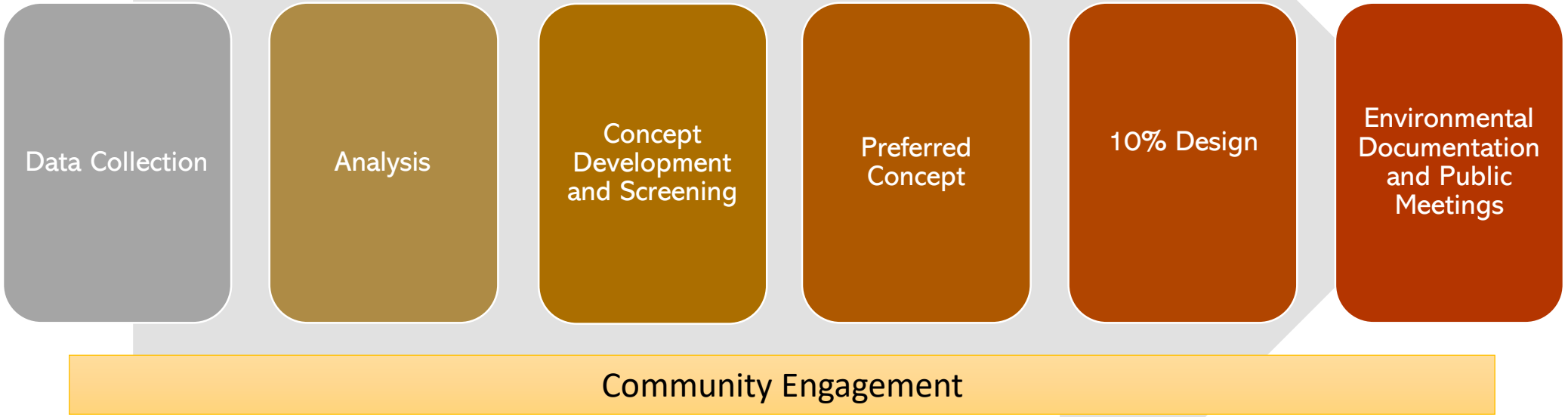
Project Study Area

Primary and Secondary Study Areas

- Corridor - Approximately 2.7 miles long
- Primary Study Area
  - Connecticut Avenue from Legation Street to Calvert Street, NW
- Secondary Study Area
  - Wisconsin Avenue to the west, Broad Branch Road to the east, Dupont Circle to the south and Western Avenue to the north.



Major Elements of Scope of Work



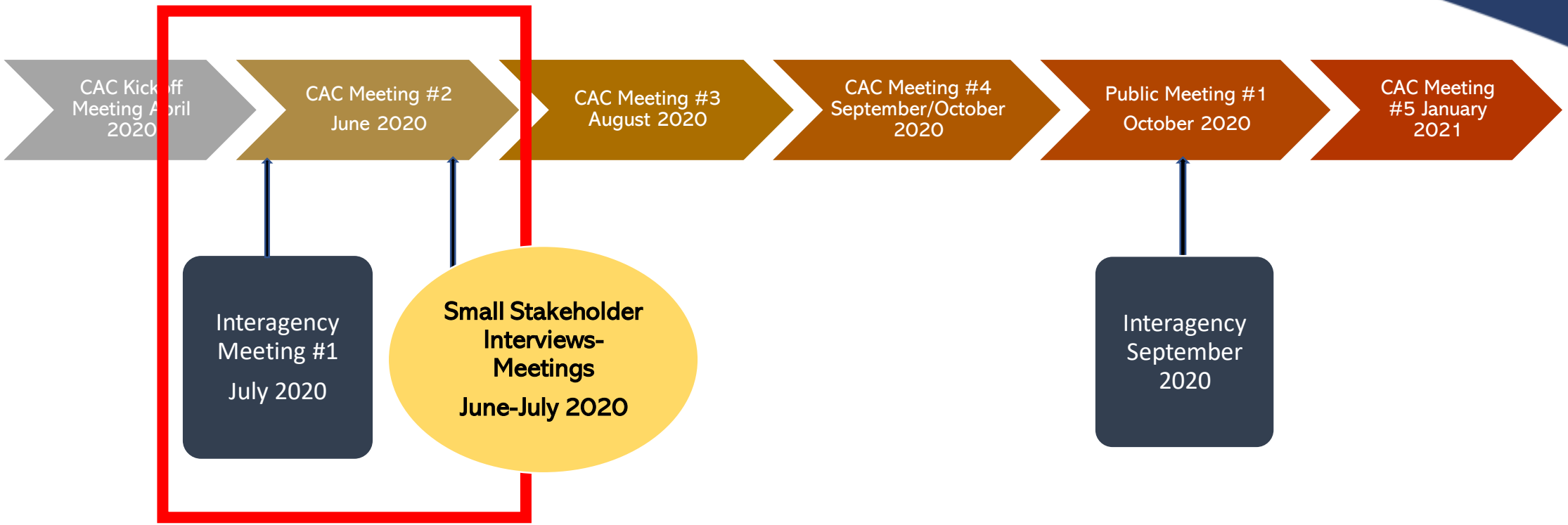
Public Engagement Activities and Tasks

- Community Advisory Committee (CAC)
- Advisory Neighborhood Commissions (ANCs)
- Stakeholder Meetings
  - Met with already: Ward 3 Vision, W3BA, Cleveland Park Main Street
  - Meetings next two weeks: ANC 3/4 G, ANC 3E, Van Ness Main Street, ANC 3C, AMC 3F, Woodley Park Citizens Association
- Interagency Meetings
- Public Meetings (2)
- Website

