Reimagine Rainbow

Rainbow Boulevard Complete Streets and Traffic Management Plan

Table of Contents

Acknowledgments

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City of Mission Woods, Kansas

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Introduction

Project Purpose and Study Area

How can a state highway transform from a barrier to a place of connection? **Reimagine Rainbow** is a planning effort to help guide the future of Rainbow Boulevard to support a vibrant and growing area in the Kansas City region.

The Reimagine Rainbow plan focuses on creating ***Complete Streets*** within the study area by improving mobility, safety, and comfort for everyone that uses Rainbow and adjacent streets. This study examines the existing road design on multiple sections throughout Rainbow Boulevard to understand how geometric changes could improve the safety, accessibility, and attractiveness of using multiple modes of transportation, such as walking, bicycling, and transit, in addition to driving.

The study area, shown in **Figure 2**, is focused on Rainbow Boulevard, running from Southwest Boulevard in Kansas City, Kansas on the north end to Shawnee Mission Parkway on the south end. The broader study area includes an area approximately one half-mile on either side of Rainbow Boulevard and areas as far north as I-35.

Complete Streets: Roadways that are designed for safe and convenient travel by users of all ages and abilities. Pedestrians, bicyclists, motorists, and transit riders must be able to move safely along and across a complete street.

Read more about Complete Streets in the Kansas City Region.

Figure 1. ***Rendering of Rainbow Boulevard at 39th Avenue looking south***

Figure 2. *Rainbow Boulevard Study Area*

Existing Conditions

Past Plans and Policy Review

There are many previous plans and recommendations within the study area. Fortunately, several of these recommendations have advanced and been implemented. This planning effort will take into consideration relevant previous plan recommendations and re-evaluate some recommendations that have not yet been implemented.

Plan Summaries

Green Corridor Master Plan **2011**
Scope: Comprehensive
Geography: Southwest Boulevard/Merriam Lane in Rosedale

A corridor plan focused on Southwest Boulevard and Merriam Lane in Rosedale aimed at stabilizing neighborhoods and businesses along the corridor, through strategies to address health and environment, land use, placemaking, and transportation.

ULI Westwood Technical Assistance Panel **2015**
Scope: Development
Geography: Key Sites in Westwood

An infill development strategy focused on several key sites within the City of Westwood aimed at increasing housing choices, improving park space, and enhancing the tax base.

Rosedale Area Plan **2016**
Scope: Comprehensive
Geography: Rosedale (KCK portion of study area)

An area plan for Rosedale in Kansas City, Kansas, including Rainbow Boulevard, focused on urban design, development, and infrastructure in the area. The plan recommended a trail and bicycle facilities for Rainbow Boulevard and other corridors. It also laid out standards for redevelopment and urban design.

47th Street Complete Street Evaluation — 2017

Scope: Transportation
Geography: 47th Street from Mission to Rainbow

A complete street plan for 47th Street (Avenue) bordering Roeland Park, Westwood, and the City of Kansas City, Kansas

Westwood Master Plan — 2017

Scope: Comprehensive
Geography: City of Westwood, Kansas

The Westwood Master Plan is Westwood's citywide comprehensive plan that guides development and public works in Westwood. Rainbow is recognized as a key commercial corridor and opportunity for pedestrian-scaled public investments and walkable infill redevelopment that respects the scale and development patterns of the area.

Smart Moves 3.0 Regional Transit Plan — 2017

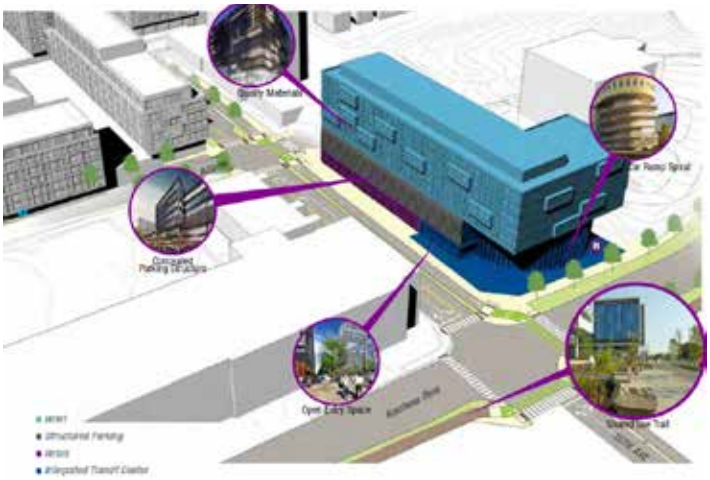
Scope: Transportation
Geography: Kansas City Metro

The official transit plan for the Kansas City region has an aim of increasing the number of jobs accessible by transit. The main strategies include adding more fast and frequent service, other fixed route bus service, on-demand services, and increasing mobility options through mobility hubs. Fast and frequent service is recommended for both Rainbow Boulevard and 39th Avenue corridors.

Rosedale University Town Plan — 2018

Scope: Transit-Oriented Development
Geography: 39th and Rainbow Hub

This plan aims to create Rosedale's University town adjacent to the University of Kansas Health System and Medical Center campus by expanding quality infill housing and development and supportive public infrastructure and amenities. The plan included concepts for multimodal transportation on Rainbow and other streets.



Connected KC 2050 — 2020

Scope: Transportation
Geography: Kansas City Metro

A region-wide plan meant to organize and prioritize transportation investments over the next 30 years, generally supporting a more multimodal and intentional transportation system. Rainbow Boulevard is included in the region's list of constrained projects for the 2020 decade.

Unified Government Complete Streets Ordinance — 2020

Scope: Transportation
Geography: Unified Government

An ordinance supporting Vision Zero and traffic safety in the Unified Government. Notably, the ordinance approves road diets by default on roadways with fewer than 20,000 vehicles per day and fewer than 1,000 vehicles in the peak hour.

47th Place Complete Streets Plan — 2021

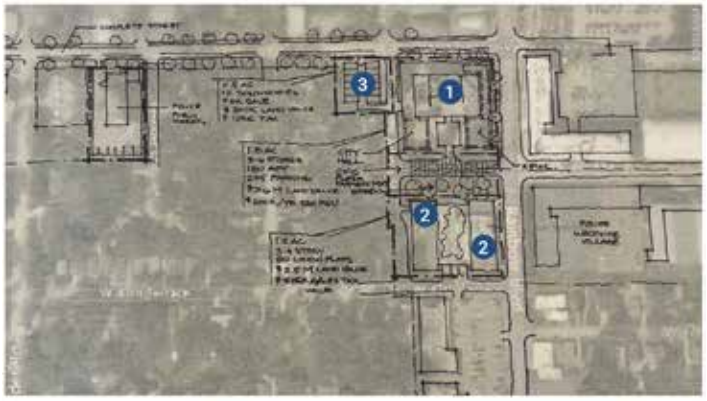
Scope: Transportation/Placemaking
Geography: 47th Place in Westwood, Kansas

A plan focused on creating better bicycle and pedestrian amenities on 47th Place between Rainbow Boulevard and State Line Road near Woodside Village in the City of Westwood.

ULI Westwood Technical Assistance Panel 2 — 2021

Scope: Development
Geography: Key Sites in Westwood, Kansas

A follow-up infill development study in Westwood focused on redevelopment opportunities at the former Westwood View Elementary School site and 47th and Rainbow.



Map	Housing Type	Anticipated Units	Configuration	Anticipated Total Annual Property Tax
1	Apartments	180	~800 sf, 1K 2 bedrooms	$560,000 (housing); $400,000 (retail)
2	For Sale Condos	80	1000-1200 sf	$500,000
3	Row Houses	12	~2000 sf	$420,000

City of Westwood Facilities Assessment and Feasibility Analysis — 2022

Scope: City-owned buildings and land
Geography: Westwood, Kansas

An assessment of the facility needs of the City of Westwood and redevelopment opportunities at 47th and Rainbow and 50th and Rainbow that could help fund new and improved facilities.

Westwood Complete Streets Policy — 2021

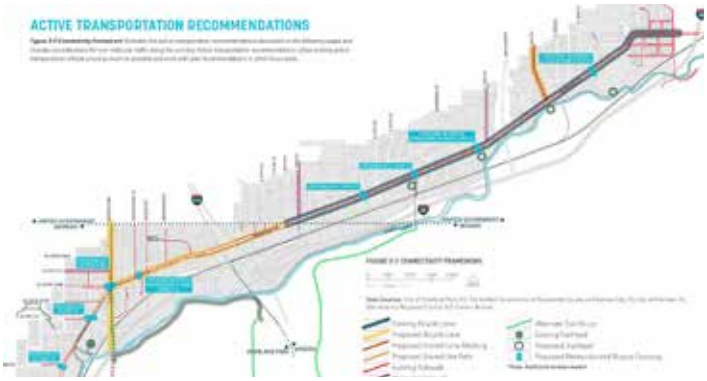
Scope: Transportation
Geography: Citywide in Westwood, Kansas

A policy emphasizing multimodal connections in key corridors in Westwood, including Rainbow Boulevard, Belinder Avenue, Mission Road, 47th Street/Avenue, 48th Street, 50th Street, and Shawnee Mission Parkway.

Merriam Connected Corridor Plan — 2021

Scope: Transportation
Geography: Merriam Drive/Lane

A complete streets plan for Merriam Drive/Lane in Overland Park, Merriam, and the Unified Government. Merriam Lane eventually becomes Southwest Boulevard, which connects to Rainbow Boulevard. The plan also includes strategies for connections to the Turkey Creek Trail.



goDotte Countywide Strategic Mobility Plan — 2022

Scope: Transportation
Geography: Unified Government

A countywide strategy focused on transportation and mobility policies and priority in the County. Rainbow is identified as a key opportunity corridor for better connections to the University of Kansas Health System and Medical Center.

Turkey Creek Corridor Enhancement Plan — 2023

Scope: Transportation/Environment
Geography: Turkey Creek Corridor

A plan focused on creating a publicly accessible trail adjacent to Turkey Creek, supported by recent improvements designed to mitigate flooding impacts in the area.

KCATA East-West Transit Study — 2023

Scope: Transportation
Geography: West 39th Street and Linwood Boulevard/31st Street

A transit study focused on bringing a streetcar to the 39th Street corridor and connecting the University of Kansas Medical Center and Health System, the existing Main Street streetcar, and the VA Hospital in Kansas City, Missouri.

Status of Relevant Recommendations

	Plan	Year	Recommendation	Status / Notes
1	Green Corridor Master Plan	2011	Implement Turkey Creek Trail	**In Progress**
2	Green Corridor Master Plan	2011	Introduce bus service to Southwest Boulevard	**Complete** The 11 now serves Southwest Boulevard to Rainbow Boulevard, where it terminates at the KU Medical Center Campus.
3	Green Corridor Master Plan	2011	Rainbow and Southwest Boulevard Gateway and Infill Development	**Not Yet Started**
4	ULI TAP - Westwood	2015	Build a new Westwood Elementary School and redevelop the existing Westwood View Elementary and Dennis Park to new mixed-use development and park.	**In Progress**
5	ULI TAP - Westwood	2015	Redevelop City Hall into a mixed-use development, potentially building a new City Hall facility for Westwood as a part of the redevelopment through a public-private partnership	**In Progress**
6	Rosedale Area Plan	2016	Expand Bike share to Rosedale	**Complete**
7	Rosedale Area Plan	2016	Complete the sidewalk network and upgrade ADA ramps in Rosedale	**In Progress**
8	Rosedale Area Plan	2016	Build a trail/shared use path from Rainbow and Southwest Boulevard to Rainbow and Adams Street.	**Revisiting**
9	Rosedale Area Plan	2016	Develop a bike facility couplet paired between Rainbow Boulevard and Adams Street, with a one-direction facility on each street from Rainbow and Adams to Olathe	**Revisiting** This recommendation is being revisited in the Rainbow PSP plan for further study and to enable coordination between Westwood and the Unified Government
10	Rosedale Area Plan	2016	Introduce a signed bike route on lower speed streets like Olathe, Lloyd, Fisher, and 41st	**Not Yet Started**
11	Rosedale Area Plan	2016	Provide transit service between downtown Kansas City, MO and Rosedale	**Complete** The 11 now travels between Downtown Kansas City, MO and KUMC
12	Westwood Master Plan	2017	Invest in infrastructure on 47th Street and Rainbow Boulevard	**In Progress**
13	Westwood Master Plan	2017	Additional crosswalks on Rainbow	**Not Yet Started**
14	Westwood Master Plan	2017	Pedestrian-scaled lighting and banners on Rainbow	**Planning**

	Plan	Year	Recommendation	Status / Notes
15	Westwood Master Plan	2017	Focus bike/ped Improvements on Belinder	**Complete**
	47th Street Complete Street Evaluation	2017	Construct a new sidewalk and site-specific traffic calming features on Belinder Road to make it safer for walking and biking	
16	47th Street Complete Street Evaluation	2017	Road Diet 47th Street / Avenue to include two through lanes, a center turn-lane, and bicycle facilities with additional crossings and pedestrian refuges	**Complete**
17	Rosedale University Town Plan	2017	Create a vibrant mixed use/retail corridor along 39th Street, extending past Rainbow to Fisher Park	**In Progress** KU has acquired properties along 39th Street and is in the process of studying redevelopment strategies
18	Rosedale University Town Plan	2017	Create higher density and missing middle housing	**In Progress** Some infill housing development is underway in the area; KU continues to acquire property in the area
19	Rosedale University Town Plan	2017	Improve Fisher Park with a Library and Community Center	**Not Yet Started**
20	Rosedale University Town Plan	2017	Improve Rainbow Boulevard Streetscape	**Planning**
21	Rosedale University Town Plan	2017	Build a transit center at 39th on Rainbow or Adams	**Revisiting**
22	Smart Moves	2017	Implement a Fast and Frequent Route on 7th Street/Rainbow	**Not Yet Started**
23	Smart Moves	2017	Implement a Fast and Frequent Route on 39th Street	**Planning**
24	Smart Moves	2017	Implement a Mobility Hub at KU Medical Center	**Not Yet Started**
25	47th Place Complete Streets Plan	2021	Develop a shared-used path between State Line and Woodside Village, as well as an off-street neighborhood trail	**Planning**
26	47th Place Complete Streets Plan	2021	Create enhanced streetscape with curbless streets, angle parking, and mid-block crossings that allows the street to be temporarily closed for festivals	**Planning**

	Plan	Year	Recommendation	Status / Notes
27	ULI TAP - Westwood	2021	Work with KDOT to transform Rainbow Boulevard into a walkable thoroughfare with protected bicycle facilities	**Planning**
28	ULI TAP - Westwood	2021	Add new infill housing opportunities with apartments, townhomes, other missing-middle housing.	**Planning**
29	GoDotte	2022	Develop fast and frequent transit along 7th Street and Rainbow Boulevard	**Not Yet Started**
30	GoDotte	2022	Work with Westwood, Westwood Hills, and Mission Woods to study a complete street on Rainbow Boulevard from Southwest Boulevard to Shawnee Mission Parkway	**Planning**
31	Turkey Creek Corridor Enhancement Plan	2023	Construct a trail connection to 7th Street	**In Progress** A trail surface has already been constructed through the Army Corps of Engineers flood control project. Public access to the trail would require a switchback ramp structure to get to the elevated 7th Street bridge over railroad tracks and Turkey Creek. Railroad coordination, property acquisition, and/or floodplain development permitting would be required to advance this.
32	East-West Transit Study	2023	Build a streetcar terminating east of Rainbow Boulevard on 39th Street	**Planning**

Figure 3. ***Location of Key Recommendations***

Demographic Overview

In some respects, the Rainbow Boulevard corridor shares many of the same demographic characteristics as the Kansas City Metro area. However, there are some key differences. The study area is generally less racially and economically segregated than the region as a whole, the result of diverse housing options in the corridor. There are fewer children in the study area (around 14% of the population, compared to 28% of the region's). There are also more renters -- half of the households in the study area rent, compared to 35% of the region's households.

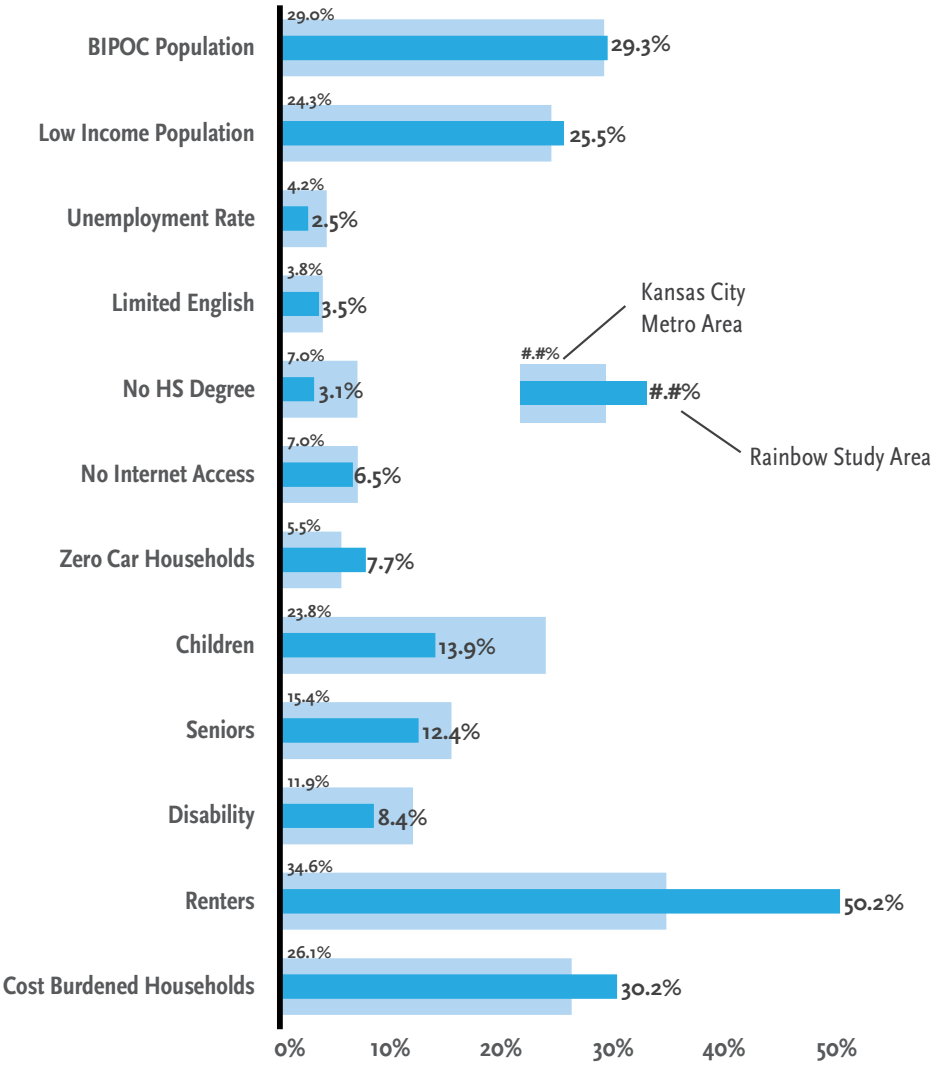


Figure 4. ***Demographic Snapshot of the Study Area Compared to the Kansas City Metro***

BIPOC: Black, Indigenous, or People of Color (sometimes known as minority population)

Low Income Population: Individuals in households making less than 2x the poverty limit.

Cost Burdened Households: Households who spend more than 30% of their income on housing costs.

Source: U.S. Census American Community Survey 5-Year Data, 2018-2022

The United States Department of Transportation (USDOT) has made equitable transportation investments a top priority. One way USDOT assesses equity is through a composite metric meant to highlight areas where residents may be disproportionately negatively impacted by our transportation system. The ***Disadvantaged Census Tracts***, shown in yellow below, are found throughout much of Wyandotte County, KS and in the northwest part of the study area, which includes much of Rosedale. The Federal Highway Administration (a part of USDOT) is also prioritizing active transportation as a part of the U.S. National Blueprint for Decarbonization.

Disadvantaged Census Tracts: Census Tracts that have a transportation disadvantage compared to all other census tracts nationally across five (5) categories of forty (40) indicators. Disadvantaged Tracts are often prioritized for Federal infrastructure investment.

Learn more about the USDOT's approach to equity through the Equitable Transportation Community Explorer web mapping tool.

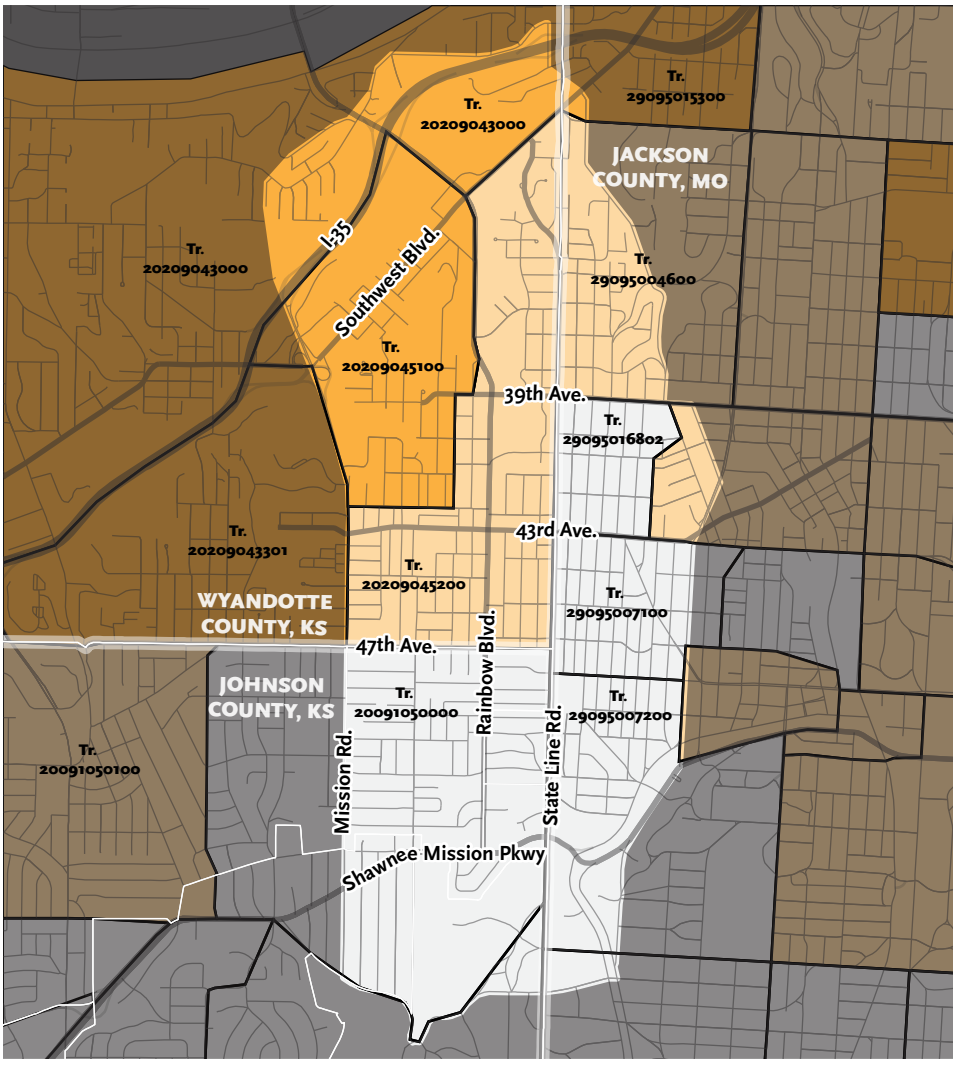


Figure 5. ***USDOT Disadvantaged Census Tracts***

Legend

- USDOT Disadvantaged Census Tract (National)
- Environmental Justice Census Tracts (MARC)

Natural Environment

The natural environment shapes development and mobility patterns within the Rainbow Boulevard study area. This analysis focuses primarily on topography, streams and waterways, land cover, and the urban heat island effect.

Rainbow Boulevard travels from Southwest Boulevard on the north to Shawnee Mission Parkway to the south. Rainbow Boulevard makes a relatively steep climb between the Rainbow Extension and 39th Avenue, with a grade in excess of 5%. Grades vary from 2-5% south of this point to Shawnee Mission Parkway.

Rainbow Boulevard's high point is between 41st and 42nd Avenues. Water to the north of this point flows to Turkey Creek, and water to the south of this point flows to Brush Creek. ***Watersheds***, or the land area that separates to which streamway water flows, can be seen in **Figure 7**.

Watersheds: an area or ridge of land that separates waters flowing to different rivers, basins, or seas.
Oxford Dictionaries

Several improvements have recently been completed as a part of the Turkey Creek Flood Damage Mitigation Program, including channel widening and improvements to the 100-year old Turkey Creek diverter tunnel. Low-lying areas around Brush Creek are also considered flood hazard areas. Some land within the Turkey Creek floodplain area has been acquired for the development of a trail, which is an appropriate use for floodplain areas. The slope profile of Rainbow Boulevard is further shown in **Figure 6**, and the topography, watersheds, and floodplain areas in the study area can be seen in **Figure 7**.

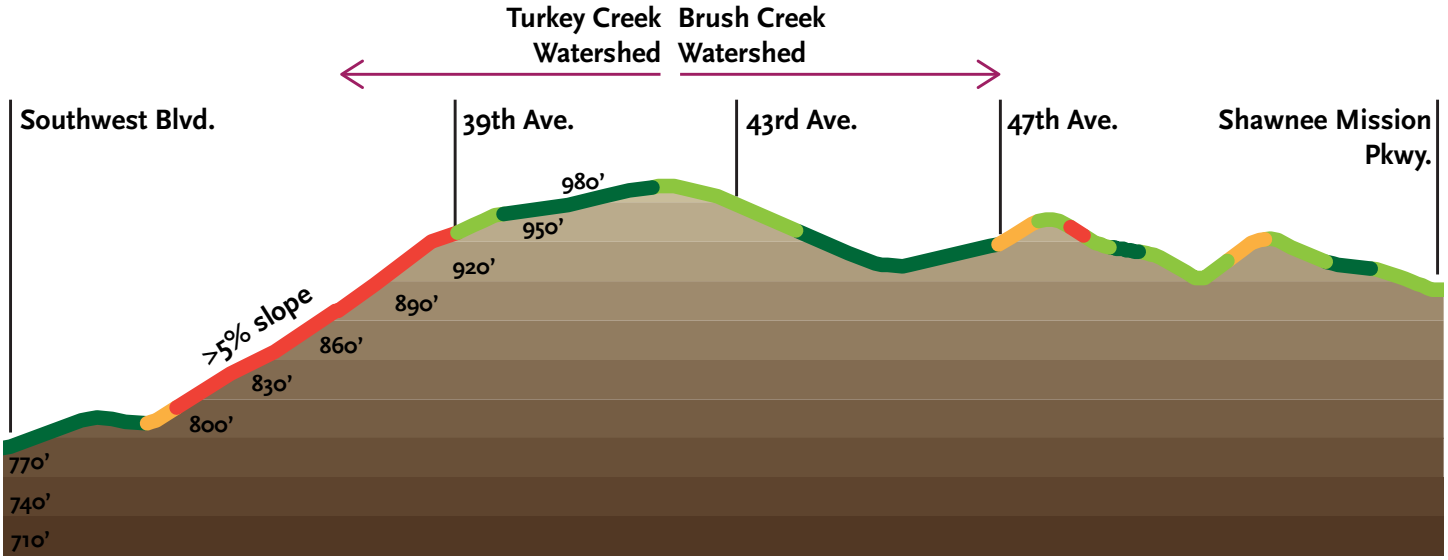


Figure 6. ***The Slope Profile of Rainbow Boulevard***

Figure 7. ***Topography, Streams, and Natural Features of the Rainbow Boulevard Study Area***
Rainbow Boulevard runs from Southwest Boulevard, near Turkey Creek, to Shawnee Mission Parkway, near Brush Creek. The dividing point between these two watersheds is generally located between 39th and 43rd Avenues.

