



# **Duke Street Service Roads & Intersections**

**December 14, 2023**

# Question & Answers

- **Write Questions & Comments on index card and raise your hand to give to staff during the presentation**
- **Staff can discuss after presentation**
- **FAQs will be posted on the website**

# Agenda

▶ **01. - 7pm**

**Open  
House**

▶ **02. - 7:15**

**Meeting  
purpose,  
project  
overview &  
schedule**

▶ **03. - 7:20**

**Cambridge  
Intersection  
& Service  
Road**

**Q&A**

▶ **04. 7:40**

**WTR & Duke  
Street  
Project**

**Q&A**

▶ **05. 8:05**

**Open  
House**

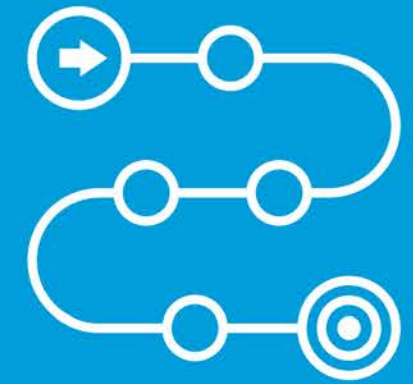
# Meeting Purpose



Follow-up on design options from the Duke Street Transitway project concept



Get Community feedback on design options and priorities



Provide process and timeline for future discussions and decisions

# DUKE STREET TIMELINE

2017  
Central  
Alexandria  
Traffic Study

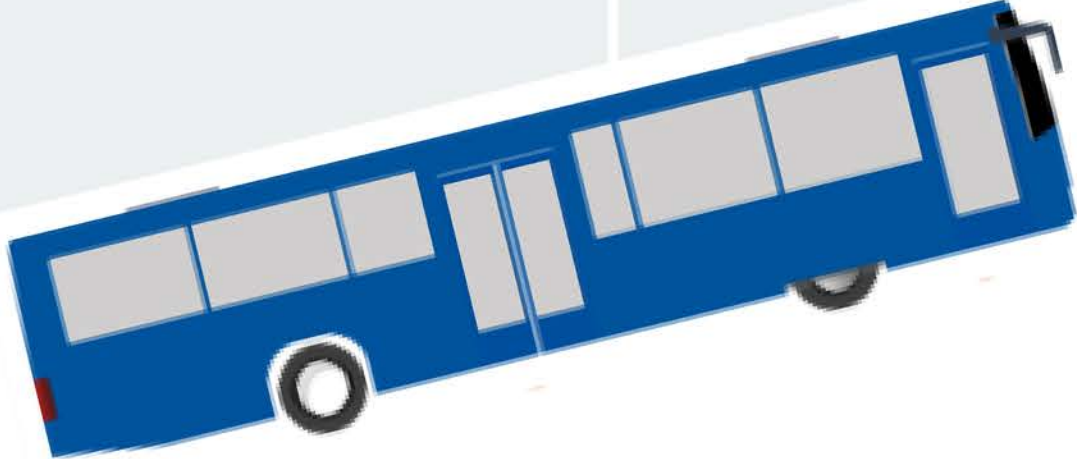
2018  
Duke Street &  
West Taylor  
Run Funding  
Request

2018 &  
2020  
Duke Street  
Transitway  
funded

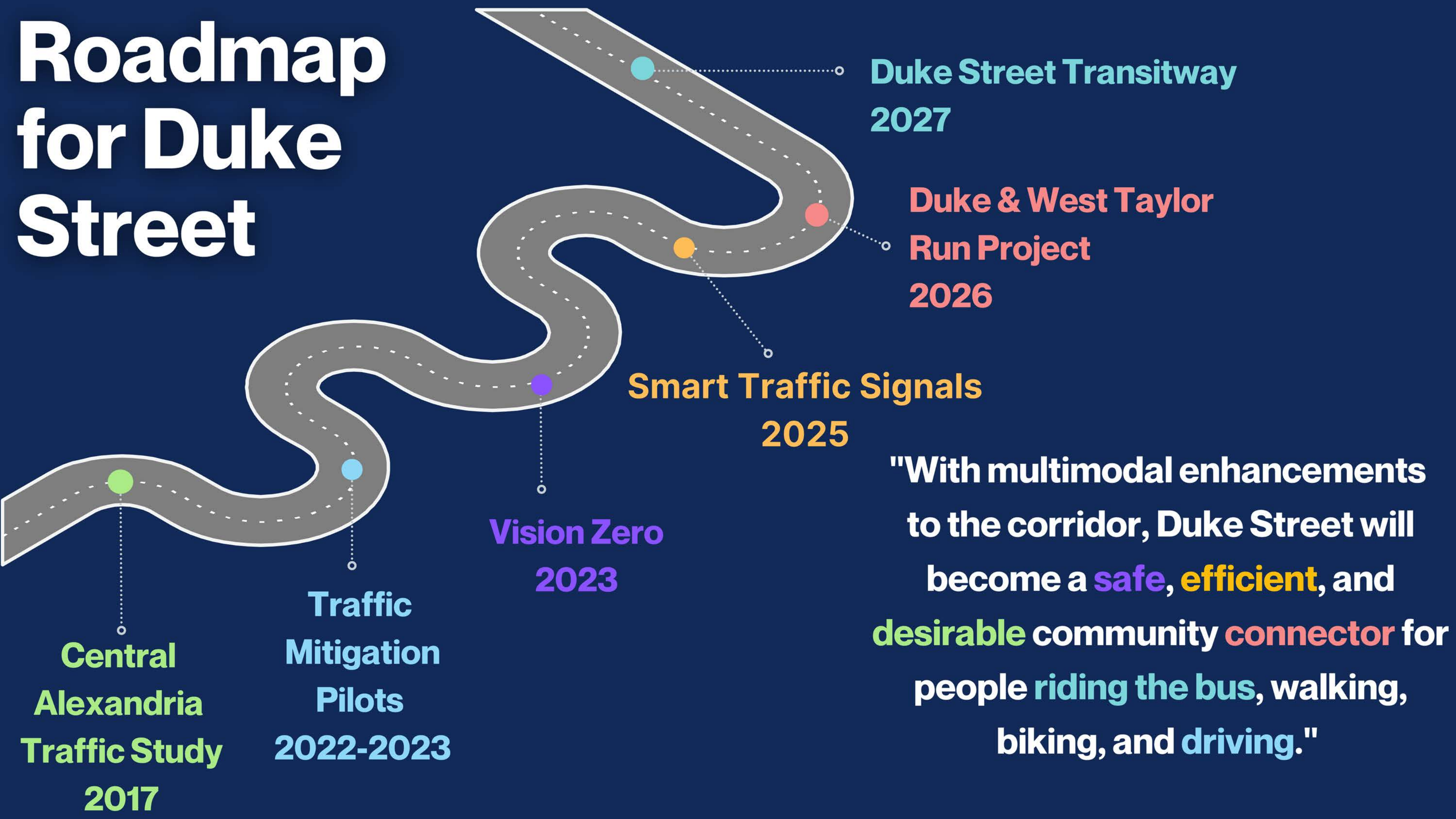
2021  
Duke Street  
Community  
Visioning

