



# BROADWAY CORRIDOR IMPROVEMENT STUDY

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Improving the safety,  
functionality, and aesthetics  
of the Broadway Corridor for  
all users, including motorists,  
pedestrians, and bicyclists.

# ACKNOWLEDGEMENTS

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# EXECUTIVE SUMMARY

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## PROJECT OVERVIEW

*The Broadway Corridor Improvement Study focuses on providing recommendations to improve the safety, functionality, and aesthetics of the corridor for users of all ages, abilities, and modes, including motorists, pedestrians, and bicyclists.*

*As it exists today, the Broadway Corridor principally serves motorists at the expense of other nonmotorized forms of transportation. Pedestrian infrastructure is lacking, and there is no bike infrastructure to speak of.*

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Toole Design led a multidisciplinary team to assist the City of Knoxville with a context sensitive study of the Broadway Corridor. The study team partnered with the City to develop improvements and alternative layouts for the intersections of North Broadway at Cecil Avenue and at Hall of Fame Drive. North Broadway is a principal arterial that serves motorists, but acts as a barrier to nonmotorized forms of transportation. The study provides short-term and long-term recommendations that include measures such as restriping, pedestrian refuge islands, alternative intersection designs, the addition of street trees, and other measures that aim to improve the corridor for all users.



## SCOPE

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The study area extends from McCroskey Avenue at the northern end of the corridor to Glenwood Avenue at the southern end. The scope of this study, which is illustrated on the following page, addresses these specific areas:

- Two intersections with North Broadway – Hall of Fame Drive, and Cecil Avenue
- The connection with the First Creek Greenway
- The overall design of the Broadway Corridor between McCroskey and Glenwood Avenue
- Recommendations for strengthening the network of multimodal facilities

## APPROACH

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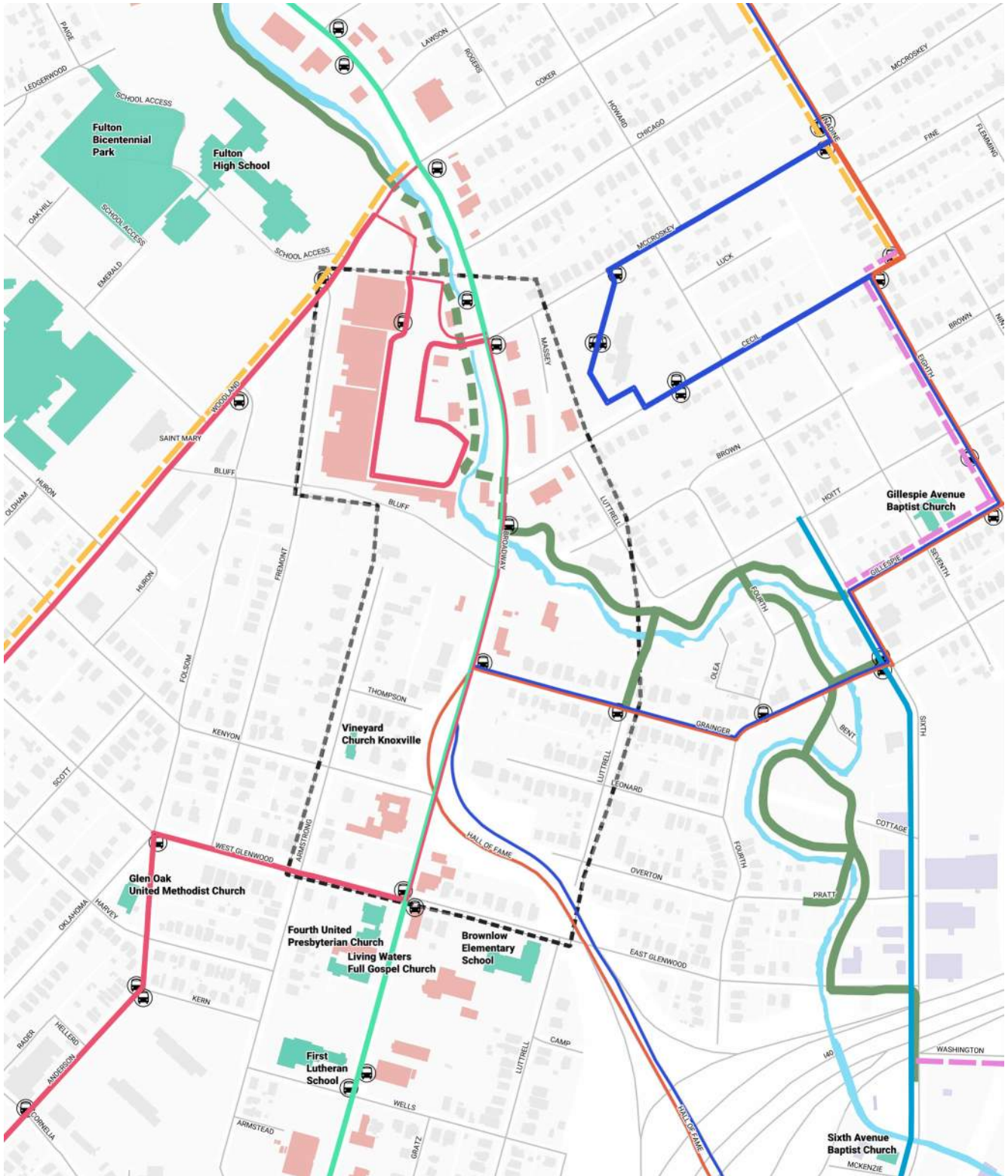
The team performed an existing conditions analysis of the corridor study area, which identified current bicycle and pedestrian facilities, the existing and proposed First Creek Greenway locations, and challenging conditions at intersections that included severe grades and skewed alignments. During several site walks along the corridor, the team also observed numerous examples of dangerous crossings by pedestrians and bicyclists, as well as illegal turning movements by motorists traveling northbound on Broadway who wished to go south on Hall of Fame Drive.

In August 2019, the project team traveled to North Knoxville for a three-day visioning workshop to hold initial stakeholder meetings, conduct a public workshop, distribute a survey to Broadway users, and develop starter concepts. The City made it clear that road diets were not on the table, so we were dealing with a five-lane cross section for a majority of the corridor. The corridor faces significant physical constraints, such as the presence of First Creek adjacent to the roadway, and the challenging ridge-and-valley topography of the Tennessee Valley.

The project team returned to Knoxville in September to interview several stakeholders, including the Knoxville Fire and Police Departments, Knoxville Area Transit (KAT), Tennessee Department of Transportation (TDOT), and several neighborhood associations. Given the feedback received from the City, the public, and local stakeholders, the project team refined the three alternatives, which included two different T-intersections and a roundabout. In all three alternatives, the design the intersection up to grade and provides a four-foot landscape buffer and an eight-foot sidewalk.

The local subconsultant, Barge Design Solutions, performed the traffic analysis that confirmed that the roundabout would perform exceptionally well in terms of both delays and queues. In future projections, the roundabout is anticipated to function at level-of-service A/A/B overall, with the most challenging condition (level-of-service C) during the morning peak occurring only at the 3-lane leg. The City confirmed that the roundabout design was the preferred concept, which is highlighted in this report along with other corridor designs and recommendations.

# STUDY AREA





## LEGEND

-  First Creek
-  Study Area
-  Points of Interest
-  Industrial Area
-  Retail Area
-  Bus Stops
-  First Creek Greenway
-  Proposed Trail Connection
- KATS routes**
-  21P
-  22P
-  23P
-  23P\_Alt
- Bike Facilities**
-  Directional Bike Lanes
-  Shared Lane Markings
-  Signed Route

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# BACKGROUND

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02



# REVIEW OF PREVIOUS PLANS

*For more than 15 years, various organizations have studied the Broadway Corridor project area. The focus of the plans and studies below cover a wide range of topics, including physical infrastructure improvements, urban design, public transit, and multimodal transportation. The summaries of each study highlight items that inform and relate to this current document.*

## **BROADWAY / HALL OF FAME INTERSECTION FEASIBILITY STUDY (2005)**

A 2005 study evaluated the feasibility of improving the Broadway – Hall of Fame intersection. The study, which was requested by residents in Old North Knoxville, included public outreach to identify issues and garner feedback as alternative layouts were developed.

During the initial community meeting, participants identified issues related to safety concerns, bicycle and pedestrian conditions, social and community impacts from heavy truck traffic and cut-through traffic, and aesthetic quality. The study team presented five concepts during a second community meeting, in which participants asked for additional concepts, including a single-lane roundabout. The idea for a pedestrian bridge across Hall of Fame Drive to connect Luttrell Street to East Glenwood was also proposed during this meeting. During the third community meeting, the study team presented all remaining alternatives under consideration. Community members raised concerns about the impacts that several alternatives would have on local businesses, but all alternatives should be considered further.

The final recommendations focused on vehicular level of service, and the City did not move forward with the alternatives as they did not include appropriate measures to address non-motorized forms of transportation.

## **BROADWAY CORRIDOR ENHANCEMENT PLAN (2015)**

The East Tennessee Community Design Center, at the request of the Broadway Corridor Task Force, developed an inventory of existing conditions, engaged the public through stakeholder outreach and a design charette, and provided recommendations for improving the corridor.

The analysis of existing conditions identified and categorized issues into three groups: Health and Safety, Access and Economy, and Visual Identity and Presence. Health and Safety issues noted the unpleasant pedestrian environment, the lack of access management resulting from an open turn lane and a proliferation of curb cuts, and dangerous crosswalk conditions. Under Access and Economy, the plan's authors noted that while the corridor hosts some of the most heavily used KAT routes in the City, bus stops are not well defined with shelters. Shallow storefront parking lots encroach on sidewalk space, and a number of vacant and derelict properties exist along the corridor. Under Visual Identity and Presence, the authors note that neighborhood gateways could be improved to highlight the charm and character of the neighborhoods. Landscaping should also be consistent and contribute to a cohesive identity for the Broadway Corridor.

The plan identified general improvements that could be applied throughout the corridor and improvements for specific segments of Broadway. Corridor-wide recommendations included the addition of pedestrian-scale lighting, sidewalk repair and improvement, access management measures, the addition of street trees and landscaped medians, increased visibility at crosswalks, and lower speed limits, which would need to be coordinated with TDOT.

The plan's recommendations for the segment of Broadway from Hall of Fame Drive to Cecil Avenue included a gateway entrance to enhance the visual identity of the corridor, the addition and improvement of crosswalk patterns and striping, and the addition of a farmer's market or business incubator at the existing Open Air Market at the corner of Grainger and Broadway. Additional recommendations included pedestrian friendly improvements at Cecil Avenue, cleaning and beautifying the banks of First Creek, and locating businesses at the creek's edge to take advantage of the views.

### **KNOXVILLE BICYCLE FACILITIES PLAN (2015)**

The Bicycle Facilities Plan developed a framework of recommendations centered on physical infrastructure improvements to advance the City's desire to become a safer and more comfortable place to bike for recreational and transportation-related purposes. During a public open house, the Broadway Corridor (from Downtown to Fountain City) was identified as one of the areas of greatest interest to participants. However, it was not included in the final list of top ranked projects.

### **KNOXVILLE REGIONAL TRANSIT CORRIDOR STUDY (2013)**

The Knoxville Regional Transportation Organization (TPO) developed the Transit Corridor Study to assess the need for rapid transit service and rank the "general feasibility of several potential transit investments." The study evaluated twelve corridors and recommended North Broadway as one of the top three project corridors that would be viable for implementing a sustainable transit system. Recommendations for Broadway included bus rapid transit (BRT) operating in mixed traffic, with the implementation of signal prioritization or queue jumper lanes at existing signalized intersections.

### **2040 LONG RANGE REGIONAL MOBILITY PLAN (2013)**

The intersection of Broadway and Hall of Fame Drive was identified and assigned Priority Level 4 in the Knoxville Regional TPO 2040 Long Range Regional Mobility Plan. The study anticipated that 80% of the funding source would come from the National Highway Performance Program (NHPP), with 20% shared by the state.

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# EXISTING CONDITIONS

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03

# CHALLENGING CONDITIONS

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## ROADWAY CHARACTERISTICS

Broadway is a five-lane principal arterial from the northern end of the corridor study area, with an average daily traffic volume of 26,600 vehicles (AADT, TDOT 2018). At the intersection with Hall of Fame Drive, Broadway transitions to a three-lane arterial. South of the Hall of Fame intersection, Broadway holds an average daily traffic volume of 9,250 vehicles. Currently, Broadway largely functions for motorists who wish to access I-40 and downtown Knoxville.

## MAJOR INTERSECTIONS

The two major intersections within the Broadway corridor study area, Cecil Avenue and Hall of Fame Drive, are challenging for motorists, pedestrians, and bicyclists. Cecil Avenue connects to North Broadway at a skew, which reduces the sightlines for all users. The severe grade of Cecil Avenue, which rises sharply uphill from Broadway, also contributes to a reduced sightline for all users. Cecil Avenue lacks curb ramps and detectable warnings at all corners, and the southern pedestrian crossing is missing the typical crosswalk pavement marking.

Hall of Fame Drive (HoF) presents numerous problems to nonmotorized users. Motorists traveling northbound on HoF merge onto North Broadway by ramping up via a free-flow lane. A marked crosswalk at the top of the HoF ramp is difficult for motorists to see because of the curving approach. Based on multiple site walks, the project team observed that many motorists accelerated near the crosswalk to complete the merge with North Broadway.

Motorists traveling southbound on Broadway that wish to connect to HoF may take two lanes at the Grainger Avenue intersection. These lanes are grade separated and cross underneath Broadway, which is supported by a bridge structure. The right-most southbound lane on Broadway is a slip lane, and motorists do not have to stop at the traffic light at Grainger. This condition presents a danger for pedestrians using the marked crosswalk to cross Broadway at Grainger. A large evergreen tree that is full to the ground obscures the sightlines for motorists who might otherwise see pedestrians waiting on the west side of Broadway.



# BROADWAY TODAY



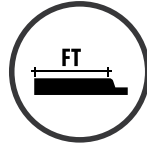
# PEDESTRIAN CONDITIONS

*The current state of the built environment along the Broadway Corridor contributes to a hostile setting for pedestrians. During multiple site visits in 2019, the project team walked the length of the corridor and experienced the various challenges corridor users face on a regular basis, including the high speeds and volume of vehicular traffic, consistently narrow and obstructed sidewalks, a lack of accessible facilities, and crossings that felt dangerous. These challenges are described in more detail below.*



## STREET BUFFER

The existing sidewalk paralleling both sides of North Broadway lacks a street buffer, which means that pedestrians are uncomfortably close to the higher-volume, higher-speed roadway traffic.



## SIDEWALK WIDTH

Sidewalk widths along Broadway are approximately 5 feet, except for the section north of Cecil Avenue. This width is frequently reduced by obstacles such as utility poles, street signage, encroaching vegetation, and debris. The discomfort caused by the lack of street buffer discourages pedestrians from using the full sidewalk width.



## CROSSINGS

When crosswalks are not provided at intersections or spaced too far apart, pedestrians may cross at uncontrolled locations, which creates unsafe situations for both pedestrians and drivers. The project team observed multiple uncontrolled pedestrian crossings during several site visits, especially near the HoF Drive intersection.



## ACCESSIBILITY

Several intersections lack basic accessible facilities such as crosswalk pavement markings, curb ramps, or detectable warning strips at all corners. The eastern crosswalk at Cecil Avenue is situated on a severe slope, making it very difficult for people using mobility aids to safely cross.



## GREENWAY

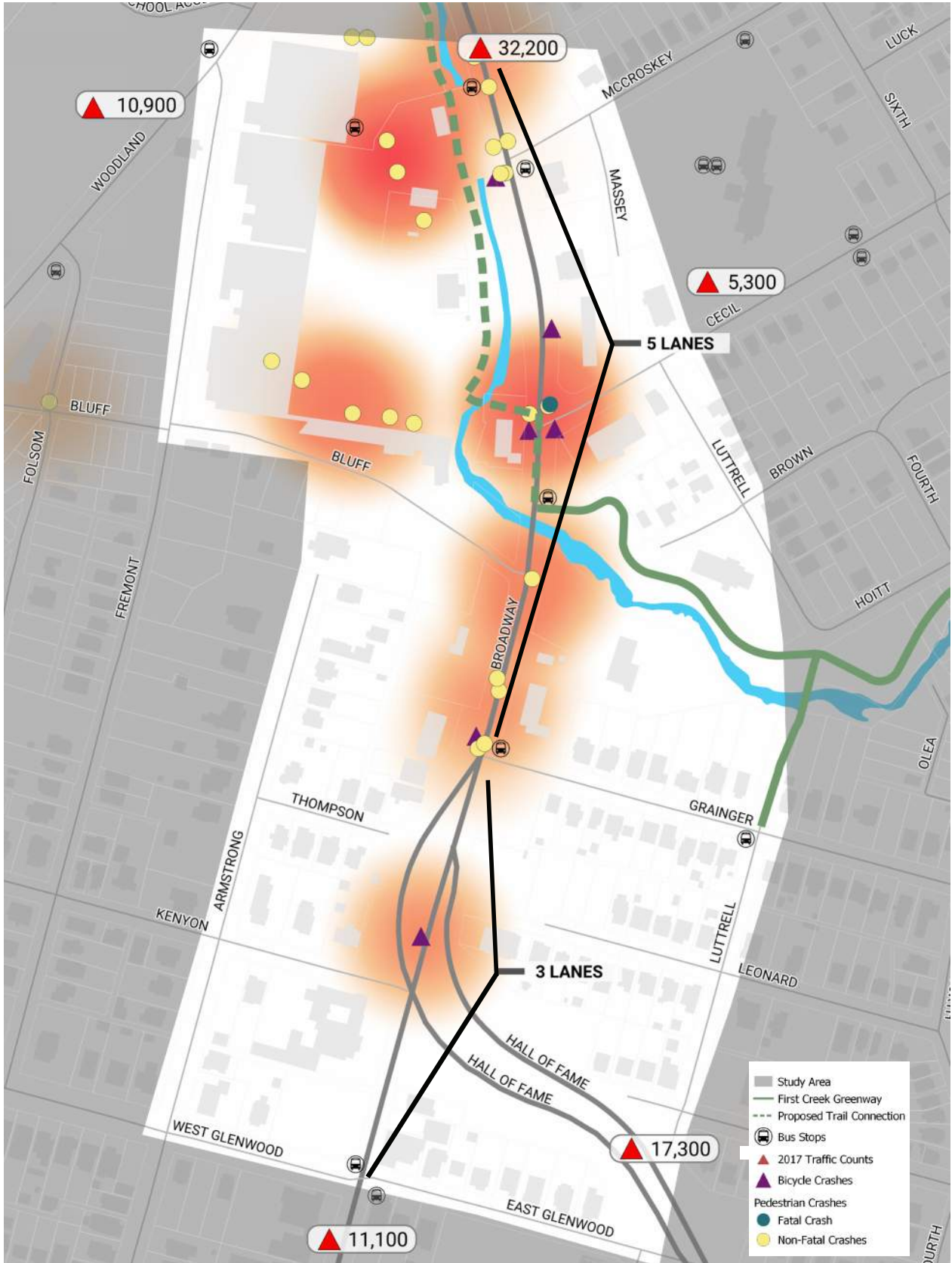
Currently, the Lower First Creek Greenway terminates on the east side of Broadway. A future phase will require greenway users to cross Broadway. It will be imperative to provide a safe crossing that can accommodate pedestrians, bicyclists, and people of all ages and abilities.



## AESTHETICS

Development along the corridor is automobile-oriented. Parking lots are immediately adjacent to the roadway, and buildings are set back from the road. There are few trees that offer shade, and the lack of pedestrian connections to building frontages creates an unwelcoming environment.

# ROADWAY SAFETY



# VEHICULAR CONDITIONS

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The physical geometry of the Broadway Corridor contributes to challenging conditions for motorists. Skewed and grade-challenged intersections can hinder motorists' sightlines and reduce reaction time. The lack of consolidated commercial access points throughout the study area creates high potential for conflicts with other motorists, bicyclists, and pedestrians. The two-way center turn lane allows motorists to make frequent turning movements throughout the corridor, and there are numerous curb cuts that allow for vehicular access to nearly every parcel.



## **SKEWED INTERSECTIONS**

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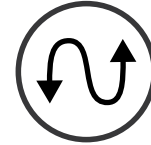
Skewed intersections occur when one street intersects another at a non 90-degree angle. These types of intersections can be challenging for drivers, pedestrians, and bicyclists. The unusual angles hinder visibility for motorists, reducing response time at conflict points with more vulnerable users.



## **GRADE-CHALLENGED INTERSECTIONS**

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Grade-challenged intersections hinder the sightlines for all users and can reduce reaction time for both bicyclists and motorists. Bicyclists and motorists traveling downhill are likely to be traveling at higher speeds and therefore have less time to apply the brakes as needed.



## **UNSAFE TURNING MOVEMENTS**

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Unsafe turning movements risk the safety of other drivers and users of the Broadway Corridor. Unsafe turns may include sudden or unexpected turns made at high speeds or by large vehicles. Given the lack of access management on Broadway, there are numerous opportunities for unsafe turning movements throughout the study area.



**SKEWED  
INTERSECTION**

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Cecil Avenue meets Broadway at a skewed angle, which reduces response times and restricts visibility for motorists. Cecil Avenue is also severely grade-challenged, with curb ramps and crosswalk on the eastern side of Broadway that do not meet accessibility standards for cross slopes.



**GRADE-CHALLENGED  
INTERSECTION**

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Bluff Avenue is grade-challenged, one-way street that meets Broadway at a skewed angle. Motorists wishing to head north or southbound on Broadway must contend with obscured sightlines due to vegetation and signage.



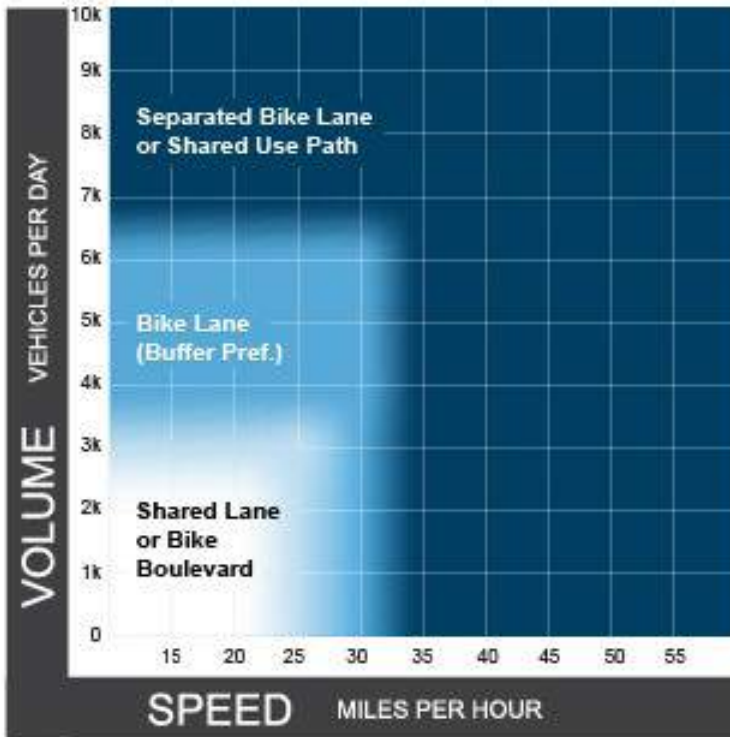
**UNSAFE TURNING  
MOVEMENTS**

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The image at left shows a truck making an illegal left turn from northbound Broadway onto southbound Hall of Fame Drive. Consultant team members observed numerous motorists making this turn on multiple site visits in 2019.

# BICYCLING CONDITIONS

Several safety challenges contribute to a difficult environment for bicyclists. First, North Broadway is a principal arterial designed for high volume and high speed vehicular through movement. Second, there are no dedicated bikeways. Assuming that most bicyclists would choose to avoid riding in the roadway, the only remaining option are the five-foot wide sidewalks adjacent to Broadway, which are interrupted by utility poles, street signs, numerous curb cuts, and pedestrians.



**Notes**

- 1 Chart assumes operating speeds are similar to posted speeds. If they differ, use operating speed rather than posted speed.
- 2 Advisory bike lanes may be an option where traffic volume is <3K ADT.
- 3 See Section 4.4 for a discussion of alternatives if the preferred bikeway type is not feasible.

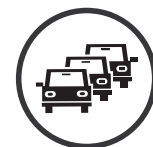
## SELECTING THE PREFERRED BIKEWAY TYPE

The selection of a preferred bikeway requires a balance of data analysis and engineering judgement. The chart above, combined with high vehicular speeds and volumes along the corridor suggest that a separated bike lane or shared use path would be the preferred bikeway type. In the event that project constraints cause the bikeway comfort level does not meet the need of bicyclists of all ages and abilities, other options should be considered. For more discussion on this topic, please see page 60.



## HIGH VEHICULAR SPEEDS

The posted speed limits throughout the project corridor are above 25 mph, which sharply increases crash and fatality risks for vulnerable users. The posted speed limit on Broadway is 35 mph south of Grainger and increases to 40 mph north of Grainger. On Hall of Fame Drive, the posted speed limit is 45 mph.



## HIGH VOLUME OF MOTORISTS

As motorized traffic volumes increase above 6,000 vehicles/day, bicyclists find it increasingly difficult to share roadway space with motor vehicles. The current traffic volumes well exceed those volumes. Likewise, motorists feel more comfortable when bicyclists are separated from motor vehicle traffic.



**SIDEWALK RIDING**

Sidewalk bicycling is an undesirable effect of the high vehicular speeds and volumes along Broadway. When bicyclists ride on the sidewalk, it creates several safety issues. First, bicyclists typically travel faster than pedestrians, who may not expect them. Second, research shows higher rates of falls on sidewalks as compared to bikeways or roadways. Falls may be attributed to sidewalk surface defects, avoidance maneuvers around pedestrians, or crashes with fixed objects such as utility poles or signage.

During multiple site visits, the project team observed bicyclists riding on Broadway’s sidewalks. Most bicyclists appeared to be local residents, and at least one rider was toting grocery bags.



**GREENWAY TRAILHEAD**

The First Creek Greenway terminates at 1912 N. Broadway, shown at left. The greenway continues north of the study area at Woodland Avenue, but there is currently no dedicated bicycle facility that connects this trailhead with the northern segment. The project team did not observe any greenway users attempting to connect between the trailhead and Woodland Avenue.



