DUKE STREET IN MOTION

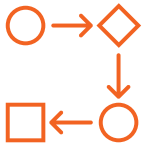
Community Outreach Presentation

April 2023

alexandriava.gov/DukeInMotion

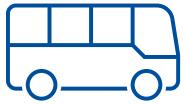
This project is funded with Northern Virginia Transportation Authority (NVTA) regional revenues.

Welcome!



Duke Street ***in Motion*** overview & Previous Community Input

Concept Overview & Comparison

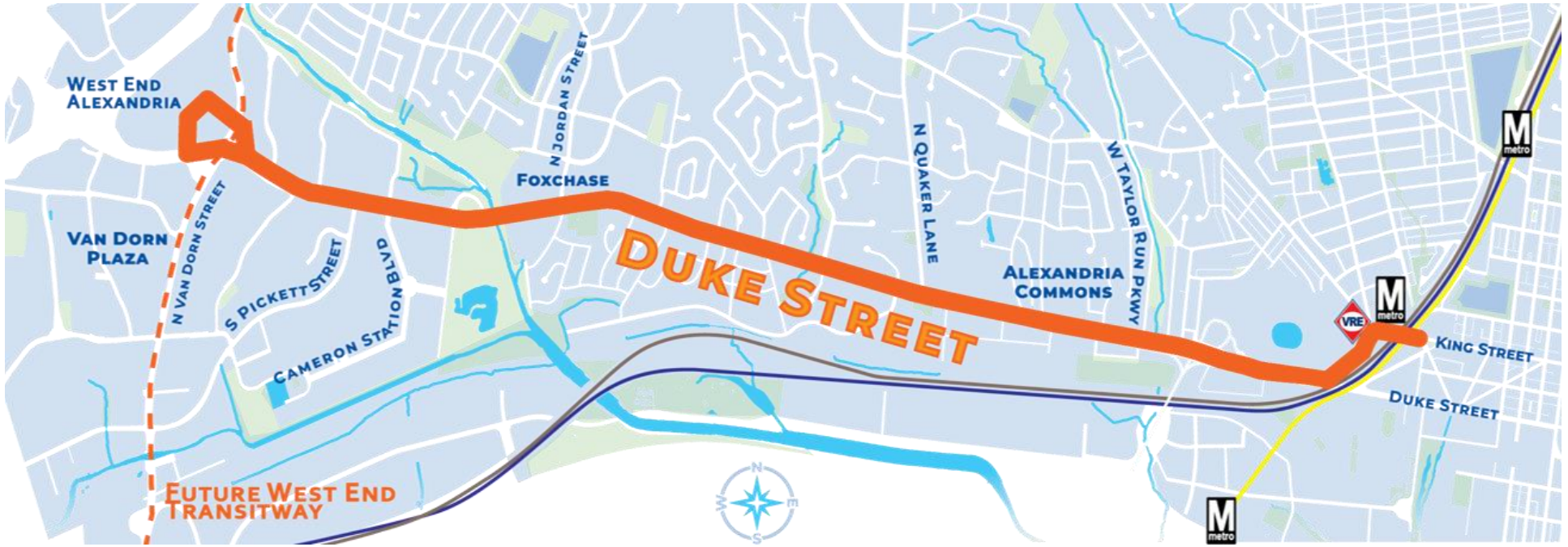


Next Steps & How to Be Involved

Project Overview

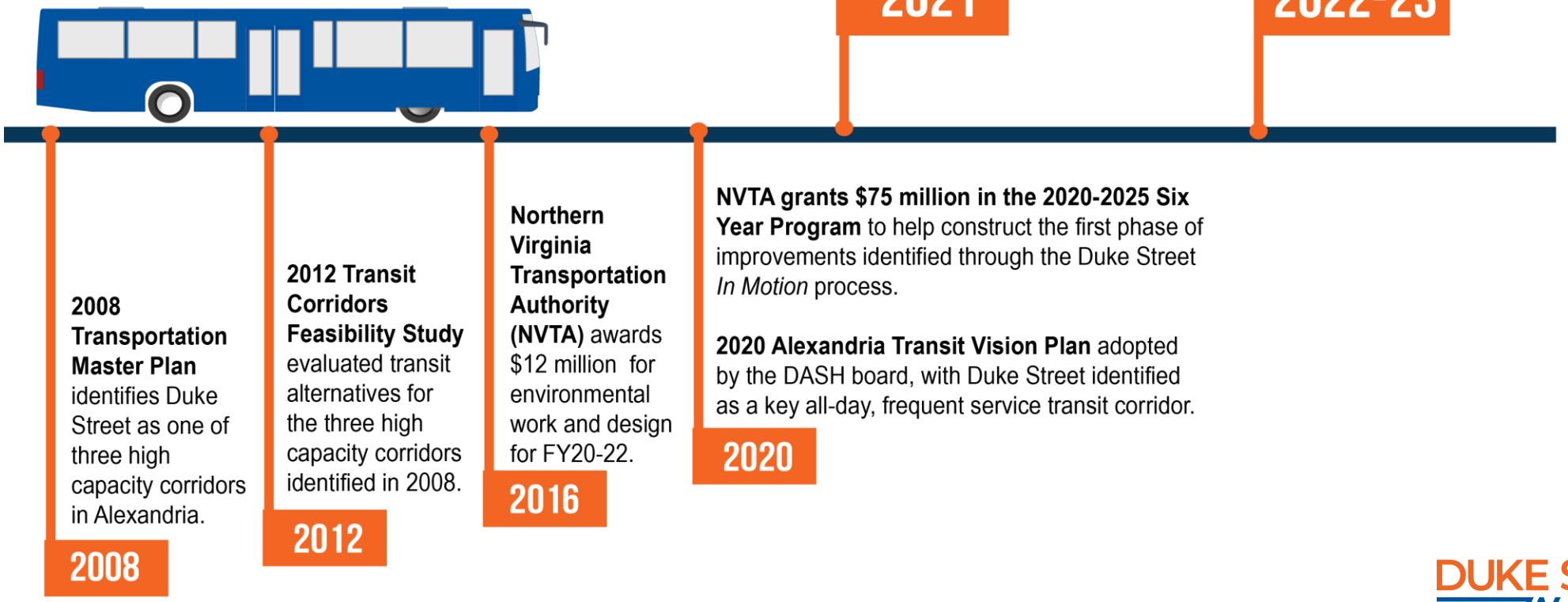
What is "Duke Street *In Motion*"?