2022  
Traffic  
Mitigation  
Pilots

2023  
Council  
approval of  
Transitway  
concept &  
Service Road  
discussions



# Roadmap for Duke Street



**Duke Street Transitway  
2027**

**Duke & West Taylor  
Run Project  
2026**

**Smart Traffic Signals  
2025**

**Vision Zero  
2023**

**Traffic  
Mitigation  
Pilots  
2022-2023**

**Central  
Alexandria  
Traffic Study  
2017**

**"With multimodal enhancements to the corridor, Duke Street will become a **safe**, **efficient**, and **desirable** community **connector** for people riding the bus, walking, biking, and driving."**

# Community Feedback



Keep Duke Street  
Moving



Reduce cut-  
through traffic on  
neighborhood  
streets



Provide safe  
streets for people  
to get around

# Schedule

Fall 2023

Community Discussions & Feedback on service road design

Narrow down options

December

Community meeting 12/14  
Analysis of feedback

Preferred Option

Winter 2024

City Council update  
Recommendation to Traffic & Parking Board

Move into Design Phase

2024-2026

Continue community and Council updates



# Cambridge & Roth Intersection

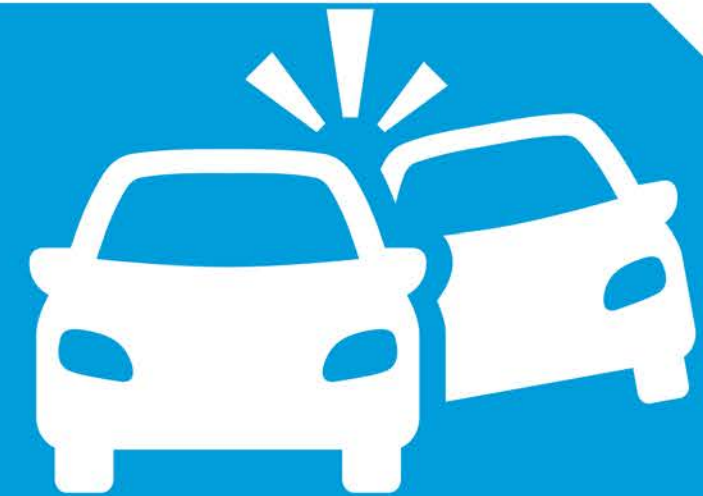
What is proposed and why we're talking about service roads



Community input to improve this intersection



Overall Intersection Level of service F (not good)



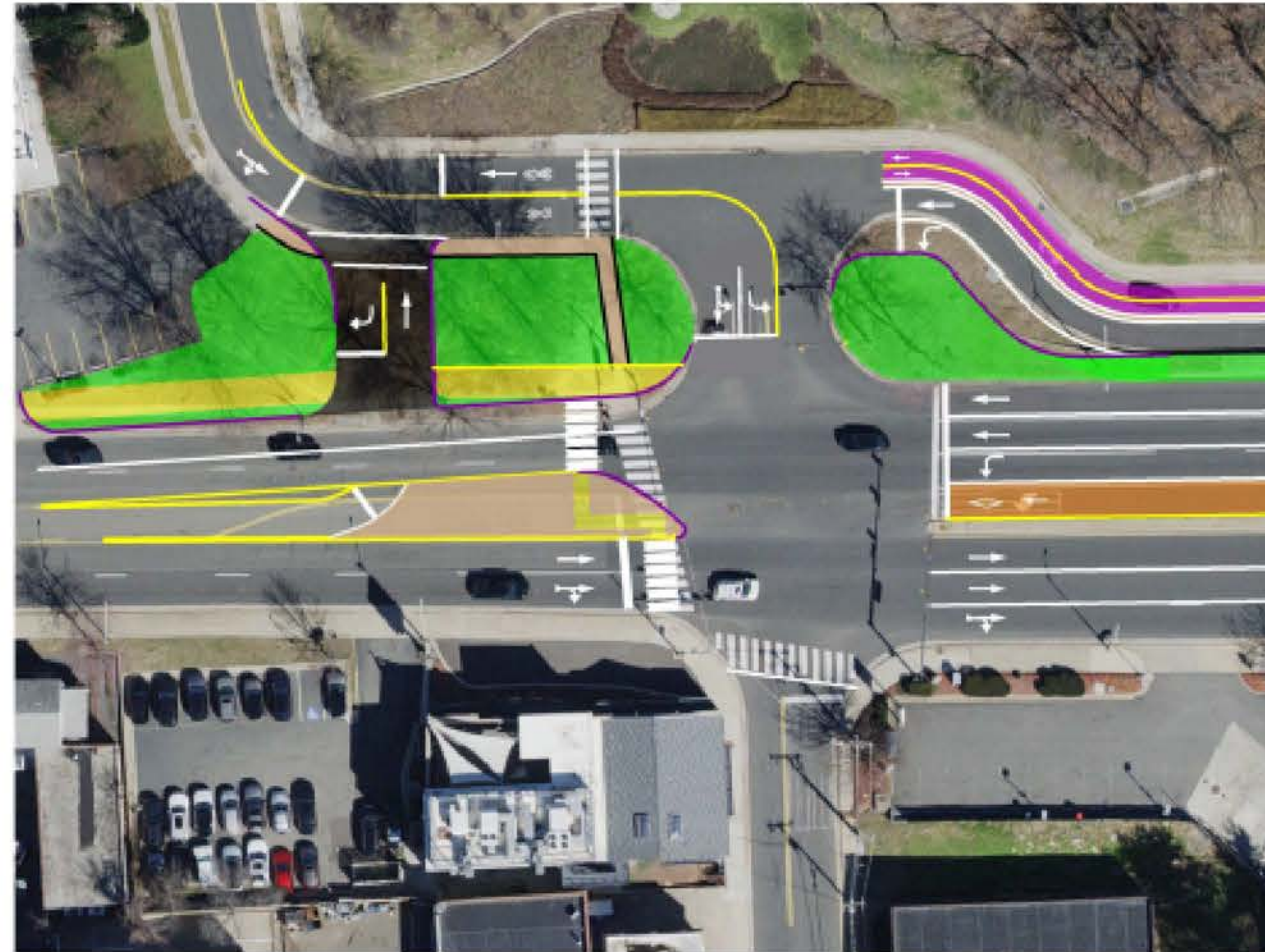
Multiple conflict points and concerns about safety

### Option 1 - No Build



- No changes to the service road
- Right turns onto Cambridge in advance of intersection

### Option 2 - Separated



- One-way service road
- Eastbound left-turns and southbound right-turns relocated to new spur road connecting to Cambridge Road

### Option 3 - Through-cut



- One-way service road
- No through movement north/south through movement

Full Intersection LOS	137 seconds/vehicle - F	87 seconds/veh - F	31 seconds/vehicle - C
Cambridge Rd LOS	195 seconds/vehicle - F	81 seconds/vehicle - F	72 seconds/vehicle - F
Conflict Points / Safety	32 at Duke St and Cambridge Rd 9 at Cambridge Rd and Service Rd	25 at Duke St and Cambridge Rd 6 at Cambridge Rd and Service Rd	23 at Duke St and Cambridge Rd 4 at Cambridge Rd and Service Rd

# Intersection Option 1 - No Build



## Intersection Description:

- Minimal changes to existing intersection
- No changes to the service road
- Right turns onto Cambridge in advance of intersection