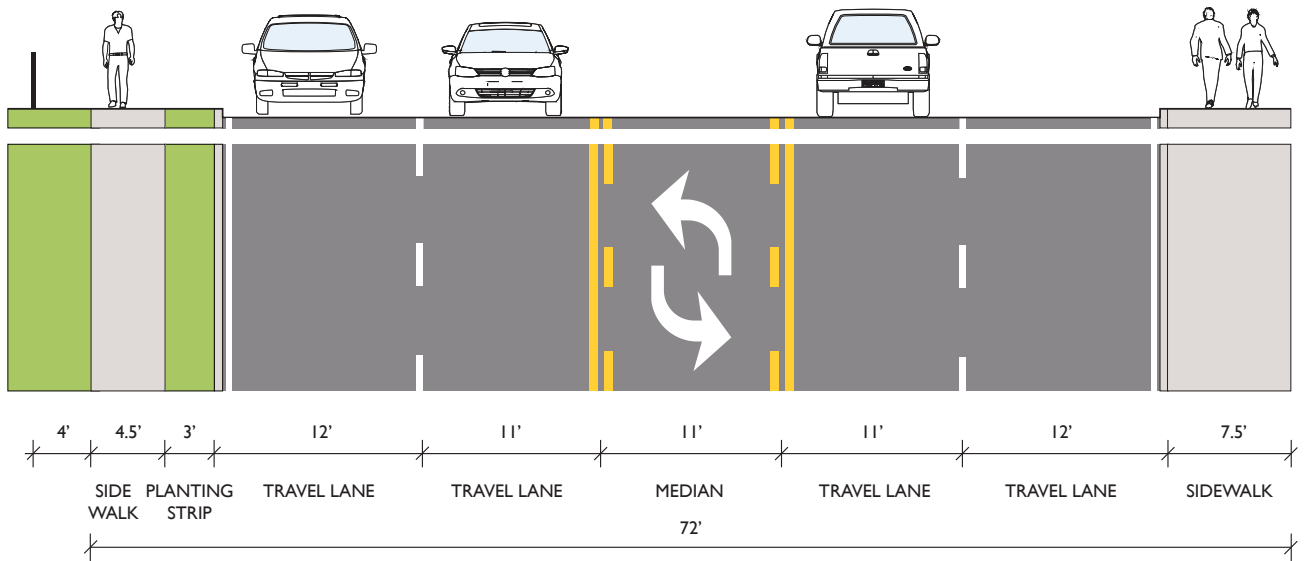
# EXISTING AERIAL

The aerial image below shows the project study area and indicates the location of the three cross sections that illustrate the existing conditions on Broadway and how they vary across the corridor. The cross sections and site photos are shown on the following pages.





# EXISTING CROSS SECTIONS

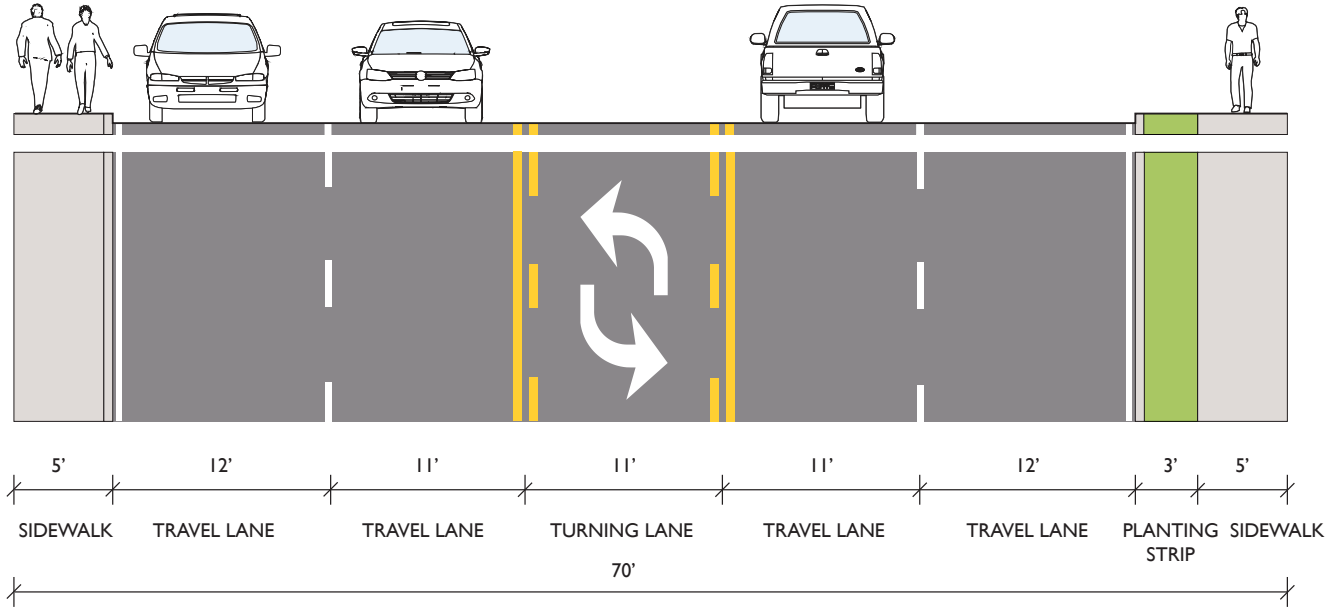


**A**

EXISTING CROSS SECTION  
BROADWAY FROM McCROSKEY TO CECIL AVENUE



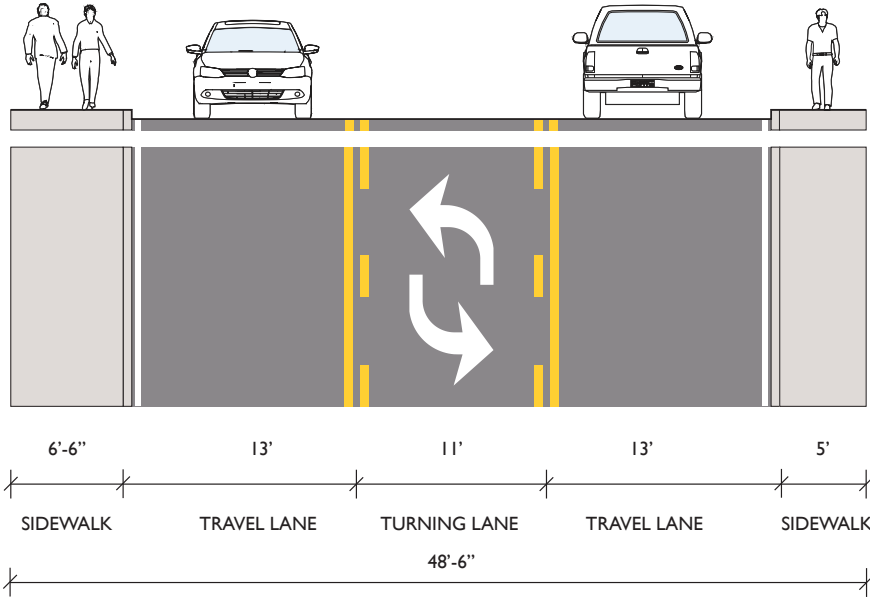
# EXISTING CROSS SECTIONS



**B**

EXISTING CROSS SECTION  
BROADWAY NORTH OF GRAINGER AVE.





**EXISTING CROSS SECTION  
BROADWAY BETWEEN KENYON ST. & W. GLENWOOD AVE.**



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# COMMUNITY ENGAGEMENT





## PUBLIC ENGAGEMENT PROCESS

### KICKOFF MEETING

In May 2019, the project team met with staff from the City of Knoxville Engineering Department and made several key decisions. First, the City appointed the Broadway Corridor Task Force (BCTF) to serve as the project's Advisory Committee. The BCTF is a local advocacy group that is developing a collaborative vision for the growth and improvement of Broadway through consensus building. The Advisory Committee met with the project team throughout the planning and design process to discuss changes and strategies they would like to see in the corridor. City staff and the project team agreed to consider a roundabout at the Broadway – Hall of Fame intersection, including a possible two-lane or turbo

roundabout. In the 2005 TDOT study of Broadway and Hall of Fame, only a single lane roundabout was considered and was discarded when the traffic analysis revealed it would not accommodate the high volume of traffic on Broadway. The team also agreed to consider an at-grade intersection that restricts pass-through traffic on Kenyon Street. Finally, the project team agreed to review and consider the recommendations included in the Broadway Corridor Enhancement Plan, produced in 2016 by the East Tennessee Community Design Center.

### PLAN SUCCESS

During the kickoff meeting, the project team asked City staff what a successful plan would look like. They responded with five key criteria that are ultimately reflected in the plan's Guiding Principles.

- 
- Community consensus on the best long-term solution
  - Viable short-term improvements
  - Become a gateway to North Knoxville
  - Stitch the community back together
  - Encourage context sensitive development above the intersection of Broadway and Hall of Fame

## VISIONING WORKSHOP

In August 2019, the project team and City staff conducted a three-day Visioning Workshop with community stakeholders, leaders of the Advisory Committee, and the general public. The workshop began with a site walk of the study area with City staff to review existing conditions, take site photos, and identify the opportunities and challenges along the corridor. During the workshop, the team reviewed data collected from the site walk and began sketching concepts for the corridor and key intersections.

## PUBLIC OPEN HOUSE

The project team and City of Knoxville staff hosted an Open House during the evening of August 13, 2019 at St. James Episcopal Church in North Knoxville. The event was a drop-in style meeting, with the entire community invited to learn about the scope and purpose of the project and the planning and design process. The goal of the Open House was to listen to the community, gather feedback, and distribute a survey to Broadway users. Community members expressed their ideas, preferences, and hopes for the Broadway Corridor through several interactive exercises. Findings from the Open House are illustrated in the following pages.

## STARTER IDEAS

Following the public meeting and stakeholder meetings, the project team developed three starter concepts for the Broadway – HoF intersection, a concept for the Broadway – Cecil Avenue intersection and an overarching concept for the entire corridor. The three starter concepts included:

### ALTERNATIVE 1

A T-intersection that accommodated the predominant vehicular movement by combining “upper” Broadway with Hall of Fame Drive. Lower Broadway forms a T-intersection with the combined Broadway / HoF Drive and creates space for redevelopment

### ALTERNATIVE 2A

A roundabout that serves the intersection of Upper Broadway, Lower Broadway, and Hall-of-Fame Drive. The

## DESIGN ASSUMPTIONS

All three starter ideas were developed with several assumptions:

- The existing ramps from Hall of Fame Drive to Broadway would be removed, as would the bridge that allows Kenyon Street to intersect with Broadway.
- A substantial amount of fill would be required to intersect the roads at-grade.
- Utilities would need to be relocated as a result of the new intersection.
- The vacant land left by the new intersection’s smaller footprint would provide development opportunities.

roundabout would be located such that each leg of the roundabout is equidistant.

### ALTERNATIVE 2B

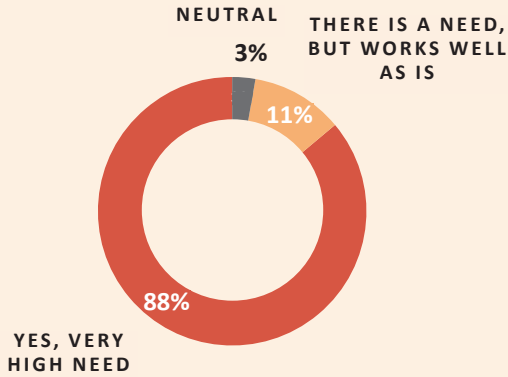
This roundabout was located as close as possible to the existing Broadway center line without impacting private property.

The project team presented the three concepts to City staff at the conclusion of the Visioning Workshop. The City confirmed that the concepts were headed in the right direction and asked that the team develop a third true alternative. Staff suggested that the third alternative show a signalized T-intersection.

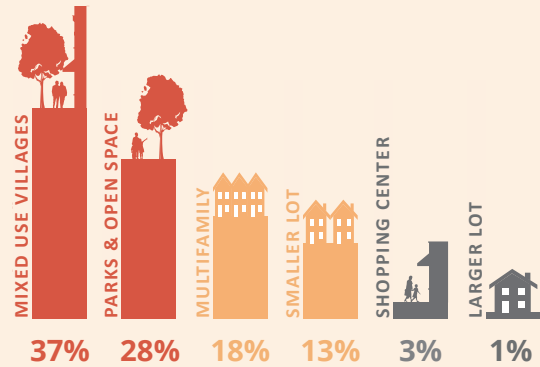
# ENGAGEMENT RESULTS

The engagement results shown on these pages reflect the feedback received from the community from a survey that was distributed in-person and online, as well as voting exercises conducted during the public open house in August 2019.

## DOES THE BROADWAY CORRIDOR NEED IMPROVEMENTS?

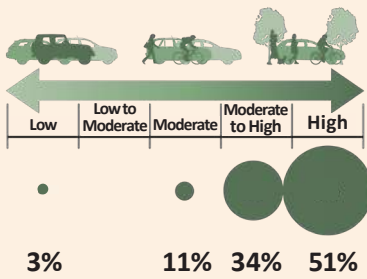


## WHAT TYPE OF DEVELOPMENT DO YOU PREFER?

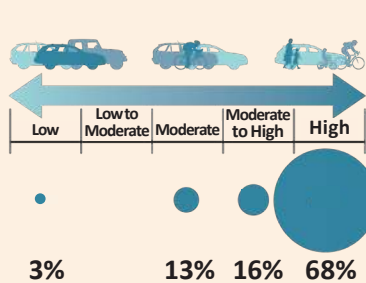


## PUBLIC PRIORITIES FOR:

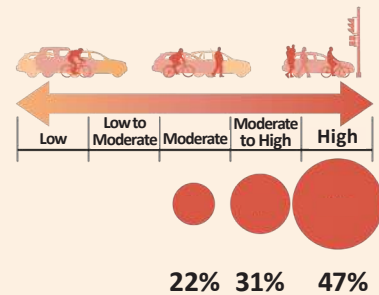
### LOCAL USER



### MOBILITY CHOICE



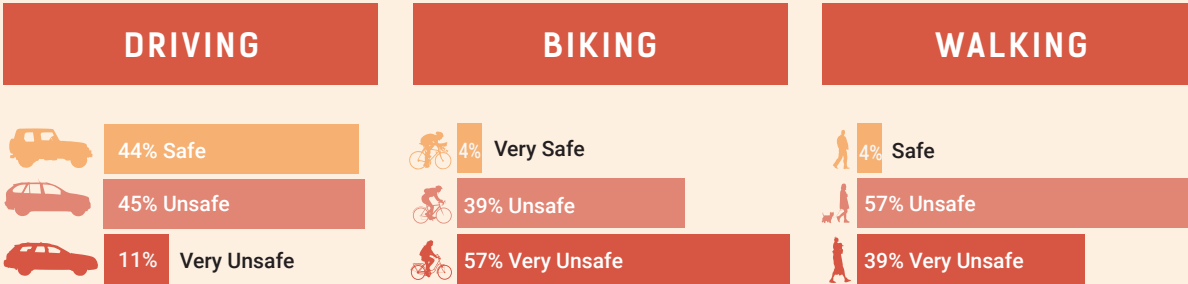
### ACCESS MANAGEMENT



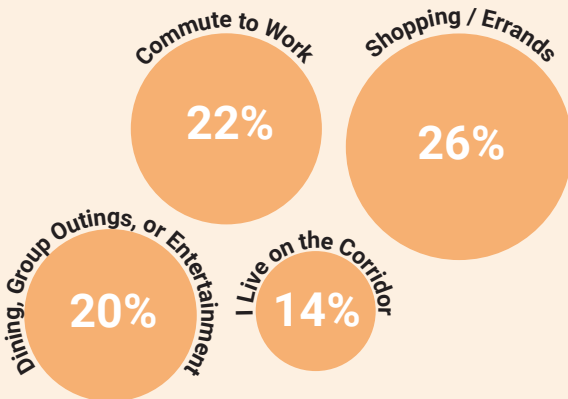


## SURVEY RESULTS

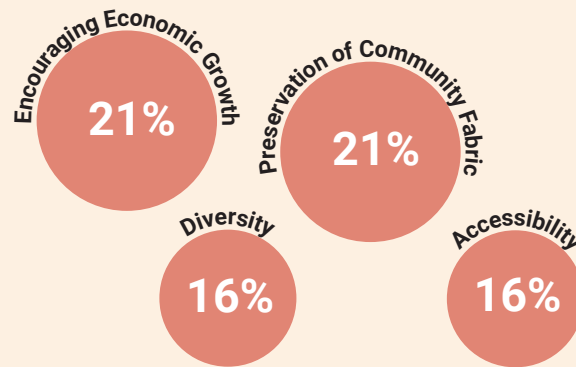
PLEASE PROVIDE THE LEVEL OF SAFETY YOU FEEL, OR WOULD FEEL, WHEN WHEN DOING THE FOLLOWING ON THE BROADWAY CORRIDOR:



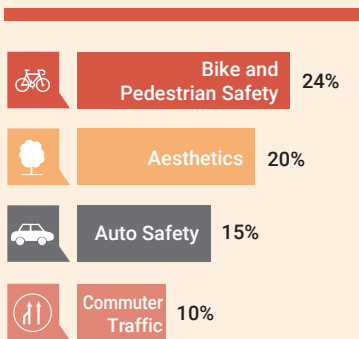
FOR WHAT PURPOSES DO YOU TRAVEL ON THE BROADWAY CORRIDOR?



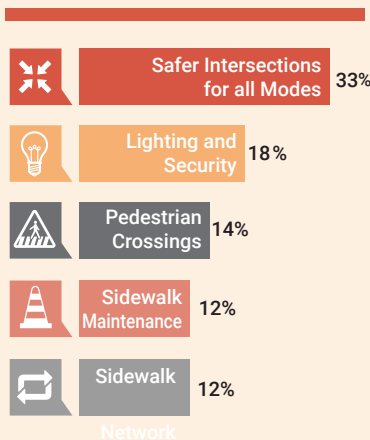
WHICH ARE THE MOST IMPORTANT IN YOUR COMMUNITY?



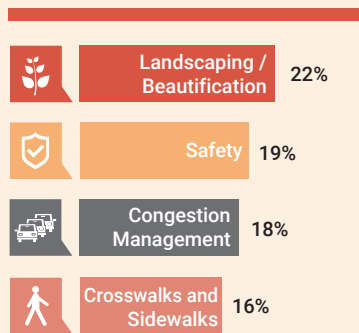
WHAT ARE YOUR PRIMARY CONCERNS WITH THE BROADWAY CORRIDOR?



WHAT IS YOUR TOP PRIORITY ON THE BROADWAY CORRIDOR?



WHAT TYPES OF IMPROVEMENTS ARE NEEDED ALONG THE BROADWAY CORRIDOR?



# STAKEHOLDER MEETINGS

*Following the Visioning Workshop, the project team returned to Knoxville to interview several key stakeholder groups that were unavailable to meet in August. These stakeholder groups included TDOT, emergency responders, KAT, the entire Advisory Committee, and local neighborhood organizations. The project team shared the three starter ideas and asked for feedback from each group. The key takeaways are summarized below.*



## KNOXVILLE FIRE DEPARTMENT

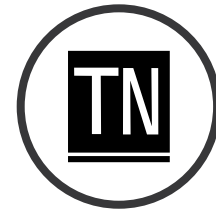
The Knoxville Fire Department (KFD) expressed support for all proposed alternatives, as each proposed intersection would be traversable by KFD’s ladder trucks. KFD noted that their longest ladder truck is 3 axles, so if a WB-67 vehicle can traverse the intersection, then their engine can. If a roundabout is selected, KFD indicated that in the event that one of the entry or exit legs is blocked with traffic, the fire engine would travel contraflow around the splitter island if necessary.



## KNOXVILLE POLICE DEPARTMENT

The Knoxville Police Department (KPD) noted that Broadway is the main link to northeast Knoxville and Fountain City from the current downtown headquarters. When KPD moves to its new headquarters, police will use southbound Broadway to Hall of Fame to access downtown.

KPD expressed their desire for any roundabout concepts to include signalized crossings for pedestrians.



## TDOT

TDOT reacted positively to roundabouts as an alternative intersection strategy. TDOT would require traffic analysis to show that the roundabout will function at an acceptable level of service.

TDOT supported the several elements of the Cecil Avenue design, including the alignment of the proposed bridge over First Creek with Cecil Avenue.

TDOT also confirmed that 11-foot lanes are acceptable and should be maintained given that transit coexists with motor vehicle traffic on Broadway.



**KNOXVILLE  
AREA TRANSIT**

Knoxville Area Transit (KAT) noted that three bus routes currently operate within the project study area: routes 21, 22, and 23. KAT expressed support for the roundabout, as it would directly benefit Routes 21 and 22 by eliminating dangerous merging movements that are required at the current ramp from northbound Hall of Fame to Broadway.



**ADVISORY  
COMMITTEE**

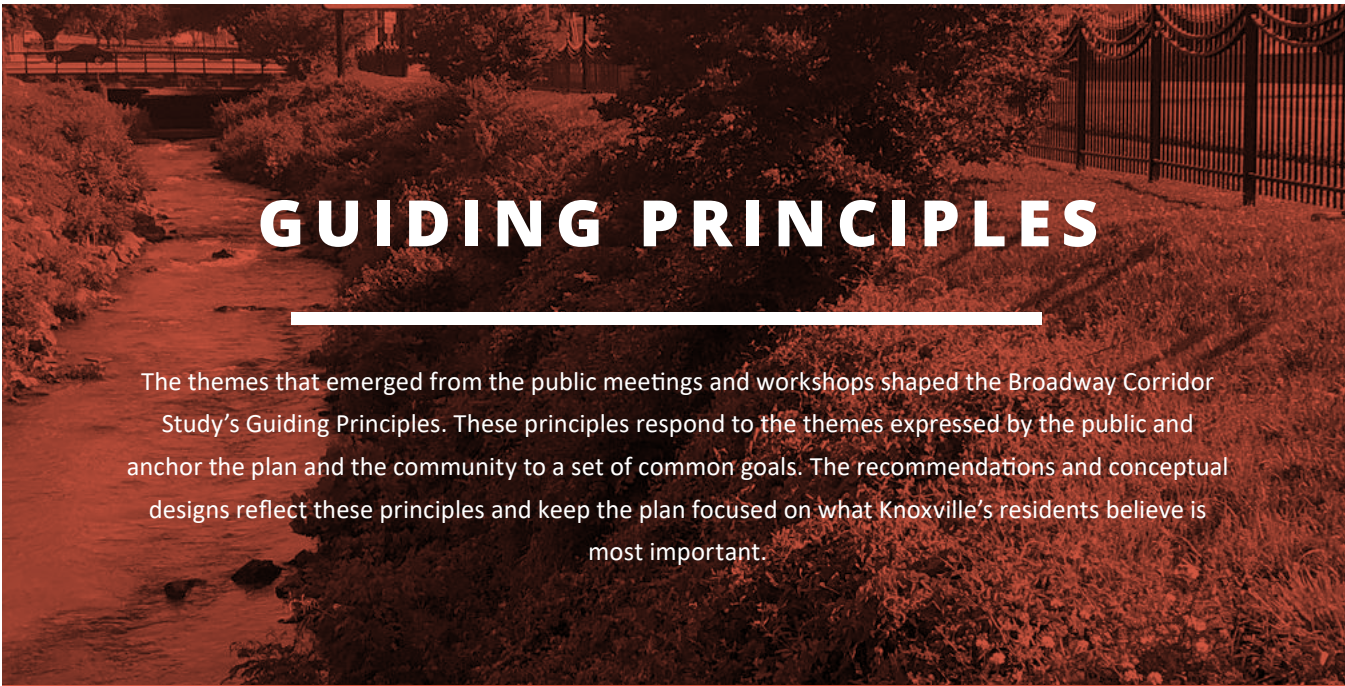
The Advisory Committee expressed a strong preference for starter concept 2B, as the roundabout aligned with Kenyon Street and provided development opportunities at all four quadrants of the roundabout. The committee communicated their vision and desires for the corridor, which were reflected in our Guiding Principles. also noted that future development should ensure that adequate parking spaces can properly support new businesses.



**NEIGHBORHOOD  
GROUPS**

Members of the Old North Knoxville and Fourth and Gill neighborhoods recognized similar challenges to the corridor: an inhospitable environment for pedestrians and bicyclists, a lack of tree coverage, and an underdeveloped commercial environment.

Both neighborhood groups expressed support for the roundabout concepts, although one group expressed concern about motorist yield rates to pedestrians at unsignalized roundabout crossings.



# GUIDING PRINCIPLES

The themes that emerged from the public meetings and workshops shaped the Broadway Corridor Study’s Guiding Principles. These principles respond to the themes expressed by the public and anchor the plan and the community to a set of common goals. The recommendations and conceptual designs reflect these principles and keep the plan focused on what Knoxville’s residents believe is most important.



## PROVIDE MULTIMODAL CONNECTIONS

The recommendations in this plan will help connect places within the Broadway Corridor Study Area for people who are walking, biking, and wheeling.



## SAFE FOR ALL AGES, ABILITIES, AND USERS

From toddlers to grandparents, everyone should feel comfortable when they are walking, biking, and driving along the corridor.



## REPAIR THE URBAN FABRIC

The construction of Hall of Fame Drive disrupted the street grid; the reimagined corridor should contribute to community placemaking that repairs the urban fabric.



## ACCOMMODATE COMMUTER TRAFFIC

Broadway is a major conduit for vehicular traffic during the morning and evening commutes, and the proposed design will accommodate this function of the corridor.



## CONTRIBUTE TO LOCAL CHARACTER

The corridor’s built environment and landscape plantings should better represent the charm of its adjoining neighborhoods – Old North Knoxville and Fourth and Gill.



## ENCOURAGE ECONOMIC VIBRANCY

The reimagined intersection of Hall of Fame and Broadway will create space for opportunities that can foster economic vibrancy and business diversity.



## PRESENTATION OF ALTERNATIVES

### PUBLIC MEETING

The project team and City of Knoxville staff hosted an Open House during the evening of December 11, 2019 again at the St. James Episcopal Church in North Knoxville. The team presented the vision for the Broadway Corridor, including improvements to the Broadway and Cecil intersection and the three alternatives for the Broadway and Hall of Fame intersection. The purpose of the meeting was to garner community feedback on a preferred alternative for the Hall of Fame intersection and the overall corridor concept. During the presentation, the project team recapped the Guiding Principles that emerged from the public engagement process through meetings, workshops, and survey results.

### TRAFFIC ANALYSIS

After revealing illustrative plans for the Broadway Corridor, the project team summarized results of the traffic analysis performed on all three proposed alternatives for the Broadway - Hall of Fame intersection. The results shown are for the 2029 design year, and the main performance measures include:

- Average delay, in seconds per vehicle, and corresponding Level of Service
- 95th percentile queue, in vehicles, which shows that 95

percent of queues are expected to be better than the shown queues.

