Changes to the intersection of King Street, Callahan Drive, and Russell Road

Agenda Item 7

Presenter: Ms. Mayeur

Staff Recommendation

Make a recommendation to the Director of T&ES to:

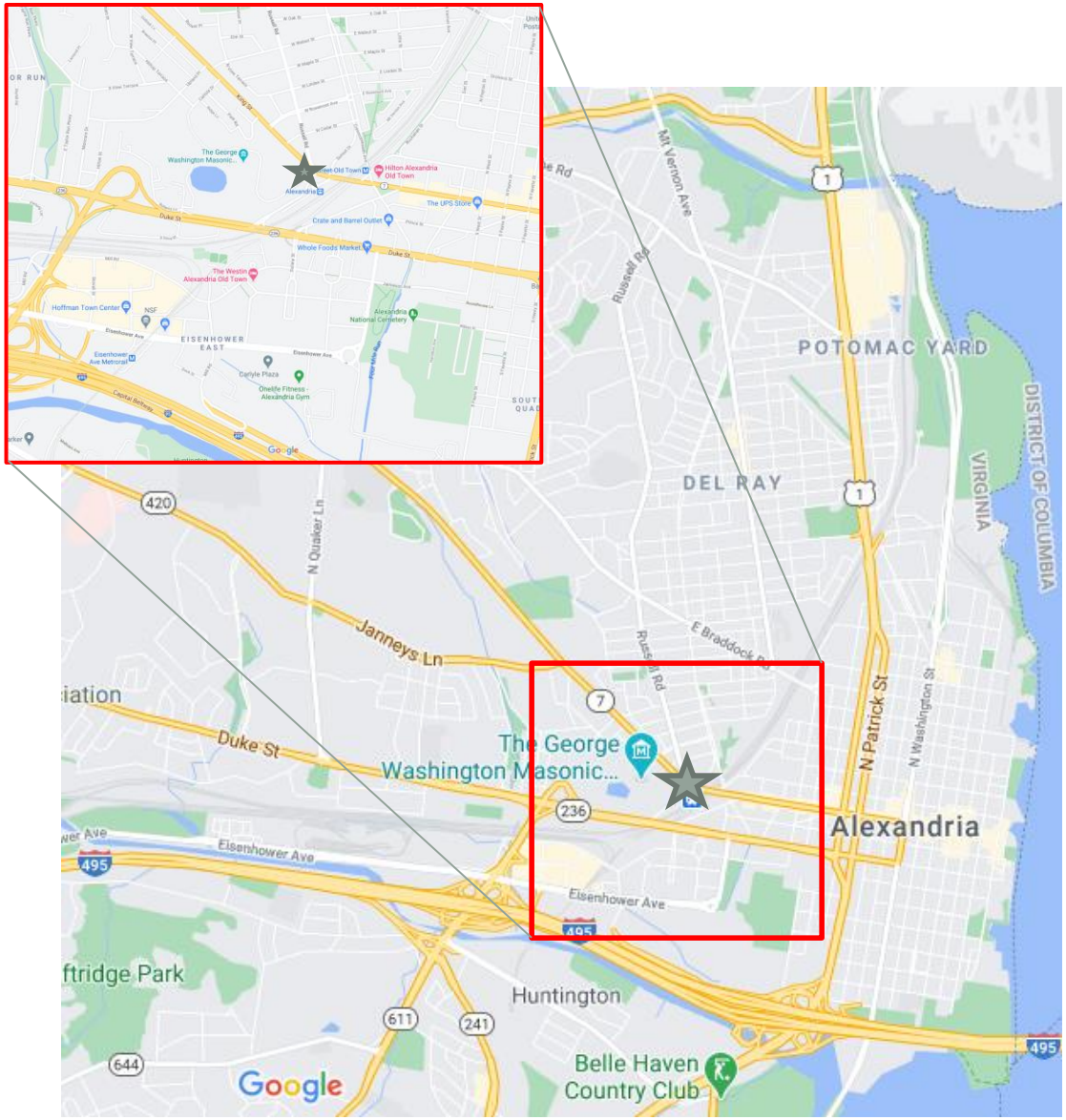
- Eliminate the rarely-used right-turn from southbound Russell Rd onto westbound King Street

Make a recommendation to City Council to:

- Convert the access street from eastbound King Street to the George Washington Masonic National Memorial from two-way to one-way southbound operation

Project Context

- Key intersection in city network
  - Other City streets and Interstate
  - Amtrak, Metro, Bus stations
  - GW Masonic National Memorial
  - Gateway between Old Town and neighborhoods
- Project Background
  - FTA Grant to improve Ped/Bike access to Transit
  - 2015 – Residents asked TES to look at improving traffic conditions



Community Concerns

- 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.

