Linwood Corridor

Complete Streets Study

OCTOBER 2020

Figure 0.1 - Photograph from Public Meeting #1 on 11.20.19

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Figure 0.2 - Historic Photograph of Linwood Boulevard at Paseo Circa 1932

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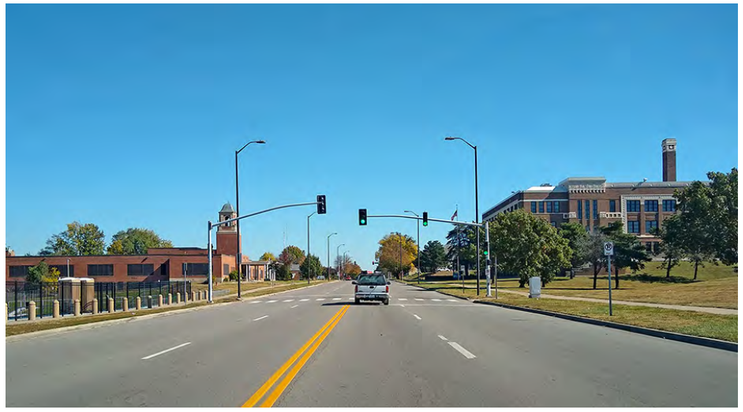


Figure 1.1 - Photograph of Linwood Boulevard near Central High School

Figure 1.2 - Photograph of Sanford Brown Plaza near Metropolitan Missionary Baptist Church

1.0 INTRODUCTION

1.1 INTRODUCTION

Linwood Boulevard is one of George E. Kessler's Intra-Neighborhood Connectors which serve as the backbone of the KCMO Parks and Boulevards system. This project seeks to further the exploration of meeting contemporary needs of transportation and mobility in the Kansas City region while still honoring the original design intent of Kessler to provide enjoyable, comfortable, and beautiful spaces for the enjoyment of society. Due to its connectedness, directness, relatively easy topography, and excess capacity, Linwood Boulevard (see Figure 1.1) was seen as a potential candidate for a reduction in the width of the roadway and implementation of enhanced bicycle, pedestrian, and transit facilities and improved landscaping and streetscaping beautification.

The primary goal of this project is to envision a new future for the study corridor reaching from the Kansas/Missouri state line all the way to the eastern boundary of Kansas City to connect to the future Rock Island Rail Corridor Authority trail. At the heart of this project, it seeks to leverage transportation improvements on the street corridor to improve safety and quality of life for area residents, connect with existing public spaces (see Figure 1.2), and to provide alternate modes of transportation to those who do not have access to cars and to those who want to engage in more active transportation for health and happiness.

1.2 PLANNING SUSTAINABLE PLACES PROGRAM

In October 2010, a consortium of more than 60 regional partners, led by the Mid-America Regional Council, received a $4.25 million planning grant from the U.S. Department of Housing and Urban Development to advance the implementation of the regional plan for sustainable development, Creating Sustainable Places. The Planning Sustainable Places program administered by the Mid America Regional Council to support plan implementation has since been augmented by Federal Highway Administration Surface Transportation Block Grants, and continues to serve as one of the most important local government assistance programs helping communities achieve their goals and facilitate the following regional objectives:

- Support the development and implementation of local activity center plans consistent with Creating Sustainable Places principles, identified regional activity centers, and the land use policy direction outlined in Transportation Outlook 2040.
- Support localized public engagement and community consensus building.
- Support the identification and conceptualization of land use strategies, transportation projects, and related sustainable development initiatives that help to realize and advance the objectives identified in the Creating Sustainable Places initiative, Transportation Outlook 2040, and the MARC Board's adopted policy statement on regional land use direction.
- Support the conceptualization, development, and implementation of Creating Sustainable Places projects.

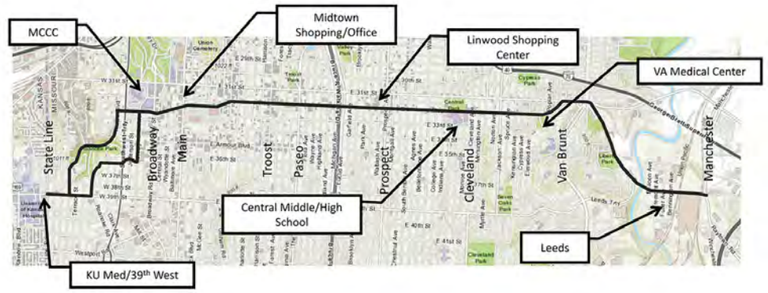


Figure 1.3 - Overview Map of the Linwood Corridor Study Area

1.3 PROJECT OVERVIEW

The Linwood Corridor stretches from the state line to the eastern boundary of Kansas City primarily along 39th Street, Karnes Boulevard, Linwood Boulevard, and Stadium Drive. This corridor passes by numerous culturally, economically, and institutionally signification destinations and neighborhoods. The map (see Figure 1.3) highlights some of these important destinations.

The corridor also passes through many of the areas of Kansas City with the highest reliance on walking, biking, and transit. The relatively flat topography lends itself to active transportation uses to connects to the highly used north-south transit corridors in the city. However, the corridor has very high rates of traffic injuries and deaths, limiting the ability of residents to comfortably and safely access transit and other destinations.

Within the framework of the Planning Sustainable Places Program, this project included a robust public engagement process; a data-driven analysis methodology; and an implementation phasing plan that provides a road map for immediate action items and future phases of design.

Figure 2.1 - Photograph of the Presentation to the Coleman Highlands Neighborhood Association on 01.23.20

2.0 PEOPLE + VISION

2.1 PUBLIC INVOLVEMENT

Community engagement for the Linwood Corridor Complete Streets Study was tied to the planning process' four phases—Discover, Devise, Distill, Deliver. Engagement activities began in fall 2019 and continued through summer 2020. The planning team engaged the project's Steering Committee, residents, businesses, property owners, officials from the City's Public Works and Parks and Recreation Departments, Kansas City Area Transportation Authority (KCATA), advocacy groups, and others. As a result, the team gathered and referenced hundreds of comments during the effort. Each phase of engagement is summarized below. Details are included in the Appendix.

DISCOVER

Engagement began with the planning effort's Discover Phase. The City, in coordination with the Mid-America Regional Council (MARC), held the first Linwood Corridor Plan Steering Committee Meeting on November 13 at the Westport Roanoke KC Parks Community Center. First the group discussed the purpose, process, and schedule for developing the plan. Then they reflected on their thoughts about the area today, memories of its past, potential accomplishments for the future, and indicators of success in order to begin framing the corridor's transportation vision and goals.

The project Vision and Goals were developed in partnership with City Staff and the project Steering Committee. The public was asked to rank the vision and goals on a 1 to 5 star rating through the online survey. The ratings are noted after each of the statements below. The project goals were then ranked in priority based on the star rating from the public.

Project Vision

4.3 / 5 ★★★★☆

"Kansas City will honor Linwood Boulevard's historic character of providing for the comfort & well-being of residents through safe multimodal connections in a pleasing & enjoyable environment."

Prioritized Project Goals

1. Reduce the number of traffic-related deaths & injuries — **4.5 / 5** ★★★★½
2. Improve walking, biking, transit connections & facilities — **4.4 / 5** ★★★★½
3. Improve access to key destinations & community assets — **3.9 / 5** ★★★★☆
4. Restore the beautiful & inviting boulevard character — **3.8 / 5** ★★★★☆
5. Provide an environment attractive for redevelopment — **3.6 / 5** ★★★½☆

Steering Committee members also used large-scale maps, post-it notes, colored dots, and markers to indicate corridor challenges and opportunities by mode of transportation. They organized their comments by corridor segment: State Line Road to Broadway, Broadway to Brooklyn Avenue, Brooklyn to Van Brunt Boulevard, and Van Brunt to Manchester Trafficway. Committee members emphasized the importance of making transportation improvements fit the character of the area. Some said it was important to take care of pedestrian infrastructure first.

Adding to the Steering Committee comments, the planning team held a public meeting on November 20 at the Mohart Multipurpose Center. A total of 33 people attended, including residents, neighboring businesses, and agency representatives. During the meeting, participants discussed existing conditions via the MySidewalk Data Dashboard (https://dashboards.mysidewalk.com/linwood-psp/) and outlined corridor issues and possibilities. They also shared their thoughts on a potential vision for the corridor and then described goals and successes related to their ideas.

A MetroQuest.com opinion survey (see Figures 2.2, 2.3, and 2.4 for the results of several questions) was available before, during, and after the public meeting. Over 400 people responded to it. The majority said they drive to destinations today but would like to use not only their vehicles, but also bicycling, walking, and public transit to reach them in the future. They included traffic safety, sidewalk pavement condition, lack of facilities, and inadequate or dark lighting as barriers to walking and bicycling. Respondents also mapped over 1,000 points and provided approximately 800 written comments about the corridor. Top comments related to dangerous transportation situations, challenges crossing the street, and speeding motorists.

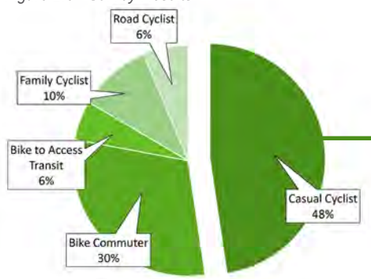
Upon request, the planning team met with the Coleman Highlands (see Figure 2.1) Neighborhood on January 23 at the Westport Roanoke KC Parks Community Center. They shared the same information presented at the public meeting (see Figure 2.5) on November 20. Key neighborhood concerns involved providing traffic-calming, maintaining parking, and incorporating wider sidewalks along Karnes Boulevard. They also expressed concerns about crossing Southwest Trafficway and the need for better traffic signal timing at 33rd Street and Southwest Boulevard.

