

BROADWAY CORRIDOR STUDY

Presentation of Alternatives

Wednesday, December 11th, 2019

AGENDA

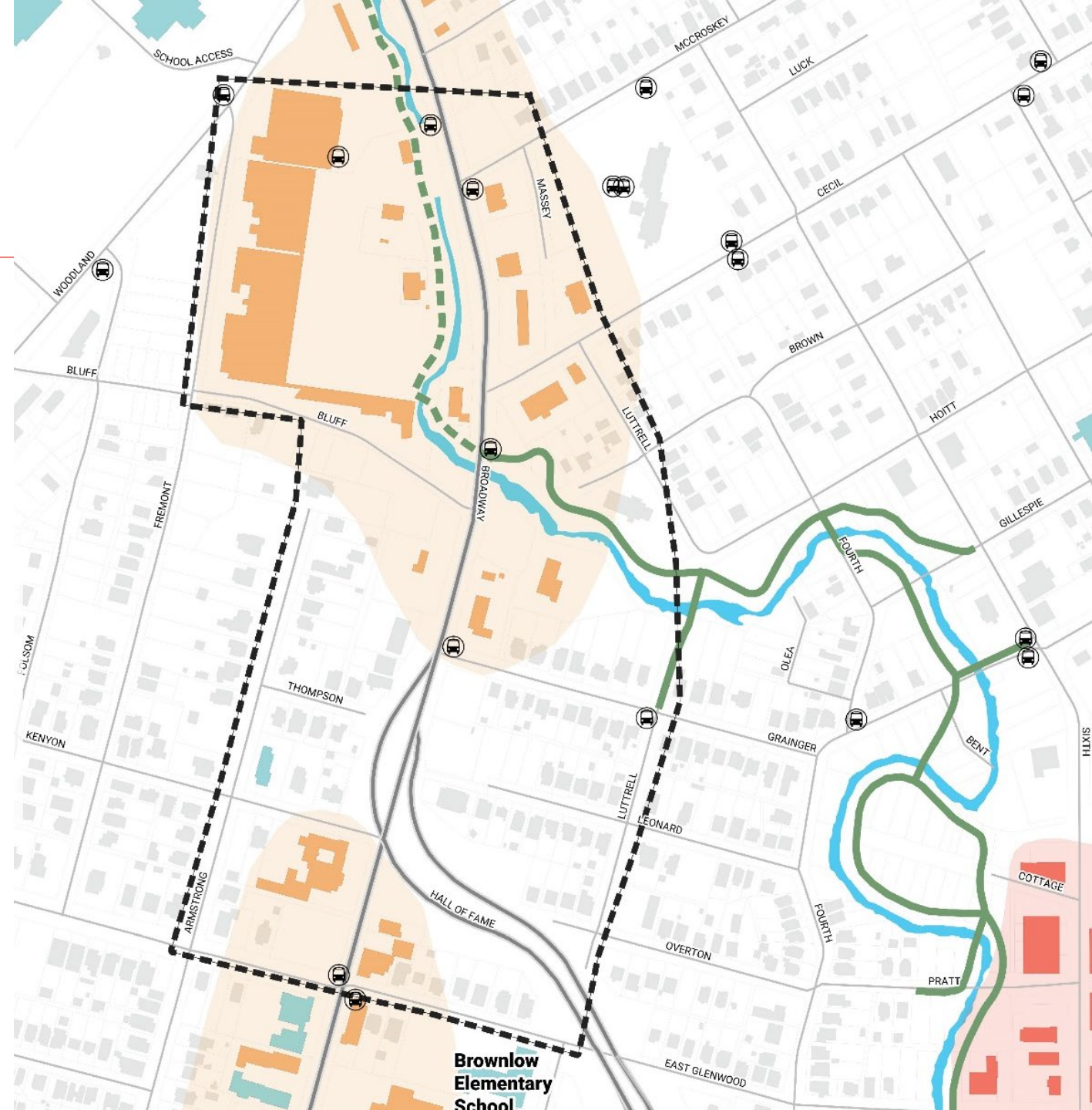
- Project review
- What we heard
- Intersection Alternatives
- Review of Traffic Analysis
- Feasibility Matrix
- **VOTE!**

PROJECT REVIEW



PROJECT AREA

- McCrosky to Glenwood
- Focus on Broadway / HOF and Broadway / Cecil intersections



BROADWAY TODAY



PEDESTRIAN CONDITIONS



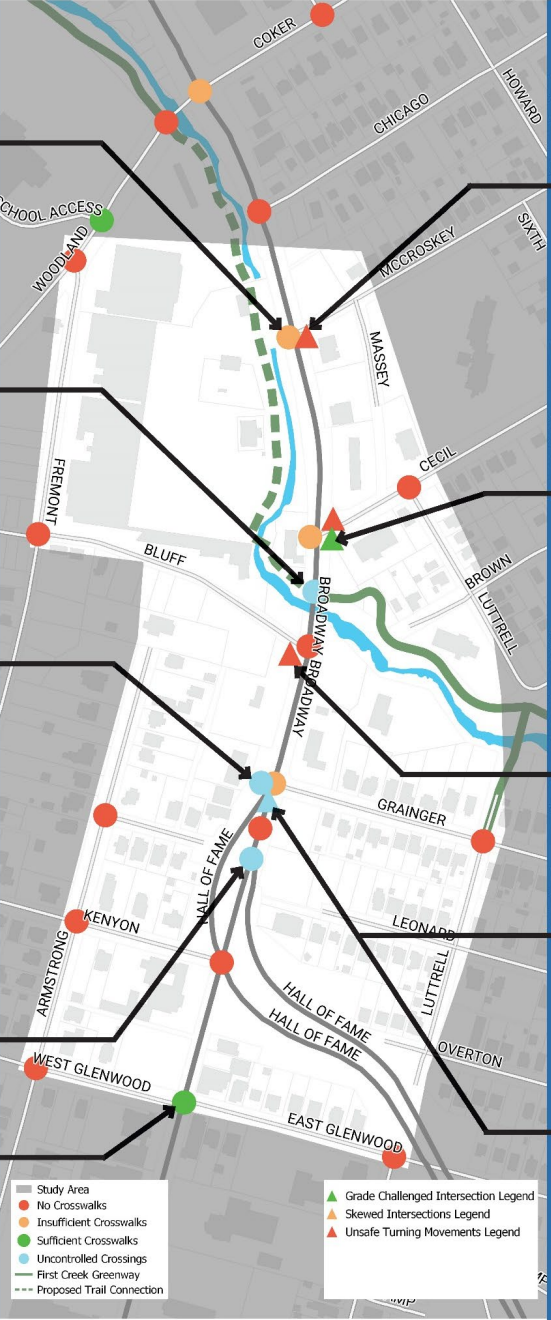
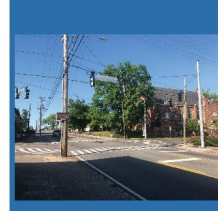
Several intersections lack complete pedestrian facilities such as crosswalks or ADA ramps installed at all corners. This deficiency hinders safe pedestrian and bicycle connectivity.



First Creek Greenway's proposed extension will connect across Broadway. It is important that this connection be safe and easy to navigate for all users.



Lack of crosswalks at intersections can contribute to pedestrians crossing at uncontrolled locations, which creates unsafe scenarios for both pedestrians and drivers.



VEHICULAR CONDITIONS



Skewed intersections can be challenging for drivers, pedestrians, and bicyclists. These configurations often hinder visibility for people driving, reducing driver response time at conflict points.



Grade challenged intersections are inclined streets that meet at an intersection and could pose a visibility and maneuvering challenge for drivers attempting to turn.



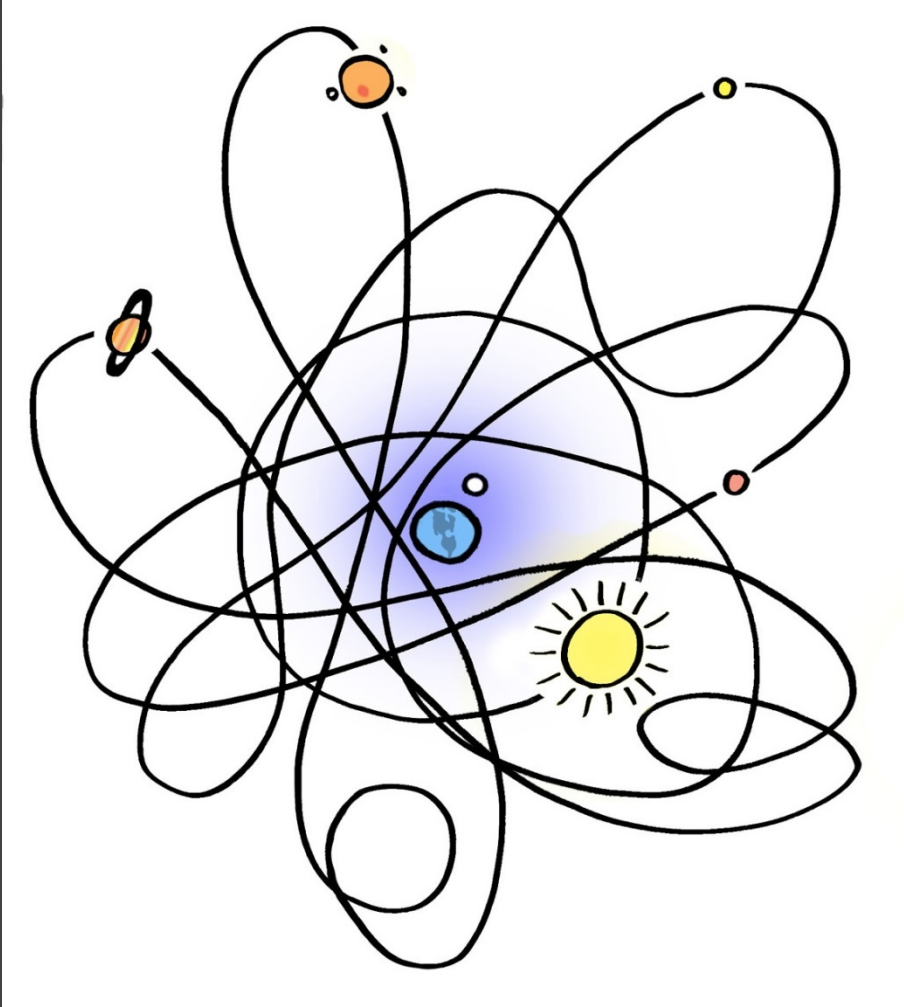
Unsafe turning movements risk the safety of other drivers and users of the Broadway Corridor. Facilities for protected intersections could reduce these unsafe movements that drivers take and improve safety for all other users on the street.