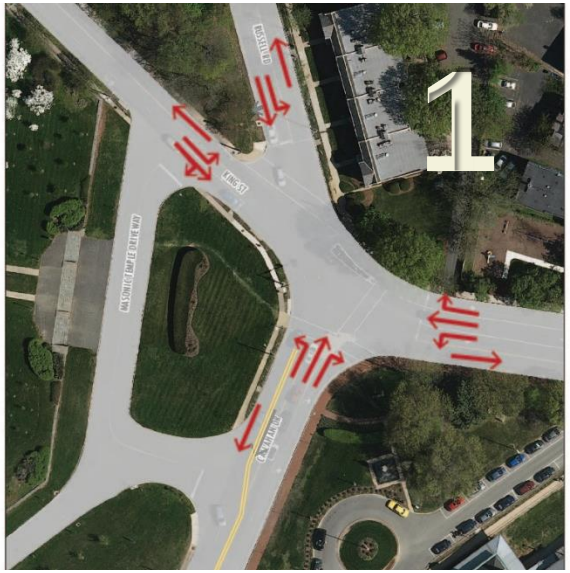
Install new King Street crossings on the west side of Russell Rd.

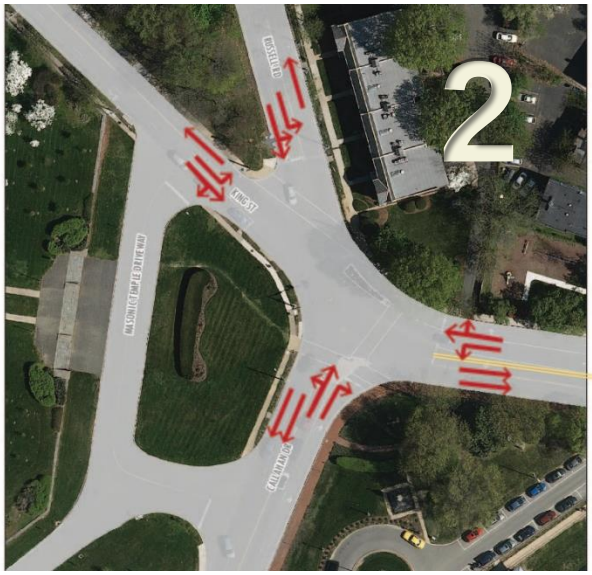
Reduce rush-hour backups in all directions and pedestrian crossing delay by changing how the traffic signals operate.

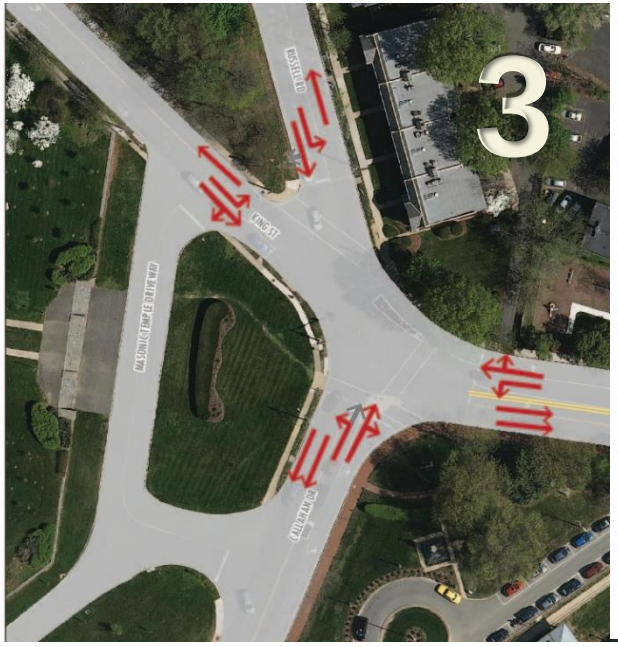
Upgrade traffic signal hardware.