Legend

- Watershed Boundary
- Stream
- Floodplain
- 1,110' / 710' Ground Elevation

Rainbow Slope (%)

- Under 2%
- 2-4%
- 4-5%
- >5%

Sources: FEMA, U.S. Census TIGER, USGS, MARC

1/2 mile

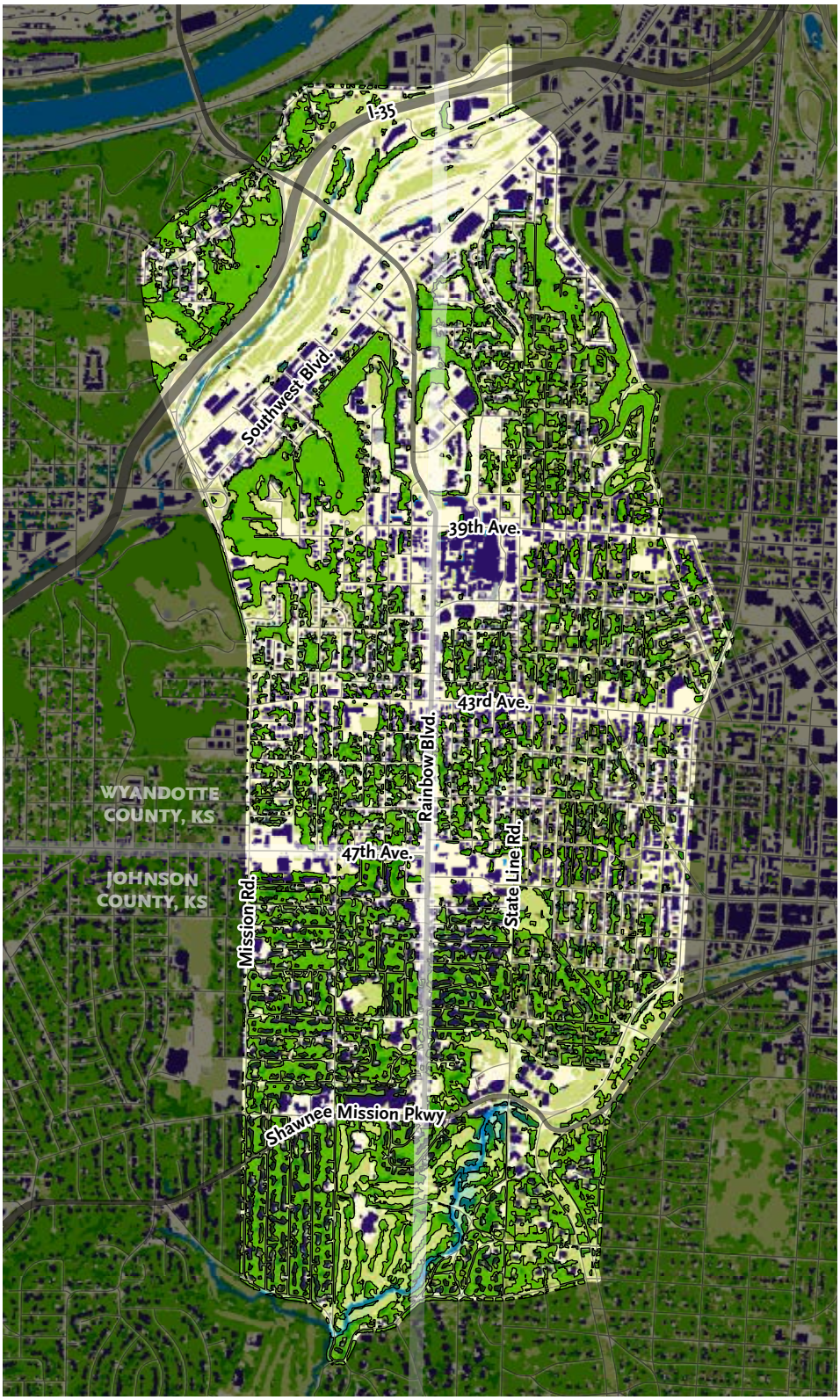


Figure 8. ***Land Cover and Tree Canopy***
The study area is almost half impervious, with 31% tree canopy cover and 20% grass cover.

Legend

Tree Canopy

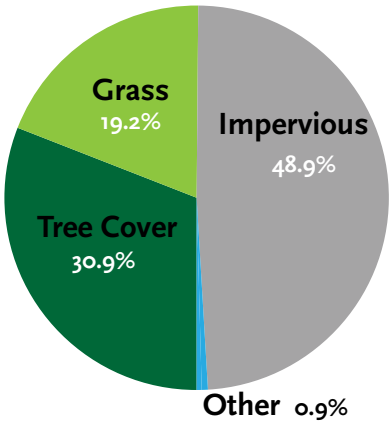
Land Cover Classifications

Impervious 48.9%
- 32.8% Impervious Other
- 16.2% Impervious Buildings

Forest/Tree Cover 30.9%
- 24.7% Upland Deciduous Forest
- 5.6% Mixed Forest
- 0.3% Coniferous Forest
- 0.3% Lowland Deciduous Forest

Herbaceous/Scrub 19.2%
- 13.5% Herbaceous
- 5.6% Shrub-Scrub
- 0.2% Lowland Herbaceous

Water/Other 0.9%
- 0.5% Water



Sources: MARC Natural Resources Inventory, U.S. Census TIGER

According to data from the Mid-America Regional Council (MARC), the study area is about 49% impervious surface, including buildings, parking lots, streets, and other surfaces. 31% of the study area is forest or woodland, and 19% is grass or other herbaceous or scrub land cover. Tree cover is most prominent around the steep slopes and bluffs or in well-established residential yards. Tree cover is notably absent on Rainbow Boulevard between 36th Avenue and 47th Terrace.

Land cover and topography also impact the relative temperature of the Rainbow Boulevard study area. Data derived from NOAA's Heat Watch studies in Johnson and Wyandotte Counties, Kansas and Kansas City, MO indicate afternoon temperatures can be up to 10 degrees Fahrenheit higher in heat island locations. Most of the study area is impacted by the ***Urban Heat Island*** effect, but areas with more tree canopy cover show some relief from the heat.

Urban Heat Island: Urbanized areas that experience higher temperatures than outlying areas due to buildings, roads, and other structures that absorb and re-emit more heat than natural features.
U.S. Environmental Protection Agency

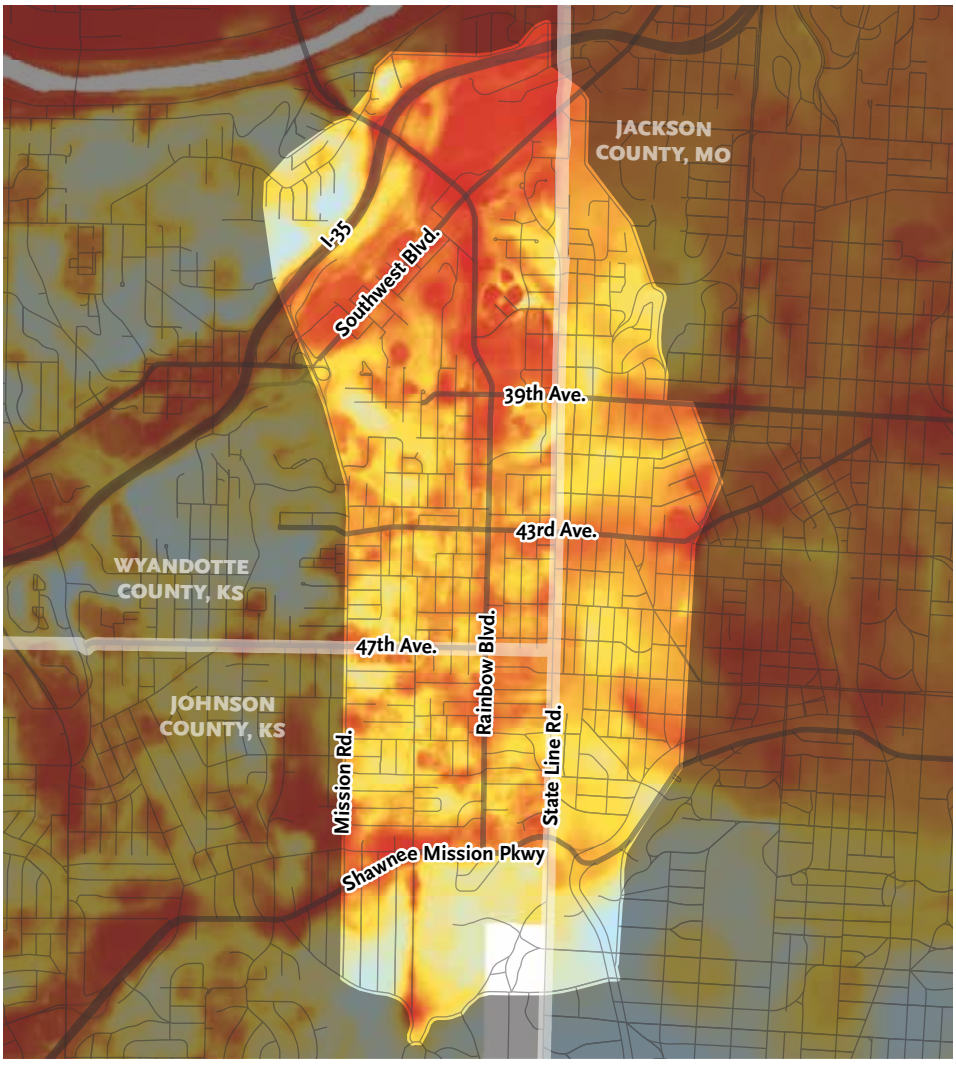


Figure 9. ***Urban Heat Island Temperature Differences in Johnson and Wyandotte Counties***
The area around Southwest Boulevard, the University of Kansas Medical Center and Health System Campus, Rainbow Boulevard, and Shawnee Mission Parkway are most impacted by the heat island effect, according to 2023 observations. Many of these areas were 5-6 degrees Fahrenheit warmer due to the heat island effect. Read the full report.

Source: National Integrated Heat Health Information System, 2021 (Kansas City, MO) and 2023 (Johnson and Wyandotte County, KS), U.S. Census TIGER

Land Use and Development

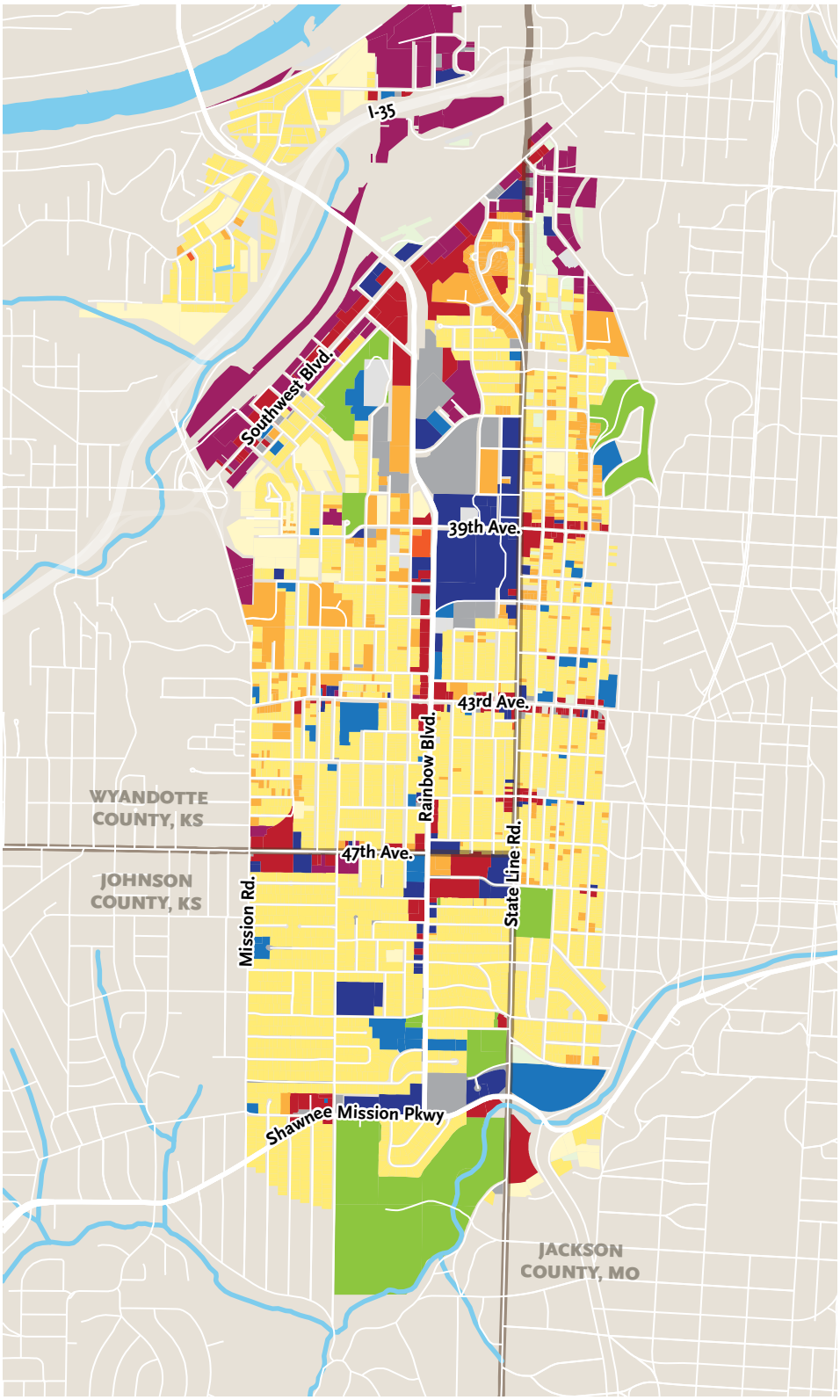


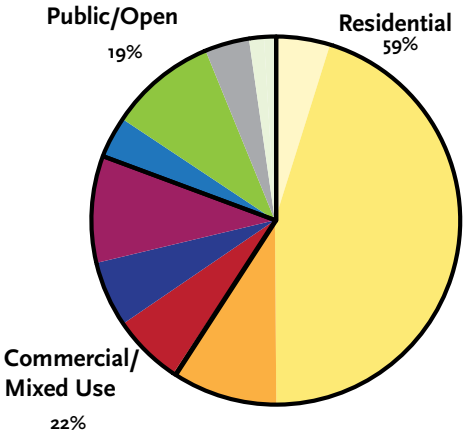
Figure 10. *Existing Land Use in the Study Area*

Legend

Residential 59%
- 5% Single Family Low Density
- 45% Single Family
- 9% Multifamily

Mixed Use/Commercial 22%
- 0.2% Mixed Use
- 6% Commercial
- 6% Office/Medical
- 9% Industrial

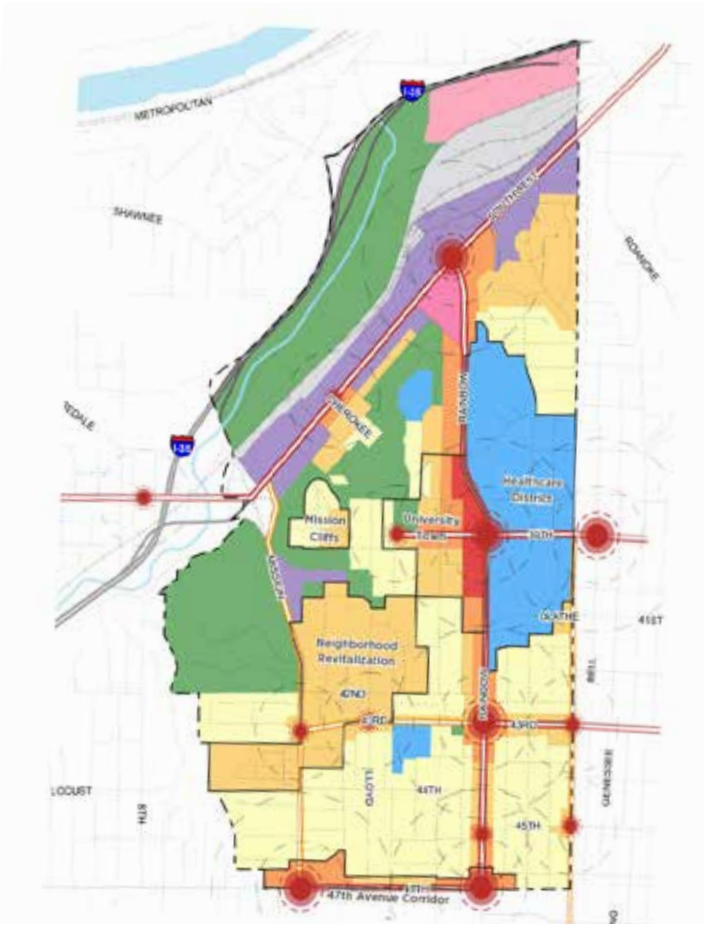
Public/Open 19%
- 4% Public/Semipublic
- 9% Park
- 4% Parking
- 1% Vacant/Ag



Sources: MARC, U.S. Census TIGER

There is a diverse mixture of land uses in the study area. While about 59% of the study area is residential (mostly single family, which is 50% of the overall land use), there are many commercial, industrial, institutional, and open space uses. A mixture of land uses helps support walkability by concentrating more destinations within a walking or biking distance.

The future land use frameworks for both Rosedale and the City of Westwood concentrate more intense uses (i.e. commercial, mixed use, multifamily) along arterial streets like Southwest Boulevard, Rainbow Boulevard, 39th, 43rd, 47th, and Shawnee Mission Parkway. They also identify nodes or gateways at key intersections, meant to serve as destinations with higher activity. Both land use plans support a transition in density from arterial streets down to adjoining single family residential properties.



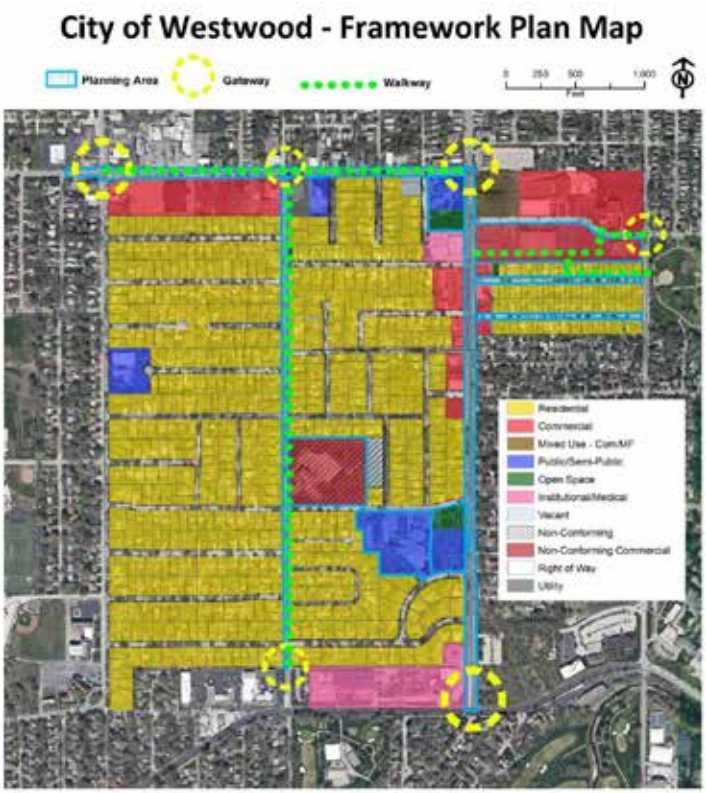


Figure 11. ***Future Land Use Plans in Kansas City, KS and Westwood***

There are many development proposals that are either under construction, approved and permitted, or proposed in the study area, including over 800 housing units, around 44,000 square feet of retail space, and 600,000 square feet of office or clinical space. These proposed developments will help balance out land use within the study area, enabling more trips to be made by walking or biking.

Table 1. ***Under Construction, Approved, or Proposed Development within the Study Area***

	Project	Housing Units	Retail	Office/Clinical	Status
1	The Hudson	228			Under Construction
2	Jamestown	226			Under Construction
3	Woodside Rosedale	149			Approved
4	Friendship Inn	27 beds			Approved
5	50th and Rainbow		44,247 s.f.	78,201 s.f.	Approved
6	Woodside Village South	243	16,000 s.f.		Approved
7	Cancer Center			500,000 s.f.	Proposed

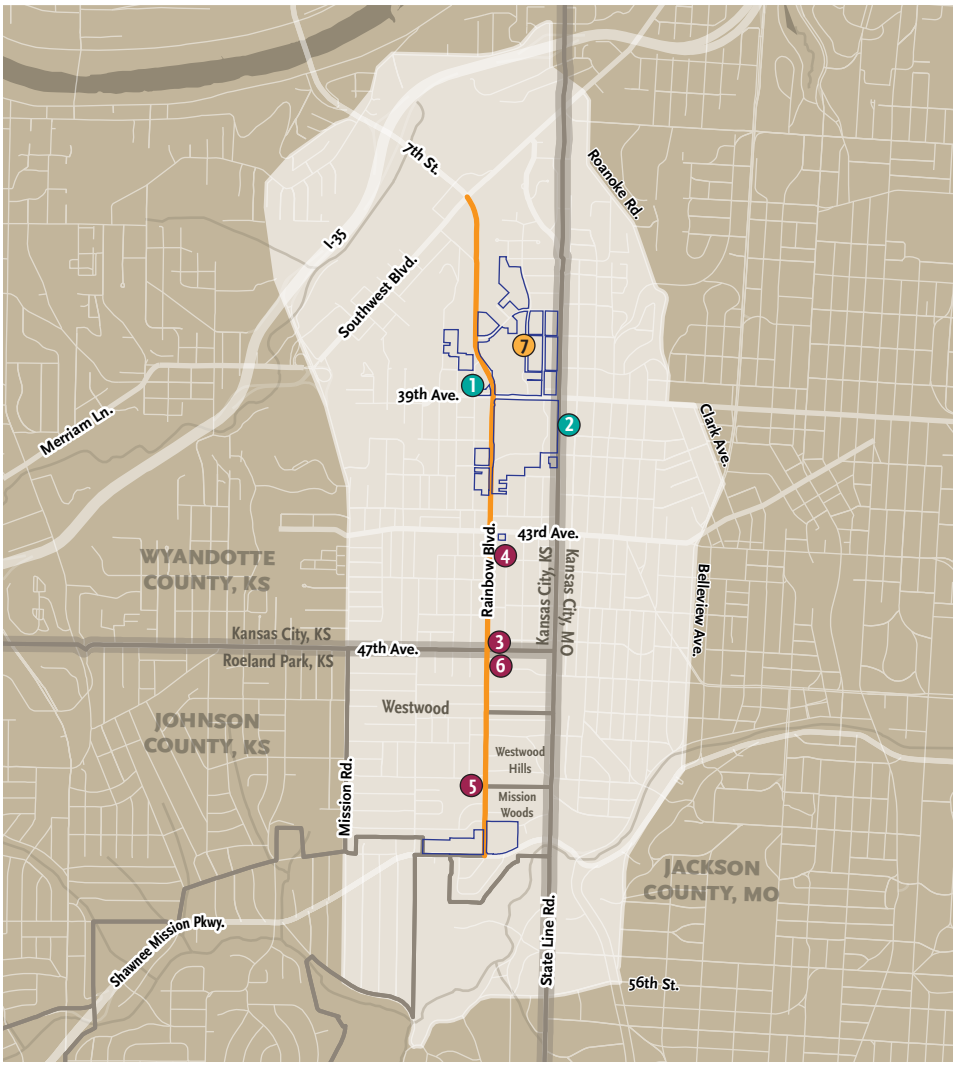


Figure 12. ***Approved or Proposed Development in the Study Area***

Legend

Rainbow Boulevard

Study Area Boundary

Owned by KU or Affiliated Group

Under Construction

1 The Hudson

2 Jamestown

Approved

3 Woodside Rosedale

4 Friendship Inn

5 50th and Rainbow

6 Woodside Village South

Proposed/Planned

7 Cancer Center

Right of Way Conditions

Information about the right of way and pavement width on Rainbow Boulevard was obtained using high resolution aerial photography, GIS information from Wyandotte County and Johnson County, and in-person site observations. A survey and detailed property research were not conducted for this study.

Rainbow Boulevard's right of way can best be characterized by the following three segments:

- Southwest Boulevard to 39th Avenue
- 39th Avenue to 47th Avenue/Street
- 47th Avenue/Street to Shawnee Mission Parkway

Southwest Boulevard to 39th Avenue

Rainbow Boulevard is widest in the section between Southwest Boulevard and 39th Avenue. This section includes 4 travel lanes (estimated to be 12 feet wide or wider), median barriers, and turn lanes. The right of way is widest in this section, ranging from 80 feet to over 200 feet in width. There is a steep rocky and vegetated slope on the east side of the right of way. The west side of the right of way has a sidewalk. In some places, the sidewalk is a 10' wide Shared Use Path.

Figure 13. ***Typical Right of Way Conditions on Rainbow from 39th Ave to Southwest Blvd***

Figure 14. ***Photographs of conditions along Rainbow Blvd. between Southwest Blvd. and 39th Ave.***

39th Avenue to 47th Avenue

Rainbow is a 4-lane, undivided road from 39th Avenue to 47th Avenue. Travel lanes are approximately 11 feet wide. The pavement width is approximately 44 feet, not including curb and gutter on both sides. Sidewalks are approximately 5 feet wide and are directly adjacent to the curb throughout this section. There are left turn lanes present at 39th Avenue and 43rd Avenue.

Figure 15. ***Typical Right of Way Conditions on Rainbow from 39th Ave to 47th Ave.***

Figure 16. ***Photographs of conditions on Rainbow from 39th Ave. to 47th Ave.***

47th Avenue to Shawnee Mission Parkway

Beginning at 47th Avenue (Street), the pavement on Rainbow is approximately 41 feet wide, slightly narrower than the section to the north. Rainbow is still a four-lane undivided roadway in this section. There are frequent uncontrolled intersections and some driveways. Frequent hills and fast speeds make for sight distance issues, particularly north of 50th Street. Sidewalks are approximately 5 feet wide with 1 to 2 feet of grass separating them from traffic lanes.

Figure 17. ***Typical Right of Way Conditions on Rainbow from 47th Ave. to Shawnee Mission Parkway***

Figure 18. ***Photographs of conditions of Rainbow from 47th Ave to Shawnee Mission Parkway.***

Multimodal Transportation

Regional Trip Patterns

According to data from ***Replica***, around half of the trips that occur in the study area are under 5 miles. Of these trips, 74% are by car. Approximately 30% of trips are under 2 miles, and 62% of those trips are by car. There is significant potential to increase walking, biking, and transit trips, particularly for shorter trips within the study area. This would also reduce traffic and improve convenience for people that do drive.

Replica: A traffic model and "big data" source that combines information from GPS data, connected vehicles, and many other sources to provide an accurate picture of travel patterns in a particular study area.

