



JULY 2024

Willow Lawn Mobility Study

SMALL AREA PLAN





Table of Contents

1. Executive Summary	1
a. Project Description	2
b. Project Goals	2
2. Existing Conditions	4
a. Safety	4
b. Existing Roadway	5
c. Traffic Analysis	6
d. Bus Network	9
e. Pedestrian Network	10
f. Bicycle Network	11
3. Biking Comfort	13
4. Concepts	14
a. Willow Lawn Drive	14
b. Libbie Avenue	14
c. Monument Avenue	14
5. Public Feedback	18
6. Conclusion	20
Appendix A - Concept Exhibits	



1. Executive Summary

The Willow Lawn area in Henrico County, bounded by West Broad Street (Route 250), Willow Lawn Drive, Monument Avenue, and Libbie Avenue, is a central hub in the community for office, retail, residential, and transportation uses. Due to its unique combination of single-family residential homes, apartments, businesses, and restaurants, many people regularly visit the Willow Lawn area.

This small area plan identifies potential pedestrian and bicycle infrastructure improvements to improve safety and connectivity in the area. Design concepts show how improved pedestrian and bicycle infrastructure would alleviate congestion and increase safety on the roadway network. Input from the community provided both valuable insights on current transportation conditions and challenges coupled with potential pedestrian and bicycle infrastructure improvement concepts.

Based on public feedback, recommended design concepts that address the pedestrian and bicycle safety and connectivity challenges in the area to improve Willow Lawn Drive, Libbie Avenue, and Monument Avenue received public support and were documented in this report.





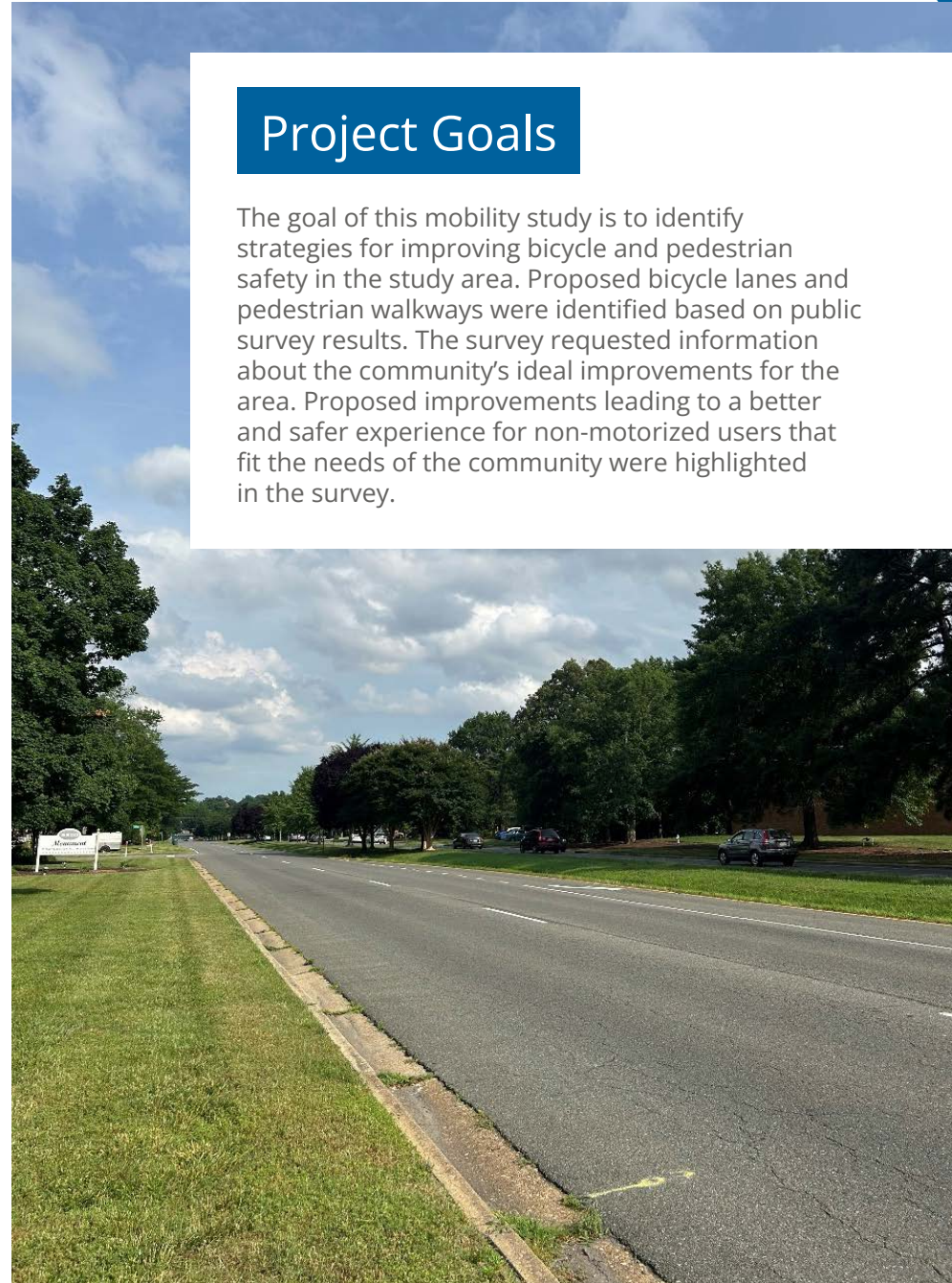
Project Description

The roadways in the study area have their unique character and challenges from a land use and multimodal perspective. Along Willow Lawn Drive, there are single- and multi-family residential units, commercial businesses, including Kroger, Dick's Sporting Goods, and Starbucks, offices, and bus stops. Libbie Avenue can be characterized as more residential and is surrounded by residences, but also includes a shopping center entrance to Target, Barnes and Noble, and Petco. Monument Avenue is a major connector through Henrico County and into the City of Richmond with apartments, community centers, and single- and multi-family residential units located along the road.

The West Broad Street Pulse Bus Rapid Transit (BRT) line connects to public transit services in the corridor. However, much of the area lacks infrastructure for pedestrian and bicycle connectivity. Incomplete sidewalk infrastructure and a lack of bicycle lanes hinders non-motorized travel users from access to safe facilities for walking and biking.

Project Goals

The goal of this mobility study is to identify strategies for improving bicycle and pedestrian safety in the study area. Proposed bicycle lanes and pedestrian walkways were identified based on public survey results. The survey requested information about the community's ideal improvements for the area. Proposed improvements leading to a better and safer experience for non-motorized users that fit the needs of the community were highlighted in the survey.