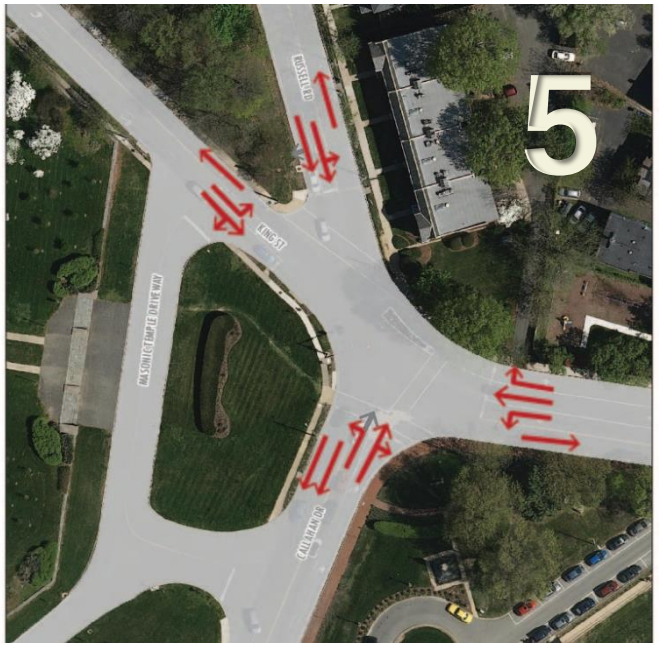
Provide safer accommodations for bicycle traffic through the intersection.