Community Advisory Committee (CAC) Members

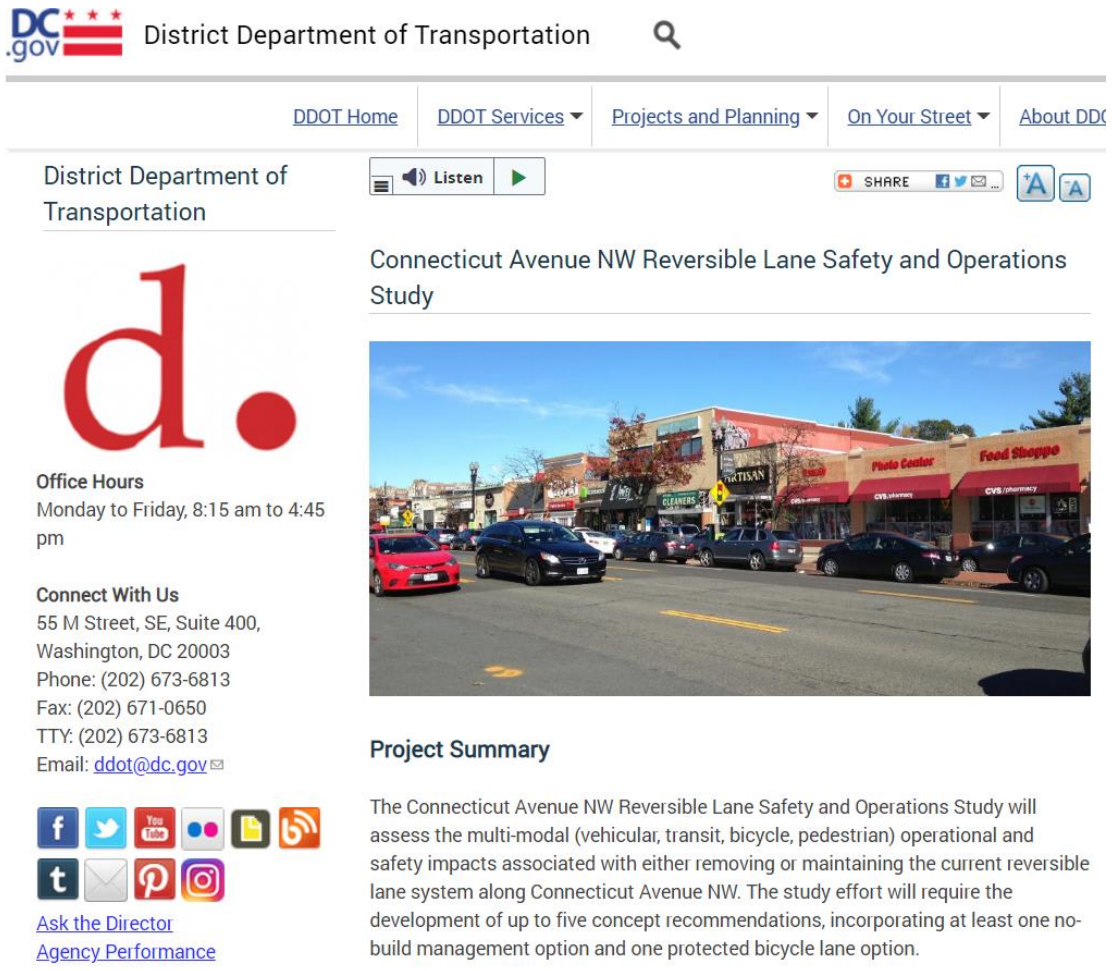
- Lee Brian Reba, 3C01
- Beau Finley, ANC 3C04
- Tom Quinn, 3E04
- David Cristeal, 3F01
- Robert Deyling, Chair, ANC 3F Streets and Sidewalks Committee
- Chris Fromboluti, 3G07
- Randy Speck, 3G03
- Eileen McCarthy, Chair, Pedestrian Advisory Council (PAC)
- Josh Rising, W3BA

Community Engagement



***The ANCs will be updated throughout the Engagement Process.
***The current meetings listed will be held virtually until further notice.
***Meeting notes from the CAC will be posted on the project webpage.

Connecticut Avenue Reversible Lane Operations and Safety Study Website



Project email:

- Conn-Ave-revstudy@dc.gov

Project website:

- https://ddot.dc.gov/page/connecticut-avenue-nw-reversible-lane-safety-and-operations-study

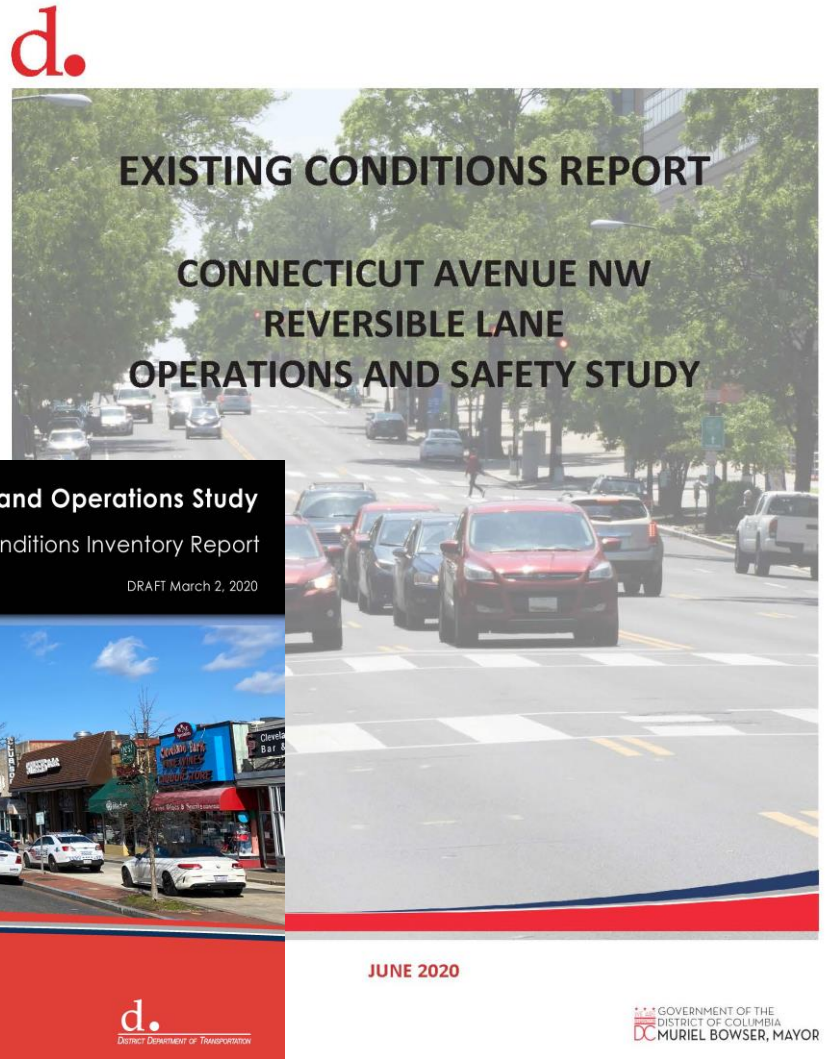
Currently on the Website:

- CAC Meeting #1 Agenda, Minutes, Presentation
- CAC Meeting #2, Agenda, Presentation
- Existing Conditions Report
- Draft Environmental Inventory

Status of Study Elements

Existing Conditions

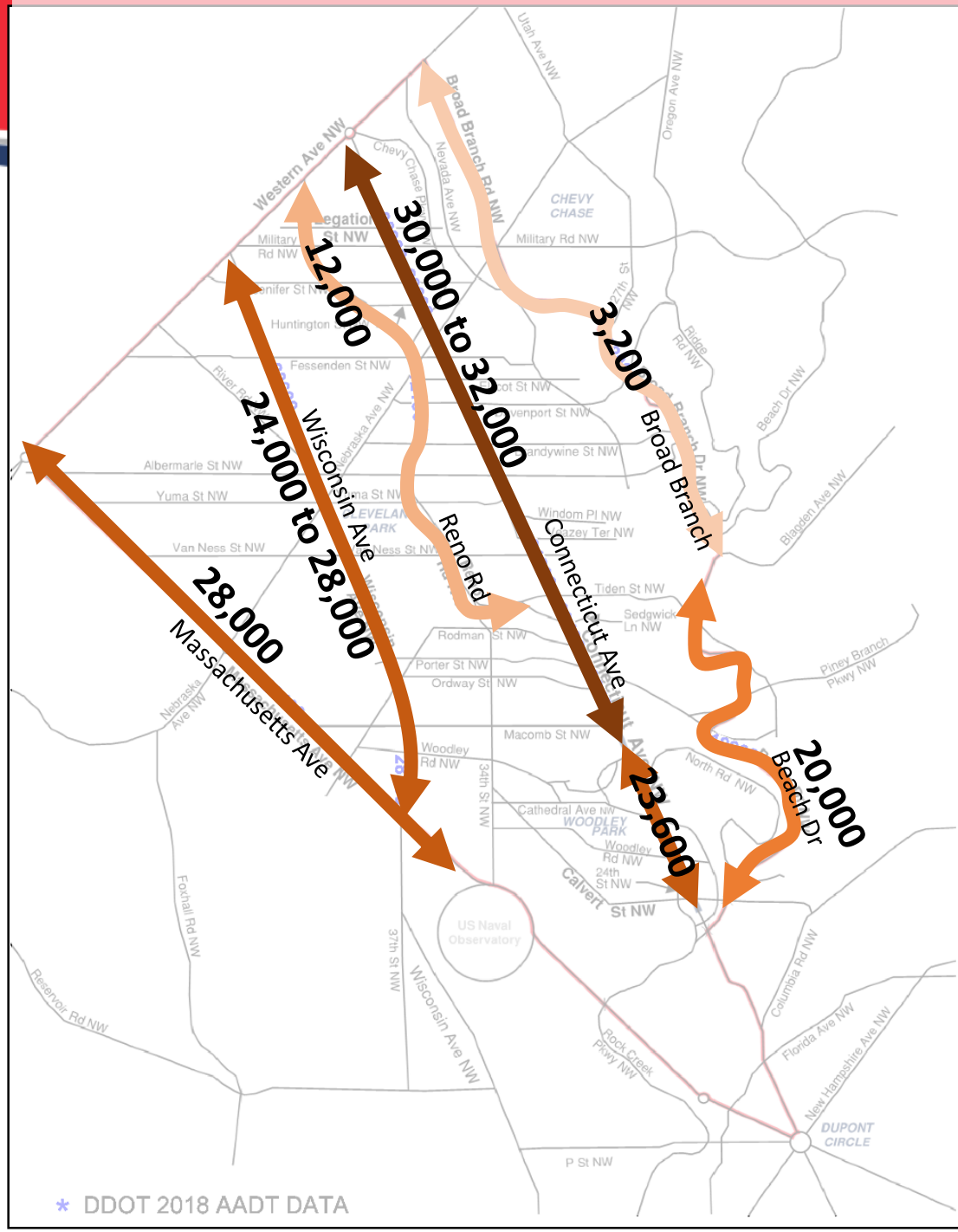
- **Data Collection**
  - Weekday AM/PM Peak and Off-Peak Turning Movement Counts (TMCs)
  - Multimodal Data (pedestrian, bicycle, parking, transit)
  - Average daily traffic volumes
  - Observations (queuing, compliance, signage)
  - Vehicle travel times/speed data
  - 5-year crash data
- **On DDOT Website**
  - Existing Conditions Report
  - Environmental Inventory



Average Daily Traffic (ADT) Volumes

Key Findings

- Connecticut Ave 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



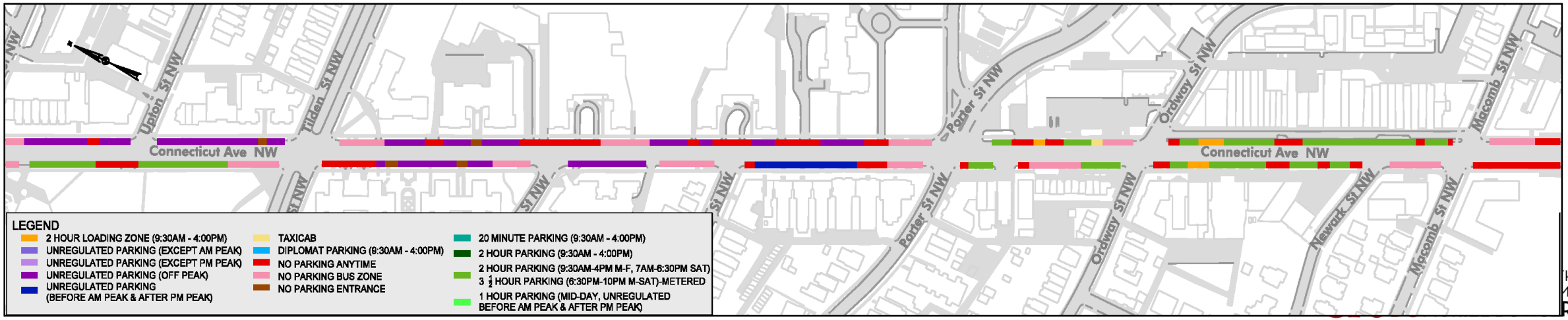
Existing Conditions-Parking Data Collection