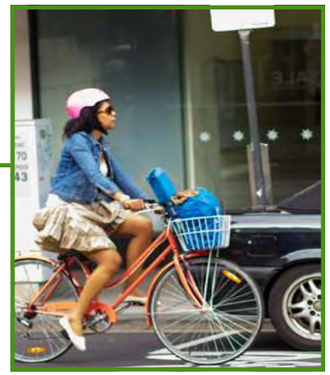
What type of pedestrian are you?

Figure 2.2 - Survey Results

What type of cyclist are you?

Figure 2.3 - Survey Results





What are the major barriers to walking and bicycling?

Figure 2.4 - Survey Results

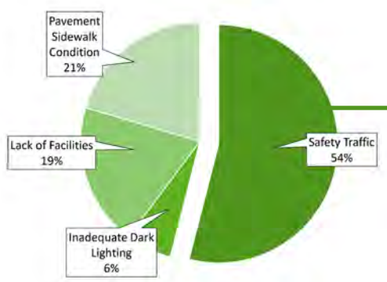


Figure 2.5 - Photograph of Work-Session at Public Meeting #1 on 11.20.19

DEVISE & DISTILL

The second and third phases of the project, Devise and Distill, happened at approximately the same time. They began during winter 2020 and ended summer 2020. The planning team held the second Steering Committee Meeting on February 24 at the Linwood Multipurpose Center. Its purpose was to build on the feedback gathered during the Discover Phase, so Committee members reviewed and approved the draft vision and goals for the project. They also discussed parking, crashes, future bus and streetcar planning, and traffic analysis. The group used StreetMix.com to develop conceptual improvement concepts for the most challenging segments of the corridor, considering all modes of transportation as well as associated benefits and tradeoffs. Key discussion items involved:

- The potential likelihood and impact of new bus service (and eventually a streetcar line) along Linwood Boulevard.
- Pedestrian improvements needed for the 31st Street/ Van Brunt Boulevard and Leeds Industrial areas.
- Issues with curb cuts and whether other routes were easier for bicycling than Linwood Boulevard.
- The 31st Street and 39th Street Improvement Projects.
- Maintaining on-street parking for businesses.

In general, how do you feel about the Linwood Corridor project?

199 total surveys completed and 110 comments received on above question

IT'S A STEP IN THE RIGHT DIRECTION.

Indicating **Positive Progress** was listed 40 times (36%)

"I feel the Linwood project is the right move for the City in terms of **pedestrian and bicycle safety**. *Please make it happen and don't let the plan sit idle with no action! Linwood is a* **prime East West connector** *and is a very accommodating grade for cyclists to navigate."*

"I'm very pleased to see thought being given to **improving the pedestrian and bike/scooter experience along the corridor**. *It's also great that* **streetscape improvements** *are being planned. I would love more street-adjacent trees."*

IT'S AN IMPROVEMENT TO SAFETY.

Listed more than 15 times (14%)

"My children are getting older and **would love to have a safer environment for them to ride their bikes**. *I love the idea of the bike lane being built next to the sidewalks. Thank you."*

"I appreciate the study and options to **improve safety without reducing vehicular lanes on the critical portions**. *Road dieting has caused significant traffic jams on Troost and Armour, pushing cars to other streets that are already overcrowded..."*

Excited! Great! I Love it!

Noting multimodal safety & off-street biking (22 total comments)

It's a good start, but not enough.

Eight participants indicated a preference for on-street biking and/or **more continuous multimodal connections throughout the city**.

Figure 2.6 - Overview of Results from the Public Survey

Figure 2.7 - Photograph of Exhibit Boards at Public Meeting #2 on 03.03.20

The Committee asked the planning team to provide the broader community with a range of design concepts to review. In response, the planning team held a public open house (see Figure 2.7) on March 3 at the Linwood YMCA/James B. Nutter, Jr. Community Center. Thirty-five (35) people attended, consisting of neighborhood residents, businesses, institutions, and others. Meeting attendees discussed existing issues and needs and commented on how roadway segments should be designed for the corridor. In every case, more participants preferred the design concepts over existing conditions.

The team also shared the design concepts via SurveyMonkey.com and gathered similar comments (see Figure 2.6) from nearly 200 respondents. More people were in favor of the concepts than leaving the roadway as it exists today.

DELIVER

The final steps in the engagement process occurred during the Deliver Phase. The planning team began by presenting the corridor concept to the Parks and Recreation Department's Development Review Committee (DRC). The team gave the presentation on May 28 and the Committee expressed support for the concept. Volker Neighborhood requested the planning team share the concept with them during their June 11 virtual neighborhood meeting. During the presentation, neighborhood members commented about neighborhood-specific improvements, such as considering a T-intersection at Roanoke, and inquired about ways to access project information.

The team held the last Steering Committee Meeting on June 18. They formatted it as a virtual meeting via zoom.us because of the coronavirus (COVID19) pandemic and related physical distancing guidance from the Center for Disease Control and Prevention (CDC) and the Kansas City Health Department. During the meeting, Committee members reviewed the corridor concept. Their comments related to:

- Parking for the Delta Athenaeum Building
- Funding for implementation
- The need to improve transportation safety as one of the key reasons for the planning effort and recommended improvements
- Issues at key locations, such as the Linwood Boulevard/Troost bus top
- Curb cuts and access needs in retail areas

The team presented the draft Linwood Corridor Plan to the City's Mobility Committee on July 13. Committee comments related to coordination with the proposed Linwood Boulevard Bus Rapid Transit (BRT) Study, transit connections at 39th Street/KU Med Center, and the cost estimates that inform implementation funding and phasing.

3.0 PROJECT BACKGROUND

3.1 HISTORY OF THE CORRIDOR

Several streets along the Linwood Corridor, including Linwood Boulevard, Karnes Boulevard, Roanoke Road, and Valentine Road, constitute important parts of the Kansas City Parks and Boulevard System. This system, included on the National Register of Historic Places, is one of the most significant contributions that Kansas City has made to urban planning in the U.S. Examples of historic character are shown in Figure 3.1, 3.2, and 3.3.

The goal of the originator of the idea, George Kessler, was to create a system of parks and park-like boulevards to connect these parks that would elevate the quality of life of residents, improve the attractiveness of city life to prevent urban sprawl and suburbanization, and improve the reputation of Kansas City as a world-class city. In George Kessler's lifetime, this plan was very successful. In 1917 an urban planning expert for the City of Philadelphia stated "Of all the actual accomplishments that American cities can boast, within the last twenty years, none surpass the park and parkways system of Kansas City. That system, by and of itself, is making that city world famous. European authorities, whether of Germany, England or France, freely admit that in their park systems American cities lead the world. And these foreigners point especially to Boston and Kansas City as the best examples of this branch of city planning." (Source: A Legacy of Design)

However, the planning of the Parks and Boulevard System also has a dark side—one that was formerly common in city planning that still has residual impacts today. Parts of the system were designed to displace residents and demolish low-income neighborhoods. Historian William H. Wilson said in The City Beautiful Movement in Kansas City that "Kessler and his associates demolished slums, unified and zoned the city, provided greatly expanded recreational facilities and replaced ugliness with beauty." J.C. Nichols was a major proponent of the system and also one of the most influential people in institutionalizing racism in Kansas City. It is through recognition of both the good and bad sides of the history of the system that we can move forward to a more inclusive, safe, equitable and happy community. By acknowledging the original ideals of the Park and Boulevard System, we can return to the intentions of the system: to provide for an elevated quality of life for residents. This can be achieved for all members of the community by making the street safer and more comfortable for all users and by improving the aesthetic beauty of the corridor. However, the focus must be first on communities with the most need--those historically disinvested neighborhoods with primarily low-income and high-minority populations. Additional information on historical context is shown in Figure 3.4.

Today, the coronavirus (COVID-19) pandemic, Centers for Disease Control and Prevention (CDC) guidance for social distancing, and the Black Lives Matter Movement are changing community expectations for freedom of movement and transportation facilities. Linwood Corridor residents and the Steering Committee have fond memories of the area's once thriving businesses and connected civic spaces. They are keenly focused on supporting existing neighborhoods and businesses while guiding Linwood Boulevard's transition from one of highest crash rate transportation routes in the city to one of the lowest. Anchored in community engagement and data analysis, the Linwood Corridor planning effort offers an opportunity to improve the transportation experience for all users and move the community forward towards a more equitable future.

Figure 3.1 - Linwood Boulevard Circa 1909

Figure 3.2 - Linwood Boulevard Sidewalks and Tree Allee Circa 1913

Figure 3.3 - Athenaeum Club on Linwood Boulevard Circa 1960

Historical Context of Black Communities on Linwood Boulevard

Slavery ended in 1863 with the Emancipation Proclamation. The City Beautiful Movement, which inspired landscape architect George Kessler to design and build a system of parks and boulevards for Kansas City, started during the 1890s and ended by the 1920s.

During City Beautiful and for decades thereafter, African Americans migrated north and west from the south, escaping Jim Crowe but facing "separate but equal" laws that cemented segregation practices everywhere else. In Kansas City, Missouri, African American were forced to live in the 18th and Vine area and prohibited from living west of Troost or farther south than 27th Street. Discrimination covered every facet of their lives, including but not limited to employment, housing, educational, and recreational access.

An historical example near the Linwood Corridor involves medical care and the siting of General Hospital No. 2. In 1914 the original Hospital No. 2 was the only medical center in the United States run entirely by African Americans and was only permitted to serve people of color. A 1927 fire triggered the need to build a new facility and the construction effort encountered numerous hurdles.

"The final obstacle to the new General Hospital No. 2 building was an intense debate over the location. The original plans were to build it on Michigan Avenue near 26th and 27th Streets, near the southern edge of the black residential area of town. The Linwood Improvement Association, which represented the white neighborhoods south of 27th Street, protested because of fear that blacks would be encouraged by the hospital to try to move into the all-white neighborhoods. The city conceded and chose a site on 22nd Street, farther north" (https://kchistory.org/week-kansas-city-history/separate-equal).