Duke Street *IN MOTION* is a project focused on ensuring that transit improvements in the Duke Street corridor, from Landmark Mall to the King Street Metro Station, provide efficient transportation options that align with all users' needs, wants, and expectations.



Project Purpose & Background

- Pursue high-capacity transit to achieve City sustainability and equity goals
- Reconsider concept plans in context of 2021 community visioning



Key Stats

14
buses per hour

~2,800 daily bus boardings (July 2022)

5
Equity Emphasis Areas

22,600 – 36,300
cars per day (May 2022)

67% DASH 30 Bus peak period on-time performance

Project Vision

This project will provide an **efficient and desirable bus rapid transit (BRT) option** along Duke Street **by improving the transit experience** for current and potential riders.

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.**

Project Guiding Principles

Convenient	Make bus travel more predictable, frequent, and comfortable
Efficient	Improve mobility for all Duke Street travelers
Equitable	Use enhanced bus transit to support equitable access for a diversity of people and places
Safe	Ensure safety and accessibility for those connecting to and riding the bus, as well as other travelers
Vibrant	Create and enhance thriving and future corridor destinations that improve resident quality of life and boost the local economy
Sustainable	Contribute positively to the environment, now and in the future

Phase 2 Community Engagement
(Fall 2022)

Recorded Webinar

Feedback Form

Focus Groups

Pop-up Events

Public Meetings

15-minute recorded presentation	Series of questions, available on website and at events	Feedback from bus riders, business owners, and teenagers	Shared multilingual information throughout the corridor	Four formal meetings for the public to engage
450+ views	1228 unique responses	4 meetings, ~28 participants	9 events, >800 people reached	4 meetings, 195 signed in

