

# Duke at West Taylor Run Intersection

## Service Road and Right-turn Lane Comparision

### Safety

### Neighborhood Access

Pedestrian

Cyclist

Vehicle

Travel Times

Direct Access to Neighborhood Roads

- OPTION 1**  
Right-turn east of East Taylor Run with Two-way Service Road
- OPTION 2**  
Right-turn east of East Taylor Run with Cycle Track and One-way Service Road
- OPTION 3**  
Right-turn east of Moncure Drive with Cycle Track and One-way Service Road
- OPTION 3A**  
Right-turn east of Moncure Drive with partial Two-way Service Road
- OPTION 4**  
Dual Right-turn lanes with One-way Service Road



# Safety Metrics



## Pedestrian

The pedestrian metrics are based on the number of vehicle lanes a pedestrian could potentially cross on the service road and if a buffer space is provided (i.e. cycle-track).

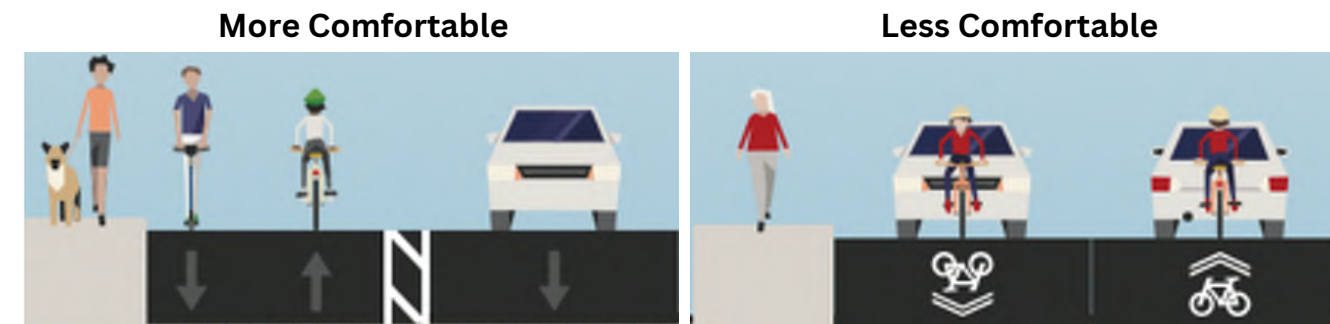
Less lanes to cross mean less risk of conflicts and less multiple threats (i.e. two directions of travel to be concerned about). As well, a buffer space makes a more comfortable environment for pedestrians while also separating all modes of transportation.



## Cyclists and E-mobility



The cyclist and e-mobility metrics are based on if a dedicated facility is provided or not. A dedicated facility has been shown to be safer and more comfortable for all users since spaces are defined and well-understood. In the case of these proposals, it does mean that there is little to no conflict with the proposed new right-turn lane.



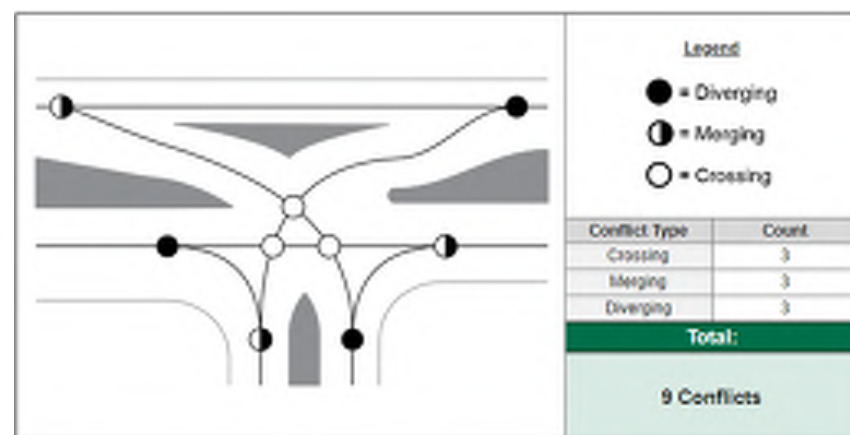
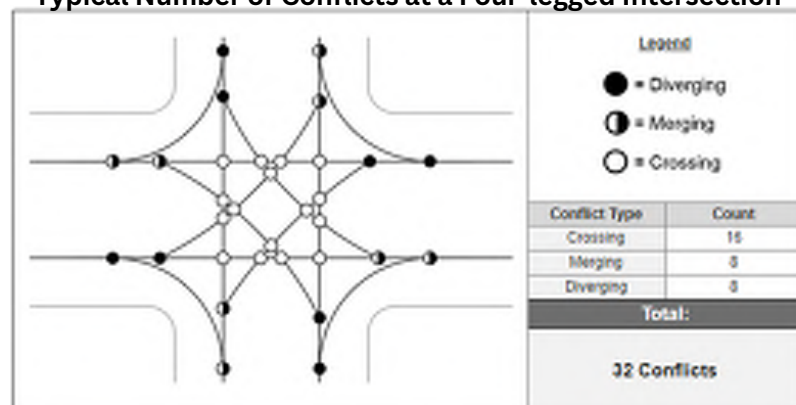
Less experienced cyclists may be inclined to use sidewalk