Willow Lawn Mobility Study

Willow Lawn Area from West Broad Street to Monument Avenue



Key Project Information

The study area boundary characteristics vary widely. The study area northern, southern, and eastern limits are bordered predominately by commercial businesses, restaurants, shopping centers, community centers, apartments, and a hospital. The study area western limit and central areas are mostly residential neighborhoods.

Speeding occurs on Willow Lawn Drive due to wide travel lanes. These roadway characteristics create a challenging environment for drivers, pedestrians, and bicyclists to operate in the same space. In addition, an incomplete sidewalk network in the study area creates an unsafe environment for people who walk and bike in the area.

Public Input Results

The public survey gathered 623 responses from members of the community. Most respondents said they do not feel that Libbie Avenue, Willow Lawn Drive, and Monument Avenue address their safety concerns for all travel modes. Most respondents ranked the proposed design concepts as desirable and stated they are more inclined to use a bicycle if the proposed design concepts are constructed.

Our Findings and Recommendations

Based on the traffic analysis, Libbie Avenue, Willow Lawn Drive, and Monument Avenue do not experience much congestion except at the Libbie Avenue and West Broad Street intersection. A shared-use path is proposed on Libbie Avenue that would improve safety for bicyclists and pedestrians in the corridor.

The Willow Lawn Drive corridor operates efficiently with minor congestion. Based on travel observations in the corridor, three lanes in each direction are not needed from a capacity standpoint. The proposed corridor design concept would remove one lane in each direction.

There is a plan to add a shared-use path on the north side of Monument Avenue. Since there are sections of Monument Avenue with no sidewalk connectivity, this project proposes sidewalk improvements to fill sidewalk gaps along Monument Avenue.

After receiving positive community feedback on the proposed design concepts, the concepts will receive consideration for advancement to construction projects. Based on community responses, the public is more inclined to bike in the area and it is anticipated that pedestrian and bicycle activity will increase.



2. Existing Conditions

Willow Lawn Drive and Libbie Avenue are two connectors between West Broad Street and Monument Avenue in the City of Richmond and Henrico County. The Shops at Willow Lawn is located on Willow Lawn Drive and includes restaurants and shopping. There is a neighborhood to the west of the mall. Libbie Avenue also provides access to area neighborhoods and the Libbie Place Shopping Center.

Safety

For the five years between 2019 and 2023, there were 157 crashes in the Willow Lawn area, excluding those on West Broad Street. Crashes were most prevalent at the Libbie Avenue and Willow Lawn Drive intersections on Monument Avenue. **Figure 1** shows a crash density map of the study area with the highest crash areas shown in yellow. **Figure 2** shows pedestrian-related crashes on a study area map.

The US 250 (West Broad Street) STARS Study is an ongoing VDOT study being performed to analyze safety and traffic congestion on West Broad Street in the study area. The Willow Lawn Mobility Study does not include any proposed improvements on West Broad Street.

Crashes

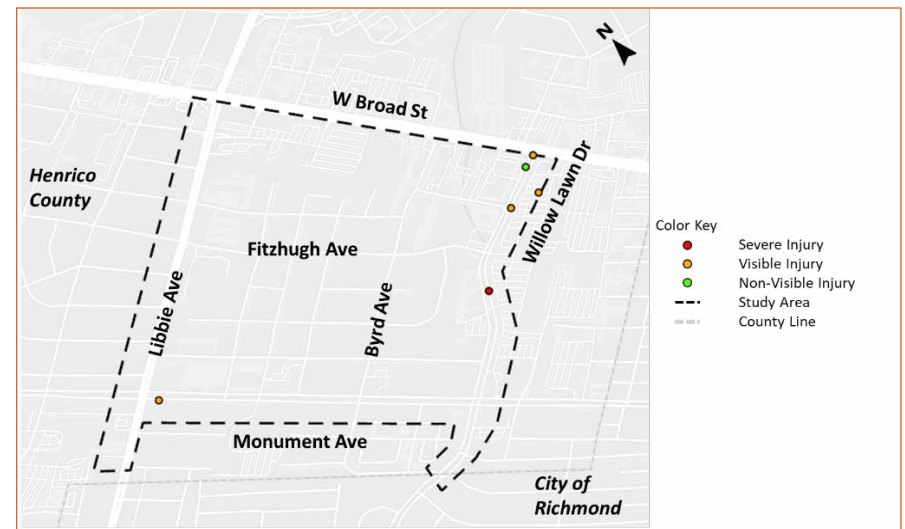
Study area crashes were characterized by:

62%	18%	4%
of crashes were angle crashes	of crashes were rear-ends	of crashes involved a pedestrian

FIGURE 1: 2019-2023 CRASH DENSITY MAP



FIGURE 2: PEDESTRIAN-RELATED CRASHES





Existing Roadway

Willow Lawn Drive

Willow Lawn Drive varies between five to six lanes, separated by a median with a posted speed limit of 35 mph. There are three lanes in the northbound direction. **Figure 3** shows Willow Lawn Drive looking south towards the bus terminal at Markel Road.

FIGURE 3: WILLOW LAWN DRIVE



Libbie Avenue

Libbie Avenue is a four-lane road separated by a raised median with a posted speed limit of 35 mph. **Figure 4** shows Libbie Avenue looking south towards the crosswalk at Fitzhugh Avenue.

FIGURE 4: LIBBIE AVENUE



Monument Avenue

Monument Avenue is a four-lane road separated by a grass median. The speed limit is 45 mph. **Figure 5** shows Monument Avenue looking west along the northside of the road just west of Willow Lawn Drive. Sidewalk exists on the north side of Monument Avenue in the project area from Treboyn Avenue to approximately 240 ft. west of Willow Lawn Drive. On the south side of Monument Avenue, there is sidewalk from the Jewish Community Center to Willow Lawn Drive.

FIGURE 5: MONUMENT AVENUE





Traffic Analysis

A traffic analysis was conducted in the study area to understand the effects of the proposed concepts and reconfiguration on the existing roadway. The analysis was performed for the peak hours of 7:45 AM-8:45 AM and 4:45 PM-5:45 PM. The analysis was performed at the following intersections:

- + West Broad Street and Willow Lawn Drive
- + Markel Road and Willow Lawn Drive
- + Monument Avenue and Willow Lawn Drive
- + Monument Avenue and Libbie Avenue
- + West Broad Street and Libbie Avenue

Morning Peak Hour

On weekday mornings, the period with the most traffic is 7:45 AM – 8:45 AM. The most travel delay occurs on the Libbie Avenue and West Broad Street corridors. No approaches experience average wait times longer than one minute. **Figure 6** shows AM peak hour study approaches delay.