By 1940 most of Kansas City's scenic parks and boulevards system was built. Linwood Boulevard is one of its east-west routes but African Americans could not freely enjoy it prior to the Civil Rights era of the 1950s and 1960s. Anti-Black racism implemented through segregation and redlining legally kept them out. Eventually, a combination of White flight and the 1954 Supreme Court Ruling for Brown V. Board of Education, which made it illegal for states to segregate schools by race, opened Linwood and parts of Kansas City to African Americans and other people of color. Its defacto legacy still impacts the community, as Troost remains its north-south dividing line.

Figure 3.4 - Additional Information on Historical Context

Figure 3.5 - Historic Cross-Section Drawing of Linwood Boulevard

3.2 ORIGINAL DESIGN OF THE CORRIDOR

The original design of Linwood Boulevard (see Figure 3.5) was for a relatively narrow street within a wide right of way. This consisted of a typical 100-foot-wide right of way, with a 40-foot-wide street so that 30-foot-wide greenways could be constructed on either side of the street. The greenways identified in the System of Boulevards and Park Reservations (see Figure 3.6) included three rows of street trees and 8-foot-wide sidewalks. As Kessler said, “The object of this division is to give the whole a park-like effect, and an appearance differing radically from that of the ordinary residence street.”

Much of the right of way of the original Linwood Boulevard alignment remains today, with the exception of the segment between Main Street and Troost Avenue. However, throughout the 1950s and 1960s, many parts of the street were widened to provide more capacity for cars, eliminating the street trees and green space and placing pedestrians closer to motor vehicles. Traffic volumes increased and vehicle speeds increased leading to the current environment we have today, which is much different than the boulevard was originally envisioned. However, due to the maintained right of way in many locations, the character of the street can be easily retrofitted to more closely resemble the original design.

Karnes Boulevard is a much more intact boulevard, still closely resembling the original layout and boulevard ideal between Roanoke Road and 31st Street. However, the section of Karnes Boulevard between Wyoming Street and Roanoke Road was not designed as a boulevard originally as this section was designed as Roanoke Road and later the name was changed to Karnes Boulevard. (Source: A Legacy of Design) As a result, this section does not include the wide right of way and wide sidewalks, but still maintains a park-like atmosphere. Similarly, Valentine Road and Pennsylvania Avenue were not originally designed to the boulevard standard.

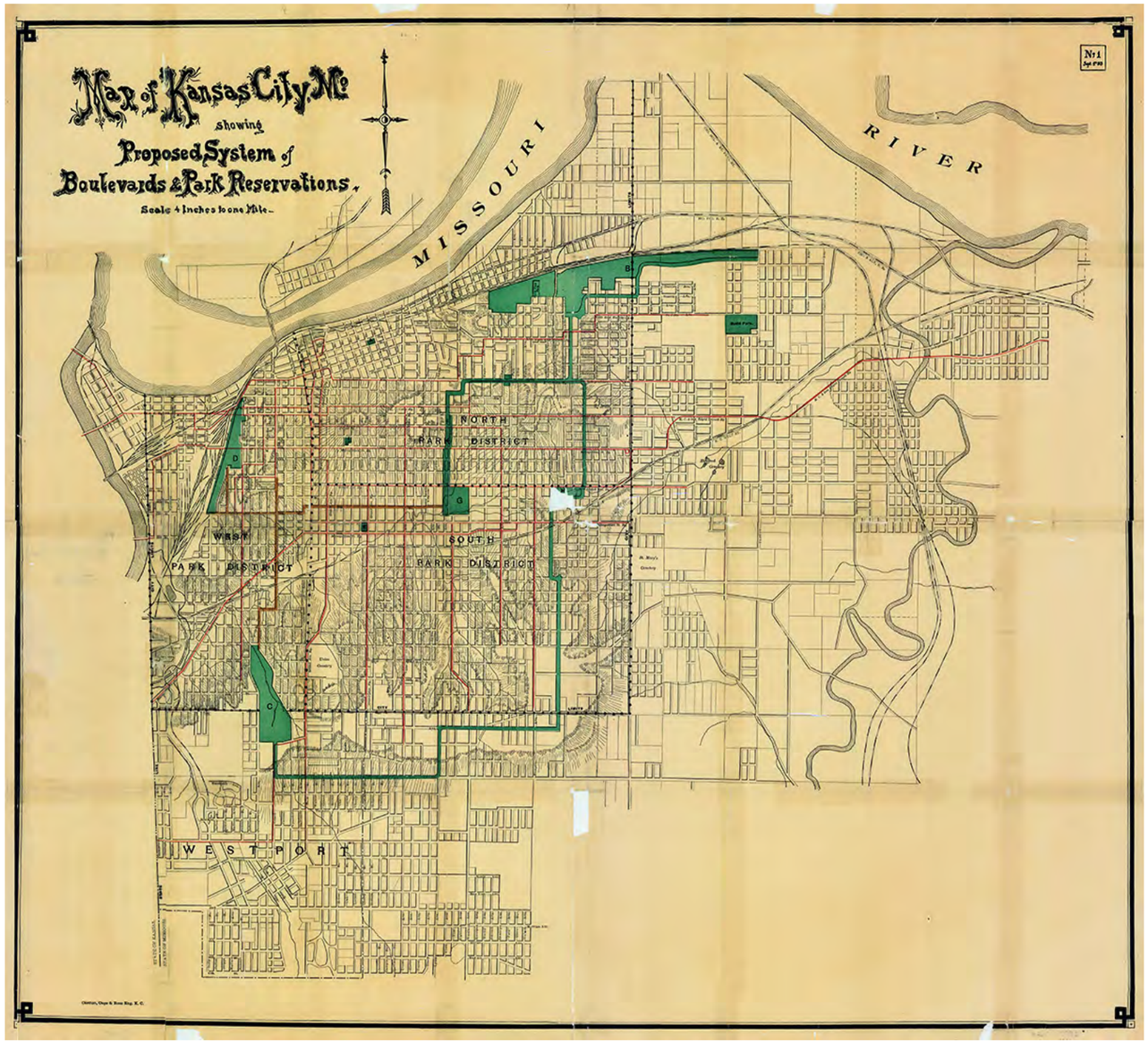


Figure 3.6 - Map of Proposed System of Boulevards and Park Reservations - 1893

3.3 COORDINATION WITH EXISTING PLANS

Many plans have been developed previously to guide the future of this area of Kansas City. To honor this work ensure that the recommendations within the Linwood Corridor Complete Streets Study are coordinated with those efforts, a review of existing plans was conducted. Each previous planning document was reviewed and evaluated in order to determine any applicable policies, projects, or recommendations that should be considered during the development of the Linwood Corridor Complete Streets Study. The following section is a summary of the results of that process.

3.4 LIST OF EXISTING PLANS

**Please see the appendices for further information on these documents.*

- Draft Bike KC Master Plan (2018)
- Kansas City Regional Bikeway Plan (2018)*
- Kansas City Complete Streets Ordinance (2017)
- Transit-Oriented Development Policy (2017)*
- Blue Ridge Area Plan (2017)*
- Midtown / Plaza Area Plan (2016)
- The Kansas City Parks and Boulevards Historic District / National Register of Historic Places Registration Form - Sections applicable to Linwood Boulevard (2016)*
- Next Rail Study (2013)
- Rock Island Corridor Report (2013)*
- Heart of the City Area Plan (2011)
- KC Parks - Boulevard & Parkway Standards (2010)
- Trails KC Plan (2008)*
- SmartMoves 3.0 (2005)*
- Kansas City Walkability Plan (2003)
- Kansas City Comprehensive Plan - FOCUS (1997)*

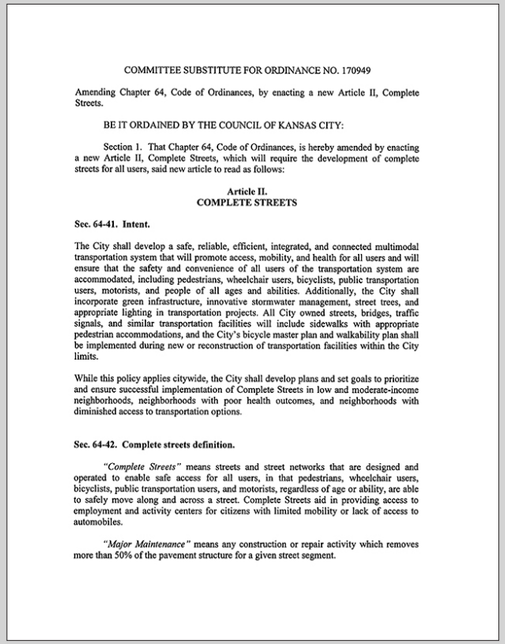
Figure 3.7 - Network Map

Draft Bike KC Master Plan (2018)

The 2018 plan is an update to the city's 2001 Bike KC plan. With things happening in Kansas City; like its first streetcar line since the 1950s, a vote to build a new single terminal international airport, the passing of the Complete Streets Ordinance and the positive reception of bikeshare programs and dockless scooters; an updated Bike KC Master Plan looks to continue the momentum. The plan recommends progressive approaches to bicycling infrastructure improvements and programs and provides a specific path forward to help Kansas City become more bicycle friendly. Several elements were factors in performing a technical analysis of the City's existing bike network which included:

- Crash Information
- Equity Information (life expectancy, vehicle accessibility)
- Topography
- Population and Activity Centers
- Level of Traffic Stress Analysis

The Linwood Corridor was identified as an essential East/West corridor and as a priority bikeway project in the plan's three-phased 5-year Priority Network. Approximately 658 centerline miles of roadway are recommended per the updated Bike KC Master Plan network. This includes three categories of facility types; major separation, minor separation and shared use. The plan recommends Major Separation along most of Linwood Boulevard as can be seen in the midtown and east detail network map in Figure 3.7 above.