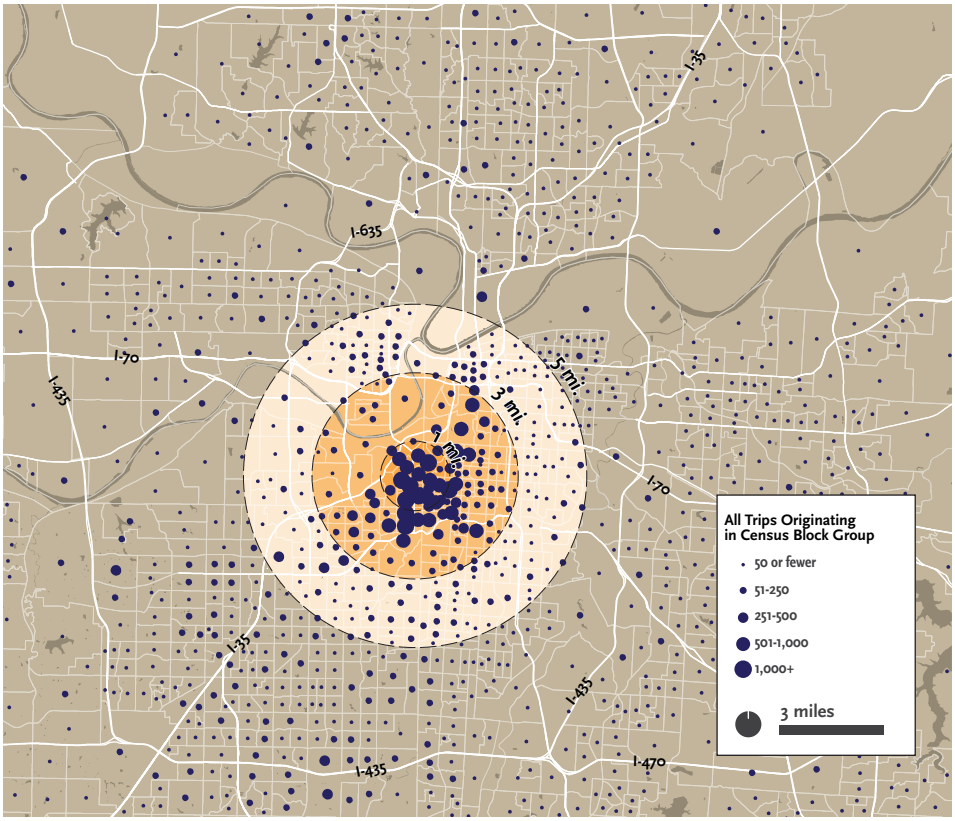


Figure 19. ***Regional Distribution of Trips Destined to the Study Area***

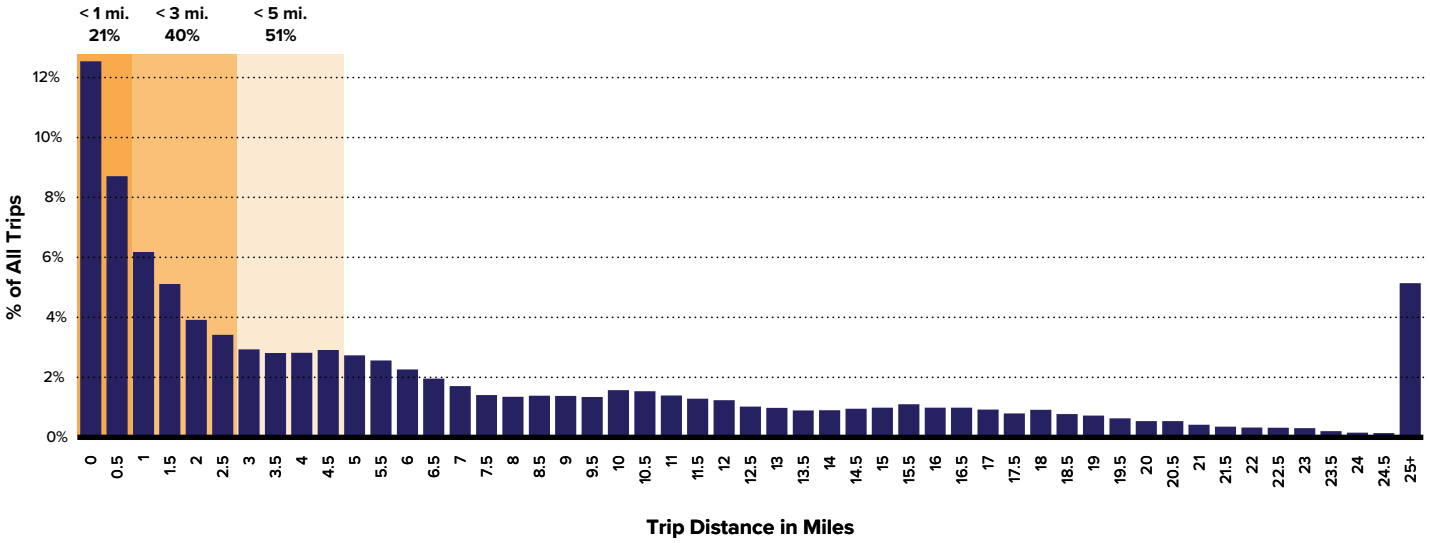


Figure 20. ***Distribution of Trip Distances traveling to the Study Area***

KU Health System / Medical Center Campus Circulation

Approximately 70% (4,900 out of 7,100) of parking spaces serving the KU Med campus are north of 39th Ave. Most of this parking serves employees of the Health System and University. However, some of this space is available to patients or visitors. Most visitor parking is located to the south of 39th Ave, and there is some employee parking to the south of 39th Ave as well. Shuttle service provides connectivity between parking locations and health system buildings, as well as to the Westwood campus. The significant amount of parking to the north of this area is responsible for higher traffic levels north of 39th Ave, while there are lower traffic volumes south of 39th.

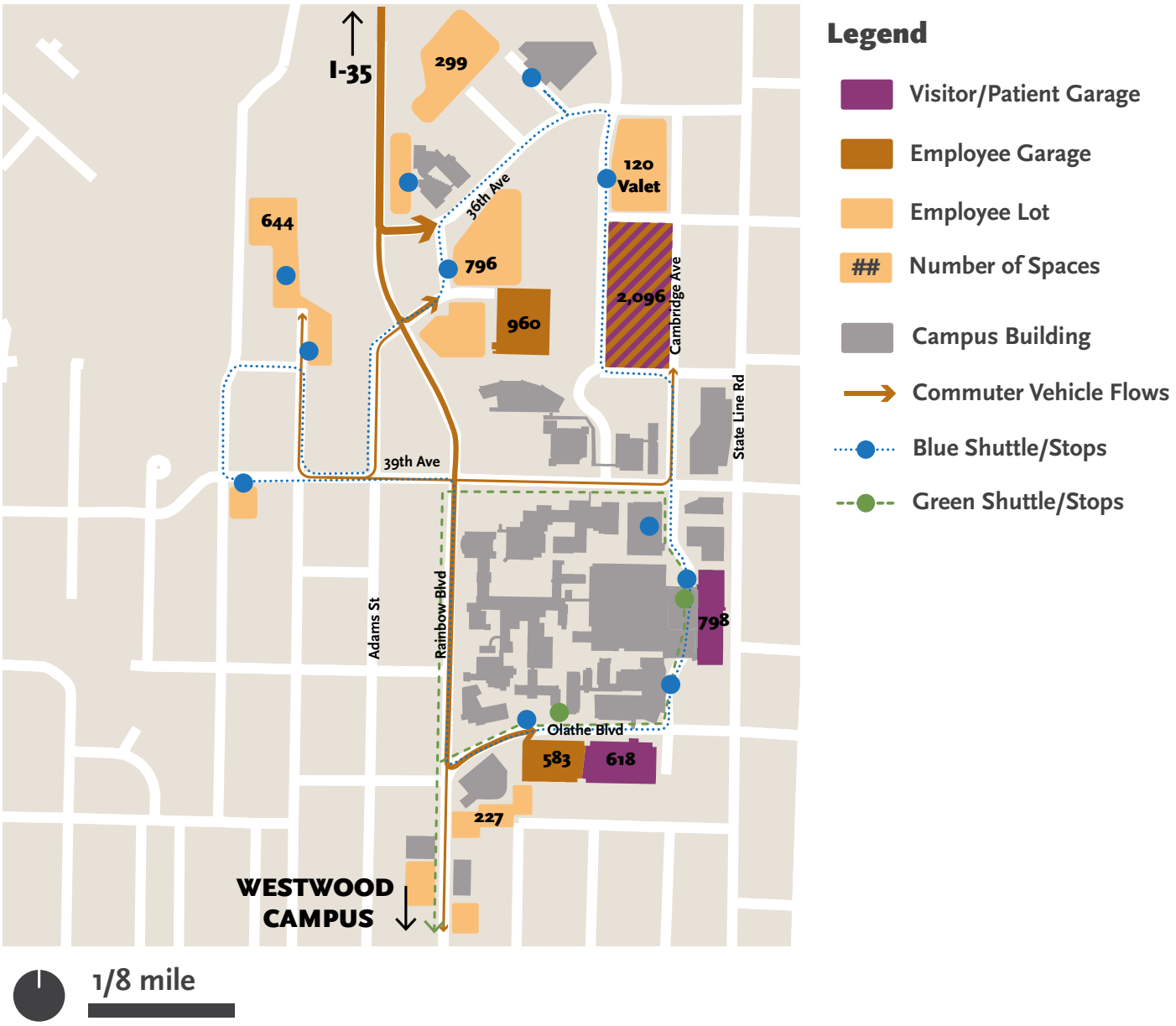


Figure 21. ***Parking and Circulation on the KU Campus***

Patient and employee data provided by the Health System shows the concentration of patients and employees being focused in northeast Johnson County and Kansas City, MO, with a strong concentration along I-35. Employee traffic is largely focused around peak-hours (7-9 am and 3:30-5:30pm), whereas patient and visitor parking is spread throughout the day. KU has the potential to manage the peak traffic flow through its operations.

Figure 22. ***Queuing for the Olathe Parking Garage at 8am***

Figure 23. ***Patient Drop-off/Pickup and Valet on Cambridge***

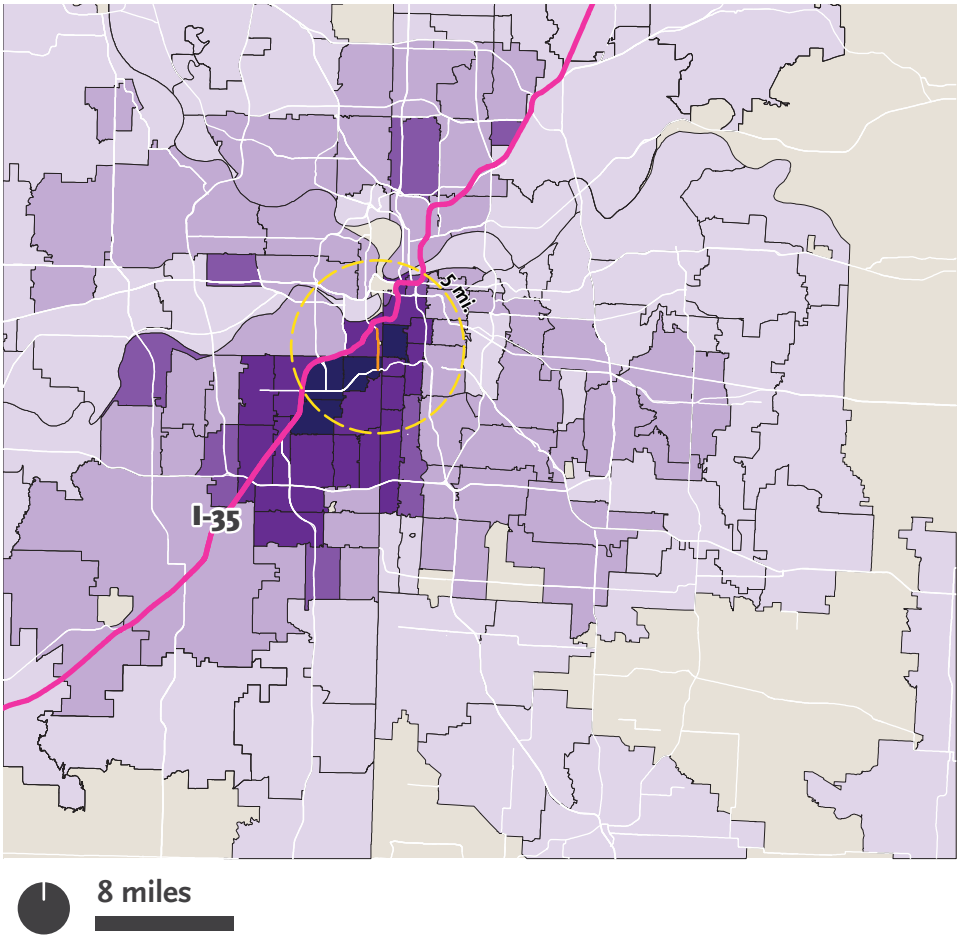


Figure 24. *Origin of University of Kansas Health System Employees*

This data includes all employees of all health system locations (not just 39th and Rainbow)

Legend

Rainbow Corridor

I-35

Employees per Square Mile

- 2 or Fewer
- >2 - 10
- >10-15
- >15-30
- >30

Source: The University of Kansas Health System

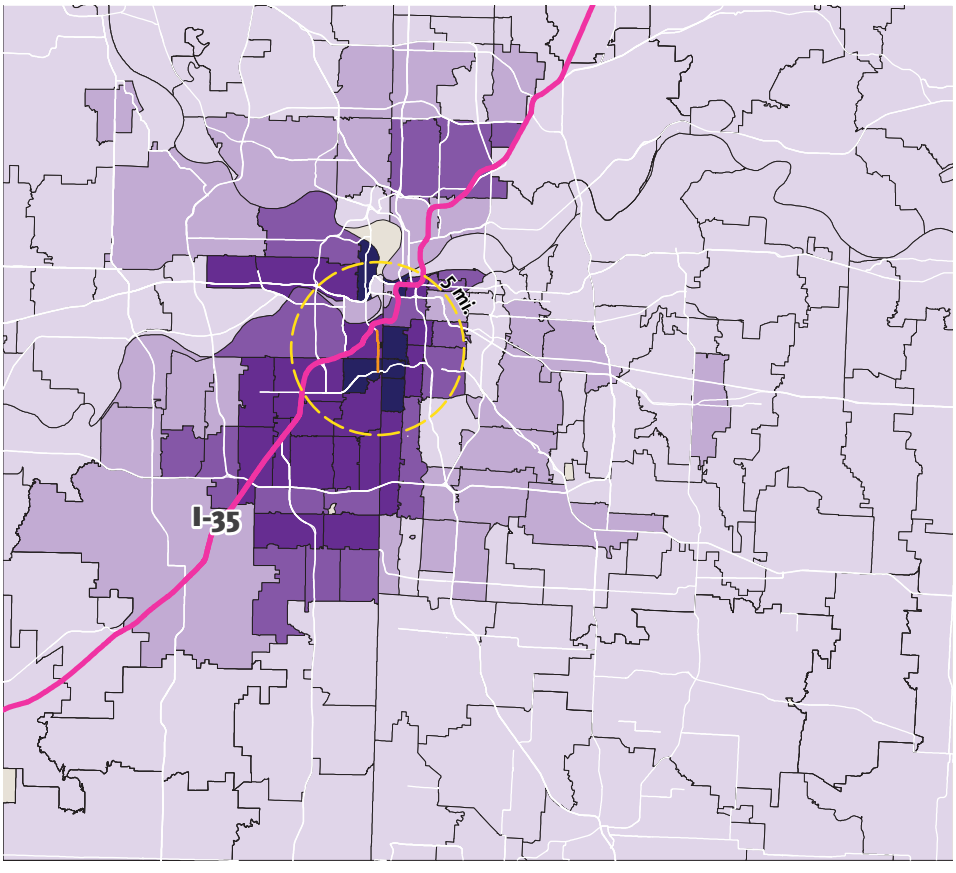


Figure 25. *Origin of University of Kansas Health System Patients*

This data includes all patients to all health system locations (not just 39th and Rainbow)

Legend

Rainbow Corridor

I-35

Patients per Square Mile

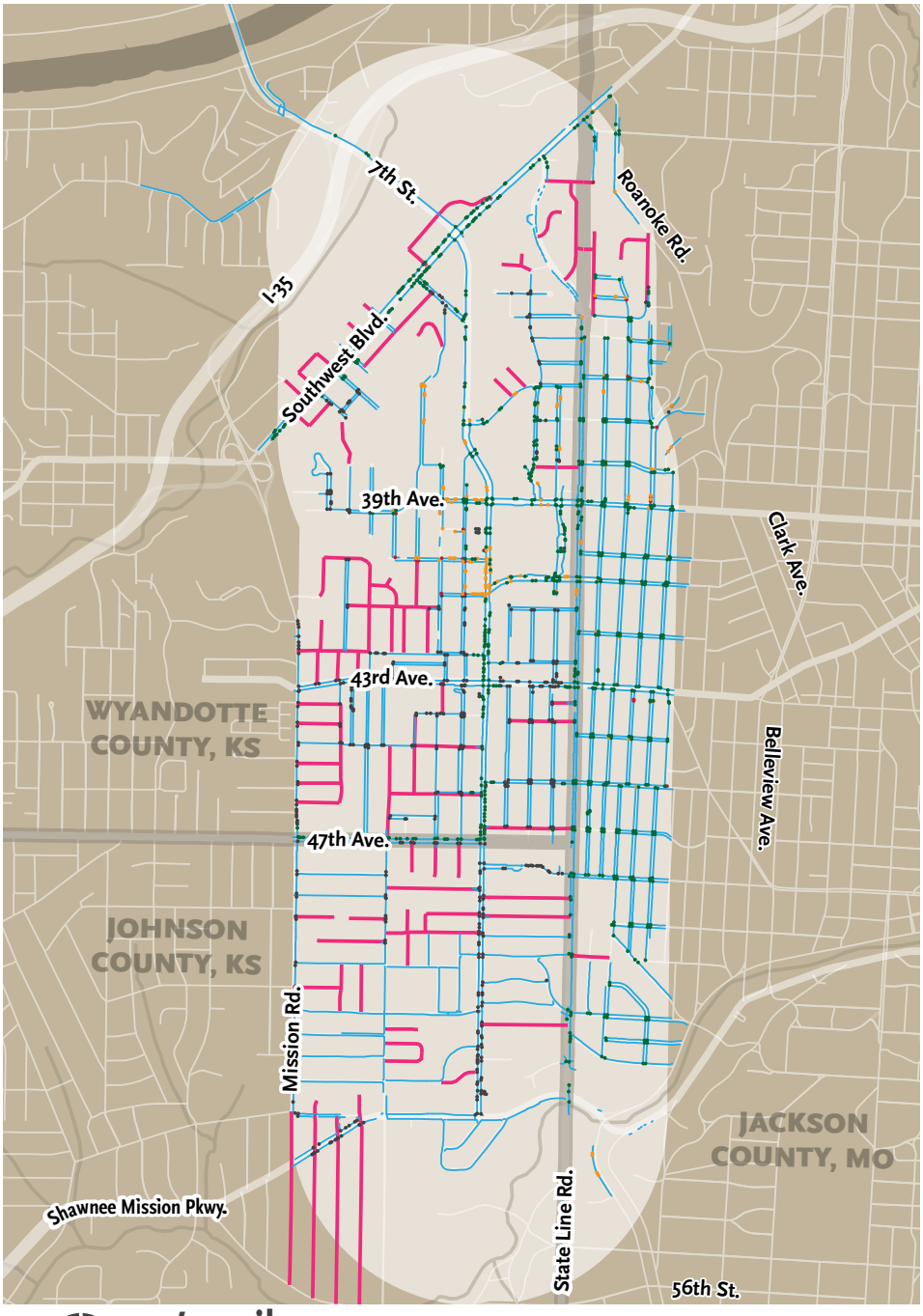
- 100 or Fewer
- >100 - 250
- >250-500
- >500-1,000
- >1,000

Source: The University of Kansas Health System

Walking and Bicycling

The surrounding network for walking and biking impacts travel patterns. If people have a gap in infrastructure that makes them feel less safe and comfortable, they are less likely to walk or bike.

Several streets within the study area lack sidewalks on one or both sides of the street, and some streets with sidewalks lack adequate curb ramps, which can be hazardous to people walking or using wheelchairs or other mobility devices.



Broken ADA detectable warning device on Rainbow

Figure 26. ***Sidewalk Coverage in the Study Area***

Legend

- Existing Sidewalk
- No Sidewalk on either side

Curb Ramp Conditions

- Good
- Fair
- Poor
- Unknown (but present)

Source: MARC

Bicyclist comfort will vary depending on their personal experience and comfort level while bicycling. However, the largest group of cyclists or would-be cyclists are most comfortable using facilities that offer full protection from traffic or that have a lower ***Bicycle Level of Traffic Stress (BLTS)***. More stressful streets have higher amounts of traffic, faster moving traffic, and other factors like on-street parking. Lower stress streets have lower amounts of traffic and slower moving cars.

Bicycle Level of Traffic Stress: A framework for understanding the level of discomfort a bicyclist would feel, combining speed limits, traffic, on-street parking, and the classification of bicycle facility.

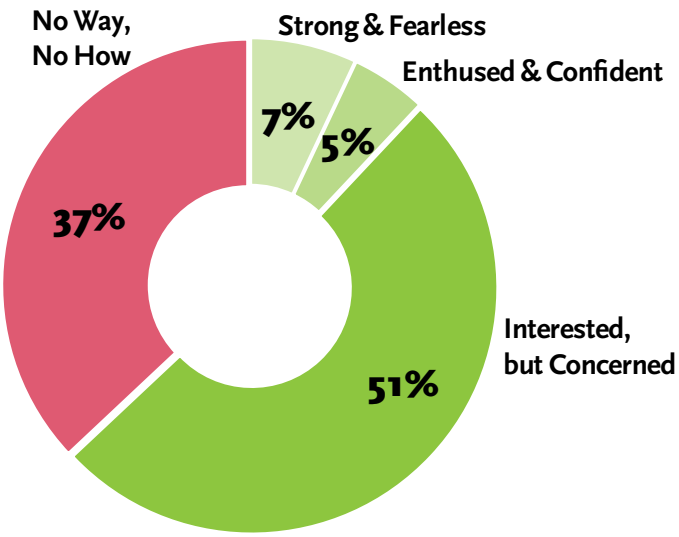


Figure 27. ***Four Types of Cyclists***

Research from Jennifer Dill of Portland State University shows that most people have an interest in bicycling but are concerned about their safety or comfort while bicycling. Read more about the Types of Cyclists by Jennifer Dill.

Figure 28. ***Bicyclists on Rainbow Boulevard***

Two bicyclists at the 39th and Rainbow intersection, despite the lack of dedicated facilities

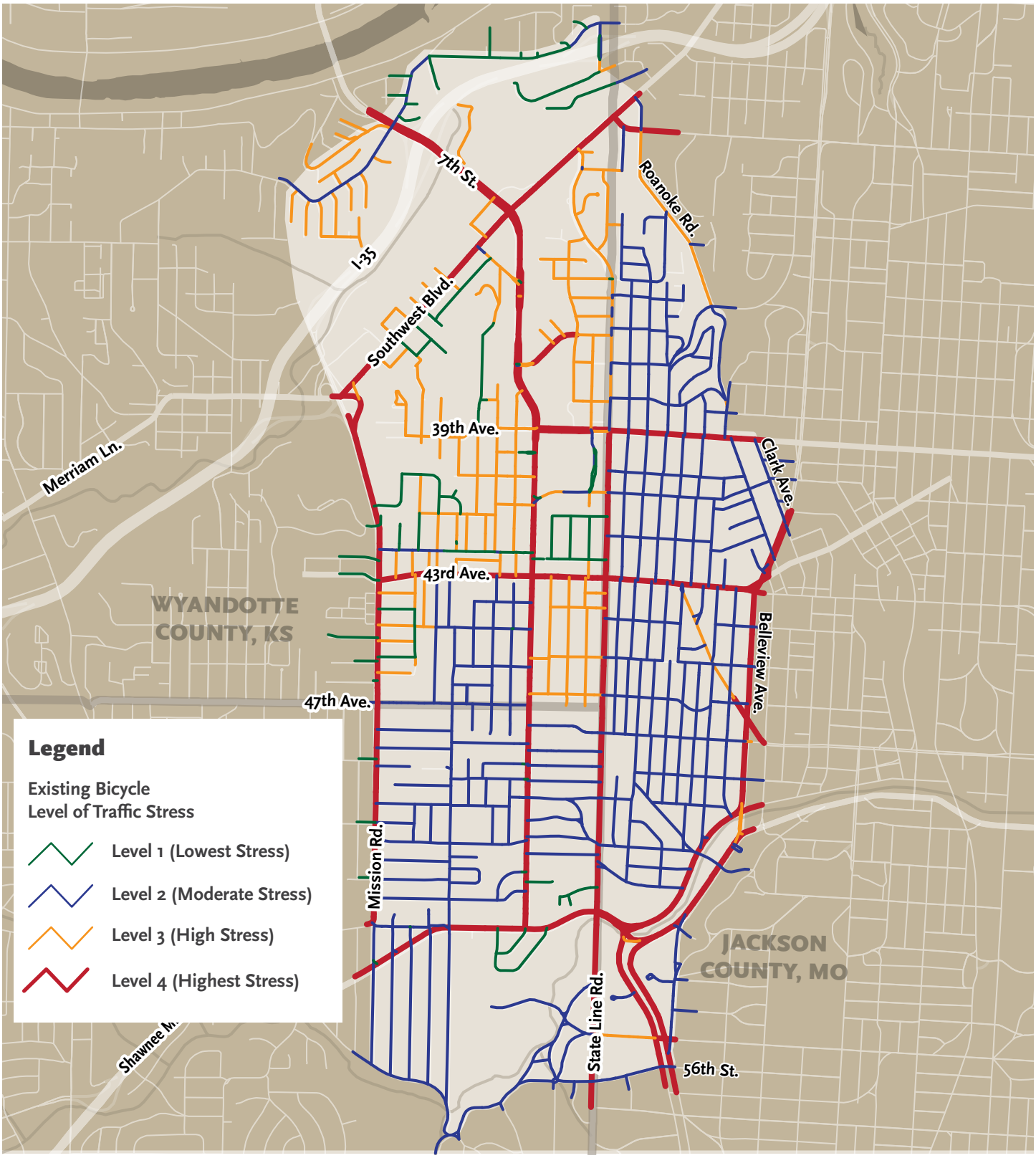


Figure 29. *Bicycle Level of Traffic Stress for Streets in the Study Area*

Public Transit Service

Four (4) fixed route buses serve the Rainbow Boulevard study area, including three (3) routes operated by the Kansas City Area Transportation Authority (KCATA) and one (1) route operated by Johnson County Transit. These routes come together around 39th and Rainbow, near the main campus of the University of Kansas Health System and KU Medical Center. The boundary of a 30-minute transit trip departing from 39th and Rainbow is shown in the blue shaded area below. 7th and Minnesota, the KCMO Central Business District, the Mission Transit Center, and Kansas City's East Side are all accessible in 30 minutes or less.

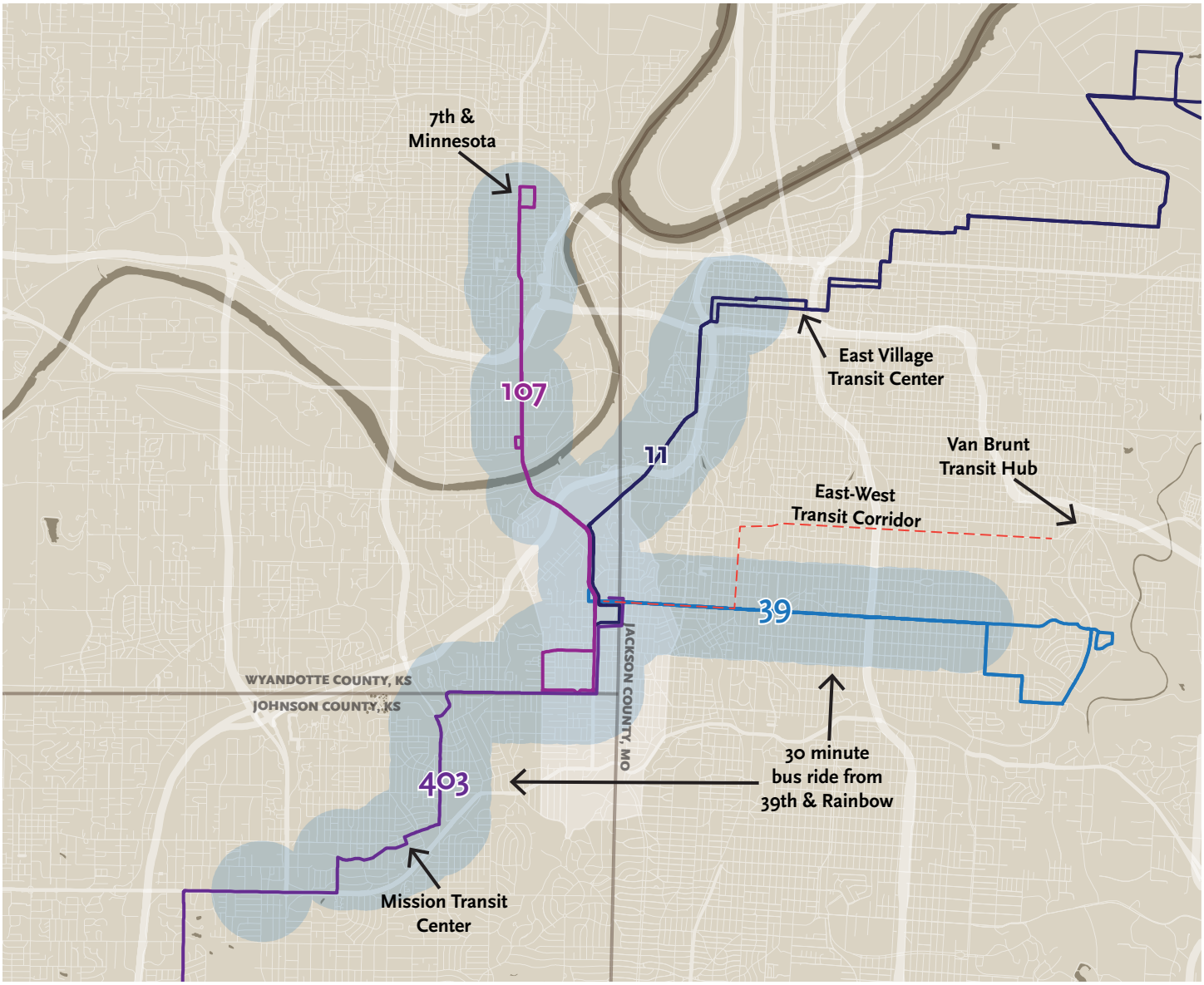


Figure 30. ***Existing Fixed Route Bus Service in the Rainbow Boulevard Study Area***

Route	12a	1	2	3	4	5	6	7	8	9	10	11	12p	1	2	3	4	5	6	7	8	9	10	11
Weekday Service																								
39						30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
11					30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
107							50	50	50	50	50	50	50	50	50	50	50	50						
403							60	60	60	60	60	60	60	60	60	60	60	60	60	60				
Saturday Service																								
39						30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
11						60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60			
107							120		120		120		120		120		120							
403																								
Sunday Service																								
39						30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
11						60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60			
107																								
403																								

Figure 31. ***Service Frequencies and Spans for Fixed Route Buses in the Study Area***

Traffic Safety

Rainbow Boulevard has a significant challenge with traffic safety, including five suspected serious injury (also known as disabling injury) crashes within the past 7 years. A lack of turn lanes, few crossing opportunities, and high posted speed limits have all contributed to safety challenges in this corridor. Rainbow is also on KDOT's priority ***Vulnerable Road User*** network.