Parking Regulation	Description	Supply
Unregulated Parking	Parking allowed at all times and days. No parking during AM and/or PM peak hours	290 spaces
2-Hour Parking	2 Hour time limited parking (9:30am-4:00pm). No parking during AM and PM peak hours	150 spaces
2-Hour and 3 ½ Hour Metered Parking	Time limited paid parking ($2.30/hr.), No parking during AM and PM peak hours	185 spaces
Loading Zone	Signed, on street metered zones exclusively for commercial vehicles for up to two hours at a time during off peak periods	12 locations

Parking Utilization by Street Segment

Connecticut Ave NW from:	to:	Unregulated Parking		2 HR Parking		2 HR (and 3 1/2 HR) Metered Parking		Loading Zone			Other Parking		
		Spaces	Utilization %	Spaces	Utilization %	Spaces	Utilization %	Spaces	Length (ft)	Utilization %	Regulation	Spaces	Utilization %
Calvert St NW	24th St NW					17	90%	6	167	100%			
24th St NW	Woodley Rd NW					3	100%						
Woodley Rd NW	Cathedral Ave NW			57	30%			2	65	100%			
Cathedral Ave NW	North Rd			34	45%								
North Rd	Devonshire Pl NW			24	85%								
Devonshire Pl NW	Macomb St NW												
Macomb St NW	Ordway St NW					42	50%	5	125	60%			
Ordway St NW	Porter St NW					12	65%	1	37	100%	TaxiCab	1	100%
Porter St NW	Sedgwick St NW*	29	50%										
Sedgwick St NW	Tilden St NW	23	45%										
Tilden St NW	Van Ness St NW	27	70%			18	30%						
Van Ness St NW	Veazey Ter NW					23	70%	1	54	100%			
Veazey Ter NW	Windom Pl NW					13	90%				Diplomat	2	100%
Windom Pl NW	Yuma St NW			5	80%	21	60%						
Yuma St NW	Albemarle St NW					17	60%	3	90	30%			
Albemarle St NW	Brandywine St NW	14	50%	18	35%								
Brandywine St NW	Davenport St NW	33	25%										
Davenport St NW	Ellicott St NW	19	35%										
Ellicott St NW	Fessenden St NW	18	10%								1 HR - Mid-day	1	0%
Fessenden St NW	Nebraska Ave NW	2	100%			18	70%						
Nebraska Ave NW	Chevy Chase Pkwy NW	14	55%	11	20%								
Chevy Chase Pkwy NW	Huntington St NW	6	0%										
Huntington St NW	Jenifer St NW	22	25%										
Jenifer St NW	Military Rd NW	36	30%										
Military Rd NW	Legation St NW	17	35%										
Legation St NW	Livingston St NW	15	95%					2	41	100%	20 MIN Mid-day	1	100%

* 13 Unregulated Parking spaces not available during mid-day



Parking Supply and Curbside Regulations

Safety and Crash Analysis

Key Findings

- 1,507 police-reported crashes occurred during the five-year study period (2015-2019)
- Although the reversible lane (RL) is in effect 15% of the time; 44% of the total crashes occur in RLs
- Approximately 1/3 of pedestrian crashes and 1/5 bicycle crashes occur during RL operations

Crash Category	Reversible Lane Operation		Normal Operation		Total Crashes	
	Count	%	Count	%	Count	%
Pedestrian	22	32%	46	68%	68	100%
Bicycle	2	20%	8	80%	10	100%
Disabling Injury	11	52%	10	48%	21	100%
Non-Disabling Injury	183	43%	239	57%	422	100%
PDO	470	44%	594	56%	1064	100%
Total Crashes	664	44%	843	56%	1507	100%

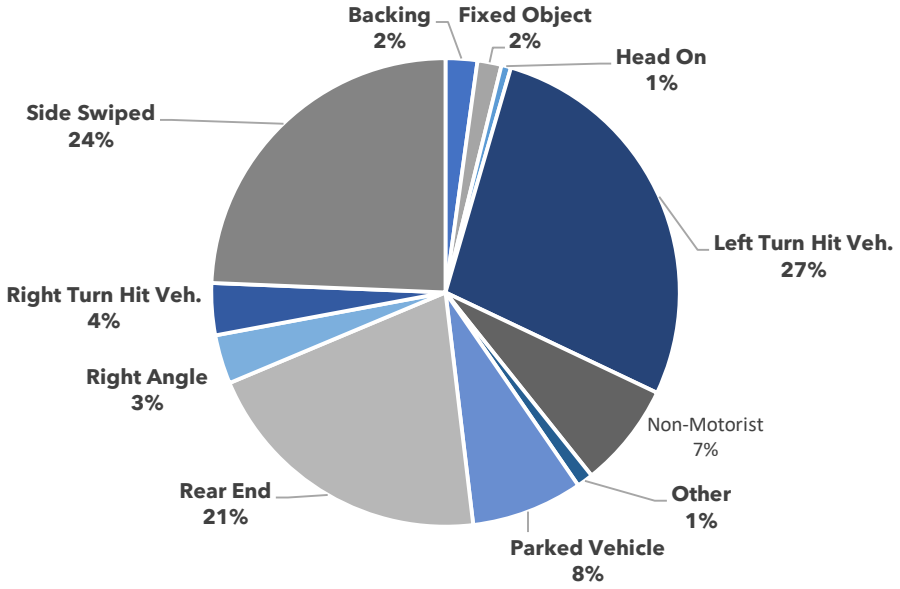
Number of Crashes by Category, by Reversible Lane, and Normal Time of Day Operations