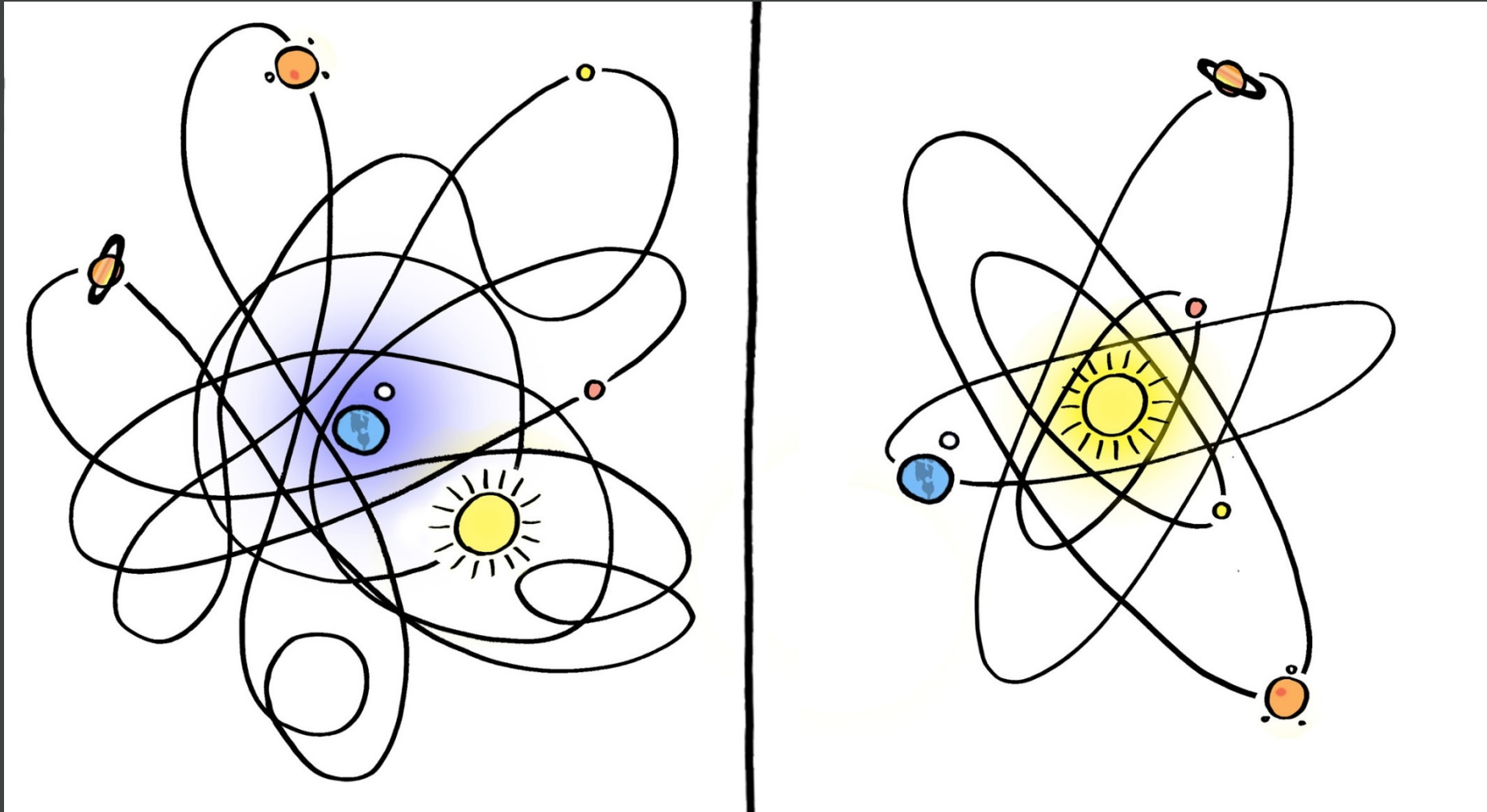


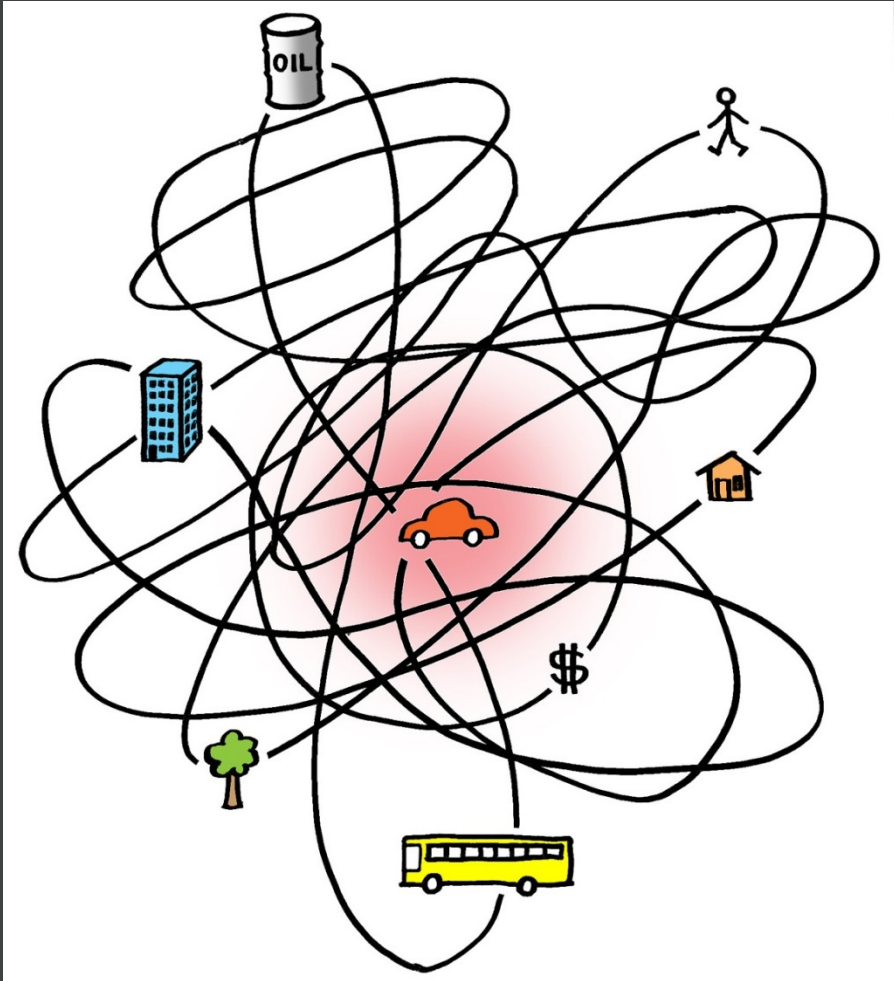
ROADWAY SAFETY

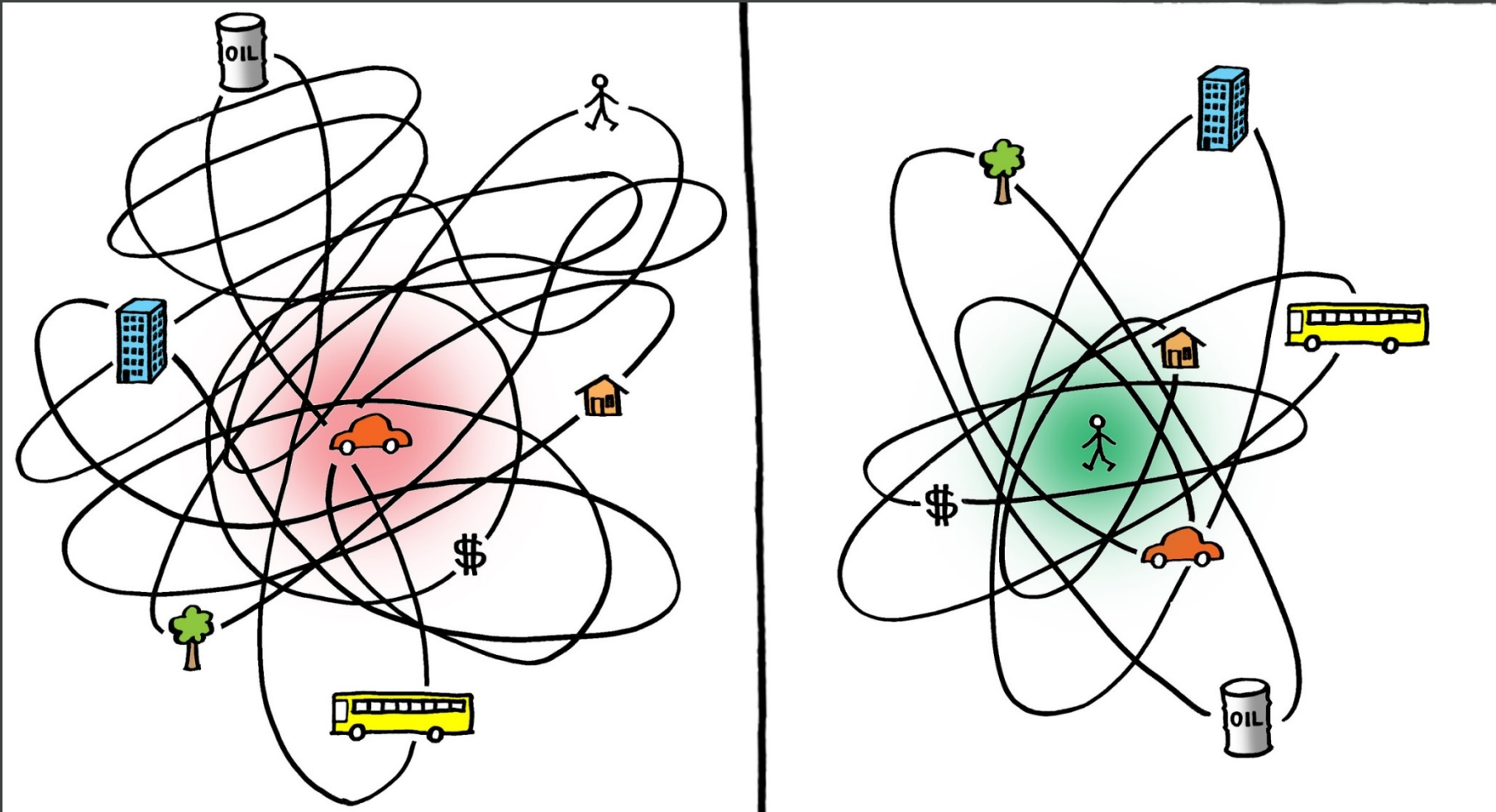
- This hotspot analysis indicates where bicyclist and pedestrian crashes have occurred from 2008-2017
- Groups of crashes are brighter than places with fewer crashes







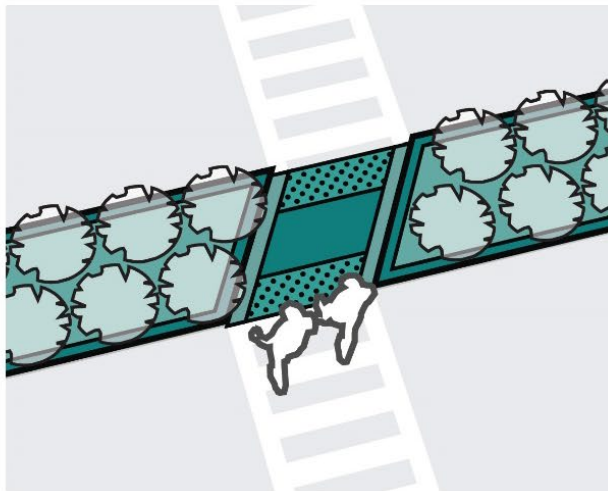




SAFE CROSSINGS

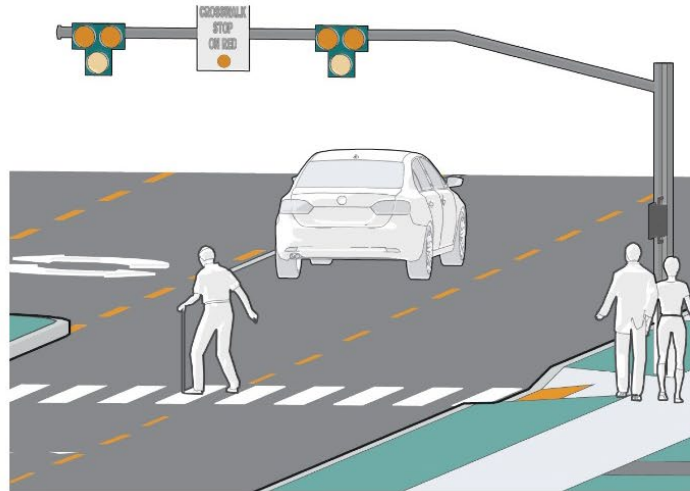
MEDIAN REFUGE

- Shortens crossing distances at intersections with many travel lanes.
- Allows for street plantings while also calming traffic speeds.
- Helps people who must cross streets slower feel more comfortable.



HAWK SIGNAL

- Push button actuated signal that stops traffic for people walking or bicycling at otherwise unsignalized crossings.
- Allows for safe trail, bikeway, or pedestrian crossings of high speed and congested roadways.

