Project Background

- The 2016 Pedestrian and Bicycle Chapter of the Transportation Master Plan, identified this portion of King Street as an Enhanced Bicycle Corridor. In 2021, the updated Alexandria Mobility Plan reaffirmed the study area as a priority location for sidewalk and bicycle connectivity.

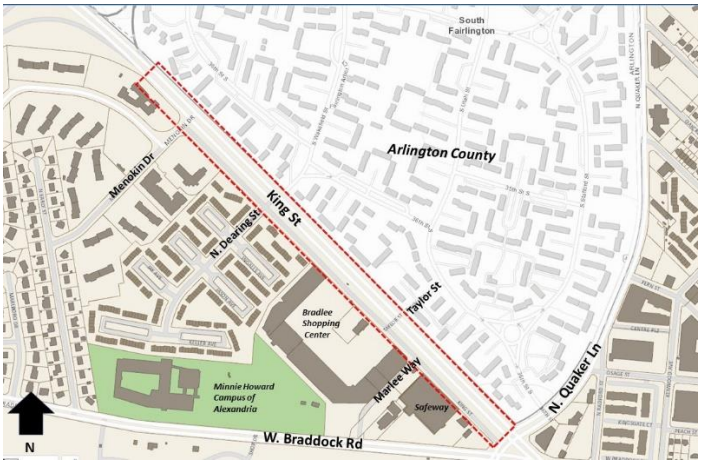
- In 2017 & 2018, the City was awarded future funding for FY 2023 & FY 2024 to provide safety and mobility enhancements along this corridor.

- In 2017, the City of Alexandria adopted the Vision Zero Action Plan to eliminate traffic fatalities and severe injuries.

    - In 2022, the City completed an updated citywide crash analysis to identify crash hotspots and trends to guide future safety work. That study identified the segment of King Street between City Line and King Street/Braddock Street/Quaker Lane intersection.

- In 2023, the City initiated a project to evaluate mobility, safety, access, and stormwater issues for the King Street corridor between Menokin Drive and King Street/Braddock Street/Quaker Lane intersection and develop concept designs for future improvements.

Project Boundaries



The Study Area consists of the King Street Corridor and parallel access road, from N. Quaker Lane in the east, to just north of Menokin Drive on the west. No design changes to the intersection of North Quaker Lane, King Street and West Braddock Road are being considered as part of this project.

Project Purpose

The purpose of this project is to evaluate existing mobility, safety, access, and stormwater issues along King Street between N. Quaker Lane and Menokin Drive and develop concept designs for future improvements.

This portion of King Street was identified for multimodal improvements in the City's 2021 adopted Alexandria Mobility Plan and is a priority location to install enhanced bicycle facilities and additional sidewalks to complete gaps in the City's existing bicycle and sidewalk network. Safety improvements along this corridor will help the City reach the Vision Zero goal of eliminating all fatal and severe crashes.

Project Goals

The goals of this project are to:

- Improve mobility, safety, and access for all roadway users of all ages, abilities and modes of travel.
- Install safer pedestrian access and bicycle facilities which connect into the surrounding network.
- Improve existing stormwater treatment in the corridor to reduce instances of standing water.
- Maintain or enhance existing transit facilities.

Project Engagement Summary

In Fall 2023, the City conducted a community engagement period to introduce the project and identify common experiences and safety concerns within the study area. Staff shared the feedback opportunity via eNews, posters in businesses in the Bradlee Shopping Center, yard signs, phone calls and emails to nearby local neighborhood organizations. Staff also had on the ground engagement with pop-ups at the Bradlee Shopping Center, bus stop chats and attending local community festivals. With over 800 responses from drivers, pedestrians, cyclists and bus riders, common experiences within the study area across all respondents, included:

- Unsafe turns by drivers;
- Speeding by vehicles;
- Confusing interactions between users at intersections;
- Long crossing distances at intersections; and
- People not following traffic signs and signals.

