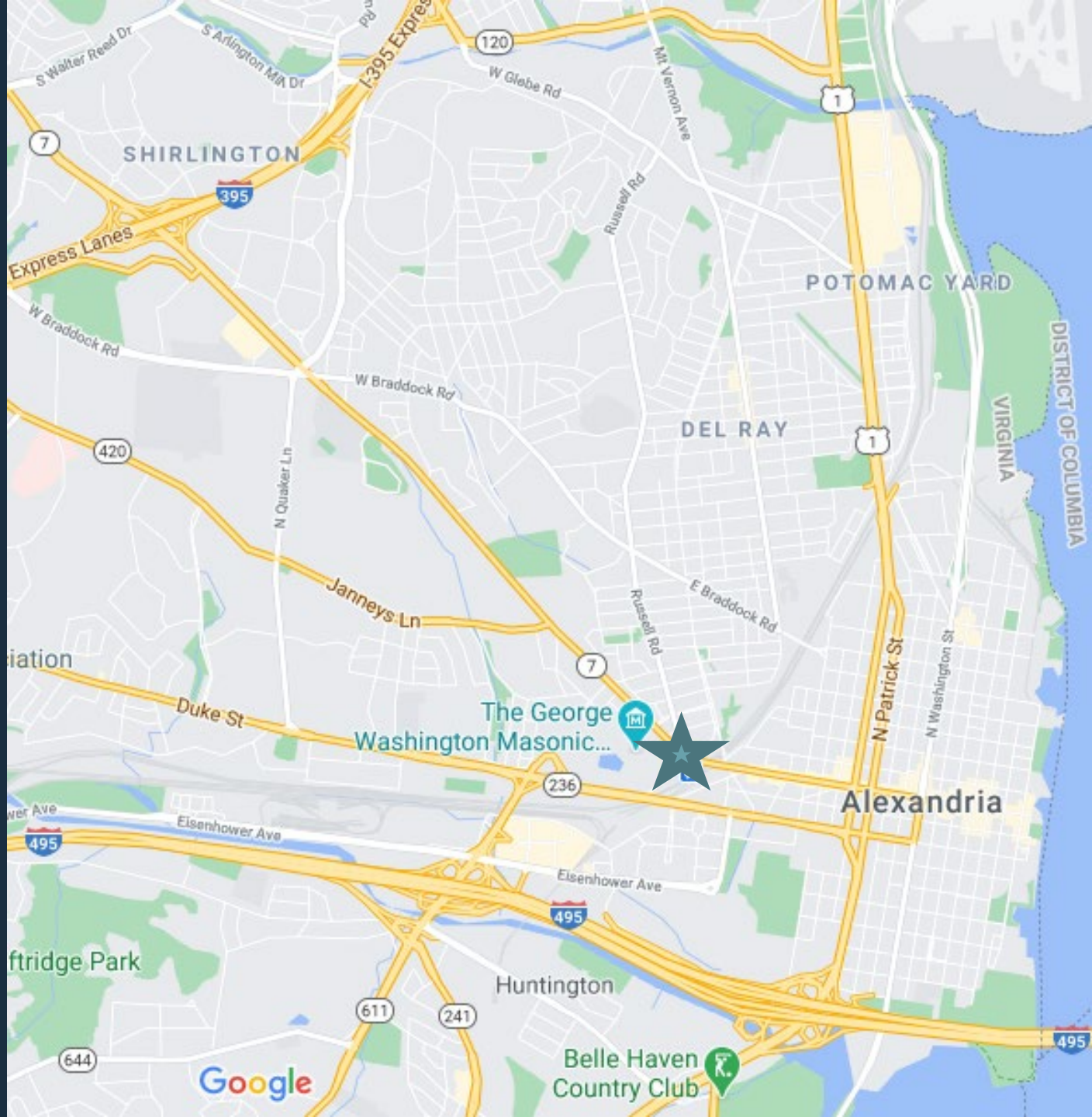
King, Callahan, and Russell Road Intersection Project