5 Options
and No Change





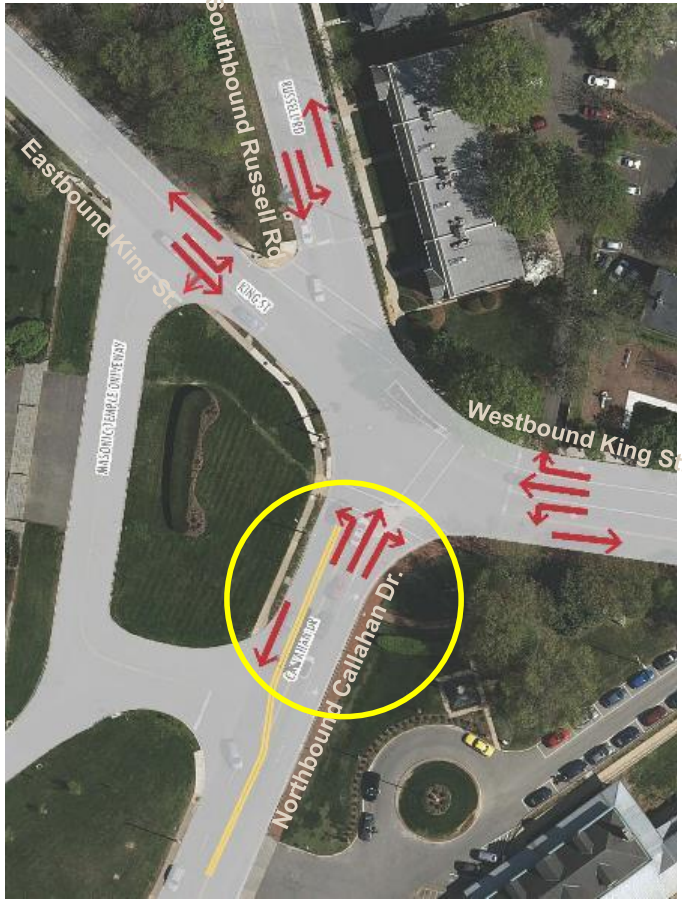




No Changes

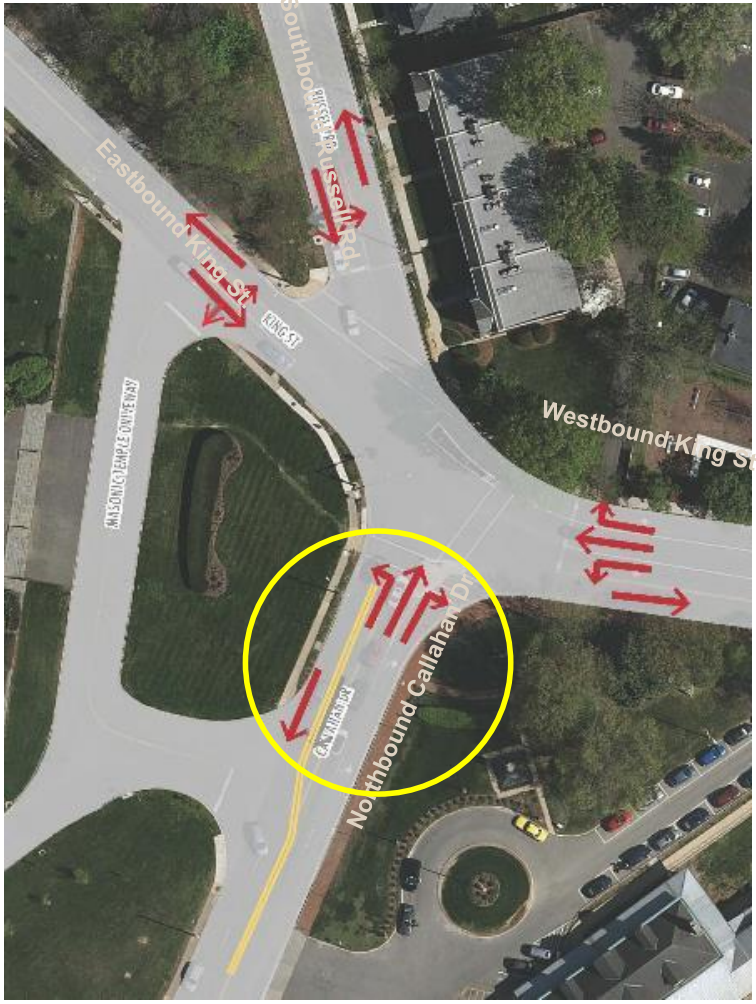
Approach	Changes	Existing Delay (AM rush)	Existing Delay (PM rush)
Eastbound King St.	No Change	2.4 Minutes	1.9 Minutes
Westbound King St.	No Change	48 Seconds	1 Minute
Northbound Callahan Dr.	No Change	2.7 Minutes	2 Minutes
Southbound Russell Rd.	No Change	2.3 Minutes	3.2 Minutes
	Total Time Savings for Intersection Design Option	**No time savings**	**No time savings**

Option 1– Best Performing



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

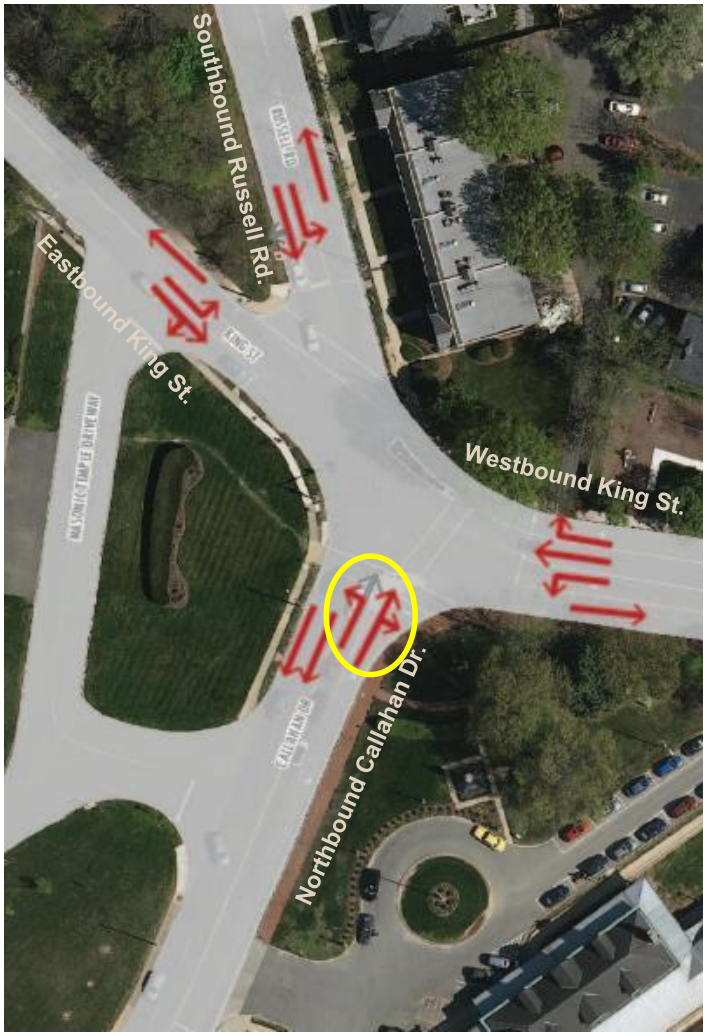


- Why does this perform best?
  - Provided the most time savings to the overall intersection- about a minute in the morning and evening rush hours
  - Signal and lane configuration saves the most time because Russell Rd. and Callahan Dr. can run at the same time.
    - Allows the Russell Rd. signal to 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**