COMMITTEE SUBSTITUTE FOR ORDINANCE NO. 170949

Amending Chapter 64, Code of Ordinances, by enacting a new Article II, Complete Streets.

BE IT ORDAINED BY THE COUNCIL OF KANSAS CITY:

Section 1. That Chapter 64, Code of Ordinances, is hereby amended by enacting a new Article II, Complete Streets, which will require the development of complete streets for all users, said new article to read as follows:

Article II.
COMPLETE STREETS

Sec. 64-41. Intent.

The City shall develop a safe, reliable, efficient, integrated, and connected multimodal transportation system that will promote access, mobility, and health for all users and will ensure that the safety and convenience of all users of the transportation system are accommodated, including pedestrians, wheelchair users, bicyclists, public transportation users, motorists, and people of all ages and abilities. Additionally, the City shall incorporate green infrastructure, innovative stormwater management, street trees, and appropriate lighting in transportation projects. All City owned streets, bridges, traffic signals, and similar transportation facilities will include sidewalks with appropriate pedestrian accommodations, and the City's bicycle master plan and walkability plan shall be implemented during new or reconstruction of transportation facilities within the City limits.

While this policy applies citywide, the City shall develop plans and set goals to prioritize and ensure successful implementation of Complete Streets in low and moderate-income neighborhoods, neighborhoods with poor health outcomes, and neighborhoods with diminished access to transportation options.

Sec. 64-42. Complete streets definition.

"Complete Streets" means streets and street networks that are designed and operated to enable safe access for all users, in that pedestrians, wheelchair users, bicyclists, public transportation users, and motorists, regardless of age or ability, are able to safely move along and across a street. Complete Streets aid in providing access to employment and activity centers for citizens with limited mobility or lack of access to automobiles.

"Major Maintenance" means any construction or repair activity which removes more than 50% of the pavement structure for a given street segment.

Figure 3.8 - Ordinance

Kansas City Complete Streets Ordinance (2018)

Kansas City adopted a complete streets Ordinance #170949 (see Figure 3.8)in December of 2017 that governs all new road construction and road reconstruction projects, the intent of which is the following:

"The City shall develop a safe, reliable, efficient, integrated, and connected multimodal transportation system that will promote access, mobility, and health for all users and will ensure that the safety and convenience of all users of the transportation system are accommodated, including pedestrians, wheelchair users, bicyclists, public transportation users, motorists, and people of all ages and abilities. Additionally, the City shall incorporate green infrastructure, innovative stormwater management, street trees, and appropriate lighting in transportation projects. All City owned streets, bridges, traffic signals, and similar transportation facilities will include sidewalks with appropriate pedestrian accommodations, and the City's bicycle master plan and walkability plan shall be implemented during new or reconstruction of transportation facilities within the City limits."

Figure 3.9 - Map of Bike and Trail Improvements

Midtown / Plaza Area Plan (2016)

The Midtown/Plaza Area Plan is one of the 18 area plans of Kansas City, MO. The plan is organized in a hierarchy of policies, starting with the Vision statement, a broad and high level policy, which is: "The Midtown/Plaza Area is a vibrant urban community where neighborhoods, businesses and institutions reinforce one another. The character and identity of the area creates a special sense of community that attracts lifelong residents, as the area evolves, respect is given to its historic development pattern and the safe, connected, diverse and sustainable environment is enhanced."

This Vision is further refined by Goals.
The goal related to transportation is:
Provide integrated modes of transportation (transit, bicycle, pedestrian, automobile, etc.) to get people from one place to another within and throughout the area plan (see Figure 3.9).

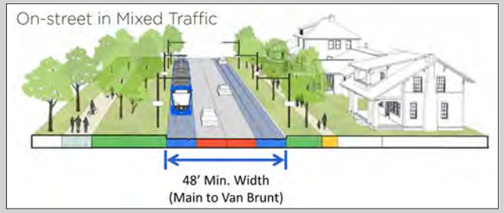


Figure 3.10 - Recommended Section for Linwood Boulevard

Next Rail Study (2013)

With the initial investment in streetcar infrastructure from River Market to Union Station, the foundation for a 21st Century fixed rail transit system to serve Kansas City has been laid. The next step is examining potential corridors to extend beyond the starter line. The NextRail Study identified eight corridors and evaluated fifteen alignment options with a goal of prioritizing which corridors are suited for detailed analysis. The following corridors were forwarded to the City Council for endorsement:

- Independence Avenue
- Linwood Boulevard/31st Street
- Main Street Plus

Recommendations for the 18th Street/ Southwest combined alignment also include an analysis of the potential for fixed rail transit service (see Figure 3.10).

Existing needs along Linwood Boulevard or 31st Street Corridor included:

- The corridor needs frequent, dependable transportation on nights and weekends.
- One day, people would like to ride a streetcar as far east as the stadiums.
- A streetcar along this corridor could drive the redevelopment of vacant commercial property along the corridor.
- A streetcar could encourage residents who have left to come back to the neighborhoods located along the route.
- There is both near-term and long-term redevelopment potential on this corridor.

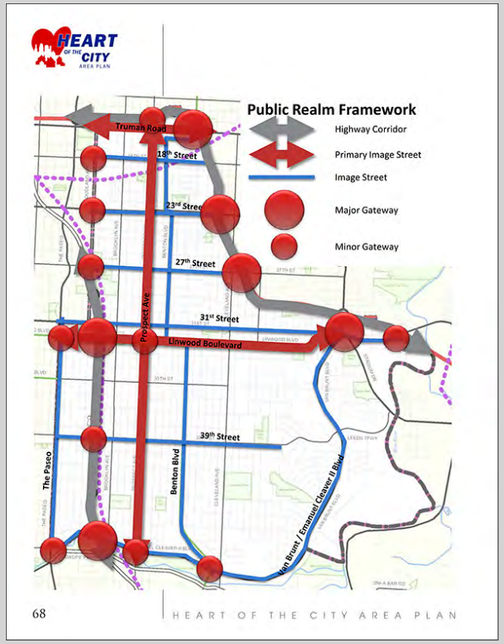


Figure 3.11 - Public Realm Framework Plan

Heart of the City Area Plan (2011)

The area of Kansas City, MO bounded by I-70 on the north, The Paseo on the west, Emmanuel Cleaver II Boulevard on the south and Blue River on the east is known as the Heart of the City. The Heart of the City Area plan was approved in April 2011 as Resolution No. 110159 and amended the Blue Valley Neighborhood, Oak Park North and Pak Park South Area Plans.

The public realm framework plan (see Figure 3.11) identified Linwood Boulevard as a:

- Candidate for a "Road Diet/Lane Narrowing"
- Key "image" street (streets that help set the "tone" of the area by establishing visual and aesthetic standards)
- Key transit corridor
- "Major gateway" at intersection of Linwood Boulevard and 31st Street/Prospect Avenue
- Proposed pedestrian zones at Linwood Boulevard and 31st/Prospect Avenue and at Van Brunt Boulevard

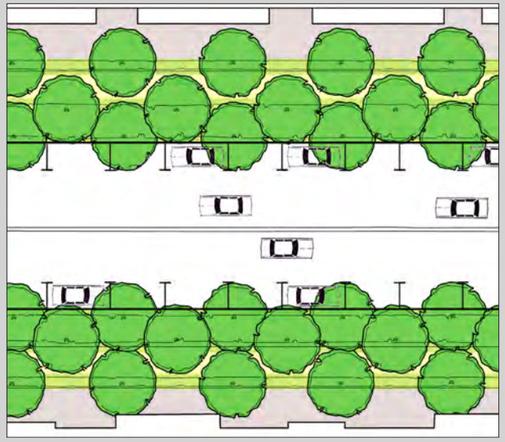


Figure 3.12 - Standard Boulevard Layout

KC Parks – Boulevard and Parkway Standards (2010)

The purpose of the Boulevard and Parkway Standards document is to preserve, protect, and extend the Kansas City, Missouri Parks and Boulevard System as first envisioned by the first board of Park Commissioners and George Edward Kessler in 1893. The entire parks and boulevards system and its effect on city development is representative of the American "City Beautiful" movement. Linwood Boulevard is considered one of the most significant works of George E. Kessler and his bold vision for a park and boulevard system in Kansas City. The planning and design criteria for boulevards and parkways differ from the general requirements used by the City. The standards and guidelines outlined in this document are based on the expectation to preserve the existing system as well as the appropriate expansion of the system to meet future needs. The Standard Boulevard Design (see Figure 3.12) include the following criteria for pedestrians/bicycles:

- Crosswalks – Brick or concrete pavers, or colored or stamped concrete
- Sidewalks – Minimum 8 foot on both sides
- Trails – No criteria
- Pedestrian Lighting – By Park Board approval
- Bike facilities – Yes (per Traffic Engineering & Design Section)

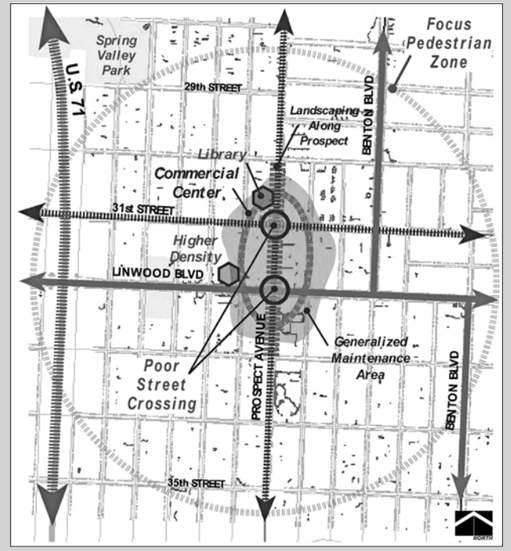


Figure 3.13 - Pedestrian Focus Zone

Kansas City Walkability Plan (2003)

The Kansas City Walkability Plan came into existence in 2003 to address a wide range of pedestrian issues in the city. There was a growing pedestrian safety concern and with multimodal planning efforts through the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, cities and municipalities began pedestrian research and planning which led to dedicated plans for pedestrians and walking like the Kansas City Walkability Plan.