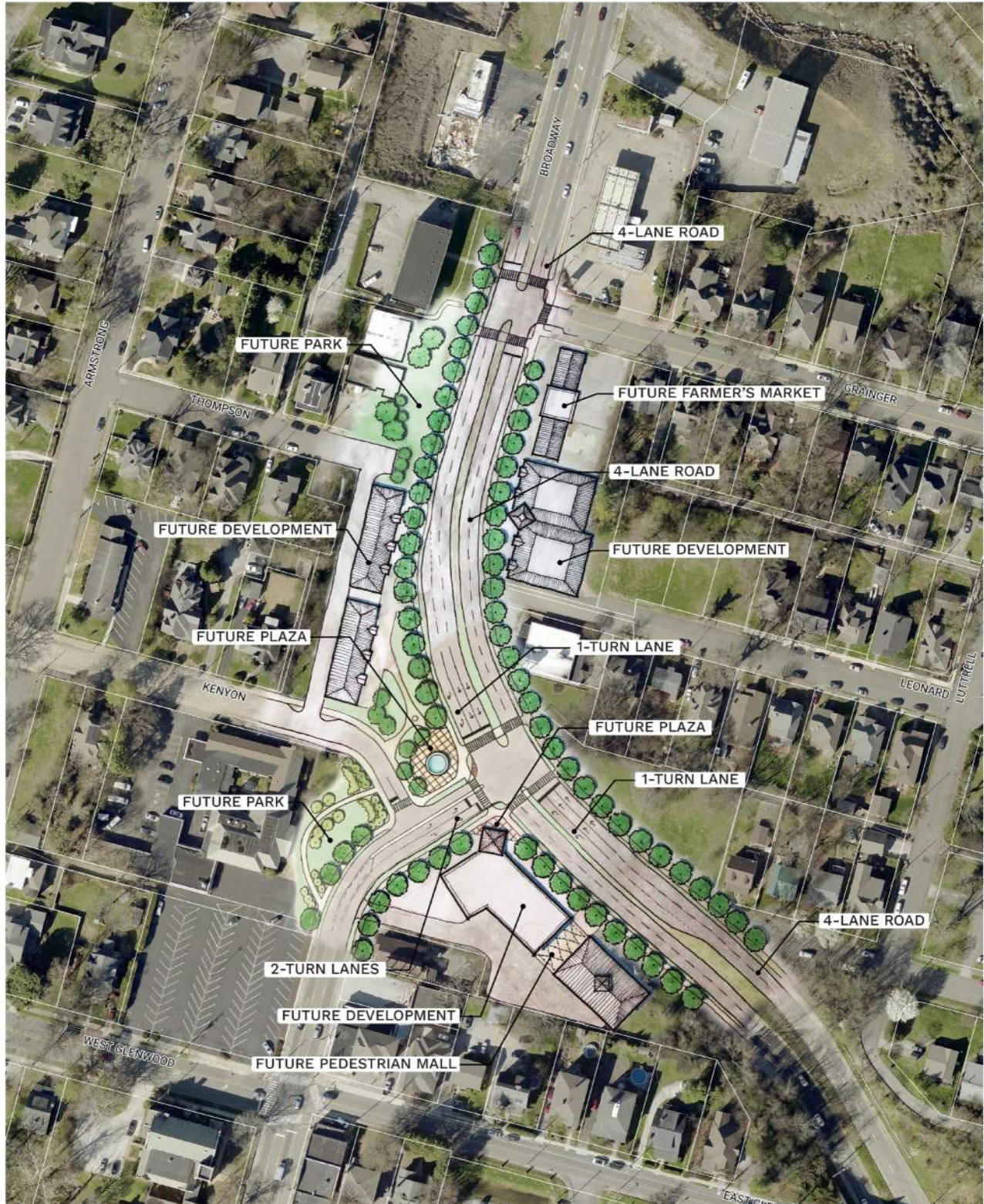
***The clear finding from the traffic analysis is that the roundabout is expected to perform exceptionally well in both delays and queues.***

- The two T-intersections perform well overall, with some exceptions.
- The northeast-bound approach of Lower Broadway operates at LOS E during the AM peak for Alternative 1.
- The mid-day and afternoon peak operate at LOS E for Alternative 2.

The project team considered the possibility that the improved intersection would create latent demand for accessing I-40. There are two reasons why this seems unlikely. First, once a motorist travels about 3/4ths of a mile southbound on Lower Broadway, there are closer interstate access points. The improved intersection will generally not be attracting many cars south of the intersection. Second, the traffic analysis performed a “stress test” analysis in which the turn from Lower Broadway onto southbound Hall of Fame was simulated with up to 300 vehicles. In this exercise, the analysis revealed that while delays increased for this turning movement, it didn’t impact other turning movements very much, since they are not expected to directly conflict with the highest volume movements.

# ALTERNATIVE 1

*A T-intersection that embraces the predominant vehicular movement by combining "upper" Broadway with Hall of Fame Drive. Lower Broadway meets the combined road at a T-intersection and creates space for redevelopment. This concept was carried over from the starter ideas.*



# ALTERNATIVE 2

A T-intersection that preserves Broadway's current alignment and brings Hall of Fame Drive into Broadway. Kenyon Street is closed to prevent motorists from using the street as a pass-through.



# ALTERNATIVE 3

*A hybrid roundabout was located as close as possible to the existing Broadway center line without impacting private property. It provides two lanes from northbound Hall of Fame to Broadway and two lanes from southbound Broadway to Hall of Fame.*





# FEASIBILITY MATRIX

The feasibility matrix was the final item presented to the public prior to the vote for the preferred alternative. The matrix compared all three alternatives based on the guiding principles, with specific design outcomes categorized within each principle. For example, to evaluate whether each alternative was safe for all ages and abilities (one of the guiding principles), the team identified outcomes such as “lowers motor vehicle speeds through the intersection” and “provide shorter pedestrian crossing distances” and rated each alternative as having a high, medium, or low ability to meet the guiding principle. The roundabout outpaced the other alternatives in terms of its ability to meet the guiding principle established through public feedback.

|                                                                                                        | Alternative 1<br>Signalized T<br>Broadway into HOF | Alternative 2<br>Signalized T<br>HOF into Broadway | Alternative 3<br>Roundabout<br>HOF & Broadway |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------|-----------------------------------------------|
| <b>Safe for all ages and abilities</b>                                                                 |                                                    |                                                    |                                               |
| Lowers motor vehicle speeds through the intersection                                                   | 1                                                  | 2                                                  | 3                                             |
| Minimize number of conflicts and crash severity                                                        | 2                                                  | 2                                                  | 3                                             |
| Minimize turning radii                                                                                 | 1                                                  | 2                                                  | 3                                             |
| Provide shorter crossing distances                                                                     | 1                                                  | 2                                                  | 3                                             |
| Improve sight lines and visibility                                                                     | 3                                                  | 3                                                  | 3                                             |
| Provide pedestrian refuge islands                                                                      | 2                                                  | 1                                                  | 3                                             |
| Provide pedestrian signal timing                                                                       | 3                                                  | 3                                                  | 2                                             |
| Provide ADA compliant curb ramps and crosswalks                                                        | 3                                                  | 3                                                  | 3                                             |
| <b>Provide multimodal connections</b>                                                                  |                                                    |                                                    |                                               |
| Locate pedestrian crossing locations at desire lines                                                   | 1                                                  | 3                                                  | 2                                             |
| Intersection design positively impacts bus routes                                                      | 2                                                  | 2                                                  | 3                                             |
| Improve sidewalk conditions adjacent to bus stops                                                      | 3                                                  | 3                                                  | 3                                             |
| <b>Encourage opportunities for economic vibrancy and business diversity</b>                            |                                                    |                                                    |                                               |
| Accommodate future development sites from reconfigured Broadway / HOF                                  | 2                                                  | 3                                                  | 3                                             |
| New development has the ability to stitch the urban fabric back together                               | 2                                                  | 3                                                  | 3                                             |
| <b>Contribute to local character, a sense of place, and an attractive environment</b>                  |                                                    |                                                    |                                               |
| Accommodate gateway or landmark                                                                        | 1                                                  | 2                                                  | 3                                             |
| Accommodate new park space                                                                             | 2                                                  | 3                                                  | 2                                             |
| Ability for new development to enclose the space so that the intersection becomes like an outdoor room | 1                                                  | 3                                                  | 3                                             |
| <b>Accommodates commuter traffic to and from I-40 while balancing needs of all users</b>               |                                                    |                                                    |                                               |
| Minimizes delay during commute                                                                         | 2                                                  | 1                                                  | 3                                             |
| Minimizes queuing                                                                                      | 2                                                  | 2                                                  | 3                                             |
| Maximizes level of service (LOS)                                                                       | 2                                                  | 1                                                  | 3                                             |

Alternative 1  
36

Alternative 2  
44

Alternative 3  
54

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Guiding Principles developed from public and stakeholder feedback

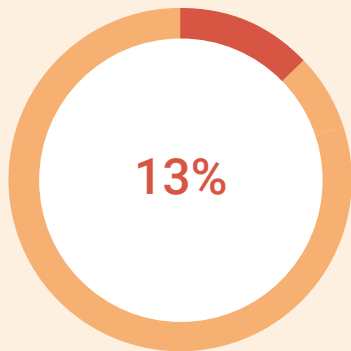
High ability to fulfill guiding principle - 3 points

Medium ability to fulfill guiding principle - 2 points

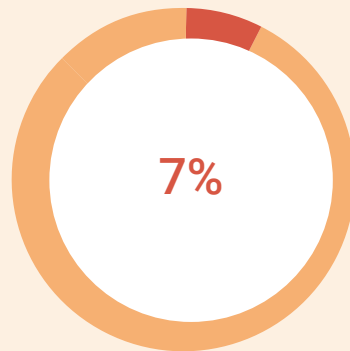
Low ability to fulfill guiding principle - 1 point

| Guiding Principle |
|-------------------|
| 3                 |
| 2                 |
| 1                 |

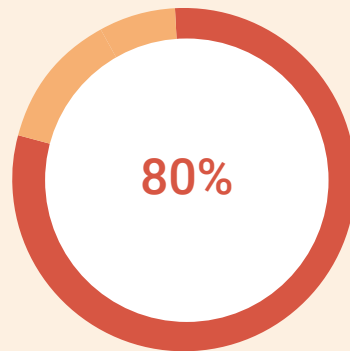
**PUBLIC VOTE TOTALS FOR PREFERRED ALTERNATIVES**



**ALTERNATIVE 1**



**ALTERNATIVE 2**



**ALTERNATIVE 3**

Signalized T: Broadway in HOF



Signalized T: HOF into Broadway



Roundabout



Following the presentation of the illustrative designs, a summary of the traffic analysis results, and a review of the feasibility matrix, the public voted on the three alternatives for the Broadway - Hall of Fame intersection. Meeting attendees overwhelmingly supported the roundabout design shown in Alternative 3. Prior to the public meeting, City staff expressed support for Alternative 3 and confirmed that it was the preferred concept for moving forward.

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# RECOMMENDATIONS

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05





# BROADWAY CORRIDOR

## CORRIDOR DESIGN GOALS

The design approach for improving the Broadway Corridor focuses on providing a safer, more comfortable and aesthetically pleasing for all modes of travel with an emphasis on the most vulnerable users. Two key recommendations will help accomplish these goals:

### SIDEWALK AND LANDSCAPE BUFFER

A four-foot planting strip should be implemented on both sides of Broadway to provide physical separation from automobile traffic. The planting strip would accommodate



most utility poles and signage, which currently obstructs pedestrians and bicyclists.

The sidewalk width should be increased to eight feet from the current five-foot width, which allows for people to walk comfortably side-by-side. The eight-foot width also allows for the occasional bicyclist to pass a single pedestrian without having to contend with the high volume and speeds of the adjacent roadway.

#### **CENTER LINE SHIFT**

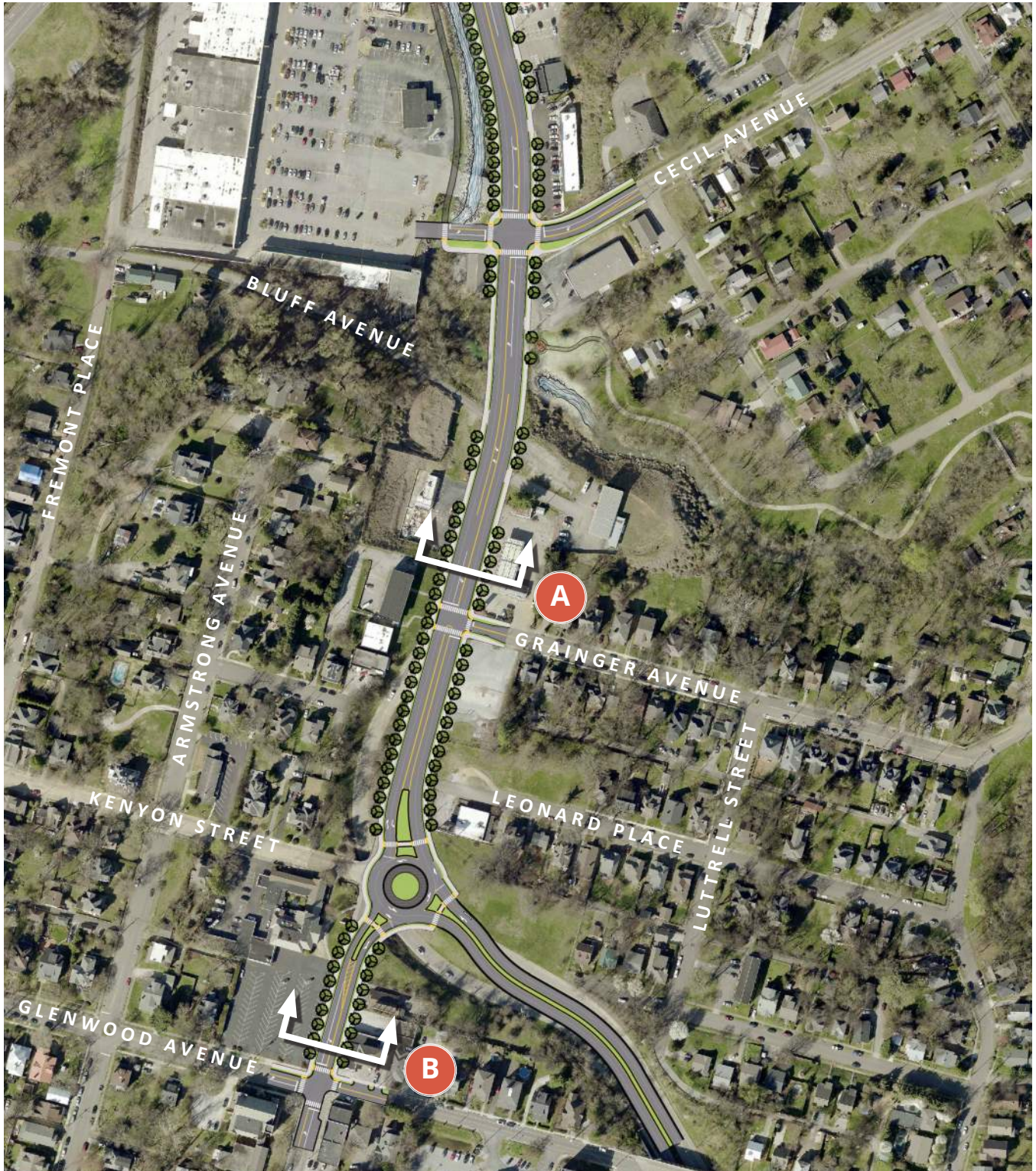
At the northern end of the corridor, the center line of Broadway should be shifted approximately six feet to the west to accommodate the proposed improvements at the intersection of Cecil Avenue and Broadway.

The center line shift would occur between McCroskey Avenue and Cecil, extend through the Cecil Avenue intersection, and would transition back to the existing Broadway center line near First Creek.

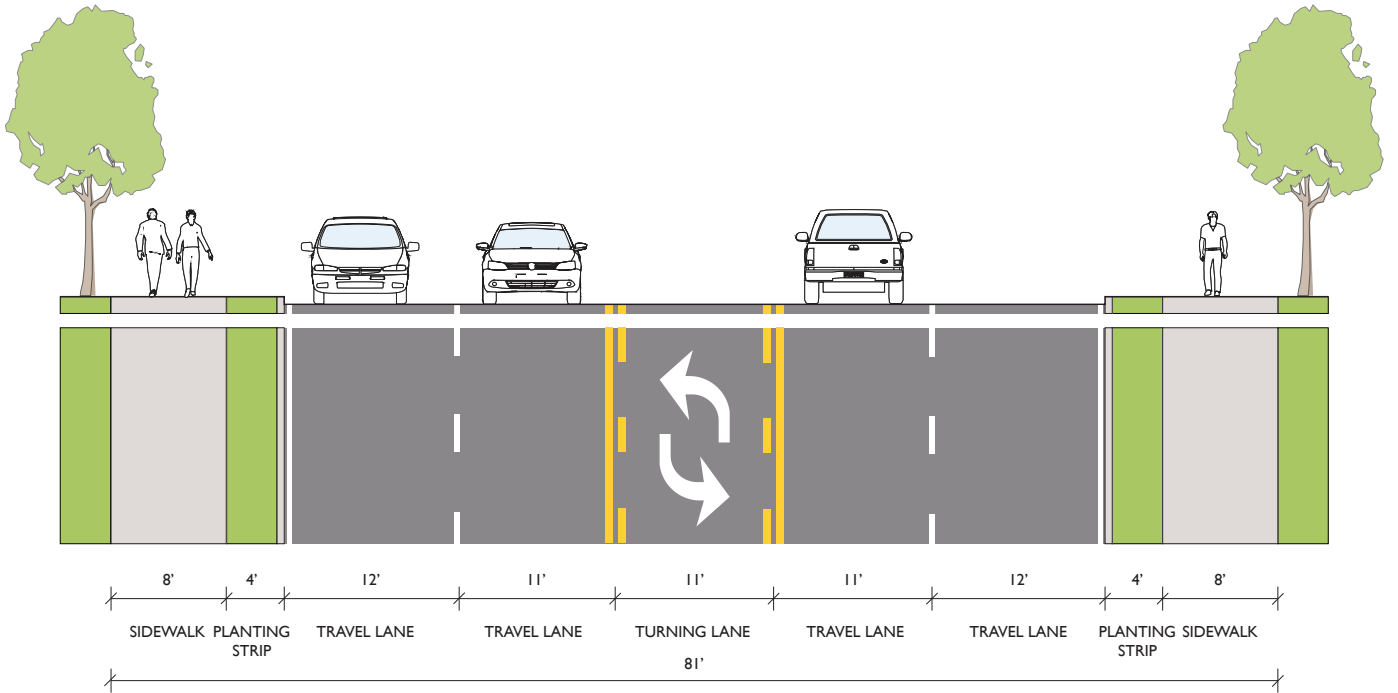
Currently, pedestrians crossing Cecil Avenue on the east side of Broadway must contend with a steep cross slope. The center line shift would allow this crosswalk to be relocated to a more level and accessible location.

# CORRIDOR PLAN

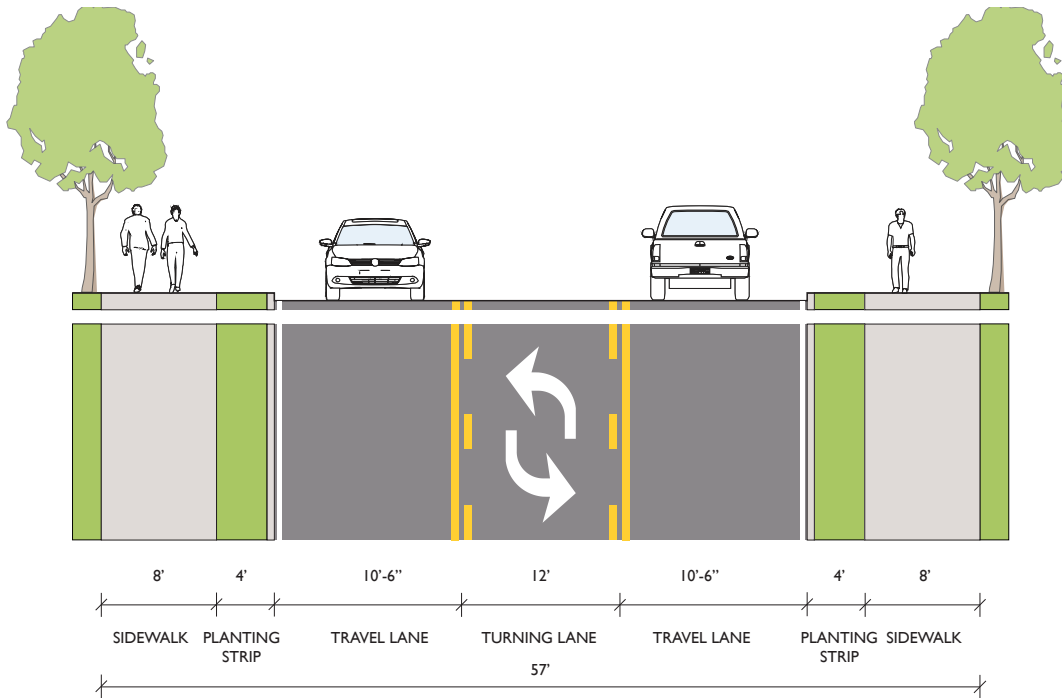
The corridor plan provides a consistent, safer and more comfortable environment for all Broadway users. A four foot planting strip provides separation from vehicular traffic, and the eight-foot sidewalks are wider and more comfortable than the existing five-foot sidewalks. Street trees planted on the outer edge of the sidewalk provide aesthetic value to the corridor and shade during warm summer months.







**A** PROPOSED CROSS SECTION  
BROADWAY NORTH OF GRAINGER AVE.



**B** PROPOSED CROSS SECTION  
BROADWAY BETWEEN KENYON ST. & W. GLENWOOD AVE.



# **BROADWAY + CECIL AVENUE**

## **INTERSECTION CONCEPT**

The intersection of Cecil Avenue and Broadway should be converted to a protected intersection. Protected intersections provide safer movements for all modes of transportation. Through proper design, protected intersections are easy to navigate for all users, promote predictability of movement, and allow for eye contact between motorists, pedestrians, and bicyclists





**THE CONCEPT**

Given that the First Creek Greenway is expected to cross at the Cecil Avenue intersection, it will be especially important to provide a safer and more comfortable intersection for all users.

**PROTECTED INTERSECTION**

The Cecil Avenue intersection should incorporate the elements of a protected intersection, which are detailed at right, to protect pedestrians and bicyclists traveling along Broadway and navigating the future linkage between the Upper and Lower First Creek Greenway segments.

**SHOPPING CENTER ENTRANCE**

To enter the Broadway Shopping Center, people travel over a bridge that crosses First Creek. This bridge is offset from the Cecil Avenue intersection. The redesigned intersection proposes removing the existing bridge and a small retail store immediately to the south of the bridge. A new bridge would be aligned with Cecil Avenue, and a left turn signal into the shopping center from Broadway would reduce the potential for crashes.

**ELEMENTS OF A PROTECTED INTERSECTION**



**CORNER ISLANDS**

Corner islands protect pedestrians and bicyclists by providing physical separation between turning motorists and the sidewalk. Corner islands also help reduce the turning speeds of motorists.



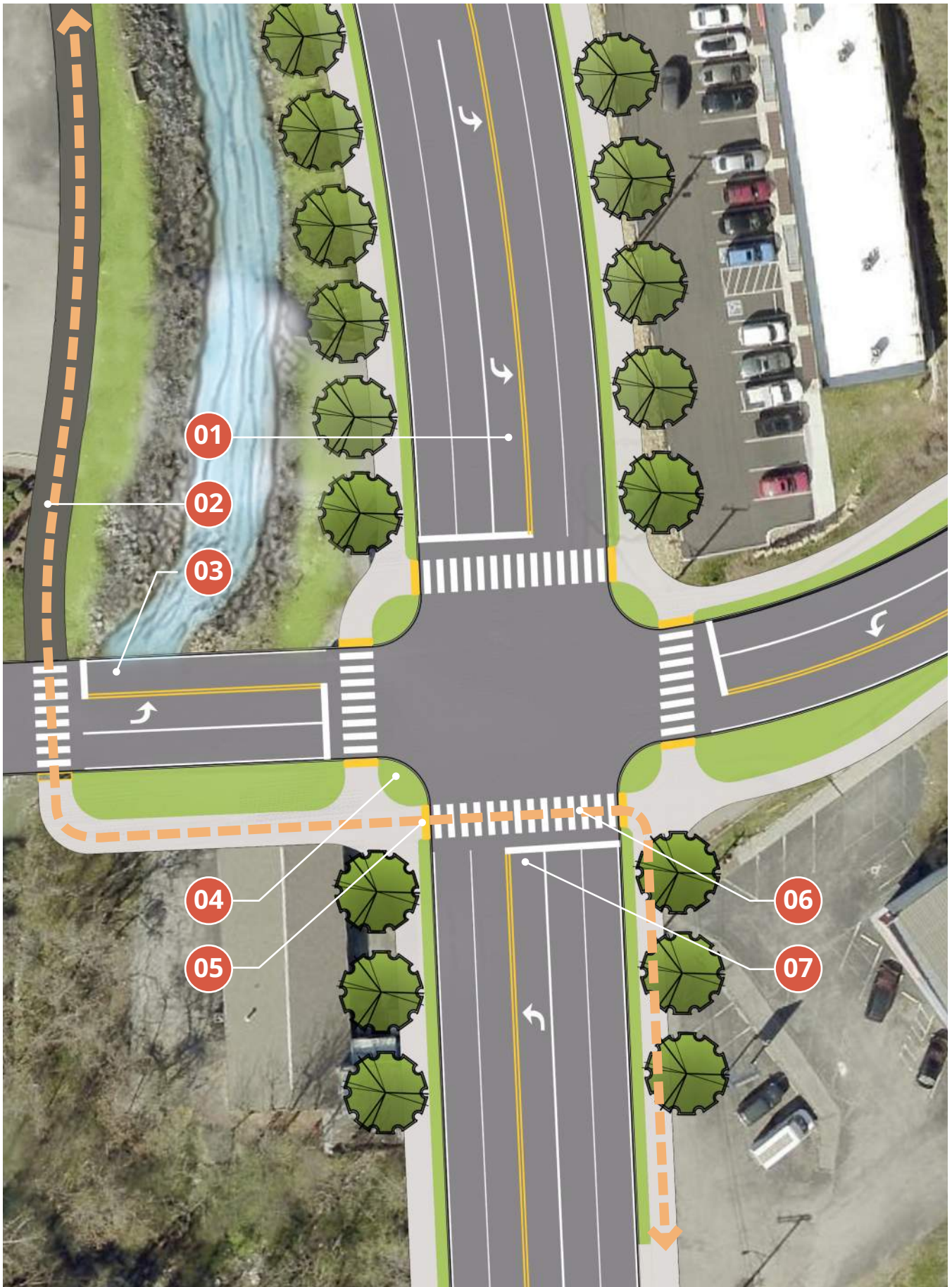
**YIELD ZONES**

Crosswalks that are offset between 6 feet and 16.5 feet from the parallel roadway help create yield space for turning vehicles. Motorists can see crossing pedestrians and bicyclists without the aid of mirrors and have more reaction time to brake.



**ACCESSIBLE CURB RAMPS**

Accessible curb ramps help accommodate persons with disabilities, including mobility and vision impairments. This is particularly important given the presence of the Broadway Towers Senior Living Apartments nearby.



01

**CENTER LINE SHIFT**

Currently, pedestrians crossing Cecil Avenue on the east side of Broadway must contend with a steep cross slope. The center line shift would allow this crosswalk to be relocated to a more level and accessible location.

02

**GREENWAY CONNECTION**

The Broadway and Cecil Avenue intersection will provide a critical linkage between the Lower and Upper segments of the First Creek Greenway. The concept plan at left shows one potential greenway alignment that is currently being developed as part of another project with the City of Knoxville.

03

**SHOPPING CENTER ENTRANCE**

The redesigned intersection proposes removing the existing bridge and a small retail store immediately to the south of the bridge. A new bridge would be aligned with Cecil Avenue and would accommodate the First Creek Greenway connection.

04

**CORNER ISLANDS**

Corner islands protect pedestrians and bicyclists by providing physical separation between turning motorists and the sidewalk. Corner islands also help reduce the turning speeds of motorists.

05

**ACCESSIBLE CURB RAMPS**

Curb ramps at all four quadrants of the intersection would be reconstructed to comply with ADA standards. The orientation of the proposed curb ramps will help orient users with the preferred path of travel.