Speeds on Rainbow Boulevard also pose a safety challenge. A speed study conducted found that observed 85th percentile speeds were close to the posted speed limit. Later findings in the report will demonstrate that these speed limits are likely too high for the context and given the crash rate.

Vulnerable Road User: Someone walking, biking, rolling, or using a mobility device along the public Right of Way.

Learn more about the Kansas Vulnerable Road User Assessment and see Vulnerable Road User priority corridors.

Figure 32. ***Traffic Crashes and Speed Limits on Rainbow Boulevard***

Existing Traffic Volumes and Change over Time

Traffic volumes on Rainbow are highest north of 39th Avenue, dropping off from 17-19,000 daily vehicles down to approximately 11,000 daily vehicles. Further south, daily traffic is closer to 8,000 daily vehicles. The large drop-off in traffic is driven by the location of parking for most KU Med employees, which is largely north of Rainbow Boulevard. While employees can access the campus from north or south on Rainbow, I-35 provides the most direct regional connection, and thus becomes the main path for most people traveling to the study area, and the KU Med campus in particular.

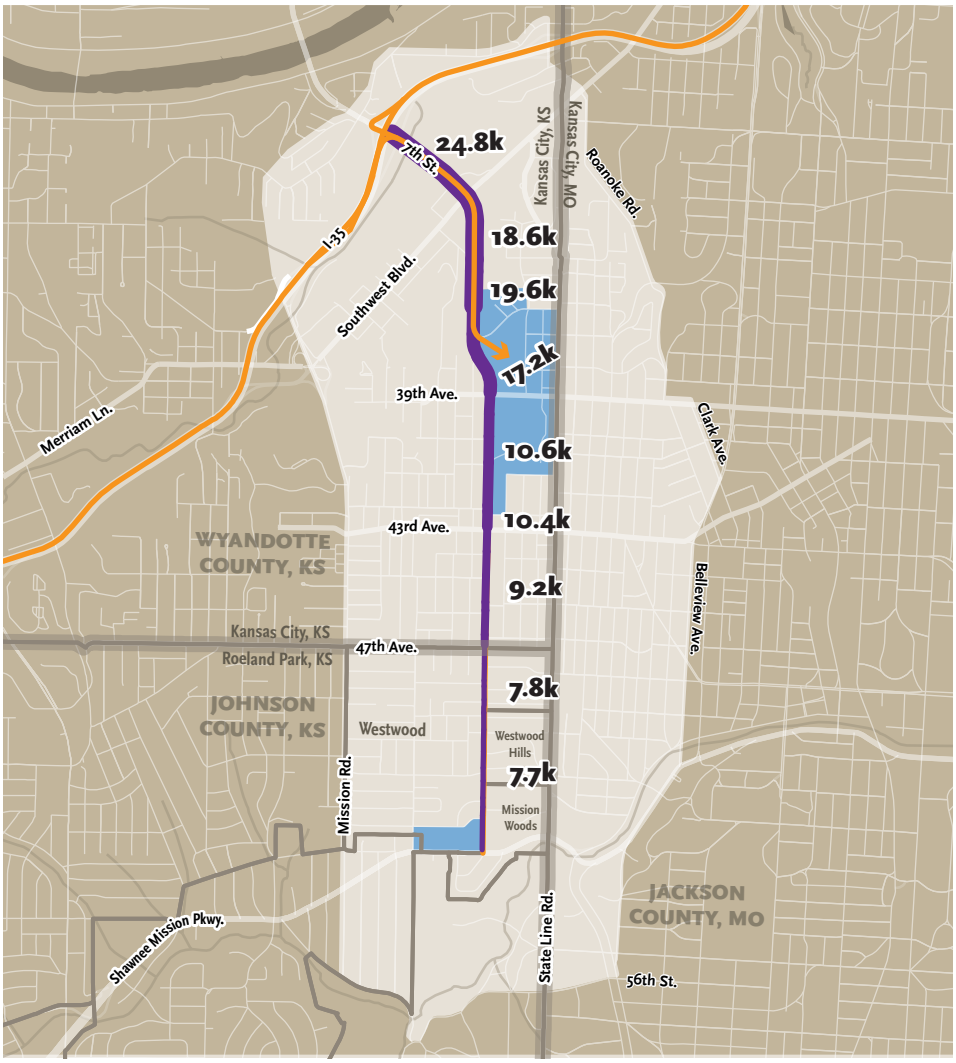


Figure 33. ***Average Annual Daily Traffic Volumes for Rainbow Boulevard***

Legend

- Study Area Boundary
- KU Med./Health System Campuses

Annual Average Daily Traffic

- <8k Vehicles per Day
- 8-10k
- 10k-15k
- 15k-18k
- >18k

Source: Replica

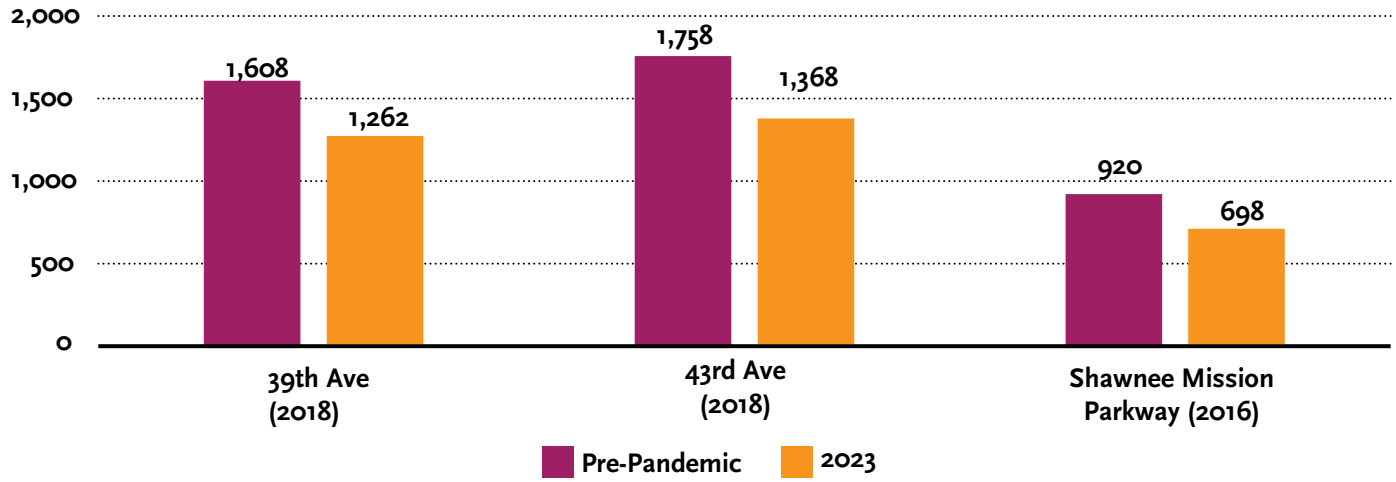


Figure 34. ***Change in Northbound/Southbound traffic on Rainbow at Peak Hour at Key Intersections, Before and After the COVID-19 Pandemic***

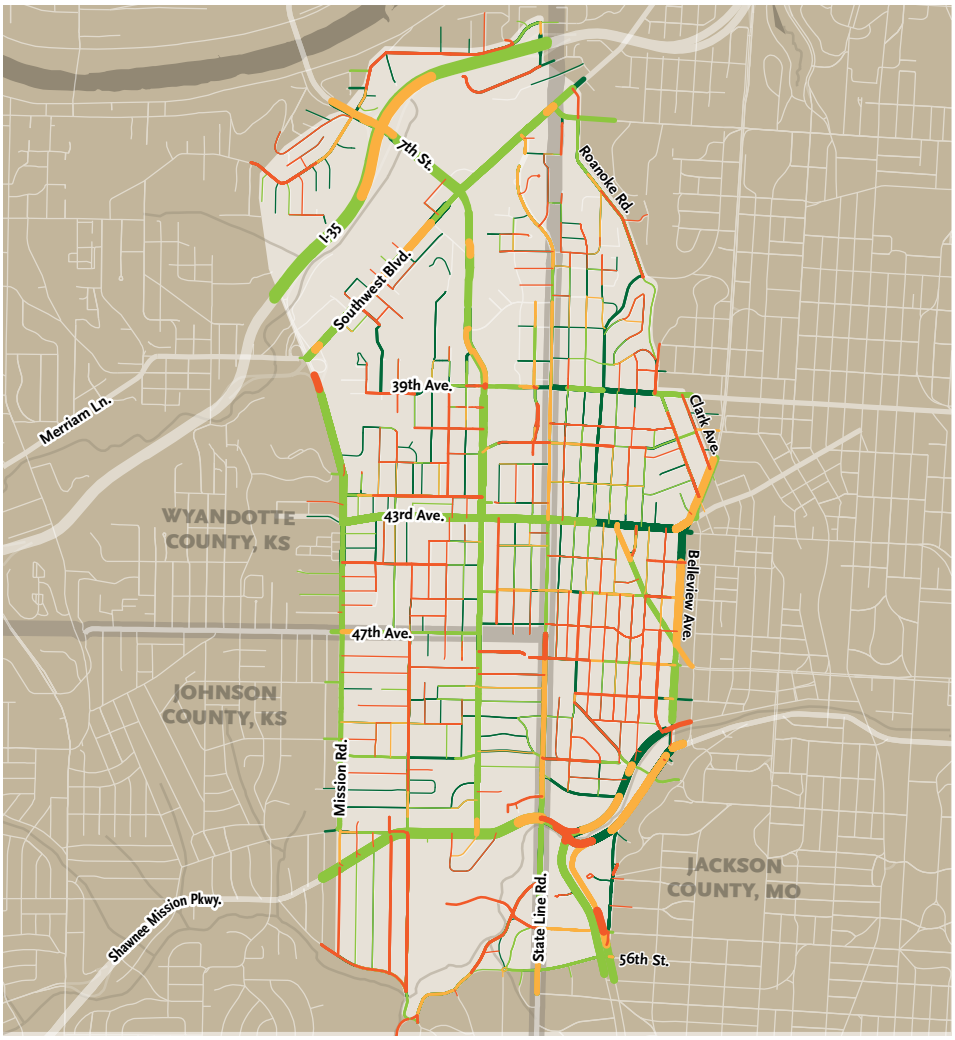


Figure 35.*Change in Average Daily Traffic Before and After the COVID-19 Pandemic*

Network level data from the big data vendor Replica is consistent with in-person manual turning movement counts conducted at 39th and 43rd street in comparison with 2018 traffic counts

Legend

Traffic Change, 2019 vs. 2022

- <-25% (Large Decrease)
- -25% to -5% (Small Decrease)
- -5% to 5% (Little Change)
- >5% (Increase)

2022 Average Daily Traffic

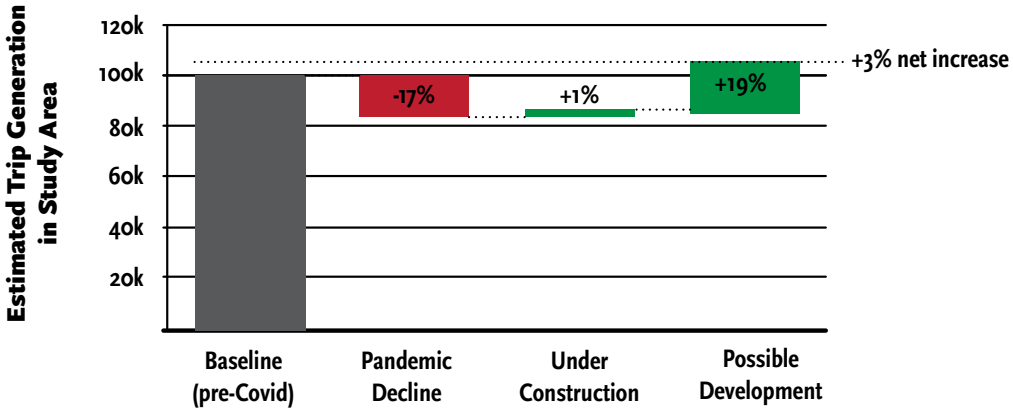
- < 500
- 501-5,000
- 5,000-10,000
- 10,001-20,000
- >20,000

Traffic volumes on Rainbow have been relatively flat over the past 30 years, according to data from KDOT. While this may seem counterintuitive due to the growth and development of Rainbow over the past 30 years, this consistent traffic reflects changing demographic and travel patterns within the Kansas City region.

Traffic volumes on Rainbow and in the study area appear to have decreased as a result of the COVID-19 pandemic, based both on "big data" vendors that use cell phone and connected vehicle data, as well as in-person counts. This decrease is estimated to be about 20%.

Figure 36. ***Long-term traffic trends on Rainbow (or 7th St.) at I-35, Southwest Boulevard, and 47th***

There is some new planned development expected in the study area that will lead to more trip generation. We applied ITE trip generation ratios to the estimated size of development to understand the increase in trips over the current year baseline. Based on the fact that there has been a 20% decrease in recent years and that the mixed use nature of this development will decrease automobile trips, we estimate that traffic may increase modestly by around 5% within the study area and on Rainbow Boulevard.



Source: Analysis of Replica and ITE Trip Generation Manual, 11th Ed.

Figure 37. ***Reconciling past trends and future growth***

Community and Stakeholder Engagement

Community Engagement Efforts

The Community Engagement process for this study included online and in-person techniques to source a broad variety of viewpoints for the study area. These included:

- **Steering Committee:** Around 40 individuals were invited to participate in the steering committee, representing institutions and neighborhood groups in and around the study area. There was one in-person meeting and three virtual steering committee meetings, averaging about 20 people per meeting.
- **Online Engagement:** Three rounds of online surveys were conducted using the online engagement platform publicinput.com. Respondents had the ability to pinpoint specific issues on a map and provide feedback and comments on priorities for the corridor.
- **Pop-up Meetings:** Four pop-up meetings were held to intercept individuals that may not have heard about the project and encourage them to participate in the survey.
- **Stakeholder / Neighborhood Meetings**: The consultant team attended neighborhood meetings and met with individual stakeholders throughout the corridor to introduce people to the project, provide updates, and hear about concerns and ideas for the corridor.
- **Public Open House:** A public open house was held in January 2024 to solicit in-person feedback on potential alternatives for Rainbow Boulevard. The open house was held on a Saturday for two hours and included large format maps, information boards, and dot voting and commenting opportunities. Consultants were also on hand to discuss issues and opportunities with the public.

Participation Totals:

- 297 pop-up meeting participants at 5 events
- 12 stakeholder meetings
- 23 open house attendees
- 4 steering committee meetings
- 3,285 online views
- 622 online participants
- 2,809 survey responses (3 rounds)
- 936 comments and replies
- 30 eblasts with 40% open rate

Figure 38. ***Multimodal tour of Rainbow Boulevard with the Steering Committee***

The project featured three rounds of engagement, focused on:

- **Issues and Opportunities**: Focused on understanding the challenges people have navigating the study area through multiple modes, as well as specific opportunities and ideas they see.
- **Exploring Alternatives**: Focused on understanding what people value in their transportation system and community (such as safety, comfort, convenience) and how those values are supported by each alternative.
- **Preferred Alternative & Refinement**: Focused on selecting a preferred alternative and refining and developing that concept.

Figure 39. ***A Pop-up public meeting (left) and Steering Committee feedback (below)***

Table 2. ***List of Community and Stakeholder Engagement Activities***

	Activity	Date	Location
Round 1 Issues & Opportunities	Project Kickoff Meeting	6/27/2023	Westwood City Hall
	KU Health System Staff	7/21/2023	KU Economic Development Offices
	Unified Government Staff	8/17/2023	KCK City Hall
	Rosedale Development Association staff	8/22/2023	RDA
	Westwood / Mission Woods / Westwood Hills	8/22/2023	Westwood City Hall
	Hanover Heights Neighborhood Association	8/27/2023	Yard of private residence
	Steering Committee Meeting #1	8/31/2023	Westwood City Hall
	Round 1 Online Survey	9/7/2023	Virtual
	Spring Valley Neighborhood Association	9/28/2023	Westwood City Hall
	Popup Meeting - Frank Rushton Elementary	10/4/2023	Frank Rushton Elementary School
	Steering Committee Meeting #2	10/5/2023	Virtual
	Popup Meeting - KU	10/19/2023	KU Hospital Cafeteria
	Popup Meeting - Westwood KC Symphony Event	10/22/2023	Westwood City Hall
	Popup Meeting - Rosedale Middle School	10/25/2023	Rosedale Middle School
Round 2 Exploring Alternatives	Popup Meeting - PlanKCK Summit	10/28/2023	Gloria Willis Middle School
	Round 2 Online Survey	11/2/2023	Virtual
	Steering Committee Meeting #3	1/4/2024	Virtual
Round 3 Preferred Alternative and Refinement	Open House	1/27/2024	Westwood City Hall
	KU Health System Staff	2/6/2024	Virtual
	Round 3 Online Survey	2/8/2024	Virtual
	Westwood Staff	2/13/2024	Westwood City Hall
	KDOT Staff	3/6/2024	Virtual
	Westwood + Unified Government Staff	3/21/2024	Virtual
	KU Health System Staff	3/22/2024	KU Hospital
	Spring Valley Neighborhood Association	3/27/2024	The Knotty Rug
	Steering Committee Meeting #4	4/2/2024	Virtual
	Westwood Staff	4/5/2024	Virtual

Issues and Opportunities

Most of the feedback around the first phase of engagement centered around feelings of safety while walking, bicycling, or even driving on Rainbow Boulevard. Traffic was described by many respondents as being ***scary***, ***dangerous***, and ***loud***. Respondents said that they hoped that future travel on Rainbow Boulevard would be ***accessible***, ***comfortable***, ***balanced***, ***multimodal***, and ***for everyone***.

Many participants specifically addressed issues surrounding speed, the feeling of safety while walking or crossing the street, and the ability to make turns safely while driving on Rainbow.

Specifically, participants suggested:

- Better crossings and crosswalks
- Easier and protected bicycling
- Consistent sidewalk elevations
- Removal of sidewalk obstacles
- Widening of sidewalks
- Narrower, fewer traffic lanes
- Intersection improvements
- Lower speed limits
- Address turning issues
- Better trail connections

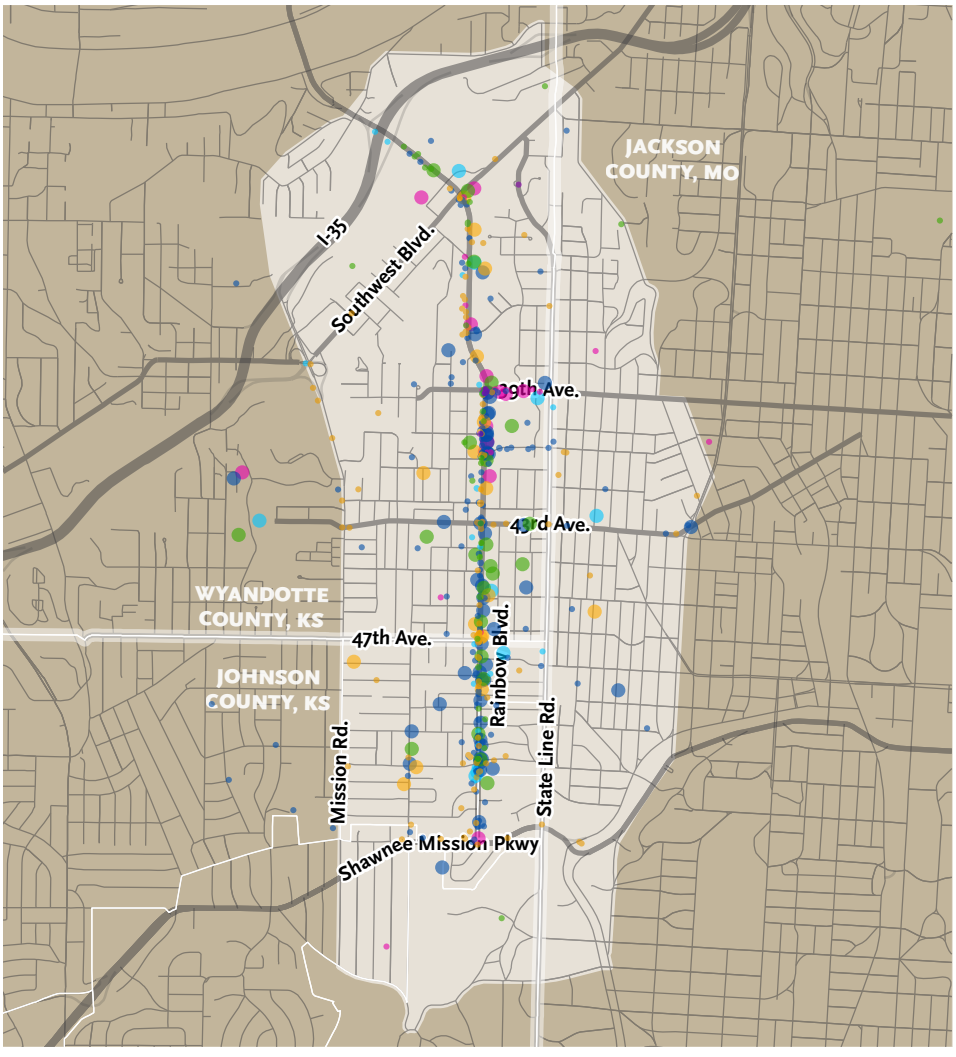


Figure 40. ***Map-based feedback identifying Issues and Opportunities on the Rainbow Corridor***

Exploring Alternatives

Following the first round of community engagement, the project team met with the steering committee to generate ideas for Rainbow Boulevard. In a virtual Zoom meeting in breakout rooms, steering committee members were assigned to different sections of the corridor and asked to develop typical sections using the online Streetmix tool.

Steering committee participants were also asked to vote on their priorities for a design for the Rainbow Boulevard corridor. The top priority was providing safety and comfort for all road users, followed by building transportation improvements that fit within existing curb limits and avoiding impacts to adjacent neighborhood streets.

Figure 41. ***Poll Results of Design Priorities Among Steering Committee Members***

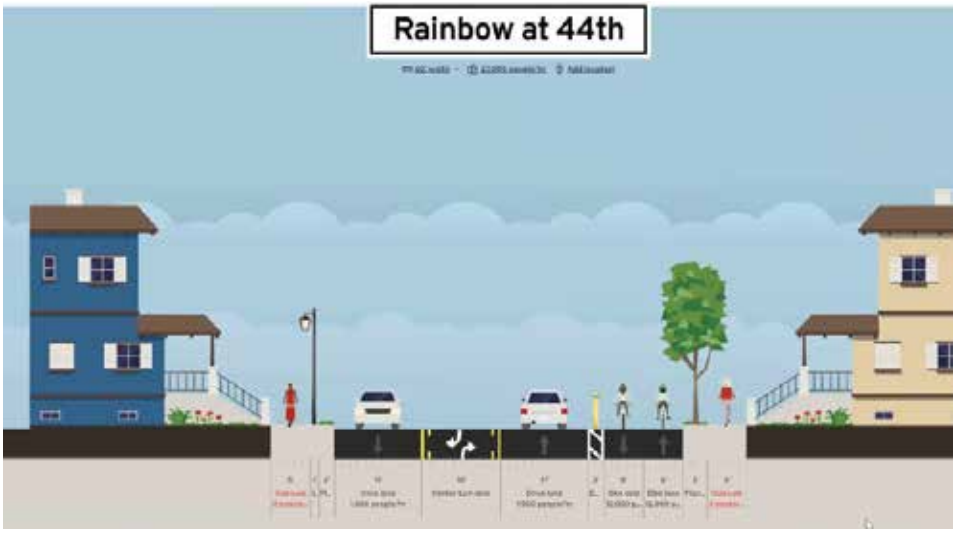


Figure 42. ***Steering Committee Designs for Rainbow Boulevard Developed in Streetmix***

A second round of community engagement asked about values and priorities for designing a solution for Rainbow Boulevard. Generally, participants felt that improving intersections, providing comfort for all users, and providing more frequent crossings were important priorities. Participants also felt strongly about limiting impacts to residential streets and building within existing curbs. However, most participants did not agree that maintaining travel speed was an important priority.

Participants were also asked to consider a trade-off between feelings of safety and convenience for all road users and the impact of corridor travel times. 59% of participants said that any amount of travel time increase was acceptable if it led to safer and more comfortable travel for all road users, and 79% said that they would be willing to spend up to 1 additional minute traveling the corridor.

This input was taken into consideration as the project team developed alternatives for Rainbow Boulevard.