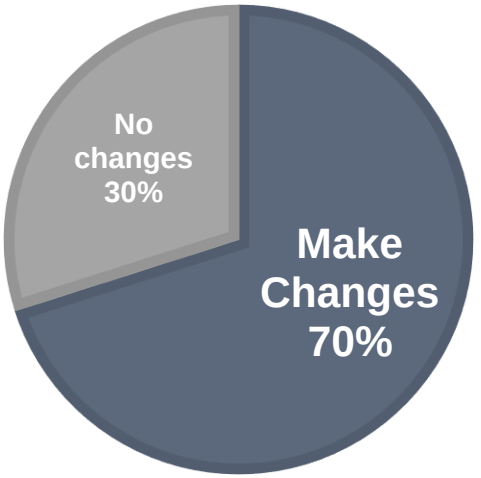
Option 4 –Improved Delay

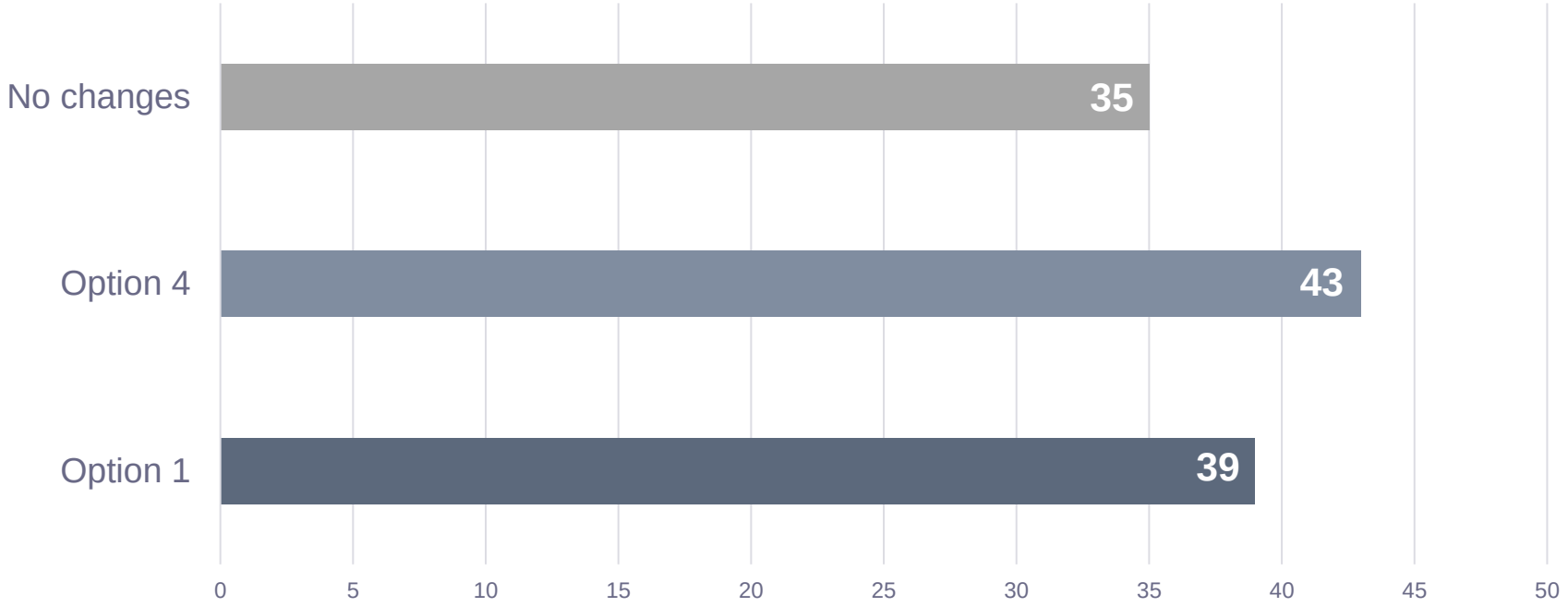


- Why was does this improve delay?
  - Time savings to the overall intersection- about 45 seconds in the morning and evening rush hours
  - Signal and lane configuration saves the most time because Russell Rd. and Callahan Dr. can run at the same time.
    - Allows the Russell Rd. signal to get more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