06

**CROSSWALKS AND YIELD ZONES**

Yield zones are an important design feature at the busy entrance to the Broadway Shopping Center. Leading pedestrian intervals would also contribute to a safe experience for all users.

07

**DEDICATED LEFT TURN SIGNAL**

A dedicated left turn lane and signal will allow motorists to turn into the shopping center from Broadway, which will make turning movements more predictable and reduce the potential for crashes for all modes.



# **BROADWAY + HALL OF FAME DRIVE**

## **INTERSECTION CONCEPT**

The reimagined approach to the intersection of Broadway and Hall of Fame Drive is the centerpiece of this study. This intersection presents the most technical challenges but also offers enormous potential to transform the corridor into an attractive gateway that invites new development and highlights existing businesses. As noted earlier, the City of Knoxville, key stakeholders, and the public expressed strong support for the hybrid roundabout concept during the December 2019 reveal of the three alternatives.



## THE CONCEPT

### SAFE FOR ALL AGES, ABILITIES, AND USERS

The geometry of the roundabout approaches requires motorists to slow down as they move through the intersection, which helps minimize the severity of crashes. The roundabout design also minimizes the number of possible conflict points. For pedestrians, the roundabout provides more opportunities to cross the intersection. Splitter islands shorten crossing distances and provide refuge to pedestrians. Depending on which leg of the roundabout pedestrians are crossing, they can cross either one or two lanes and only one direction of travel at a time.

### ENCOURAGE ECONOMIC VIBRANCY

The roundabout has a smaller footprint than the existing intersection and will free up more space for development that better fits the traditional context.

### PROVIDE MULTIMODAL CONNECTIONS

Pedestrian crossing locations have been increased, and the roundabout design will positively impact several existing KAT bus routes.

### REPAIR THE URBAN FABRIC

The current grade-separated intersection disrupted the pattern of development, with traditional development to the south, as represented by the small businesses near the Glenwood intersection and the Fourth and Gill neighborhood. To the north of the intersection, Broadway's five-lane cross section encouraged strip development in stark contrast to the older development.

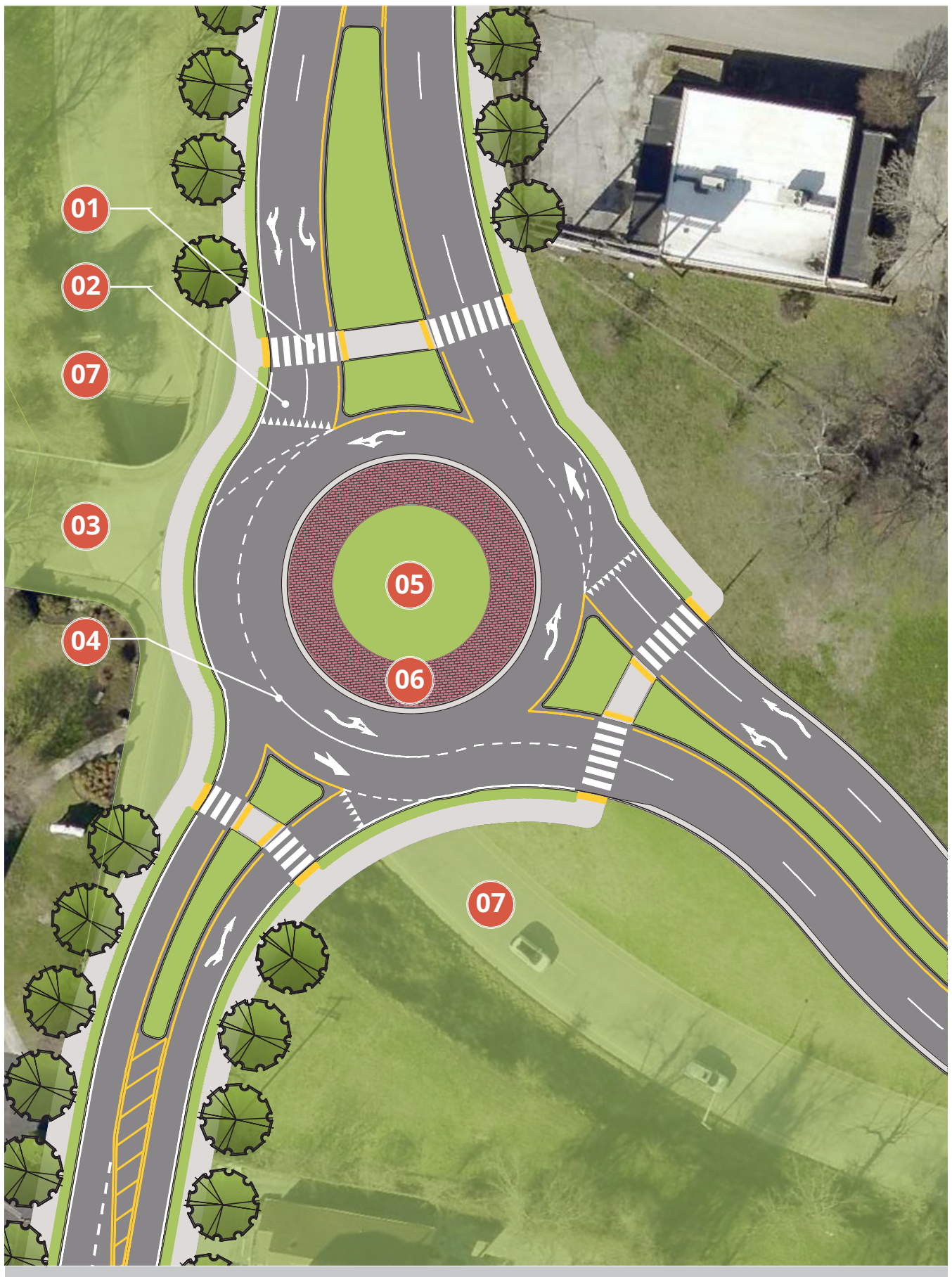
### CONTRIBUTE TO LOCAL CHARACTER

The large center island can accommodate a lush landscape and sculptural elements to serve as a gateway to North Knoxville.

### ACCOMMODATE COMMUTER TRAFFIC

The proposed design provides two lanes for motorists traveling southbound from Broadway to Hall of Fame Drive and two lanes for motorists traveling northbound from Hall of Fame Drive to Broadway. This will accommodate peak volumes that occur during morning and evening commutes. The roundabout narrows to one lane for motorists traveling northbound on Hall of Fame who then wish to head southbound on Broadway.







01

**PEDESTRIAN CROSSINGS**

Pedestrians can now cross one direction of traffic on each leg of the roundabout and have shorter crossing distances to contend with. Maintaining clear sight distances will be important for ensuring motorists and pedestrians can see each other.

02

**ENTRY DESIGN**

The roundabout entry lanes feature horizontal deflection to slow motorists' speeds. After yielding to any crossing pedestrians, motorists may wait in the space forward of the crosswalk if needed before entering the roundabout.

03

**KENYON STREET GREENSPACE**

The roundabout design is safer if the connection from Broadway to Kenyon Street is converted to a greenspace. The greenspace provides the added benefits of preventing motorists from using Kenyon Street as a shortcut to Woodland Avenue and will also reinforce the sense of arrival to North Knoxville.

04

**HYBRID ROUNDABOUT**

Two lanes are provided to accommodate the large volume of motorists traveling to and from Hall of Fame Drive during morning and evening peak hours. The roundabout narrows to one lane to accommodate motorists traveling northbound on Hall of Fame who then wish to head southbound on Broadway.

05

**CENTRAL ISLAND**

The large central island can accommodate a lush landscape and sculptural elements to serve as a gateway to North Knoxville. The central island represents a major opportunity for contributing to the character of North Knoxville.

06

**TRUCK APRON**

The truck apron surrounding the central island can accommodate wheel tracking of larger vehicles that traverse the roundabout. The apron will consist of pavers or stamped concrete, and will be slightly raised to slope toward the roadway.

07

**RECLAIMED AREA**

Construction of the roundabout will require the removal of the existing bridge and adding a substantial amount of fill soil to repair the gashes left by the Hall of Fame ramps. Bringing these areas up to grade will provide opportunities for development.



# BICYCLE NETWORK

## RECOMMENDATIONS

Given the project's goal of improving the safety, functionality, and aesthetics of the corridor for all users, the design team explored Broadway's suitability for accommodating an on-road bikeway. Based on the speed and volume of vehicular traffic, only a separated bikeway would offer acceptable levels of safety and comfort for most bicyclists. Separated bikeways use vertical elements and a horizontal buffer to provide physical separation between the bicyclists and motorists. Providing a separated bikeway facility proved to be infeasible for several reasons. First, TDOT and the City did not desire to reduce the number of travel lanes to accommodate an on-street bicycle facility. Second, the First Creek crossing and the corridor's topography limited the viability of widening the roadway to accommodate protected bike lanes or a side path. To accommodate bicyclists in a comfortable and safe manner, the project team developed several recommendations within the project study area that are adjacent to Broadway.



## ELEMENTS OF MULTIMODAL NETWORKS

### WHAT MAKES A GOOD MULTIMODAL NETWORK?

A well-designed multimodal network must consider and address the safety and comfort of all users while providing appropriate access to destinations within a community. The transportation system should provide mobility options and accommodate and/or prioritize more vulnerable users such as pedestrians and people riding bicycles along travel corridors and intersections. Safety should be prioritized over saving a few seconds per trip and the downtown multimodal network should be a place where all users are welcome. While the street network is connected for motorized vehicles, other modes of travel have fragmented or limited infrastructure. Although installing a single bicycle or pedestrian facility might support and encourage active travel in one specific place, it is unlikely to have a greater impact on how community members travel. The more effective approach to encouraging bicycling and walking is through developing a network of interconnected facilities that run between key destinations.



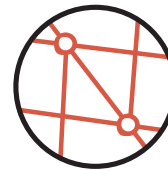
#### SAFETY

The frequency and severity of crashes are minimized and conflicts with motor vehicles are limited.



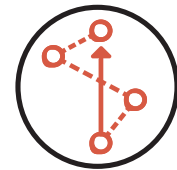
#### COMFORT

Conditions do not deter bicycles due to stress, anxiety, or concerns over safety.



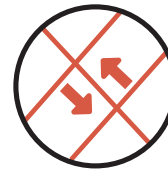
#### CONNECTIVITY

All destinations can be accessed using a complete bicycle and pedestrian network with no gaps or missing links.



#### DIRECTNESS

Bicycling distances and trip times are minimized.



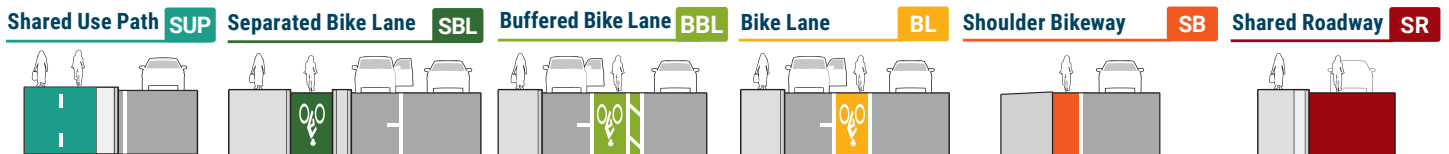
#### COHESION

Distances between parallel and intersecting bike routes are minimized.



#### ATTRACTIVENESS

Routes direct bicyclists and pedestrians through lively areas and personal safety is prioritized.



COMFORTABLE

UNCOMFORTABLE



## BICYCLE BOULEVARDS

Bike boulevards, sometimes referred to as neighborhood greenways, are streets designed to prioritize bicycle traffic by minimizing motorized traffic volumes and operating speeds. Often, bicycle boulevards prioritize traffic calming, pedestrian movement, and some include green infrastructure to manage stormwater. Several local streets adjacent to Broadway may provide alternative routes that are safer and more comfortable experience for bicyclists. Retrofitting these streets may be required to ensure that they provide the lower speed, lower volume characteristics of bicycle boulevards.

The proposed bicycle boulevards would connect to several existing bike facilities, including the First Creek Greenway, shared bike lane facilities on Woodland Avenue and Nadine Avenue, and a signed bike route on Gillespie Avenue.



## BIKE/PED BRIDGE

The construction of Hall of Fame Drive severed Luttrell Street north of East Glenwood Avenue, and the ramp to Broadway serves as a barrier between the neighborhoods of Old North Knoxville and Fourth and Gill. To restore this connection, we recommend a bicycle-pedestrian bridge over Hall of Fame Drive. This bridge would provide a direct connection to the First Creek Greenway and would reinforce Luttrell Street as an alternate route to Broadway for bicyclists and pedestrians.

The idea for a bicycle-pedestrian bridge in this location is not new. In the 2005 TDOT study of the Broadway-Hall of Fame intersection, a member of the community and workshop participant proposed that a bridge be built in this location.

## GREENWAY CONNECTION

The Lower First Creek Greenway currently terminates on the east side of Broadway, as the shared use path slopes uphill to meet the sidewalk. There are plans to connect the lower greenway segment with the Upper First Creek Greenway, which terminates at Woodland Avenue. The proposed connection would extend along Broadway to connect the two existing segments. Although the design and final alignment of the proposed connection is outside the scope of this study, the project team has communicated and collaborated with the City and the designers of the greenway connection.

The proposed connection would pick up at the current trailhead on the east side of Broadway and extend north to the Cecil Avenue intersection. Greenway users would cross Broadway to the shopping center, where the shared use path would then extend north to Woodland Avenue.



# BICYCLE NETWORK COMPONENTS

01

## PROPOSED GREENWAY EXTENSION

Although this portion of the greenway extension is still being designed, one possible alignment is routing the greenway on the west side of First Creek along the edge of the shopping center.

02

## FIRST CREEK GREENWAY (EXISTING)

The existing segment of Lower First Creek Greenway extends to a modest trailhead on the east side of Broadway. During future design efforts, the trailhead should be upgraded to celebrate the presence of the greenway.

03

## CONNECTION TO LUTTRELL STREET

A narrow bridge and trail currently provides a connection from Grainger Avenue to the First Creek Greenway. Future efforts to upgrade this connection may include a wider bridge and better signage and visibility.

04

## PROPOSED ON-STREET BIKE FACILITIES

As noted in previous pages, the local streets adjacent to Broadway may be suitable for being retrofitted as bicycle boulevards or other interventions that strengthen the network of non-motorized transportation options.

05

## PROPOSED BIKE-PEDESTRIAN BRIDGE

This bridge would provide a direct connection to the First Creek Greenway and would reinforce Luttrell Street as an alternate route to Broadway for bicyclists and pedestrians. Engineering considerations will include clearance requirements over Hall of Fame Drive and the tie-in point to the Glenwood Avenue bridge.

06

## PROPOSED WOODLAND AVE. BIKE LANES

The proposed design for buffered bike lanes on Woodland Avenue, when installed, will only strengthen the network of non-motorized transportation facilities in the vicinity of the Broadway Corridor.

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# MENU OF PLANNING-LEVEL COSTS

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06

# OPINION OF PROBABLE COSTS

The budget-level opinion of probable cost (OPC) for each of the three alternatives is organized into individual design elements on the opposite page. These are order-of-magnitude OPCs made for budget purposes only. OPCs shall be reviewed, revised, and adjusted accordingly at program verification and/or the schematic design phase. The OPCs assume a competitive bid and are opinions of probable cost based on fair market value, historical TDOT bid tabulations, and estimator's judgement. These are not predictions of the anticipated low bid. For each fiscal year after the publication of this document (2020), the estimator should add 5% to the unit cost of each item.

## ALTERNATIVE 1

Signalized T: Broadway in HOF



**TOTAL  
PROJECT COST  
\$7,852,560**

## ALTERNATIVE 2

Signalized T: HOF into Broadway



**TOTAL  
PROJECT COST  
\$8,133,720**

## ALTERNATIVE 3

Roundabout



**TOTAL  
PROJECT COST  
\$7,373,880**

All alternatives will have substantial fill to ensure that Broadway and Hall of Fame Drive now intersects at-grade. Removal of existing structures, including the single span bridge at the intersection of Kenyon and Broadway, will also contribute to the total project costs for each alternative. Utility relocations and Right-of-Way acquisitions have also been incorporated into each alternative's opinion of probable cost.

## OPINION OF PROBABLE CONSTRUCTION COST

| Construction Items                                               | ALTERNATIVE 1      | ALTERNATIVE 2      | ALTERNATIVE 3      |
|------------------------------------------------------------------|--------------------|--------------------|--------------------|
| Pavement Removal                                                 | \$114,600          | \$121,500          | \$96,900           |
| Asphalt Paving                                                   | \$378,900          | \$392,600          | \$218,000          |
| Drainage                                                         | \$309,300          | \$335,200          | \$209,100          |
| Appurtenances                                                    | \$234,200          | \$255,300          | \$163,500          |
| Structures                                                       | \$1,730,000        | \$1,730,000        | \$1,730,000        |
| Signalization                                                    | \$300,000          | \$300,000          | \$0                |
| Earthwork                                                        | \$111,000          | \$54,400           | \$68,300           |
| Seeding and Sodding                                              | \$8,900            | \$11,100           | \$6,400            |
| Guardrail                                                        | \$42,200           | \$44,400           | \$37,300           |
| Signing                                                          | \$4,500            | \$4,500            | \$5,100            |
| Pavement Markings                                                | \$19,100           | \$21,400           | \$12,900           |
| Maintenance of Traffic                                           | \$88,000           | \$88,400           | \$81,700           |
| Mobilization (5%)                                                | \$167,000          | \$167,900          | \$131,500          |
| Other items (10%)                                                | \$350,800          | \$352,700          | \$276,100          |
| Contingency (30%)                                                | \$638,600          | \$644,800          | \$392,000          |
| <b>Construction Estimate</b>                                     |                    |                    |                    |
| <b>Interchanges &amp; Unique Intersections</b>                   |                    |                    |                    |
| Roundabouts                                                      | \$0                | \$0                |                    |
| Interchanges                                                     | \$0                | \$0                | \$0                |
| <b>Right-of-Way &amp; Utilities</b>                              |                    |                    |                    |
| Right-of-Way                                                     | \$848,300          | \$938,600          | \$780,700          |
| Utilities                                                        | \$1,198,400        | \$1,315,300        | \$935,400          |
| <b>Preliminary &amp; Construction Engineering and Inspection</b> |                    |                    |                    |
| Preliminary Engineering (10%)                                    | \$654,380          | \$677,810          | \$614,490          |
| Construction Engineering and Inspection (10%)                    | \$654,380          | \$677,810          | \$614,490          |
| <b>Total Project Cost</b>                                        | <b>\$7,852,560</b> | <b>\$8,133,720</b> | <b>\$7,373,880</b> |

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# PHASING AND IMPLEMENTATION



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# PHASING AND IMPLEMENTATION

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*A plan that is not grounded in truth is a plan that will sit on a shelf. The transformation of the Broadway Corridor will not be realized overnight. Careful planning, negotiating, design, funding, and construction can take several years to materialize. Understanding this, attention must be given to a succinct and well thought out phasing and implementation plan. This chapter seeks to guide the City through the proposed phasing, implementation, and funding process, outlining a clear path forward to a lasting legacy for the Broadway Corridor.*



## PHASING PLAN

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The Broadway Corridor Plan will be implemented over the course of several years. Starting with catalyst projects that can be implemented quickly and provide immediate positive impacts will help show the City's commitment to improving the quality of life along the Broadway Corridor.

For projects with longer anticipated timelines, local champions should start by coordinating with TDOT to ensure that projects are incorporated into the State Transportation Improvement Program.



## IMPLEMENTATION PLAN

---

The visioning process for this project has brought the community together to develop a shared vision for the Broadway Corridor. The plan itself is just the beginning of the process and cultivates momentum for change. The excitement gained during the process must be continued.

Now that a clear vision and a Corridor Plan have been established, complete with an understanding of community desires and guidance on key design features, it is time to advance the plan to reality.



## FUNDING PHASE

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Funding is a critical element for successful implementation of any project. Key partnerships and resources will need to be made, identified, and applied for to leverage existing dollars for more construction funds.

Outlined later in this chapter are key partnerships and potential funding opportunities for the City of Knoxville to explore.

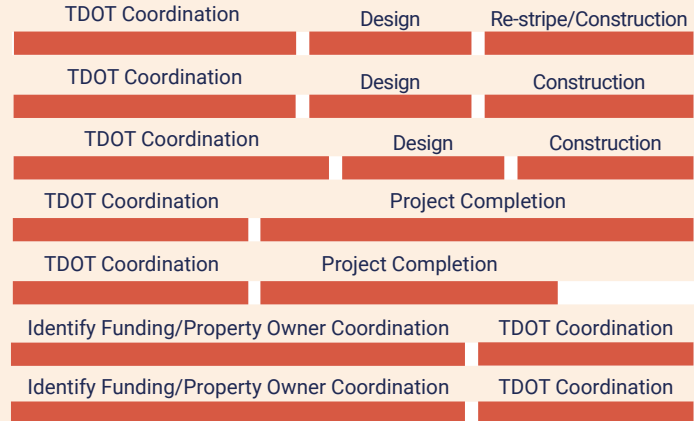
# PHASING PLAN

NOW

01

## Broadway + Cecil Avenue

- Update crosswalk markings
- Upgrade accessible curb ramps to ADA standards
- Convert shopping center entrance to right-in, right-out
- Move R10-15 sign from cable to utility pole
- Implement longer leading pedestrian intervals
- Shift the center line of Broadway to the west
- Align shopping center bridge with Cecil Avenue and construct corner islands



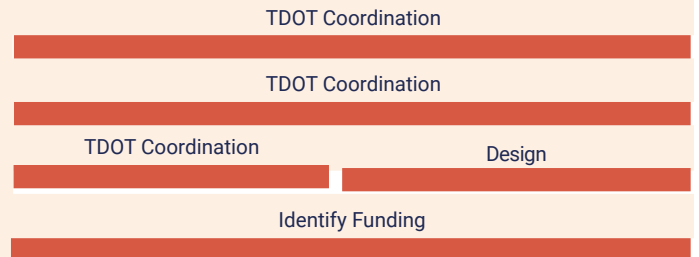
## Broadway + McCroskey Avenue

- Convert median to accommodate left hand turn from Broadway to McCroskey Avenue
- Install audible pedestrian traffic signals near crosswalks



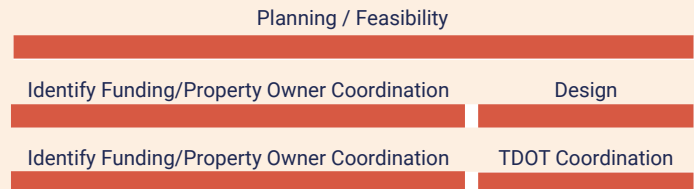
## Broadway + Hall of Fame Drive

- Add left hand turn and signal from northbound Broadway to southbound Hall of Fame Drive
- Provide crosswalk striping and pedestrian refuge island
- Provide a pedestrian connection to Thompson and Kenyon
- Install the roundabout at Broadway + HoF Drive



## Bicycle Network

- Convert local streets into Bicycle Boulevards
- Upgrade the First Creek Greenway connection
- Install bike-pedestrian bridge at Luttrell Drive







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# CATALYST PROJECTS

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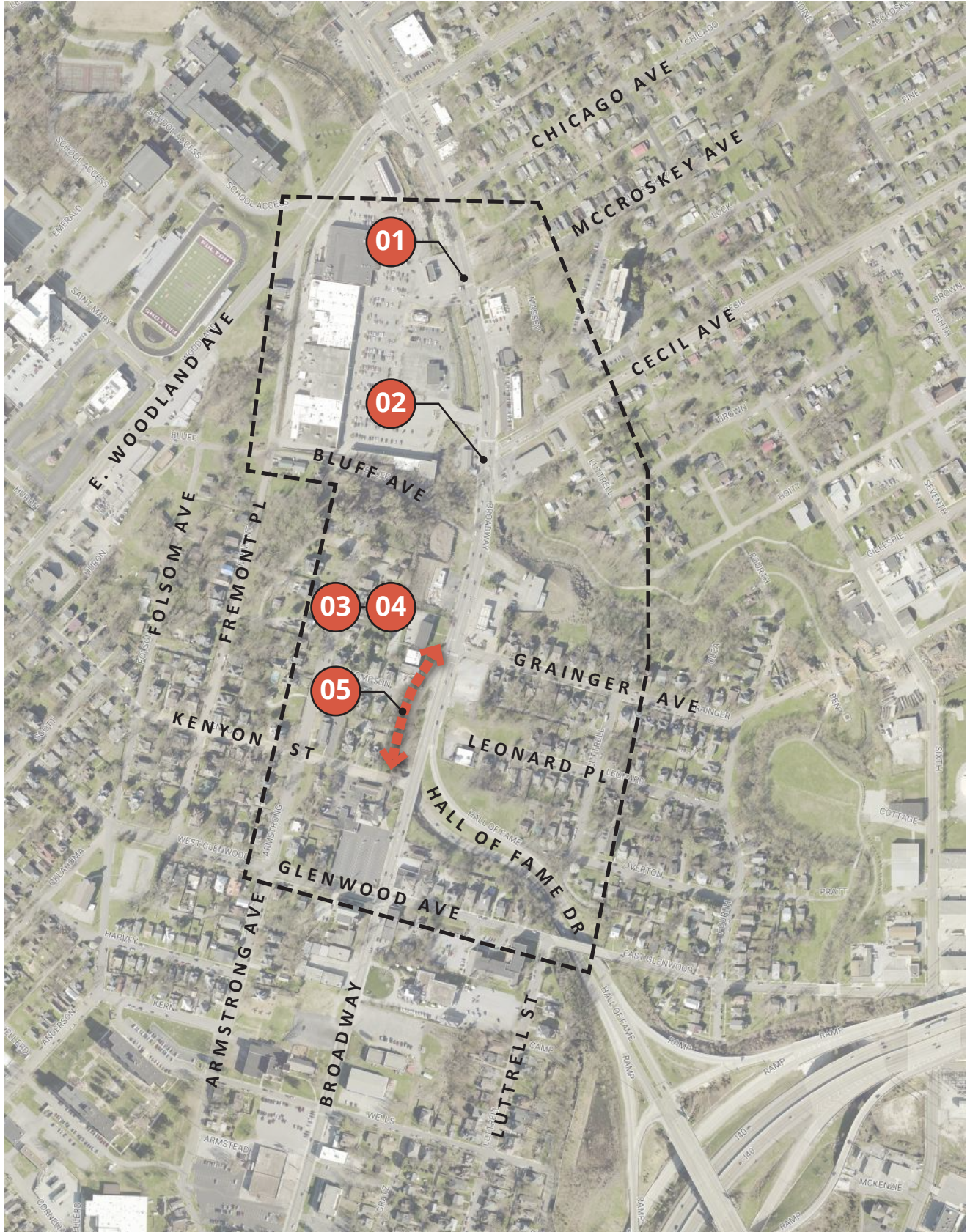
OLD  
NORTH KNOXVILLE  
HISTORIC DISTRICT



08



# CATALYST PROJECT MAP



# CATALYST PROJECTS

01

## MCCROSKEY AVENUE: LEFT TURN

The two-way center turn lane would be restriped to indicate a dedicated left turn from southbound Broadway onto McCroskey Avenue. Audible pedestrian signals would be added, and the crosswalk on the west side of Broadway would be restriped to increase the visibility of the pedestrian crossing location.