PROJECT UPDATE

Fall 2020

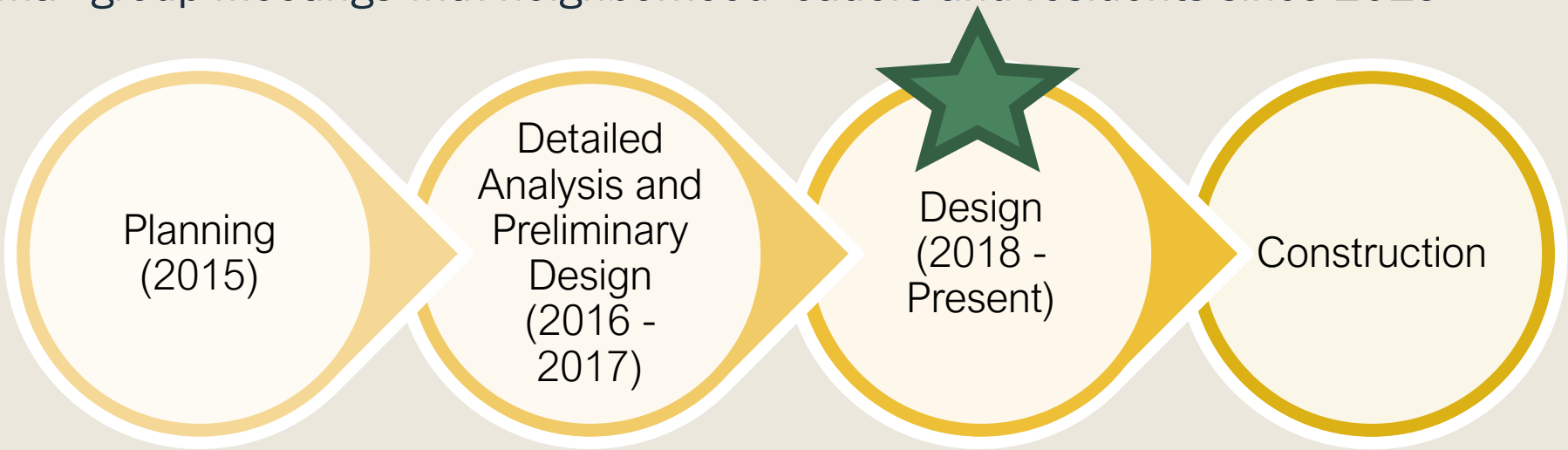
Project Context

- Key intersection in city network
  - *Connection to other City streets*
  - *Access to interstate system*
  - *Amtrak, Metro, Bus stations*
  - *George Washington Masonic National Memorial*
  - *Gateway between Old Town and neighborhoods*
- Connectivity is important for all modes at this location
  - *Drivers*
  - *Buses*
  - *People walking or in wheelchairs*
  - *People biking*



Project Background

- City Awarded grant funding from Federal Transit Authority (FTA) to make pedestrian and bicycle safety and access improvements on streets and intersections near transit stations.
  - *King St., Callahan Dr., and Russell Rd. intersection was identified as a priority*
- In 2015, the community asked for improvements to traffic operations at the intersection. Last meeting was December 2015.
  - *Present improvement options for people walking, in wheelchairs, and bicycling based on input and present configuration options*
- Small group meetings with neighborhood leaders and residents since 2015



Project Background

- Since then, project delays from:
  - *Requested study of traffic conditions and develop congestion mitigation options*
  - *King Street Metro Project and the Summer 2019 Metro Shutdown,*
  - *Staff turnover*
  - *Other priority projects that took a lot more staff time than anticipated.*
  - *Due diligence to collect new data and rerun modeling*
  - *COVID 19 pandemic and City response*

Project Considerations

- In 2015, staff reviewed pedestrian and bicycle improvements to the intersection that can be built without impacts to vehicle traffic or changes to the number of vehicle lanes
  - *New curb ramps, curb extensions, painted crosswalks, crossing signals, bicycle facilities and markings*
  - *Could be implemented without operational changes*
- Since 2015, Neighbors asked staff to look at options to improve traffic congestion
- Staff evaluated 5 design options and a no-build condition and is seeking feedback
  - *Neighborhood feedback on viable options or no operational change*
  - *Options for the access road to the Memorial*
- The resulting build options improve conditions for people using the intersection that are driving, walking, in wheelchairs, on a bike, and using transit
  - *Build options showed reductions in delay for drivers*
  - *No build option is still available*

Planning Process – What you told us

- Sidewalks are narrow
- Long crossing distances
- Accessibility concerns
- People riding bikes on sidewalks
- No designated space for people biking to ride
- Unpredictable turning movements by drivers
- Poor access to Metrorail station
- Complicated intersection geometry
- Congestion during peak hours
- Congestion (present and future) on neighborhood streets

Project Goals

Create safer, more direct pedestrian crossings across King St. and Callahan Dr.

Install new King Street crossings on the west side of Russell Rd.

Reduce rush-hour backups in all directions and pedestrian crossing delay by changing how the traffic signals operate.

Upgrade traffic signal hardware.

Provide safer accommodations for bicycle traffic through the intersection.

Options that were Evaluated

- 5 options with the addition of existing conditions as a baseline
- Used new traffic counts taken over 3-day period in January 2020, when traffic conditions were representative of general traffic conditions
- Modeling was rerun using the highest volumes of each approach to determine impacts on delay for each option
- All options removed the complex and rarely-used right turn from southbound Russell Rd. to westbound King St. and converted the service road near the Masonic Temple to a one-way southbound operation
- The model results are presented in the amount of time saved or increased over the existing delay per each signal cycle at the intersection in the morning and evening peak