Public Input – Lane Configuration

- 70% of participants wanted changes
- More participants preferred Option 4



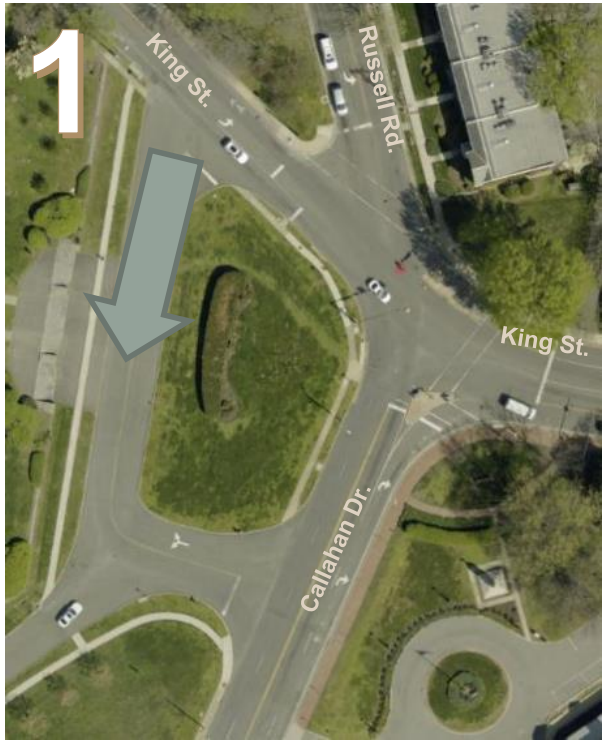


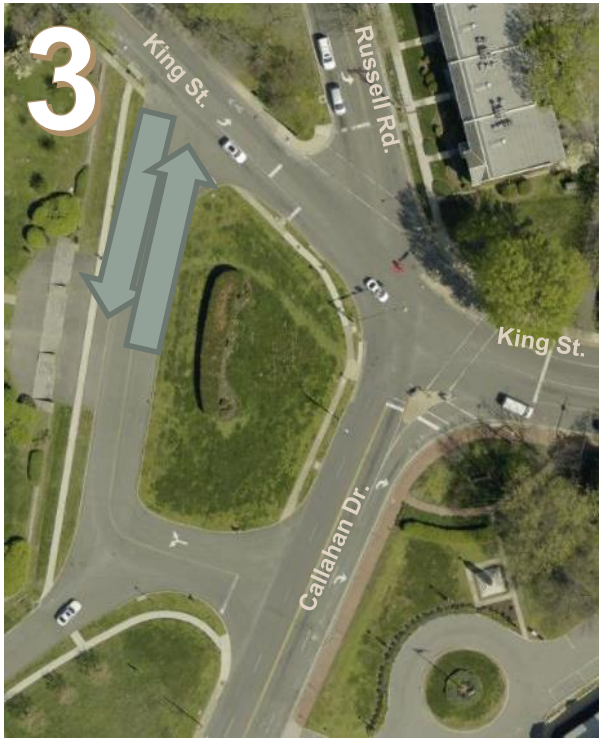
Access Street Operation Options

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

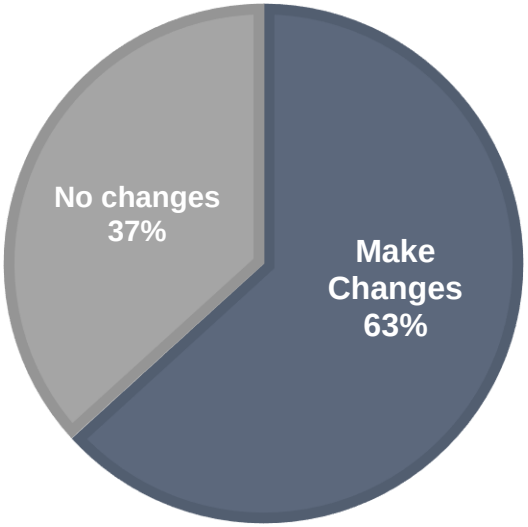
3. **No-Change**
   - Feasible with all options
   - Maintains two-way traffic
   - Shows increases to delay on King Street with Options 1 and 4, and no improvement with the No Change option
   - Pedestrian safety concerns