## Traffic Operations:

- Intersection Level of Service: **F**
  - **137 seconds** per vehicle
- Cambridge Road Level of Service: **F**
  - **197 seconds** per vehicle



## Safety:

- Similar conflicts as existing intersection
- Modest pedestrian improvements
- Conflict Points: **32** at Duke & **9** at Cambridge



*Conflict Point: Potential locations of where vehicle travel paths intersect and a collision risk occurs*

## Intersection Option 2 - Separated



### Intersection Description:

- One-way service road
- Eastbound left-turns and southbound right-turns relocated to new road connecting to Cambridge Rd.
- Right turns onto Cambridge Rd. in advance of intersection

### Traffic Operations:

- Intersection Level of Service: **F**
  - **87 seconds** per vehicle
- Cambridge Rd. Level of Service: **F**
  - **81 seconds** per vehicle



### Safety:

- Pedestrian refuge with less conflicting movement
- Conflict Points: **25** at Duke & **6** at Cambridge



*Conflict Point: Potential locations of where vehicle travel paths intersect and a collision risk occurs*

## Intersection Option 3 - The Through-cut



### Intersection Description:

- Same as Option 2
- No southbound access from Cambridge to Roth (5 cars in peak)

### Traffic Operations:

- Intersection Level of Service: **C**
  - 31 seconds per vehicle
- Cambridge Road Level of Service: **F**
  - 72 seconds per vehicle



### Safety:

- Pedestrian refuge with less conflicting movement
- Minimal conflicts with all modes at service road
- Faster travel on Duke Street reduces cut-through traffic
- Conflict Points: **23** at Duke & **4** at Cambridge



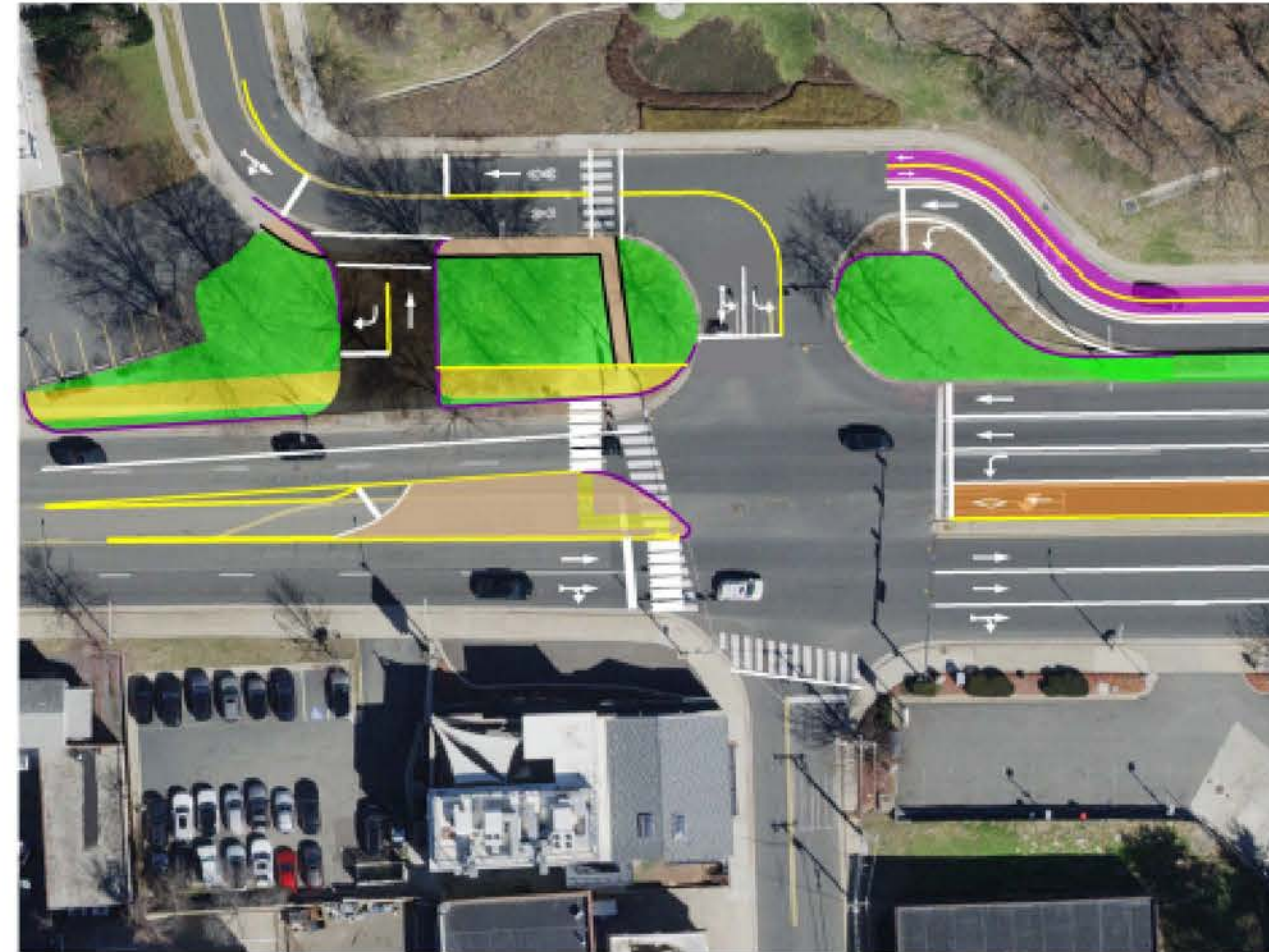
*Conflict Point: Potential locations of where vehicle travel paths intersect and a collision risk occurs*