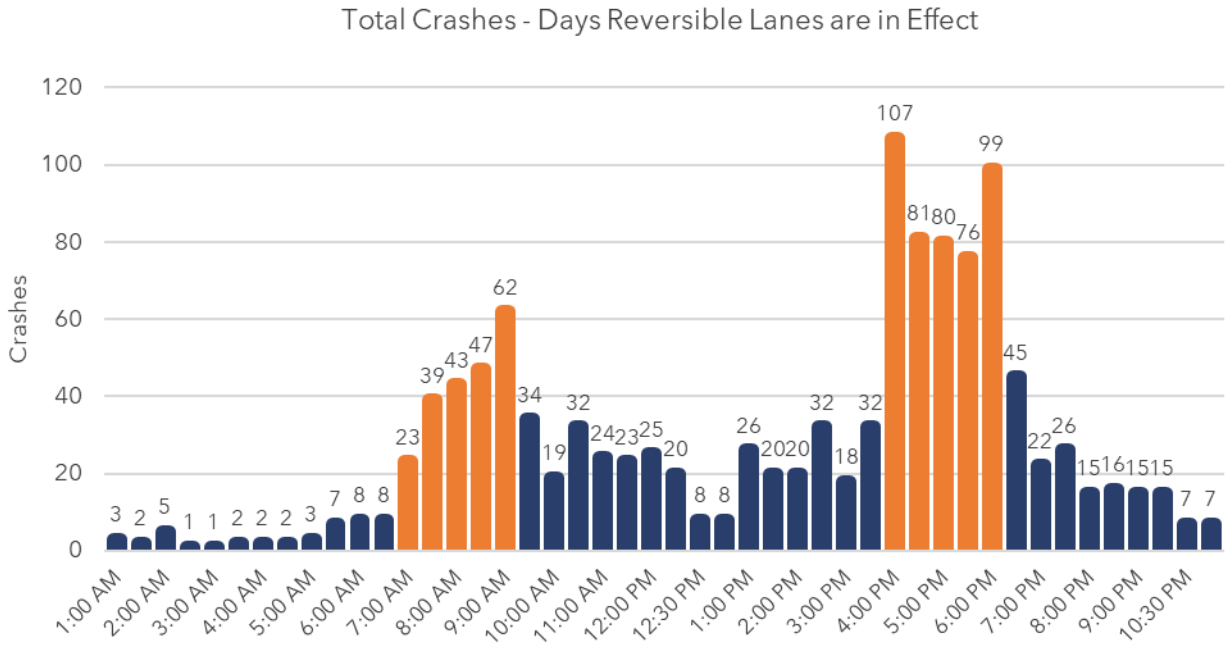
Connecticut Avenue NW Injury Crashes 2015-2019

Safety and Crash Analysis

Three crash types accounted almost 75% of all crashes:

- Left Turn Hit Vehicle (27%)
- Side Swiped (24%)
- Rear End (21%)





Connecticut Avenue NW Crashes by Time of Day

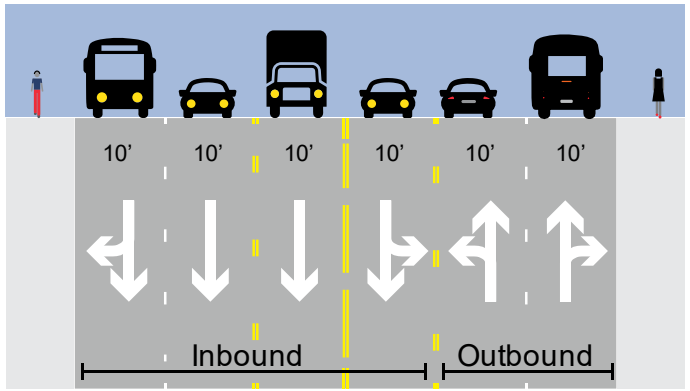
Initial Concept Alternatives

Concept Feasibility

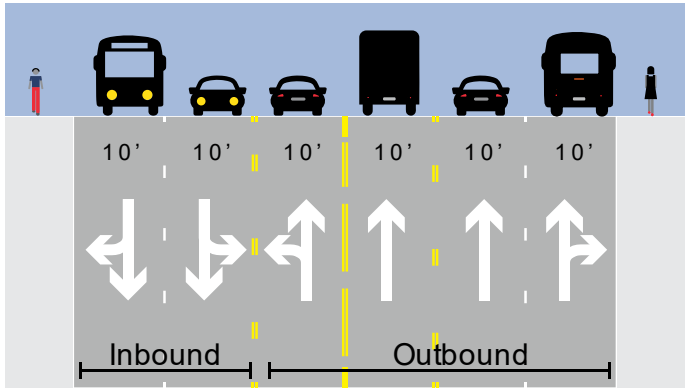
1. Meet design standards
2. Inclusive of multimodal objectives
3. Implementation complexity, easily understandable/confusing
4. Is the concept safe? How safe?
5. Modal conflicts/priorities; how to resolve
6. Vehicular traffic operations
7. Parking/loading
8. Tradeoffs
9. Neighborhood traffic impacts