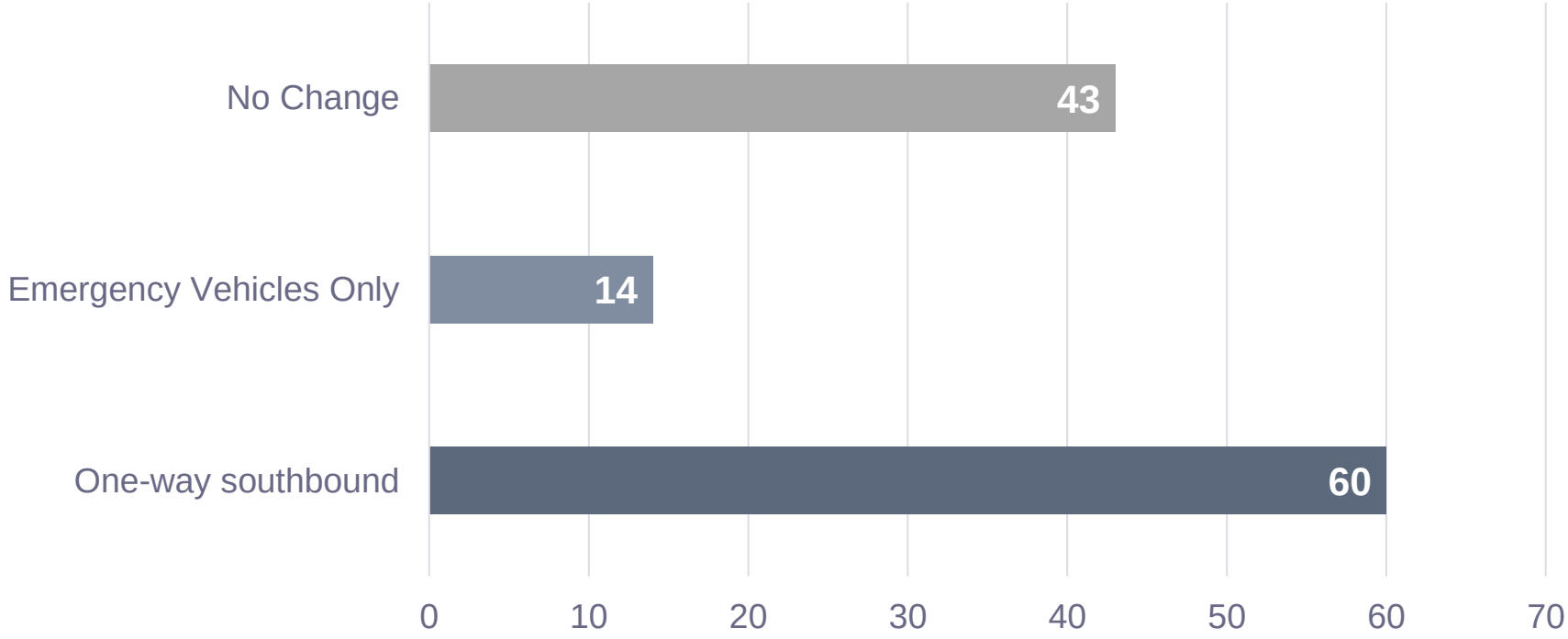




Public Input – Access Street

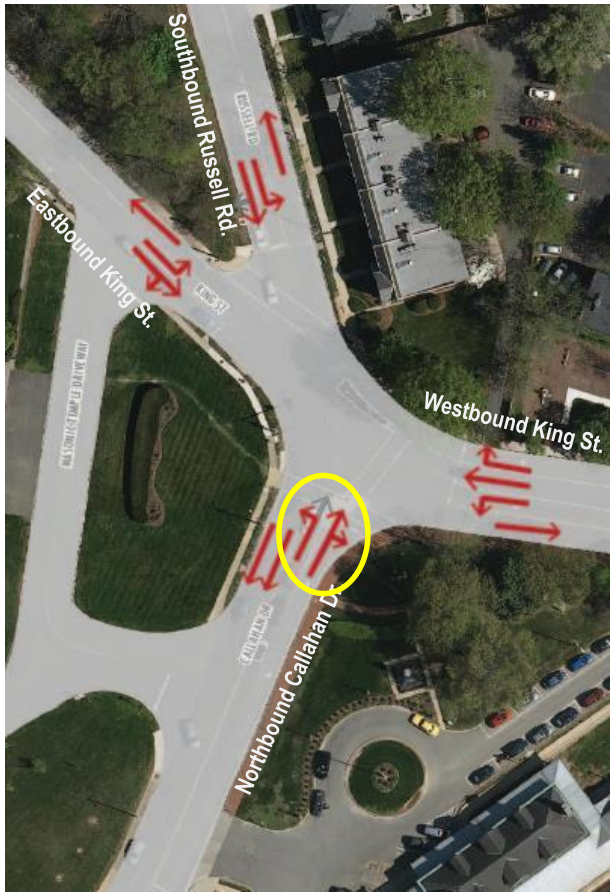
- 63% of participants wanted changes
- More participants preferred one-way southbound operations