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### Option 2 - Separated



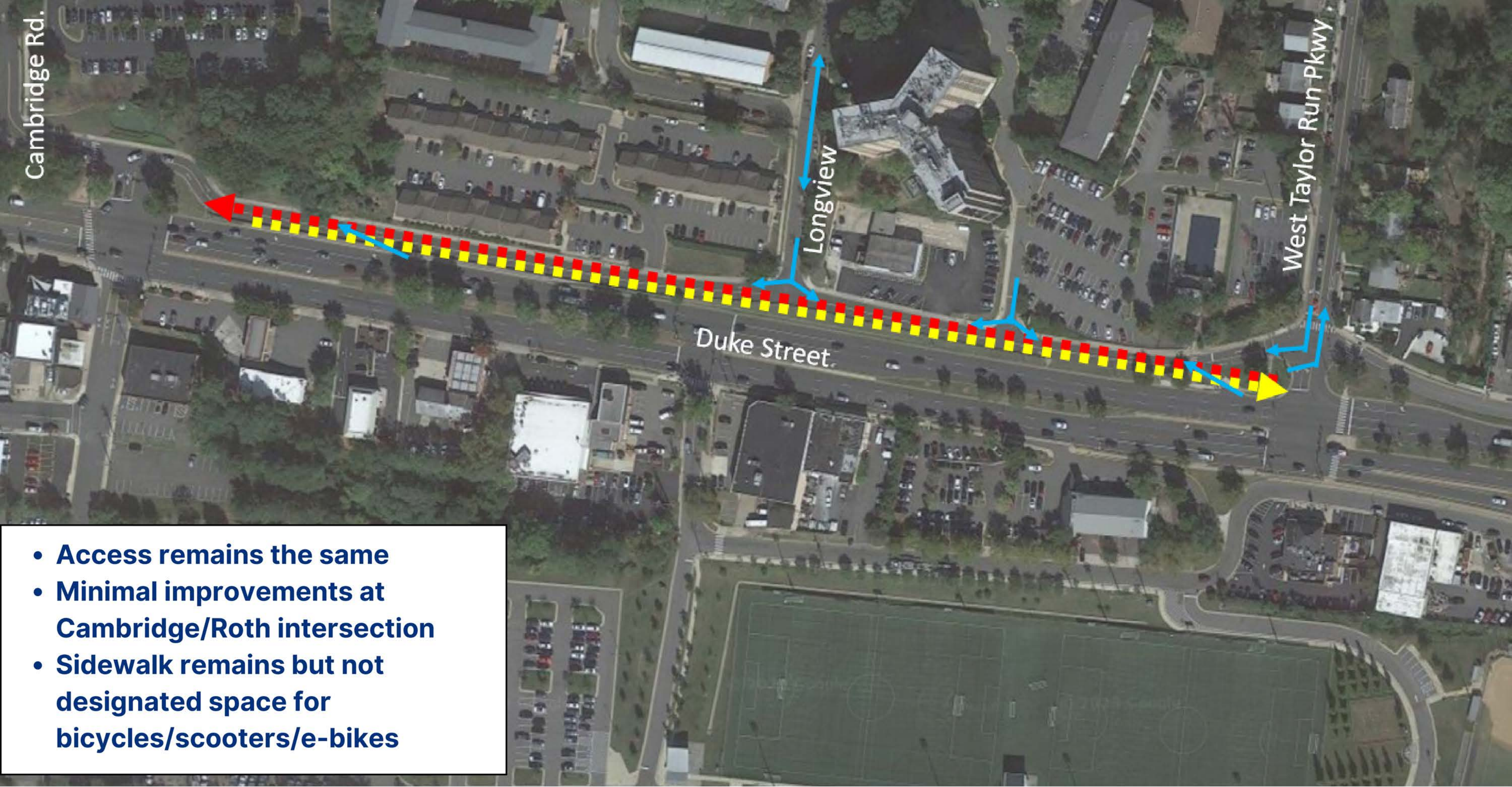
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### Option 3 - Through-cut



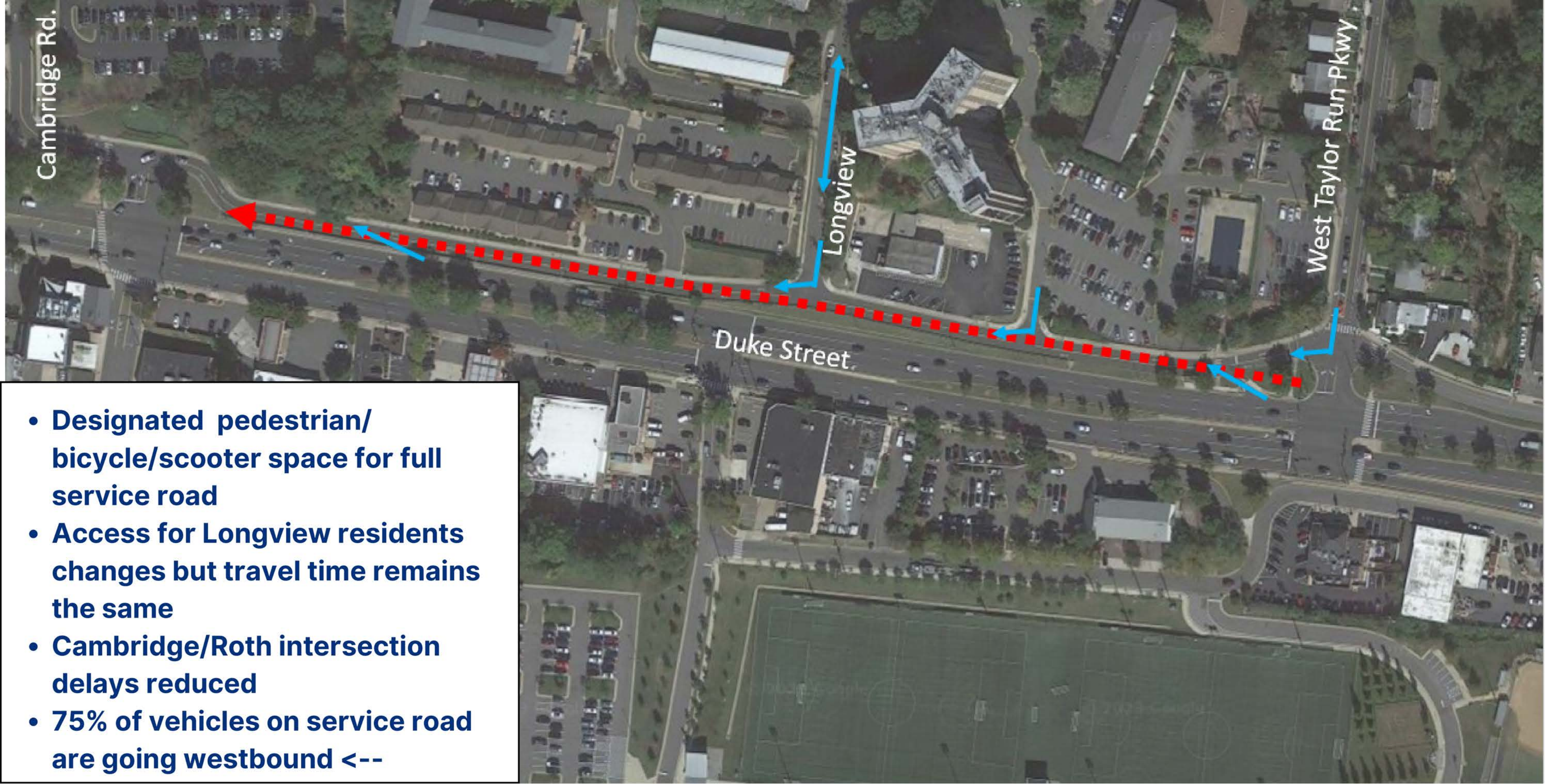
- One-way service road
- No through movement north/south through movement

Full Intersection LOS	137 seconds/vehicle - F	87 seconds/veh - F	31 seconds/vehicle - C
Cambridge Rd LOS	195 seconds/vehicle - F	81 seconds/vehicle - F	72 seconds/vehicle - F
Conflict Points / Safety	32 at Duke St and Cambridge Rd 9 at Cambridge Rd and Service Rd	25 at Duke St and Cambridge Rd 6 at Cambridge Rd and Service Rd	23 at Duke St and Cambridge Rd 4 at Cambridge Rd and Service Rd