Evening Peak Hour

On weekday evenings, the period with the most traffic is 4:45 PM – 5:45 PM. As in the morning peak hour, the most travel delay occurs on the Libbie Avenue and West Broad Street corridors. However, no average wait times are over one minute except for two approaches at Broad Street and Libbie Avenue. **Figure 7** shows study approaches PM peak hour delay.



FIGURE 6: DELAY AT STUDY INTERSECTIONS - AM PEAK HOUR

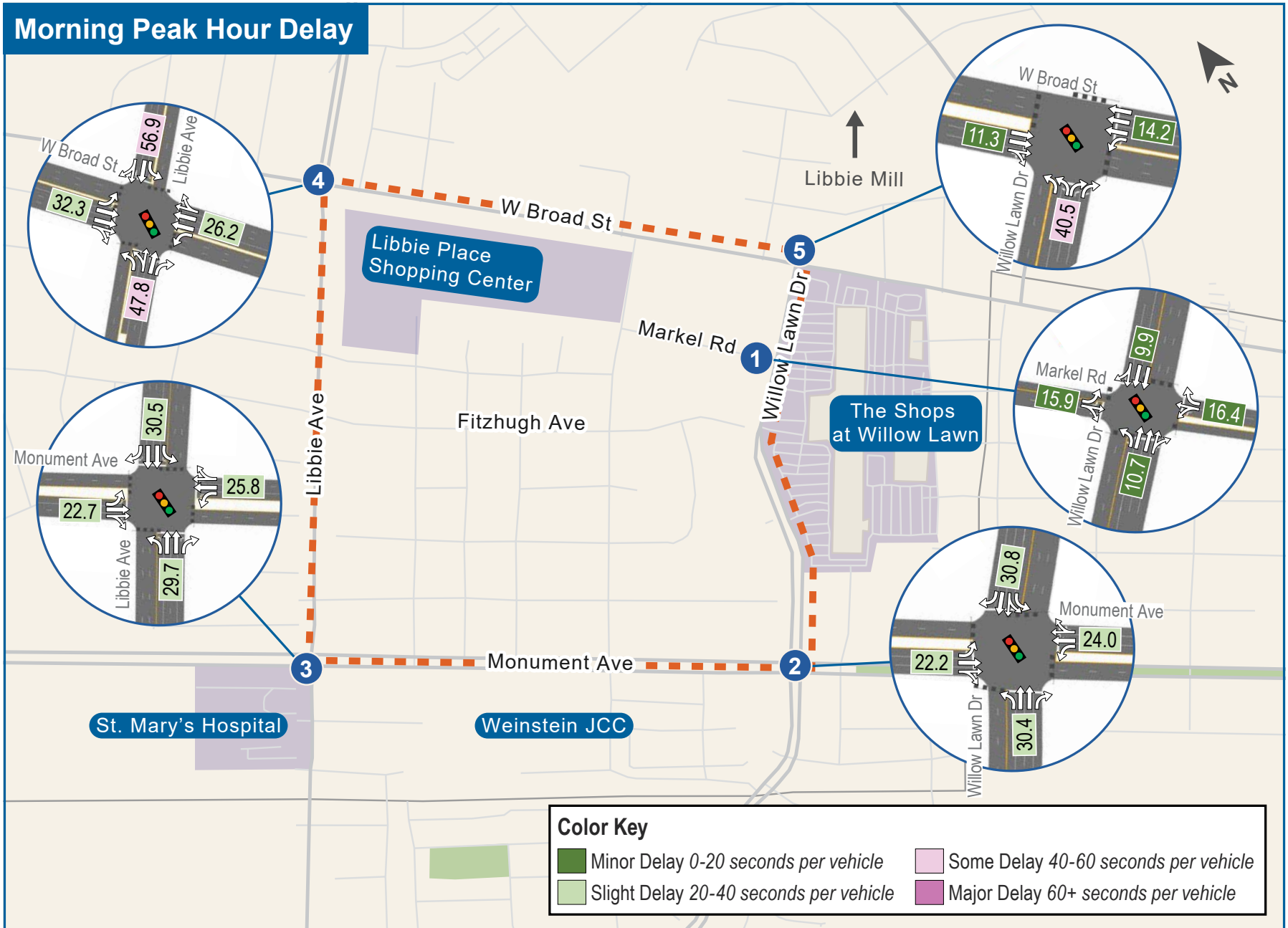
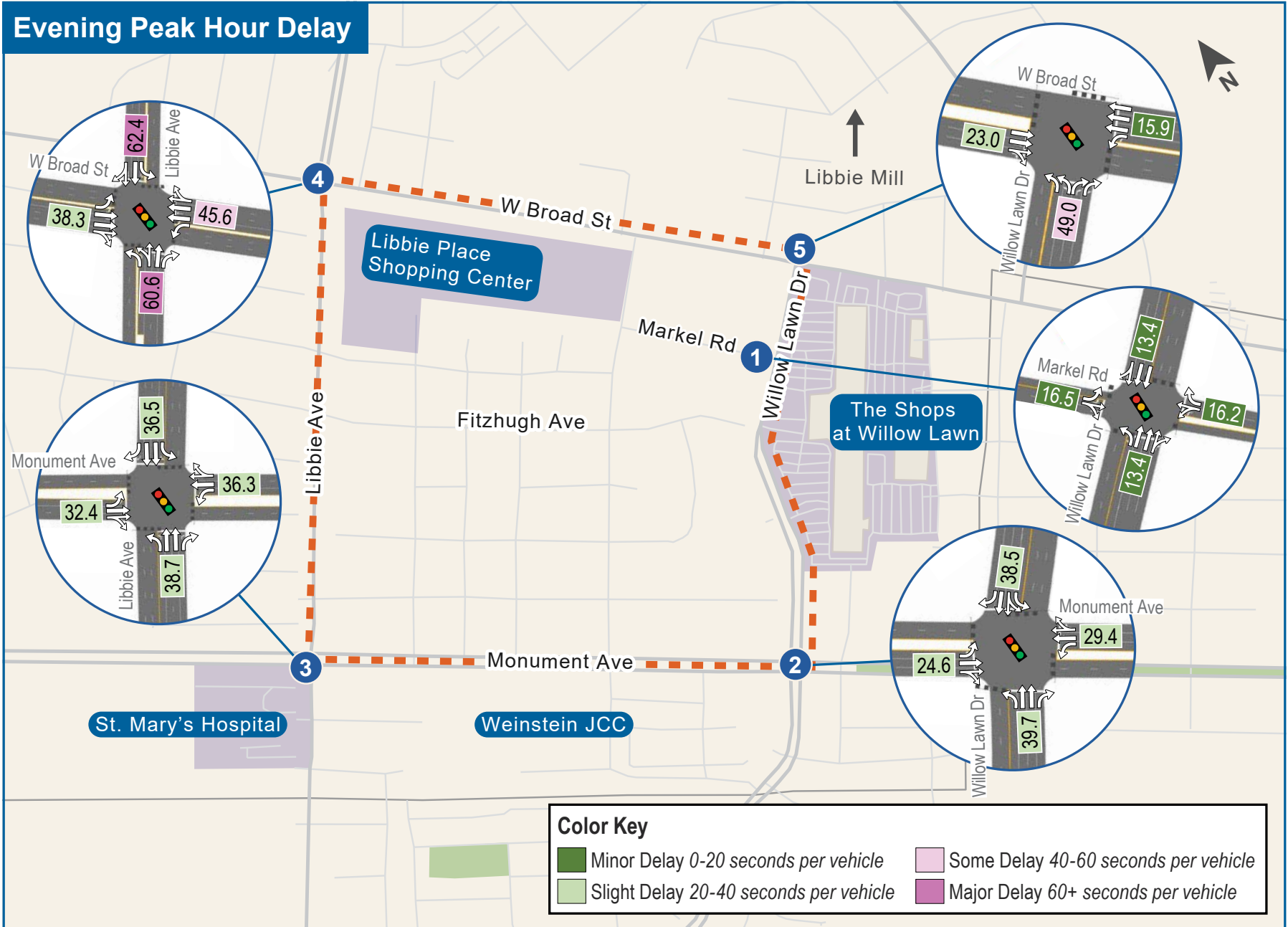