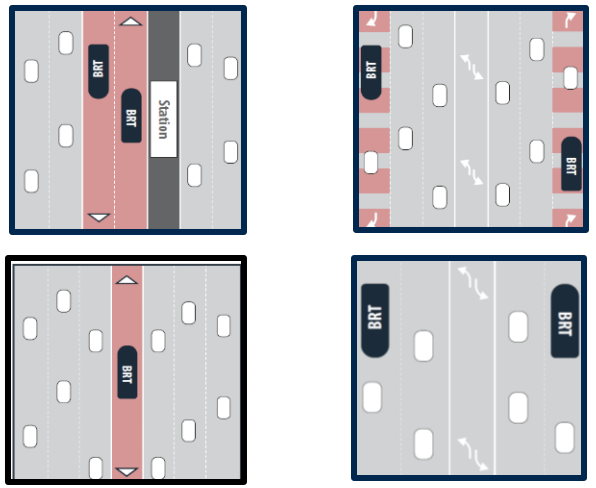
Preferred Alternative Inputs

Concept Overview & Comparison

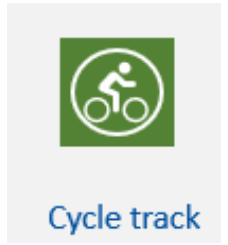
Street Design Concepts

Busway *and* Curb Features

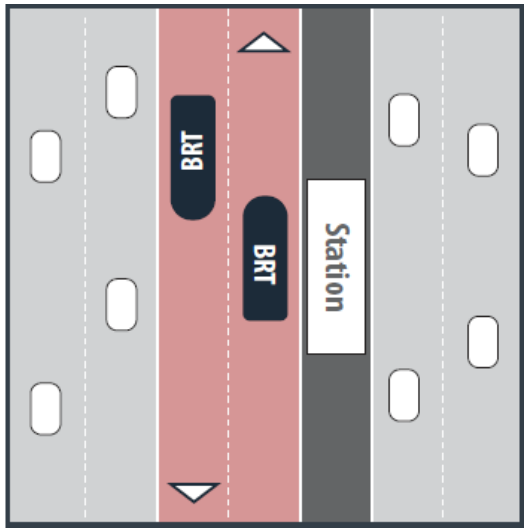
Step 1: Busway



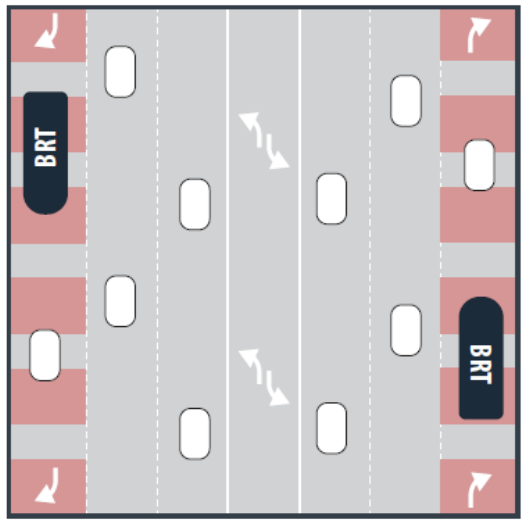
Step 2: Curb features



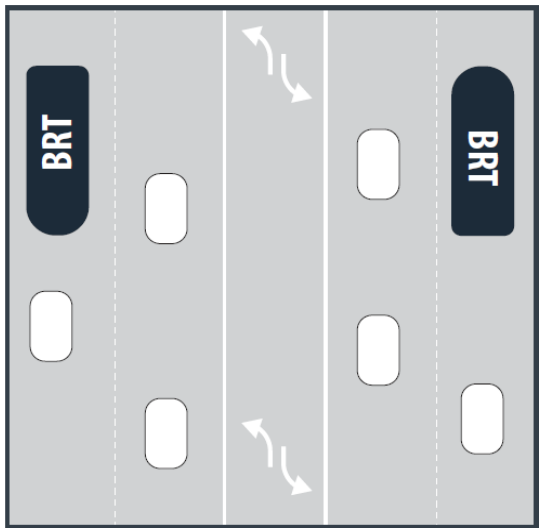
Bus Improvements Can Take Different Forms



Center Running



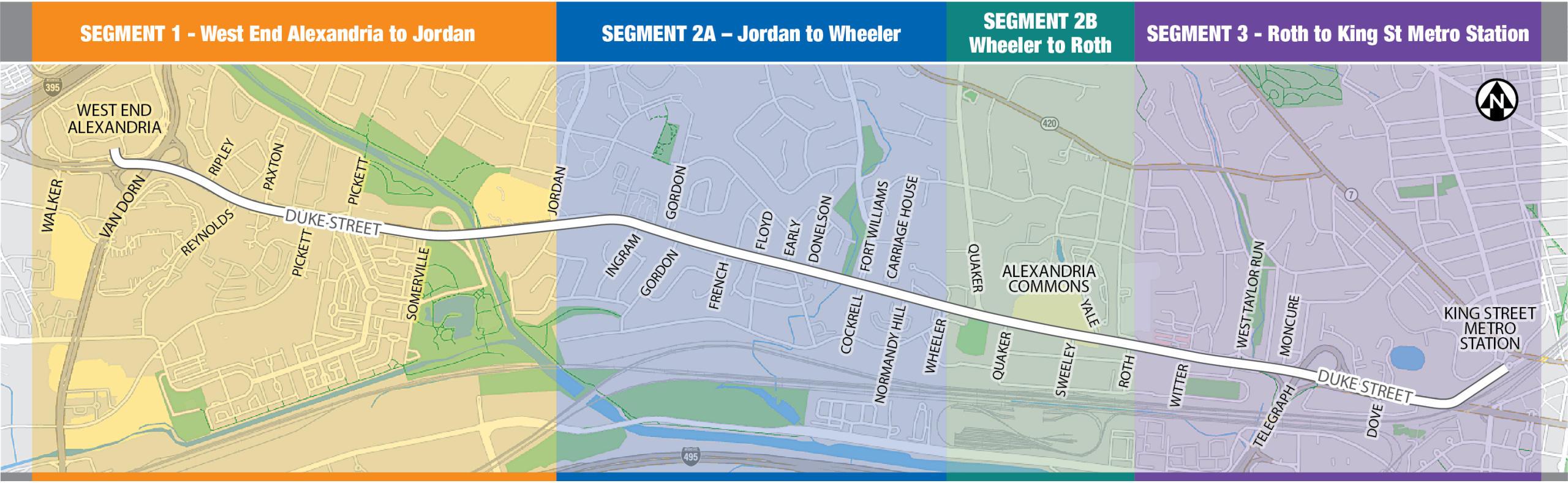
Curb Running



Mixed Traffic

Concepts have a mix of different treatments to make bus service faster and more reliable while balancing trade-offs

Duke Street Corridor Segments



Corridor Concept A

Mostly Center-running & Mixed Traffic

- **Segment 1:**
  - Center bus lanes in both directions
  - Utilize available roadway space for busway improvements
- **Segment 2A:**
  - Mixed traffic bus operations in both directions
  - Avoid residential service roads with busway improvements
- **Segment 2B:**
  - Eastbound center bus lane, westbound mixed traffic
  - Goal was to avoid Telegraph Road congestion
- **Segment 3:**
  - Eastbound mixed traffic through Telegraph Road to balance traffic and bus operations
  - Westbound center bus lane

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Corridor Concept B

Mostly Curb-running & Mixed Traffic

- **Segment 1:**
  - Curb bus lanes in both directions
  - Utilize available roadway space for busway improvements
- **Segment 2A:**
  - Mixed traffic bus operations in both directions
- **Segment 2B:**
  - Mixed traffic bus operations in both directions
  - Avoid significant impacts at Alexandria Commons
- **Segment 3:**
  - Eastbound mixed traffic, westbound curb lane through Telegraph Road interchange
  - Center bus lanes east of Telegraph to King Street