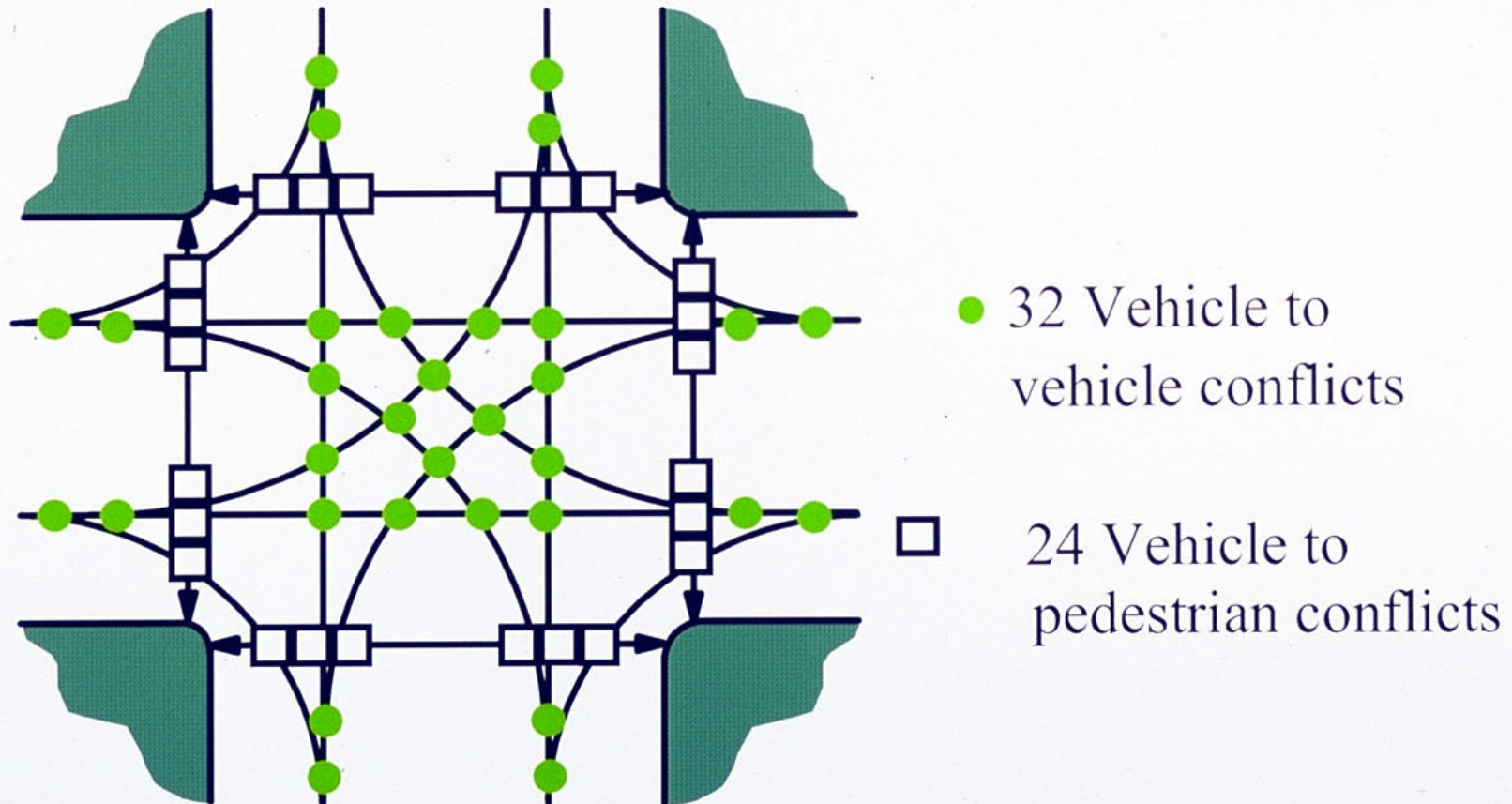


RAPID FLASHING BEACON

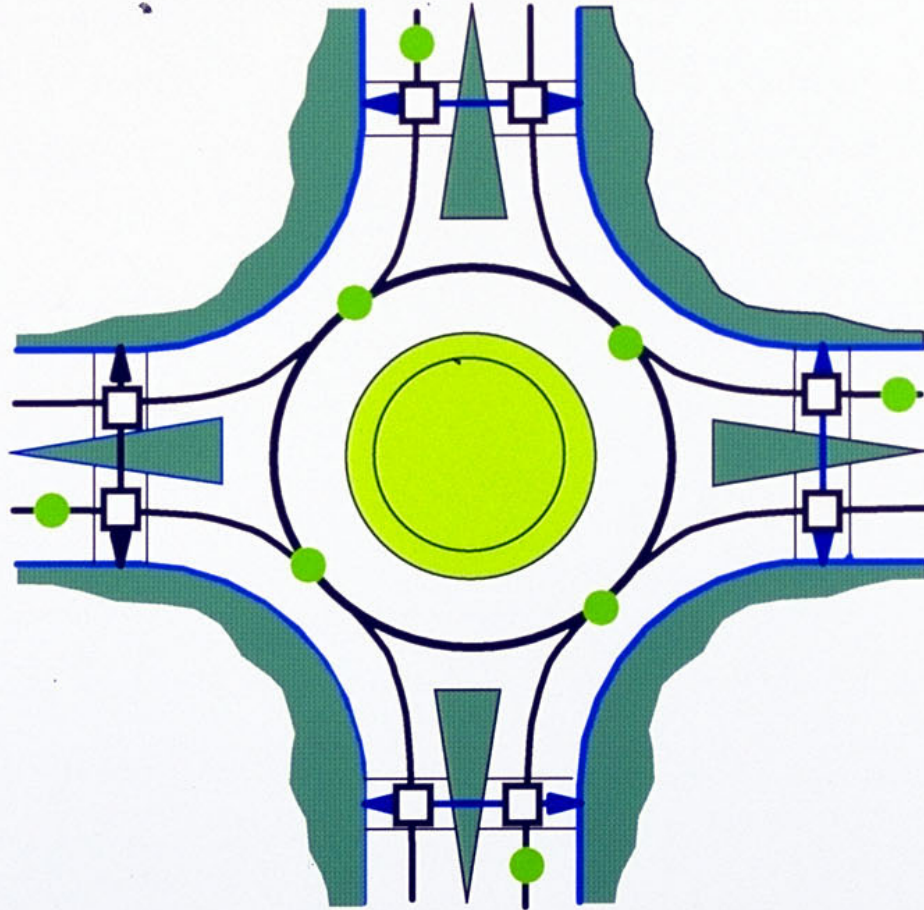
- Flashing light encourages drivers to yield to people at crosswalks.
- Often used at mid-block crossings (i.e., crossings not at intersections).
- Creates additional visibility at crossings during at night.



Conflicts At a Four-Way Intersection



Conflicts At Roundabouts



● 8 Vehicle to vehicle conflicts

□ 8 Vehicle to pedestrian conflicts

SAFE CROSSINGS - VIDEO

- Video: Pedestrians crossing a roundabout


WHAT WE HEARD

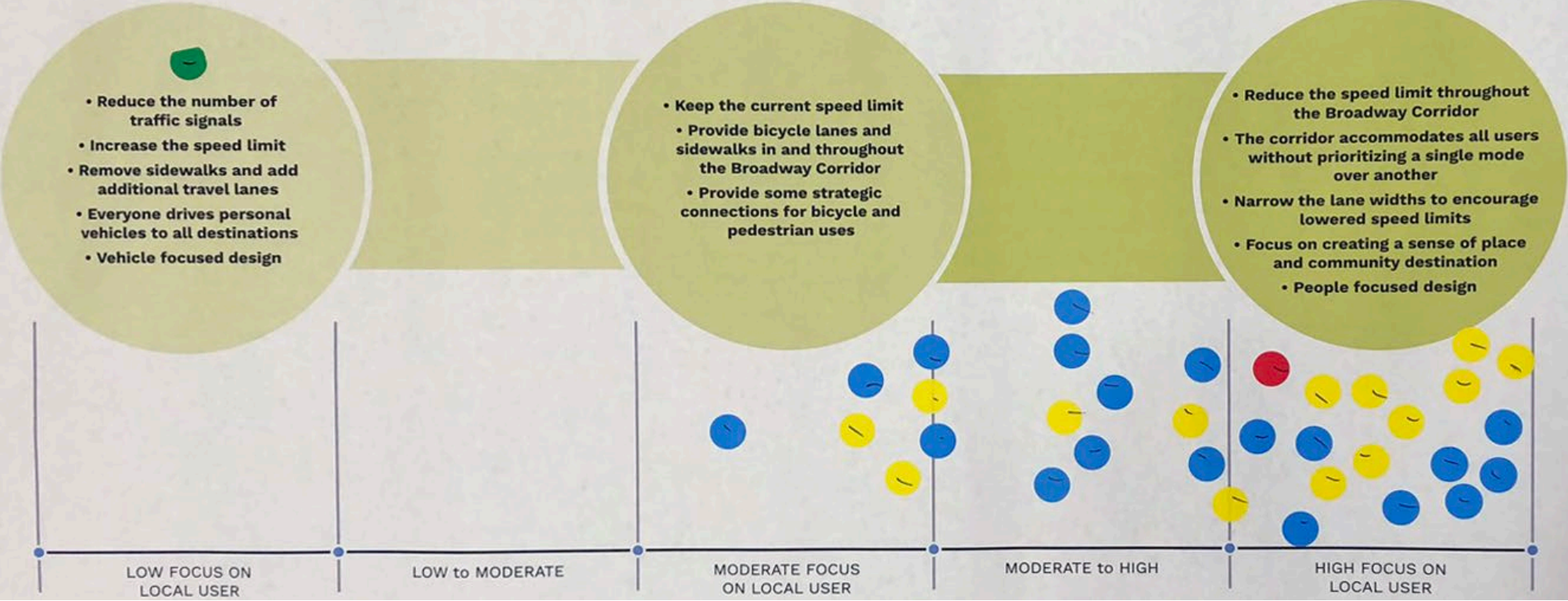


Balancing Priorities for

Local User

People use streets for many different reasons - life, work, school, accessing a destination. Residents, visitors all utilize the Broadway Corridor with different purposes in mind. Local user refers to daily users that access commerce, work, home, and other destinations within their community.

Please place your sticker dot  below the Local User Spectrum to indicate your priority.