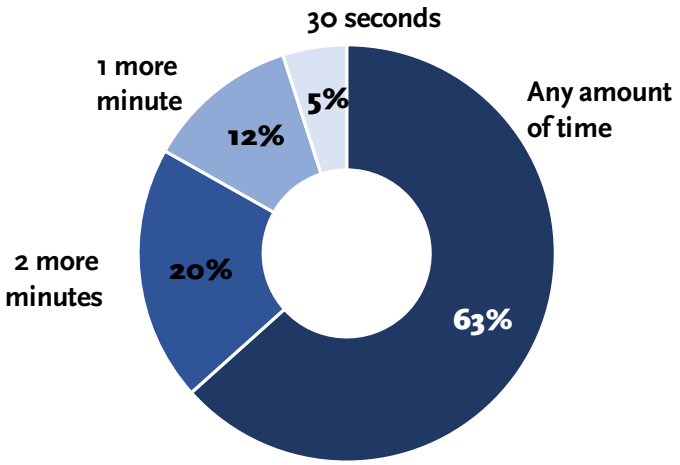


Figure 43. *Travel Time Trade-off Preferences of Online Poll Participants ("How Much Additional Travel Time would you be willing to spend on Rainbow in exchange for improvements?")*

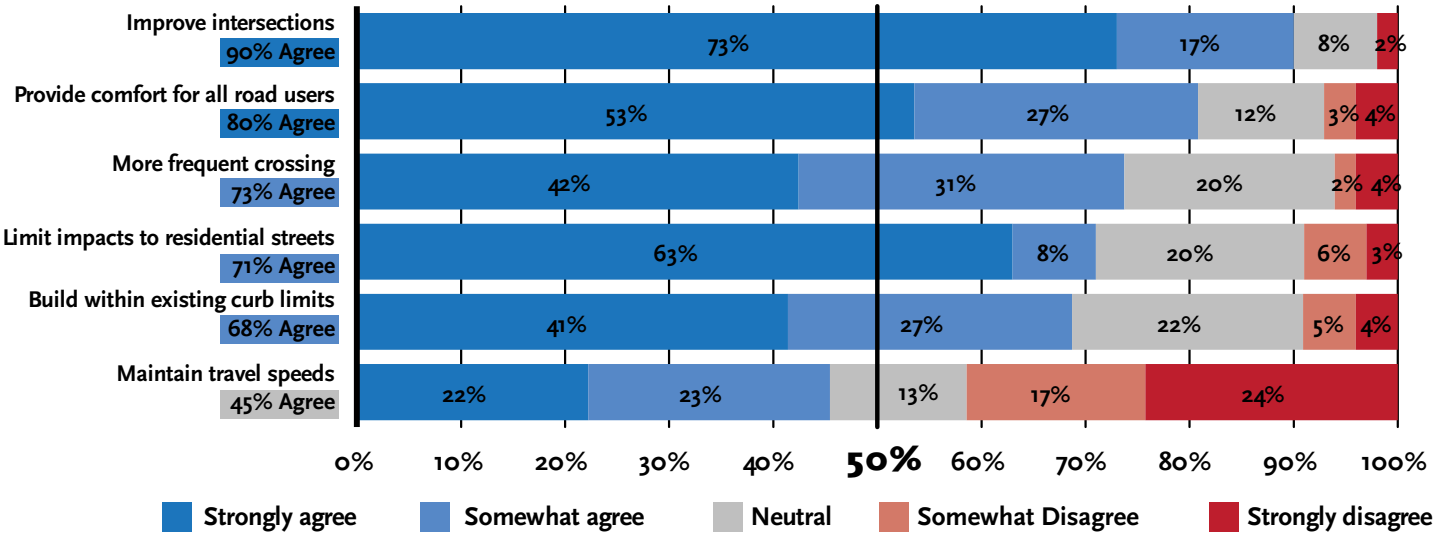


Figure 44. *Design Priorities of Online Poll Participants*

Preferred Alternative and Refinement

Two alternative concepts were developed for three segments of Rainbow Boulevard. Option 1 provided an expanded Shared Use Path from Southwest Blvd to 39th Ave and an on-street cycle track from 39th Ave to Shawnee Mission Parkway. Option 2 provided on-street buffered or protected bicycle facilities on both sides of the street from Southwest Boulevard to Shawnee Mission Parkway.

The project team consulted steering committee members, participants in the open house, and online participants on their preferred alternatives. Participants were asked to provide feedback on their overall preferred concept by segment and the degree to which each alternative met various project goals.

Participants generally preferred Option 2, with paired bicycle lanes on each side of the street. This preference was strongest for the segments between 39th Ave and Shawnee Mission Parkway. Preferences were split more evenly for the segment north of 39th Ave. Participants felt that having bicycle facilities on both sides of the road would be more intuitive to people biking and driving and offer additional separation from traffic for pedestrians on both sides of the street. Other concerns were expressed by steering committee members and others, such as downhill bicycle speeds on a Rainbow Boulevard Shared Use Path and the best way to transition from a cycle track facility to paired bicycle lanes.

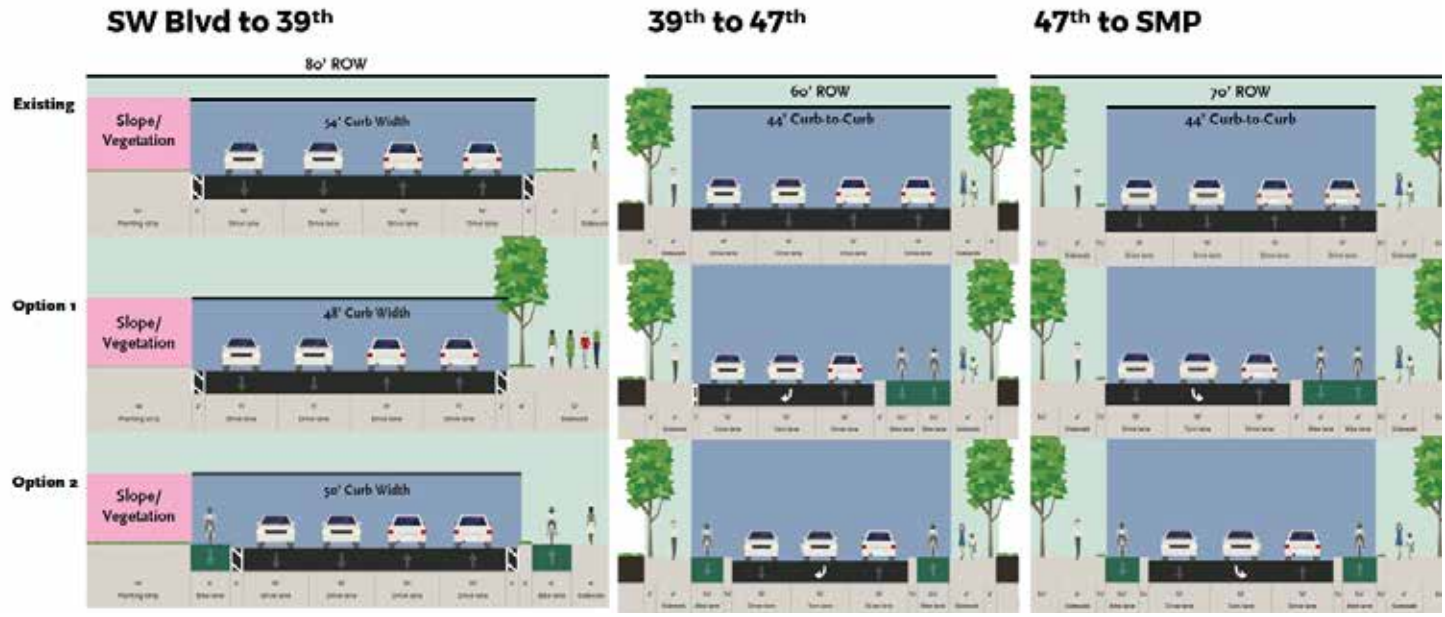


Figure 45. ***Streetmix Design Concepts for Three Rainbow Segments***

There were some dissenting comments regarding on-street bicycle facilities or a road diet within the Rainbow corridor, with a preference for the status quo. There were also several strong opinions voiced sharing support for a road diet, slower speeds, bicycle facilities, and increased pedestrian crossing opportunities.

The project team advanced a final concept that included an off-street Shared Use Path from Southwest Boulevard to approximately 39th Avenue, and bicycle facilities on both sides of the street from 39th Avenue. The design included a protected 2-stage turn intersection at 39th Avenue to transition from an off-street Shared Use Path. The proposed concept also included centerline striping to delineate two-way bicycle traffic and pedestrian traffic.

The project team also met with municipal stakeholders and the KU Health System to address specific issues and further refine conceptual design. Some stakeholders raised concerns about the feasibility of a road diet between 39th Ave and 43rd Ave given that there will be future development and trip generation in the area. These concerns were taken into account in the road diet feasibility analysis. While the project team still generally supports a road diet in this section of the corridor, a secondary alternative from 39th to 43rd that maintained four through lanes was developed. To accommodate bicyclists in the corridor, a concept for a cycletrack on Adams was developed as a secondary alternative.

Ongoing Engagement

Although this feasibility study has concluded, ongoing community and stakeholder engagement should continue as the corridor advances through project development. Preliminary and final engineering should include continued public engagement opportunities. As more details are decided through preliminary and final engineering, project partners should seek the input of individual property owners and tenants, while still respecting the goals and the will of the general public that were identified through this study.

Exploring Solutions for Rainbow

Road Reconfiguration ("Road Diet") Feasibility

Many of the safety issues expressed by the community and stakeholders are very common on four-lane, undivided roadways that lack left turn and right turn lanes. Rainbow Boulevard is on KDOT's Vulnerable Road User priority corridor list, which is a list of roadways with a higher risk to pedestrians and bicyclists.

Road reconfigurations, or road diets, help to alleviate the unsafe speeds and erratic turning movements that can lead to car crashes and make it unsafe or uncomfortable to cross the street, as shown in the diagrams below.

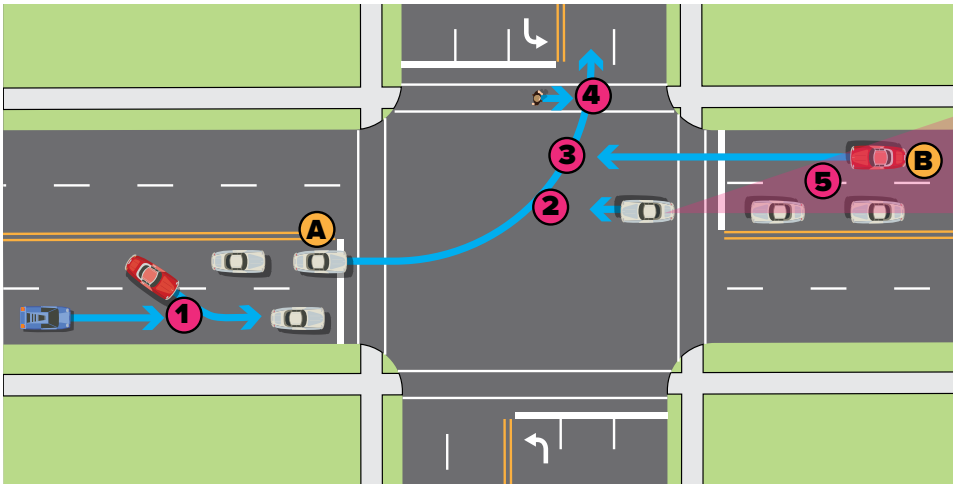


Figure 46. ***Safety and Operations Issues with 4-lane, Undivided Roadways***

- **A** **Left-turning car blocks through-traffic in inside lane**
- **B** **Speed and pace difference between lanes**
- **1** **Sideswipe crash from car changing lanes**
- **2** **Broadside crash with outer lane vehicle**
- **3** **Broadside crash with inner lane vehicle**
- **4** **Pedestrian-vehicle crash (driver focused on oncoming vehicle traffic)**
- **5** **Blocked sight lines**

Road reconfigurations also help to make room for other modes, such as bicyclists. Because the Right of Way and existing pavement are constrained within our study area, a road diet enables the opportunity for dedicated bicycling facilities, in addition to turn lanes and other safety features for motorists. Bicycle lanes also benefit pedestrians by adding physical distance between pedestrians and moving traffic. From 39th to 47th Avenue, the sidewalk is directly adjacent to the roadway.

Figure 47. ***Rainbow Boulevard South of 43rd Ave.***

There is no separation from moving traffic and sidewalks on Rainbow between 39th Ave and 47th Ave.

According to information from the Federal Highway Administration, road diets are generally feasible if a roadway's Average Annual Daily Traffic is less than 18,000-22,000.

Traffic volumes on Rainbow are generally under this threshold. However, the project team considered factors such as the future growth of the corridor as well as the results from traffic microsimulation using software based on the Highway Capacity model. Based on this analysis, the project team views a road diet as feasible between 39th Avenue and Shawnee Mission Parkway.

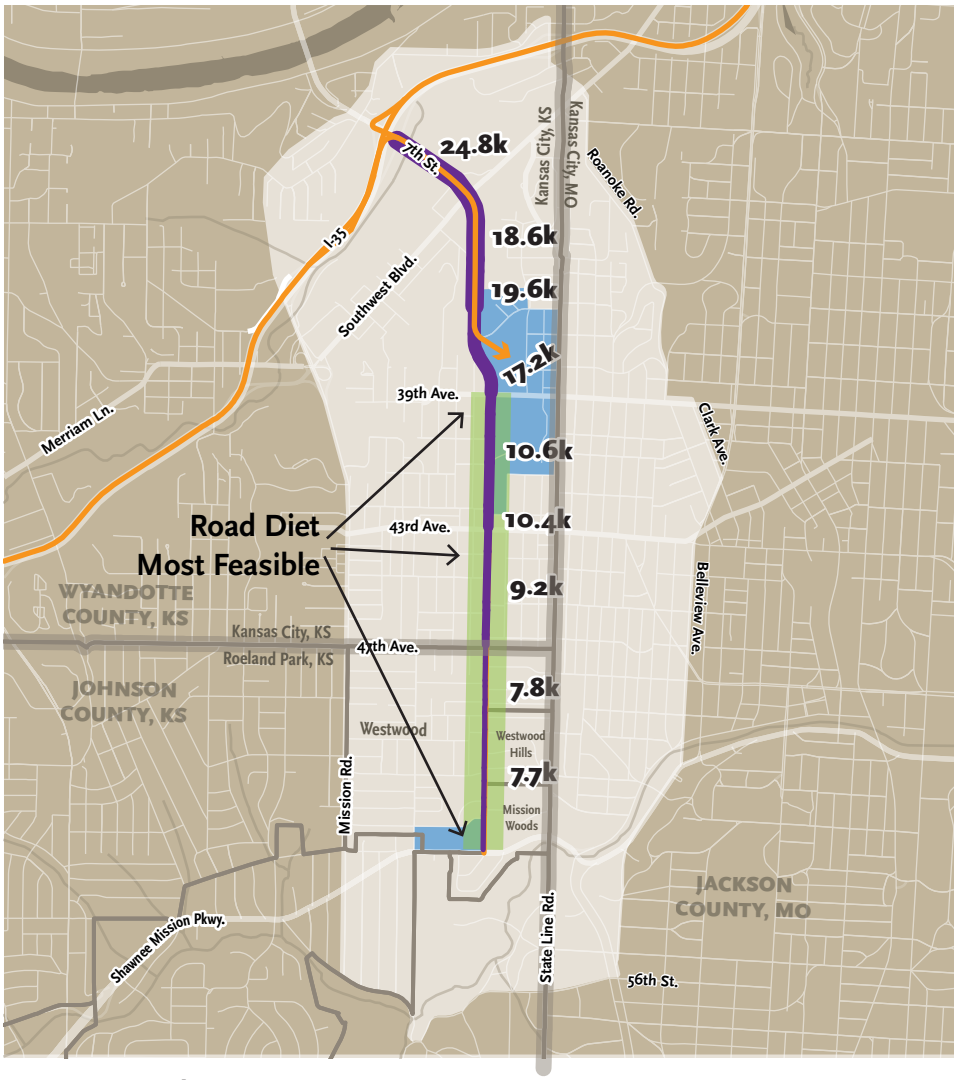


Figure 48. ***Recommended Extent for a Road Diet on Rainbow Boulevard***

Microsimulation is a technique used to analyze the impact of roadway configuration and signal operations on motorist travel times and delays. The project team adapted existing ***Synchro*** models used by ***Operation Green Light*** for this analysis. Corridor Travel Times and intersection ***Level of Service*** were the two metrics used to analyze the impact of a road diet on motorist traffic. Analysis of the corridor was based on the busiest 15-minute peak period of the morning, mid-day, and afternoon periods.

Results of traffic microsimulation show only minor increases in motorist delay at intersections and in travel times on Rainbow Boulevard, assuming a road diet only from 39th Ave to Shawnee Mission Parkway. Some additional signal optimization and timing adjustments were made on the afternoon peak model, such as a split phase signal at 43rd Avenue and extending green time for Rainbow to accommodate larger queues. These optional operational changes would only be recommended during busy times of the afternoon peak.

Synchro: Software used for modeling traffic in corridors and at intersections

Operation Green Light: A Mid-America Regional Council effort to coordinate traffic signals on high-traffic corridors that cross jurisdictions

Level of Service: A letter rating of the delay per vehicle at intersection locations.

Table 3. *Travel Time Changes Due to a Road Diet on Rainbow Boulevard*

Northbound Travel (seconds)

Segment	AM	Noon	PM
Shawnee Mission Parkway	-5.9	-27.6	-37.4
50th St	-0.1	-1.6	-0.2
47th Place	1.2	4.6	-0.6
47th Ave	0.5	5.1	-4.3
43rd Ave	22	-0.5	43.2
Olathe Blvd	5.2	2.3	11.5
Marty Ave	0.3	4.4	-1.3
39th Ave	-0.7	1.4	-3
Adams St	-4.5	-2.2	-0.4
36th Ave	-5.4	9.1	-1.5
	-2.1	-3.1	4.2
Southwest Boulevard	-9.7	-9.4	-12.7
Total Change	**0.8**	**-17.5**	**-2.5**

Southbound Travel (seconds)

Segment	AM	Noon	PM
Southwest Boulevard	-2.5	4.2	-1.9
	-0.4	0.5	0.4
36th Ave	0.2	-2.9	-1.2
Adams St	3.7	21.6	6.9
39th Ave	-1.1	2.5	6.2
Marty Ave	-1.4	0.7	-0.3
Olathe Blvd	-3.0	6.7	25.2
43rd Ave	31.5	-1.9	81.4
47th Ave	-3.3	5.5	1.4
47th Place	-2.2	-0.6	-6.8
50th St	5.7	1.4	-1.5
Shawnee Mission Parkway	-1.7	0.7	-1.0
Total Change	**25.5**	**38.4**	**108.8**

Level of service (LOS) is a measure of the delay per vehicle for all vehicles entering an intersection. While corridor travel times measure the average time it takes to travel the entirety of Rainbow Boulevard, level of service provides a performance measure for cross-streets that intersect with Rainbow. A letter grade of A-F is assigned based on the total level of delay. Level of service remained mostly the same in the study area, with most intersections only changing by one level in the AM, Midday, and PM periods.

Even when accounting for the future growth along the Rainbow Corridor, a road diet is highly feasible from 39th Ave to Shawnee Mission Parkway. The road diet would add less than two minutes of travel time across the entire corridor, and only during the busiest time of the evening rush hour. A 3-lane section on Rainbow helps improve safety for everyone who uses Rainbow, including drivers. Many drivers will also benefit from an added left turn lane, allowing for safer and less stressful movements onto cross streets and driveways. Furthermore, the remaining road space enables a more comfortable and convenient experience for people walking or bicycling by adding distance between moving traffic and sidewalks, providing space for bicycle lanes, and making it easier to cross Rainbow Boulevard.

Table 4. ***Level of Service Definitions***

Level of Service	Seconds of Delay per Vehicle
A	10 or less
B	>10 -20
C	> 20-35
D	> 35-55
E	> 55-80
F	> 80

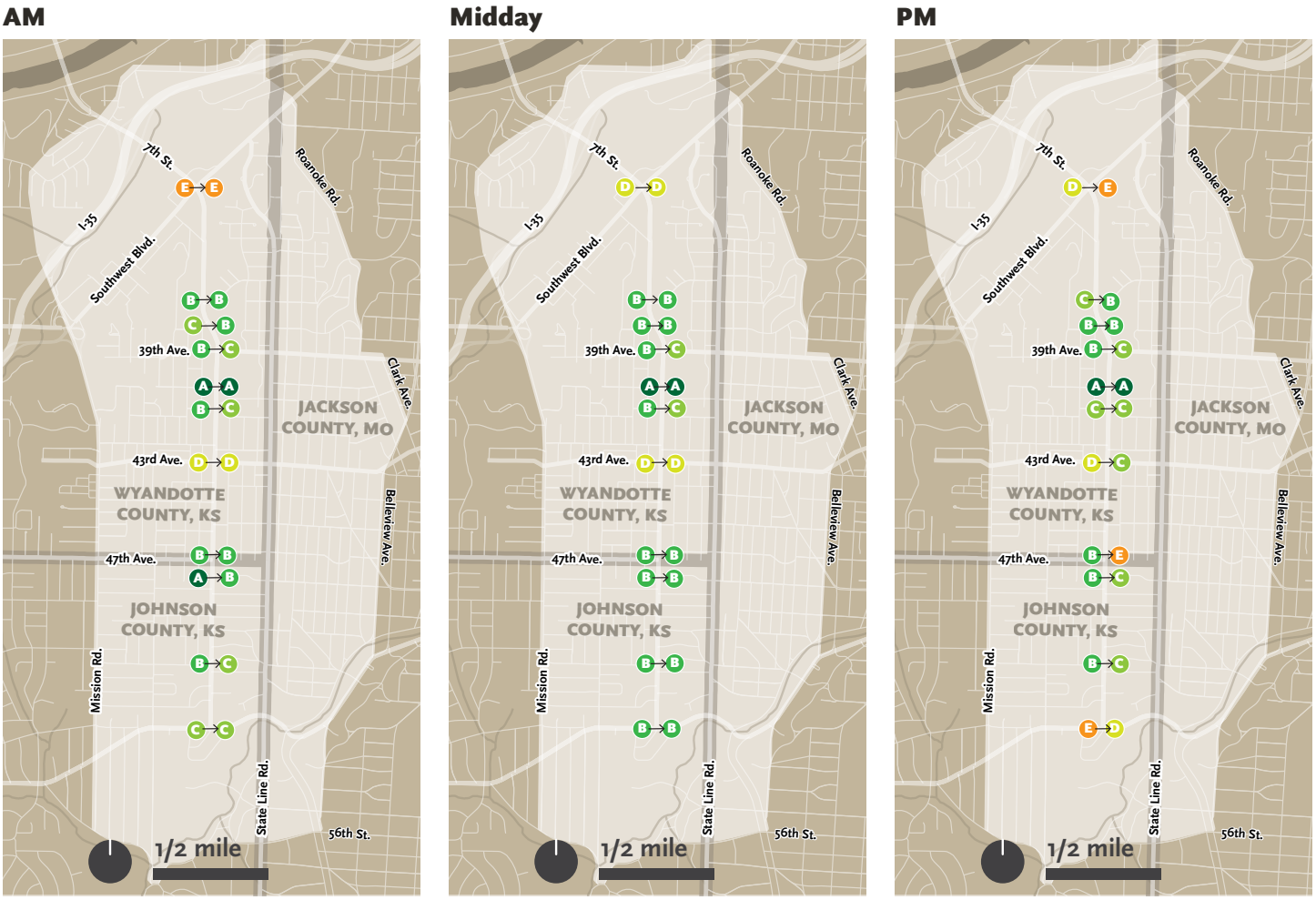


Figure 49. ***Change in Level of Service at AM, Midday, and PM Periods Due to a Road Diet on Rainbow Boulevard***

Corridor Alternatives

Why Rainbow?

During the engagement process, some individuals asked whether considering an alternative corridor for bicycle travel would be beneficial. The study area has a handful of north-south alternatives that could be considered for bicycle travel. These corridors include State Line Road and a combination of Rainbow, Adams, Booth, and Belinder.

Our screening found that Rainbow was still the most suitable corridor for bicyclists, based on the following criteria:

- **Removes a Barrier**: Implementing a road diet and adding mid-block crossings to Rainbow would remove a substantial barrier within the study area and make pedestrian traffic more safe, comfortable, and convenient.
- **Direct Connection**: Rainbow connects the most destinations and is the most straightforward north-south route in the study area.
- **Right of Way Width**: Rainbow has sufficient ROW width to accommodate a shared use path or on-street bicycle facilities.
- **Pavement Width**: Rainbow has sufficient pavement width to accommodate dedicated bicycle facilities.
- **Traffic Volumes**: Rainbow's traffic volumes are compatible with a 3-lane road diet section.
- **Low-Stress Bike Facility Potential**: The addition of a bicycle facility on Rainbow would create a lower stress bicycling facility than the existing roadway, or the existing roadway is already low-stress (as is the case with some alternatives to Rainbow).
- **Bike-Friendly Terrain**: Topography on Rainbow is gentler than alternatives like State Line Road.
- **Placemaking**: Rainbow offers the most opportunity to create a unique street that benefits adjacent land uses and future development and supports sustainability and public health.
- **Crash Reduction**: This alternative for Rainbow could result in fewer crashes by implementing a 4-to-3 road diet, which can reduce crashes by up to 47%.

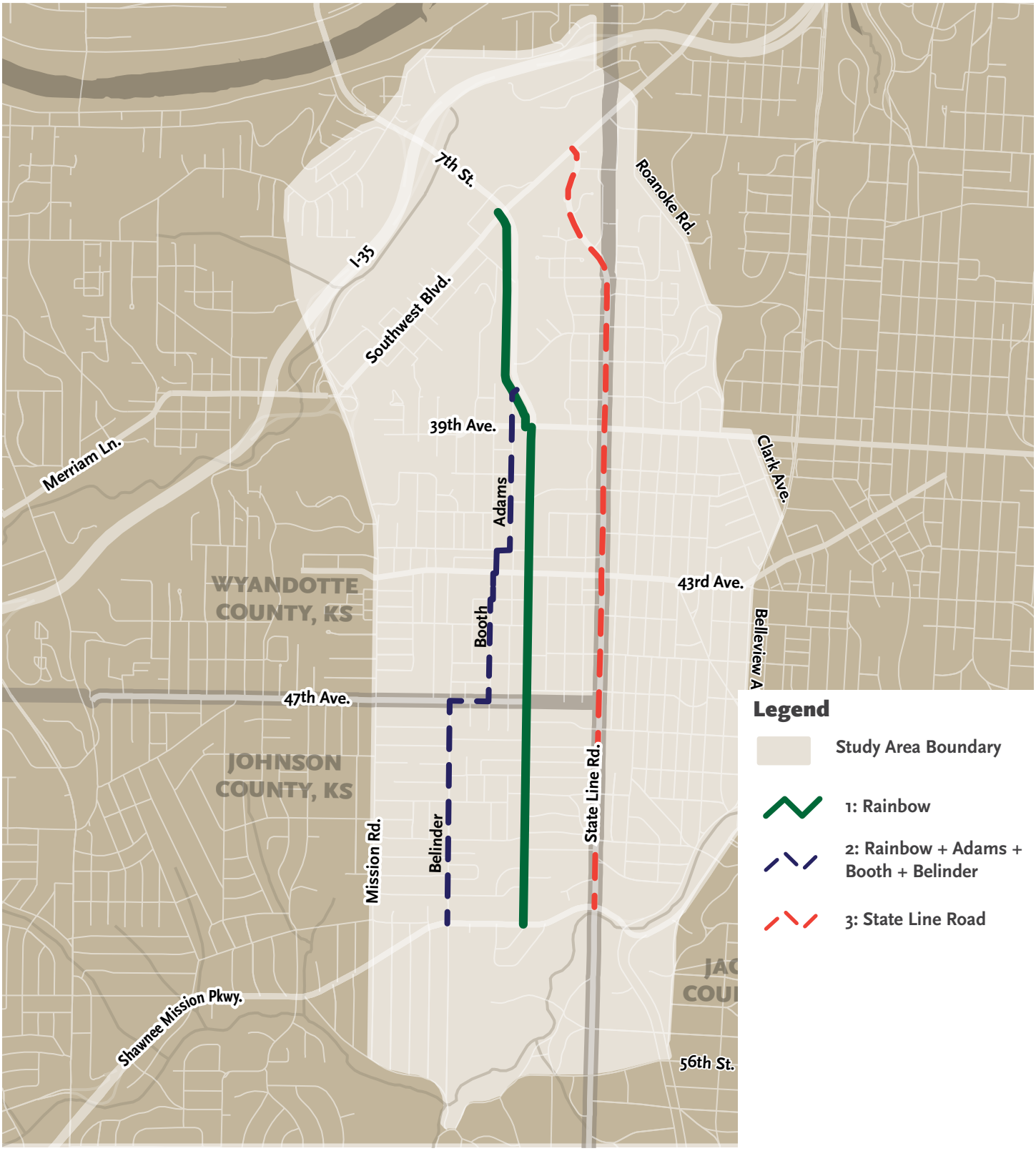


Figure 50. *Alternatives for north-south bicycling corridors on Rainbow Boulevard*

Table 5. *Alternative North-South Corridor Screening Results*

	1: Rainbow Shared Use Path + Road Diet	2: Rainbow Shared Use Path + Adams, Booth, and Belinder	3: State Line Road
Removes Barrier	✓	✗	✗
Direct Connection	✓	−	−
Right of Way Width	✓	−	−
Pavement Width	✓	−	−
Traffic Volume Supports Road Diet	✓	✓	−
Low-Stress Bicycle Facility Potential	✓	✓	−
Bicycle Friendly Terrain	−	−	−
Placemaking	✓	−	✗
Crash Reduction	✓	−	−