This plan (see Figure 3.13) identifies where pedestrian demands exist, determines the current pedestrian system, recommends pedestrian improvements, establishes priorities for public investment in the pedestrian network and recommends changes to current codes, ordinances, standards and policies. The plan provides a systematic way to measure the quality of the pedestrian system in the community as defined as: Directness, Continuity Street Crossings, Visual Interest and Amenities, and Security.

4.0 CASE STUDIES

Urban shared use paths and mixed-mode bicycle networks are incredibly important for neighborhoods. In particular, urban trails can result in better health outcomes due to physical activity. They also provide economic benefits, such as revitalization activities and increased property values. Further, they offer additional mobility options, opportunities to build stronger community relationships, reduced pollution, and safer environments for all.

To better understand potential impacts, the team considered a number of case studies that are relevant to the Linwood Corridor project, primarily due to their scale, neighborhood geography, and intended connection to cultural and historic assets and amenities. These case studies included:

- Armour Road Complete Street; North Kansas City, MO
- St. Vincent Greenway; St. Louis, MO
- Centennial Greenway; St. Louis, MO
- Jackson Street Bikeway; St. Paul, MN
- Cultural Trail; Indianapolis, IN

Figure 4.2 - Example Facility from the St. Vincent Greenway

ST VINCENT GREENWAY; St. Louis, MO

Although too new to provide ridership figures, this 1.95-mile greenway connects from Forest Park, the regions largest public park with over 10M visitors per year, north through the Ruth Porter Mall Park along Etzel Avenue to Trojan Park. The urban greenway (see Figure 4.2) features a shared use path along a mixed-use commercial and institutional corridor, sharing a portion of its alignment with the Delmar Loop Trolley. At an estimated $3.2M, the trail also connects the disinvested areas of North St. Louis with light rail.

For further information see:
https://greatriversgreenway.org/st-vincent-greenway-master-plan/

Figure 4.4 - Example Facility from the Jackson St. Bikeway

JACKSON ST BIKEWAY: St. Paul, MN

As part of a the Capital City Bikeway Plan, this $16.5M complete streets reconstruction of Jackson Street in Downtown St. Paul also included a 1/2-mile portion of elevated, separate bike trail (see Figure 4.4) intended to link the waterfront at Shepard Road to11th Street and across Interstate-94. Running along the west side of the street for 9-blocks in front of and adjacent to existing businesses, the design includes sidewalks for pedestrians and landscaping buffers to separate the various forms of traffic.

For further information see:
https://www.stpaul.gov/departments/public-works/bicycles/capital-city-bikeway

Figure 4.1 - Example Facility from the Armour Road Complete Street

ARMOUR ROAD COMPLETE STREET; North Kansas City, MO

Estimated at $625K in implementation cost, the 0.6-mile, first phase of the Armour Road Complete Streets project (see Figure 4.1) included a road diet, mid-block crossings with pedestrian refuge islands, intersection bumpouts, protected bike lanes, high-visibility crossings, on-street parking, and signal optimization. The project has resulted in improved safety, reduced speeds, and reduced police citations at an estimated 18:1 benefit-to-cost ratio over a 20-year project life cycle.

For further information see: http://www.nkc.org/departments/community_development/current_projects/armour_road_complete_street

Figure 4.3 - Example Facility from the Centennial Greenway

CENTENNIAL GREENWAY; St. Louis, MO

Completed in 2011, this 0.67-mile length of mode-separated bike and pedestrian path (see Figure 4.3) is an urbanized portion of a 20-mile greenway network intended to eventually connect multiple suburban communities of St. Louis with Washington University in St Louis' Main Campus. The 16' wide facility connects from the student center to Forest Park along the south side of the campus, providing warning paving, wayfinding signage, lighting, and other amenities that provides students with a safe, comfortable walking and biking environment.

For further information see: https://greatriversgreenway.org/centennial-greenway-master-plan/

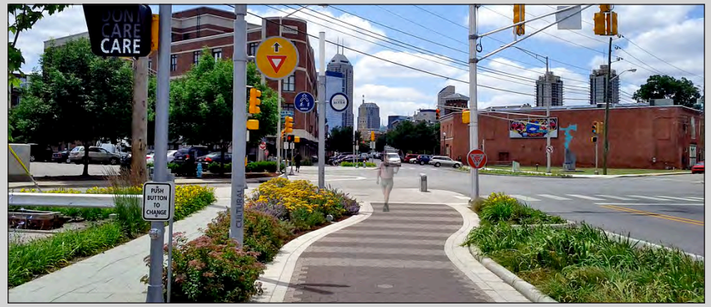


Figure 4.5 - Example Facility from the Cultural Trail

CULTURAL TRAIL; Indianapolis, IN

At a total estimated implementation cost of $63 million, the Indianapolis Cultural Trail is an internationally-acclaimed 8-mile biking and walking trail (see Figure 4.5) connecting all six of Indy's Cultural Districts, including Massachusetts Avenue, Fountain Square, The Canal & White River State Park, Indiana Avenue, the Wholesale District, and Broad Ripple. The latest economic impact report indicates that properties within1/8-mile of the trail increased 148% since 2008 resulting in $1B increase in assessed property value with over 1 million users per year.

For further information see: https://indyculturaltrail.org/

5.0 DATA ANALYSIS

5.1 EXISTING CONDITIONS

A data-driven approach was utilized for decision making during the Linwood Corridor Complete Streets study. As part of the project, the team assembled data on existing conditions and compiled it using GIS mapping. The data was collected from the City of Kansas City, the Mid-America Regional Council, the Kansas City Area Transportation Authority (RideKC) and the US Census Bureau. This data was mapped to show different areas of needs, trends, and features in the Linwood Corridor area. Primary data sets included traffic crashes, traffic volumes, and demographics. The data was also assembled into an online dashboard to help the public and Steering Committee members better understand the corridor. This dashboard contains all of the data collected and can be viewed here (https://dashboards.mysidewalk.com/linwood-psp) and excerpts of this data are included in this document.

In general, the Linwood Corridor:

- Is **losing population** (23% population decline since 1990)
- Has **older residents** on average (median age 37 years) than the city on average but also has **more millennials** (41%) than the city and region on average
- Is **more diverse** average (56% racial/ethnic minority population) than the city and region on, but still has a **division in the racial and ethnic makeup** in the middle segment of the corridor at Troost Avenue (see Figure 5.3)
- Has **lower median household** incomes than the city and region as a whole ($37,000 median income) and a **substantially higher poverty rate** (24%, see Figure 5.2)
- Has a **double the share of zero car households** compared to the city as a whole (20%, see Figure 5.5), and a **transit mode share nearly three times** higher (8%, see Figure 5.4)