3%

0%


11%

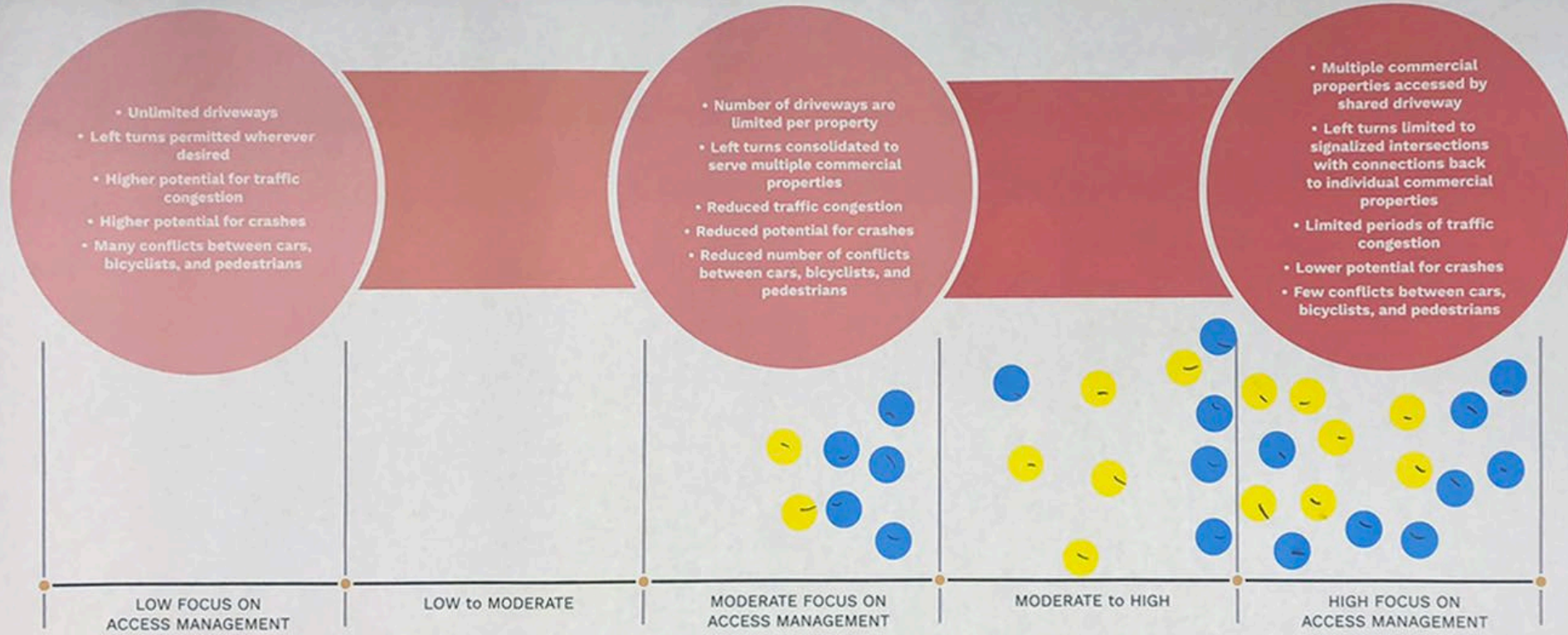
34%

51%

Balancing Priorities for Access Management

When a person driving a car decides to stop, turn, or change lanes, there is the potential for conflict with other people driving, walking, and bicycling. Access management organizes vehicle movements through strategic driveway placement, left-turn consolidation, and property connectivity.

Please place your sticker dot  below the Access Management Spectrum to indicate your priority.



0%

0%


22%

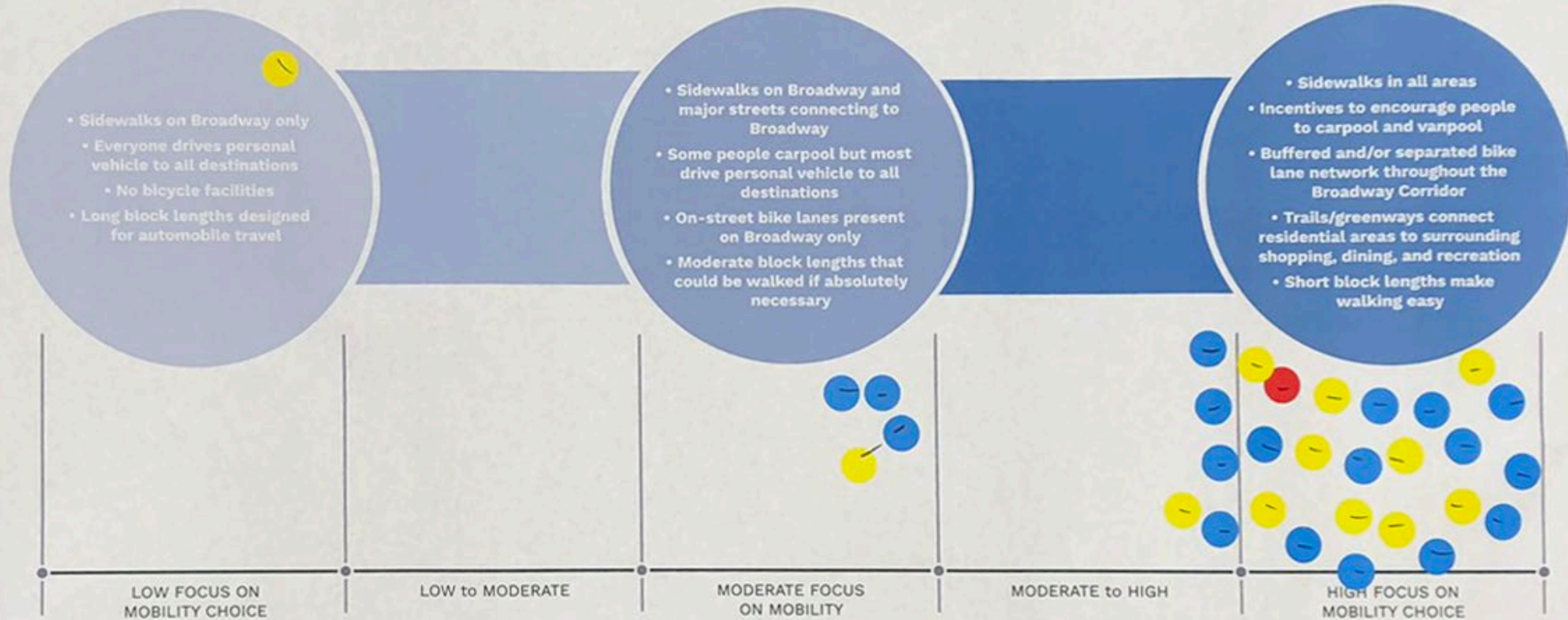
31%

47%

Balancing Priorities for Mobility Choice

There are many ways that people can travel - driving a car, walking, and bicycling to name a few.
The types of transportation facilities we provide influence our mobility choices.

Please place your sticker dot  below the Mobility Choice Spectrum to indicate your priority.



3%

0%

13%

16%

68%

WHAT DO YOU PREFER? DEVELOPMENT TYPES

We want to know your preferences for development types along Broadway Corridor

Please consider each of the photos below, then use the sticker dots to select three (3) development types that you would like to see along the Broadway Corridor.

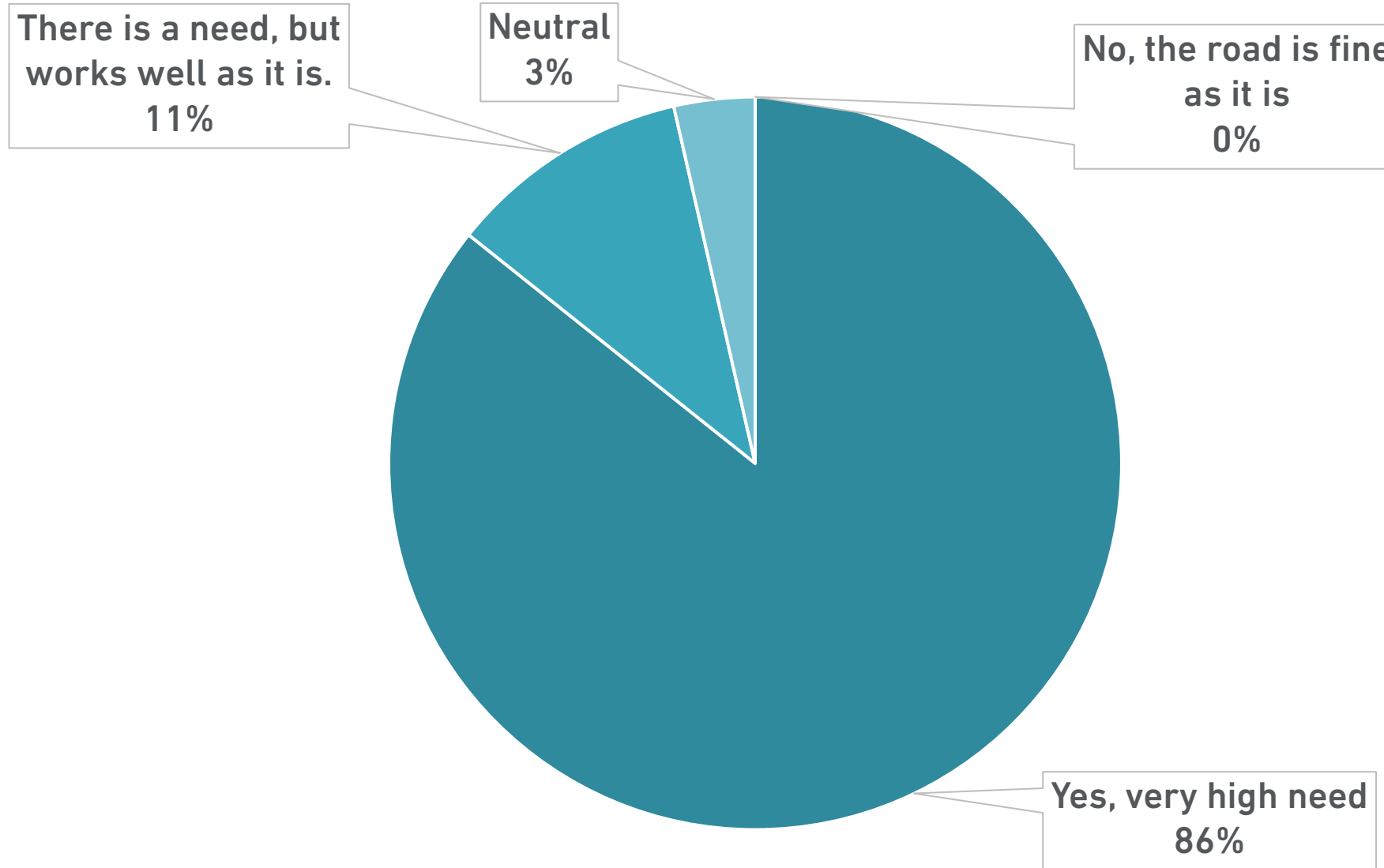
Thank you for your participation!