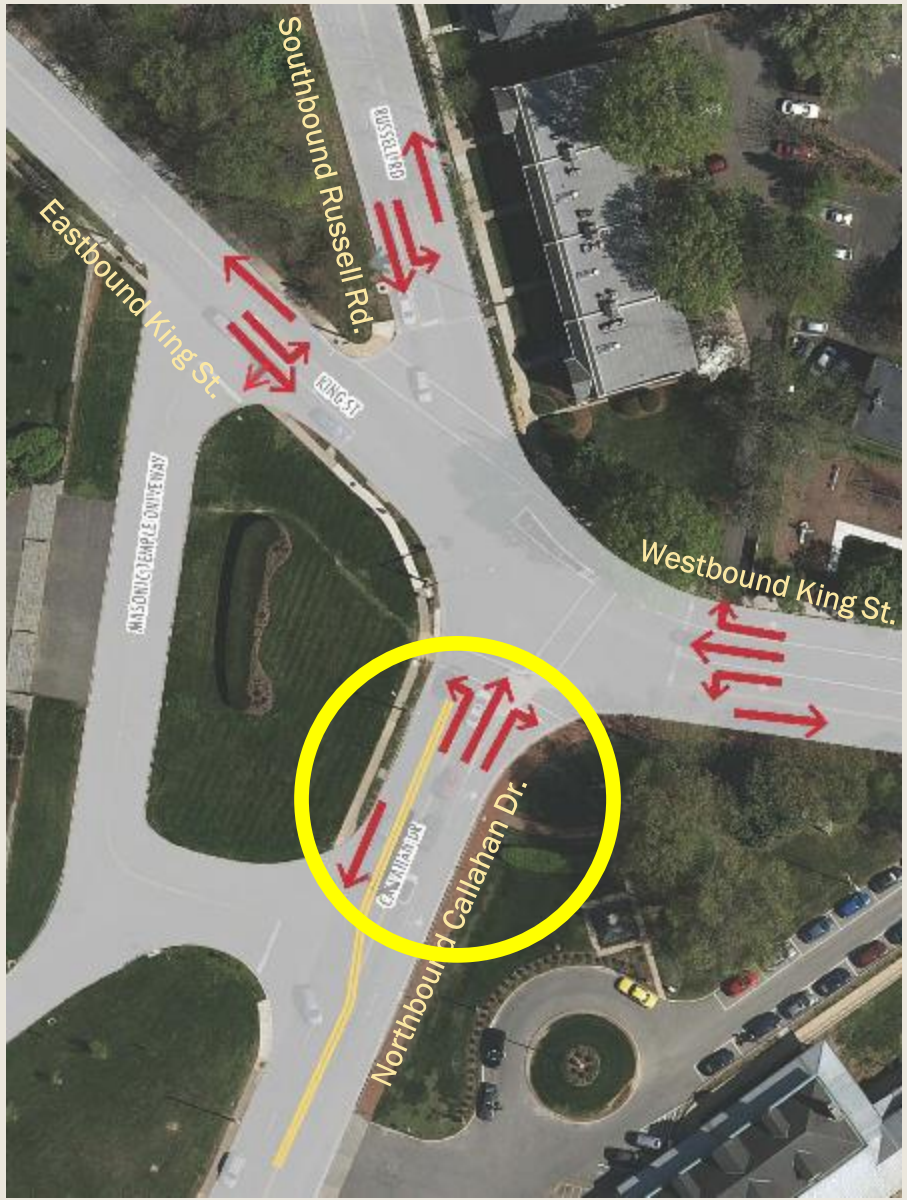
Traffic Models

- **What is a model?**
  - *A simplification of reality*
  - *A tool for understanding*
  - *A technology that improves over time*
- **Why use models?**
  - *To make reality comprehensible*
  - *To see signals in the noise*
  - *To guide and test policy options*
  - *To forecast events*

"All models are wrong, but some are useful."
- Statistician George Box

- **What can models do?**
  - *Help us understand complex systems*
  - *Make clear what we do and do not know about these systems*
  - *Make approximate forecasts for future outcomes*
  - *Make approximate estimates about the effect of policy choices*
- **What can't models do?**
  - *Make precise predictions about future events – models are tools, not crystal balls*
  - *Make choices among competing priorities*
  - *Make up for lack of knowledge, data or subject matter expertise*