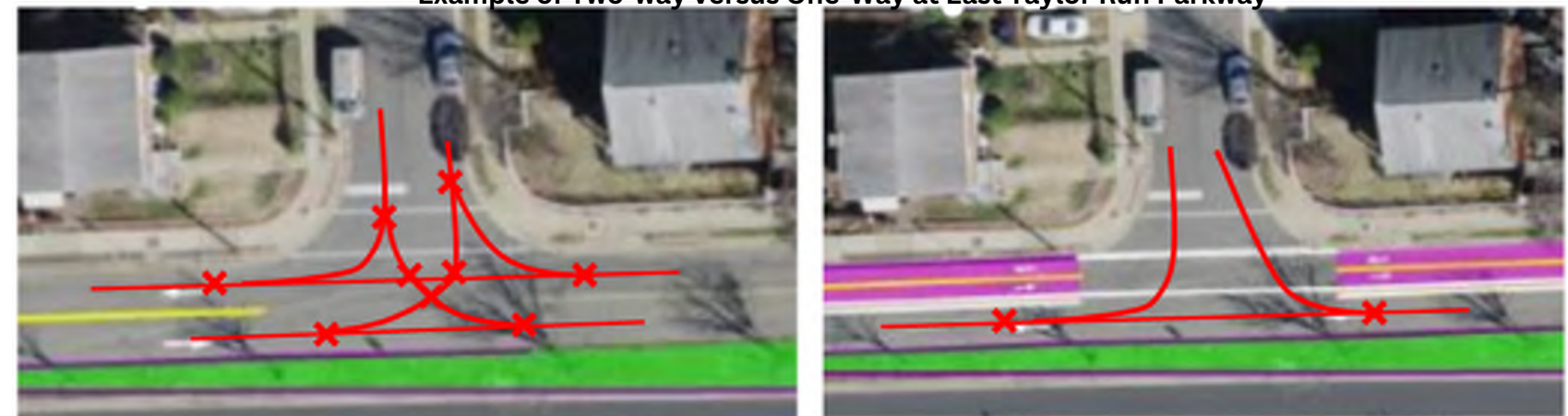
## Vehicles

A key tenant of safety in transportation is to reduce the amount of vehicle conflict points when possible. A conflict point are potential locations of where vehicle travel paths intersect and a collision risk occurs. Therefore reducing that number reduces risk. In the case of the service road we are measuring the number of conflict points between West Taylor Run Parkway and the location of the **new** right-turn lane. In general a one-way road will have less conflict points than a two-way road because one direction of travel is omitted. As well, the further the right-turn lane is located east, the number of conflicts increase.

Typical Number of Conflicts at a Four-legged Intersection



Example of Two-way versus One-Way at East Taylor Run Parkway



Our Sources: Virginia Department of Transportation Bicycle and Pedestrian Treatments, AASHTO Design Guidelines, Maryland Department of Transportation (MDOT) Level of Traffic Stress Methodology

Some sites to visit to better understand these concepts are at

[https://www.virginiadot.org/programs/bikeped/biking\\_and\\_pedestrian\\_treatments.asp](https://www.virginiadot.org/programs/bikeped/biking_and_pedestrian_treatments.asp)

[https://virginiadot.org/info/innovative\\_intersections\\_and\\_interchanges/virginia\\_icap.asp](https://virginiadot.org/info/innovative_intersections_and_interchanges/virginia_icap.asp)



# Neighborhood Access Metrics

The most recent data used for the volumes shown on the presentation are from February and May 2023 data during the weekday

## Travel Times

The travel time metrics are based on the amount of time a relocated vehicle would need to get back to a certain roadway. The three slides following this one show more detail about the assumed re-routes. In general, we assumed the most conservative (or longest reasonable route) to get to a roadway (East Taylor Run Parkway, Moncure Drive, or Hilton Street). The travel times assume that drivers are traveling 20 MPH AND additional peak delay from stopping associated with that movement.