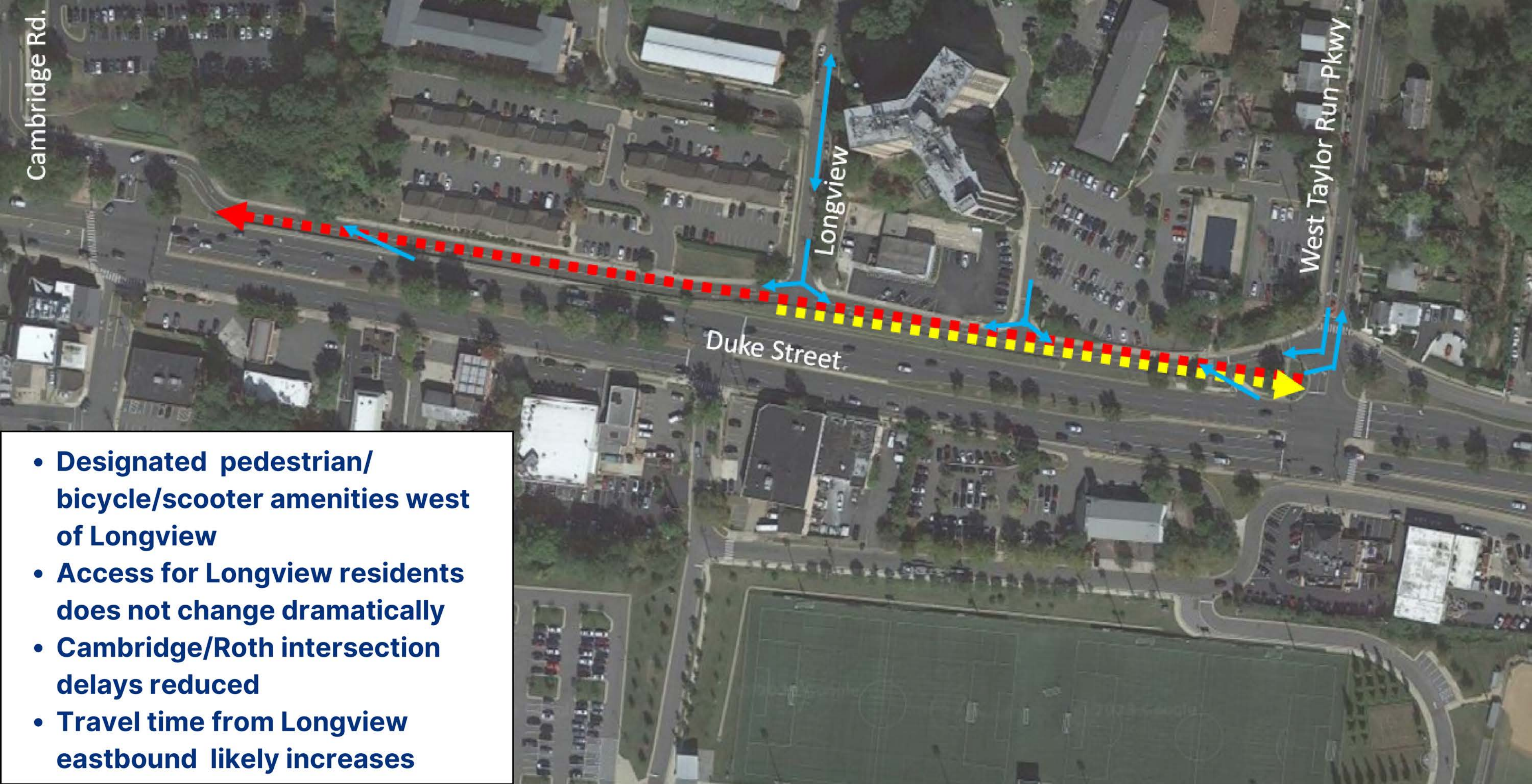
- Access remains the same
- Minimal improvements at Cambridge/Roth intersection
- Sidewalk remains but not designated space for bicycles/scooters/e-bikes

**Service Road Option 1 - Two-way**



**Service Road Option 2 - One-way westbound**





- Designated pedestrian/ bicycle/scooter amenities west of Longview
- Access for Longview residents does not change dramatically
- Cambridge/Roth intersection delays reduced
- Travel time from Longview eastbound likely increases

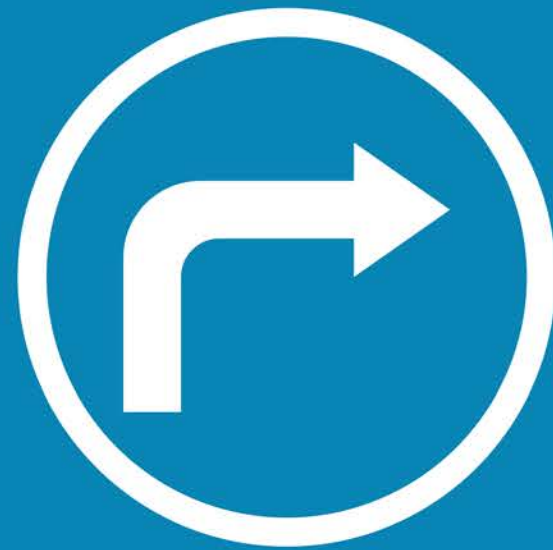
**Service Road Option 3 - Partial One-way**

# Key Takeaways

For people using Longview Drive or 2727 Duke....



With Cambridge/Roth improvements, travel times do not change much with a one-way service road



One-way service road minimally impacts eastbound Duke to Longview trips (14AM & 20PM)



A partial one-way service road doesn't reduce travel time much more than a fully one-way street



# **Duke Street & West Taylor Run Project**

# Duke at West Taylor Run Intersection

## Project Goals

The project purpose is focused on enhancing safety and access for people who walk, drive, bike and take transit.