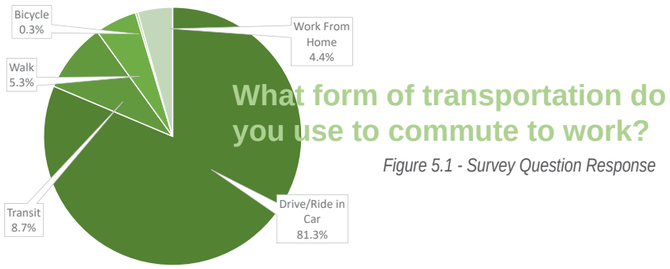


Figure 5.1 - Survey Question Response

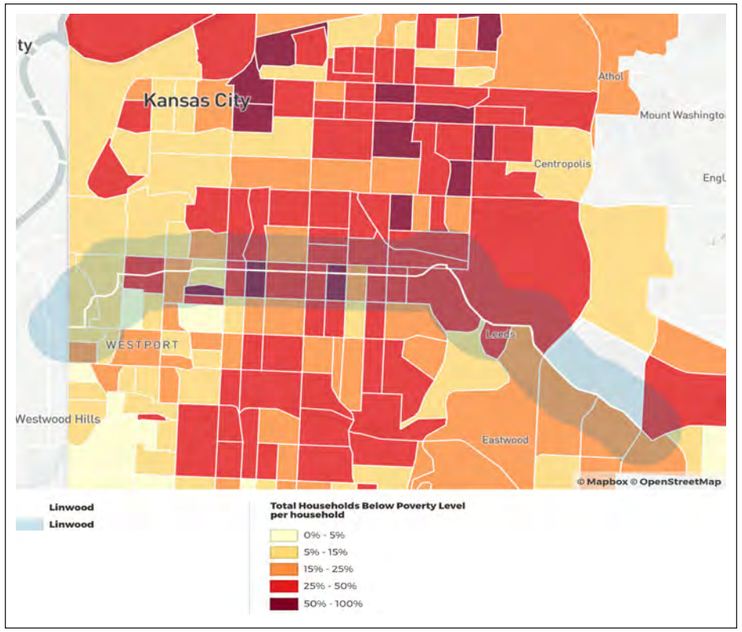


Figure 5.2 - Map of Households Below the Poverty Level

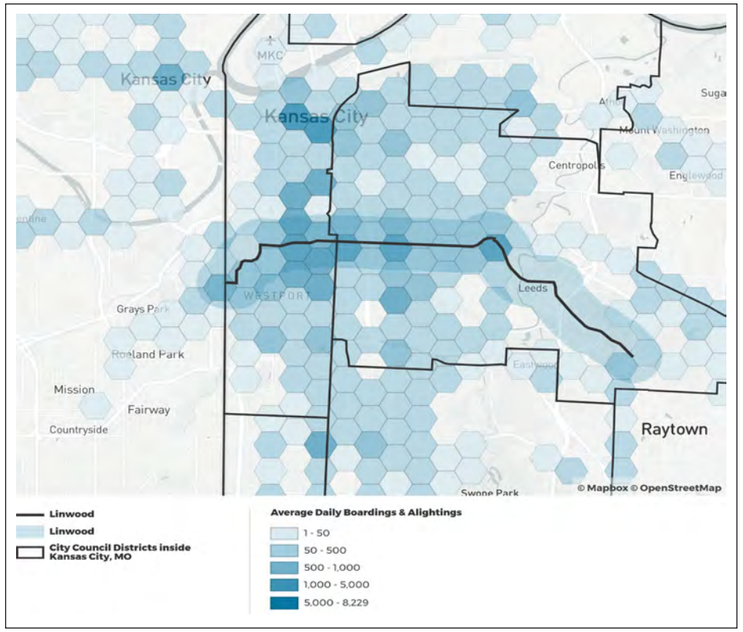


Figure 5.4 - Map of KCATA Bus Ridership

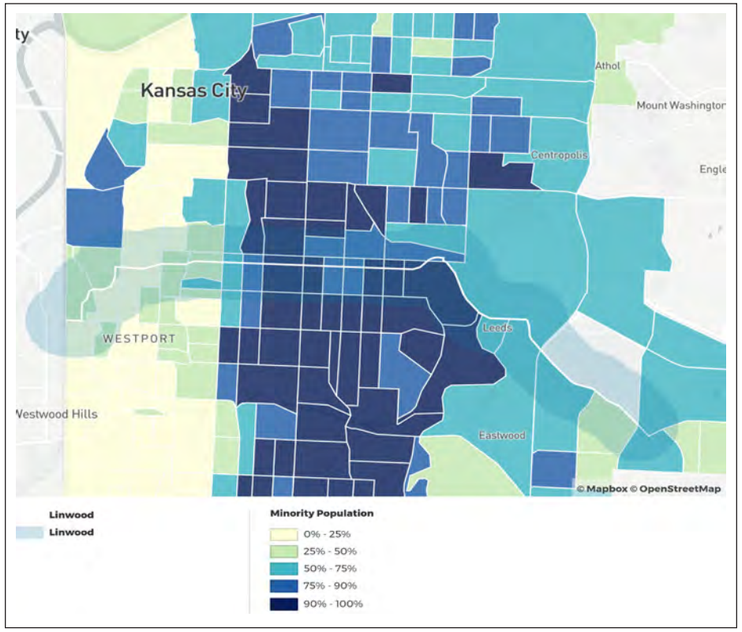


Figure 5.3 - Map of Minority Populations

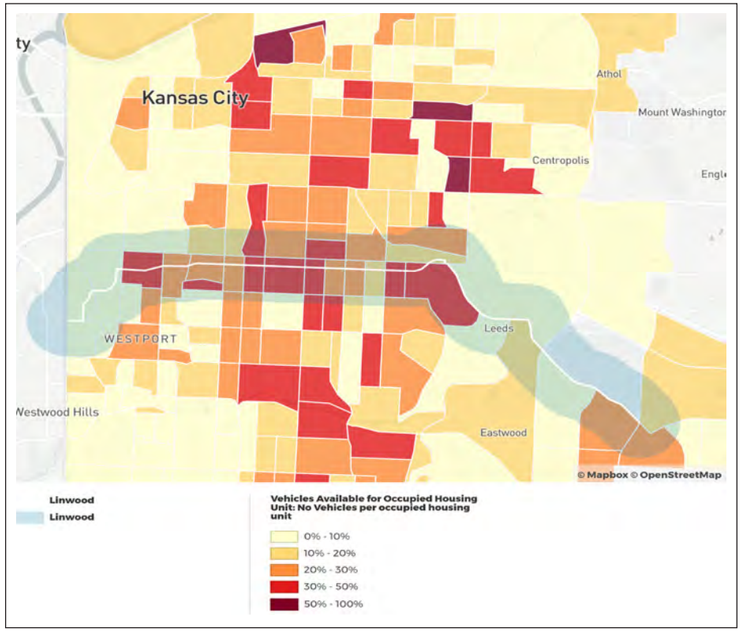
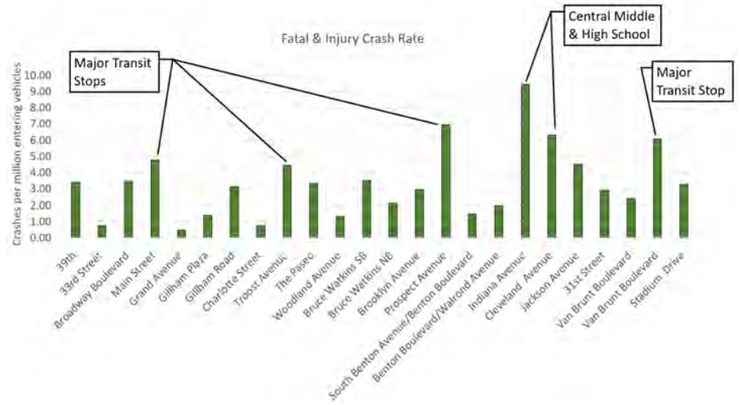


Figure 5.5 - Map of Zero Vehicle Households

Figure 5.6 - Fatal Injury Crash Rates along Linwood Corridor



Comment Classification	Total	Share of Total
Dangerous	**141**	**18%**
Crossing Street Challenging	**121**	**15%**
Drivers Speeding	**114**	**14%**
No Dedicated Bike Infrastructure	55	7%
Uncomfortable Experience	51	6%
Drivers Don't Yield/Illegal Maneuvers	48	6%
Overly Wide Street/Need Road Diet	46	6%
Signal Timing/Detection Issues	43	5%
Complex/Confusing Intersection	40	5%

Figure 5.7 - Number of Crashes as a Share of the Total Crashes

Figure 5.8 - Map of Walking Issue Hotspots

Figure 5.9 - Map of Biking Issue Hotspots

Figure 5.10 - Map of Driving Issue Hotspots

5.2 TRAFFIC SAFETY ANALYSIS

Traffic safety on the Linwood Corridor was noted as a top concern from the outset of the project and remained at the forefront of the discussion for the public and Steering Committee members throughout the process. This is not without reason, as discovered in the traffic safety analysis on the corridor. The data revealed that intersections along the corridor have, on average, a crash rate six times higher than the typical statewide crash rate on similar streets. On average as a result of traffic crashes on the Linwood Corridor:

- **One person dies every year**
- **One person is disabled every two months**
- **One person is injured every three days**

These numbers are startlingly high for a street corridor like the study area. The chart above (see figure 5.6) shows the rates of traffic injuries, deaths, and a general crash rate - which is the number of crashes relative to the amount of traffic traveling through the intersection. These figures allow for an apples-to-apples comparison among intersections to determine relative danger and need for safety interventions.

The data shows an equal comparison between intersections to determine which intersections have the most safety need. **The highest rates of injury & fatal crashes occur at the intersections with major transit transfer points and at the intersections on either side of Central High School and Central Middle School.**

By using the methodology contained in the Highway Safety Manual, it is possible to quantify the total crash cost to society resulting from costs like property damage, medical bills, insurance claims, lost productivity, lawsuits, and mental pain and anguish. Based on the number of deaths, injuries, and property damage crashes on the Linwood Corridor, **the total crash cost to society over the past 10 years has added up to approximately $200 million.**

The crash data collected was supplemented with crowd-sourced data through an online survey. The top comments (see Figure 5.7) related to the corridor being dangerous, the high speed of cars, and the difficult to cross the major streets on the Linwood Corridor. Survey respondents were also asked to pin locations on a map where it was difficult or felt unsafe to walk, bike, and drive and note what the specific issues were. Maps (see figure 5.8, 5.9, and 5.10) were created indicating those locations and an analysis of the comments received were made.

Using the Highway Safety Manual, forecasts on the reduction of crashes can also be made. An analysis was made to predict the impact of the concept plan shown in Section 6 of this report. This analysis was done in a conservative manner, and the safety benefits are likely even greater than predicted with this study. That analysis determined that if these improvements were implemented, over the next 20 years at least:

- **Three fatal crashes could be prevented**
- **Fourteen disabling injury crashes could be prevented**
- **301 injury crashes could be prevented**
- **$81.6 million in crash cost savings could be realized**