Duke Street Eastbound Left-turn	Existing or Proposed Two-Way Options	Proposed Options One-way
East Taylor Run Parkway	1.5 - 2 min	5 - 6 min
Moncure Drive	2 - 2.25 min	5.5 - 6 min
Hilton Street	2 - 2.5 min	6 - 6.25 min

Duke Street Westbound Right-turn	Existing	Option 1 or 2	Option 3, 3A or 4
East Taylor Run Parkway	1-1.5 min	<1 min	<1 min
Moncure Drive	1- 1.5min	1- 1.5min	<1 min
Hilton Street	1- 1.5min	1- 1.5min	<1 min

Why is Option 1 or 2 faster or same as existing?

The current traffic signal requires that the right-turn lane be stopped more frequently due to conflicts with the service road and cut-through control. The future right-turn location is closer to neighborhood roads with less delay and improved operations and control with new signal equipment.

All delay is calculated using VISSIM and Synchro software calibrated with existing conditions.

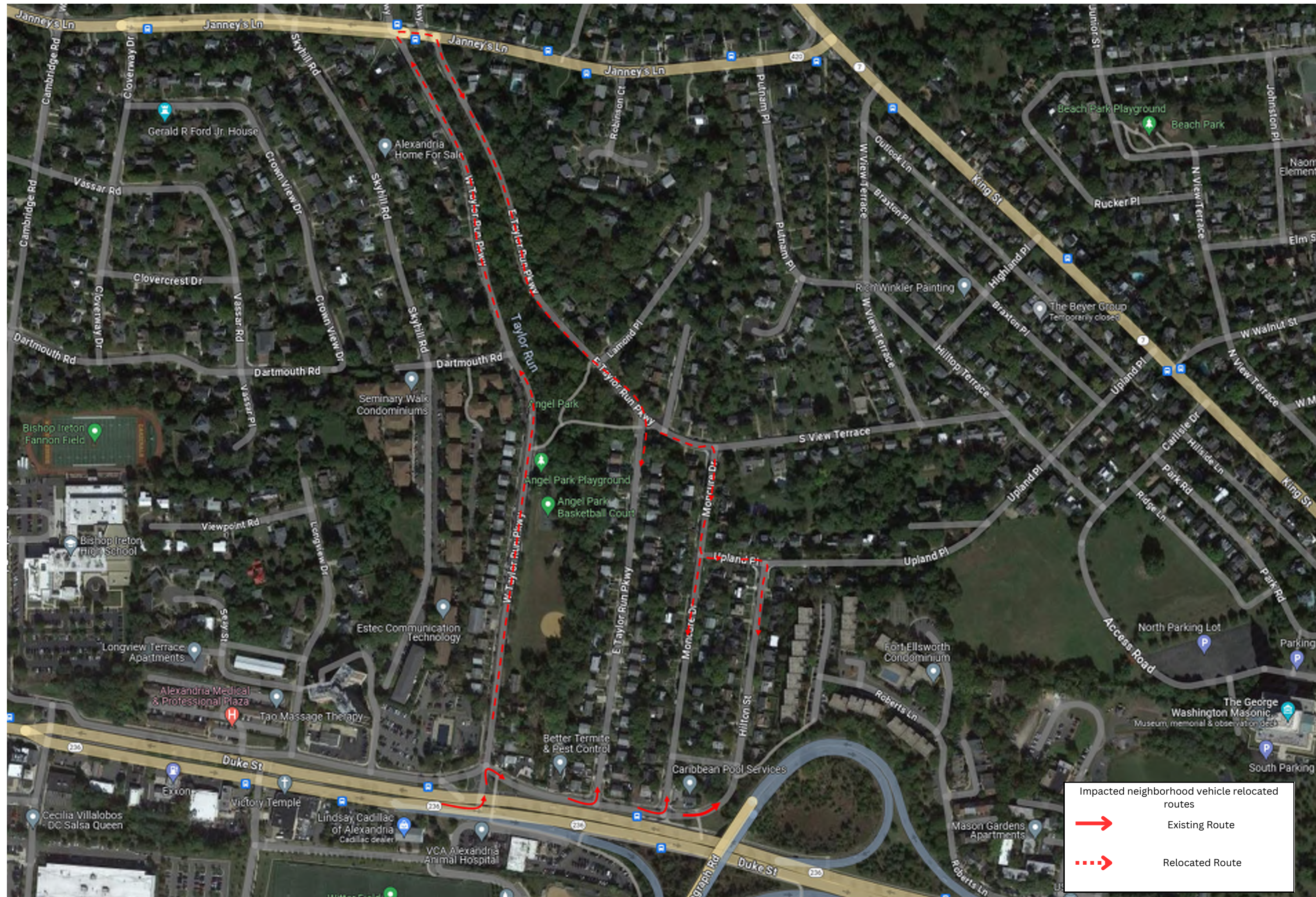
## Direct Access to Neighborhood Roads

We also evaluated the amount of direct access points to East Taylor Run Parkway, Moncure Drive, or Hilton Street as it is today. We recognize that not all residents enter or exit those roads only during the peak times, therefore outside of the peak periods, drivers could access their homes quicker than some of the existing travel times during non-peak hours (as shown above). Therefore, we want to show the amount of direct access points compared to today and proposed. There are no egress changes from these roads, all users will be able to access West Taylor Run Parkway and Duke Street as they can today.