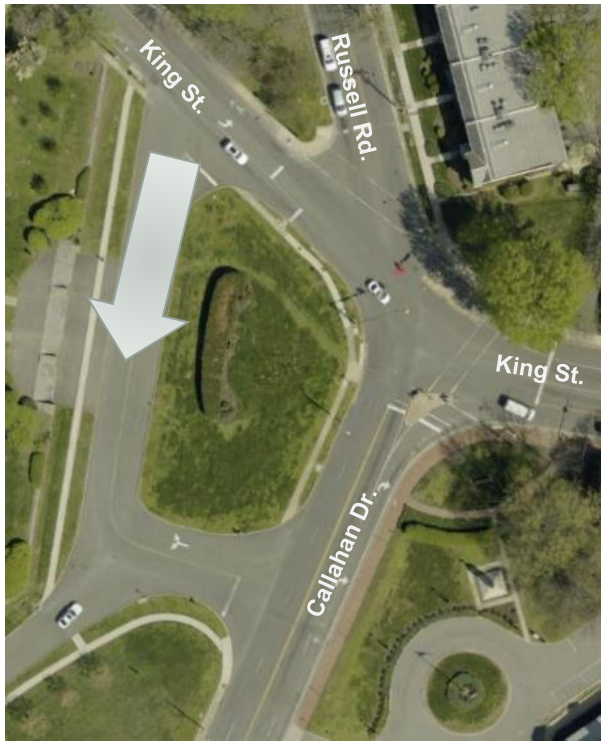


Staff Recommendation

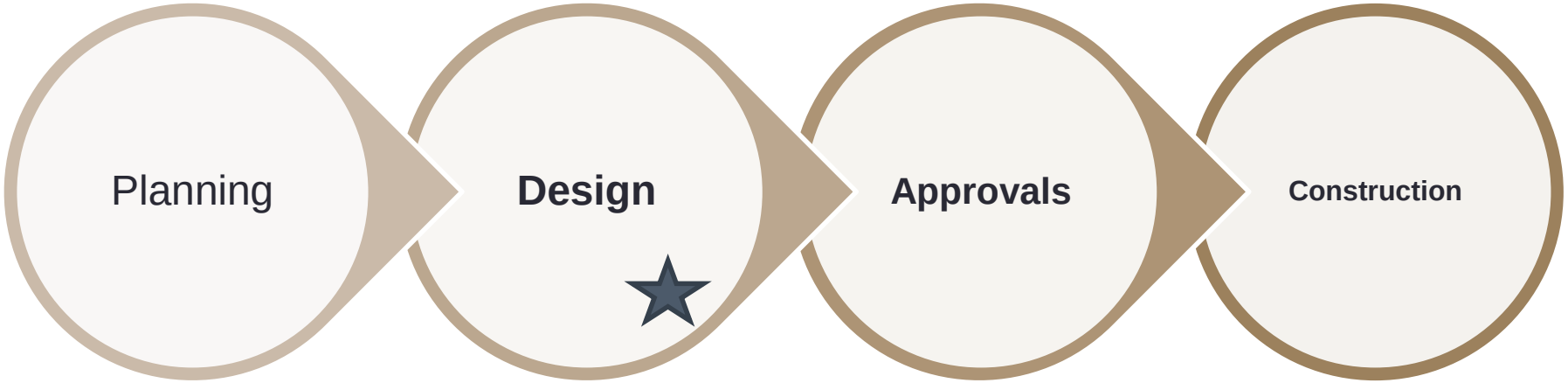
- Implement Option 4



- Access Street Operation converted to one-way southbound



Where We are Now and Next Steps



- Final outreach to neighborhoods (Fall 2020)

- Final approvals- (Fall/Winter 2020)
- Contracting for Construction

- Pre-construction Meeting
- Begin construction (Spring 2020)
- Finish construction, add new pedestrian signals, resurface, and implement striping (Fall 2021)

Staff Recommendation

Make a recommendation to the Director of T&ES to:

- Eliminate the rarely-used right-turn from southbound Russell Rd onto westbound King Street

Make a recommendation to City Council to:

- Convert the access street from eastbound King Street to the George Washington Masonic National Memorial to one-way southbound operation

Questions?

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