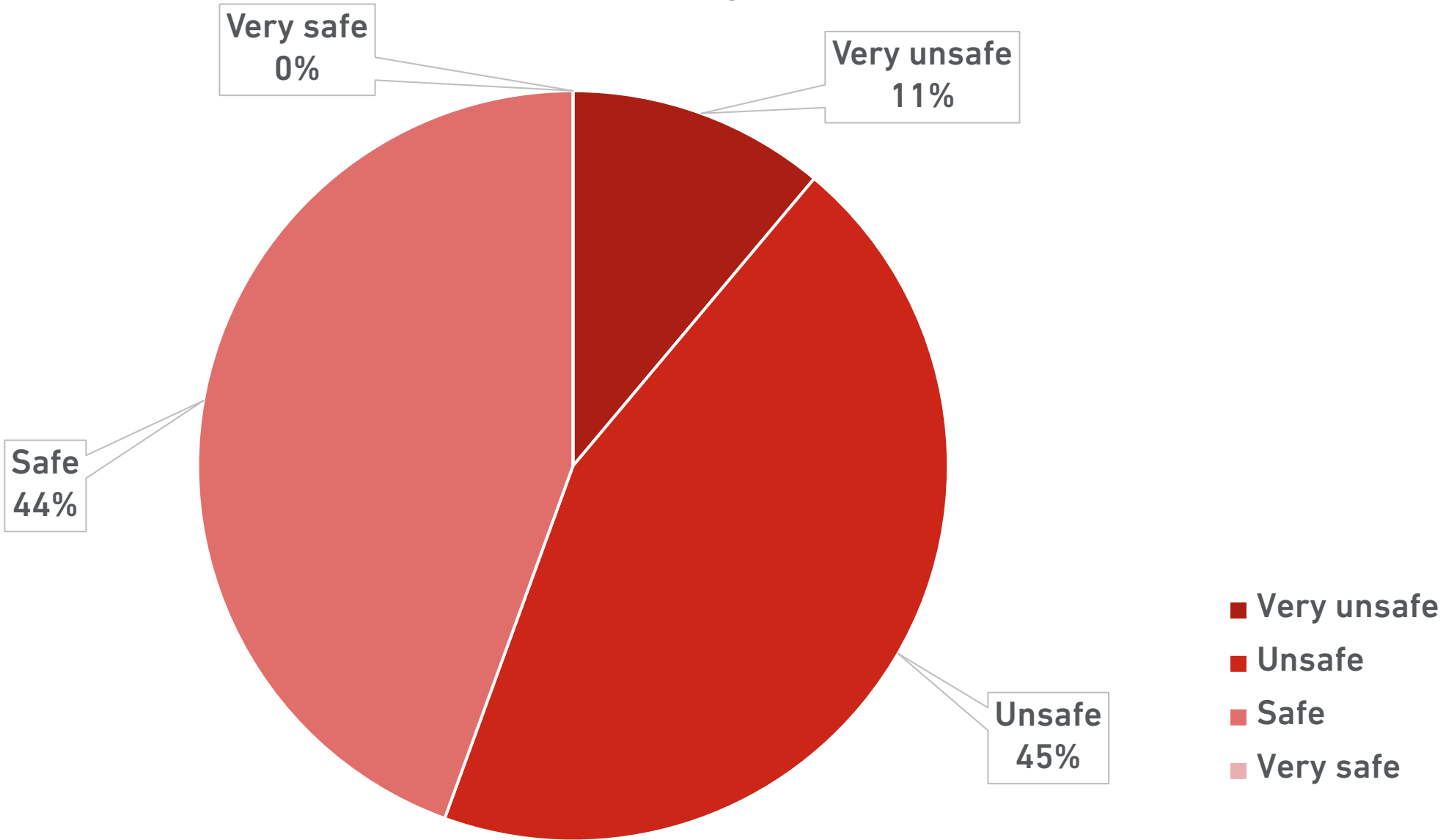
SURVEY RESULTS



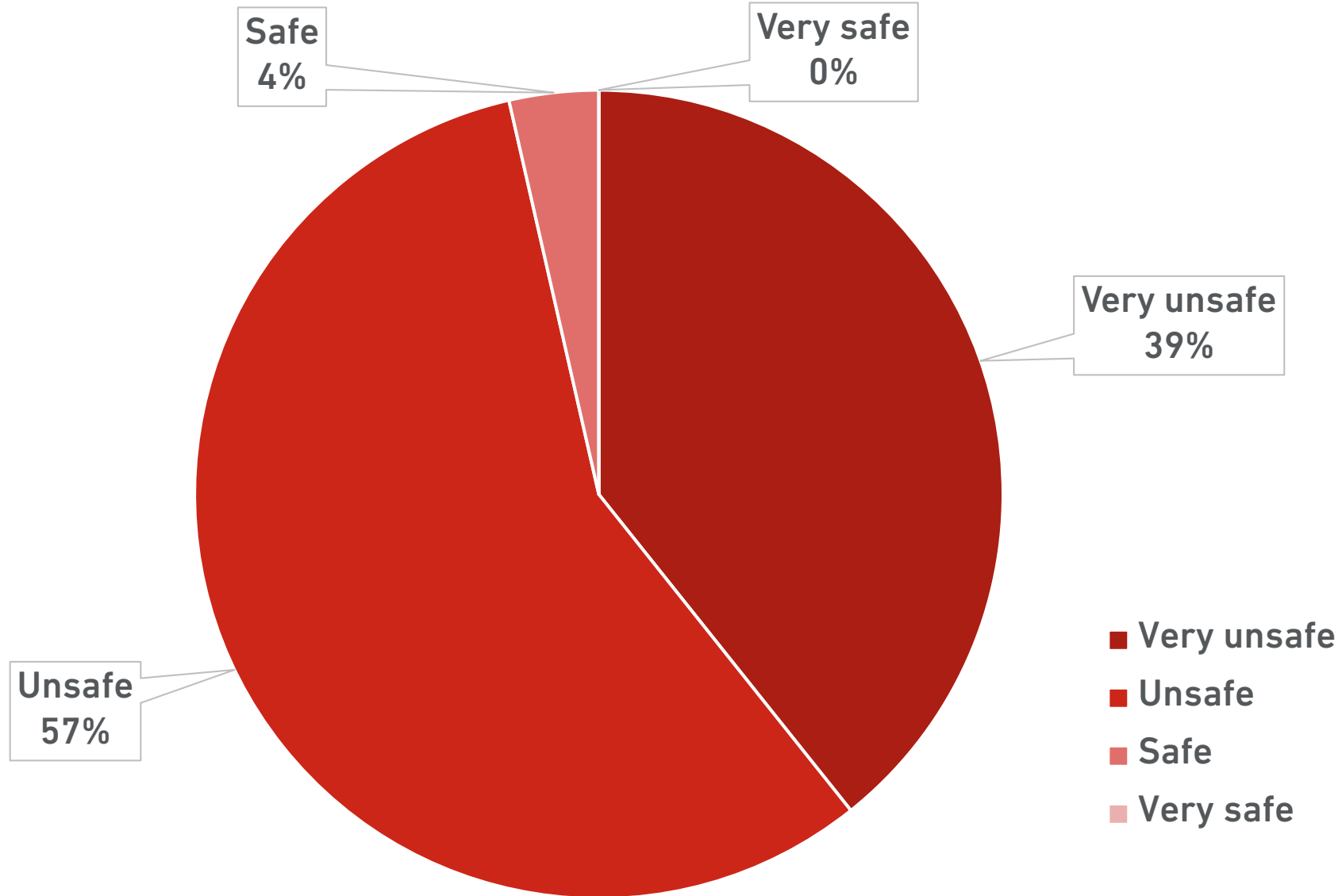
Is there a need for improvements to the Broadway Corridor?



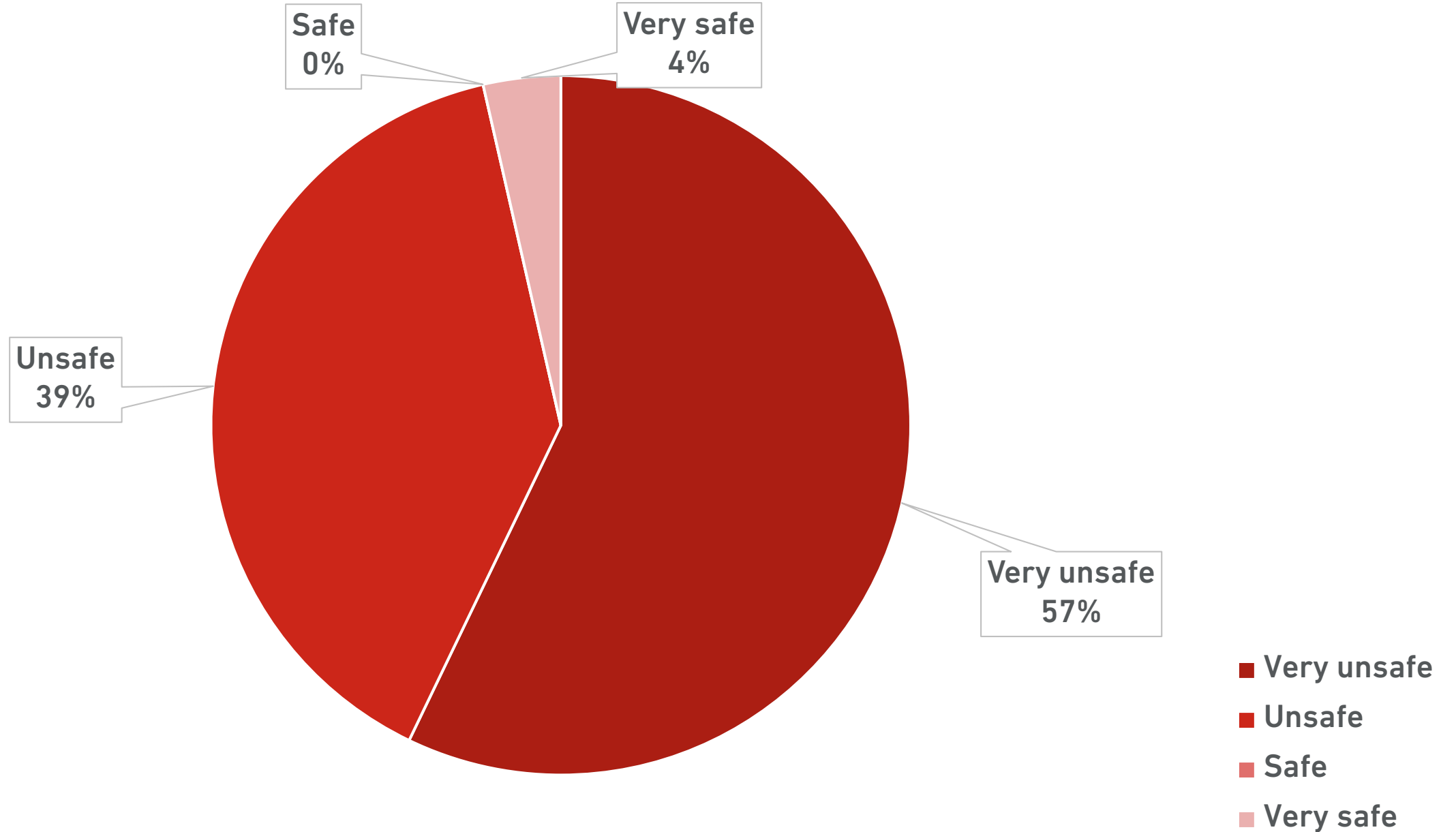
Please provide the level of safety you feel when driving on the Broadway Corridor



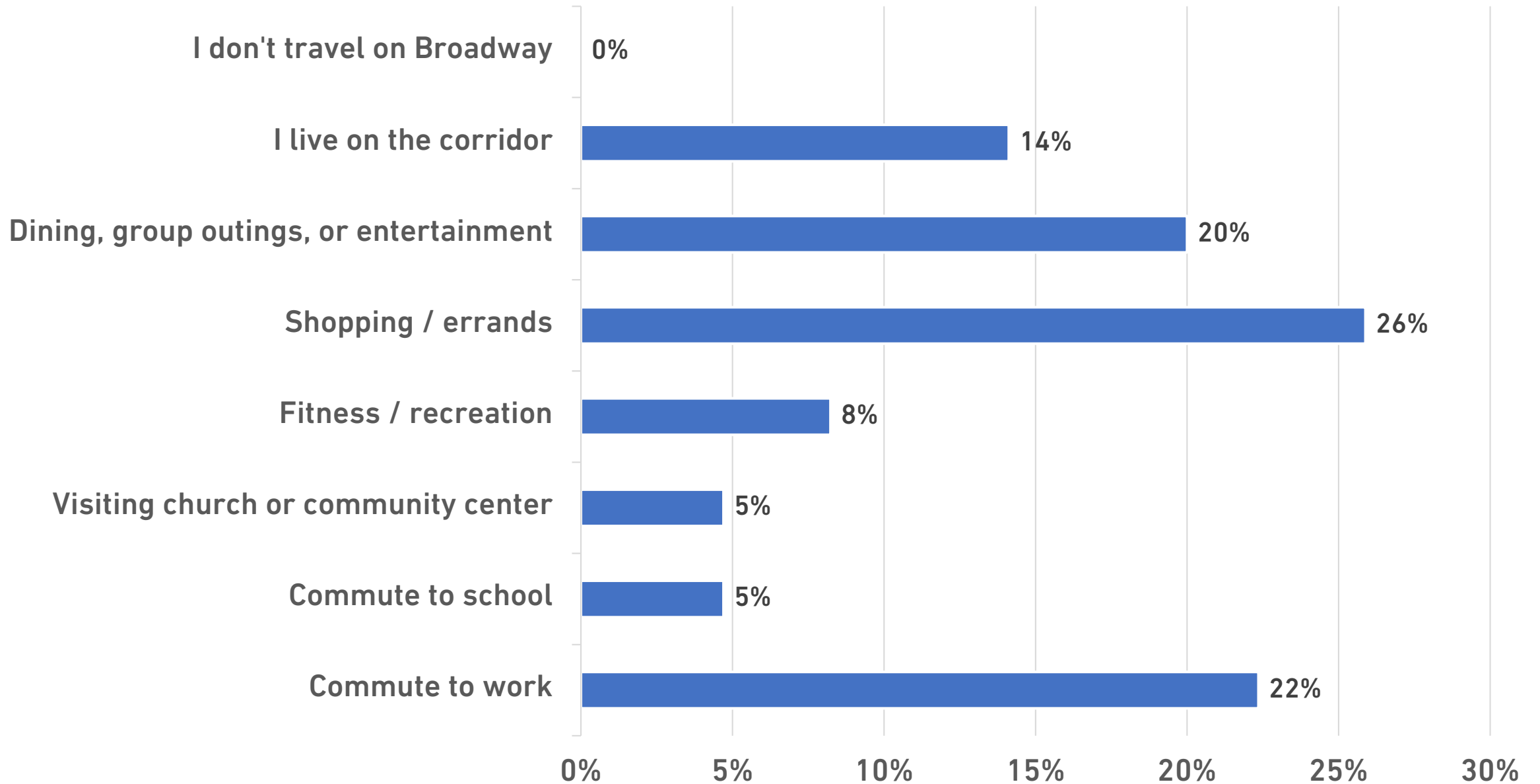
Please provide the level of safety you feel, or would feel, when walking on the Broadway Corridor's sidewalks