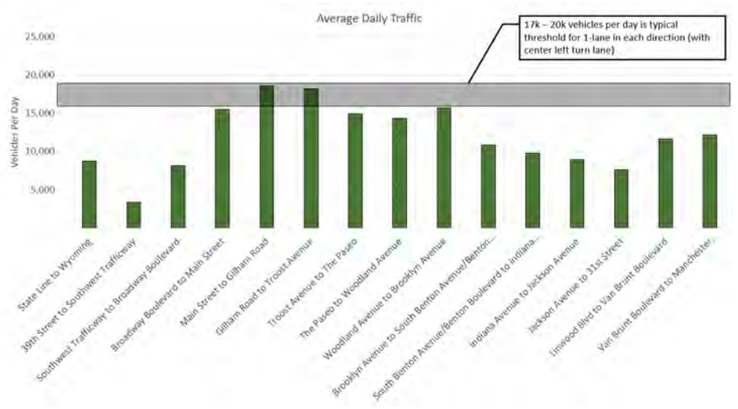


Figure 5.11 - Graph of Traffic Volumes Along Linwood Corridor

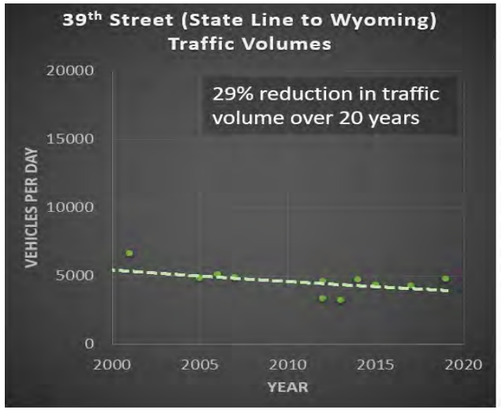


Figure 5.12 - Trends in the Western Section of the Corridor

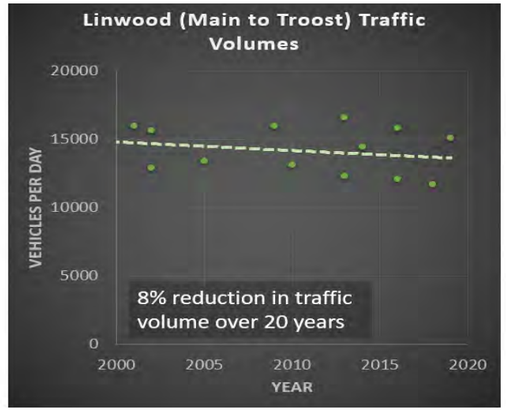


Figure 5.13 - Trends in the Central Section of the Corridor

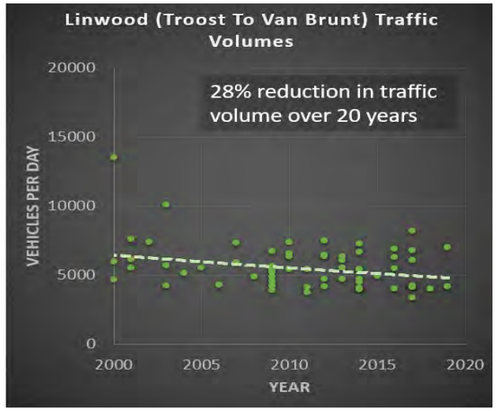


Figure 5.14 - Trends in the Eastern Section of the Corridor

5.3 TRAFFIC OPERATIONS ANALYSIS

A traffic analysis was completed to determine potential impacts to motor vehicle operations as a result of proposed changes. The ability to drive efficiently on a corridor is an essential function of a street. However, it is not the only function, especially in an area like the Linwood Corridor, where many users are on foot, bike, or utilizing transit for transportation purposes. If changes are recommended to the street layout, an estimate of the impacts is needed so that the public and City staff can make informed decisions. To estimate these impacts, a traffic analysis was conducted.

Existing traffic volumes were collected for all of the corridor traffic signals over the past 20 years. These traffic volumes were used to estimate traffic trends and to determine existing and predicted operations. The charts on this page (see Figure 5.11) depict the traffic volumes on the corridor. **In all areas of the corridor, traffic volumes have reduced.** In the western (State Line Road to Wyoming Avenue, see Figure 5.12) and eastern (Troost Avenue to Van Brunt Boulevard, see Figure 5.14) sections, the traffic volumes have dropped drastically—there is almost 30% less traffic on the corridor today than in 2000. The central section through the heart of Midtown (see Figure 5.13) has seen less dramatic traffic volume decreases, with just an 8% reduction in traffic volumes since 2000. Based on these trends, no growth in traffic is expected in the future.

For the most part, **traffic volumes fall within the threshold of operating well with a 2-lane or 3-lane (two lanes plus a center turn lane) roadway.** The chart on this sheet (see Figure 5.11) shows the vehicles per day on each segment of the corridor. All segments except between Main Street and Troost Avenue fall under the typical threshold for 2-lane/3-lane roads. To determine the impacts of a reduction in the number of lanes on Linwood, a traffic model was generated using the latest traffic volumes. The first scenario tested was to reduce the number of lanes along the entire corridor so that the whole corridor was either a 2-lane or 3-lane road. The model showed that this significantly impacted traffic operations in the segment between Main Street and Troost Avenue. This section saw a 4-minute increase in travel time over the 0.75-mile-long segment. The Steering Committee and City staff felt that this was too onerous of an impact.

A second traffic model scenario was tested where the section from Main Street to Troost Avenue remained 5-lanes wide and the rest of the corridor was 2-lanes or 3-lanes. **This second scenario predicts no significant impact to traffic at any location on the corridor.** The "Level of Service" for each of the traffic signals along the corridor are noted on this page (see Figure 5.15). This is a measure of how much time a driver has to wait at the traffic signal. None of the traffic signals show a lower level of service after the lane reduction than before. The number of traffic lanes in this model were used to develop the concept design in this report. A full technical memorandum describing the traffic analysis is contained in the appendix of this report.

	Level of Service			
39th Street	**AM Existing**	**AM Lane Reduction**	**PM Existing**	**PM Lane Reduction**
State Line Road	B	B	B	B
Wyoming Street	A	B	B	B
Roanoke Street	A	B	B	B

	Level of Service			
Linwood Boulevard	**AM Existing**	**AM Lane Reduction**	**PM Existing**	**PM Lane Reduction**
Soutwest Trafficway	B	B	C	C
Broadway Avenue	B	C	D	D
Main Street	B	C	E	E
Grand Avenue	A	A	B	B
Gillham Plaza	B	C	F	C
Gillham Rd	C	A	B	A
Street	B	A	A	B
Troost Avenue	C	C	E	D
Paseo Street	D	C	C	C
Woodland Avenue	B	A	C	B
Bruce Watkins SB	A	B	C	B
Bruce Watkins NB	B	C	A	B
Brooklyn Avenue	A	A	B	B
Prospect Avenue	B	A	B	C
South Benton Avenue	A	A	A	A
Benton Boulevard	A	A	A	A
Indiana Avenue	A	A	A	B
Cleaveland Avenue	A	A	B	B
Jackson Avenue	A	A	B	B
31st Street Extension	B	B	B	C
Van Brunt Boulevard	B	B	B	B

Figure 5.15 - Levels of Service for all Traffic Signals Along Linwood Boulevard

Improvements	Address Concerns from Public?															Achieve Project Goals?						Predicted Safety Benefit		Combined Score
	Dangerous	Crossing Street Challenging	Drivers Speeding	No Dedicated Bike Infrastructure	Uncomfortable Experience	Drivers Don't Yield/Illegal Maneuvers	Overly Wide Street/Need Road Diet	Signal Timing/Detection Issues	Complex/Confusing Intersection	Poor Sidewalks	Lack of Transit Options	Car Congestion	Missing Sidewalks	Poor Pavement Quality	Poor Visibility		Reduce Deaths & Injuries	Improve Multimodal Connections	Improve Access	Restore Historic Character	Promote Redevelopment				
	18%	15%	14%	7%	6%	6%	6%	5%	5%	3%	2%	2%	2%	2%	2%	Overall User Issue Score (out of 5)	4.5	4.4	3.9	3.8	3.6	Overall Goals Score (out of 5)	Crash Reduction Potential	Overall Safety Score (out of 5)	Overall Combined Score (out of 5)
Improve Intersection Geometry	Yes	Yes	Yes			Yes	Yes		Yes			Yes			Yes	3.6	Yes	Yes		Yes	Yes	4.0	47%	2.4	3.3
Narrow Road (Reduce # of Lanes)	Yes	Yes	Yes		Yes		Yes		Yes					Yes		3.5	Yes	Yes		Yes		3.1	65%	3.3	3.3
Install Frequent Safe Ped/Bike Crossings	Yes	Yes	Yes	Yes	Yes	Yes				Yes					Yes	3.7	Yes	Yes	Yes		Yes	4.1	40%	2.0	3.3
Increase Bike/Ped Buffer & Green Space		Yes	Yes	Yes	Yes					Yes						2.4	Yes	Yes		Yes	Yes	4.0	N/A*	N/A*	3.2
Install Protected Bike Infrastructure	Yes	Yes	Yes	Yes	Yes	Yes										3.5	Yes	Yes	Yes		Yes	4.1	39%	2.0	3.2
Improve Lighting	Yes	Yes			Yes										Yes	2.2	Yes	Yes		Yes	Yes	4.0	59%	3.0	3.0
Improve Signal Timing/Detection/Infrastructure	Yes	Yes			Yes	Yes		Yes	Yes			Yes				3.0	Yes	Yes	Yes			3.2	50%	2.5	2.9
Improve/Widen Sidewalks					Yes					Yes			Yes			0.6	Yes	Yes	Yes	Yes	Yes	5.0	N/A*	N/A*	2.8
Reduce Speed Limit	Yes	Yes	Yes		Yes	Yes										3.1	Yes	Yes		Yes		3.1	6%	0.3	2.2
Maintain/Improve Parking			Yes		Yes							Yes			Yes	1.3	Yes		Yes		Yes	3.0	N/A*	N/A*	2.1
Improve Maintenance	Yes				Yes					Yes		Yes	Yes	Yes		1.7	Yes	Yes		Yes	Yes	4.0	11%	0.6	2.1
Plant Trees			Yes		Yes											1.1		Yes		Yes	Yes	2.9	N/A*	N/A*	2.0
Add Turn Lanes	Yes					Yes			Yes			Yes				1.6	Yes		Yes		Yes	3.0	26%	1.3	2.0
Reduce # of Driveways & Driveway Width	Yes				Yes	Yes			Yes	Yes		Yes				2.1	Yes	Yes		Yes		3.1	12%	0.6	1.9
Remove Unwarranted Signals	Yes					Yes		Yes				Yes				1.6	Yes			Yes		2.1	24%	1.2	1.6

Figure 5.16 - Improvements Scoring Matrix

5.4 IMPROVEMENTS SCORING MATRIX

Utilizing the background data, crowd-sourced data, and project vision and prioritized goals, a set of potential improvements were envisioned. These improvements were then scored against three criteria:

- **How well each improvement addressed specific issues noted by the public**
- **The potential for each improvement to achieve the prioritized project goals**
- **What the potential crash reduction potential was for each improvement according to the Highway Safety Manual**

The criteria were then combined into an overall score indicating which improvements were most likely to be beneficial to the corridor. This scoring matrix (see Figure 5.16) helped guide the decision making to develop the project alternate concepts, which where then presented to the public and refined into the final concept design in partnership with the Steering Committee, City staff, and staff of other governmental agencies.