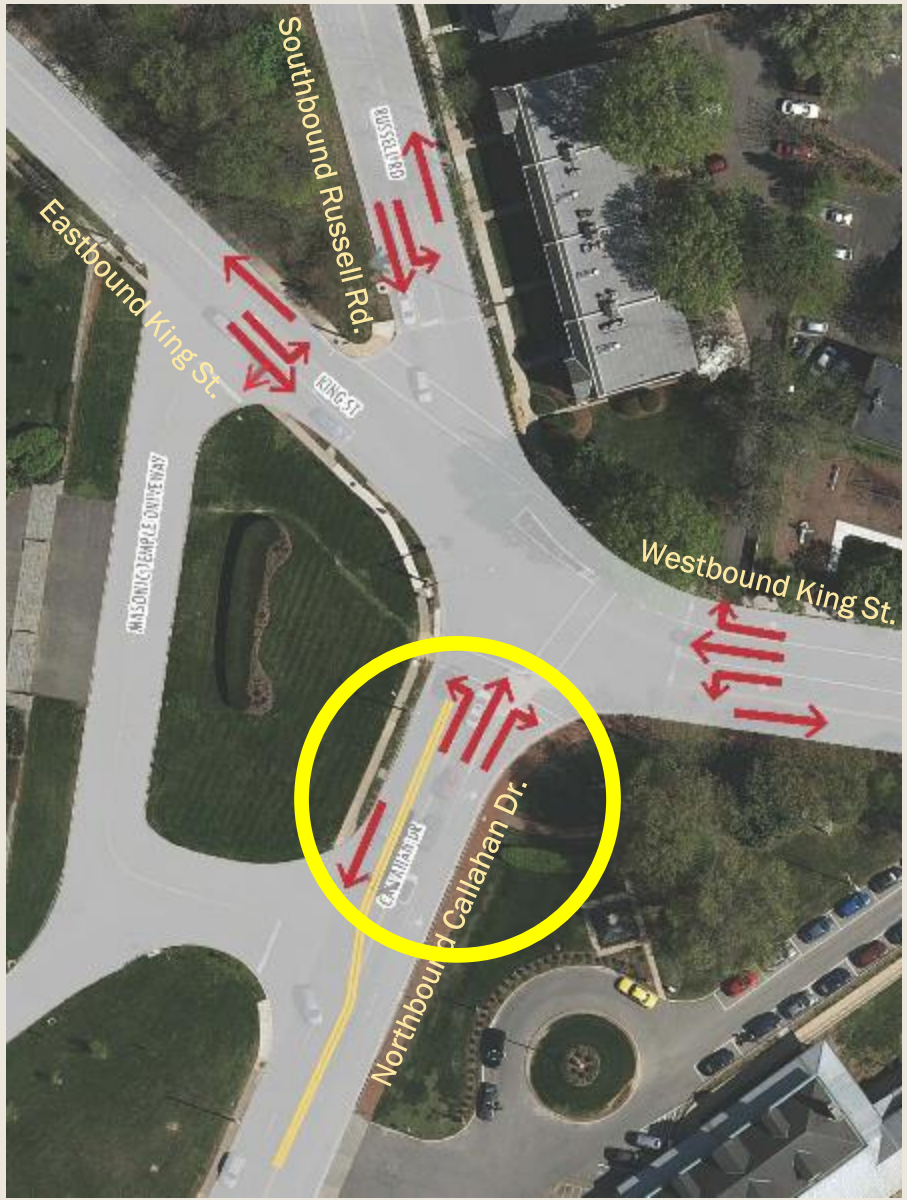
Option 1 – Best Performing



This is the preferred option that alters the lanes for a short section on Callahan Dr. to allow for the traffic flow improvements described below:

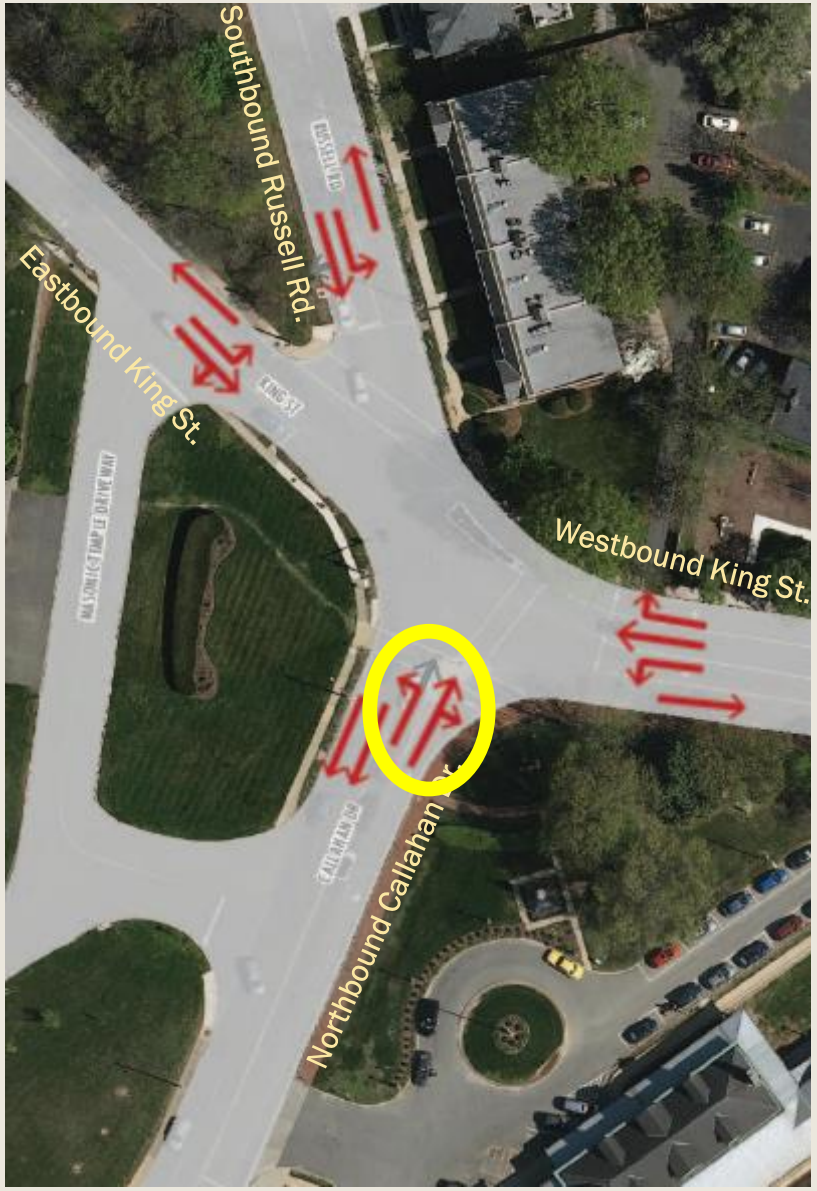
Approach	Changes	Model Results (AM rush)	Model Results (PM rush)
Eastbound King St.	No Change	Saves about 1 minute	Saves about 50 seconds
Westbound King St.	No Change	Saves about 7 seconds	Saves about 4 seconds
Northbound Callahan Dr.	Southbound lane reduced to one to allow for a northbound left turn lane	Saves about 2 minutes	Saves about 1.3 minutes
Southbound Russell Rd.	Removes right turn onto westbound King St.	Saves about 1.1 minutes	Saves about 2 minutes
	Total Time Savings for Intersection Design Option	**Saves about 1 minute overall**	**Saves about 50 seconds overall**