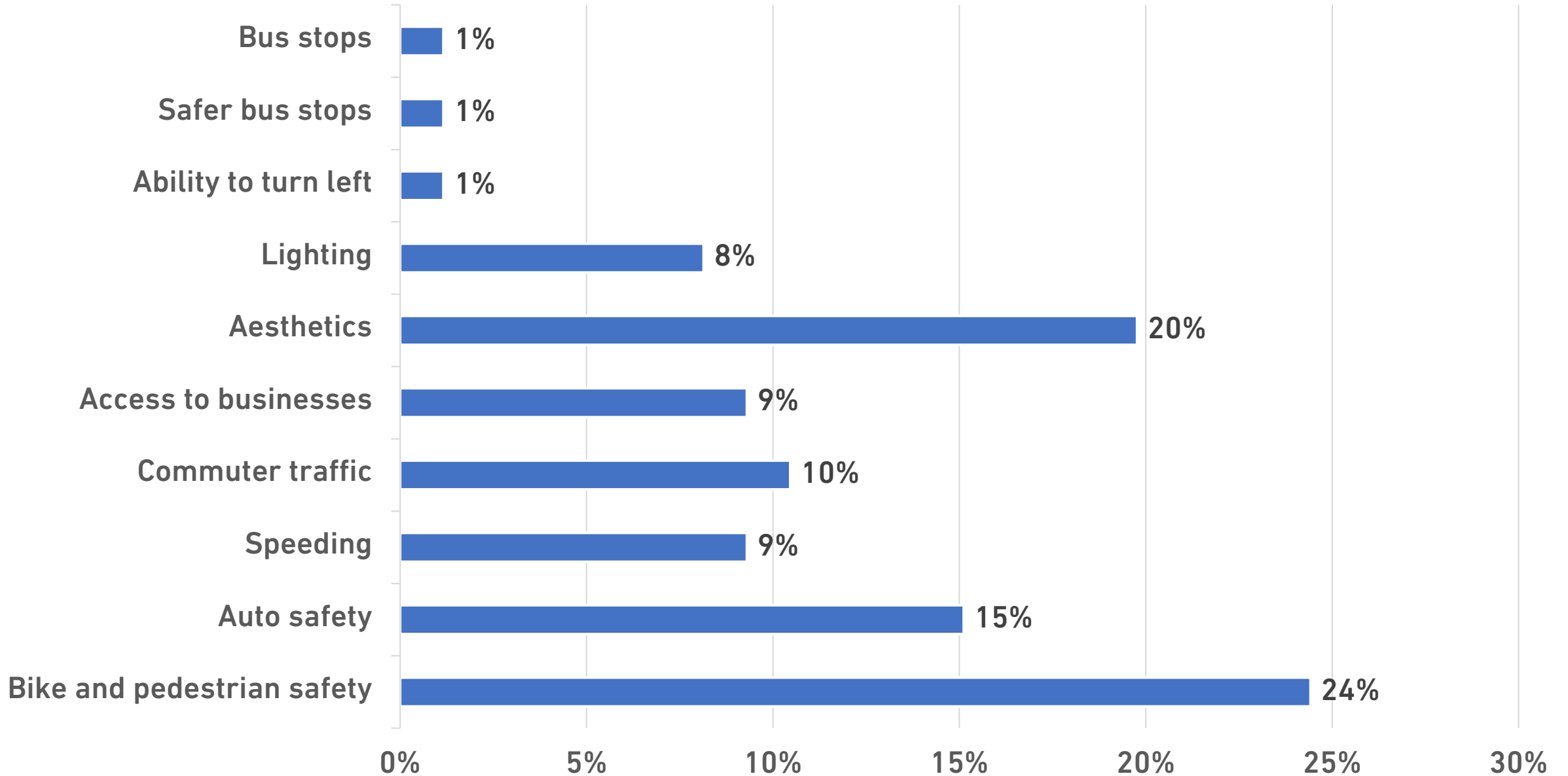
Please provide the level of safety you feel, or would feel, when biking on the Broadway Corridor



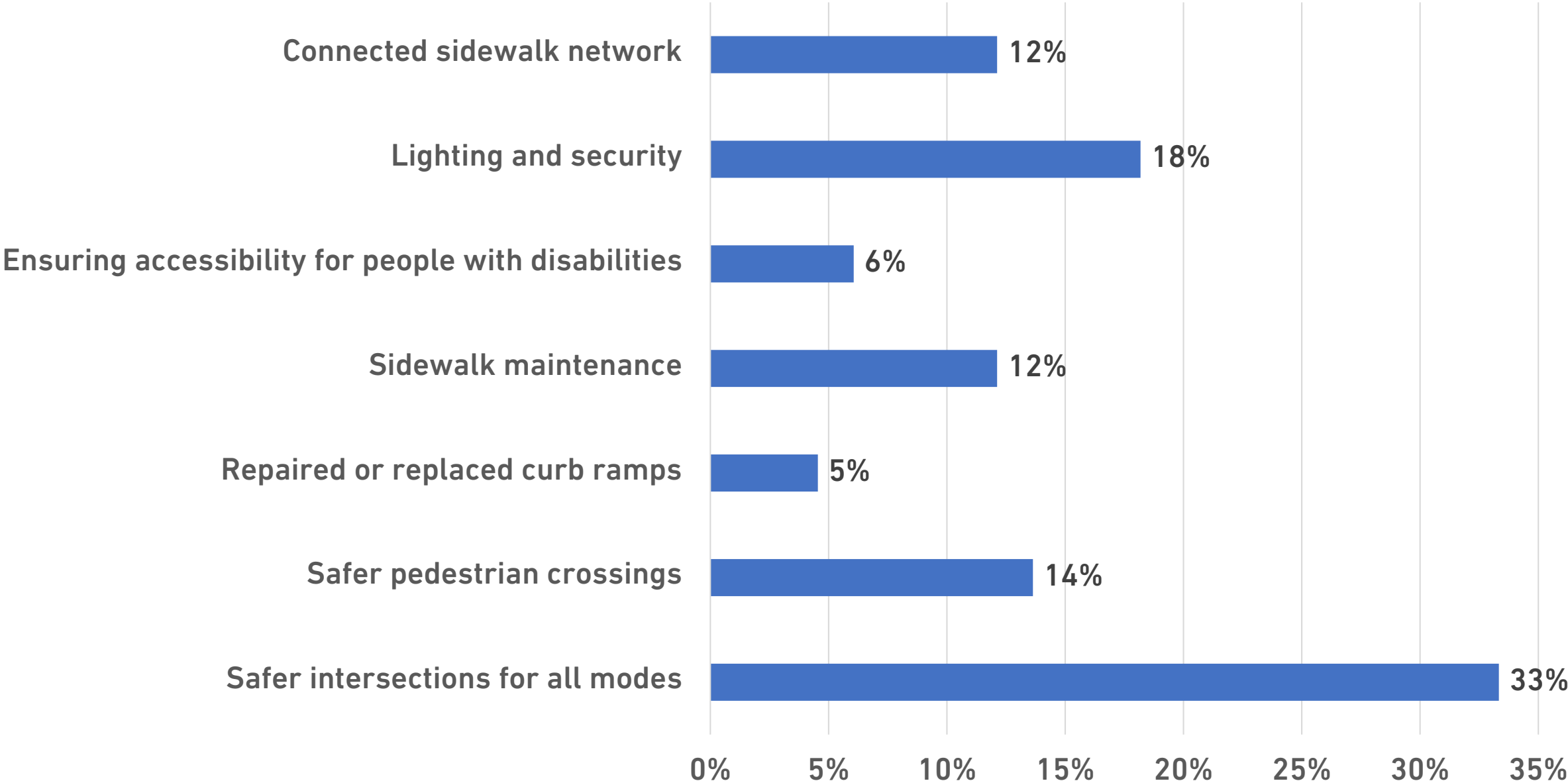
For what purposes do you travel on the Broadway Corridor? (Select all that apply)



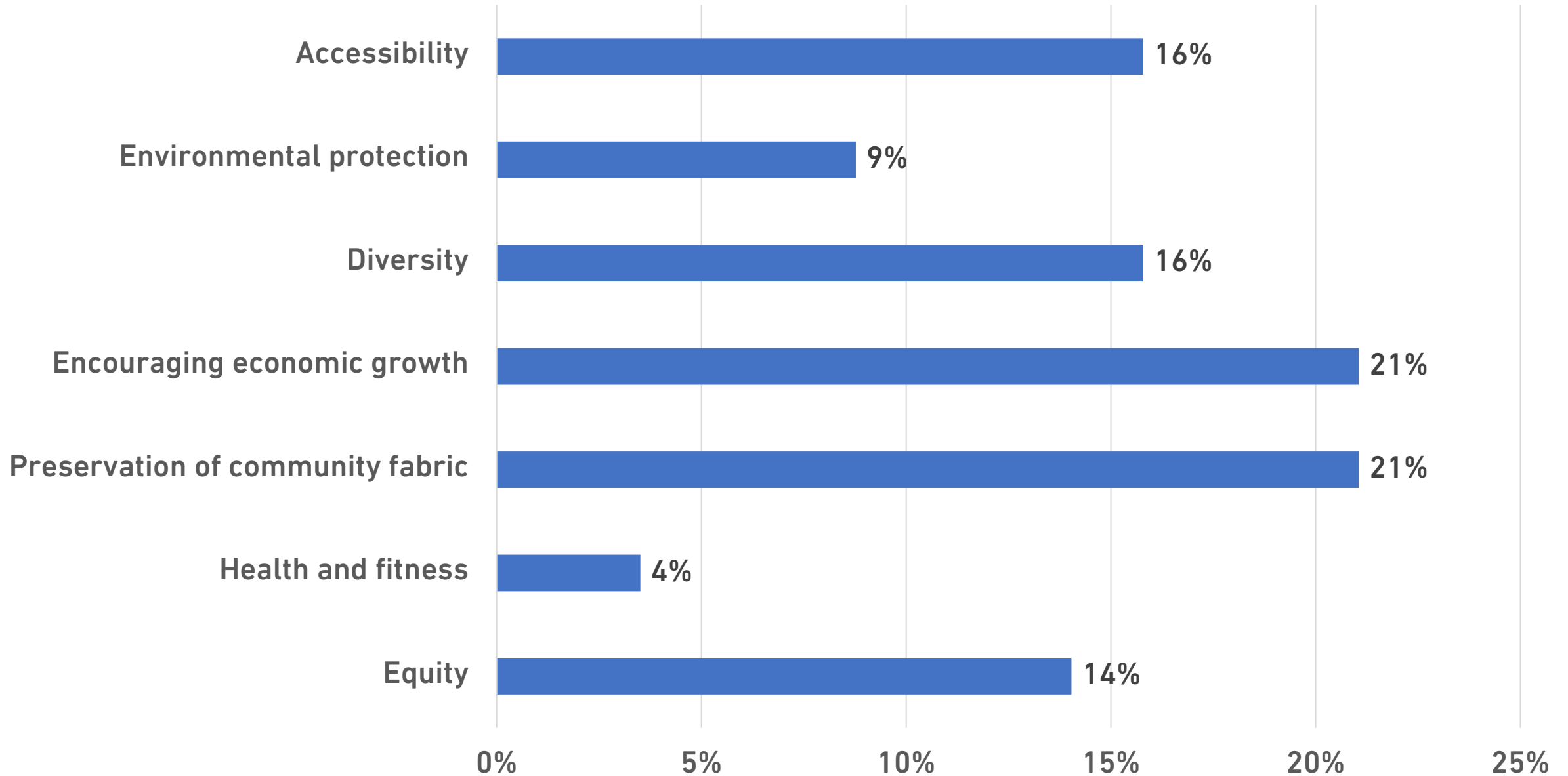
What are your primary concerns with the Broadway Corridor? (Select two)