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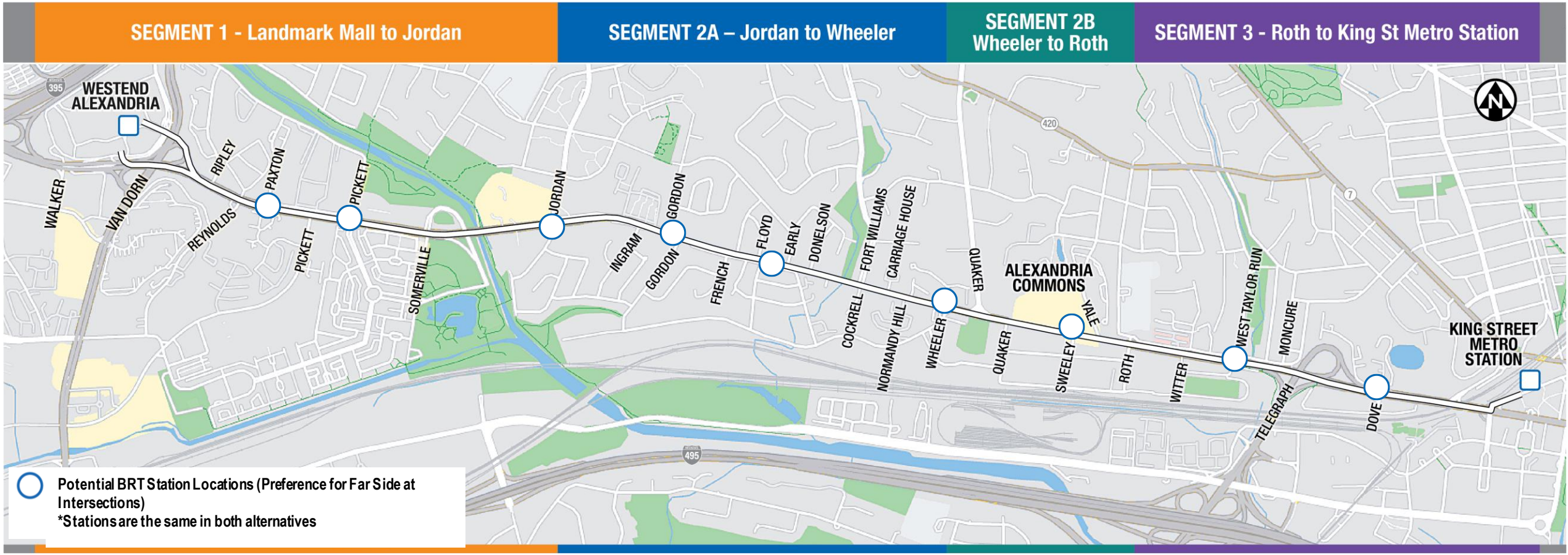
Corridor Stations



- Balance space constraints, activity centers, and convenient bus stop spacing
- Maximum spacing 0.5 miles, minimum spacing 0.25 miles, average spacing 0.4 miles
- .4 miles ~ 4 min maximum walk time to a stop if already on Duke Street

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Proposed Curb Concept Y

(North Side of Duke Street)

KEY

- Shared Use Path
- Cycle Track + Sidewalk
- Potential Woonerf (shared street) Location on Service Road

Shared Use Path

Two-Way Cycle Track

Woonerf

Cycle track locations reduce conflicts between pedestrians and cyclists

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Proposed Curb Concept Z

(North Side of Duke Street)

KEY

- Shared Use Path
- Cycle Track + Sidewalk
- Potential Woonerf (shared street) Location on Service Road

Shared Use Path

Two-Way Cycle Track

Woonerf

More shared use path provides a greater opportunity to add green space

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Concept Comparison

- Following slides show how Corridor Concept A and Corridor Concept B compare to each other.
- The "Business as Usual" results show expected future conditions if no changes are made to the roadway. These are also compared to Concept A and B where applicable.
- Models were used to develop many comparisons. Models are informative, but not a crystal ball.
- Details about the comparisons can be found at alexandriava.gov/DukeInMotion.

2030 Business as Usual Scenario

Includes:

- **Transportation Improvements**:
  - Adaptive signals
  - West Taylor Run
  - Landmark redevelopment roadway improvements
  - West End Transitway
- **Currently planned development** (West End Alexandria, Land Rover dealership)