02

## CECIL AVENUE: ACCESSIBILITY

Crosswalk markings would be added across Broadway aligning with the south side of Cecil, and accessible curb ramps would be constructed. The entrance to the Broadway Shopping Center would be converted to right-in, right-out. Longer leading pedestrian intervals would be implemented.

03

## HALL OF FAME DRIVE: OPTION 1

The intersection of Broadway and Grainger would be restriped to allow for legal left turns from northbound Broadway onto southbound Hall of Fame Drive. A left turn signal may be required to allow for a dedicated turning phase. A pedestrian refuge island would be added to protect pedestrians crossing Broadway.

04

## HALL OF FAME DRIVE: OPTION 2

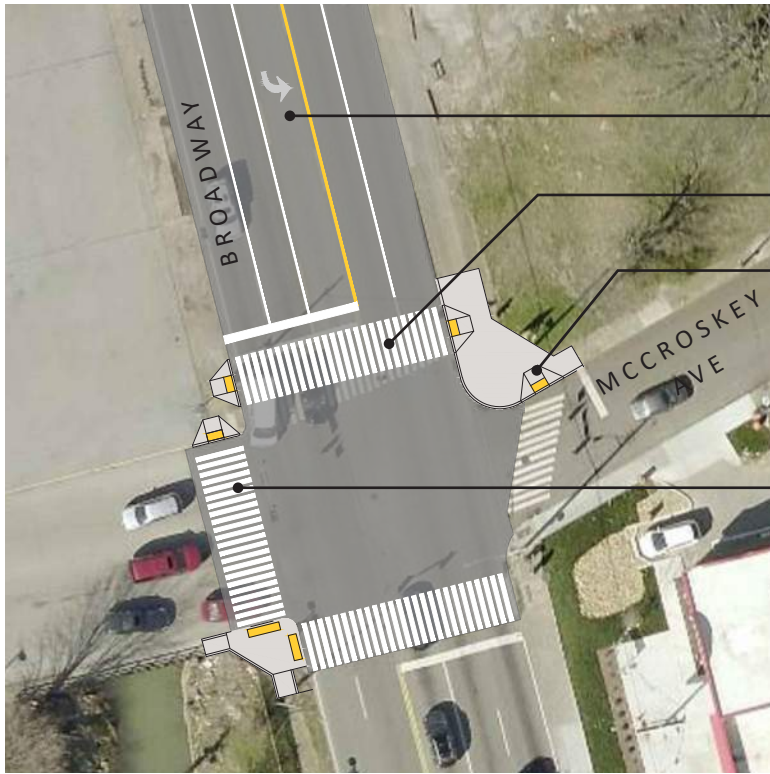
A planted median prevents left turns onto southbound Hall of Fame from motorists traveling northbound on Broadway. An additional curb and planted area visually narrows the roadway and reduces vehicular speeds. The planted areas provide opportunities to improve the aesthetics of the area in the short-term. A pedestrian refuge island protects pedestrians crossing Broadway.

05

## KENYON STREET SIDEWALK

A new sidewalk from Kenyon Street to Grainger will provide a safer and more direct pedestrian connection to Broadway. This new sidewalk would be on the west side of the ramp to southbound Hall of Fame Drive. Pedestrians would no longer have to cross the southbound ramp as they do in its current configuration.

# CATALYST PROJECTS



## MCCROSKEY AVENUE

Convert center lane to dedicated left turn

Restripe crosswalk perpendicular to road

Upgrade curb ramps to be accessible

Add crosswalk marking at shopping center entrance

Note: Accessible curb ramps and adjacent sidewalks will need to be thoroughly designed to ensure full compliance with the Americans for Disabilities Act.



## CECIL AVENUE

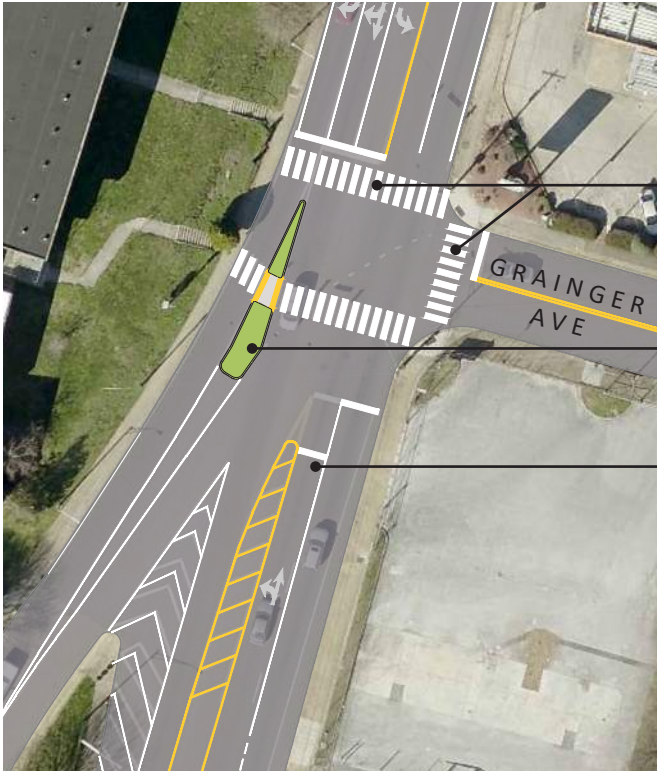
Convert shopping center entrance to right-in, right-out to reduce potential conflicts

Add parallel curb ramp

Add parallel curb ramp

Add crosswalk marking

Add perpendicular curb ramps

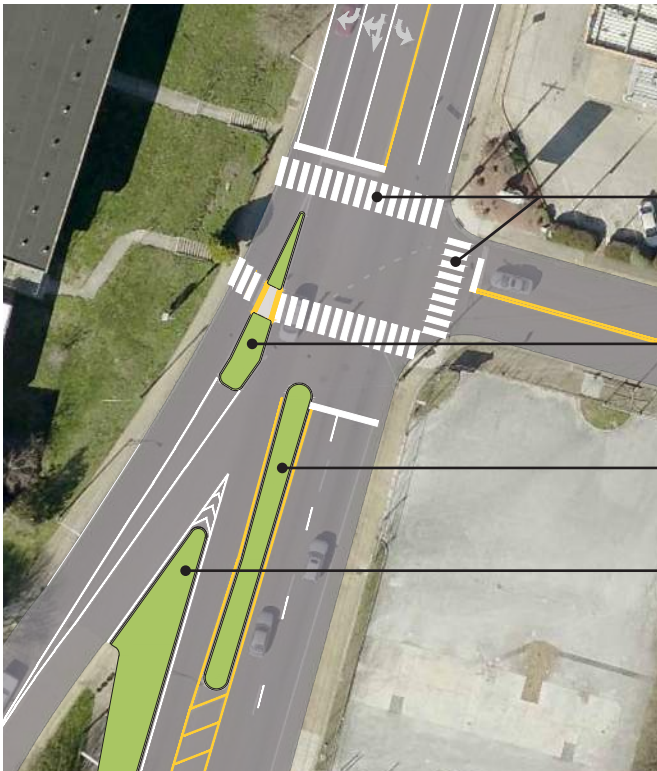


**HALL OF FAME: OPTION 1**

Add crosswalk markings at north and east legs

Add pedestrian refuge island; may be planted with groundcovers or paved with concrete

Restripe to allow for left turn onto southbound Hall of Fame Drive. May require a left turn signal.



**HALL OF FAME: OPTION 2**

Add crosswalk markings at north and east legs

Add pedestrian refuge island; may be planted with groundcovers or paved with concrete

Add median island to prevent left turns onto southbound Hall of Fame

Add curb and planting area to visually narrow lane widths and help slow motorists

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# APPENDICES



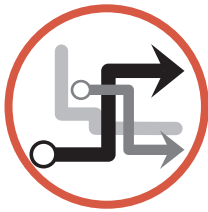
09



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# APPENDICES

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## APPENDIX A: TRAFFIC ANALYSIS

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The raw traffic analysis data in Appendix A provides a more detailed look at the performance measures that were evaluated, including average delay and 95th percentile queue. The traffic analysis was performed by Barge Design Solutions.



## APPENDIX B: PUBLIC PRESENTATION

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Appendix B includes the Presentation of Alternatives slide deck shown to the public on December 11, 2019. The presentation includes a review of the project's basic information, a summary of public feedback to date, proposed intersection alternatives, a review of the traffic analysis data, and a feasibility matrix comparing the alternatives.



## APPENDIX C: CONCEPT DESIGNS

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Appendix C includes the full-size concepts for the Pedestrian Bridge at Luttrell Street, the reimagined Cecil Avenue, and the three alternative concepts for the Hall of Fame Drive intersection with Broadway.

|              |                                          |                   | 2019 T        |             |          | 2019 RB     |          |       | 2029 T      |          |            | 2029 RB     |          |       |      |
|--------------|------------------------------------------|-------------------|---------------|-------------|----------|-------------|----------|-------|-------------|----------|------------|-------------|----------|-------|------|
| Intersection | Approach                                 | Available Storage | Delay         | LOS         | Queue    | Delay       | LOS      | Queue | Delay       | LOS      | Queue      | Delay       | LOS      | Queue |      |
| <b>AM</b>    |                                          |                   |               |             |          |             |          |       |             |          |            |             |          |       |      |
| Signal       | <b>Hall of Fame Drive &amp; Broadway</b> | <b>Overall</b>    | <b>9.5</b>    | <b>A</b>    | --       | <b>7.7</b>  | <b>A</b> | --    | <b>9.5</b>  | <b>A</b> | --         | <b>8.4</b>  | <b>A</b> | --    |      |
| Signal       |                                          | Eastbound         | <b>63.7</b>   | <b>E</b>    | --       | 10.0        | B        | 1.7   | <b>63.1</b> | <b>E</b> | --         | 11.5        | B        | 2.1   |      |
| Signal       |                                          | EB Left           | 175' (7 veh)  | <b>61.8</b> | <b>E</b> | <b>8.6</b>  |          |       | <b>61.2</b> | <b>E</b> | <b>9.2</b> |             |          |       |      |
| Signal       |                                          | EB LT/RT          | 400' (16 veh) | <b>65.6</b> | <b>E</b> | 15.0        |          |       | <b>65.1</b> | <b>E</b> | 16.0       |             |          |       |      |
| Signal       |                                          | Northbound        |               | 2.6         | A        | --          | 5.3      | A     | 1.0         | 2.8      | A          | --          | 5.6      | A     | 1.1  |
| Signal       |                                          | NB Left           | 200' (8 veh)  | 3.0         | A        | 1.1         |          |       |             | 3.3      | A          | 1.2         |          |       |      |
| Signal       |                                          | NB Thru           | 999' (40 veh) | 2.5         | A        | 2.9         |          |       |             | 2.7      | A          | 3.3         |          |       |      |
| Signal       |                                          | Southbound        |               | 0.5         | A        | --          | 8.1      | A     | 3.3         | 0.5      | A          | --          | 8.9      | A     | 3.8  |
| Signal       |                                          | SB Thru           | 475' (19 veh) | 0.3         | A        | 0.2         |          |       |             | 0.3      | A          | 0.2         |          |       |      |
| Signal       |                                          | SB Right          | 200' (8 veh)  | 0.8         | A        | 0.5         |          |       |             | 0.9      | A          | 0.6         |          |       |      |
| <b>MD</b>    |                                          |                   |               |             |          |             |          |       |             |          |            |             |          |       |      |
| Signal       | <b>Hall of Fame Drive &amp; Broadway</b> | <b>Overall</b>    | <b>23.2</b>   | <b>C</b>    | --       | <b>7.6</b>  | <b>A</b> | --    | <b>22.3</b> | <b>C</b> | --         | <b>8.5</b>  | <b>A</b> | --    |      |
| Signal       |                                          | Eastbound         |               | 47.6        | D        | --          | 11.3     | B     | 3.8         | 46.9     | D          | --          | 13.3     | B     | 4.9  |
| Signal       |                                          | EB Left           | 175' (7 veh)  | 47.6        | D        | 1.4         |          |       |             | 46.9     | D          | <b>12.2</b> |          |       |      |
| Signal       |                                          | EB LT/RT          | 400' (16 veh) | 0.0         | A        | 0.0         |          |       |             | 0.0      | A          | 0.0         |          |       |      |
| Signal       |                                          | Northbound        |               | 5.0         | A        | --          | 7.0      | A     | 1.3         | 5.5      | A          | --          | 7.6      | A     | 1.5  |
| Signal       |                                          | NB Left           | 200' (8 veh)  | 10.6        | B        | 2.0         |          |       |             | 11.6     | B          | 2.3         |          |       |      |
| Signal       |                                          | NB Thru           | 999' (40 veh) | 4.1         | A        | 3.9         |          |       |             | 4.5      | A          | 4.5         |          |       |      |
| Signal       |                                          | Southbound        |               | 22.1        | C        | --          | 6.2      | A     | 2.0         | 20.2     | C          | --          | 6.6      | A     | 2.2  |
| Signal       |                                          | SB Thru           | 475' (19 veh) | 23.9        | C        | 9.1         |          |       |             | 21.9     | C          | 9.2         |          |       |      |
| Signal       |                                          | SB Right          | 200' (8 veh)  | 19.9        | B        | <b>18.6</b> |          |       |             | 18.0     | B          | <b>20.1</b> |          |       |      |
| <b>PM</b>    |                                          |                   |               |             |          |             |          |       |             |          |            |             |          |       |      |
| Signal       | <b>Hall of Fame Drive &amp; Broadway</b> | <b>Overall</b>    | <b>22.7</b>   | <b>C</b>    | --       | <b>12.0</b> | <b>B</b> | --    | <b>22.1</b> | <b>C</b> | --         | <b>14.9</b> | <b>B</b> | --    |      |
| Signal       |                                          | Eastbound         |               | 48.6        | D        | --          | 17.5     | C     | 8.9         | 47.6     | D          | --          | 23.4     | C     | 12.6 |
| Signal       |                                          | EB Left           | 175' (7 veh)  | 48.6        | D        | <b>13.6</b> |          |       |             | 47.6     | D          | <b>16.8</b> |          |       |      |
| Signal       |                                          | EB LT/RT          | 400' (16 veh) | 0.0         | A        | 7.2         |          |       |             | 0.0      | A          | 0.0         |          |       |      |
| Signal       |                                          | Northbound        |               | 7.7         | A        | --          | 14.0     | B     | 5.2         | 8.7      | A          | --          | 17.3     | B     | 6.9  |
| Signal       |                                          | NB Left           | 200' (8 veh)  | 13.6        | B        | <b>13.6</b> |          |       |             | 15.1     | B          | 2.8         |          |       |      |
| Signal       |                                          | NB Thru           | 999' (40 veh) | 7.2         | A        | 7.2         |          |       |             | 8.2      | A          | 11.4        |          |       |      |
| Signal       |                                          | Southbound        |               | 21.2        | C        | --          | 6.3      | A     | 2.1         | 19.0     | B          | --          | 6.8      | A     | 2.4  |
| Signal       |                                          | SB Thru           | 475' (19 veh) | 24.4        | C        | <b>24.4</b> |          |       |             | 22.3     | C          | 9.7         |          |       |      |
| Signal       |                                          | SB Right          | 200' (8 veh)  | 17.4        | B        | <b>17.4</b> |          |       |             | 15.3     | B          | <b>23.1</b> |          |       |      |

# BROADWAY CORRIDOR STUDY

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## Presentation of Alternatives

Wednesday, December 11th, 2019

# AGENDA

---

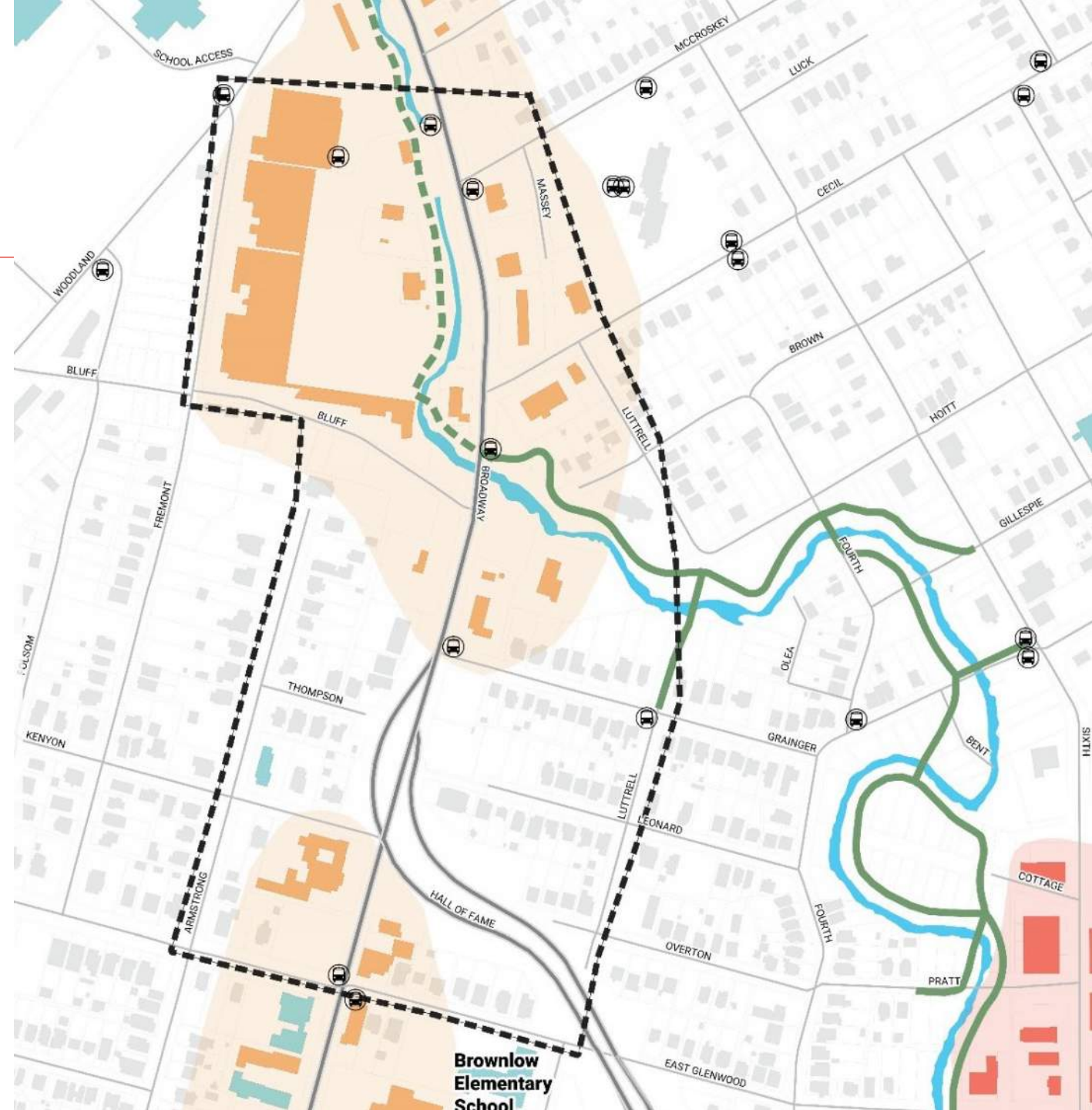
- Project review
- What we heard
- Intersection Alternatives
- Review of Traffic Analysis
- Feasibility Matrix
- **VOTE!**

# PROJECT REVIEW



# PROJECT AREA

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





# BROADWAY TODAY



## PEDESTRIAN CONDITIONS



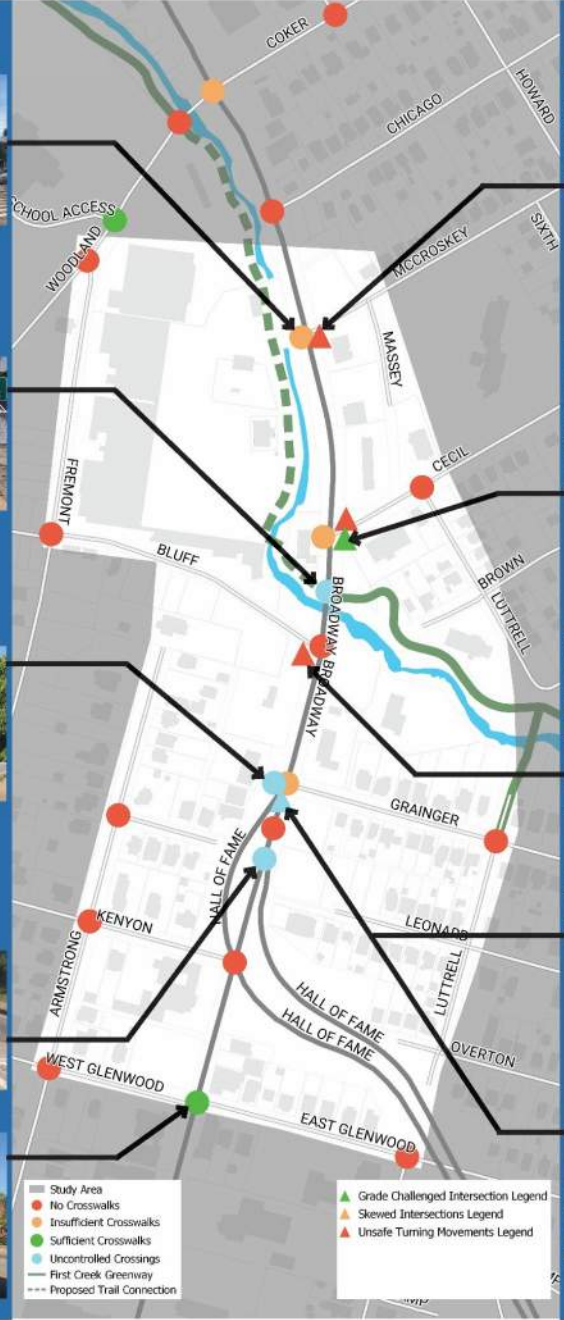
Several intersections lack complete pedestrian facilities such as crosswalks or ADA ramps installed at all corners. This deficiency hinders safe pedestrian and bicycle connectivity.



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.



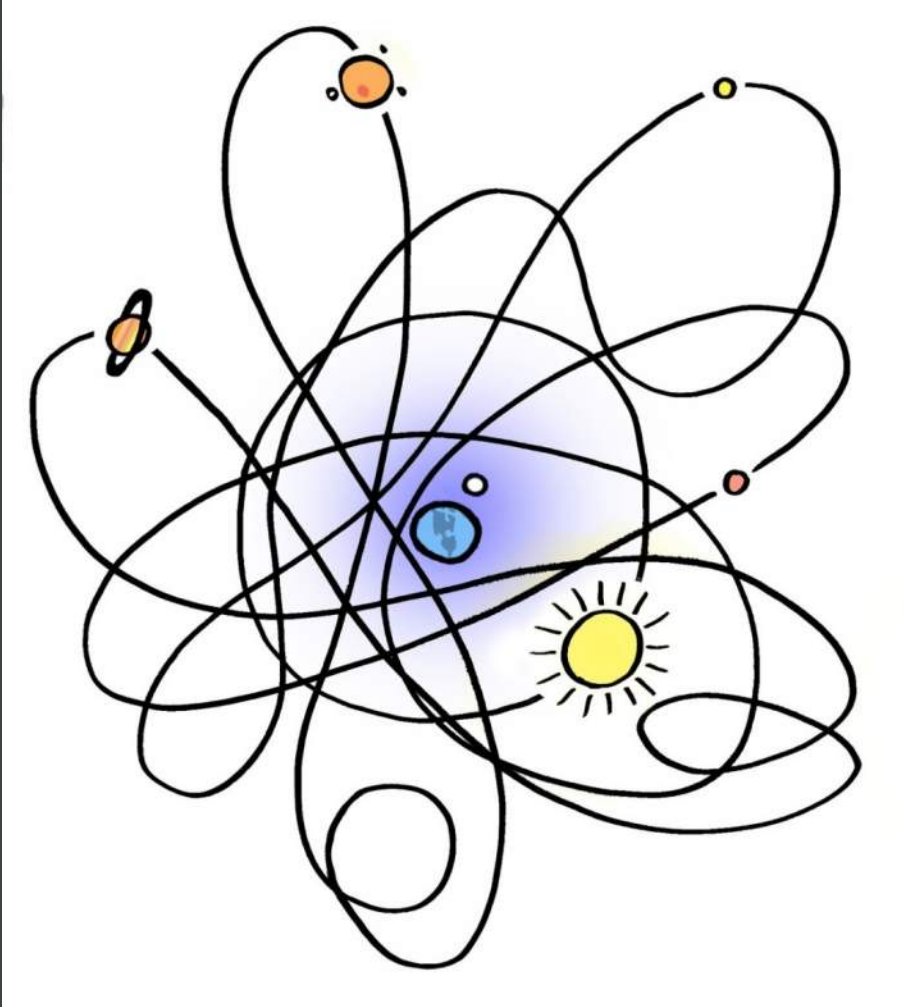
Unsafe turning movements risk the safety of other drivers and users of the Broadway Corridor. Facilities for protected intersections could reduce these unsafe movements that drivers take and improve safety for all other users on the street.