Staff worked with the design team to develop three concepts based on community input and project goals. These concepts were titled:

- Alternative 1: Two-Way Traffic with Transit
- Alternative 2: One-Way Traffic & Bus Lane
- Alternative 3: One-Way Shared Traffic

All three options propose the installation of an improved sidewalk and two-way cycle track along the south side of the access road but vary in how the access road would operate in the future. In

Alternative 1, the access road has been simplified to reduce the frequency of turn lanes but maintains mixed vehicle traffic in both directions. In Alternative 2, the access lane between Taylor Street and Menokin Drive is converted to one-way traffic in a west-bound direction and proposes a dedicated bus lane in addition to a one-way vehicle lane. In Alternative 3, the access lane is reduced to one lane that is one-way in the west-bound direction and combines bus and vehicle traffic. *See "Concepts" for section views of each concept.*

The concept designs were then shared with the community at a February 2024 Open House and a recording of the presentation was shared on the project website. A second feedback form was issued to collect community feedback. After the Open House, Staff conducted an additional five meetings and presentations with nearby community groups and associations to share information on the proposed design concepts and answer community questions.

Based on the community feedback form, the three alternatives scored the following out of five-point scale, 1 being "strongly dislike" and 5 being, "strongly like":

- Alternative 1: Two-Way Traffic with Transit - Average Rating of 3.0
- Alternative 2: One-Way Traffic & Bus Lane – Average Rating of 2.8
- Alternative 3: One-Way Shared Traffic – Average Rating of 2.1

Based on the relatively close scores of Alternative 1 and 2, staff proceeded with a full corridor analysis of the benefits and potential impacts of the design options of those two concepts to identify which concept may provide stronger safety and operational improvements while removing Alternative 3 from consideration based on community feedback. *See, "Full Corridor Design" for full corridor designs of Alternatives 1 and 2.*

Project Analysis & Preferred Concept Identification

To assess the strengths or weaknesses of the two remaining corridor concepts, Two-way Traffic with Transit and One-Way Traffic and Bus Lane, staff used four metrics to review the plans, including, traffic delay experienced by drivers, safety improvements, transit operations, and bicycle facilities.

- **Traffic Delay**: At the three pairs of traffic signals within the project area, the design team compared current levels of delays with the expected levels of delay from each design concept. Compared to the existing traffic delays and potential traffic delays there were minimal impacts and the two concepts scored similarly.
- **Safety Improvements**: The design team identified a number of potential safety improvements that could be implemented in the corridor and applied a crash reduction factor -or safety score - to those safety improvements (the value of the safety treatments are determined through engineering studies and real-world crash data). These safety improvements include elements such as leading pedestrian intervals, adding or upgrading sidewalks and new signal phasing. As both concepts proposed the same safety improvements they received the same values in crash reduction factors. Staff also assessed the number of potential conflict points in each intersection between the two

concepts. As Alternative 2 proposed the conversion of two-way traffic to one-way traffic, it reduces the number of vehicle movements through the intersection, lowering the opportunities for crashes between roadway users compared to Alternative 1 with two-way traffic; as such, Alternative 2 scored slightly higher from a safety perspective.

- **Transit Operations**: When evaluating the potential impact on bus operations in the corridor, the team assessed the current conditions which often saw several vehicles in front of buses. During peak PM traffic, existing conditions saw buses delayed on average by three vehicles, slowing down bus operations and efficiency through the corridor. Under Alternative 1, with shared lanes between buses and vehicles potential delays increase by up to nine vehicles in front of buses. However, under Alternative 2, the proposed bus only lane in the access road mitigates the potential for vehicle delays in front of the buses and offers improved bus operations and timing through the corridor and offers an improvement from existing conditions. As this corridor sees an average of over 1,300 on and off weekday riders in the corridor, this creates significant improvements for bus riders in the immediate vicinity and along the overall routes that traverse the study area.
- **Bicycle Facilities**: As both alternatives provide a separated two-way cycle track along the southern side of the access road, both concepts scored the same.