FIGURE 7: DELAY AT STUDY INTERSECTIONS - PM PEAK HOUR





Bus Network

There are multiple bus routes, including the Pulse BRT along West Broad Street, that serve the neighborhood. Both Willow Lawn Drive and Libbie Avenue have three bus stops in the project area, with six others within the neighborhood area. **Figure 8** shows a map of all study area bus stops.

FIGURE 8: WILLOW LAWN AREA BUS STOPS



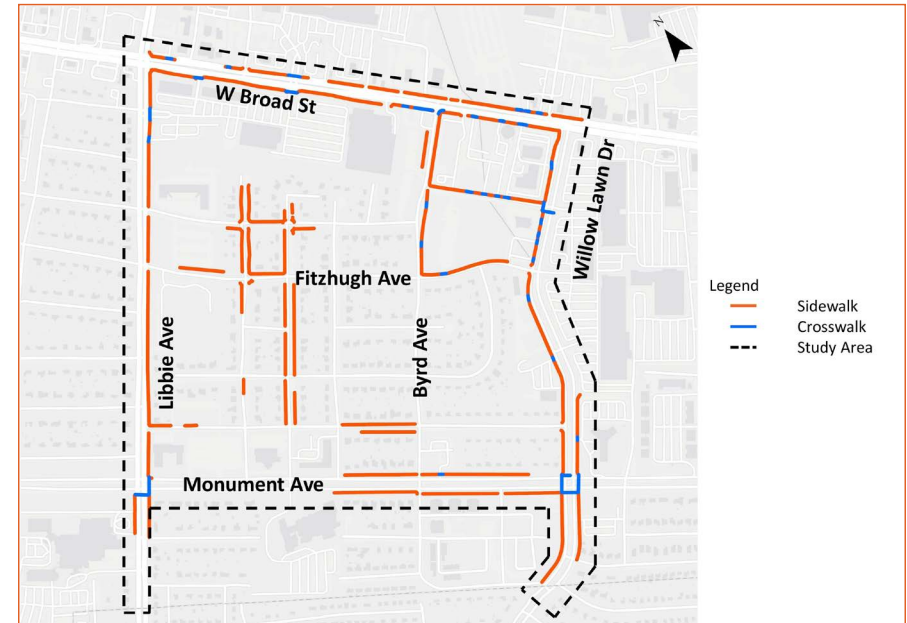


Pedestrian Network

There are sidewalks on both sides of Monument Avenue from Trebov Avenue to Willow Lawn Drive, but no sidewalk west of Trebov Avenue. Willow Lawn Drive includes sidewalk on the west side of the road and Libbie Avenue includes sidewalk on the east side of the road. Sidewalk is interspersed within the neighborhood but does not provide complete connectivity. **Figure 9** shows sidewalk and crosswalks in the study area.