Existing Conditions (Pre-COVID): Overview

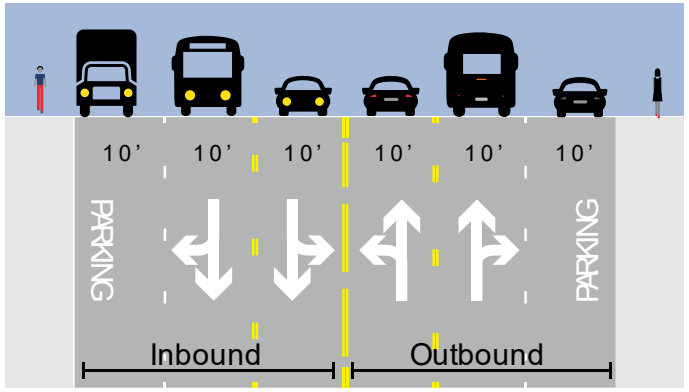
AM Peak



PM Peak



Off Peak

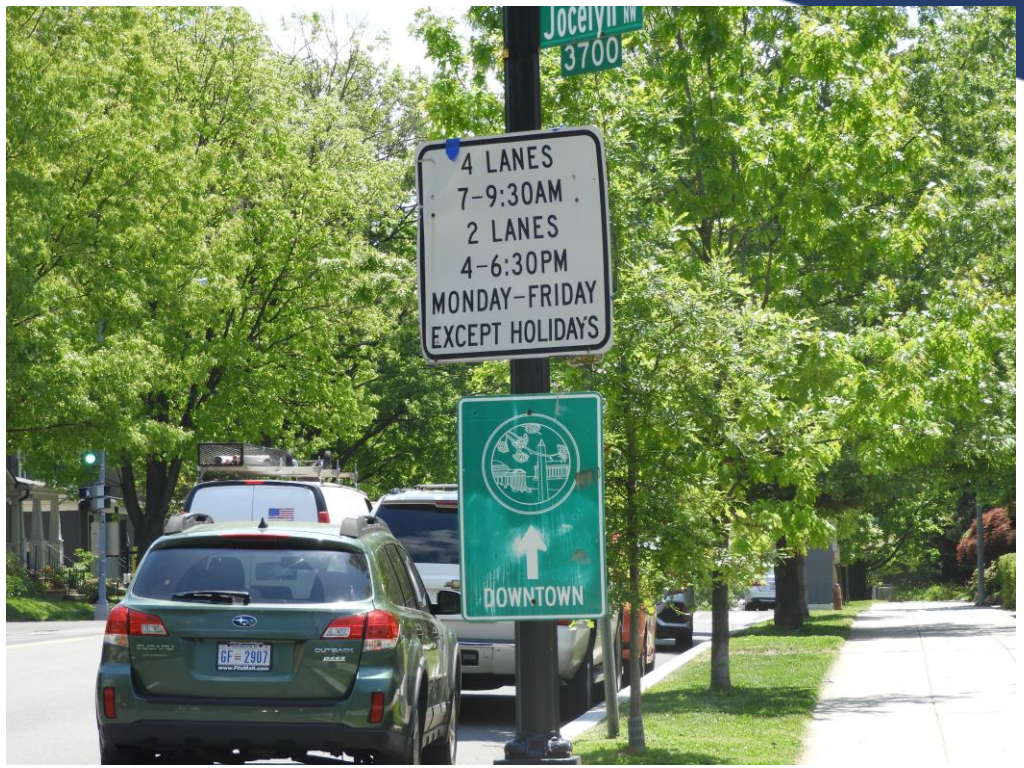


	AM Peak		Mid Day		PM Peak	
	Inbound	**Outbound**	**Inbound**	**Outbound**	**Inbound**	**Outbound**
Travel Lanes Six (6) 10-foot lanes	4 lanes	2 lanes	2 travel lanes in each direction; parking on east and west sides of Connecticut Avenue		2 lanes	4 lanes

No-Build Concept: Management and Operations Improvement

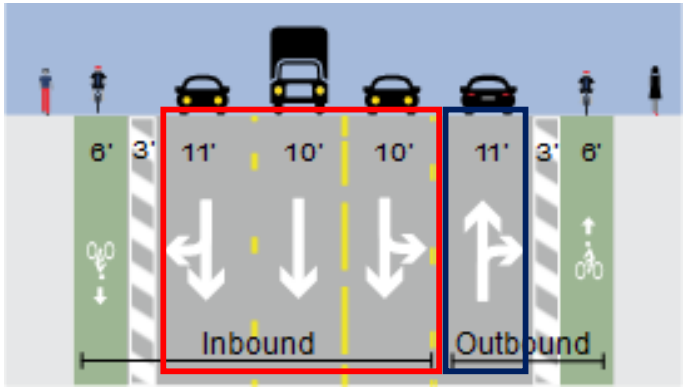
- Enhance signage and markings
  - ***Visibility of reversible lane signage***
- Future considerations for signage:
  - Signage position, condition, location, height, and content
- Signal operations improvements
- Turn restrictions /access management
- Pedestrian improvements

Management and Operations improvements could be included in some of the build options

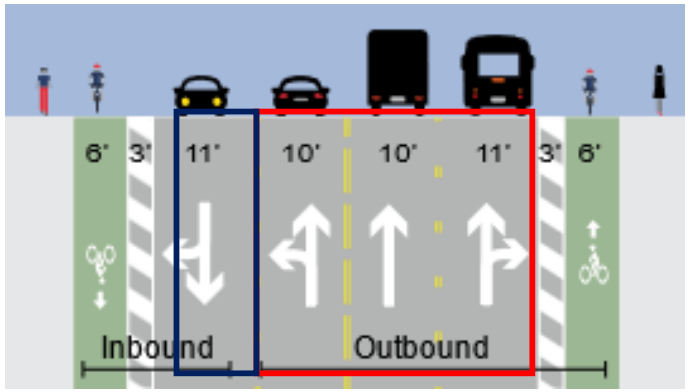


Concept A
Retains 2 Reversible Lanes; Protected Bicycle Lane, No Off-Peak Period Parking