Table 1: Alternative Scoring Across Metrics

Metric	Alternative 1	Alternative 2	Comments
Traffic Delay	✓	✓	Equal benefit
Safety	✓	✓+	Similar benefit but slight advantage to Alternative 2
Transit Operations	✗	✓	Greater benefit to prevent buses from being stuck behind traffic on access road in Alternative 2
Bicycle Facilities	✓	✓	Equal benefit

Alternatives 1 and 2 score similarly in terms of potential traffic delay and bicycle facilities and a slight benefit in terms of safety under Alternative 2 due to the simplification of traffic patterns and a reduction in potential conflict points. A noticeable difference between the two alternatives can be found in improvements to transit operations as Alternative 2 offers a dedicated bus lane which results in greater bus reliability and speed through the study area. This corridor is one of the City's highest volumes for buses, during peak weekday travel periods, a bus travels through the corridor every three to four minutes. Offering a design alternative that improves bus operations will have a large impact on the overall reliability of DASH's network and improve the rider experience. Additionally, a separate bus lane will offer drivers improvements through the corridor as they will not be stuck waiting behind buses as they pick up and drop off passengers. As such, staff is recommending Alternative 2: One-Way Traffic with Transit and Bus.

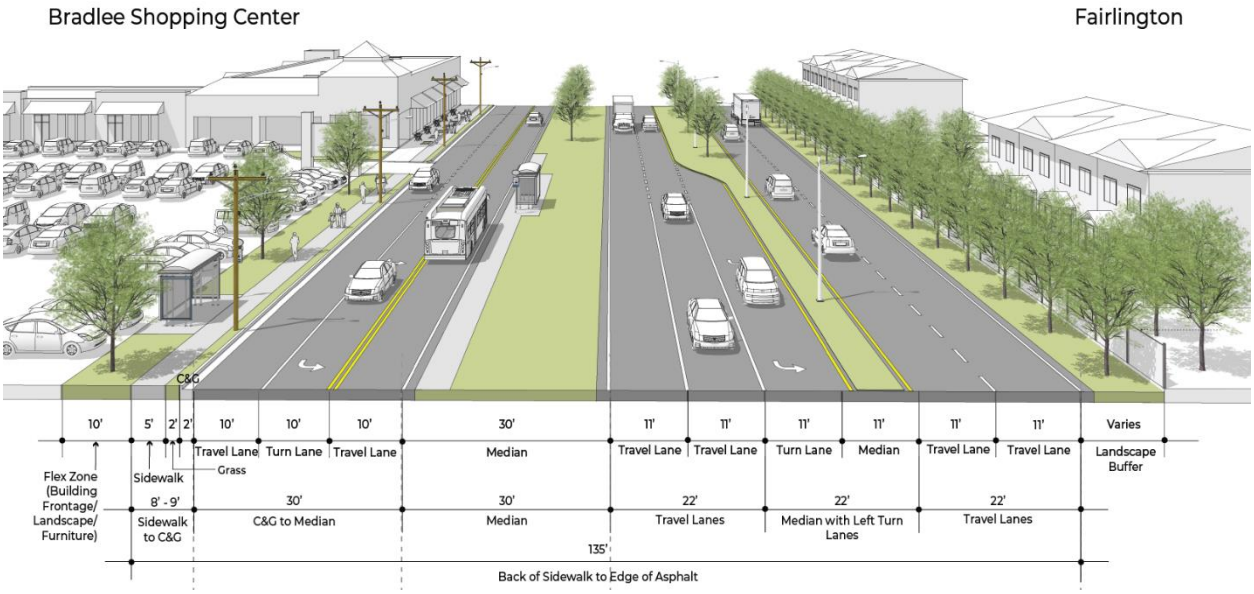
Additional Roadway Treatments

In addition to the proposed changes to the roadway configuration and modifications to the access road to accommodate the sidewalk, cycle track and one-way vehicle traffic and dedicated bus lane, the project proposes additional corridor wide treatments that will improve safety and accessibility. These treatments include:

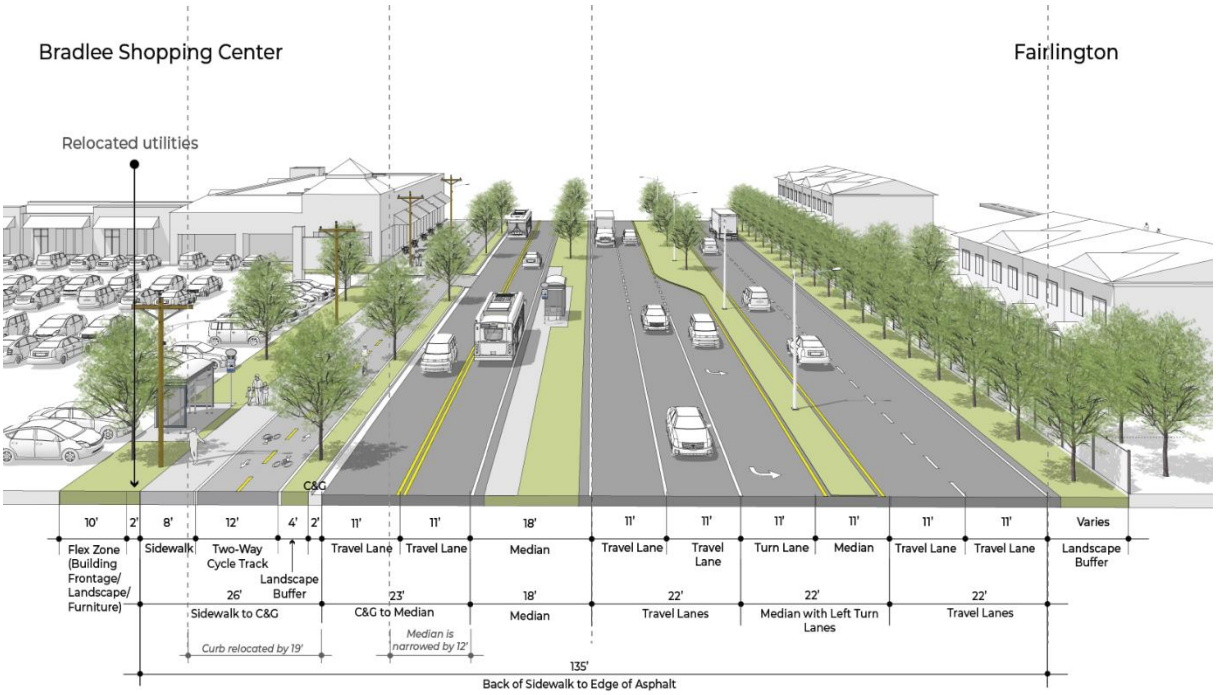
- Stormwater Management to treat roadways;
- Signal Timing Adjustments;
- Transit Signal Priority;
- Leading Pedestrian Intervals;
- Hardening of Pedestrian Refuges;
- Consolidated and Enhanced Bus Shelters;
- Pedestrian Lighting;
- Increased Canopy Cover over Sidewalk and Cycle Track;
- Protected Cycle Track and Sidewalk; and
- Dedicated Bicycle Crosswalk Across King Street.