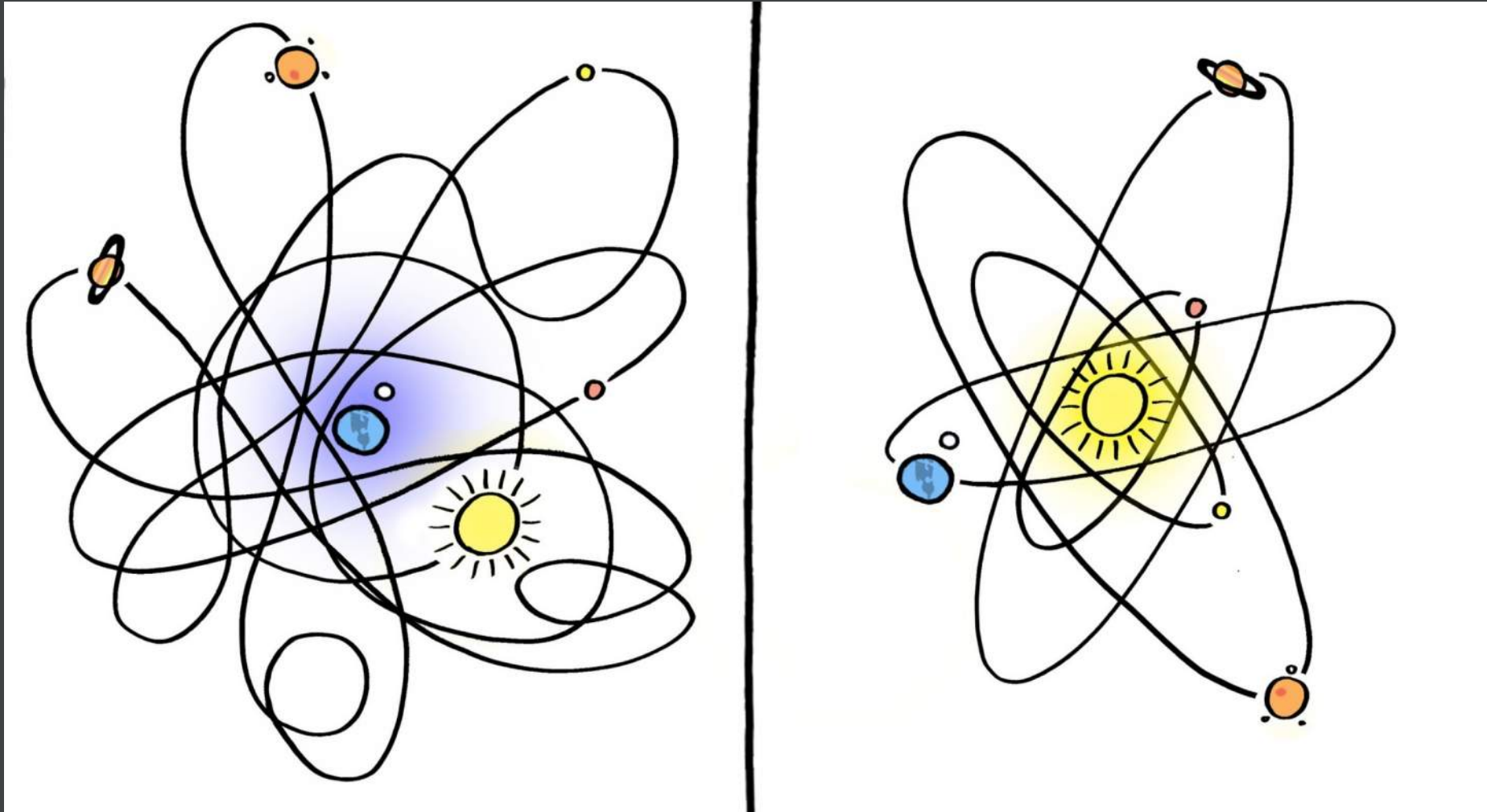


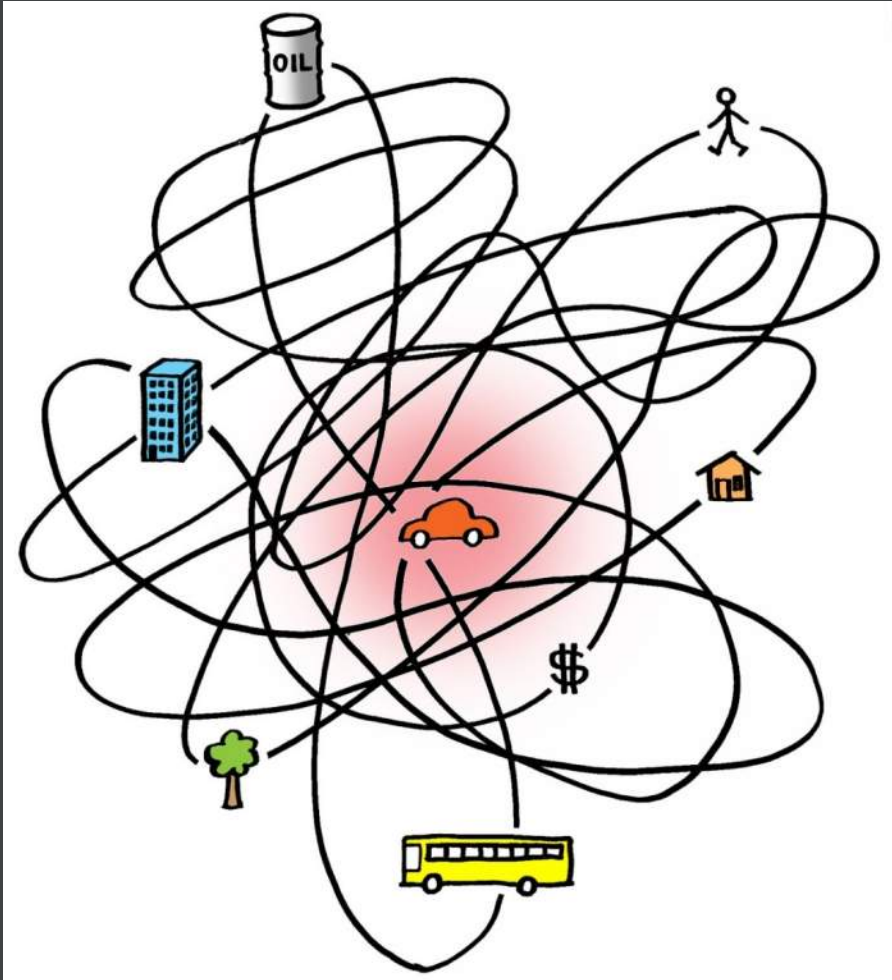
# ROADWAY SAFETY

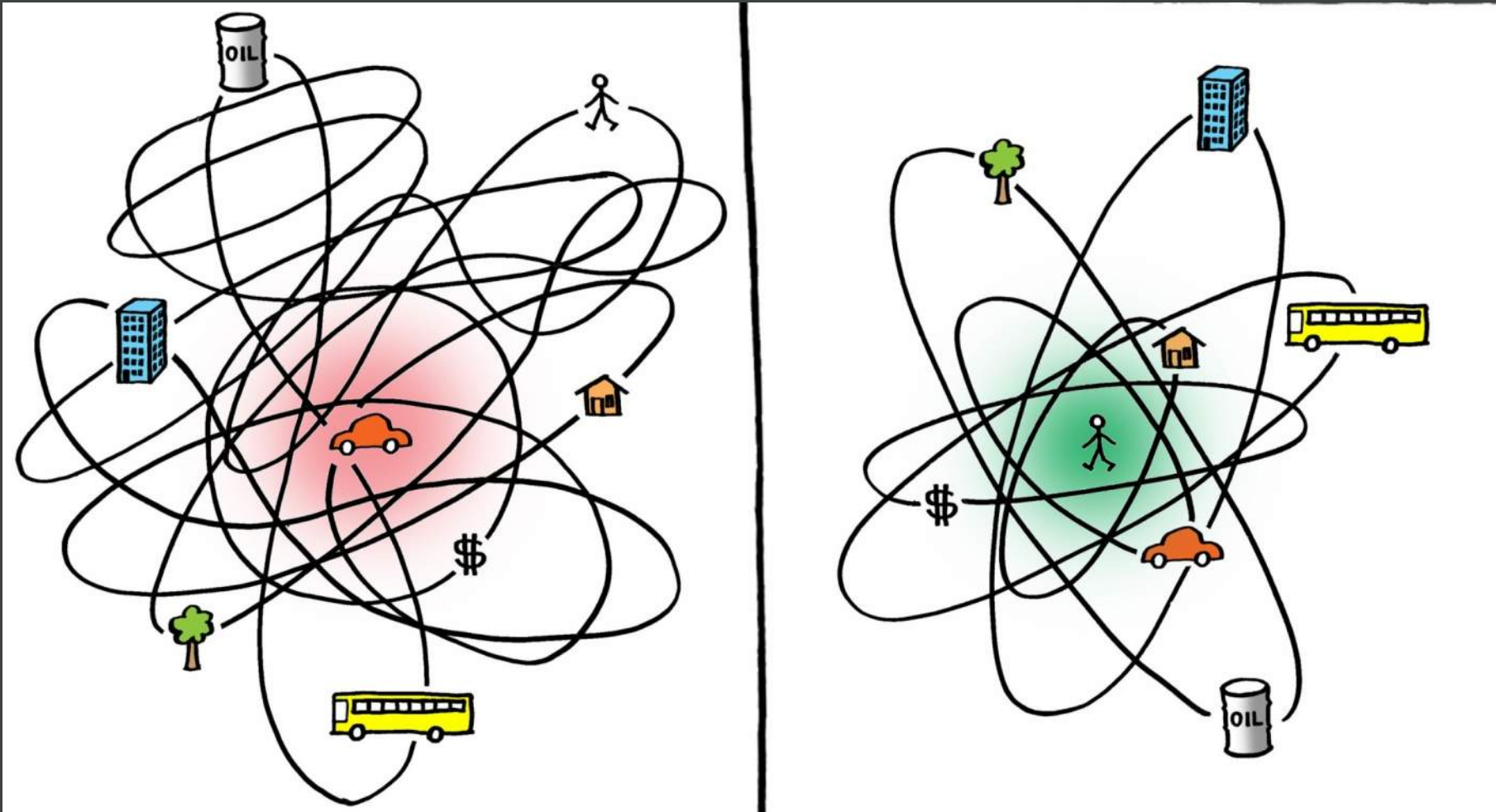
- This hotspot analysis indicates where bicyclist and pedestrian crashes have occurred from 2008-2017
- Groups of crashes are brighter than places with fewer crashes







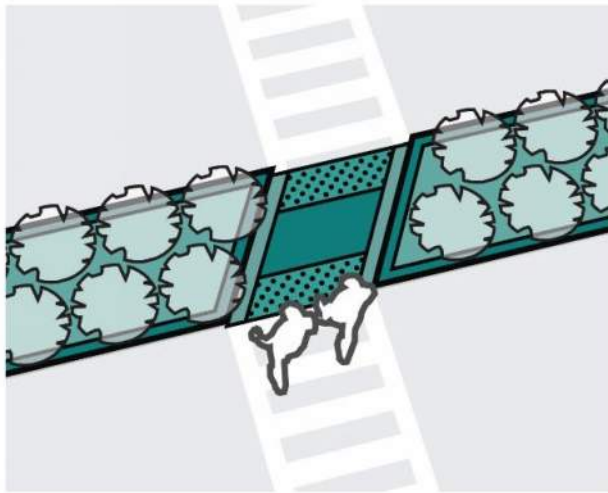




# SAFE CROSSINGS

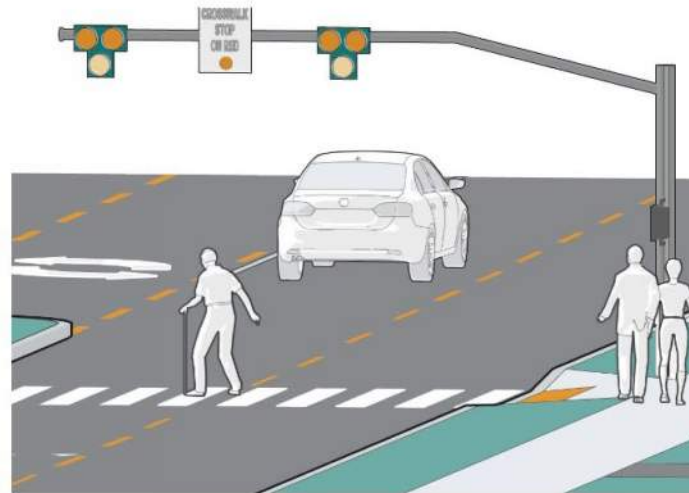
## MEDIAN REFUGE

- 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.

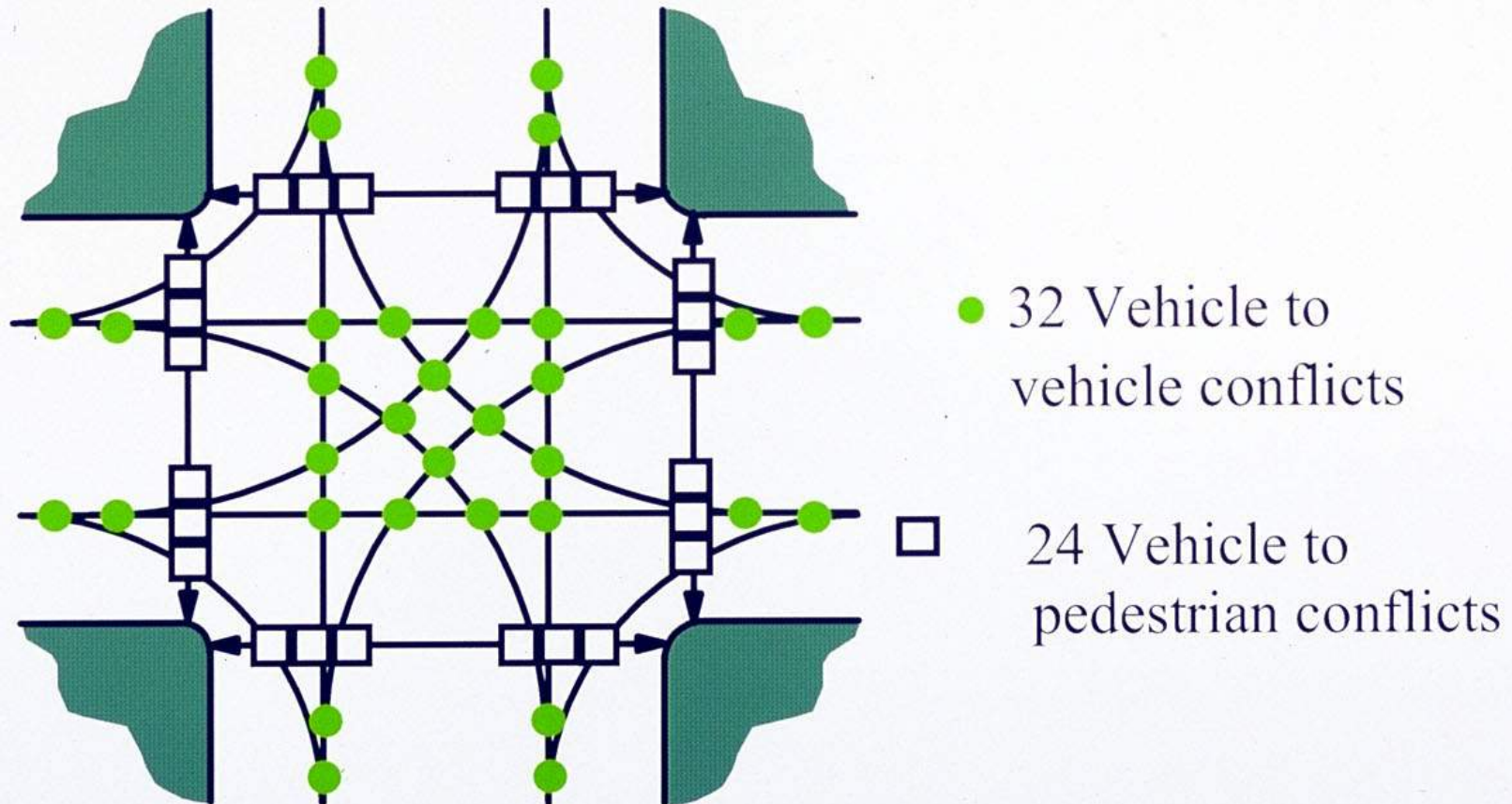


## RAPID FLASHING BEACON

- 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.

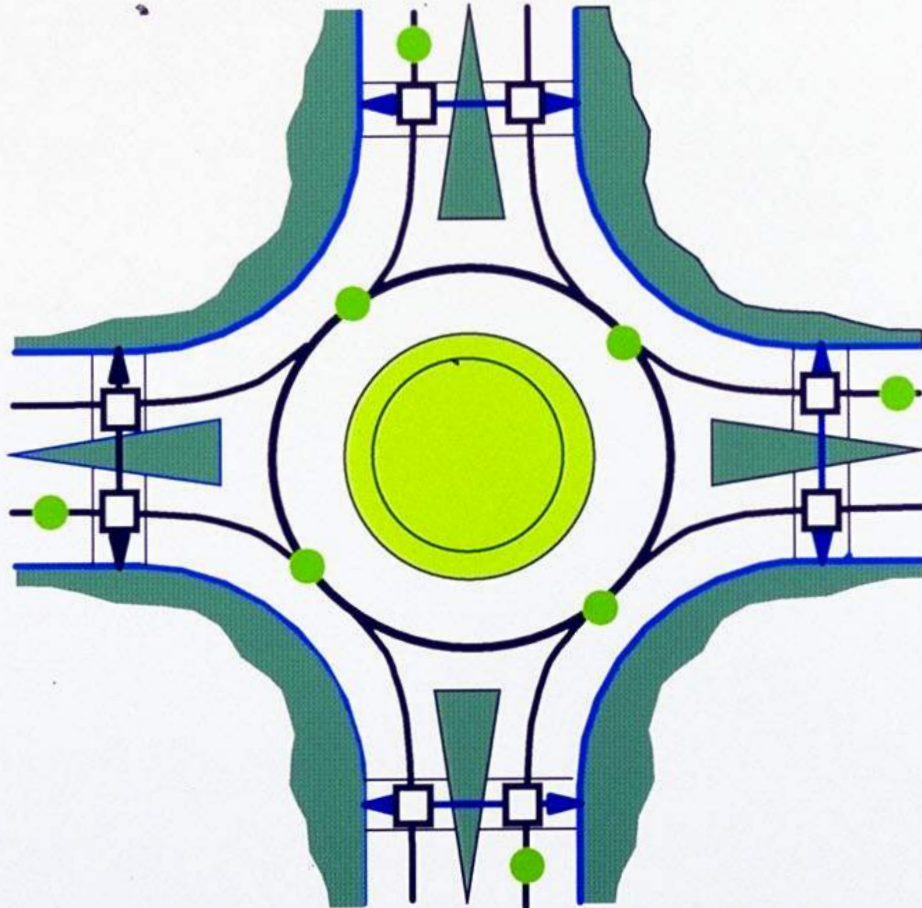


# Conflicts At a Four-Way Intersection





# Conflicts At Roundabouts



● 8 Vehicle to vehicle conflicts

□ 8 Vehicle to pedestrian conflicts

# SAFE CROSSINGS - VIDEO

---

- Video: Pedestrians crossing a roundabout


# WHAT WE HEARD

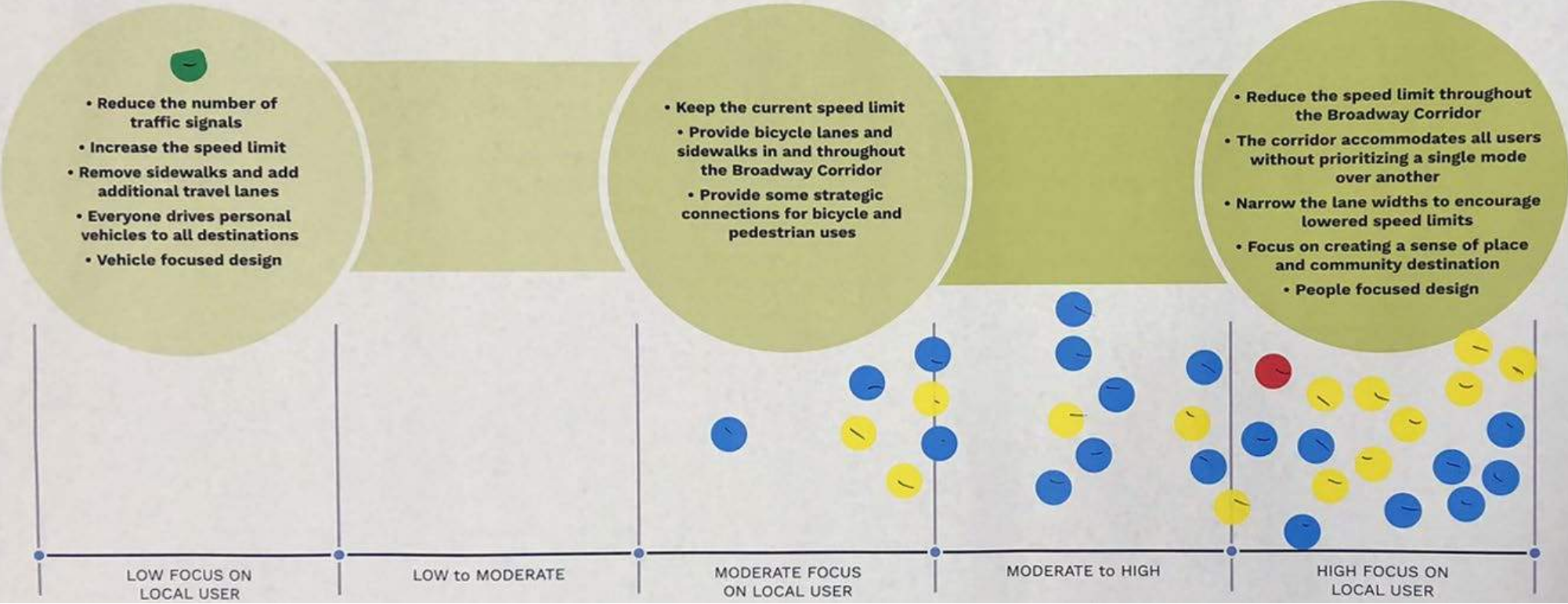


# Balancing Priorities for

# 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%

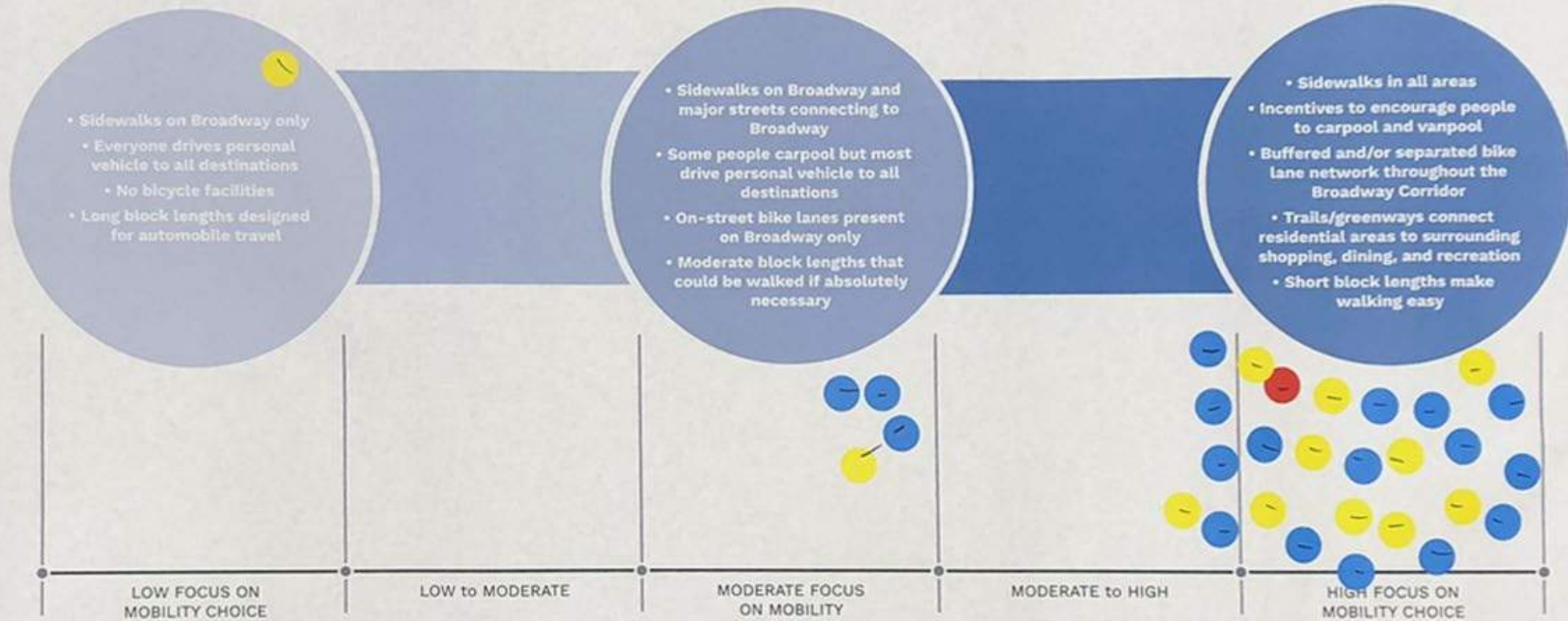
31%

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!