Option 1 – Best Performing



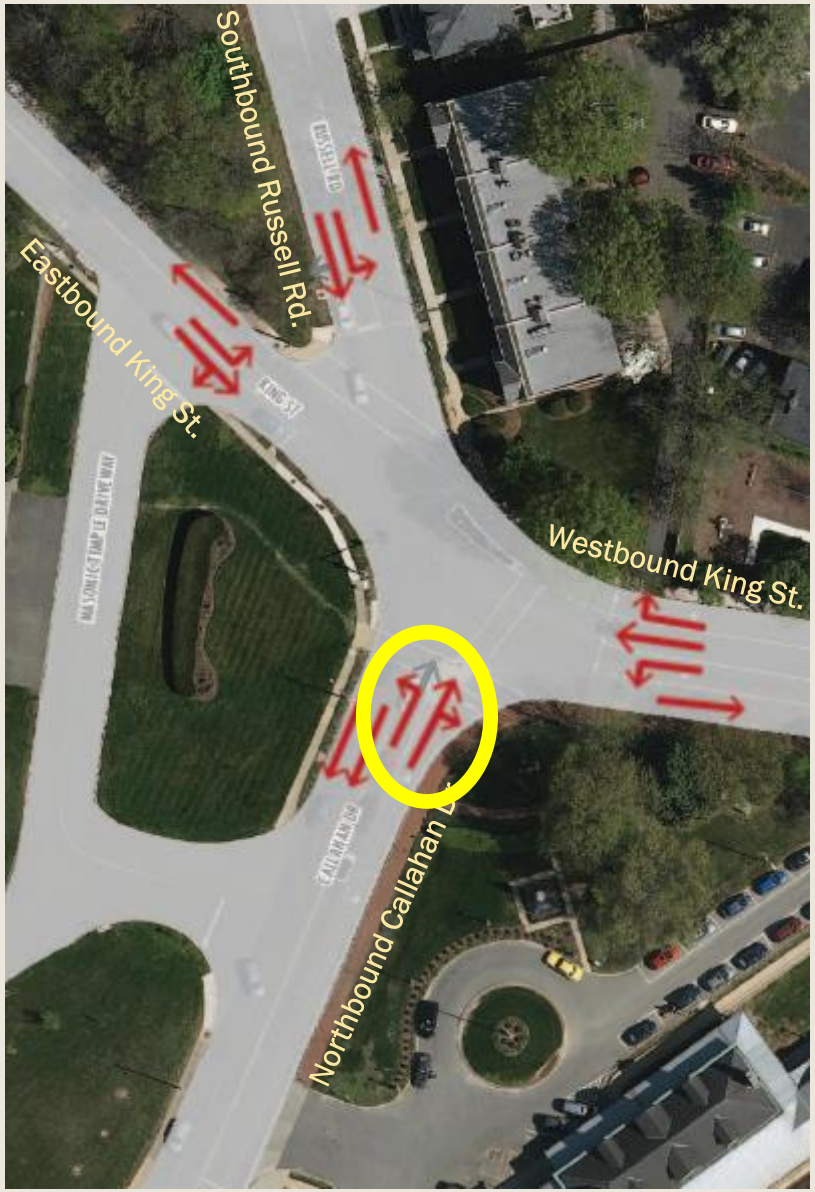
- Why does this perform best?
  - *Option provided the most time savings to the overall intersection- about a minute in the morning and evening rush hours*
  - *Signal and lane configuration saves the most time because Russell Rd. and Callahan Dr. can run at the same time.*
    - Allows the Russell Rd. signal to get more green time than current operations
    - Intersection can process more traffic, more efficiently
  - *Safety improved for pedestrians and bicyclists*

Option 4 –Improved Delay



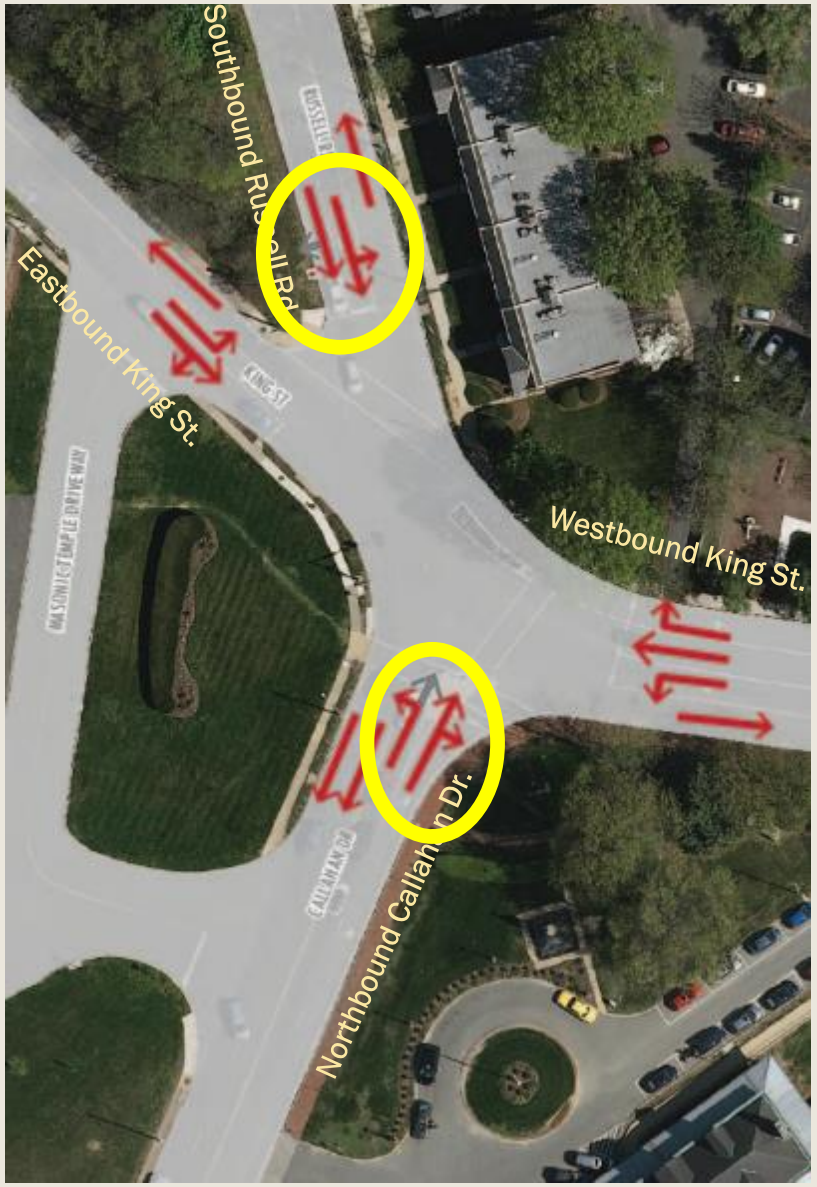
Approach	Changes	Model Results (AM rush)	Model Results (PM rush)
Eastbound King St.	No Change	Saves about 1 minute	Saves nearly 50 seconds
Westbound King St.	No Change	Saves about 5 seconds	Saves about 4 seconds
Northbound Callahan Dr.	Separates left turns and combines through and right-turn movements	Saves about 1.1 minutes	Saves about 1.1 minutes
Southbound Russell Rd.	Removes right turn onto westbound King Street	Saves about 1.2 minutes	Saves about 2 minutes
	Total Time Savings for Intersection Design Option	**Saves about 45 seconds overall**	**Saves about 48 seconds overall**