Daily volumes are projected to increase by 10%

Duke Street peak delay is projected to increase by 20-30%

Guiding Principle Comparative Metrics

Convenient

- Transit Reliability
- Station Experience
- Transit Frequency

Equitable

- Serving needs
- ADA Access
- Access time

Vibrant

- Access to Services / Jobs / Recreation / Future Development

Sustainable

- Alternative Modes / Travel options

Efficient

- Bus Travel Time
- Car Travel Time

Safe

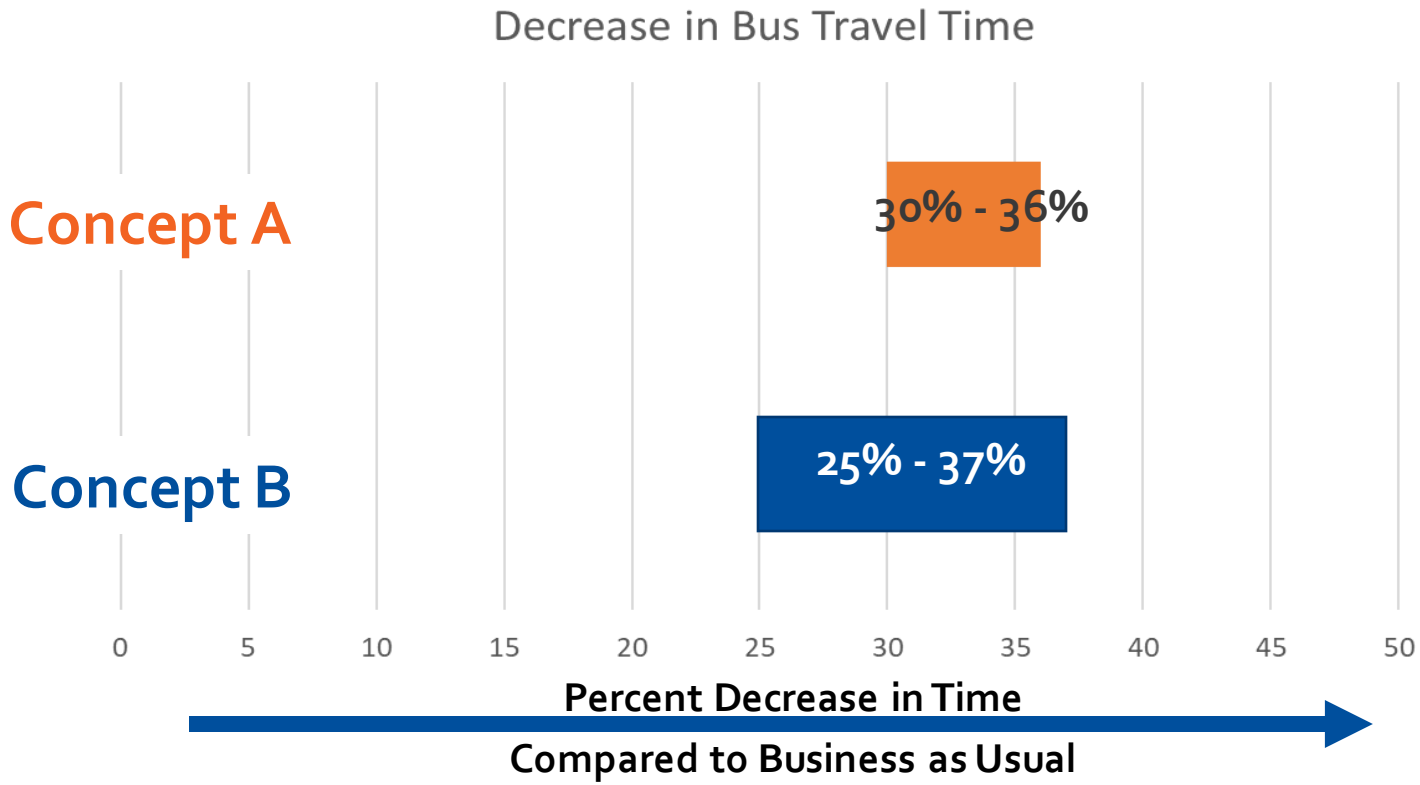
- Pedestrian Safety
- Bicycle Safety
- Intersection Safety