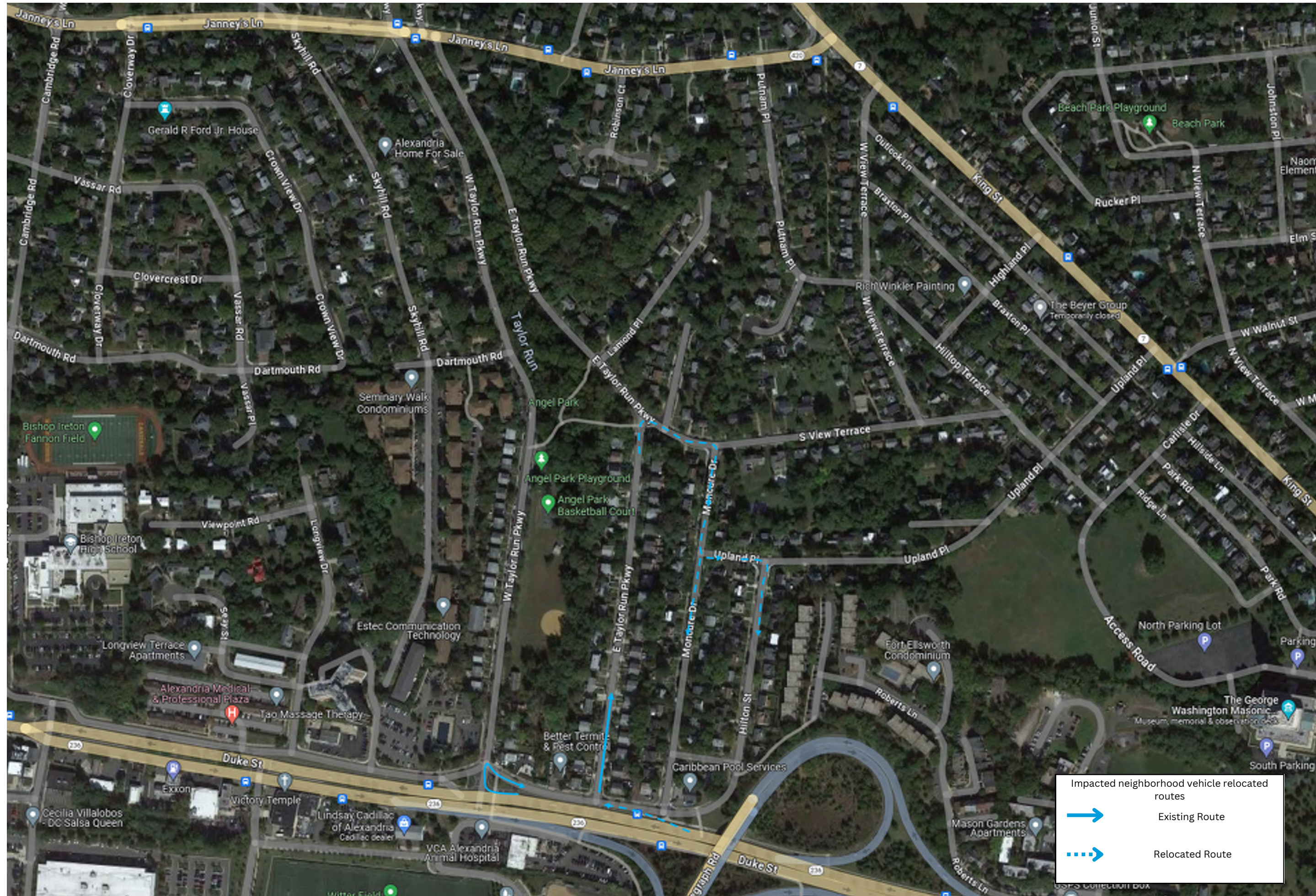


# Relocated Route for Neighborhood vehicles Access their homes from Eastbound Duke Street





# Option 1 & 2 Only: Relocated Route for Neighborhood vehicles Access their homes from Westbound Duke Street





# Option 3, 3A & 4 Only: Relocated Route for Neighborhood vehicles Access their homes from Westbound Duke Street