Southwest Blvd to 39th Ave

Existing Condition

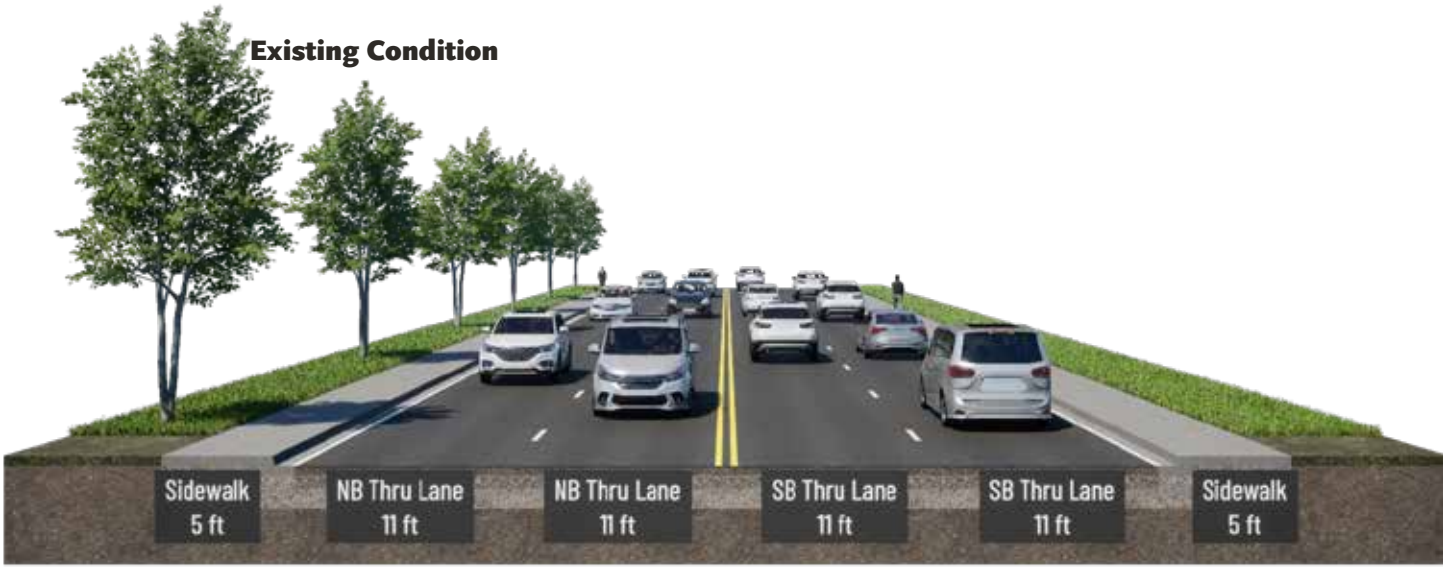
Option 1: Shared Use Path

Option 2: Raised Bike Lanes

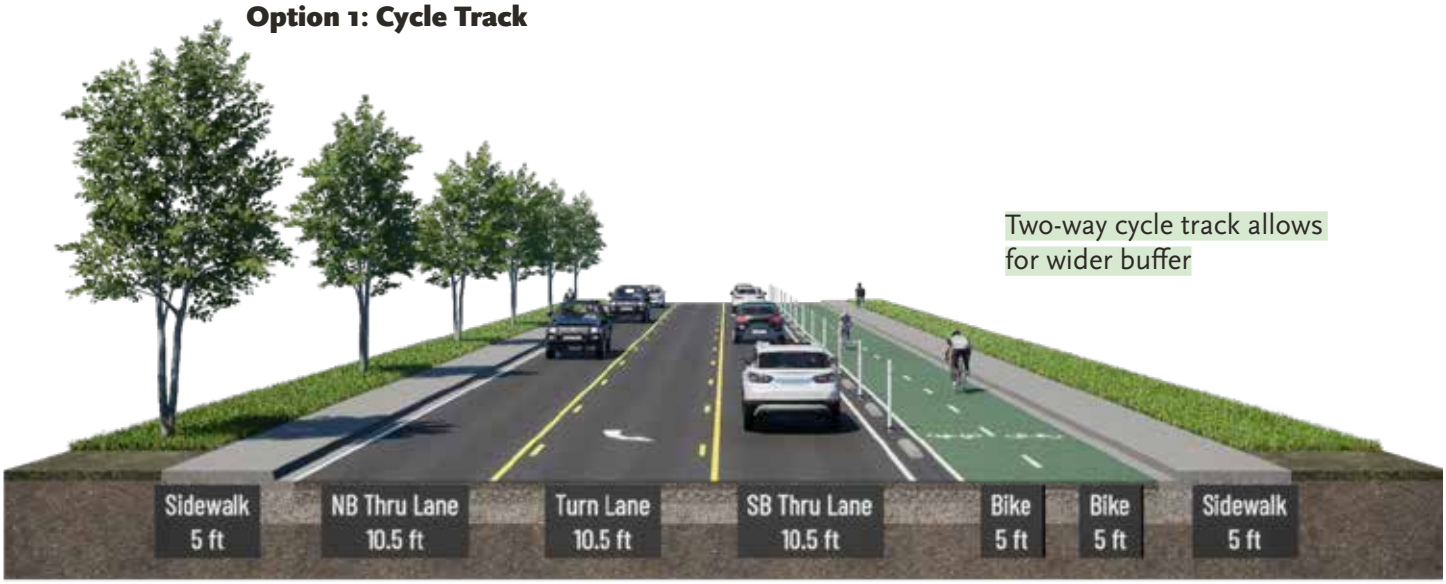
Figure 51. *Alternatives for Rainbow Boulevard Between Southwest Boulevard and 39th Avenue*

Options for 39th Ave to 47th Ave/St

Existing Condition



Option 1: Cycle Track



Option 2: Paired Bike Lanes

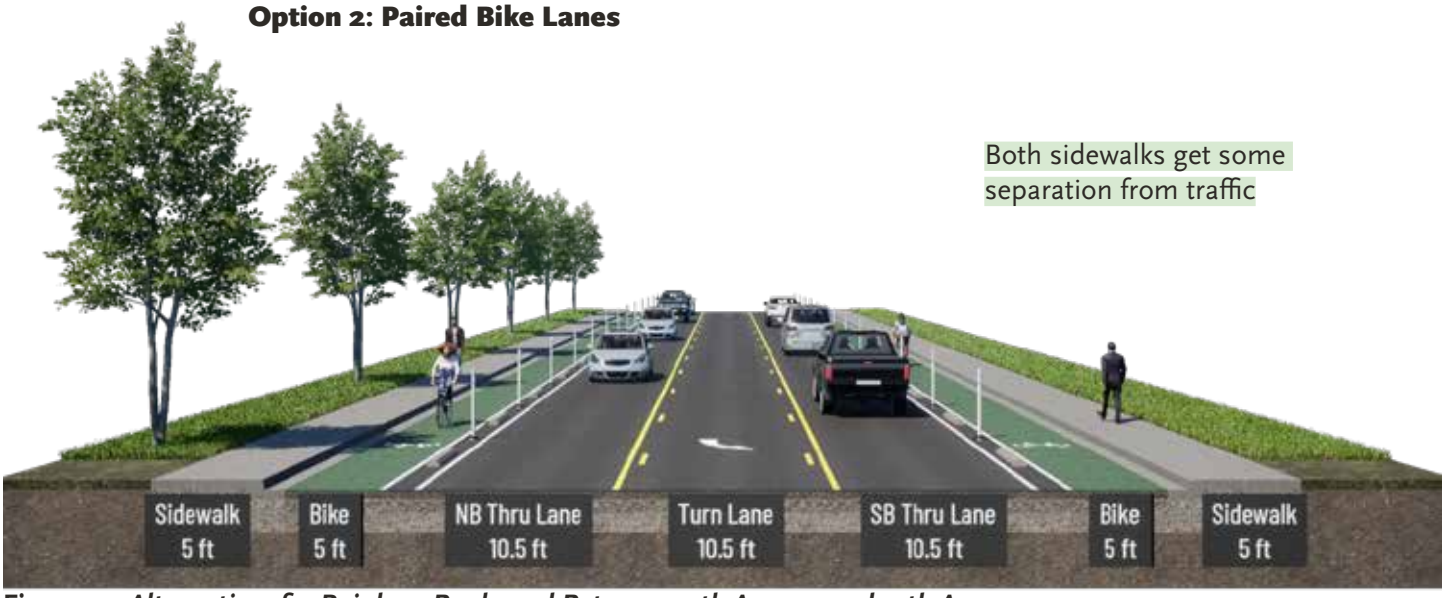


Figure 52. ***Alternatives for Rainbow Boulevard Between 39th Avenue and 47th Avenue***

Options for 47th Ave/St to Shawnee Mission Parkway

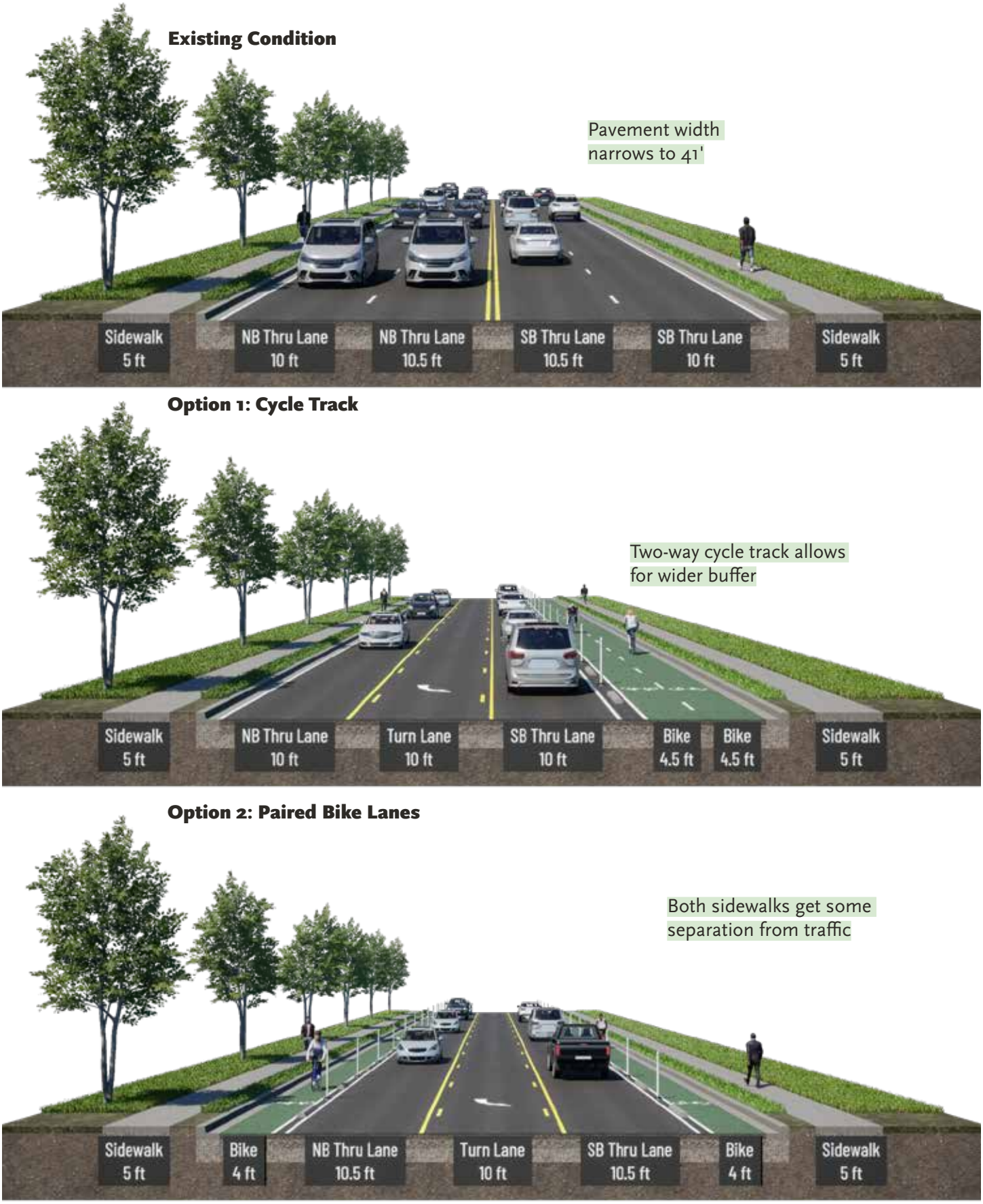


Figure 53. *Alternatives for Rainbow Boulevard Between 47th Avenue and Shawnee Mission Parkway*

Recommendations

Recommended Program of Projects

Based on community engagement results, project goals, and technical analysis, the following program of projects is recommended for Rainbow Boulevard:

- Rainbow Road Reconfiguration ("Road Diet")
- Shared Use Path (Southwest Boulevard to Adams St.)
- On-Street Bicycle Facilities (Adams St. to Shawnee Mission Pkwy)
- Olathe Boulevard Realignment
- New Pedestrian Crossings
- Neighborhood Traffic Calming
- Turkey Creek Trail Connection

Rainbow Road Reconfiguration ("Road Diet")

A road diet is feasible from 39th Avenue to Shawnee Mission Parkway on Rainbow Boulevard. This reduction in lanes would enable easier crossing, safer travel for both motorized and non-motorized users, and safer, more predictable left turns from Rainbow. Road diets also reduce speed differential between vehicles, leading to safer and more efficient travel.

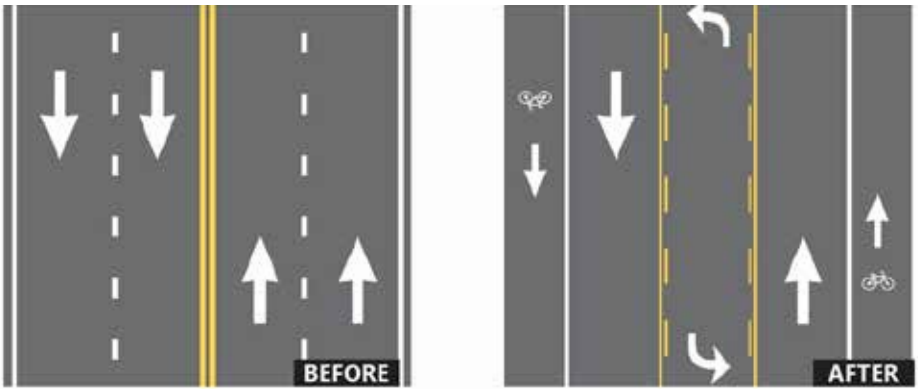


Figure 54. ***Road Reconfiguration Information from the Federal Highway Administration***

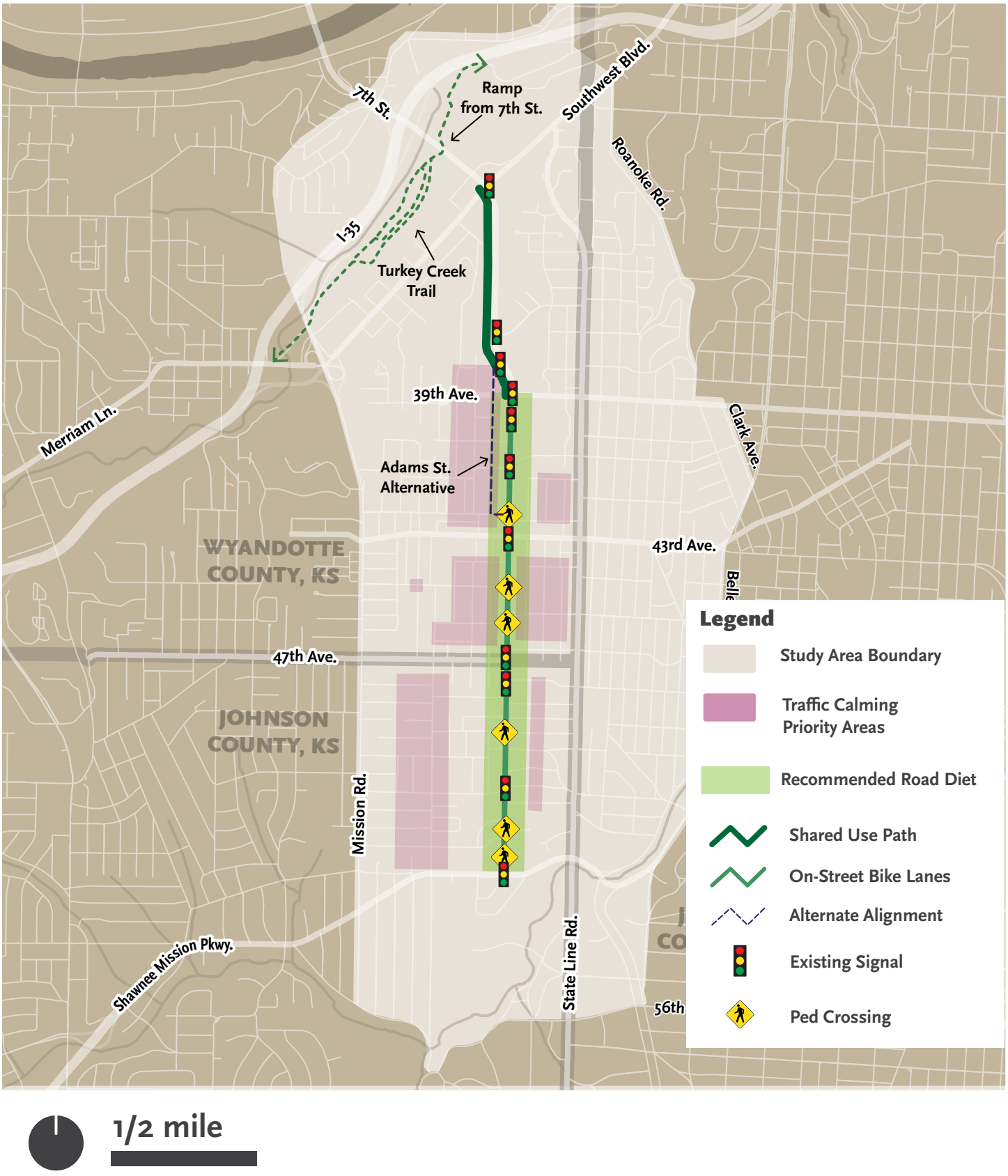


Figure 55. *Recommended Program of Projects for the Rainbow Boulevard Study Area*

Shared Use Path: Southwest Boulevard to Adams Street

While a road diet is not recommended for this section of Rainbow Boulevard, there is sufficient Right of Way width to accommodate a 12-foot shared use path on the west side of Rainbow Boulevard. Striping could be used to delineate space meant for northbound and southbound bicycle traffic and pedestrian traffic.

Figure 56. ***A Separated Shared Use Path on Rainbow Between Southwest Boulevard and Adams Street***

Figure 57. ***On-Street Bicycle Facilities South of 39th Avenue***

On-Street Bicycle Lanes: 39th Ave to Shawnee Mission Pkwy

On-street bicycle facilities are recommended for the road-dieted section of Rainbow Boulevard between approximately 39th Ave to Shawnee Mission Pkwy. Pavement width is estimated to be 44 feet, excluding the curb and gutter, for a majority of the corridor from 39th Ave to 47th Ave. The pavement width narrows to an estimated 41 feet from 47th Ave to Shawnee Mission Pkwy. Specific lane widths, bicycle lane widths, and buffer areas should be determined as a part of a physical survey and preliminary engineering. Parking stops, flex post delineators, and/or low concrete walls could be used at various portions of the corridor to create physical separation from traffic.

Parking blocks and flex post delineators

Proprietary Zicla "Zipper" System

Low concrete walls

Doweled Concrete Curbs

Figure 58. ***Barrier Options for Protected Bicycle Facilities***

Figure 59. ***Protected intersection at Rainbow Boulevard and 39th Avenue looking south***

Figure 60. ***Rainbow Boulevard and 43rd Avenue looking south***

Figure 61. ***Rainbow Boulevard at 47th Avenue looking south***

Adams Street Cycletrack Alternative

While a road diet and on-street bicycle facilities on Rainbow provide a number of benefits, an alternative cycletrack on Adams Street between 39th Avenue and 42nd Avenue could also support the goals of this project. If project partners decide to advance a cycletrack on Adams Street, on-street parking would be impacted on the blocks between 39th Ave and 42nd Ave. Traffic on Adams from its intersection with Rainbow Ave all the way to 39th Ave would need to be converted to one-way southbound traffic. Further engagement of residents along Adams street should also occur if the project partners decide to advance this alternative. The Adams Street cycle track would connect to Rainbow at 42nd Ave via a shared road facility near a proposed pedestrian crossing.

Figure 62. ***Concept for a Cycletrack on Adams Street from Rainbow Boulevard to 42nd Avenue***

Figure 63. ***Existing condition on Adams Street Looking South from 39th Avenue***

Olathe Boulevard Realignment

Olathe Boulevard forms an irregular intersection with Rainbow Boulevard and 41st Avenue, which makes for difficult vehicle maneuvers and pedestrian crossings. This plan proposes realigning Olathe Boulevard to create a more perpendicular intersection with Rainbow. This could also align with a new driveway at a potential infill development location on the west side of Rainbow. An optional bypass lane on Olathe could help with parking garage queuing that sometimes backs up from the garage entry to Rainbow.

Figure 64. ***Olathe Boulevard Realignment (Option 1)***

Figure 65. ***Olathe Boulevard Realignment (Option 2)***

New Pedestrian Crossings

Pedestrian crossings are proposed at several new locations, including:

- 42nd Ave (existing location with no pedestrian refuge island)
- 44th Ave
- 45th Ave
- 48th Ter
- 51st St

These proposed crossings would reduce the gap in crossing distances south of 39th Ave from up to 1/2 mile to no more than 1/4 mile. The pedestrian crossings would include a pedestrian refuge island in the median as well as rectangular rapid flashing beacons (RRFBs).

Figure 66. ***Proposed Pedestrian Crossing with Rectangular Rapid Flashing Beacon and Median Refuge Island***

Figure 67. ***Pedestrian Median Refuge Island with Rectangular Rapid Flashing Beacons on 47th Ave.***

Neighborhood Traffic Calming

Public meeting participants said that reducing impacts to local residential streets should be a top design consideration. Some people expressed concerns about "cut-through" traffic, or traffic that would divert off of Rainbow on to local residential streets. The street network within the study area does not provide many direct paths for automobiles to divert off of Rainbow, and Rainbow would still likely be the quickest route for most motorists. However, this project recommends including traffic calming measures on local residential streets. Traffic circle islands and chicanes are popular traffic calming tools that have been used in the Kansas City region to slow traffic. They also provide opportunities for green infrastructure and stormwater capture. These devices should be deployed after consultation with neighborhood residents after road diet implementation.

Figure 68. ***Examples of Traffic Calming in the KC Metro Area***

Figure 69. ***Asphalt Art Project on Westport Road in Kansas City, MO (Source: Bloomberg)***

Turkey Creek Trail Connection

The US Army Corps of Engineers recently completed improvements to Turkey Creek that will reduce flooding in the area, and a nature trail has been constructed as a part of these improvements. Rainbow Boulevard becomes 7th Street north of Southwest Boulevard, bridging over railroad tracks and Turkey Creek before the I-35 interchange. A switchback bicycle and pedestrian ramp has been proposed to connect this bridge to the Turkey Creek trail. This structure would provide trail access to a major employment and population center in the region.

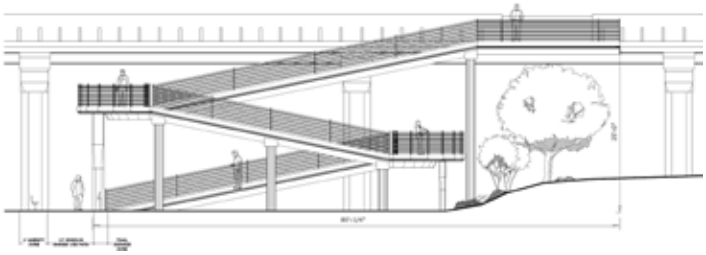
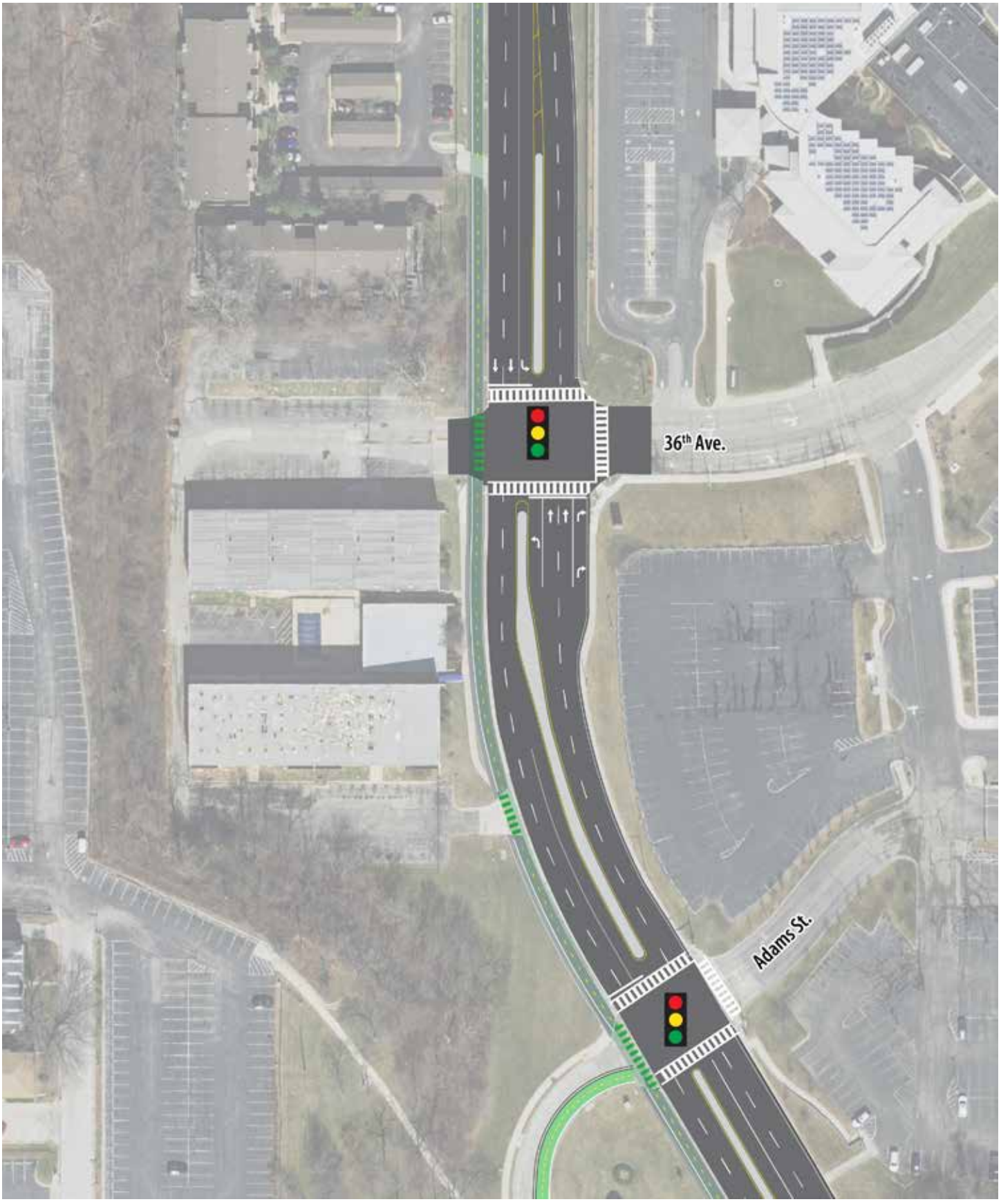