Impacts

- Impact to Service Road
- Parking
- Impact to ROW
- Project Costs

Efficient

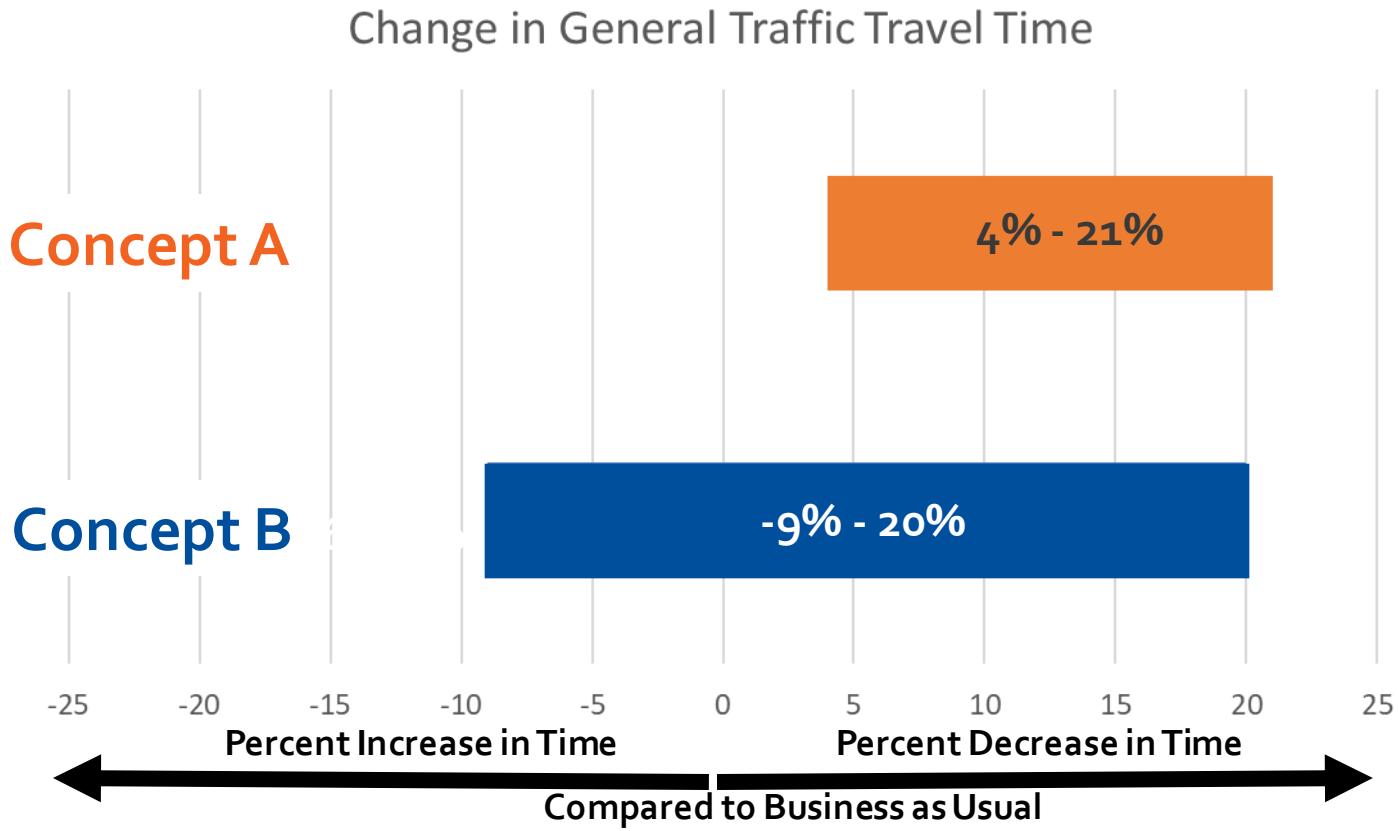
Travel Time (Bus)



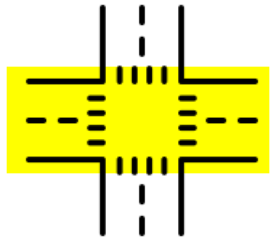
- Both concepts significantly improve bus travel times in the afternoon/evening rush hour
  - Afternoon/evening rush hour was determined to be the most challenging hour of the day based on initial traffic and bus data
  - Concept A improves a little more than Concept B, on average

Efficient

Travel Time (Vehicular)

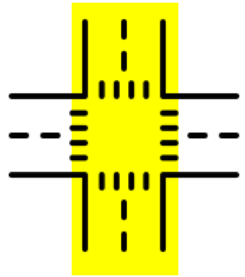


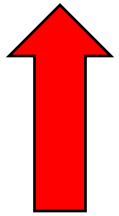
Duke Street Delay



Delay decreases with increased green time

Side Street Delay





Delay increases with bus and Duke Street priority

Convenient

Transit Reliability
(Bus travel time variability)

Concept A

Less than 1 minute variability

Concept B

Less than 2 1/2 minute variability

- Both concepts are highly reliable & provide improvement
- Concept A is less variable (locations with center bus lanes)
- Concept B is more variable (locations with curb bus lanes/mixed)
- Modeling limitations may underestimate variability in Concept B

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Sustainable

Alternative Modes / Travel Options
(Ridership)

Concept A

5,940 riders/day (210% increase)

Concept B

5,770 riders/day (205% increase)

- Both concepts increase ridership significantly
  - Increase is primarily driven by faster, more reliable bus service
  - Other scenarios show similar percentage increase in ridership
- Zero-car household ridership more than doubles for both concepts
- Bus trips for households with cars increase, suggesting that some trips by car could be eliminated from Duke Street in the future

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Safe

Pedestrian Safety

Concept A

28 refuge islands

25 Protected Lefts

Concept B

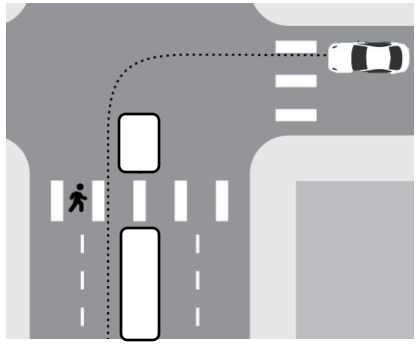
10 refuge islands

4 Protected Lefts

Pedestrian Refuges

46%-56% reduction in pedestrian crashes

FHWA



Protected Lefts and Calming

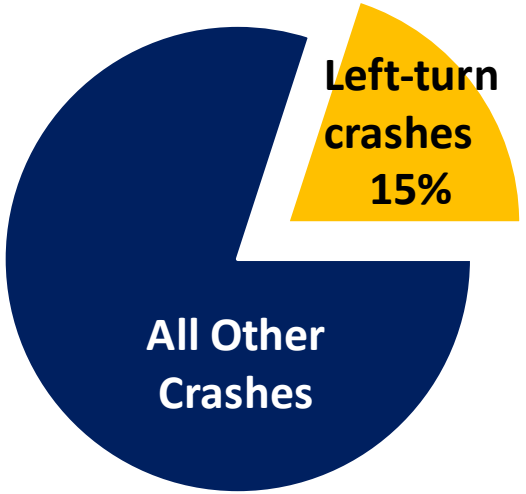
Up to 18% reduction in pedestrian crashes