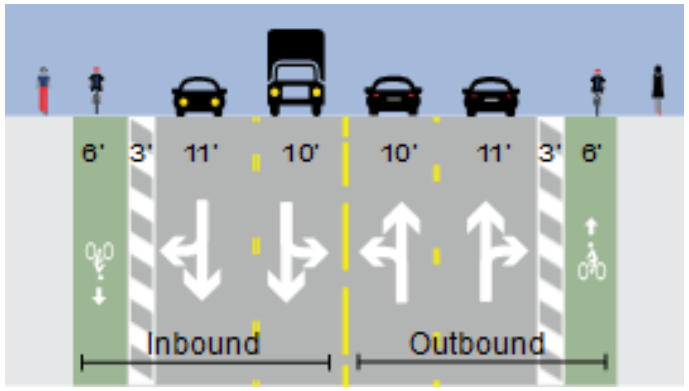
AM Peak



PM Peak



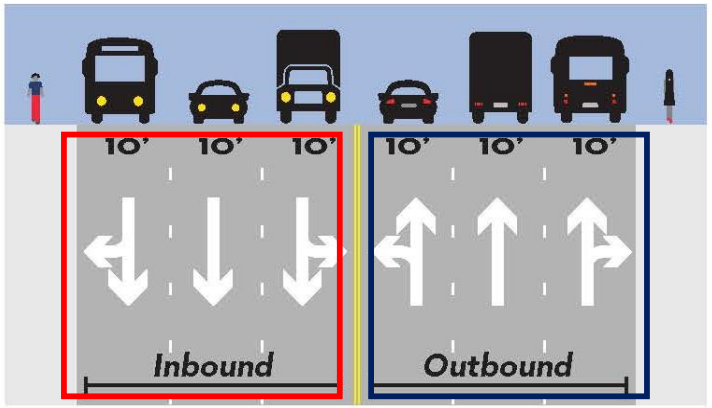
Off Peak



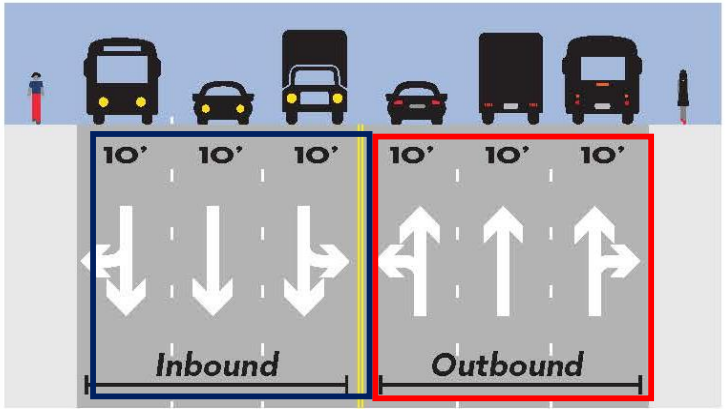
- During the AM peak period, peak direction, **3 lanes inbound and 1 lane outbound** in the non-peak direction.
- The reverse is true during the PM peak period, peak direction. **1 lane inbound (towards DC) and three lanes outbound** (towards Maryland).
- During the off-peak condition, we maintain two lanes of traffic in each direction. Parking is not permitted.
- Protected Bicycle Lane on the east and west sides of Connecticut Avenue (6'-foot bike lane and 3' buffer)
- Issues to address: parking, loading, bus/bike conflicts

Concept B
Removes both Reversible Lanes; No Protected Bicycle Lane (PBL), Includes Off-Peak Period Parking

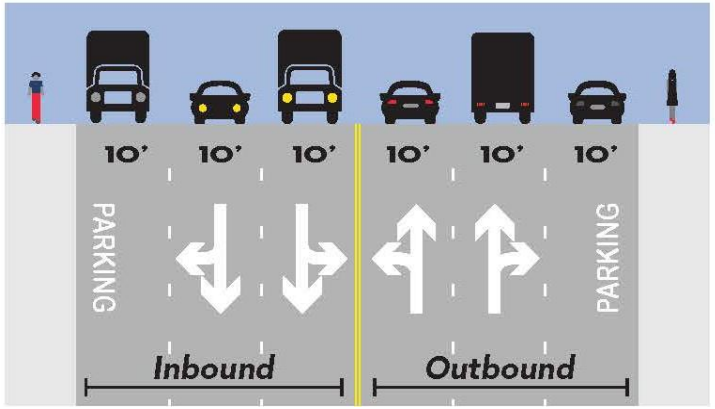
AM Peak



PM Peak



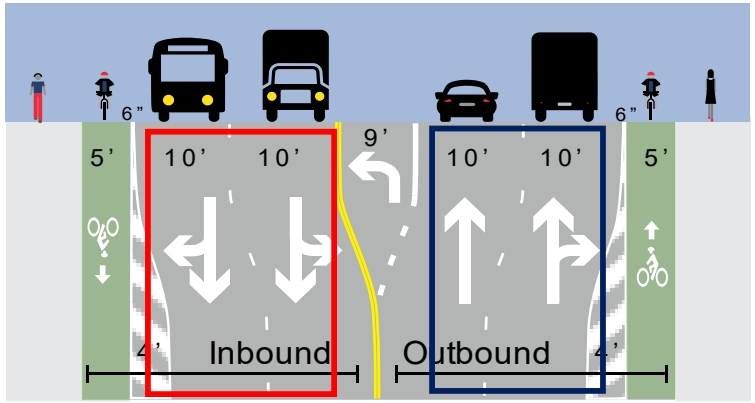
Off Peak



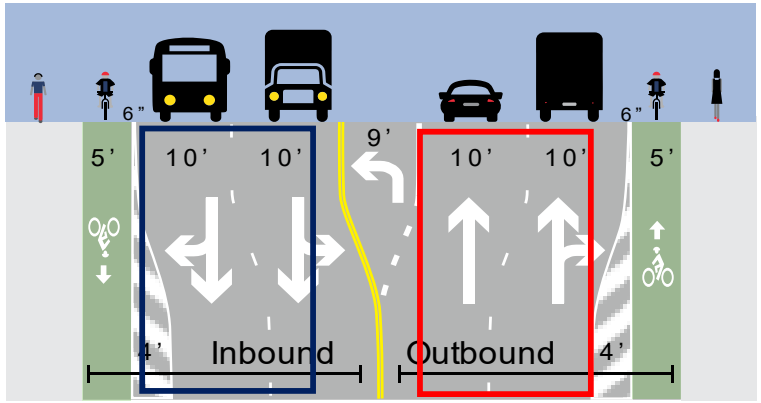
- Removes both reversible lanes
- No PBL. (Only concept of the four presented that does not have a PBL)
- Provides for 3 travel lanes in each direction during the AM/PM peak periods.
- During the off-peak periods, **2 travel lanes in each direction with parking permitted on both the east and west sides** of the street. This is the same configuration as we have today.