FIGURE 9: SIDEWALK AND CROSSWALK IN THE STUDY AREA





Bicycle Network

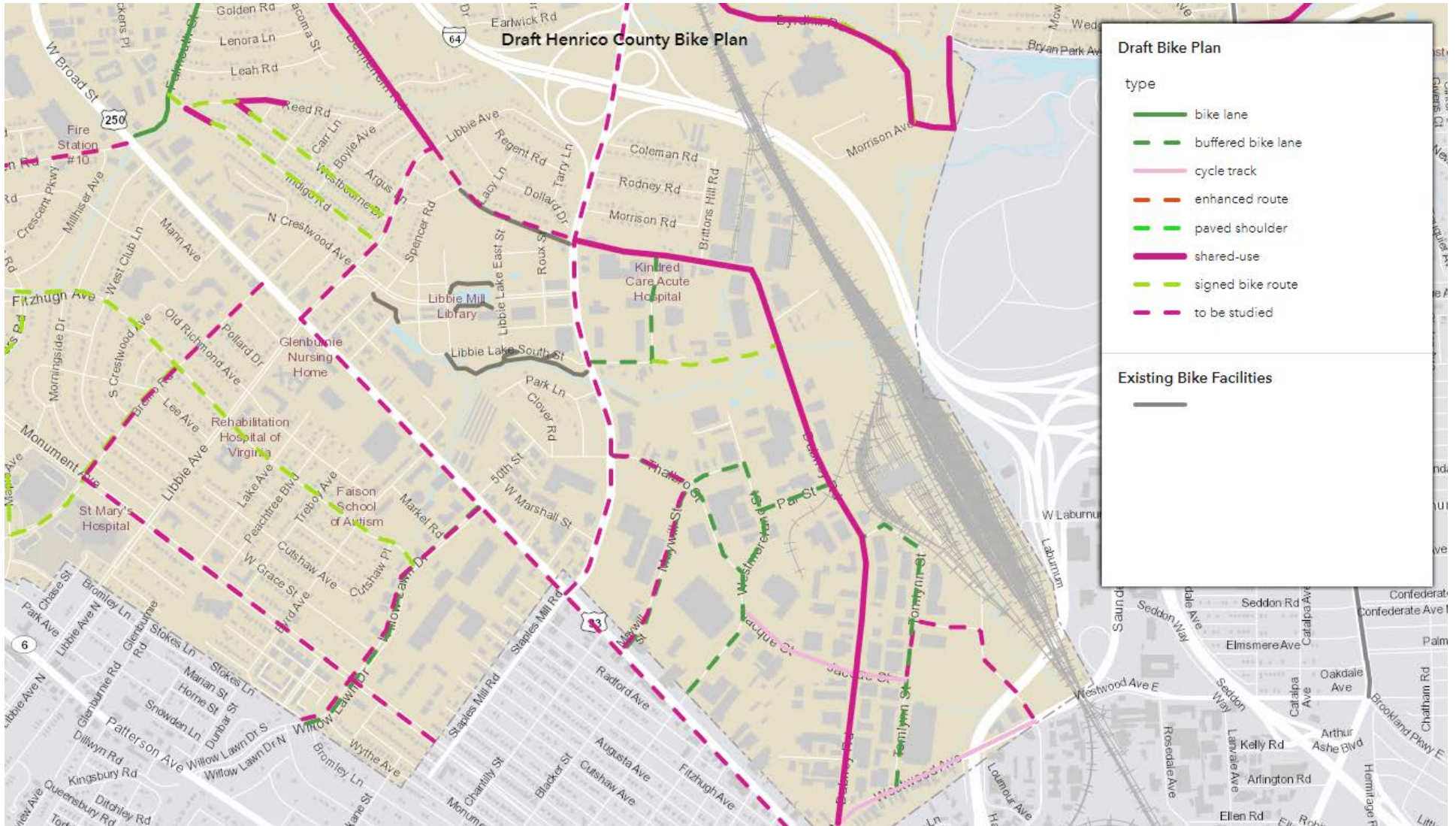
There are no bicycle lanes in the Willow Lawn area. A bicycle network exists within the City of Richmond on Patterson Avenue that ends ~ 5,000 feet east of Willow Lawn Drive. The City plans to extend this network to the west to connect to Willow Lawn Drive.

Draft Henrico County Bike Plan

The Henrico County Draft Bike Plan is part of Henrico County's 2045 Comprehensive Plan and was created to address concerns with bicycle accessibility and facilities. As shown in **Figure 10**, the County plans to create a significantly more connected bicycle network. The bike lanes proposed in this study shown on Willow Lawn Drive provide important connectivity to the Libbie Mill area north of West Broad Street.



FIGURE 10: DRAFT HENRICO COUNTY BIKE PLAN



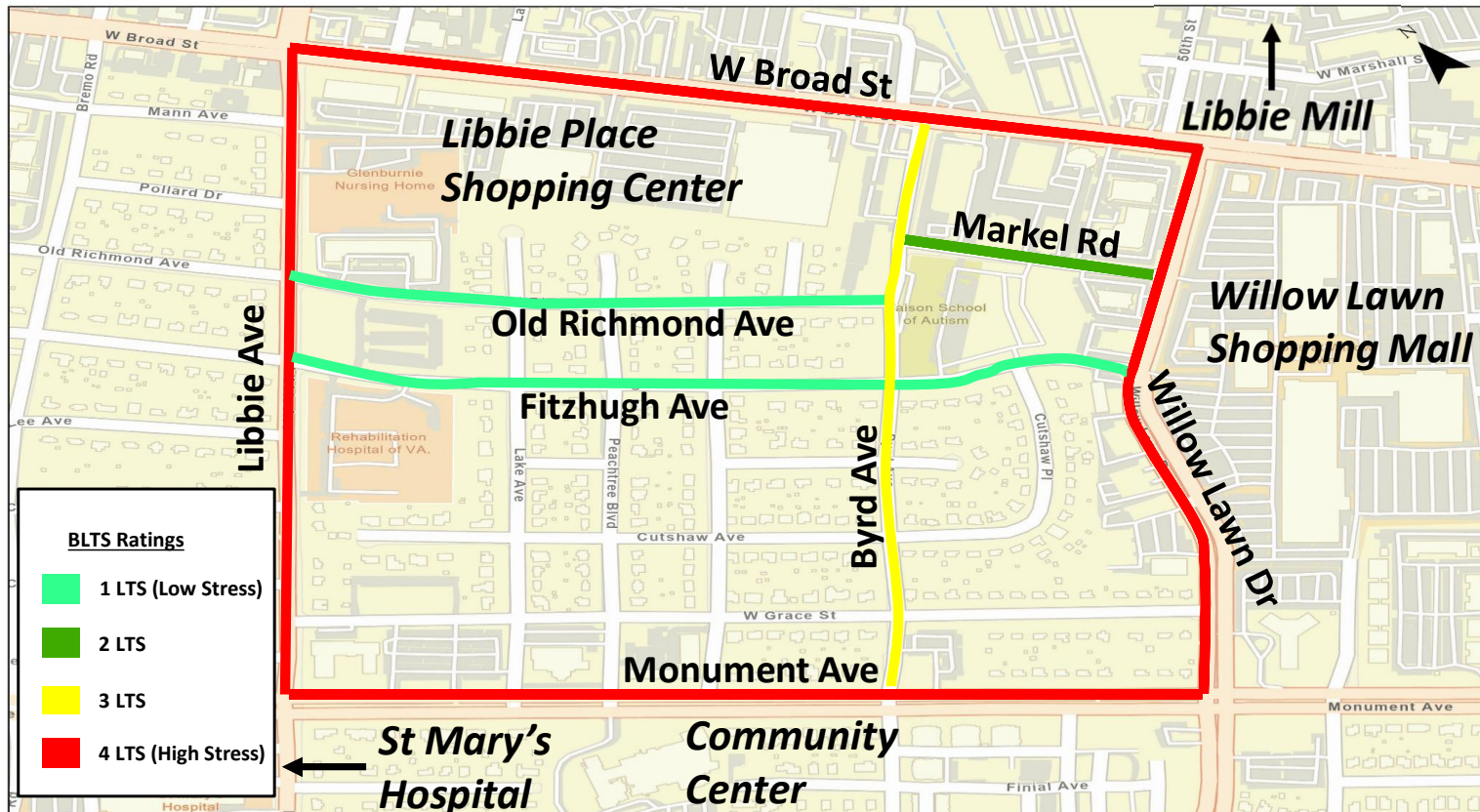


3. Biking Comfort

Streets surrounding the Willow Lawn area are not comfortable for bicyclists. Many factors make biking uncomfortable in network, including the lack of bike lanes, and wide streets to name a few. People driving at higher than posted speeds is especially challenging on Willow Lawn Drive. The most comfortable streets for biking are on neighborhoods streets like Old Richmond Avenue and Fitzhugh Avenue due to lower driving speeds, fewer travel lanes, and lower vehicular volume.