Concepts

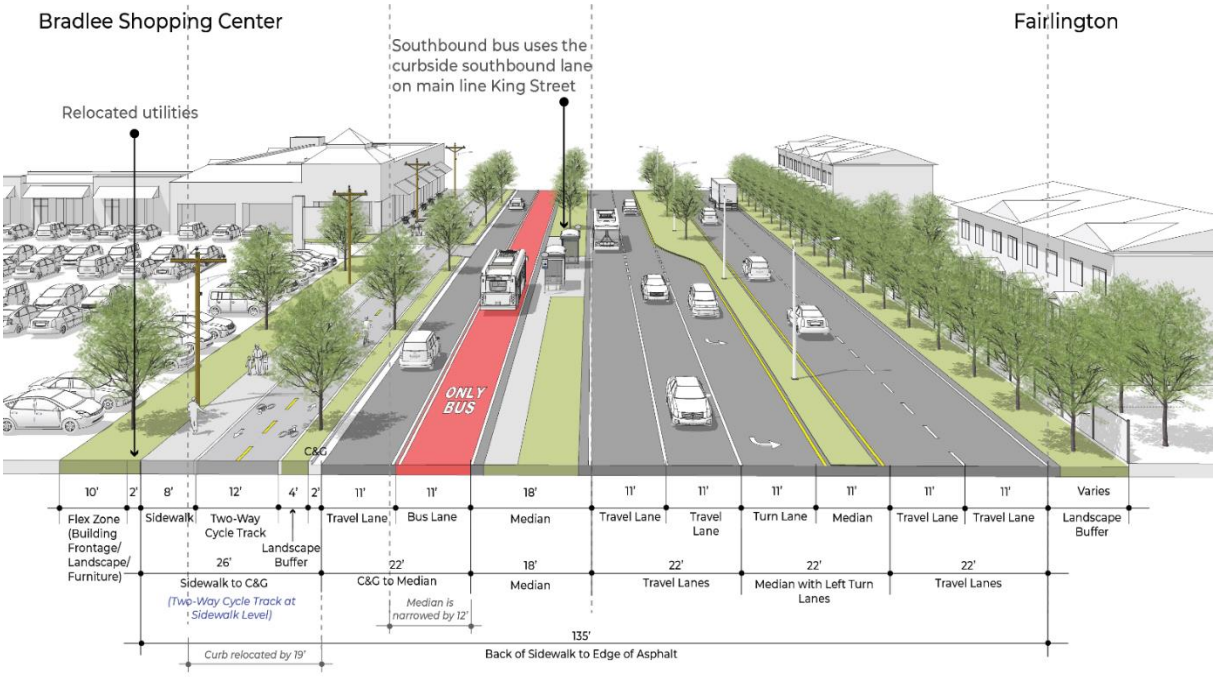
Existing Conditions



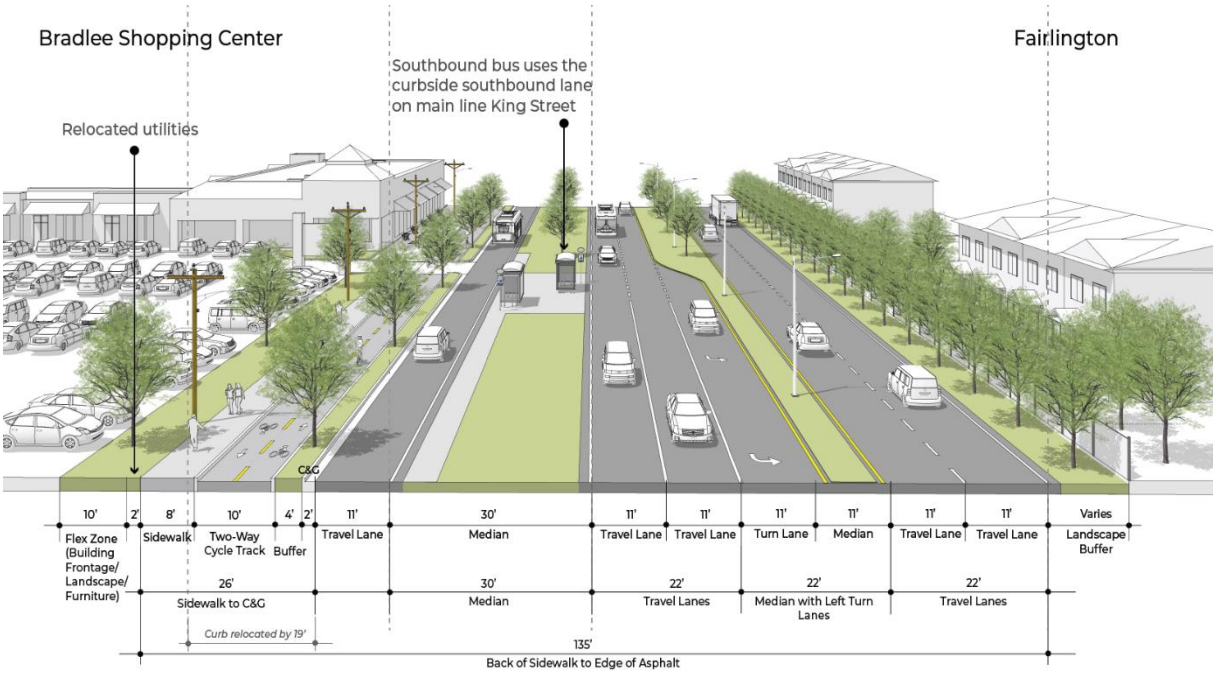
Alternative 1: Two-Way Traffic with Transit



Alternative 2: One-Way Traffic & Bus Lane



Alternative 3: One-Way Shared Traffic



Full Corridor Designs

Alternative 1: Two-Way Traffic with Transit

Alternative 2: One-Way Traffic & Bus Lane