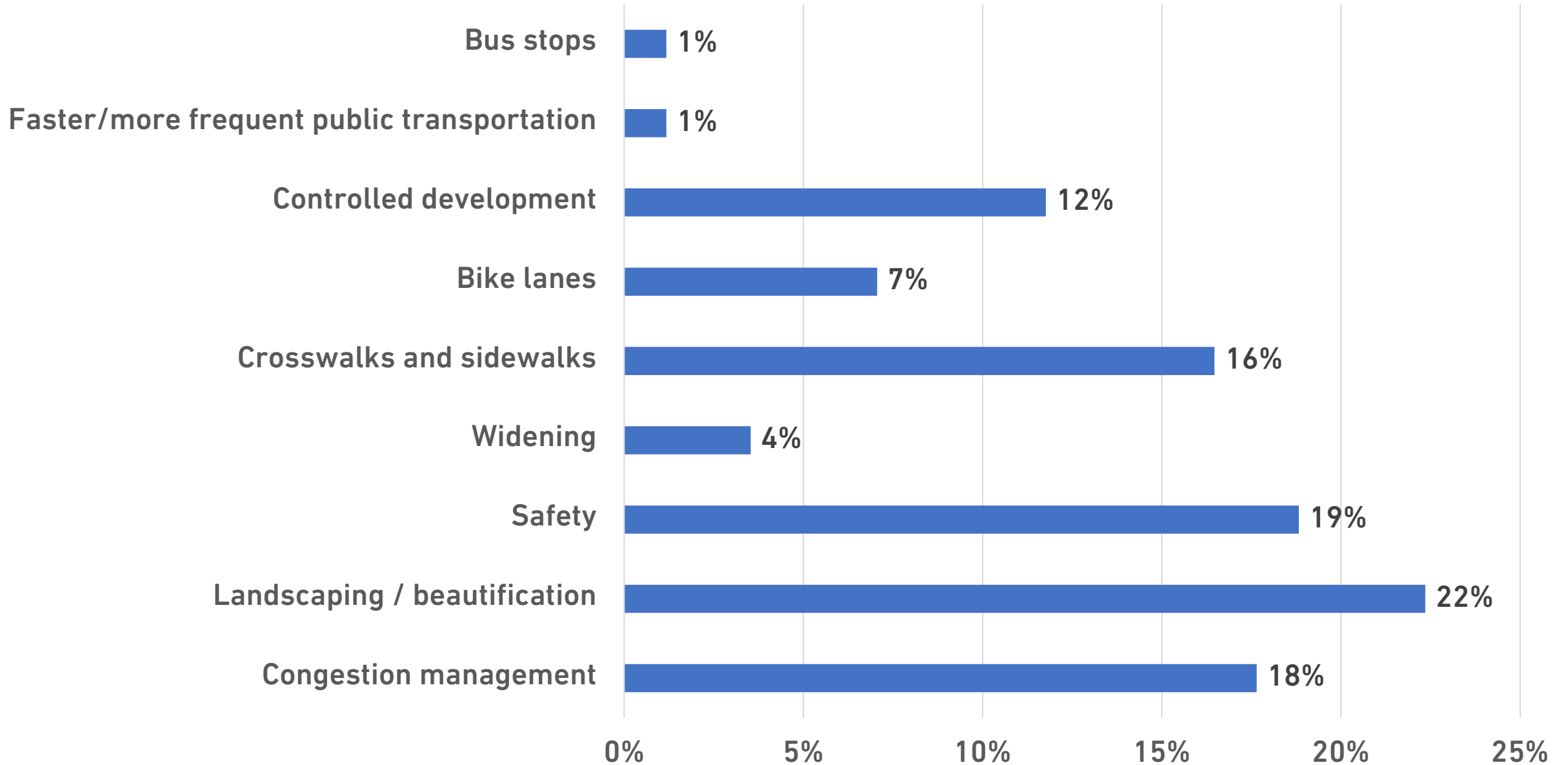
What is your top priority on the Broadway Corridor? (Select two)



Which are the most important in your community? (Select two)



What types of improvements are needed along the Broadway Corridor? (Select three)



STAKEHOLDER FEEDBACK

- Broadway Corridor Task Force
- Knoxville Police Department
- Knoxville Fire Department
- Knoxville Area Transit
- Fourth and Gill Neighborhood
- Old North Knox Neighborhood
- TDOT



ALTERNATIVE 1
T-INTERSECTION



ALTERNATIVE 2A
ROUNDBOUT



ALTERNATIVE 2B
ROUNDBOUT



SUMMARY



Stakeholder	T-INTERSECTION	ROUNDAABOUT 1	ROUNDAABOUT 2
BCTF			
KPD			
KFD			
KAT			
4 th & Gill			
Old North Knox			
TDOT			

KEY POINTS

- KFD: If the intersection is traversable, then any of the starter ideas are acceptable.
- KAT: The roundabout would positively impact Routes 21 and 22
- KPD, 4th and Gill, TDOT: Concerned about pedestrian crossings at roundabout; no dedicated pedestrian signal
- TDOT: Roundabouts are valid intersection designs provided traffic analysis shows that they'll function properly

GUIDING PRINCIPLES

The Broadway Corridor should:

- Provide multimodal connections across Broadway and between places
- Be safe for all ages, abilities, and users
- Contribute to community placemaking that stitches the urban fabric back together
- Accommodates commuter traffic to and from I-40 while balancing needs of all users
- Contribute to local character, a sense of place, and an attractive environment
- Encourage opportunities for economic vibrancy and business diversity