Improve safety for all  
people at the  
intersections



Reduce cut-through  
traffic on  
neighborhood  
streets

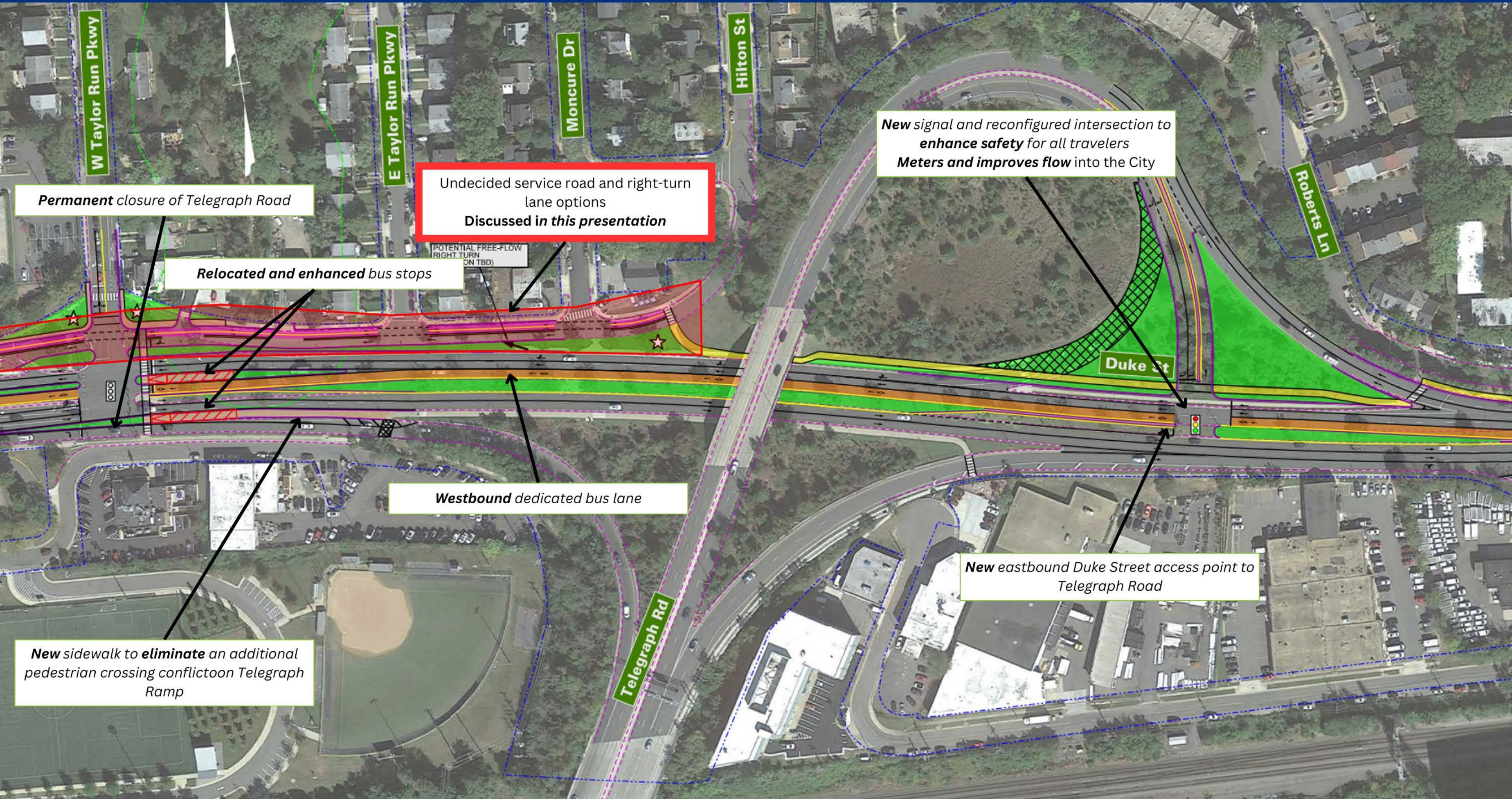


Reduce  
congestion on  
Duke Street



Improve the  
quality of life for  
residents

# Current Proposed Plan



**Permanent** closure of Telegraph Road

Undecided service road and right-turn lane options  
**Discussed in this presentation**

Relocated and enhanced bus stops

Westbound dedicated bus lane

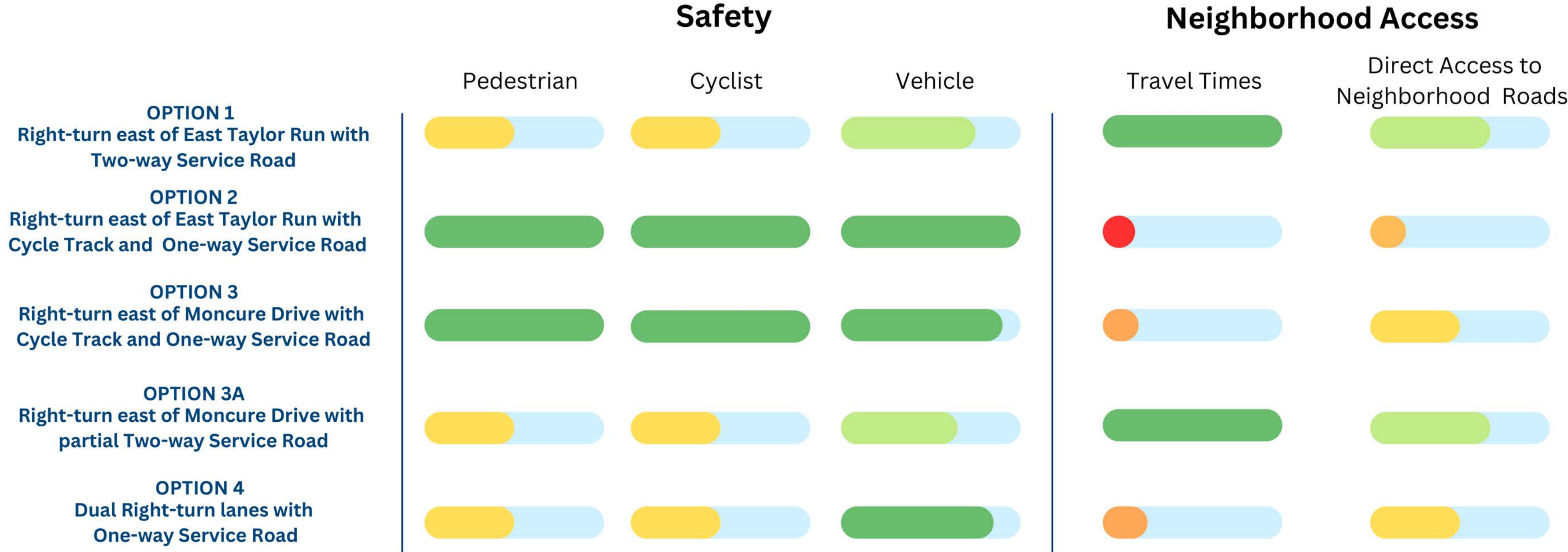
New sidewalk to **eliminate** an additional pedestrian crossing conflict on Telegraph Ramp

New signal and reconfigured intersection to **enhance safety** for all travelers  
**Meters and improves flow** into the City

New eastbound Duke Street access point to Telegraph Road

# Duke at West Taylor Run Intersection

## Service Road and Right-turn Lane Comparision



# Option 1



West Taylor Run Pkwy.

East Taylor Run Pkwy.

Moncure Dr.

Hilton St.

0

12

0  
0


7  
0

5  
0

- The two-way road configuration maintains similar conflicts as today with the addition of the right-turn lane on the service road
- No buffer is provided for the sidewalk and cycling facilities
- Travel times are the same or faster to residences because no waiting is required at the West Taylor Run parkway light
- Eastbound Duke Street access to the service road remains the same