Figure 11 shows bicycle level of traffic stress, which is a measure of how stressful biking is on a particular roadway based on several factors, including speed, number of lanes, and average daily traffic. Roads are rated based on a scale of 1 (low stress) to 4 (high stress).

FIGURE 11: BIKE LEVEL OF COMFORT IN THE STUDY AREA





4. Concepts

Willow Lawn Drive

The design concept for Willow Lawn Drive includes buffered cycle tracks (two-way protected bike lanes) on both sides of the road near the Willow Lawn Drive Shopping Center that transition to buffered one-way bike lanes south of Monument Avenue. **Figure 12** shows the bike lane concept for Willow Lawn Drive. See **Appendix A** for full exhibits of the Willow Lawn Drive design concept.

Libbie Avenue

The design concept for Libbie Avenue from West Broad Street to Wythe Avenue includes a shared-use path on the southeastern side of the road protected by a grass buffer. **Figure 13** shows the shared-use path concept for Libbie Avenue. See **Appendix A** for full exhibits of the Libbie Avenue design concept.

Monument Avenue

The design concept for Monument Avenue from Westlyn Avenue to Libbie Avenue includes sidewalk to close gaps on the southern side of the road. A shared use path would also be constructed in the future on the north side of Monument Avenue under a different project. **Figure 14** shows the sidewalk connections proposed for Monument Avenue. See **Appendix A** for full exhibits of the Monument Avenue design concept.