Option 4 – Improved Delay



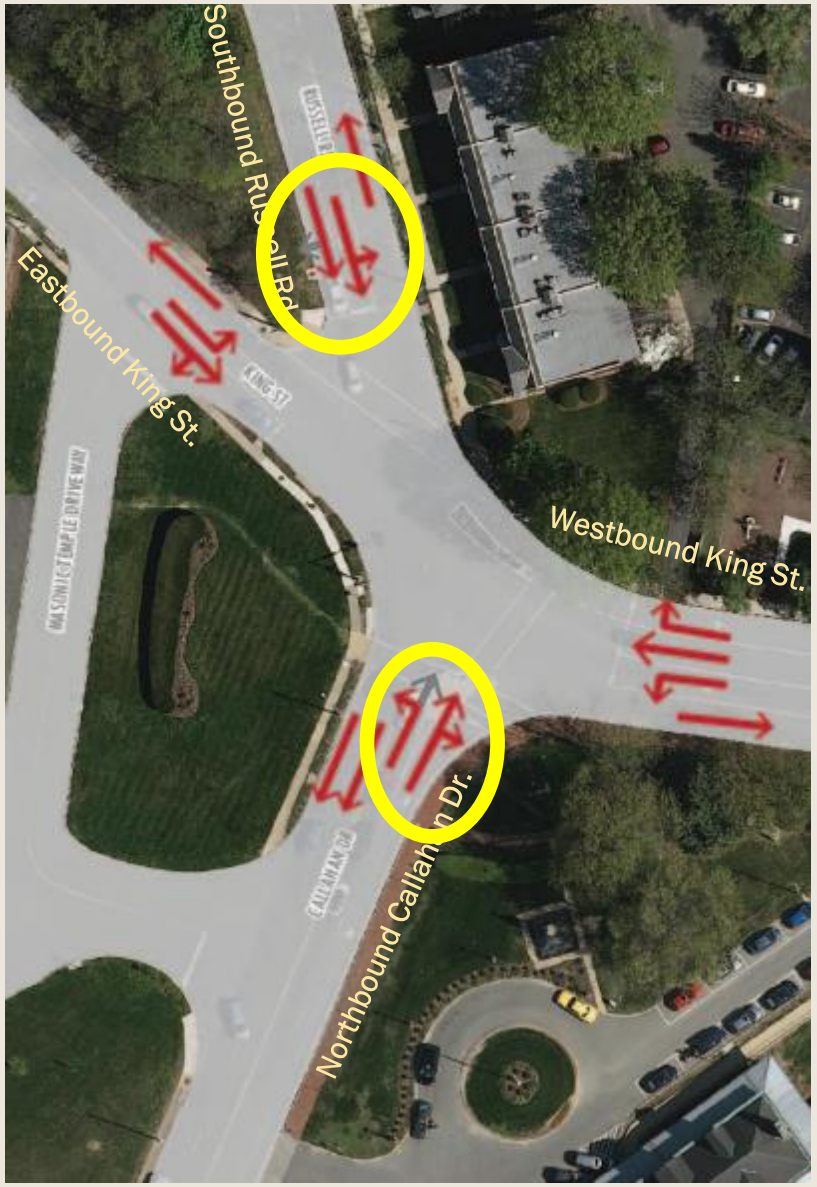
- Why was does this improve delay?
  - *Option provided time savings to the overall intersection- about 45 seconds in the morning and evening rush hours*
  - *Signal and lane configuration saves the most time because Russell Rd. and Callahan Dr. can run at the same time.*
    - Allows the Russell Rd. signal to get more green time than current operations
    - Intersection can process more traffic, more efficiently
  - *Safety improved for pedestrians and bicyclists*

Option 5 – Not Feasible



Approach	Changes	Model Results (AM rush)	Model Results (PM rush)
Eastbound King St.	No change	Saves about 7 seconds	Saves about 42 seconds
Westbound King St.	No change	Increases delay about 16 seconds	Increases delay about 27 seconds
Northbound Callahan Dr.	Through and right-turning traffic mixes, left turns get a dedicated lane	Saves about 1.5 minutes	Saves about 1 minute
Southbound Russell Rd.	Introduces one through lane and one through and left turn lane. Removes right turn onto westbound King Street	Saves about 45 seconds	Saves about 2 minutes
	Total Time Savings for Intersection Design Option	**Saves about 27 seconds overall**	**Saves about 32 seconds overall**

Option 5 – Not Feasible



Why is this option not feasible?