**Impacted Movements East of West Taylor Run Parkway**

Eastbound Duke Street Left-turns  
 # Peak vehicles per hour

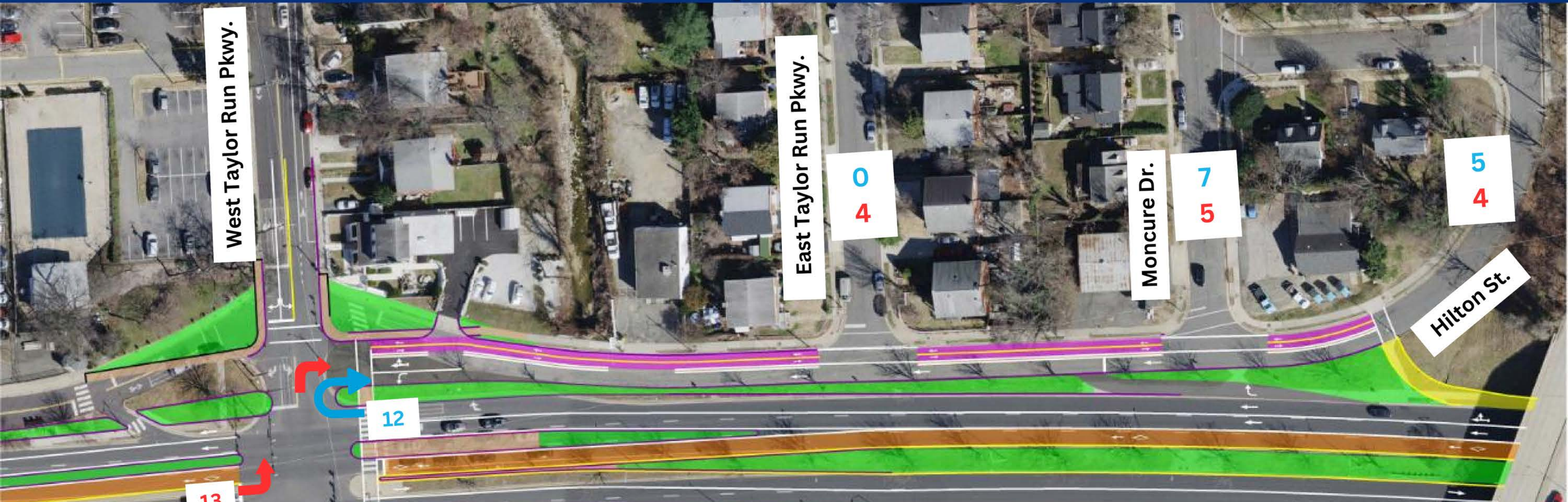
Westbound Duke Street Right-turns  
 # Peak vehicles per hour

*If a 0 is represented, then that movement has direct access*

**Measurements of Effectiveness**

Safety	Access
Pedestrian	Travel Times
Cyclist	Direct Access to Neighborhood Roads
Vehicle	

# Option 2



- The service road becomes one-way and offsets the new right-turn lane and results in the same amount of conflicts
- A dedicated cycletrack is provided that also acts as a buffer for pedestrians
- Travel times are longer primarily for vehicles who access the service road from eastbound Duke St

**Impacted Movements East of West Taylor Run Parkway**

Eastbound Duke Street Left-turns  
**Peak** vehicles per hour

Westbound Duke Street Right-turns  
**Peak** vehicles per hour

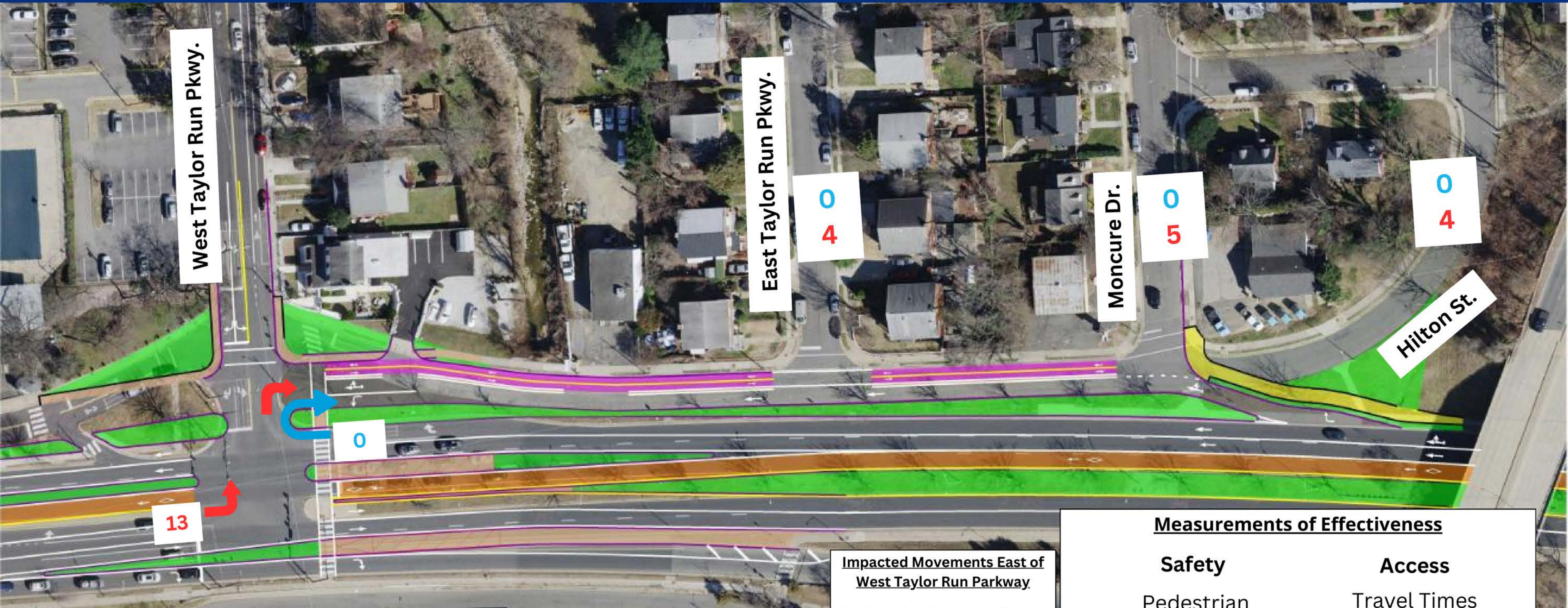
*If a 0 is represented, then that movement has direct access*

**Measurements of Effectiveness**

<b>Safety</b>	<b>Access</b>
Pedestrian	Travel Times
Cyclist	Direct Access to Neighborhood Roads
Vehicle	





# Option 3



- The service road becomes one-way and offsets the new right-turn lane and results in the same amount of conflicts
- A dedicated cycle track is provided that also acts as a buffer for pedestrians
- Travel times are longer primarily for vehicles who used to access the service road from eastbound Duke St
- No change and faster access to residents along East Taylor Run, Moncure, and Hilton who access the roads from westbound Duke Street






**Impacted Movements East of West Taylor Run Parkway**

Eastbound Duke Street Left-turns  
 # *Peak* vehicles per hour

Westbound Duke Street Right-turns  
 # *Peak* vehicles per hour

*If a 0 is represented, then that movement has direct access*

**Measurements of Effectiveness**

Safety	Access
Pedestrian 	Travel Times 
Cyclist 	Direct Access to Neighborhood Roads 
Vehicle 	

# Option 3A



- The service road becomes partial two-way but with an increase of conflict points due to the new right-turn lane
- A contra-flow lane is provided between East Taylor Run and Moncure Drive
- Limited change and faster access to residents along East Taylor Run, Moncure, and Hilton