VDOT

Safe

Intersection Safety

Duke Street Crashes

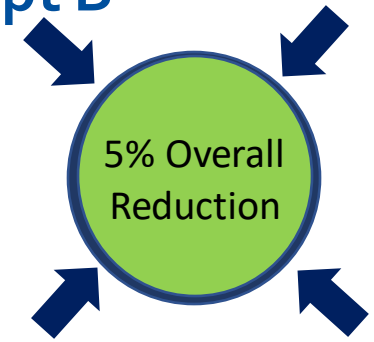


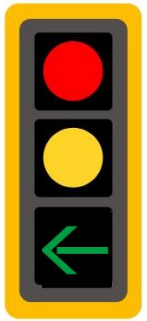
Concept A

70% Left-turn crash reduction

Concept B

10% Left-turn crash reduction





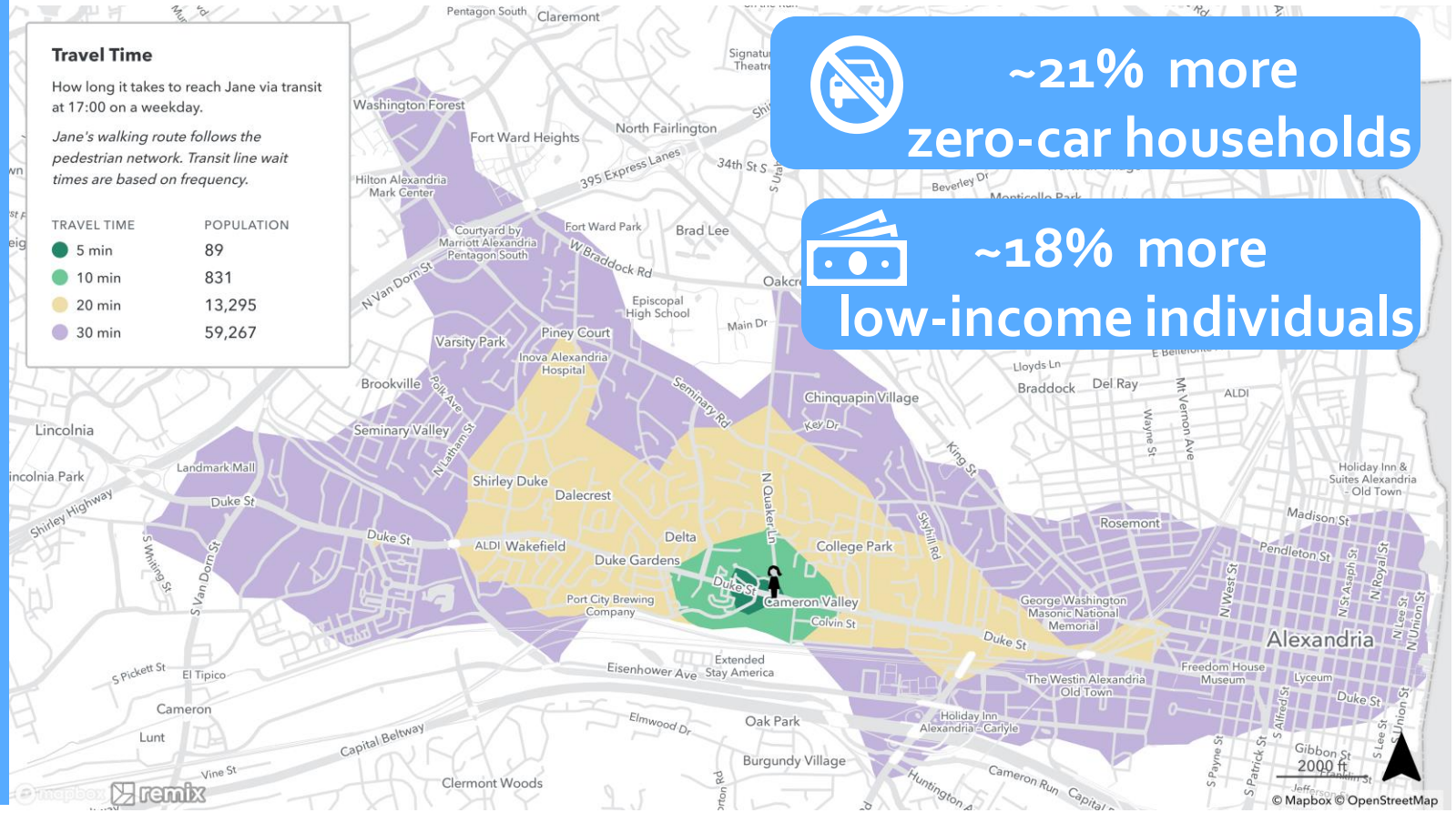
Protected left turns (which require a green arrow) reduce left-turn or angle crashes by 99%

NCHRP Report 617

Equitable

Serving Low-Income and Zero-Car Households

Increased access to jobs within 30 minutes by transit from Alexandria Commons:



Vibrant

Improved Access
(Access to Activity Centers)

- **Access to activity centers within 30 minutes by transit, driven by faster bus service**