Concept C
Removes both Reversible Lanes; Protected Bicycle Lane
No Off Peak Period Parking, Left turn pockets

AM Peak



PM Peak



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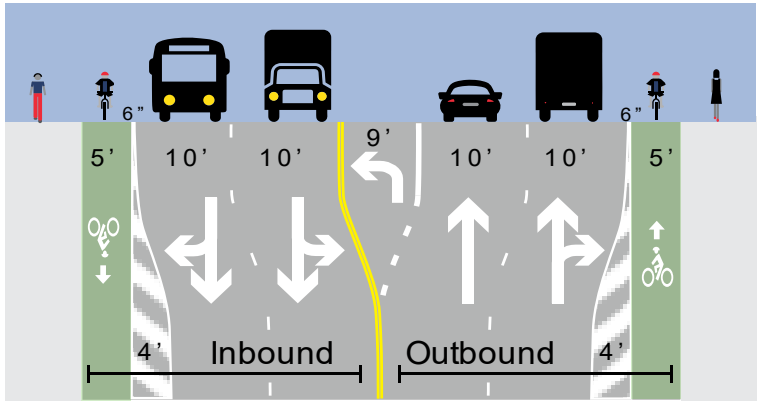


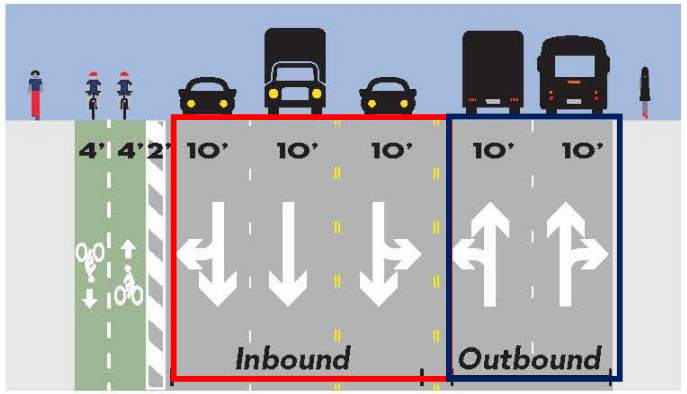
- Removes both reversible lanes
- During the **AM, PM and Off-Peak Period,** we have 2 lanes inbound and 2 lanes outbound. Lane usage consistent all times of the day.
- Includes one-way PBL on the east and west sides of Connecticut Avenue. 5’ PBL with variable 6”-4’ buffer.
- Provision for left turn pockets/median if required
- No Parking during the off-peak period
- Could accommodate floating bus islands

Concept C Rendering

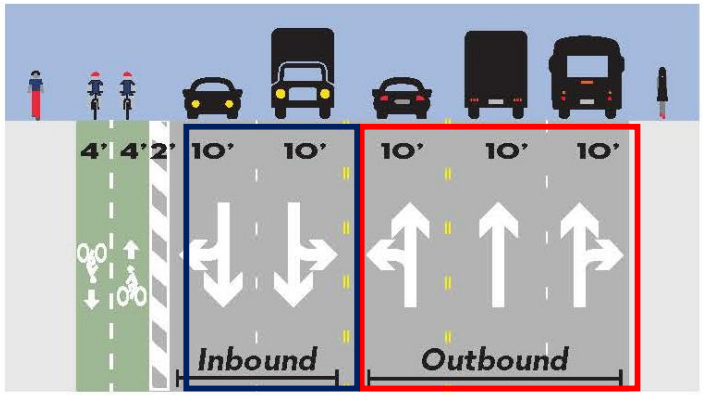
- Early drawing; modifications to be developed for this rendering
- Drawings for other concepts to be developed

Concept D
Removes 1 Reversible Lane; 2-Way PBL west side only, Off Peak Period Parking east side of Connecticut Avenue

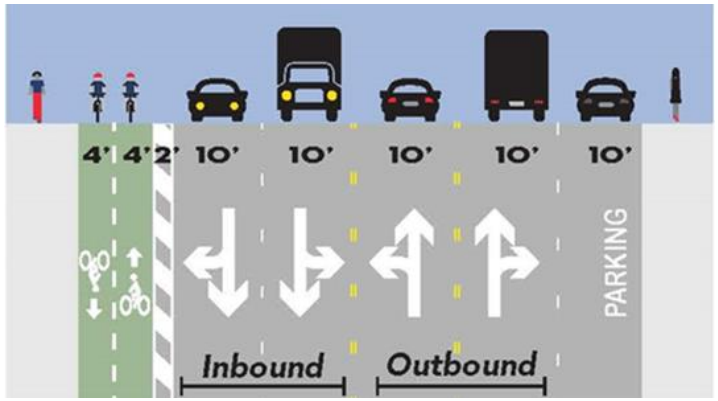
AM Peak



PM Peak



Off Peak



- Removes 1 Reversible lane
- Two-way PBL on the west side of Connecticut Avenue
- AM: 3 lanes inbound, 2 lanes outbound; PM: 2 lanes inbound, 3 lanes outbound
- Off-peak parking is permitted on the east side of Connecticut Avenue (only)
- Option: If no parking, center lane could be used for pedestrian refuge/median
- Issues to resolve: Bus/Bike right turn conflicts, PBL dimensions

Next Steps

- Continue analysis of alternatives
- Obtain CAC, ANC, Stakeholder and Interagency comments
- Conduct detailed traffic operations/modeling, safety analysis
- Recommend a Preferred Concept
- Go/No Decision on Build Alternate
- Prepare 10% Concept Design Preferred Concept
- NEPA, Environmental Analysis

Contact Information

Project Website-

https://ddot.dc.gov/page/connecticut-avenue-nw-reversible-lane-safety-and-operations-study

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Concept Summary

- Four alternatives
- Thee alternatives show a PBL (Concepts A, C and D); Concept B does not include a PBL.
- One alternative retains on-street parking during the off peak period. (Concept B)
- Reversible Lanes: 2 alternatives remove both RLs (Concepts B and C); 1 alternative removes 1 RL (Concept D) and Concept A retains both RLs.
- Travel Lanes.
  - Three of the alternatives carry 3 travel lanes in the peak period, peak direction (Concepts A, B and D) (a reduction of one lane as compared to today)
  - One concept we would reduce the peak period, peak direction travel lanes by two lanes (Concept C).
- One concept includes a consistent cross section of 2 lanes inbound and 2 lanes outbound during all times of the day (Concept C)
- Left Turn Pockets: One concept allows for the inclusion of a left turn pocket and floating bus islands in the design (Concept C)

Discussion