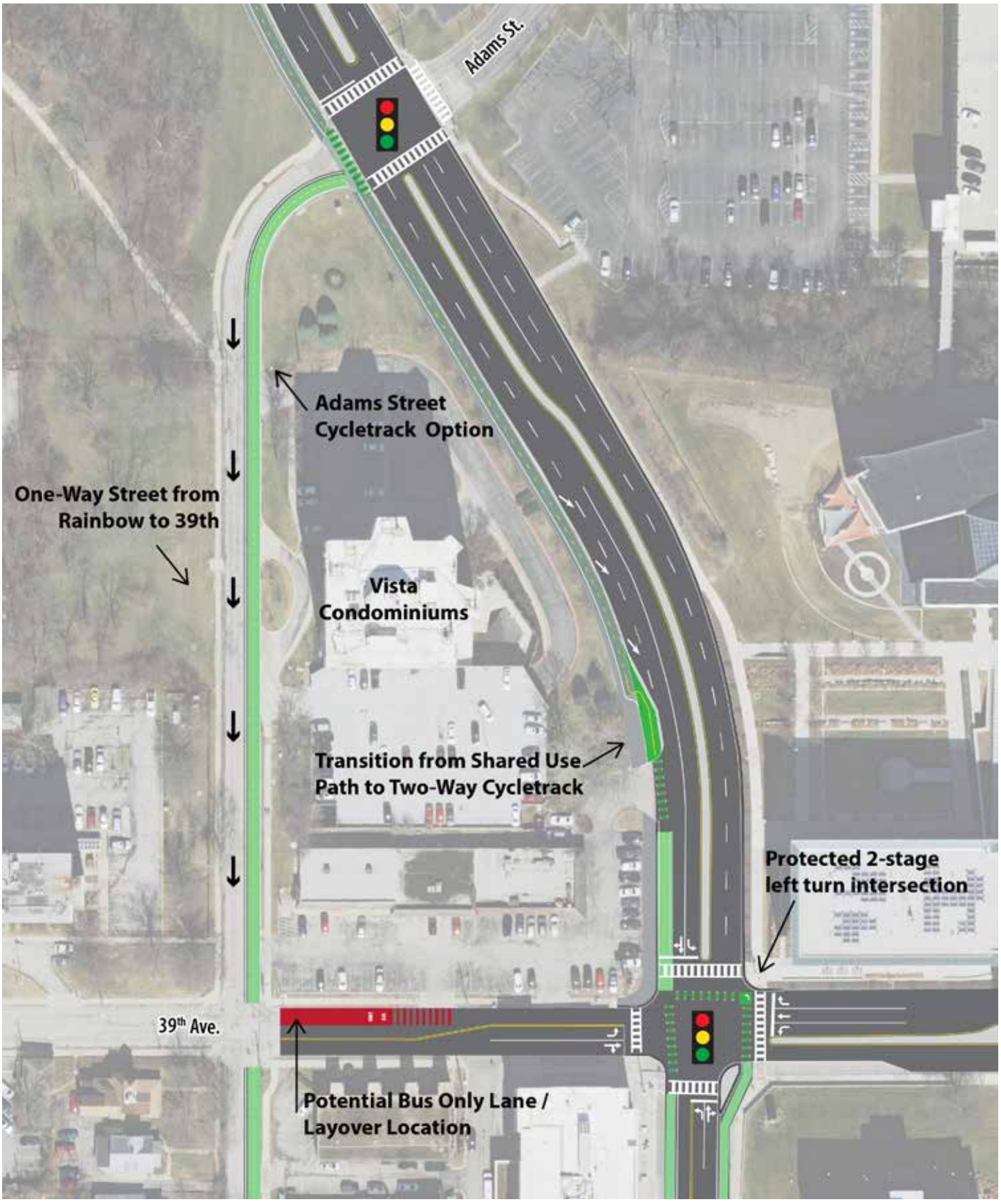
Figure 70. ***Conceptual Drawings for the Turkey Creek Trail Connection at 7th Street***
Images: Turkey Creek Corridor Enhancement Plan

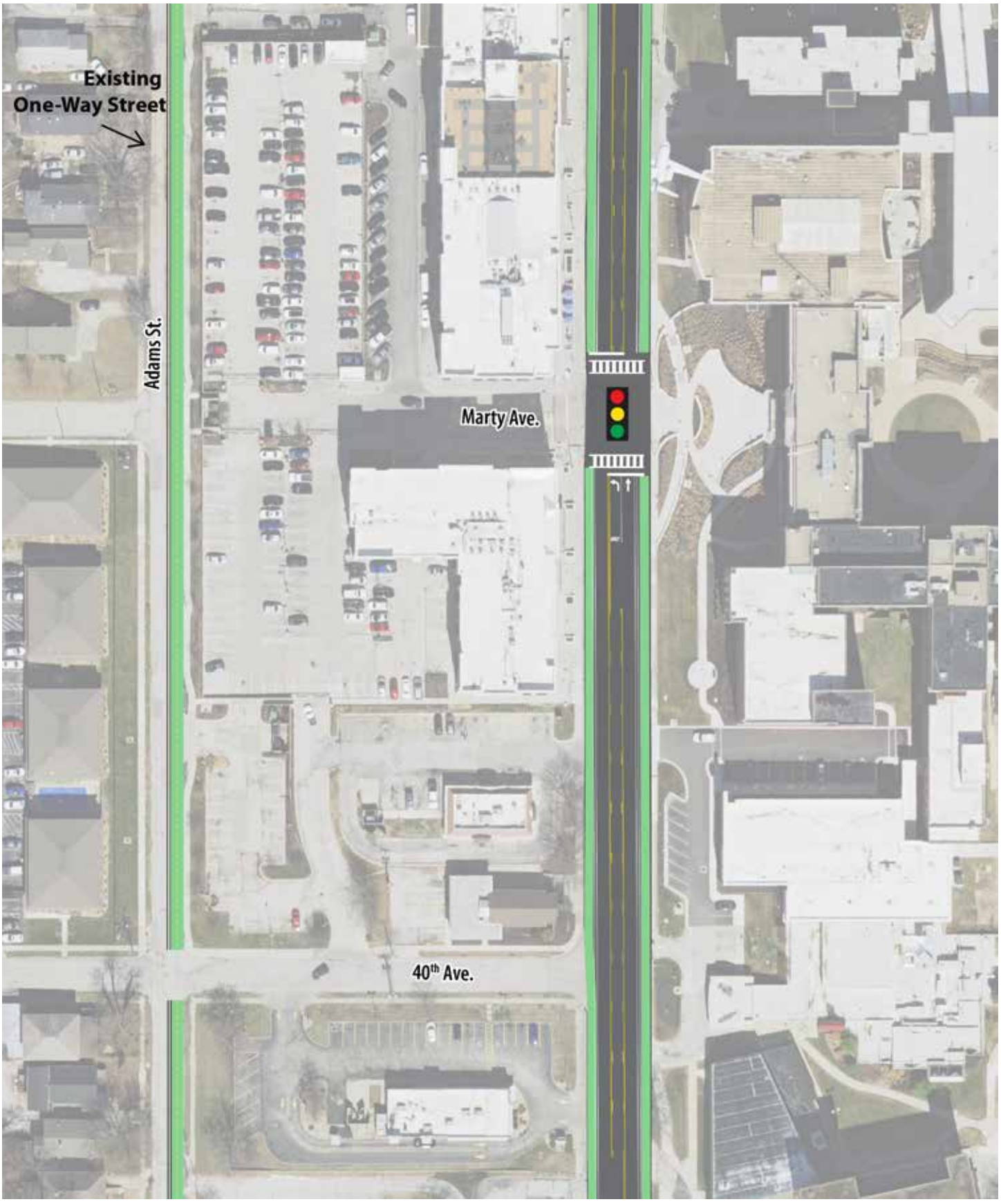
Corridor Concept Plans

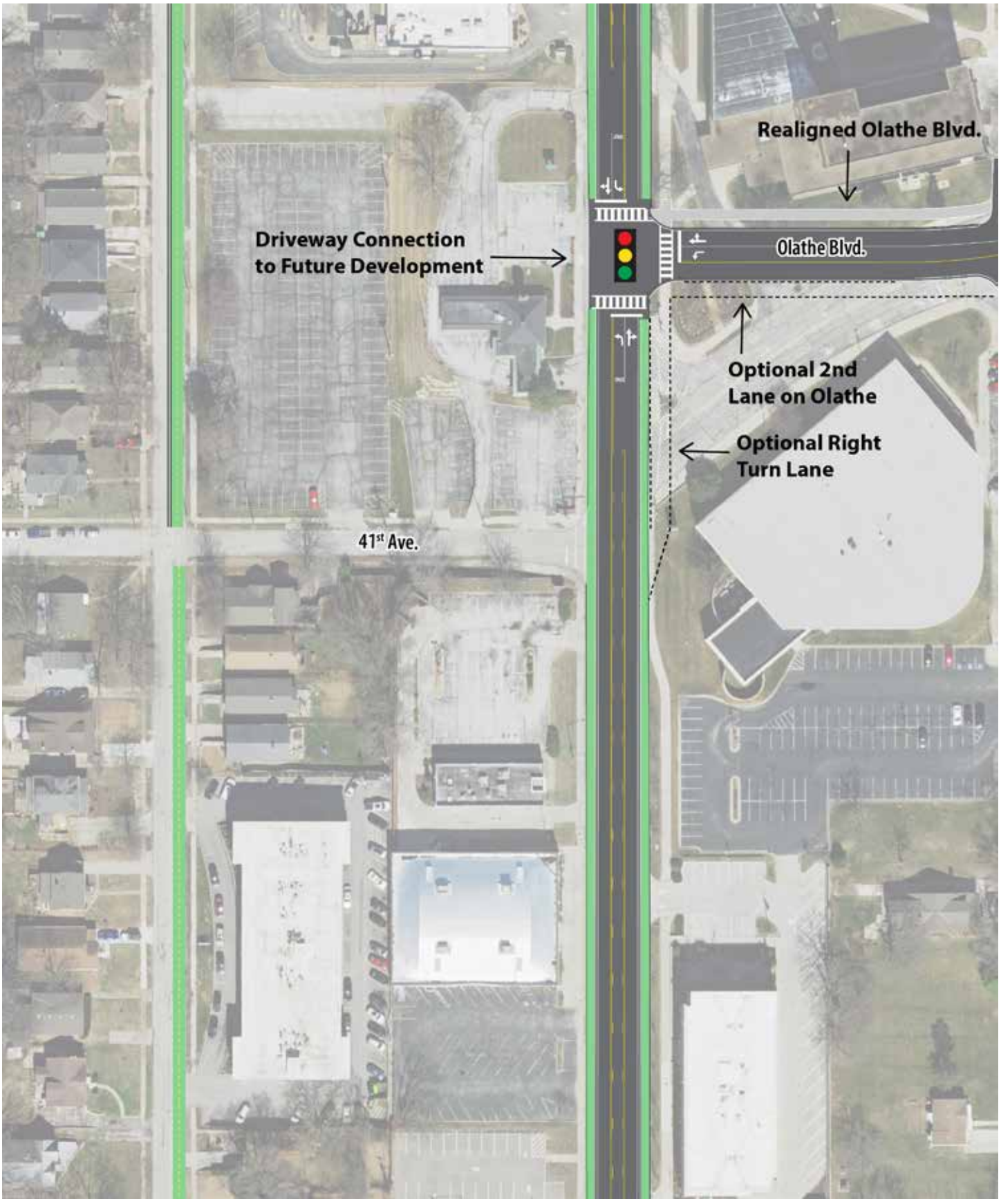

Home2 Suites
Rainbow Ext.
Consider Extending
Median Island
(No Left turn,
Right-in, Right-Out)
Former
Bank Midwest
Site
N
100 feet


Rainbow
Ridge
Apartments
N
100 feet


36th Ave.
Adams St.
N
100 feet


Adams St.
Adams Street
Cycletrack Option
One-Way Street from
Rainbow to 39th
Vista
Condominiums
Transition from Shared Use
Path to Two-Way Cycletrack
Protected 2-stage
left turn intersection
39th Ave.
Potential Bus Only Lane /
Layover Location
N
100 feet


Existing
One-Way Street
Adams St.
Marty Ave.
40th Ave.
N
100 feet

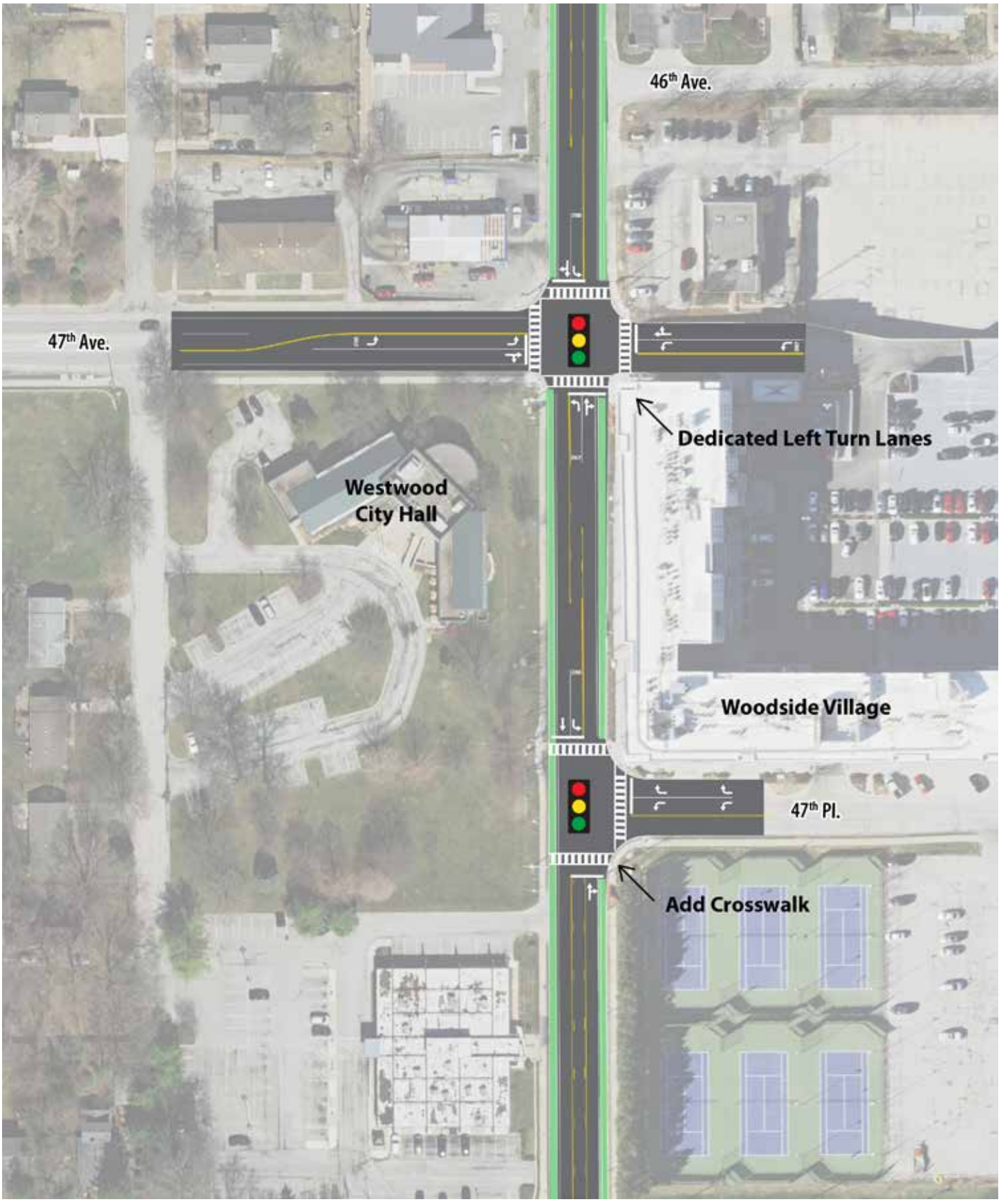

Realigned Olathe Blvd.
Driveway Connection
to Future Development
Olathe Blvd.
Optional 2nd
Lane on Olathe
Optional Right
Turn Lane
41st Ave.
N
100 feet


New Median Refuge Island and RRFB
42nd Ave.
New Dedicated Right Turn Lane
McDonald's
43rd Ave.
CVS
New Dedicated Right Turn Lane
N
100 feet

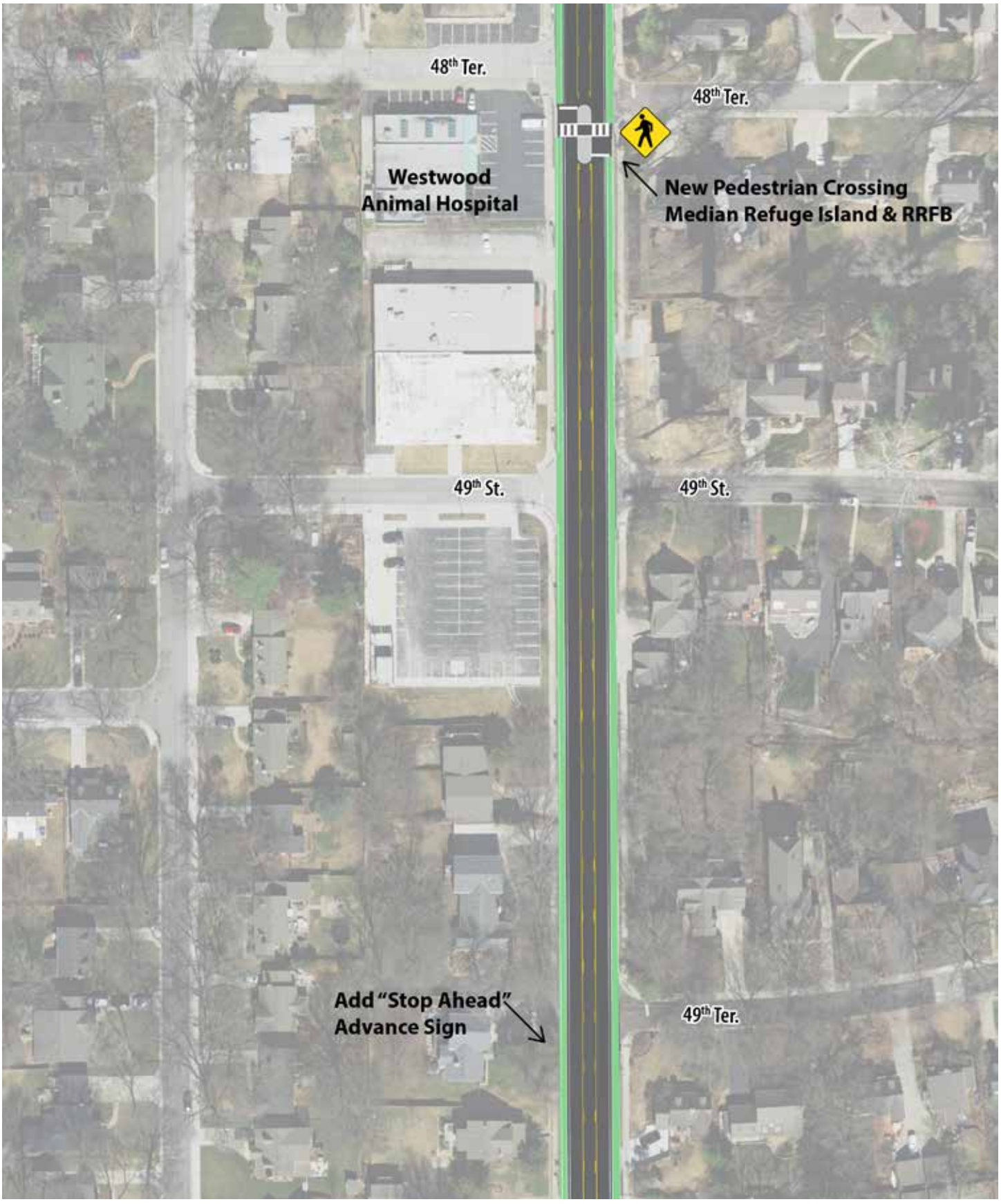

New Dedicated Right Turn Lane
McDonald's
43rd Ave.
CVS
New Dedicated Right Turn Lane
Seneca Ave.
N
100 feet

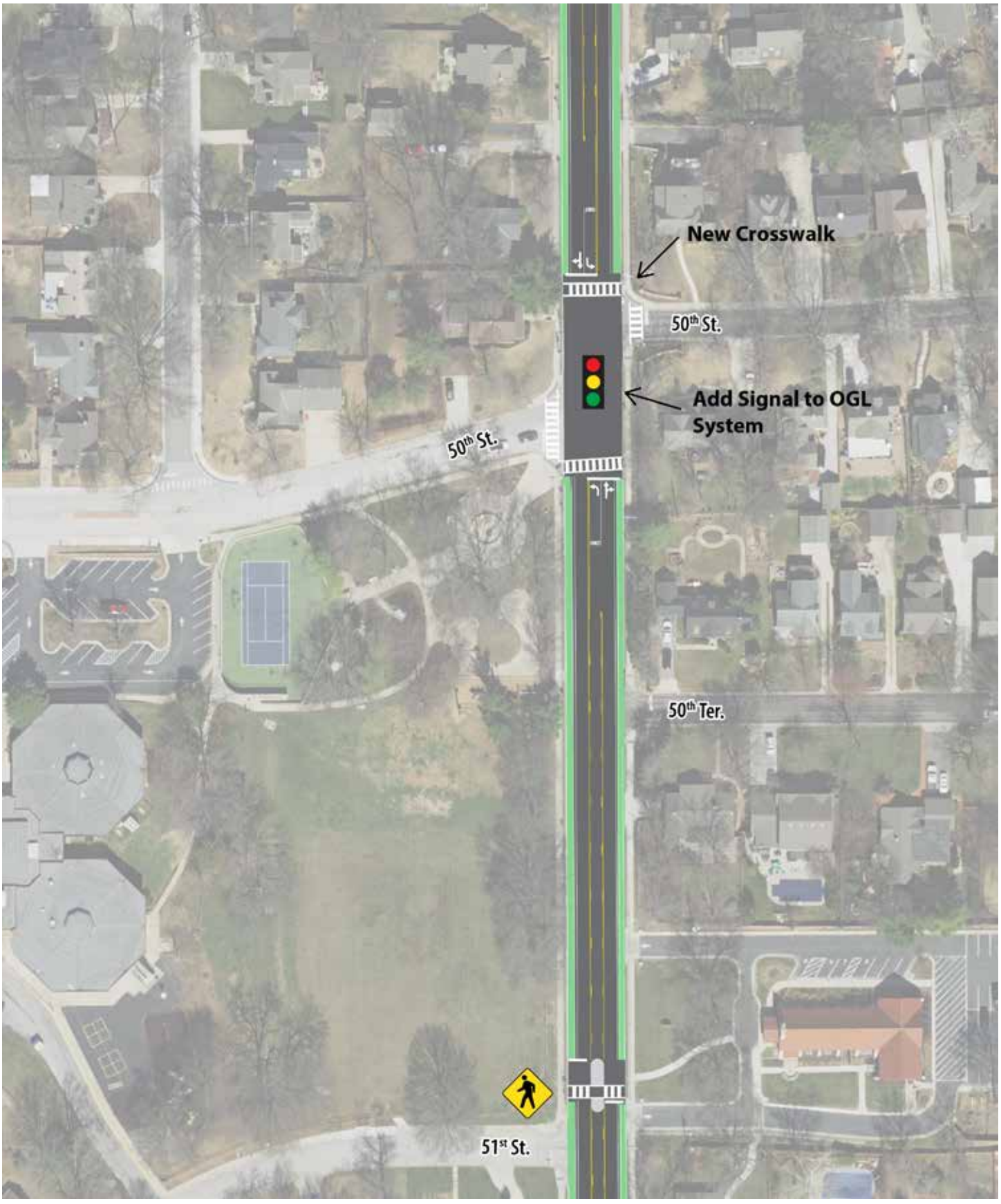

44th Ave.
New Pedestrian Crossing
Median Refuge Island & RRFB
45th Ave.
N
100 feet


45th Ave.
45th Ave.
New Pedestrian Crossing
Median Refuge Island & RRFB
46th Ave.
N
100 feet


46th Ave.
47th Ave.
Dedicated Left Turn Lanes
Westwood
City Hall
Woodside Village
47th Pl.
Add Crosswalk
N
100 feet


47th Ter.
Conroy's
47th Ter.
48th St.
48th St.
48th Ter.
48th Ter.
Westwood
Animal Hospital
New Pedestrian Crossing
Median Refuge Island & RRFB
N
100 feet


48th Ter.
48th Ter.
Westwood
Animal Hospital
New Pedestrian Crossing
Median Refuge Island & RRFB
49th St.
49th St.
Add "Stop Ahead"
Advance Sign
49th Ter.
N
100 feet


New Crosswalk
50th St.
Add Signal to OGL System
50th St.
50th Ter.
51st St.
N
100 feet


51st St.
51st St.
N
100 feet


Add Bike Box
Shawnee Mission Pkwy.
N
100 feet

Supporting Recommendations

Speed Limit Reductions

Fast vehicle speeds were a top concern listed by stakeholders. The project team conducted a speed study in three different zones along the corridor and used the ***FHWA USLIMITS2*** tool to understand an appropriate speed limit for these zones. Based on the crash history, number of driveways and access points/driveways, land use context, and existing observed speed data, lower speed limits on the corridor would be justified. According to results from USLIMITS2, the appropriate speed limit on Rainbow Boulevard is 30 mph from Southwest Boulevard to Adams Street and 25 mph from Adams Street to Shawnee Mission Parkway. Speed limit reductions are usually implemented in 5 mph increments to avoid creating excessive enforcement issues. Speed limit reductions are a low-cost safety countermeasure that could be implemented prior to a road diet and revisited with further studies after a road diet is implemented.

USLIMITS2: USLIMITS2 is a free tool from the Federal Highway Administration designed to set appropriate speed limits based on a variety of inputs, including observed speeds.

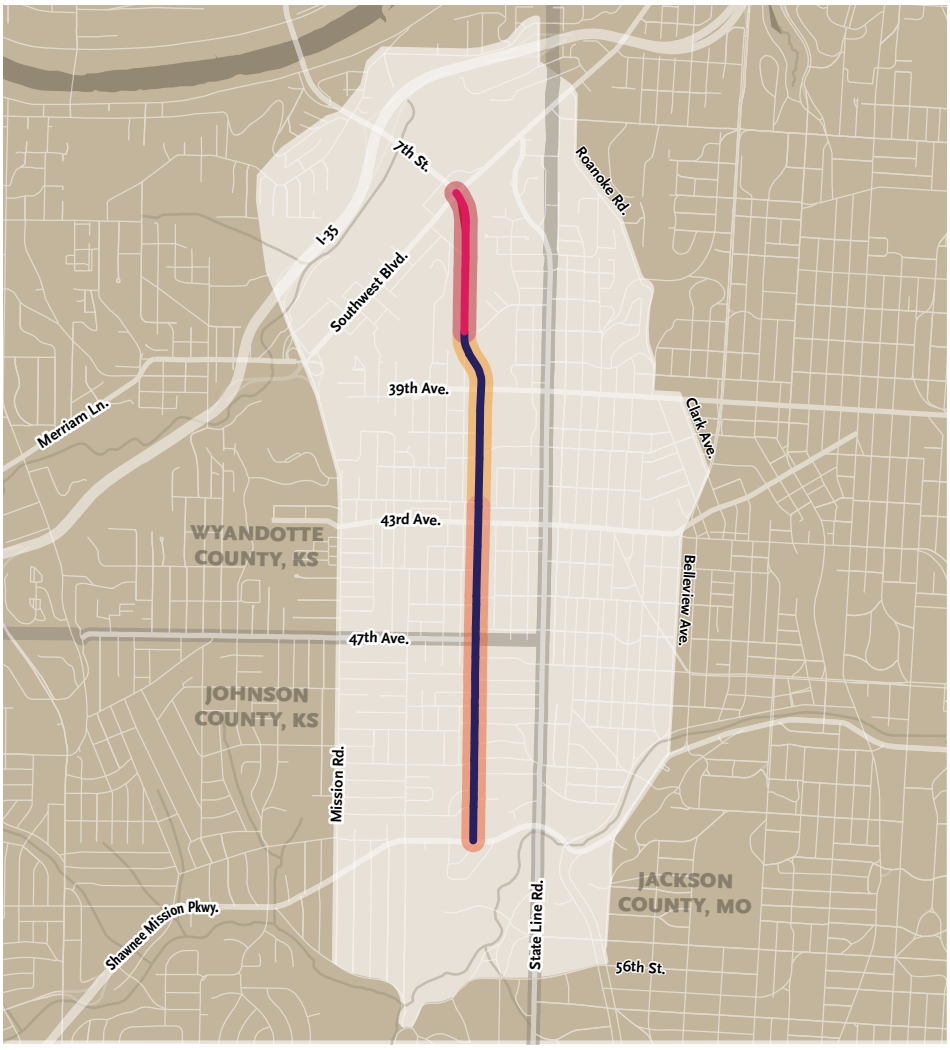


Figure 71. ***Speed Limit Reduction Recommendations on Rainbow Boulevard***

Public Transit Improvements

Increasing public transit service should be a key priority for the Rainbow Boulevard study area. Four routes radiate from the KU campus at 39th and Rainbow in an emerging transit hub. Better frequency and service spans would make transit more useful to far more people, reducing the automobile traffic on Rainbow.