~13% more residents within 30 minutes of **Alexandria Commons** by transit

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Impacts

Right of Way
(Number of parcels potentially touched)

Concept A
10-19 Parcels

Concept B
12-21 Parcels

- Between Quaker and Roth is the area of most significant right-of-way impact in Concept A
- Survey will be completed as design advances, so impacts will be refined
- Curb feature impacts are being assessed and are similar for both concepts, outside of the Quaker to Roth area
- Continued planning and design will work to minimize needs

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Impacts

Cost

(Based on initial conceptual estimates and contingencies)

Concept A

$90-100M

Concept B

$70-80M

- While the initial cost estimate shows that either concept is close to target budget of $85M, Concept A included more "nice to have" curb features
- Includes healthy contingency amounts
- Opportunities to blend elements from either concept to hit target budget
- Costs will refine as more design information, utility information, and survey information becomes available

DUKE STREET IN MOTION

Guiding Principles Comparative Metrics

Convenient

- ✓ Transit Reliability
- ✓ Station Experience
- ✓ Transit Frequency

Equitable

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- ✓ ADA Access
- ✓ Access time

Vibrant

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Sustainable

- ✓ Alternative Modes / Travel options

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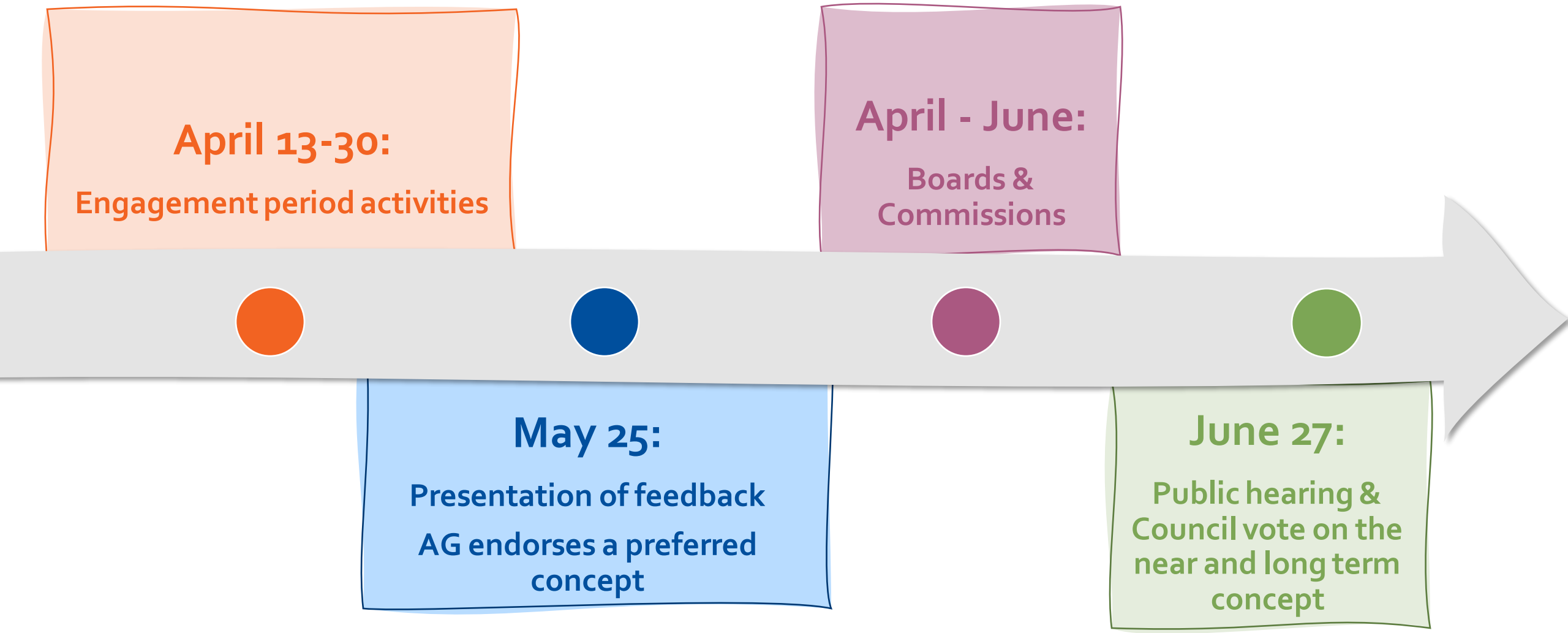
Next Steps & How to Be Involved

Upcoming Engagement & Key Meetings



Engagement Period Activities

Website

- Meeting Materials
- FAQs
- Feedback form

Pop-up Events & On-bus Chats

- Throughout April

Hello Duke Street

- Gathering input via text message
- Signage along Duke Street at bus stops and other community hubs

In-Person Meeting

- Bishop Ireton (Cafeteria)
- 5-7:30 pm: Open House
- 7:30 pm: Open Comment period
- Open house continues until 8:30 pm

In-Person Meeting		
April 20	**Event @** Bishop Ireton School	5-8:30 PM

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Provide Input Through April 30

Feedback Form available at: alexandriava.gov/DukeInMotion

Attend in-person meeting and speak with staff

Email: Jen Monaco: jennifer.monaco@alexandriava.gov

Get Updates: Sign up for Duke Street Projects eNews

Thank you!

alexandriava.gov/DukeInMotion