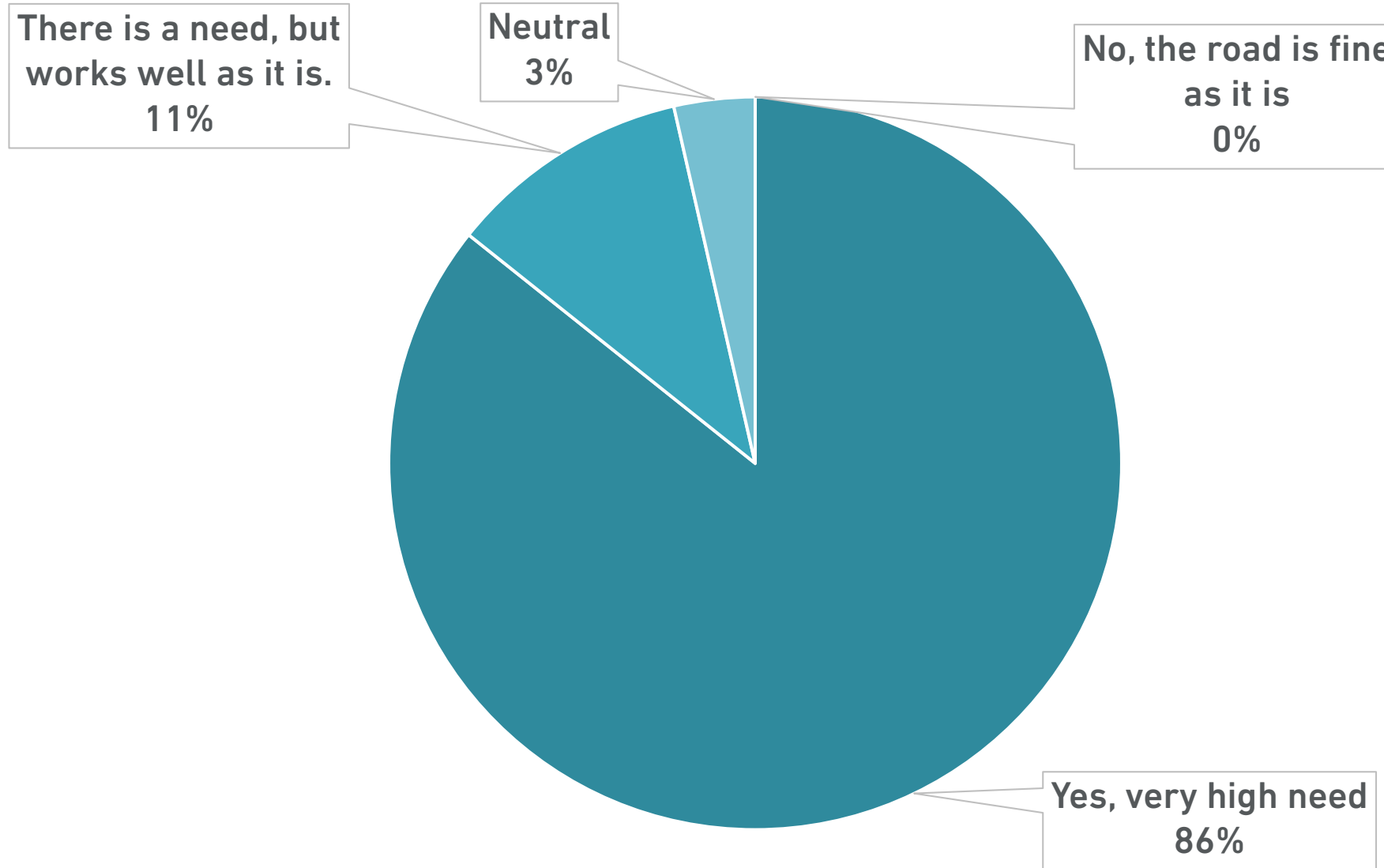


# SURVEY RESULTS

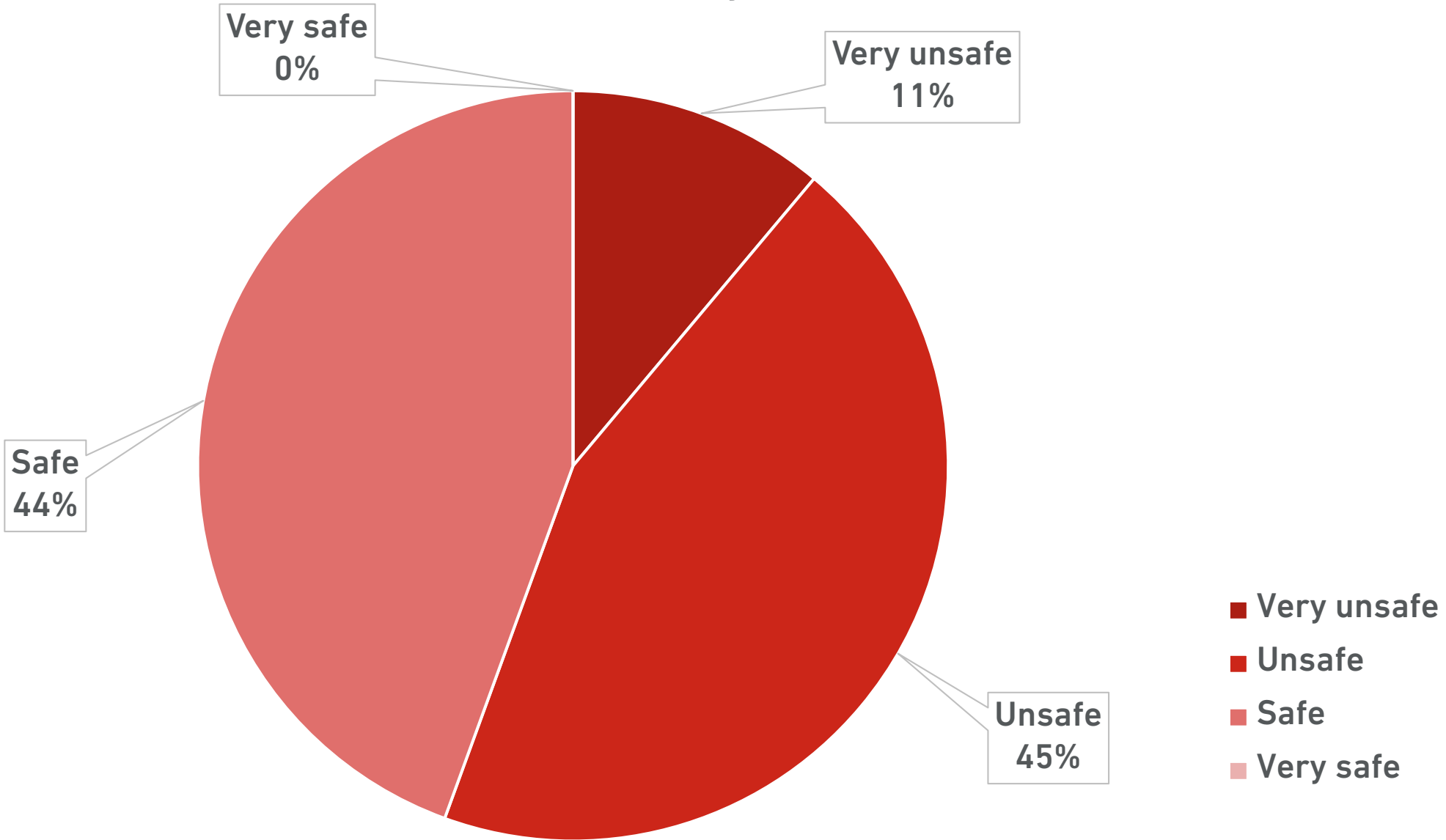




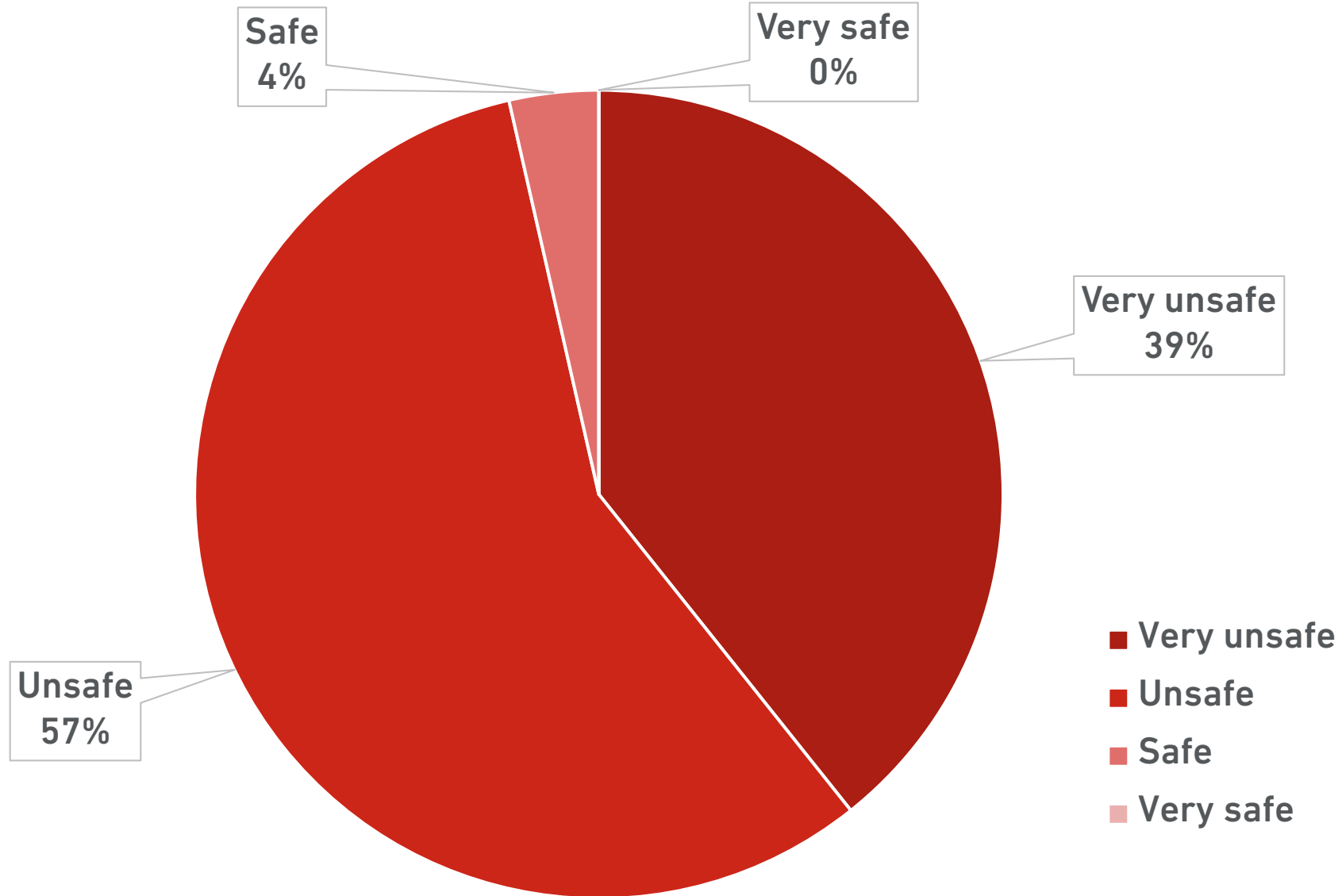
# Is there a need for improvements to the Broadway Corridor?



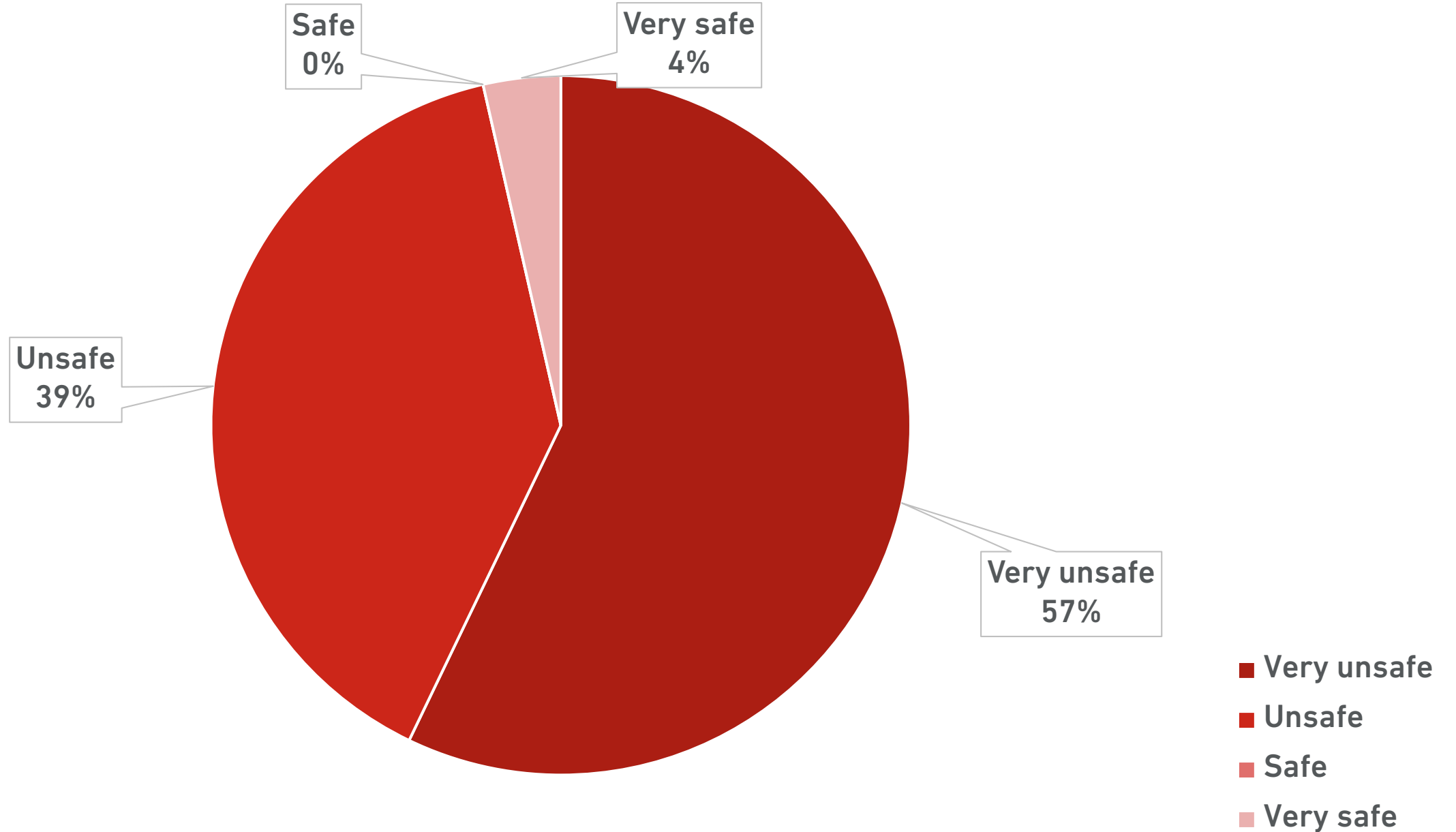
# Please provide the level of safety you feel when driving on the Broadway Corridor



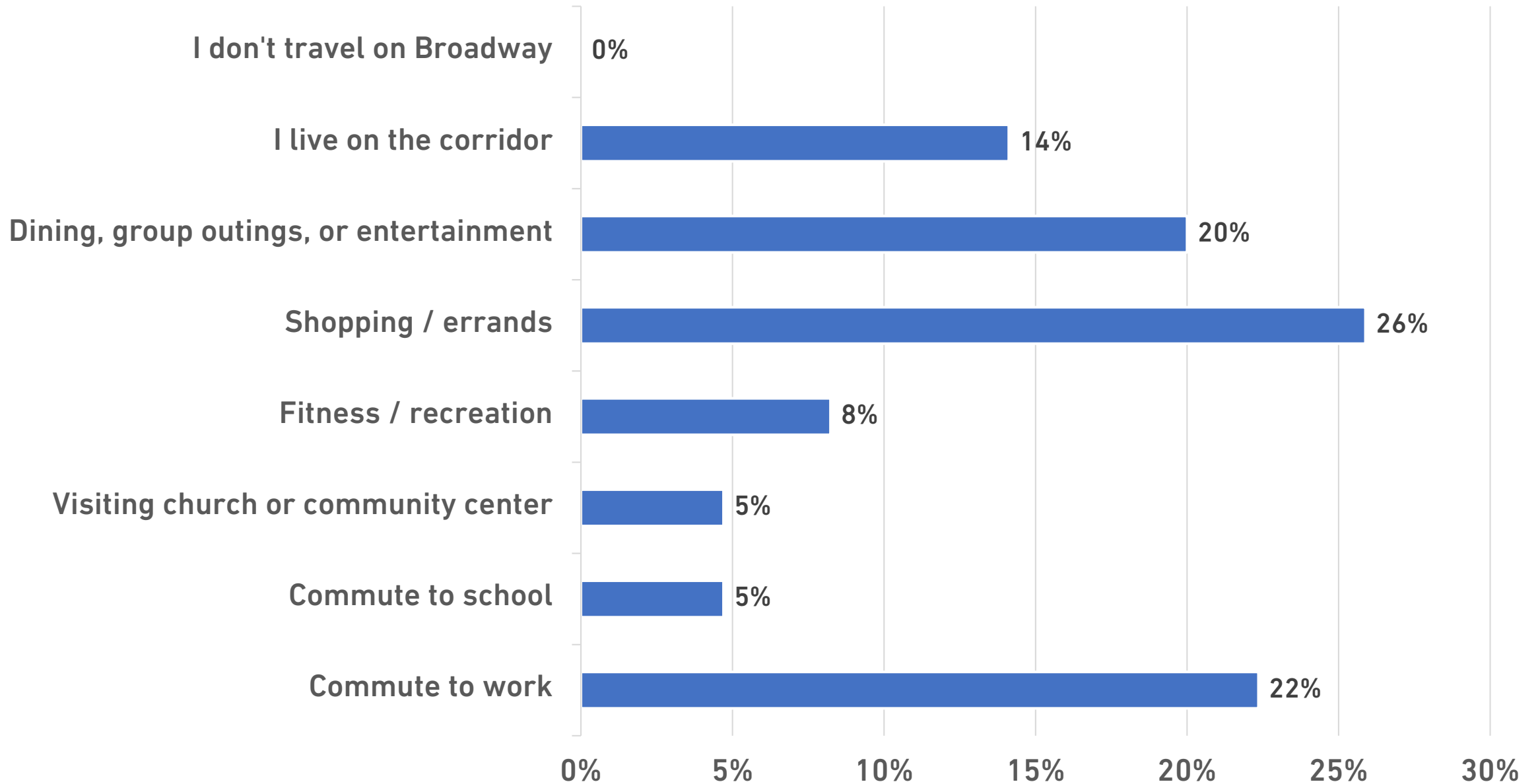
# Please provide the level of safety you feel, or would feel, when walking on the Broadway Corridor's sidewalks



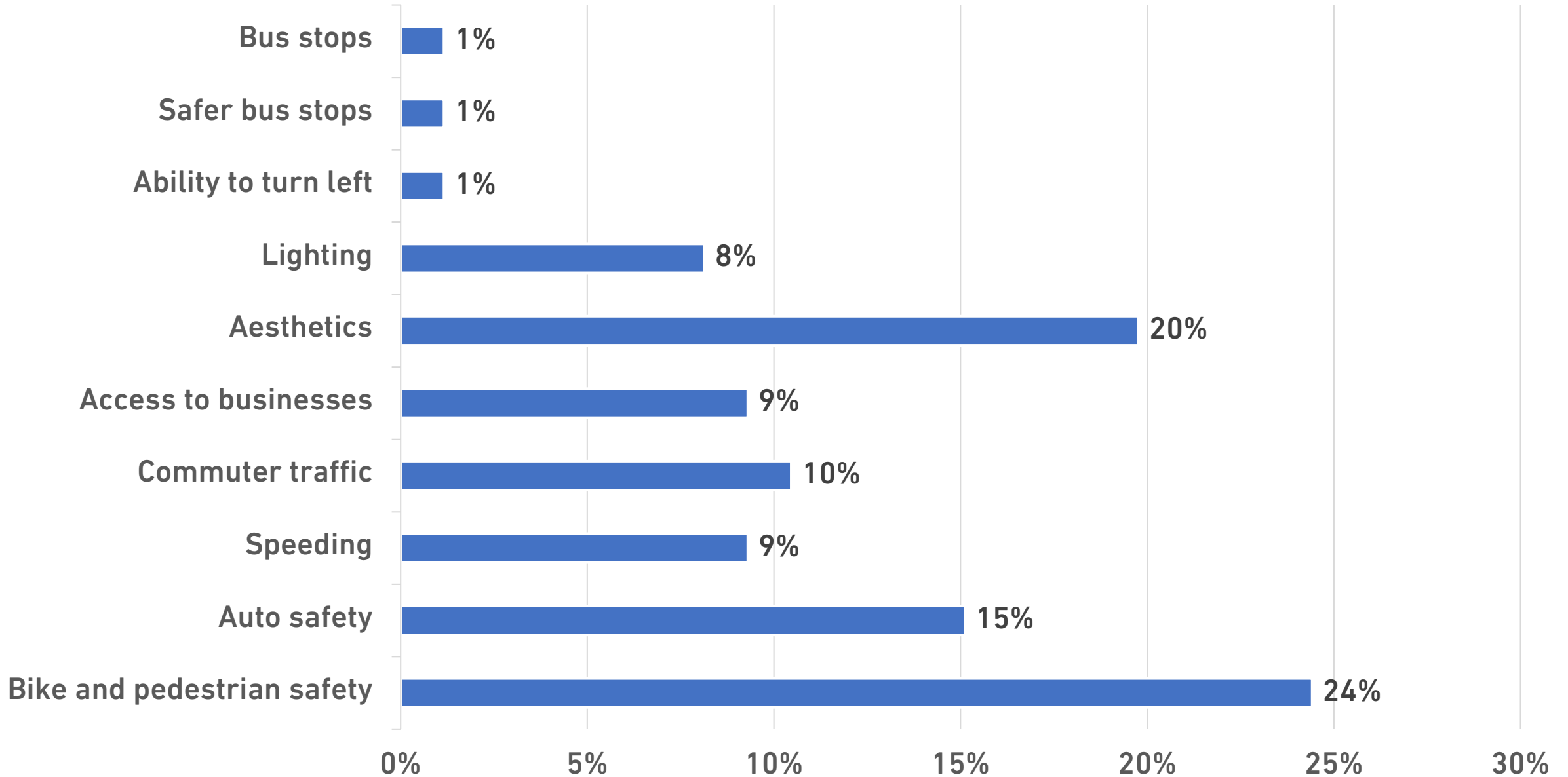
# Please provide the level of safety you feel, or would feel, when biking on the Broadway Corridor



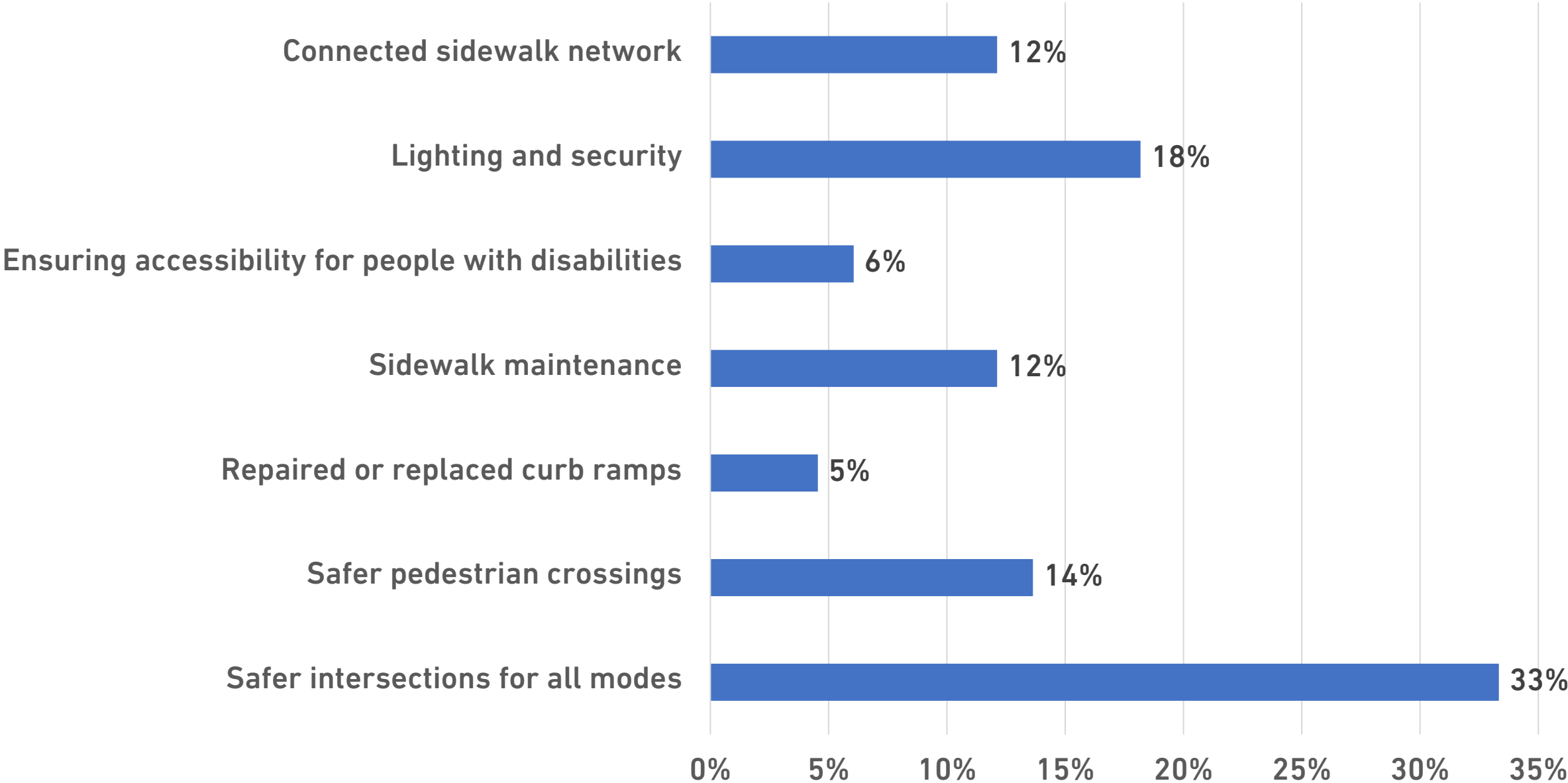
# For what purposes do you travel on the Broadway Corridor? (Select all that apply)



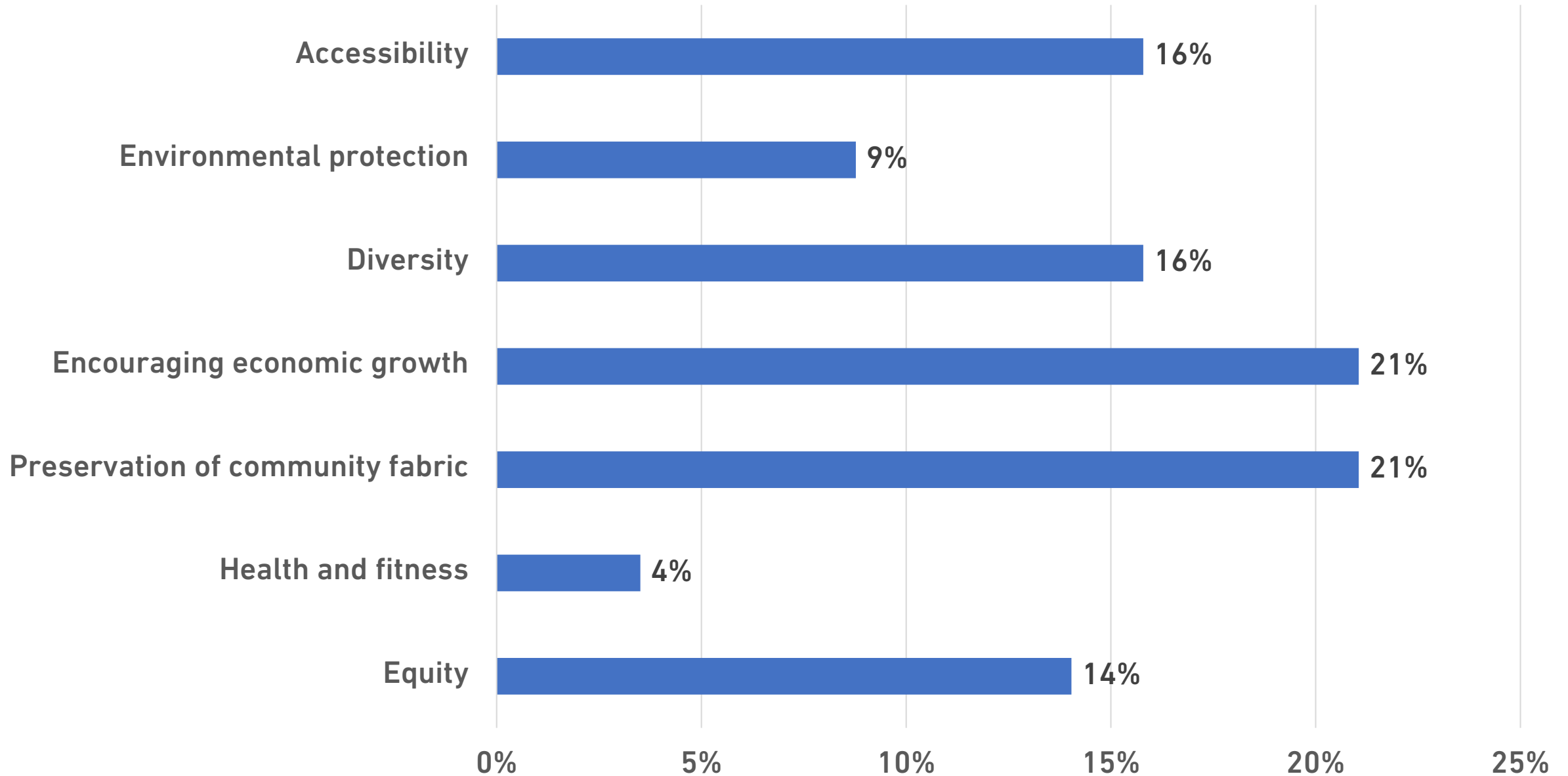
# What are your primary concerns with the Broadway Corridor? (Select two)