INTERSECTION ALTERNATIVES



ALTERNATIVE 1

SIGNALIZED T
HOF + BROADWAY



ALTERNATIVE 2

SIGNALIZED T
BROADWAY + HOF



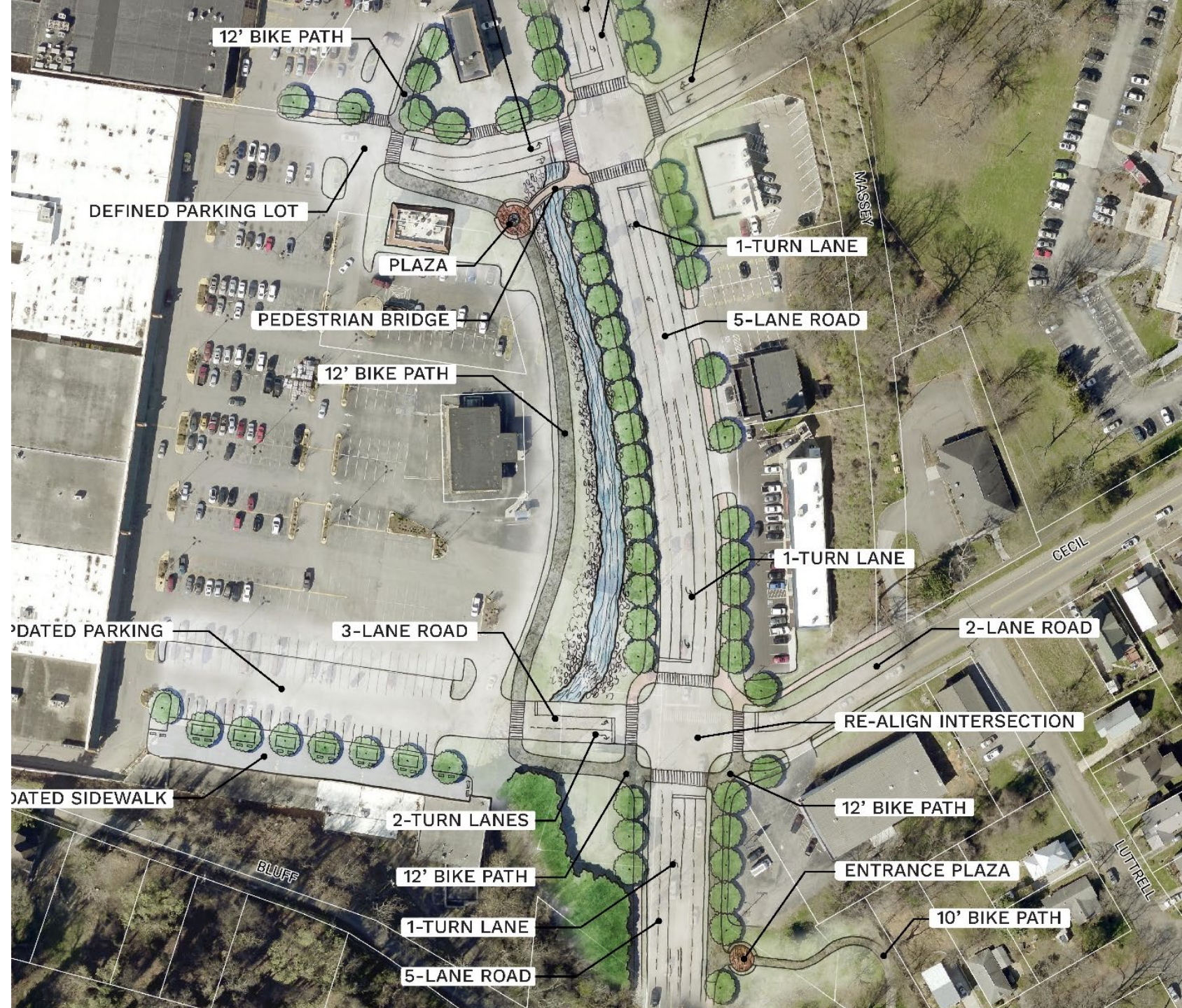
ALTERNATIVE 3

ROUNDAABOUT
BROADWAY + HOF



ALTERNATIVE 4

PROTECTED INTERSECTION BROADWAY + CECIL AVENUE



PRELIMINARY TRAFFIC ANALYSIS



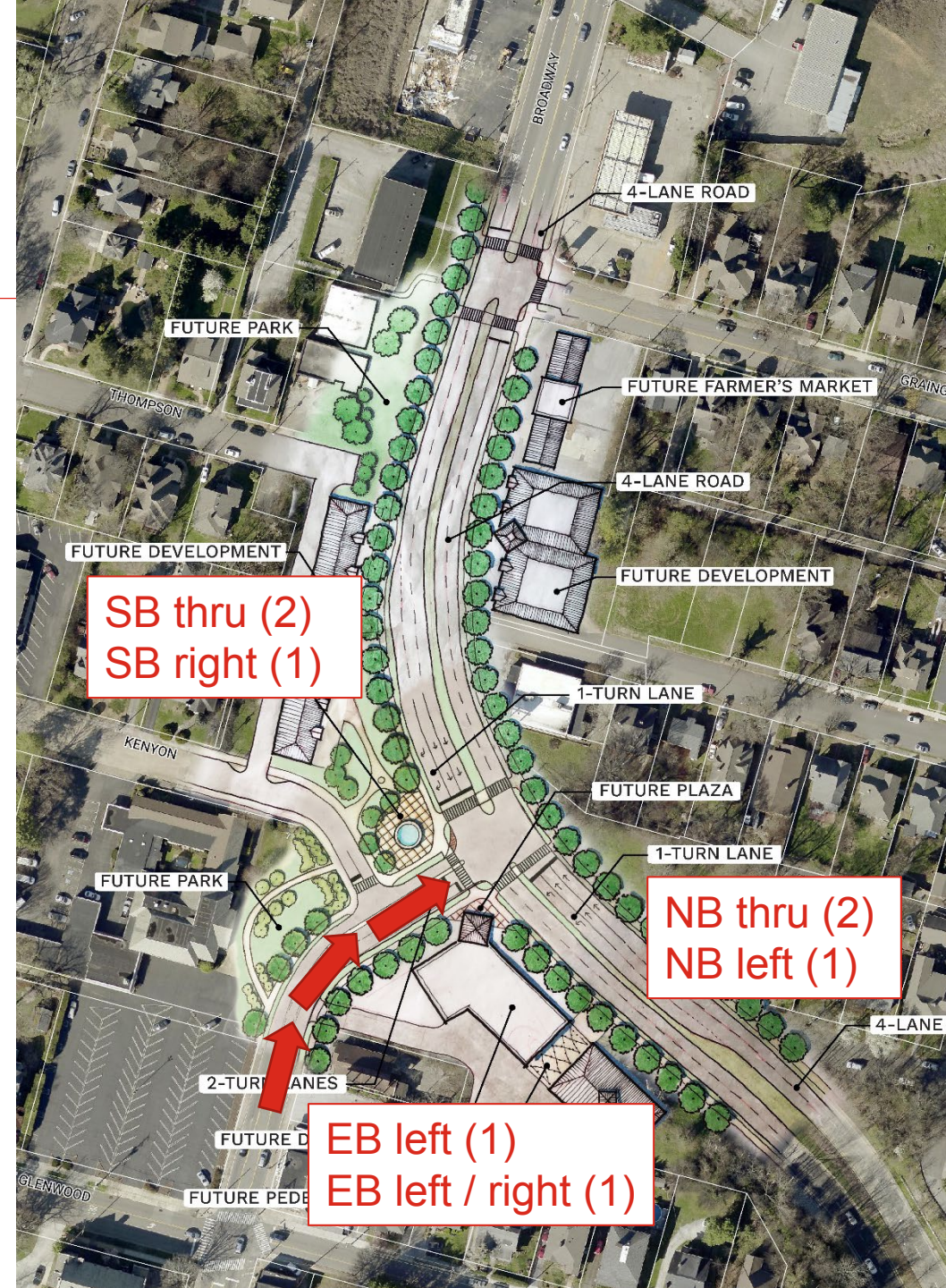
OVERALL TRAFFIC ANALYSIS



	Alternative 1 2029 Broadway T			Alternative 2 2029 Hall of Fame T			Alternative 3 2029 Roundabout		
	Delay (seconds)	LOS	Queue	Delay (seconds)	LOS	Queue	Delay (seconds)	LOS	Queue
AM	12.2	B	-	29.3	C	-	8.4	A	-
Mid-day	27.9	C	-	21.5	C	-	8.4	A	-
PM	27.7	C	-	24.1	C	-	14.7	B	-

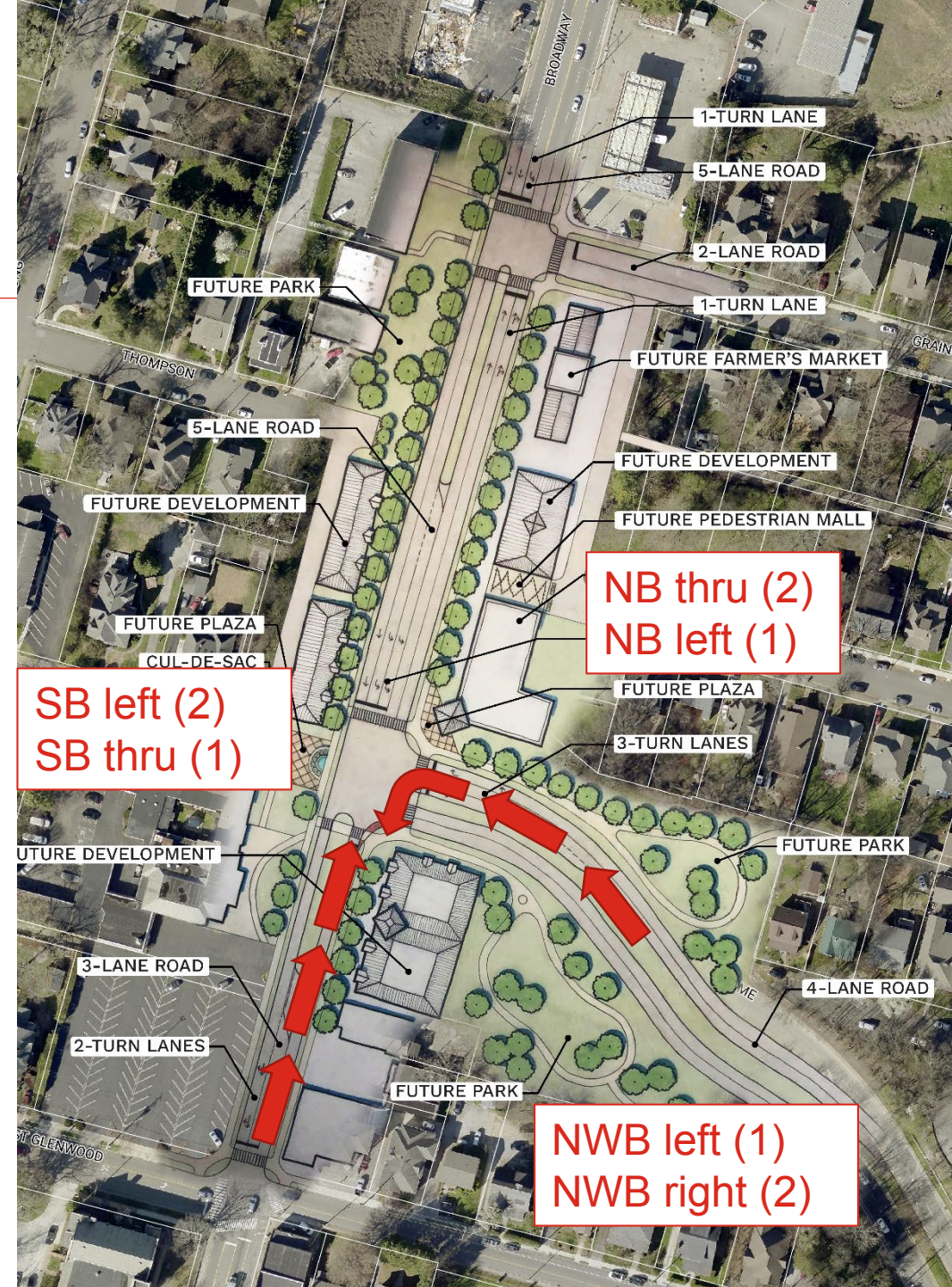
ALTERNATIVE 1 (2029)

- The eastbound approach is the problematic leg
- Operates at LOS E with long queues
- AM peak is the most challenging time period for this concept



ALTERNATIVE 2 (2029)

- The northeast-bound approach is the problematic leg
- Operates at LOS E with long queues
- Mid-day and PM peak are the most challenging times for this concept
- The left turn from HOF backs up during the PM peak



ALTERNATIVE 3 (2029)

- The roundabout is expected to perform exceptionally in both delays and queues
- Operates at LOS C during the PM peak; this is the most challenging period for drivers



TRAFFIC ANALYSIS: TAKEAWAYS

- The roundabout is expected to perform exceptionally in both delays and queues and is the clear winner
- T intersections overall perform well, with some exceptions that were noted earlier

TRAFFIC ANALYSIS: TAKEAWAYS

- What about latent interstate demand?
- What about existing conditions?

BICYCLE NETWORK





Bicycle Boulevards
Bicycle Boulevard Signs and Pavement Markings - Decision Sign

LOCAL BICYCLE NETWORK

- Proposed pedestrian bridge at Glenwood and Luttrell
- Bike boulevards / shared lanes
- First Creek Greenway Connection
- Pedestrian improvements on Broadway



FEASIBILITY MATRIX



	Alternative 1	Alternative 2	Alternative 3
	Signalized T	Signalized T	Roundabout
	Broadway into HOF	HOF into Broadway	HOF & Broadway
Safe for all ages and abilities			
Lowers motor vehicle speeds through the intersection	Red	Yellow	Green
Minimize number of conflicts and crash severity	Yellow	Yellow	Green
Minimize turning radii	Red	Yellow	Green
Provide shorter crossing distances	Red	Yellow	Green
Improve sight lines and visibility	Green	Green	Green
Provide pedestrian refuge islands	Yellow	Red	Green
Provide pedestrian signal timing	Green	Green	Yellow
Provide ADA compliant curb ramps and crosswalks	Green	Green	Green

	Alternative 1	Alternative 2	Alternative 3
	Signalized T	Signalized T	Roundabout
	Broadway into HOF	HOF into Broadway	HOF & Broadway
Provide multimodal connections			
Locate pedestrian crossing locations at desire lines			
Intersection design positively impacts bus routes			
Improve sidewalk conditions adjacent to bus stops			

	Alternative 1	Alternative 2	Alternative 3
	Signalized T	Signalized T	Roundabout
	Broadway into HOF	HOF into Broadway	HOF & Broadway
Encourage opportunities for economic vibrancy and business diversity			
Accommodate future development sites from reconfigured Broadway / HOF			
New development has the ability to stitch the urban fabric back together			

	Alternative 1	Alternative 2	Alternative 3
	Signalized T	Signalized T	Roundabout
	Broadway into HOF	HOF into Broadway	HOF & Broadway
Contribute to local character, a sense of place, and an attractive environment			
Accomodate gateway or landmark	Red	Yellow	Green
Accommodate new park space	Yellow	Green	Yellow
Ability for new development to enclose the space so that the intersection becomes like an outdoor room	Red	Green	Green

	Alternative 1	Alternative 2	Alternative 3
	Signalized T	Signalized T	Roundabout
	Broadway into HOF	HOF into Broadway	HOF & Broadway
Accommodates commuter traffic to and from I-40 while balancing needs of all users			
Minimizes delay during commute	Yellow	Red	Green
Minimizes queuing	Yellow	Yellow	Green
Maximizes level of service (LOS)	Yellow	Red	Green

Alternative 1

Signalized T

Broadway into HOF

Alternative 2

Signalized T

HOF into Broadway

Alternative 3

Roundabout

HOF & Broadway

Safe for all ages and abilities			
Lowers motor vehicle speeds through the intersection	Red	Yellow	Green
Minimize number of conflicts and crash severity	Yellow	Yellow	Green
Minimize turning radii	Red	Yellow	Green
Provide shorter crossing distances	Red	Yellow	Green
Improve sight lines and visibility	Green	Green	Green
Provide pedestrian refuge islands	Yellow	Red	Green
Provide pedestrian signal timing	Green	Green	Yellow
Provide ADA compliant curb ramps and crosswalks	Green	Green	Green

Provide multimodal connections			
Locate pedestrian crossing locations at desire lines	Red	Green	Yellow
Intersection design positively impacts bus routes	Yellow	Yellow	Green
Improve sidewalk conditions adjacent to bus stops	Green	Green	Green

Encourage opportunities for economic vibrancy and business diversity			
Accommodate future development sites from reconfigured Broadway / HOF	Yellow	Green	Green
New development has the ability to stitch the urban fabric back together	Yellow	Green	Green

Contribute to local character, a sense of place, and an attractive environment			
Accommodate gateway or landmark	Red	Yellow	Green
Accommodate new park space	Yellow	Green	Yellow
Ability for new development to enclose the space so that the intersection becomes like an outdoor room	Red	Green	Green

Accommodates commuter traffic to and from I-40 while balancing needs of all users			
Minimizes delay during commute	Yellow	Red	Green
Minimizes queuing	Yellow	Yellow	Green
Maximizes level of service (LOS)	Yellow	Red	Green

NEXT STEPS

- Opinion of probable cost
- Implementation strategy for the preferred concept

VOTE!