- It **causes additional delay** for King St. and does not provide as much savings for the overall intersection as other options
  - *The time savings benefit to the overall intersection was **only 60-70% of Option 1***
- **Concern of sideswipe crashes**
  - *Large vehicles traveling in proposed the shared through/left lane on Russell Rd. may sideswipe other trucks or larger vehicles traveling through from the northbound Callahan Dr. lane or those in the other through lane on Russell Rd.*

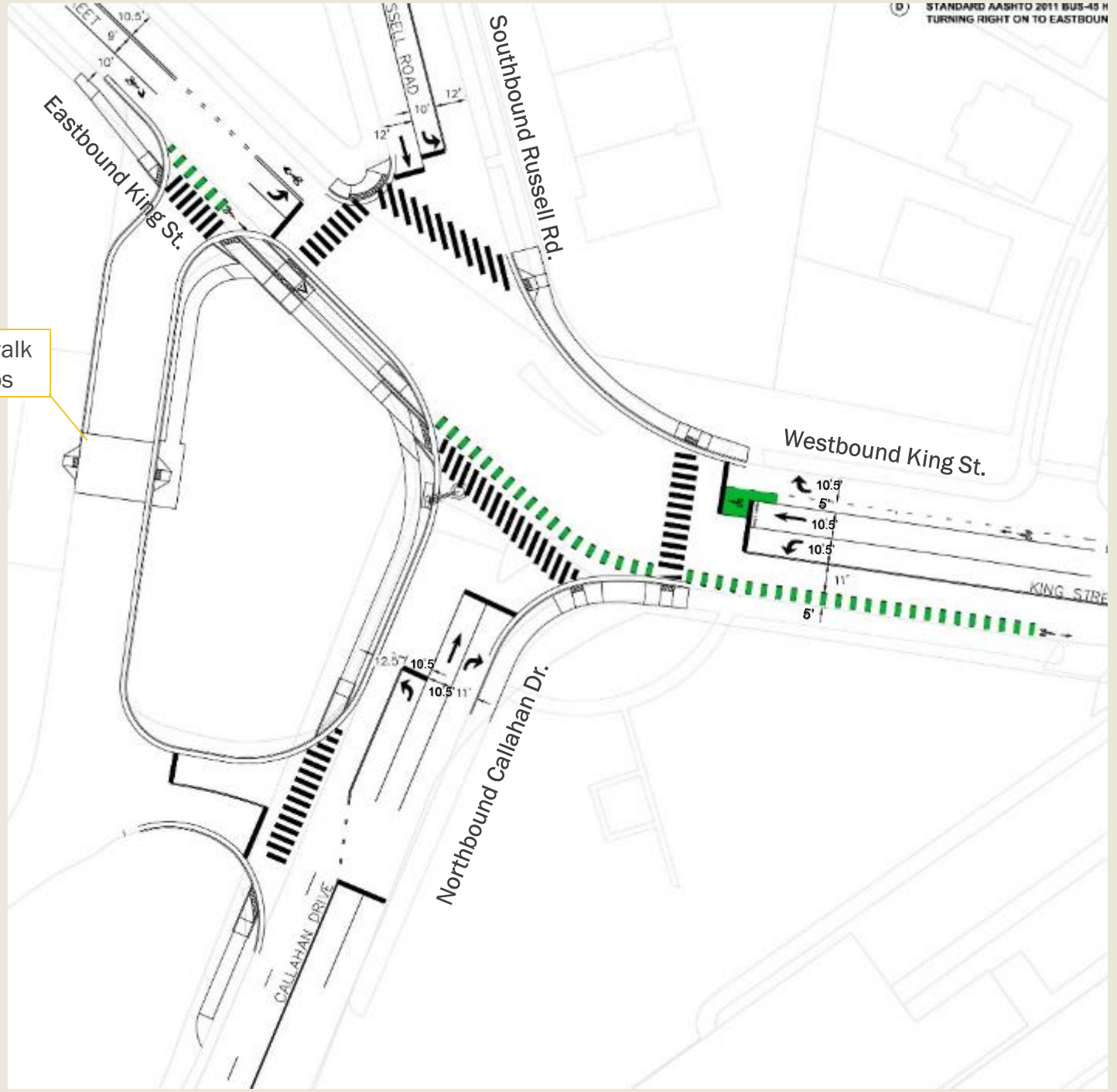
Options Compared

Legend (Changes from Existing Conditions)	
Saves time	
Increases delay	

	Option 1 - Model Results		Option 2 - Model Results		Option 3 - Model Results		Option 4 - Model Results		Option 5 - Model Results	
Approach	(AM rush)	(PM rush)	(AM rush)	(PM rush)	(AM rush)	(PM rush)	(AM rush)	(PM rush)	(AM rush)	(PM rush)
Eastbound King St.	1 minute	50 seconds	2 seconds	13 seconds	1 minute	50 seconds	1 minute	50 seconds	7 seconds	42 seconds
Westbound King St.	7 seconds	4 seconds	1.2 minutes	55 seconds	8 seconds	1 second	5 seconds	4 seconds	16 seconds	27 seconds
Northbound Callahan Dr.	2 minutes	1.3 minutes	1.5 minutes	50 seconds	1.3 minutes	1.1 minutes	1.1 minutes	1.1 minutes	1.5 minutes	1 minute
Southbound Russell Rd.	1.1 minutes	2 minutes	2 minutes	40 seconds	1 minute	2 minutes	1.2 minutes	2 minutes	45 seconds	2 minutes
Total Intersection Results	**1 minute overall**	**50 seconds overall**	15 seconds overall	No change	45 seconds overall	46 seconds overall	**45 seconds overall**	**48 seconds overall**	27 seconds overall	32 seconds overall
	Best Performance						**Improved Delay**			