FIGURE 12: WILLOW LAWN DRIVE - BIKE LANE CONCEPT

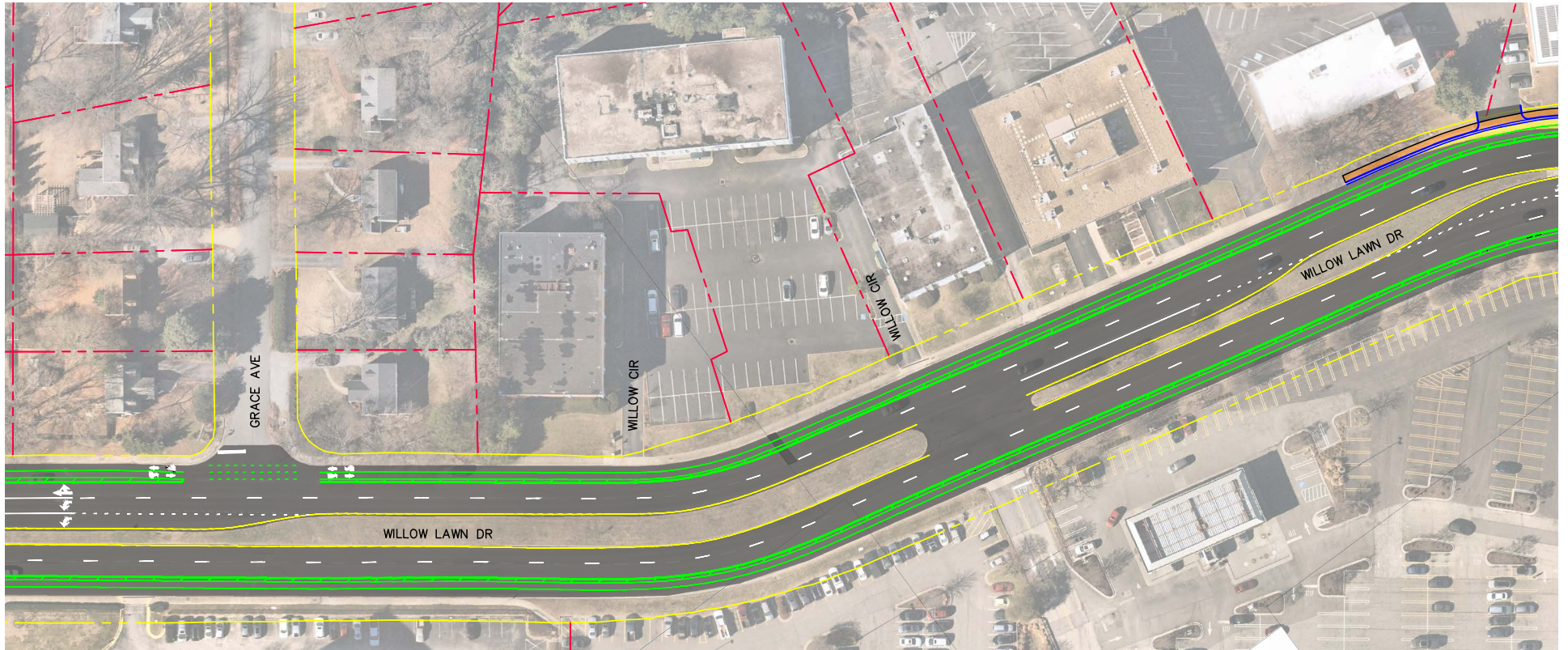




FIGURE 13: LIBBIE AVENUE - SHARED-USE PATH CONCEPT

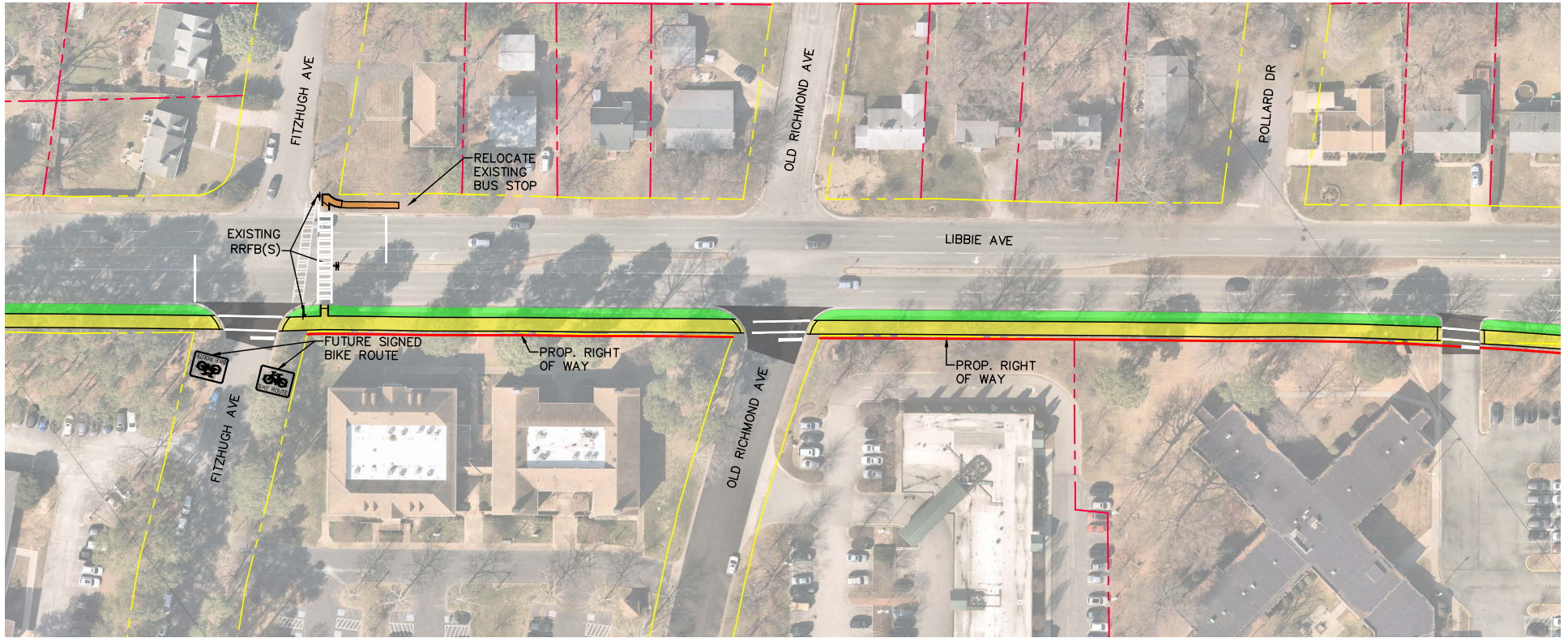
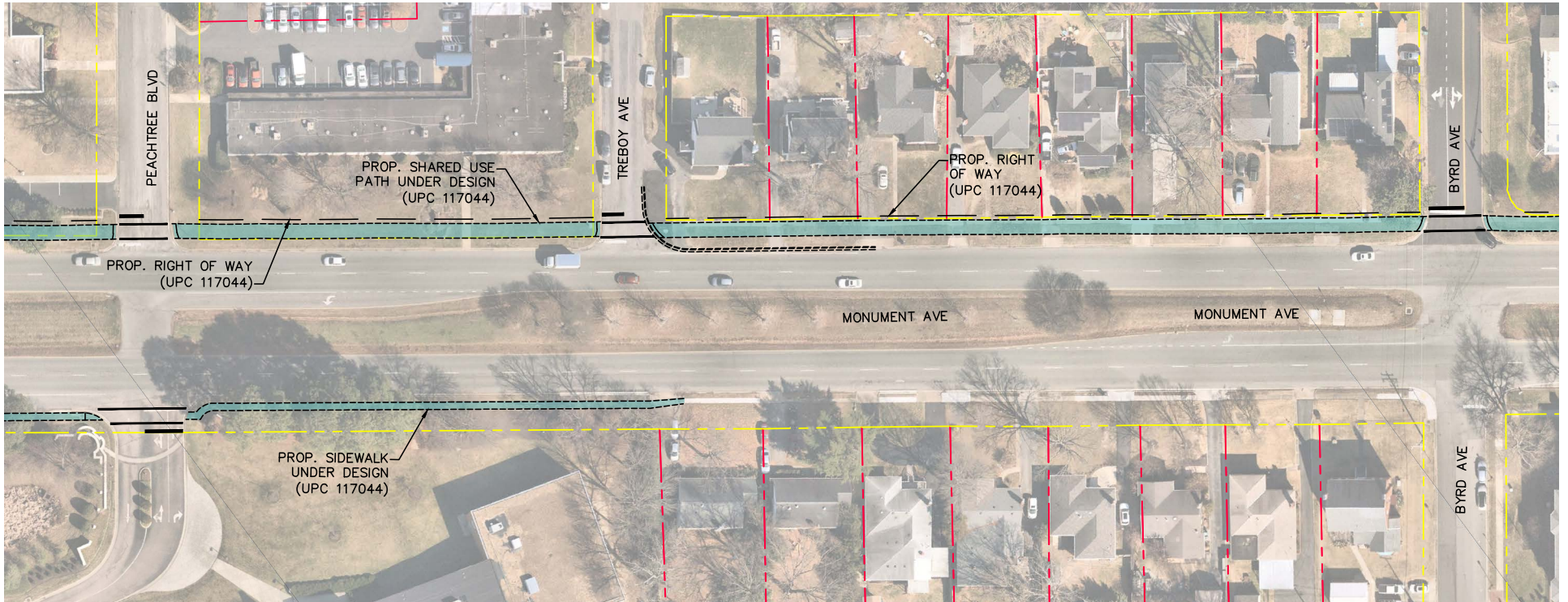




FIGURE 14: MONUMENT AVENUE – SIDEWALK CONCEPT





5. Public Feedback

Community members provided feedback on design alternatives via an online public survey open between January 2 and January 19, 2024. Respondents indicated how the three corridors addressed safety concerns before rating proposed designs on a scale from not desired to desired. **Figure 15** shows responses for each roadway regarding current safety concerns.

Participants were also asked to rate each proposed design concepts and to share their likelihood of walking and bicycling in the Willow Lawn area if the proposed design concepts were constructed. **Figure 16** shows public rankings for each concept.