Service enhancement concepts include:

- **Route 39**: Restore frequent service to Route 39 in anticipation of future high-capacity transit
- **Route 107**: Extend to the Country Club Plaza to increase jobs and housing access; increase frequency on Route 107 to every 30 minutes and every 15 minutes during weekday peak periods; Add Sunday service
- **Route 11**: Increase morning and evening peak frequency to every 15 minutes.
- **Route 403:** Increase frequency to 30 minutes on weekdays; Add Saturday and Sunday service

Together, these service improvements would solidify 39th and Rainbow as a transit hub within the region, offering convenient service to students, patients, visitors, and employees at the KU Med campus and beyond.

Additional service would require revenue in order to be sustainable. Additional revenue sources could include ***Congestion Mitigation and Air Quality (CMAQ)*** funds, partnerships with employers and institutions, or a dedicated regional or county-wide funding source for transit.

CMAQ: Federal funding to improve air quality and reduce traffic congestion that is allocated by the Mid-America Regional Council (MARC).

Additionally, enhanced transit stops such as the bus platform shown below improve the accessibility of the transit system and can speed up service, leading to cost savings and a better rider experience. These capital improvements could be implemented alongside a road diet project. An improved rider experience and an increase in service will help to build a market for mass transit in this vital economic hub.

Figure 72. ***Level Boarding Platform with Protected Bicycle Facility***

This bus platform in Portland extends into an on-street bicycle lane to create an accessible boarding platform for riders. Image: Jonathan Maus/Bike Portland

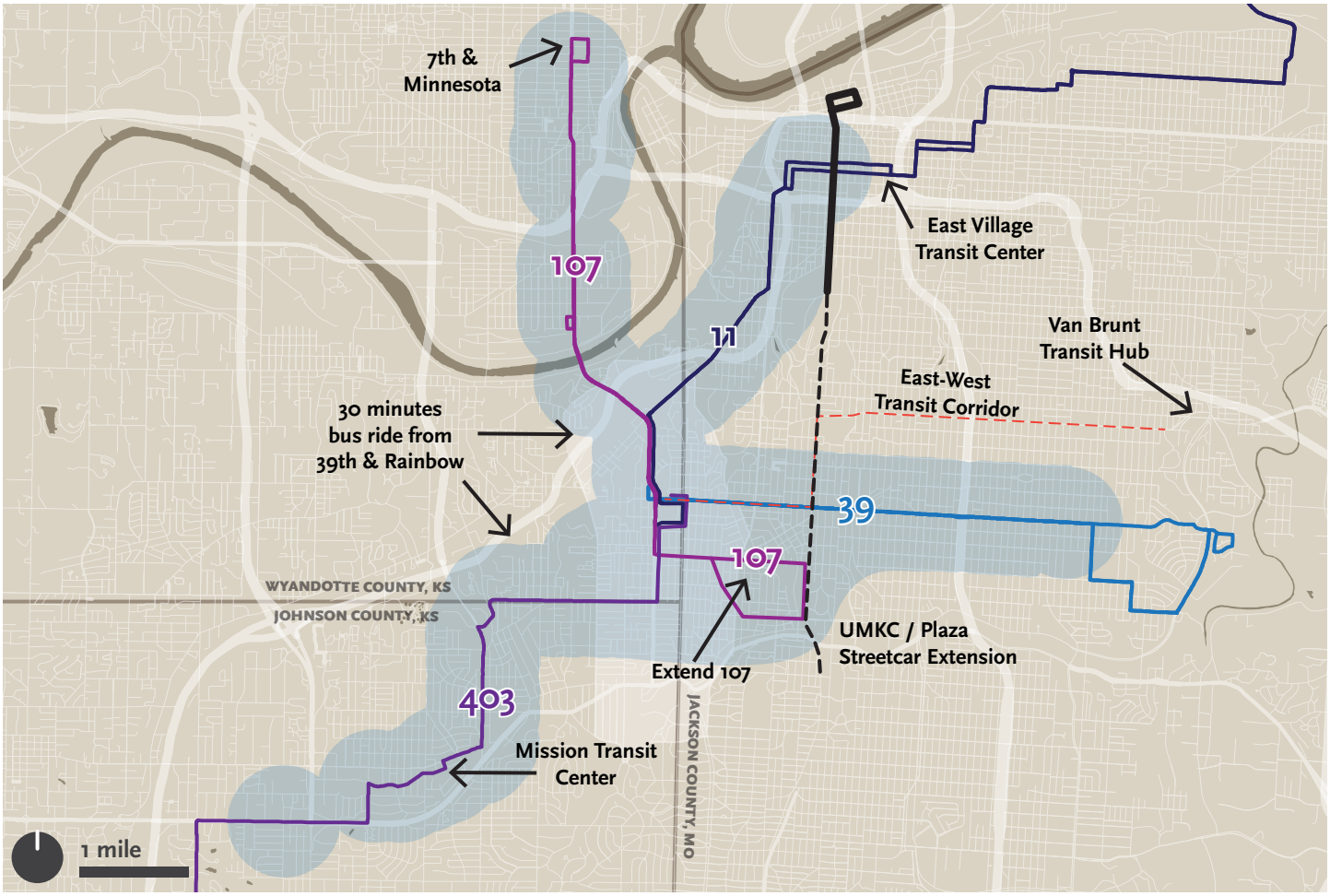


Figure 73. *Proposed Transit Service Coverage Improvements*

Route	12a	1	2	3	4	5	6	7	8	9	10	11	12p	1	2	3	4	5	6	7	8	9	10	11
Weekday Service																								
39						15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	30	30	30
11					30	30	15	15	15	30	30	30	30	30	30	30	15	15	15	30	30	30	30	30
107						30	15	15	15	30	30	30	30	30	30	30	15	15	15	30	30	30	30	
403							30	30	30	30	30	30	30	30	30	30	30	30	30	30				
Saturday Service																								
39						15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	30	30	30
11						60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60			
107						60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60			
403						60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60			
Sunday Service																								
39						30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
11						30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30			
107						60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60			
403						60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60			

Figure 74. *Concept for Service Increases on Rainbow Boulevard Fixed Routes*

Mobility Hubs

Mobility Hubs are a key component of the region's Smart Moves 3.0 transit plan. A mobility hub is a location, typically near a transit stop, that includes amenities that help people reach their destination by transferring to another mode. Mobility hubs can also support shifting modes from driving to walking, biking, or transit for shorter trips. They include amenities like:

- Enhanced transit stops
- Bike share and/or electric scooters
- Microtransit pickup/drop-off
- Uber/Lyft Pick-up/drop-off
- Wayfinding signs and kiosks
- Long-term bicycle storage or lockers
- Food and coffee vendors
- Bathrooms

Mobility Hubs are often located in the public Right of Way in high activity areas. They can also be incorporated into Transit-Oriented Development projects in spaces either owned or leased by public agencies. Ongoing maintenance and staffing to support these amenities should be incorporated into mobility hub initiatives. Two key sites at 39th and Rainbow and 47th and Rainbow have the potential to become mobility hubs.

Figure 75. ***Regional Mobility Hub Concept***
Image: MARC Smart Moves 3.0

39th and Rainbow

This location is served by at least four transit routes and is a major regional hub. It is the only location identified as a mobility hub in the Smart Moves 3.0 Plan. An existing coffee shop and cafe at this location drives pedestrian activity. A future streetcar stop is also planned for the area around 39th Ave.

Figure 76. ***Looking east on 39th at Rainbow (right) and inside Spokes Cafe (left)***

Because the receiving lanes on 39th Ave only require one lane in each direction, there is room to provide a dedicated transit stop or layover location, as well as extend a curb to add space for additional mobility hub amenities. Most property in this area is owned by KU or proposed for redevelopment. The redevelopment of these locations could request new mobility hub amenities in exchange for a density bonus or a reduction in the required off-street parking.

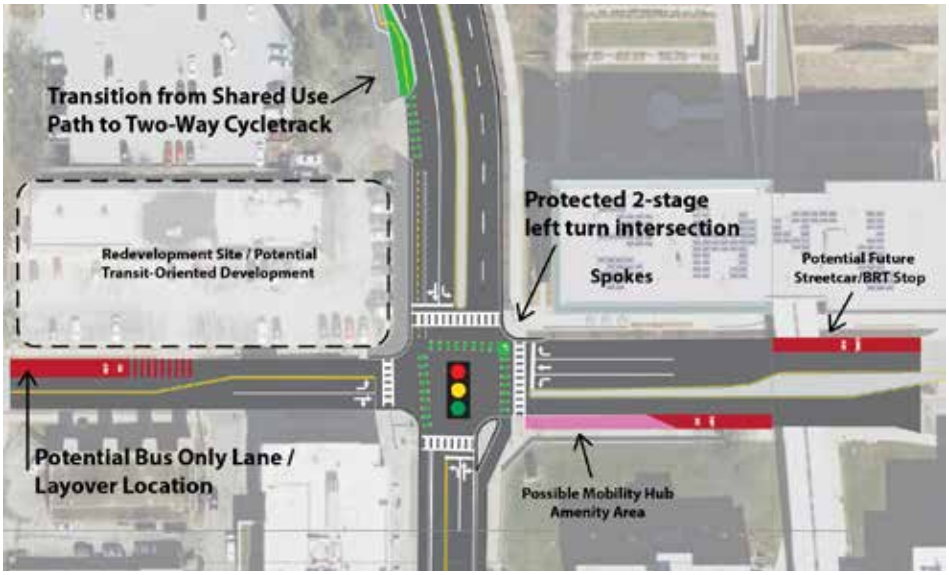


Figure 77. ***Opportunities for Mobility Hub and Transit Facilities at 39th and Rainbow***

47th and Rainbow

47th and Rainbow has also emerged as a potential mobility hub. This area has seen significant redevelopment in the past several years, including a mixed use multifamily and retail development known as Woodside Village and a planned expansion. Woodside and Woodside Village introduced the RideKC E-Bike system to non-park locations in Johnson County. The Westwood City Hall site and adjoining properties are also proposed for future redevelopment.

The 403 is the only fixed route bus to serve 47th and Rainbow. Increased frequencies and service spans would help support the site's accessibility while helping limit traffic stress. This location could also serve as a future microtransit hub for one of the region's microtransit services.

Mobility Hub amenities could be incorporated into redevelopment projects at 47th and Rainbow. Resources like expanded bike share or shared electric vehicles could help reduce car ownership and offset the parking demand at these sites, making redevelopment more financially feasible while offsetting single occupancy vehicle trips.

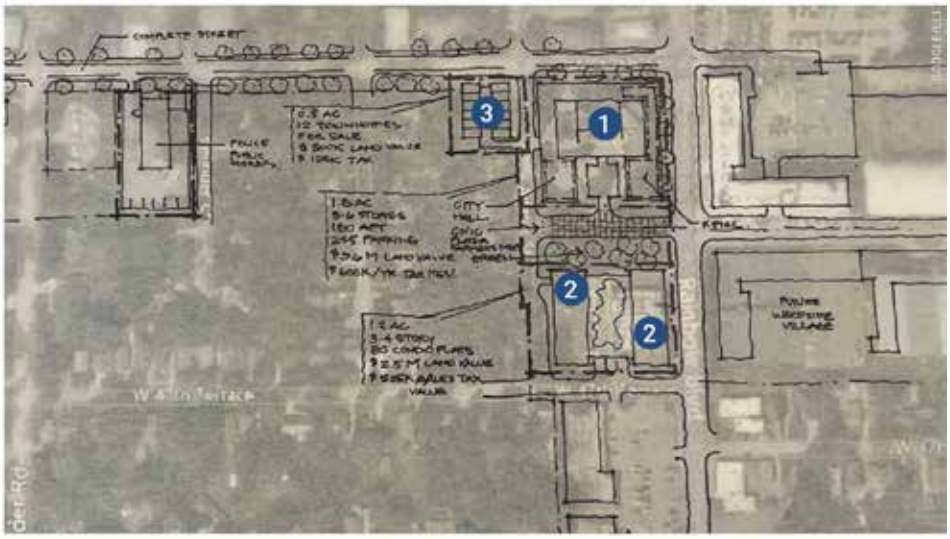


Figure 78. ***Redevelopment Concept from the 2021 ULI Technical Assistance Panel at Westwood City Hall***

Map	Housing Type	Anticipated Units	Configuration	Anticipated Total Annual Property Tax
1	Apartments	180	~800 sf, 1& 2 bedrooms	$600,000 (housing); $400,000 (retail)
2	For-Sale Condos	80	1000-1200 sf	$500,000
3	Row Houses	12	~2000 sf	$420,000
	Duplexes & ADUs			

Other locations along Shawnee Mission Parkway may also support mobility hub improvements. The 1900 Building, KU Cancer Center, and Fairway Shops are all within walking distance of Rainbow Boulevard and could support a program of mobility hub amenities that reduce single occupancy vehicle travel demand.

Transportation Demand Management

Transportation Demand Management (TDM) is an effort to reduce private automobile trips in order to make more efficient use of roadways. TDM strategies can be implemented by large employers and institutions, local governments, and regional planning or transit agencies. In the Kansas City area, the Way to Go program operated by MARC has implemented several TDM strategies. KU Med has also implemented various TDM strategies. Some TDM strategies to consider for Rainbow include:

Flexible Work Hours: Flexible work hours and remote work provide an enormous potential to reduce vehicle trips. Remote work enables people whose jobs do not require them to be in the office to forego trips. Flexible work hours allow employees to arrive or depart at off-peak times, where traffic capacity is most constrained, "flattening the curve" of travel demand. COVID-19 showed how remote work can be effective for certain industries and occupations.

Green Commute Incentives and Parking Buy-Outs: Employers can offer incentives for employees who choose walking, bicycling, or transit. Employers can offer a benefit to a tax-advantaged commuter account to help assist with transit fares (which may be implemented in Kansas City in the future) or rideshare memberships. For employees whose parking is paid by employers, these employees could be offered cash compensation in place of a parking space, which could be directed to a pre-tax commuter account or used however that employee wishes.

Parking Management: Private parking and garage owners can implement policies to encourage quicker turnover of parking spaces and place parking at areas with fewer traffic constraints. Valet services and shuttles can help employees and visitors bridge the gap from their parking location to work location. KU already offers patient valet services and provides shuttles.

Mixed Use Development: Increasing the balance of jobs, housing, and places to complete errands (i.e. grocery shopping) within an area reduces the travel distance between these places. Shorter travel distances make walking and bicycling more practical. Westwood, the Unified Government, and KU Med have supported and implemented mixed use infill within the study area and have plans to continue to do so.

Carpool/Rideshare Services: MARC's Way to Go app provides a way to match coworkers who live nearby with potential carpool opportunities. Carpooling can help offset traffic, especially for peak-hour commutes.

Guaranteed Ride Home: Many employees are concerned that irregular work hours or a personal emergency will make it difficult for them to get a ride home in an emergency. A guaranteed ride home provides commuters with an option to be reimbursed for a taxi or ***TNC*** ride in the event of a missed bus, irregular commute, or personal emergency. MARC's Way to Go program also offers this service.

Transportation Network Company (TNC): A service such as Uber or Lyft that provides on-demand transportation via a mobile phone app.

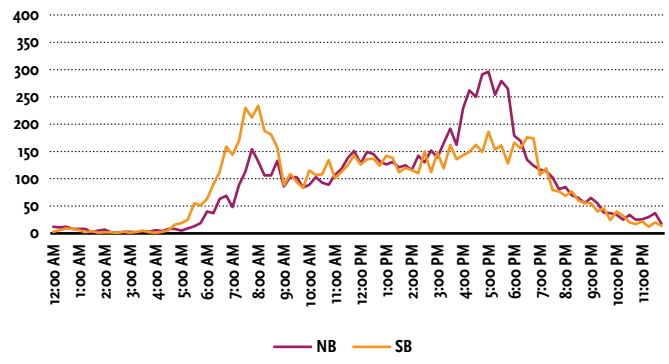


Figure 79. *24-hour Traffic Volumes on Rainbow (15-minute increments). "Flattening the curve" of Peak Hour trips*

Figure 80. *Outdoor Bicycle Storage at the KU Medical Pavilion around 8:00 a.m.*

Implementation and Next Steps

Project Costs

The combined project costs for the Rainbow Boulevard program of projects are estimated to total approximately $15.2 million, including future-year cost escalation and contingency.

Table 6. ***Cost Estimates by Project***

	Project/Item	Cost (2028$)
A	Turkey Creek Trail Access *	$ 1,976,000
B	Southwest Blvd to 39th	$ 2,468,000
C	39th to 43rd	$ 1,794,000
D	43rd to Shawnee Mission Parkway	$ 4,086,000
E	Olathe Boulevard Realignment	$ 1,810,000
	ADA Ramps + Sidewalk Replacement Allowance *	$ 800,000
	Neighborhood Traffic Calming Allowance *	$ 550,000
	Streetlight Allowance *	$ 954,000
	Landscape / Green Infrastructure Allowance *	$ 550,000
	Right of Way (ROW) Allowance *	$ 200,000
	Total ROW + Construction Cost	**$ 15,188,000**
	Maximum Federal Share (80%)	$ 12,150,400
	Survey, Engineering, and other Soft Costs (15%)	$ 2,279,000

** Not based on unit cost estimate*

These estimates assume that construction costs will increase an average of 5% per year, for a total escalation of 22% to 2028 dollar terms. A 25% contingency is also included in these costs. Costs such as utility relocation, stormwater inlets, new driveways, or full-depth pavement replacement are not included in these estimates.

Approximately 77% of these costs are in Wyandotte County, and 23% are in Johnson County. 35% of the costs are in USDOT Disadvantaged Tracts, and 77% are in MARC Environmental Justice tracts.

Figure 81. ***Rainbow Project Locations***

Legend

- A — Turkey Creek Access
- B — SW Blvd to 39th Ave
- C — 39th Ave to 43rd Ave
- D — 43rd Ave to Shawnee Mission Pkwy
- Potential Demonstration Project (47th to SMP)
- E — Olathe Blvd Realignment
- Traffic Calming Priority Areas

Funding

This program of projects would be eligible and potentially competitive for several funding sources, including Federal, State, and Local programs.

While Federal funding can sometimes complicate project implementation by adding certain requirements and administrative procedures, a project of this size could easily justify that added effort.

The Mid-America Regional Council (MARC) allocates Federal funding for projects through its committee structure. Although they require an intensive grant application and screening process and are typically highly competitive, Federal discretionary programs such as the RAISE program, Safe Streets and Roads for All, and Reconnecting Communities offer opportunities for major funding.

State and local programs can help provide required matching funds required for Federal projects. Typically, Federal projects can only cover a maximum of 80% of project costs, although there are certain exceptions for projects located within Historically Disadvantaged Census Tracts for certain programs. For this program of projects, a combination of Federal sub-allocated funding, KDOT, and local funding sources could realistically provide sufficient funding for the proposed program of projects.

Table 7. ***Potential Funding Sources***

Category	Name	Typical Range / Max Award	Competition / Difficulty
Federal - Suballocated (MARC Programs)	Surface Transportation Block Grant (STBG)	Total $30 M in KS	Moderate
	STBG Set-Aside (Transportation Alternatives)	Max $1.5 M Total $4.5 M in KS	Moderate
	Congestion Mitigation and Air Quality (CMAQ)	Total $5.6 M in KS	Moderate
	Carbon Reduction Program (CRP)	Total $8 M in KS	Moderate
Federal Discretionary	Community Project Funding ("Earmarks")	$500k- $4 M	Moderate
	Rebuilding America's Infrastructure with Sustainability and Equity (RAISE)	Max $25 M	High
	Safe Streets and Roads for All - Demonstration Grant	Max $10 M	Moderate
	Safe Streets and Roads for All - Implementation Grant	Max $25 M	High
	Reconnecting Communities & Neighborhoods	Min $5 M	High
KDOT (or KDOT Allocated)	Connecting Link Improvement Program	Max $1.5 M	Moderate
	Highway Safety Improvement Program - VRU Set Aside (Future)	TBD	Moderate
	Cost Share Program	Max $1 M	Lower
	Build Kansas Fund	TBD	Moderate
Local	Johnson County County Assistance Road System (CARS)	Likely $1-2 M per project	Lower
	Street Maintenance/Preservation Funds	Varies (Unified Government is around ~ $12 M/year citywide)	Lower

Project Delivery Process

The project delivery process includes several steps, outlined below. These project delivery steps may vary depending on the scope of the project. For example, more time may be required if right of way acquisition is required.

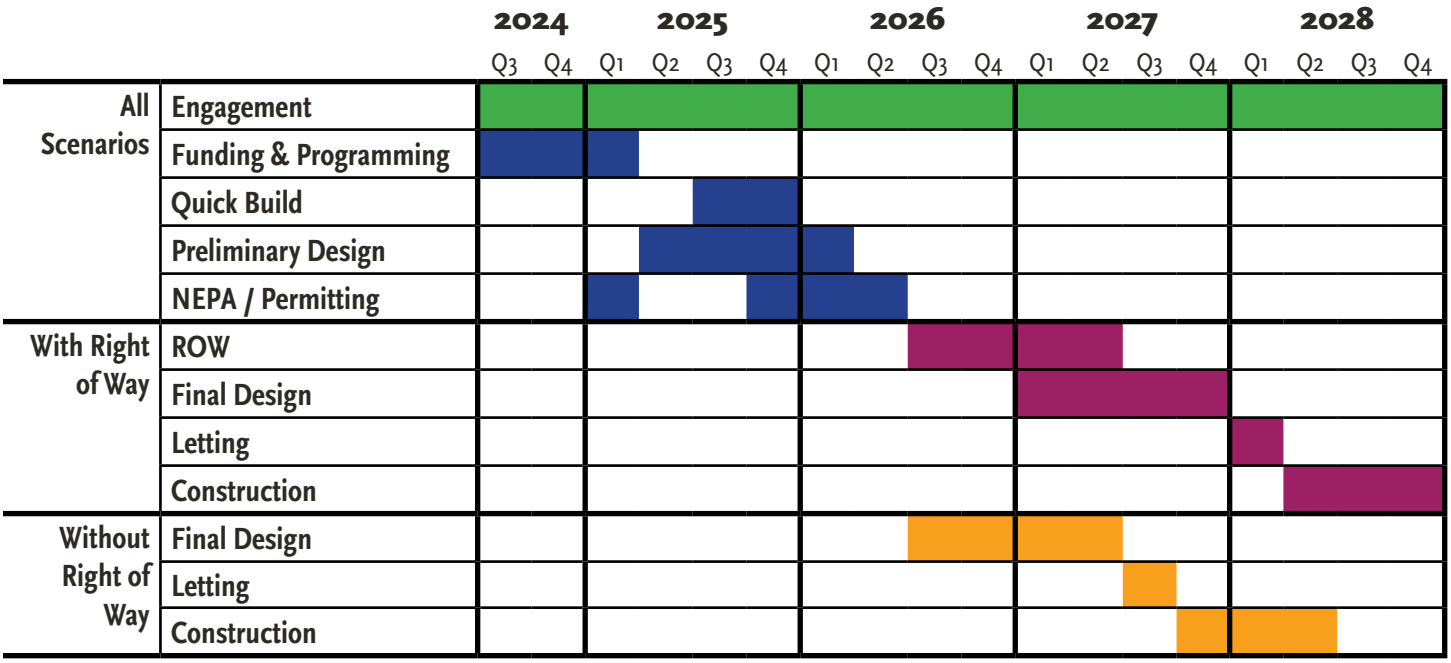


Figure 82. ***Example project development scenarios***

Community and Stakeholder Engagement: It is important for community and stakeholder engagement to continue beyond this study as design decisions are finalized and construction begins. Individual stakeholder and property owner engagement can help refine design to meet the needs of properties adjacent to Rainbow and further define broader community preferences.

Figure 83. ***Steering Committee and Open House Meetings for the Rainbow Complete Street Plan***

Funding and Programming: The Federal funding and allocation process administered by the Mid-America Regional Council helps to allocate funding such as STBG, STBG Set-Aside, CMAQ, and CRP funds. As local agencies apply for funding, projects are evaluated, scored, and recommended to various committees that provide recommendations and final approval for project funding. This process typically takes several months. Once that process is complete, project sponsors will have an understanding of the amount of funding allocated to their project(s). This allows project sponsors to understand which projects they can afford, the amount of matching funding required, and the timeline when funds will be available. Once funding is secured, ***Local Public Agencies (LPAs)*** should begin coordinating with KDOT's Bureau of Local Projects to begin the Discovery Phase of the project by submitting a Project Programming Request Form.

Local Public Agencies (LPA): A public agency (i.e. City, County, or other non-State government entity) sponsoring a Federal-Aid (federally funded) project

The Kansas Department of Transportation's Bureau of Local Projects (KDOT BLP) assists Local Public Agencies (LPAs) in project development for Federally-funded projects. As the owner of Rainbow Boulevard, KDOT will be involved in decisions about the facility as it is designed.

A detailed LPA Project Development Manual can be found on KDOT's Authentication & Resource Tracking (KART) web portal.

Quick-Build Demonstration: Quick-build or demonstration projects are a low-cost way to implement a road diet or roadway reconfiguration in order to prove their effectiveness at calming traffic and improving safety and operations. For example, the City of Westwood and the Unified Government implemented a roadway reconfiguration on 47th Avenue/Street using a quick-build approach. Following a quick build project, the street was upgraded with new, more permanent improvements including pedestrian refuge islands and new curb ramps and sidewalks.

The section of Rainbow from Shawnee Mission Parkway to 47th Avenue would serve as an ideal quick-build project that could be implemented earlier on in the process to serve as a proof of concept for the Rainbow Boulevard Road Diet.

Figure 84. ***Demonstration Project (Left - photo by Laura Fox) and Permanent Installations on 47th Street/Avenue***

Discovery and Preliminary Design: Once funding is secured, preliminary engineering can begin. Project sponsors should meet with KDOT's Bureau of Local Projects to discuss the project scope, limits, and any complex details. An engineering consultant should be competitively selected in accordance with KDOT rules. An engineering survey is also needed to support design. Discovery and preliminary engineering may dictate further evaluation of the concepts within this study and their safety and operational impacts. Preliminary plans (30%) are followed by field check plans (50-60%), produced prior to right of way plans (if applicable).

Environmental Review and Permitting: The National Environmental Policy Act (NEPA) requires Federally-funded projects to adhere to certain standards and processes. KDOT will determine the environmental class of the project, depending on the scale, complexity, and anticipated impacts of the project. Because these projects are mostly within existing developed Right of Way, they are likely to be classified as Categorical Exclusions (CATX). KDOT's Environmental Services Section (ESS) will draft a Preliminary Memo when the project is programmed to begin coordination with various review agencies. Review agencies will provide their review letters to KDOT ESS. KDOT ESS will compile those responses and provide a Final Memo, indicating which permits and actions need to be taken by the LPAs. The LPA is responsible for obtaining permits.

Right of Way: While this project will work mostly within existing right of way, there may be a need to acquire partial tracts of temporary or permanent easements or right of way to complete certain projects, depending on the results of preliminary design. LPAs must follow specific rules when acquiring right of way. Title reports, legal descriptions, right of way plans, and property valuation are required in order to begin negotiation with property owners and acquiring property.

Final Design: The final design stage includes development of a set of office check plans (90% plans), final plans (100% plans), and the final plans, specification, and estimate (PS&E).

Advertising, Letting, and Construction: Once the final PS&E is complete, KDOT will advertise the project for bid on its portal for one month. The contract is awarded to the lowest responsible and responsive bidder. After a contract is executed, a pre-construction meeting is held, and a Notice to Proceed is issued. During construction, the LPA, KDOT, and/or a consultant share responsibilities for construction engineering, inspection, and oversight.

Alternative Delivery: Alternative delivery methods, such as design-build or construction manager at risk, can help save time and costs over design-bid-build delivery. Alternative delivery methods may be appropriate for certain projects in this program. However, further design, definition of the scope of work, and an understanding of environmental and permitting considerations would be required for alternative delivery. There is currently no defined design-build process for KDOT local projects, and additional consultation with KDOT will be needed if project partners desire to pursue alternative delivery. Project sponsors should consider using an owner's representative to help manage the process.

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