**Impacted Movements East of West Taylor Run Parkway**

Eastbound Duke Street Left-turns  
**#** Peak vehicles per hour

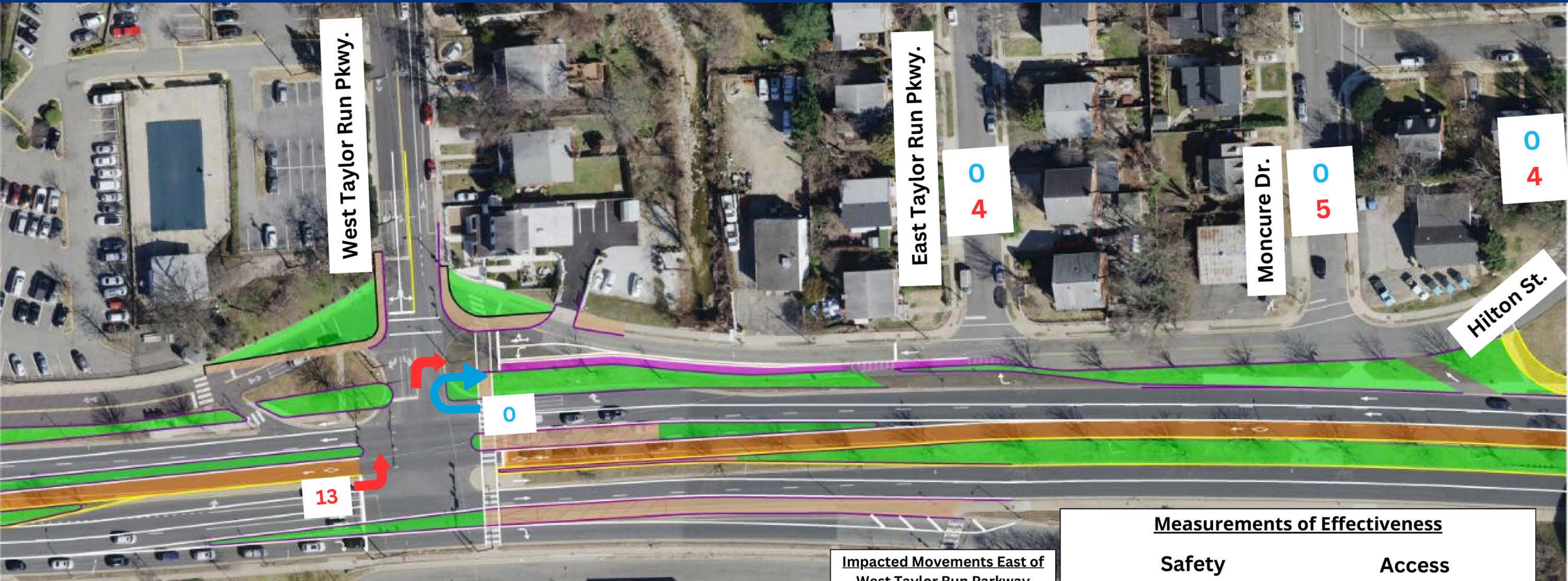
Westbound Duke Street Right-turns  
**#** Peak vehicles per hour

*If a 0 is represented, then that movement has direct access*

**Measurements of Effectiveness**

Safety	Access
Pedestrian	Travel Times
Cyclist	Direct Access to Neighborhood Roads
Vehicle	

# Option 4



- The service road becomes one-way and results in more conflicts due to both right-turn lane additions
- A partial contra flow lane is provided from West Taylor Run to East Taylor Run
  - Sharrows will be provided between East Taylor Run and Moncure Drive
- Travel times are longer primarily for vehicles who access the service road from eastbound Duke St
- No change and faster access to residents along East Taylor Run, Moncure, and Hilton who access the roads from westbound Duke Street

**Impacted Movements East of West Taylor Run Parkway**

Eastbound Duke Street Left-turns  
 Peak vehicles per hour

Westbound Duke Street Right-turns  
 Peak vehicles per hour

*If a 0 is represented, then that movement has direct access*

**Measurements of Effectiveness**

Safety		Access	
Pedestrian		Travel Times	
Cyclist		Direct Access to Neighborhood Roads	
Vehicle			

13

0

0  
4

0  
5

0  
4

West Taylor Run Pkwy.

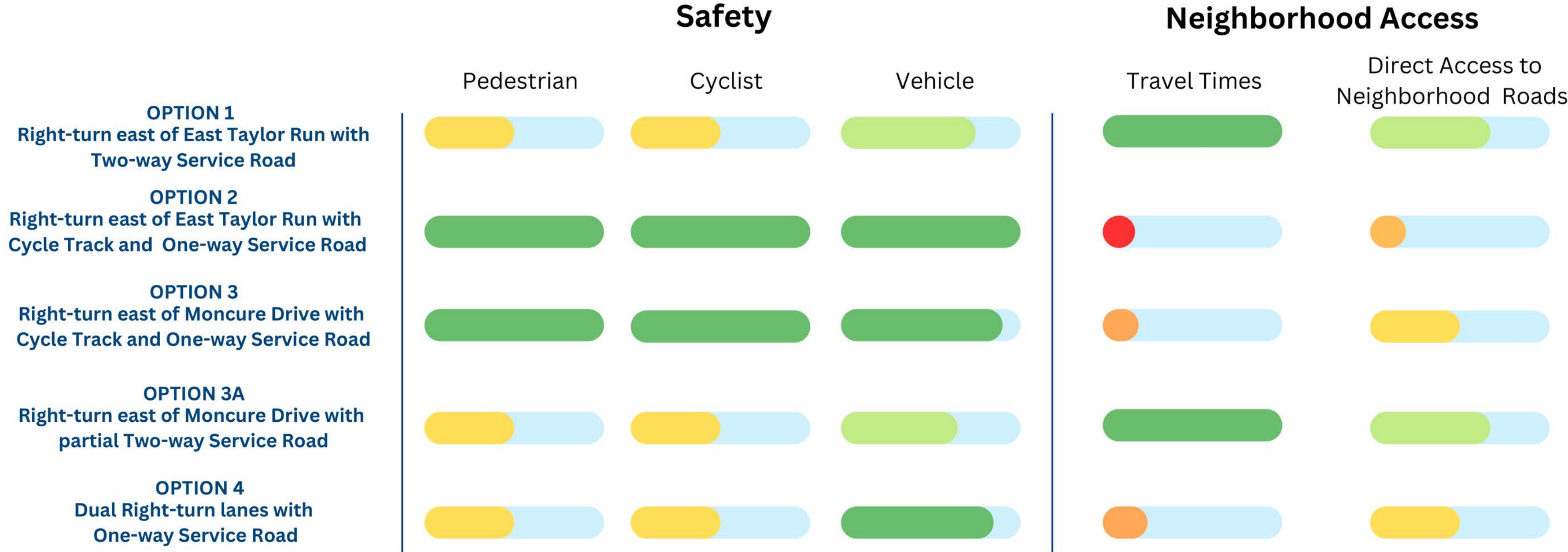
East Taylor Run Pkwy.

Moncure Dr.

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# Duke at West Taylor Run Intersection

## Service Road and Right-turn Lane Comparision



# Next Steps

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Community Discussions & Feedback on service road design

Narrow down options

December

Community meeting 12/14  
Analysis of feedback

Preferred Option

Winter 2024

City Council update  
Recommendation to Traffic & Parking Board

Move into Design Phase

2024-2026

Continue community and Council updates

# CONTACT AND PROJECT INFORMATION

## DUKE STREET IN MOTION BUS RAPID TRANSIT

**DUKE STREET**  
*IN MOTION*



703.746.4017



hillary.orr@alexandriava.gov



<https://www.alexandriava.gov/DukeInMotion>

## WEST TAYLOR RUN IMPROVEMENT PROJECT



703.746.4266



daniel.scolese@alexandriava.gov



<https://www.alexandriava.gov/transportation-planning/duke-street-and-west-taylor-run-project>