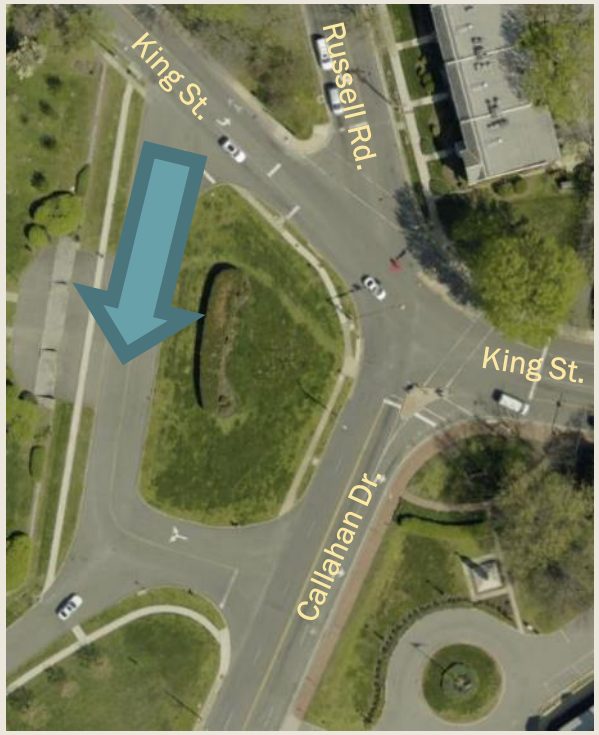
Pedestrian and Bicycle Improvements Design

(Shown with Option 1 configuration)



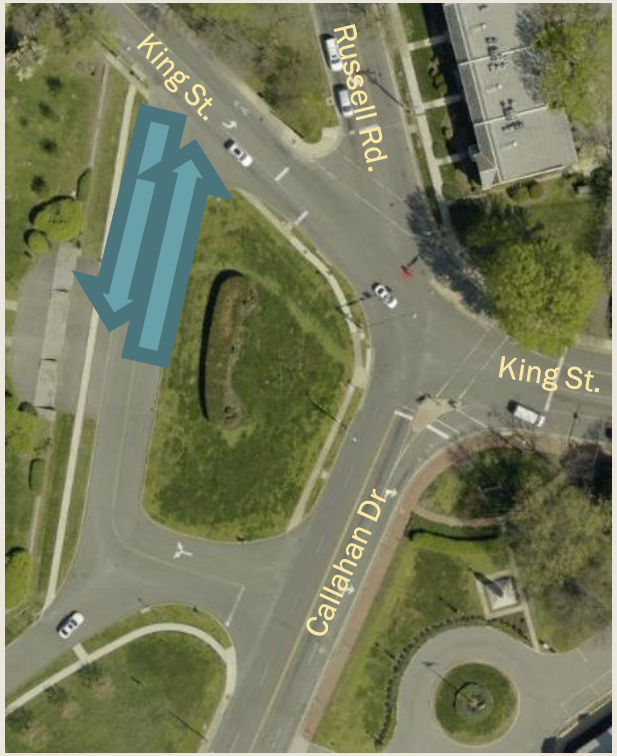
Access Road Operation Options

1. **One-way southbound**
   - *Feasible with Option 1 and 4, potential to work with No Change option*
   - *Reduces delay at main intersection*
   - *Safer for pedestrians*



2. **Emergency Vehicles Only**
   - *Feasible with all options*
   - *Increases right-turning traffic at intersection slightly*
   - *Safest for pedestrians*

3. **No-Change**
   - *Feasible with all options*
   - *Maintains two-way traffic*
   - *Shows increases to delay on King Street with Options 1 and 4, and no improvement with the No Change option*
   - *Pedestrian safety concerns*



Where We are Now and Next Steps

- Complete

- Final outreach to neighborhoods (Fall 2020)

- Final approvals- (Fall/Winter 2020)

- Project put out to bid for construction work (Winter 2020)
- Award contract (Winter 2020/2021)

- Pardon our Dust meeting
- Begin construction (Winter 2020/Spring 2020 – weather permitting)
- Finish construction, add new pedestrian signals, resurface, and implement striping (Spring- Summer 2021)

How can I share my feedback?

- Complete the feedback form by Monday, November 2nd at 5 p.m.
  - https://www.surveymonkey.com/r/KCRoutreach
  - Design Options
    - Option 1
    - Option 4
    - No operational Changes
  - Access Road Configuration
    - As-is
    - One-way
    - Emergency Vehicle Only

Project Contact Information

- **Website**
  - www.alexandriava.gov/77933
- **Staff Contact**
  - Christine Mayeur christine.mayeur@alexandriava.gov