FIGURE 15: CURRENT SAFETY CONCERNS – SURVEY RESPONSE

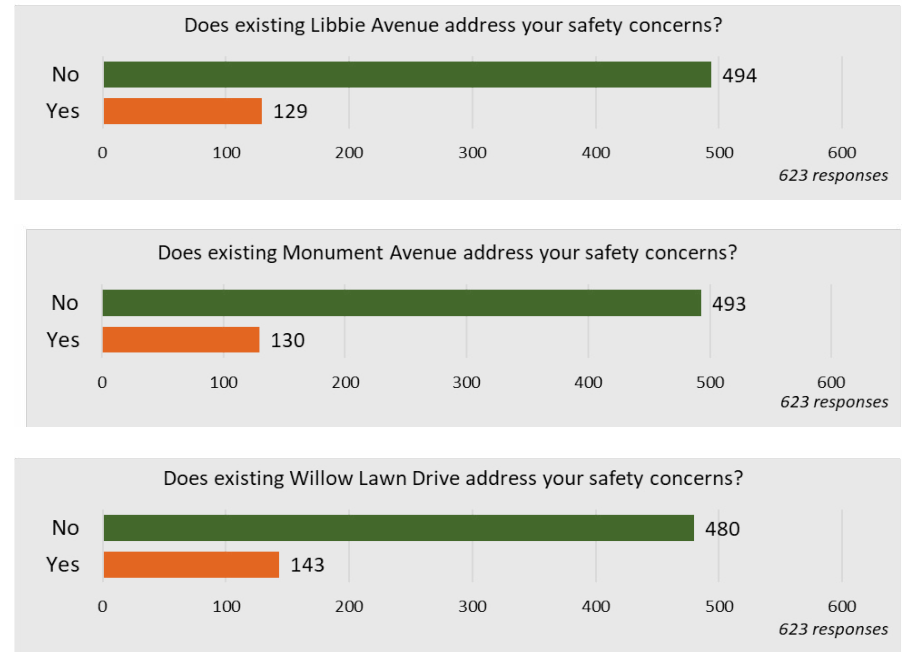
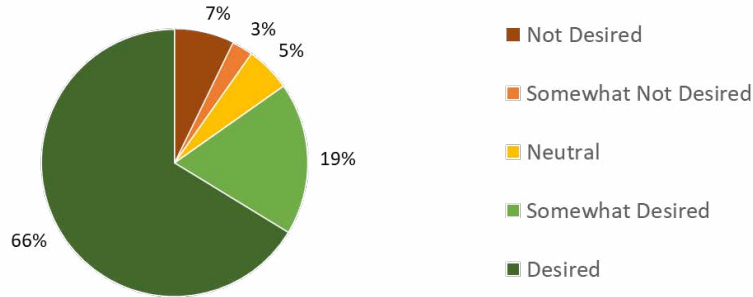


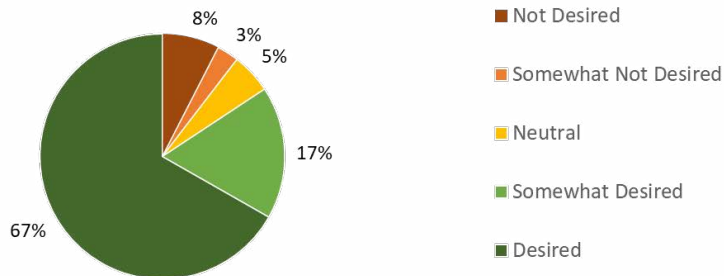


FIGURE 16: CONCEPT RANKINGS – SURVEY RESPONSE

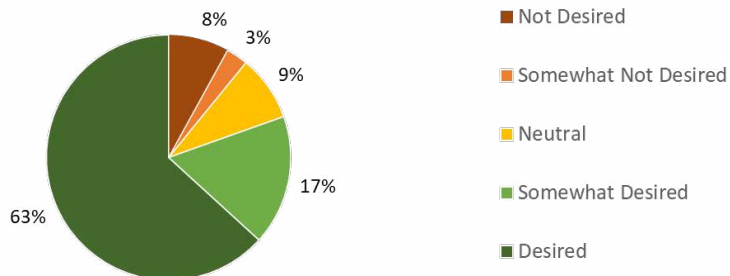
Please rank the proposed concept for Libbie Avenue on a scale from Not Desired to Desired.



Please rank the proposed concept for Monument Avenue on a scale from Not Desired to Desired.

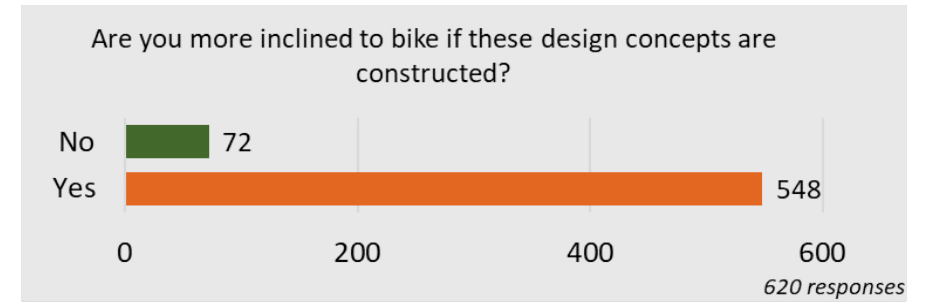


Please rank the proposed concept for Willow Lawn Drive on a scale from Not Desired to Desired.



A majority of respondents indicated they would be more inclined to bike if the proposed design concepts were constructed. **Figure 17** shows the responses for future infrastructure use.

FIGURE 17: FUTURE INFRASTRUCTURE USE – SURVEY RESPONSE





6. Conclusion

According to the public survey results, the community expressed positive support for the proposed bicycle and pedestrian infrastructure improvements in the Willow Lawn area. A portion of the proposed shared-use path and sidewalk improvements on Monument Avenue are currently under construction.

Henrico County plans to adopt and implement the improvements on Libbie Avenue and Willow Lawn Drive as funding becomes available. Once funding becomes available, the following improvements will receive consideration for advancement to construction:

- + a shared-use path on the east side of Libbie Avenue from Wythe Avenue to W Broad Street
- + a buffered two-way cycle track on both sides of Willow Lawn Drive from Fitzhugh Avenue to Monument Avenue
- + one-way buffered bike lanes from Monument Avenue to Wythe Avenue on the east and west sides

The Willow Lawn area is a major hub for shopping and business surrounded by regional public transit facilities on West Broad Street. The proposed improvements identified in this plan are aimed at addressing the lack of safe and connected bicycle and pedestrian infrastructure in the area.