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

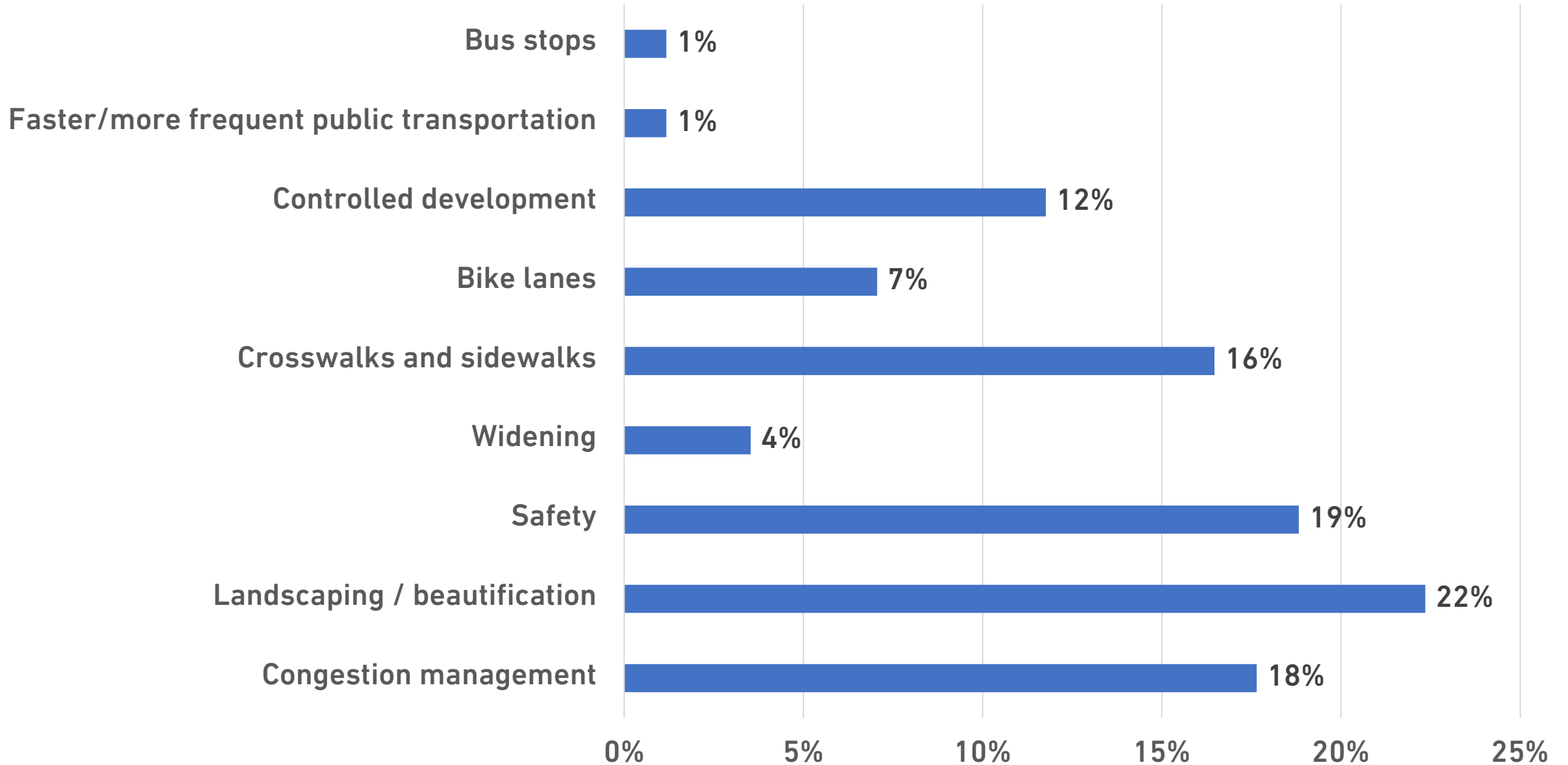


# Which are the most important in your community? (Select two)





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



# STAKEHOLDER FEEDBACK

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- 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**

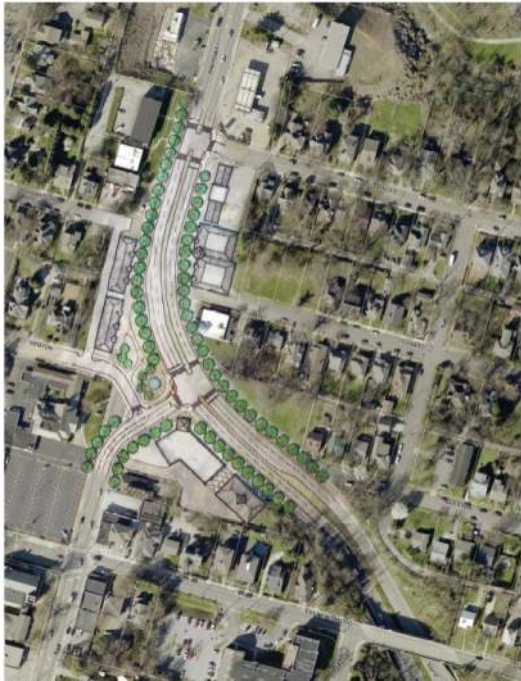

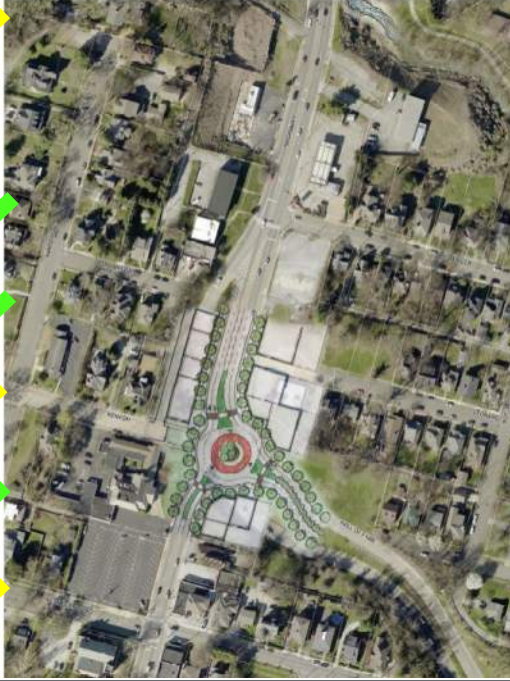


**ALTERNATIVE 2B**  
**ROUNDBOUT**



# SUMMARY



| Stakeholder            | T-INTERSECTION                                                                      | ROUNDAABOUT 1 | ROUNDAABOUT 2                                                                        |   |                                                                                      |   |
|------------------------|-------------------------------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------|---|
| BCTF                   |  | ✗             |  | ✓ |  | ✓ |
| KPD                    |                                                                                     | ✓             |                                                                                      | ✓ |                                                                                      | ✓ |
| KFD                    |                                                                                     | ✓             |                                                                                      | ✓ |                                                                                      | ✓ |
| KAT                    |                                                                                     | ✓             |                                                                                      | ✓ |                                                                                      | ✓ |
| 4 <sup>th</sup> & Gill |                                                                                     | ✗             |                                                                                      | ✓ |                                                                                      | ✓ |
| Old North Knox         |                                                                                     | ✓             |                                                                                      | ✓ |                                                                                      | ✓ |
| TDOT                   |                                                                                     | ✓             |                                                                                      | ✓ |                                                                                      | ✓ |

# KEY POINTS

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- 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, 4<sup>th</sup> 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

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*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



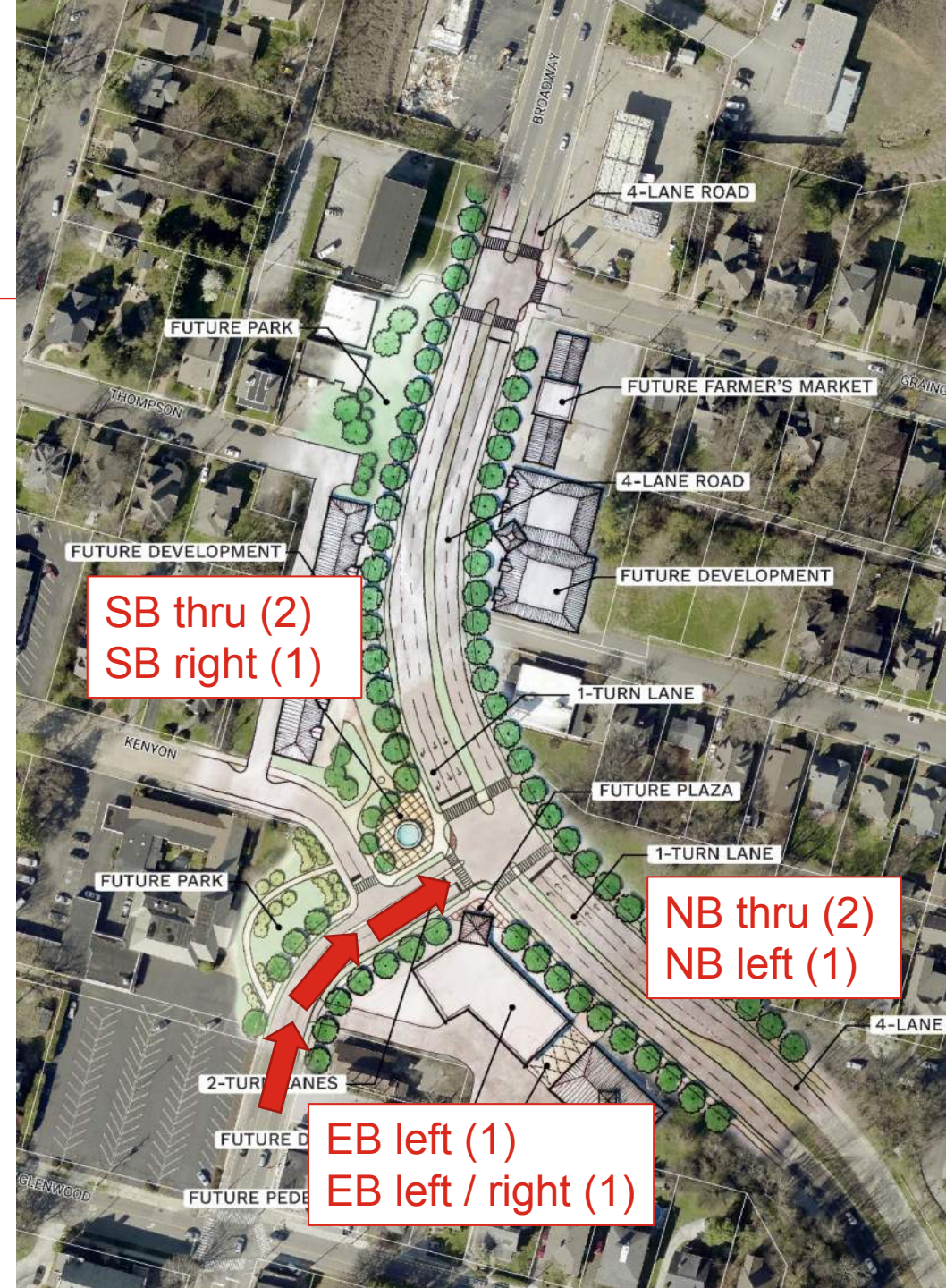
# OVERALL TRAFFIC ANALYSIS



|         | <b>Alternative 1</b><br>2029 Broadway T |     |       | <b>Alternative 2</b><br>2029 Hall of Fame T |     |       | <b>Alternative 3</b><br>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   | -     |

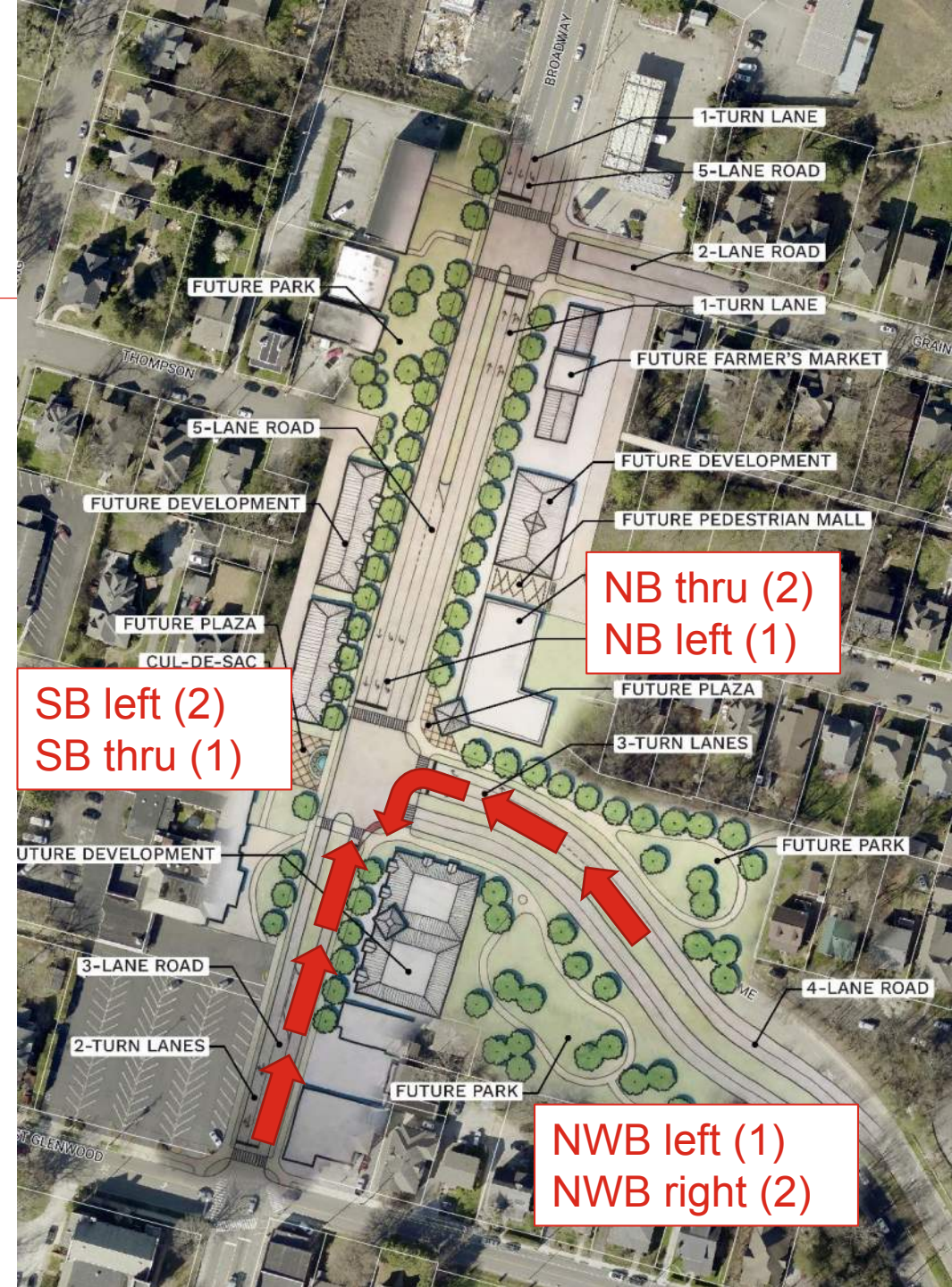
# ALTERNATIVE 1 (2029)

- 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

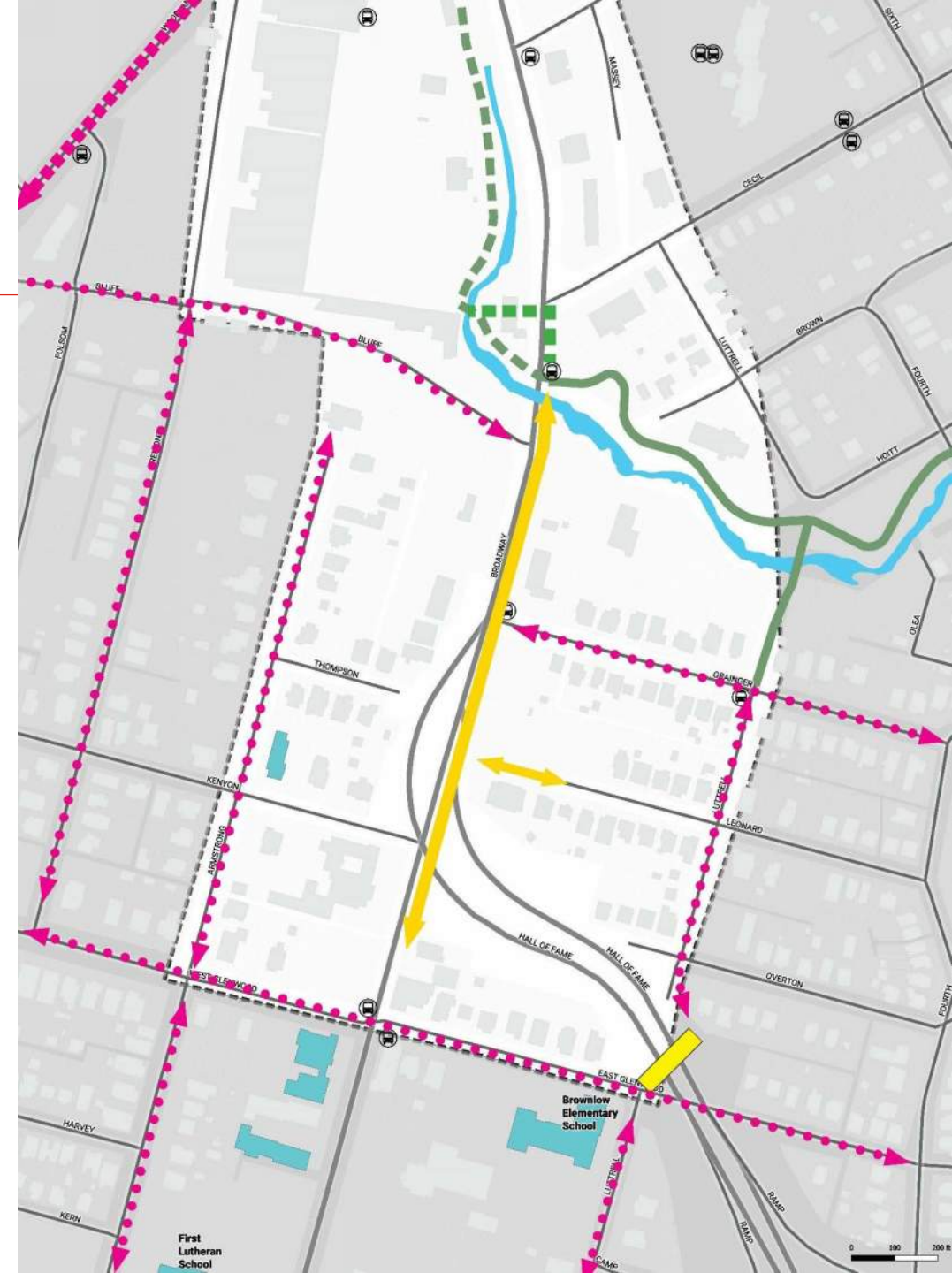




**Bicycle Boulevards**  
Bicycle Boulevard Signs and Pavement Markings - Decision Sign

# LOCAL BICYCLE NETWORK

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



# FEASIBILITY MATRIX

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|                                                      | <b>Alternative 1</b> | <b>Alternative 2</b> | <b>Alternative 3</b> |
|------------------------------------------------------|----------------------|----------------------|----------------------|
|                                                      | Signalized T         | Signalized T         | Roundabout           |
|                                                      | Broadway into HOF    | HOF into Broadway    | HOF & Broadway       |
| <b>Safe for all ages and abilities</b>               |                      |                      |                      |
| 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                |



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

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

|                                                                                                        | <b>Alternative 1</b> | <b>Alternative 2</b> | <b>Alternative 3</b> |
|--------------------------------------------------------------------------------------------------------|----------------------|----------------------|----------------------|
|                                                                                                        | Signalized T         | Signalized T         | Roundabout           |
|                                                                                                        | Broadway into HOF    | HOF into Broadway    | HOF & Broadway       |
| <b>Contribute to local character, a sense of place, and an attractive environment</b>                  |                      |                      |                      |
| 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                |

|                                                                                          | <b>Alternative 1</b> | <b>Alternative 2</b> | <b>Alternative 3</b> |
|------------------------------------------------------------------------------------------|----------------------|----------------------|----------------------|
|                                                                                          | Signalized T         | Signalized T         | Roundabout           |
|                                                                                          | Broadway into HOF    | HOF into Broadway    | HOF & Broadway       |
| <b>Accommodates commuter traffic to and from I-40 while balancing needs of all users</b> |                      |                      |                      |
| 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 &amp; 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

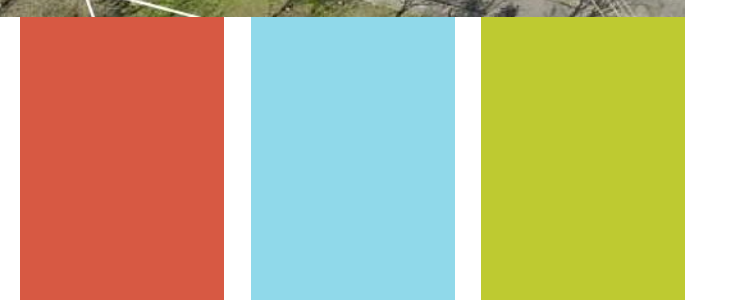
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- Opinion of probable cost
- Implementation strategy for the preferred concept

# VOTE!



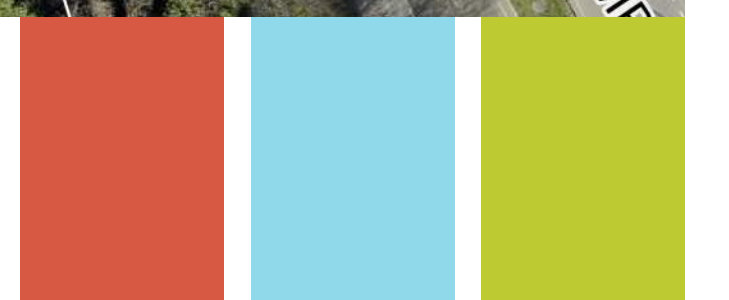
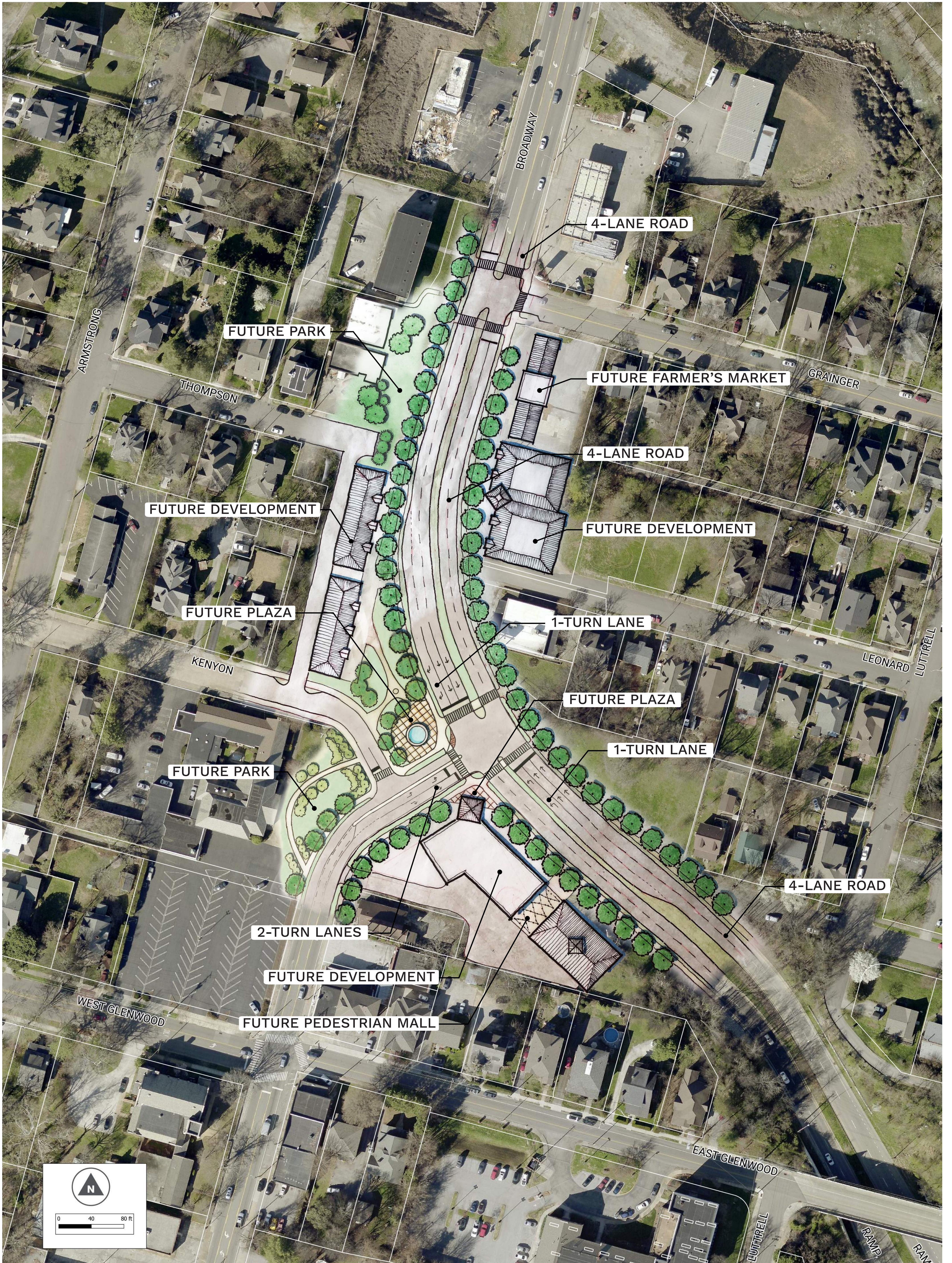
# ALTERNATIVE: PEDESTRIAN BRIDGE



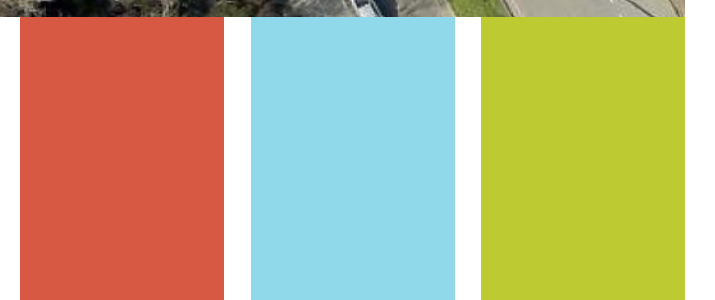




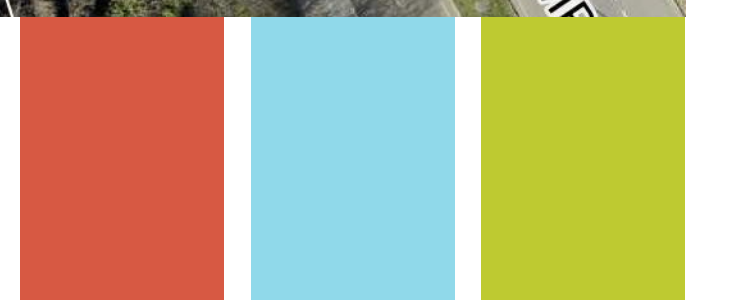
# ALTERNATIVE 1



# ALTERNATIVE 2



# ALTERNATIVE 3



**B R O A D W A Y  
C O R R I D O R  
I M P R O V E M E N T  
S T U D Y**

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