Figure 6.1 - Linwood Corridor Route Map

6.0 CONCEPT PLAN

The Linwood Corridor route (see Figure 6.1) was selected based on the documented and clear safety needs of the users in the corridor, the high number of important destinations on the corridor, and the high use of transportation modes alternate to personal vehicles. The data analysis and public involvement activities undertaken with this plan further highlighted the needs of the corridor and reinforced the importance of providing safety, multimodal mobility, and aesthetic improvements on the corridor. No demolition of existing buildings or acquisition of private property will be needed for implementation of the improvements in this concept plan.

A range of possible improvements were explored as they related to the corridor challenges noted by the public and Steering Committee members and as related to project goals and quantitative safety benefits. Using the selection methodology, as described in the Data Analysis chapter, along with coordination with the Steering Committee and City staff, several preliminary concepts alternates were developed for each of the corridor segments. These alternates, along with the option to leave the corridor in its current configuration, were presented to the public at the March 3 public open house and complimentary online survey. In every case, the public indicated a strong preference for change according to the improvement concepts presented.

The concept alternates preferred by the public were then refined through the process of evaluating feasibility related to avoiding private property acquisition, minimizing construction costs, and avoiding utility relocations while still providing the desired types of improvements. The refined concept was then reviewed by staff from the Kansas City Planning Department, Parks & Recreation Department, Public Works Department, Streetcar Authority, Mobility Committee, and the Kansas City Area Transportation Authority (RideKC) along with the Steering Committee members and several Neighborhood Associations. Further refinements were made after this process of review, and the concept plan detailed on the following pages represent the recommended concept design of this plan.

39th Street West Area

This area (see Figure 6.2) starts at the state line on 39th Street in the 39 West District. Overall this area is already relatively walkable, bikeable, and safe. So only minor interventions are proposed. The most significant change is on 39th Street between Wyoming Avenue and Roanoke Road. This section is a 4-lane road with parking allowed in off-peak traffic times. However, the lanes are very narrow and the road effectively operates as a 2-lane road today. 4-lanes of traffic capacity are not needed based on the traffic volume, so this plan proposes 39th Street be converted to 2-lane road with parking on both sides between Wyoming Avenue and Roanoke Road (mirroring the configuration that currently exists between State Line Road and Wyoming Avenue).

Traffic calming elements have already been planned on 39th Street at Genessee Street and Terrace Street and on Wyoming Avenue at 38th Street. The need for these is reinforced by this study. 39th Street, Wyoming, and Roanoke Road/Valentine Road are also indicated with a need for traffic calming measures. These improvements could look like other traffic calming measures already in place on Karnes Boulevard, Valentine Road, and Pennsylvania Avenue in the area. Improvements to the Roanoke Road & Valentine Road intersection are also detailed on this page. These improvements will provide a safer and less confusing intersection at this location.

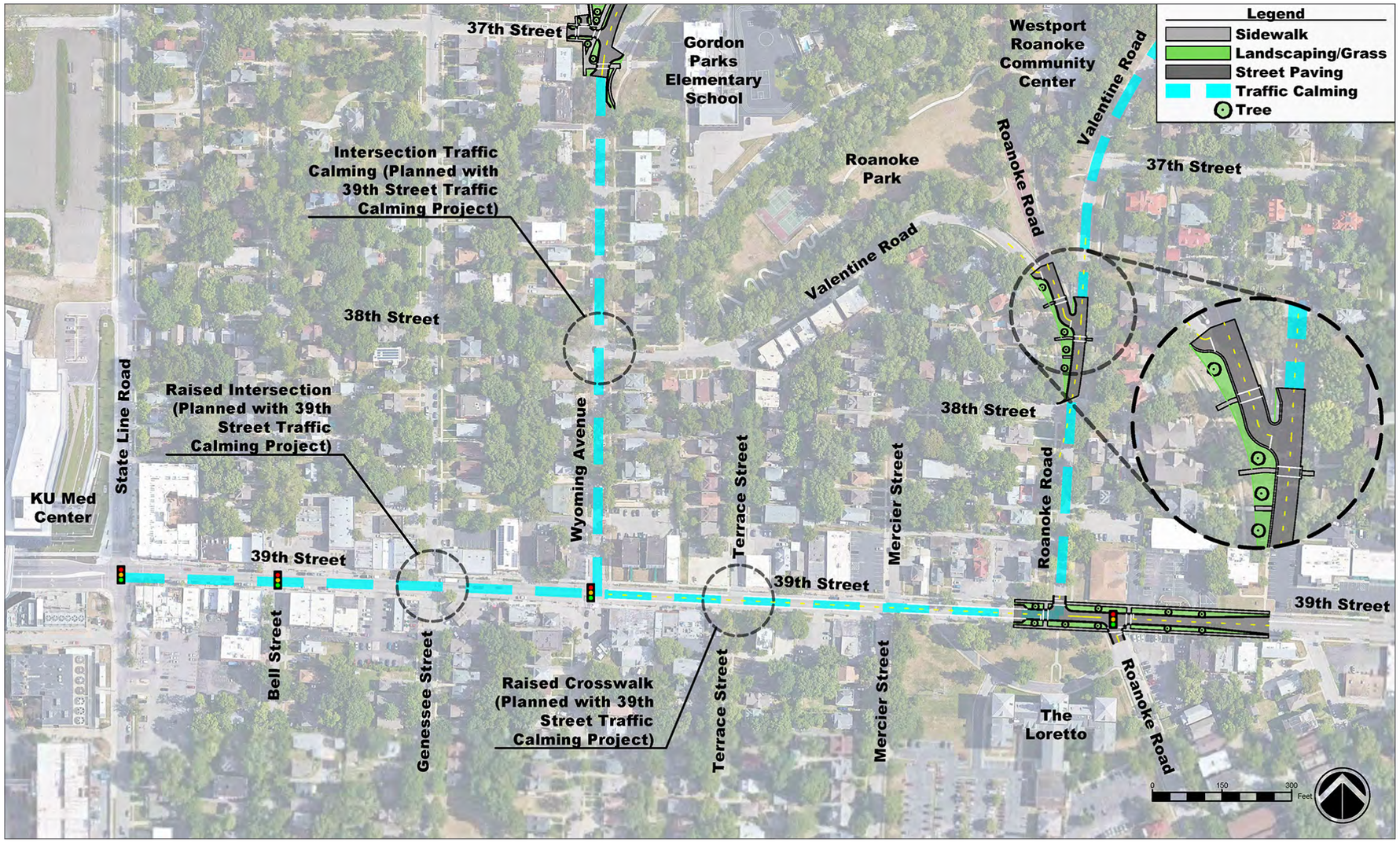
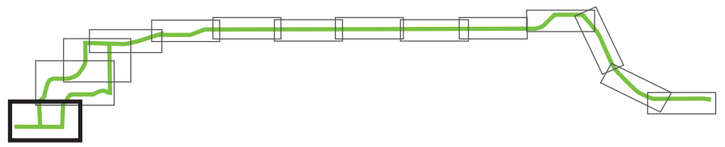
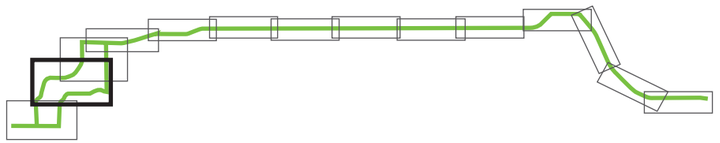


Figure 6.2 - 39th Street West Area: Plan Rendering on 39th Street from State Line Road to Roanoke Road, and Wyoming Avenue and Roanoke Road between 39th Street and 37th Street.

Locator Map



Locator Map



Roanoke Park Area

Two routes were chosen through the Roanoke Park section of the corridor (see Figure 6.3). These routes are on Wyoming Avenue/Karnes Boulevard and Roanoke Road/Valentine Road. Significant grade change is experienced on Wyoming Avenue/ Karnes Boulevard, so bicycling is not comfortable here for casual cyclists. Roanoke Road/Valentine Road has much less grade change, and is preferable for cyclists. For this reason, the Roanoke Road/Valentine Road route was identified to provide a comfortable cycling experience through the neighborhood. However, there are many pedestrian-oriented amenities on Wyoming/Karnes Boulevard such as the Gordon Parks Elementary School and Roanoke Park amenities. For this reason, a route was maintained on this alignment primarily for pedestrians.

Improvements on the Roanoke Road/Valentine Road route in this area consist of minor traffic calming improvements. The most significant improvement on this corridor will be to modify the traffic signal at Southwest Trafficway & Valentine Road to promote safe and comfortable crossings of this major thoroughfare. These improvements should include providing bicycle and pedestrian detection, minimum green times for cyclists, and lengthening the cycle length to provide sufficient pedestrian crossing time.

More substantial improvements are recommended on Karnes Boulevard, especially in the segment between Wyoming Avenue and Roanoke Road (see Figure 6.4). In this segment, pedestrian access is very difficult due to limited sidewalks and sidewalks with access only by stairs. It is recommended that the roadway width be narrowed to the typical 12' wide lanes to provide space for a 10' wide shared use path on the west side. Improvements (see Figure 6.5) are detailed to the Karnes Blvd/ Wyoming Avenue & 37th Street intersection as well to provide safe and less confusing access at this location. Beyond these changes, it is recommended that sidewalks along Karnes Boulevard be expanded to 10' wide paths up to 34th Street.

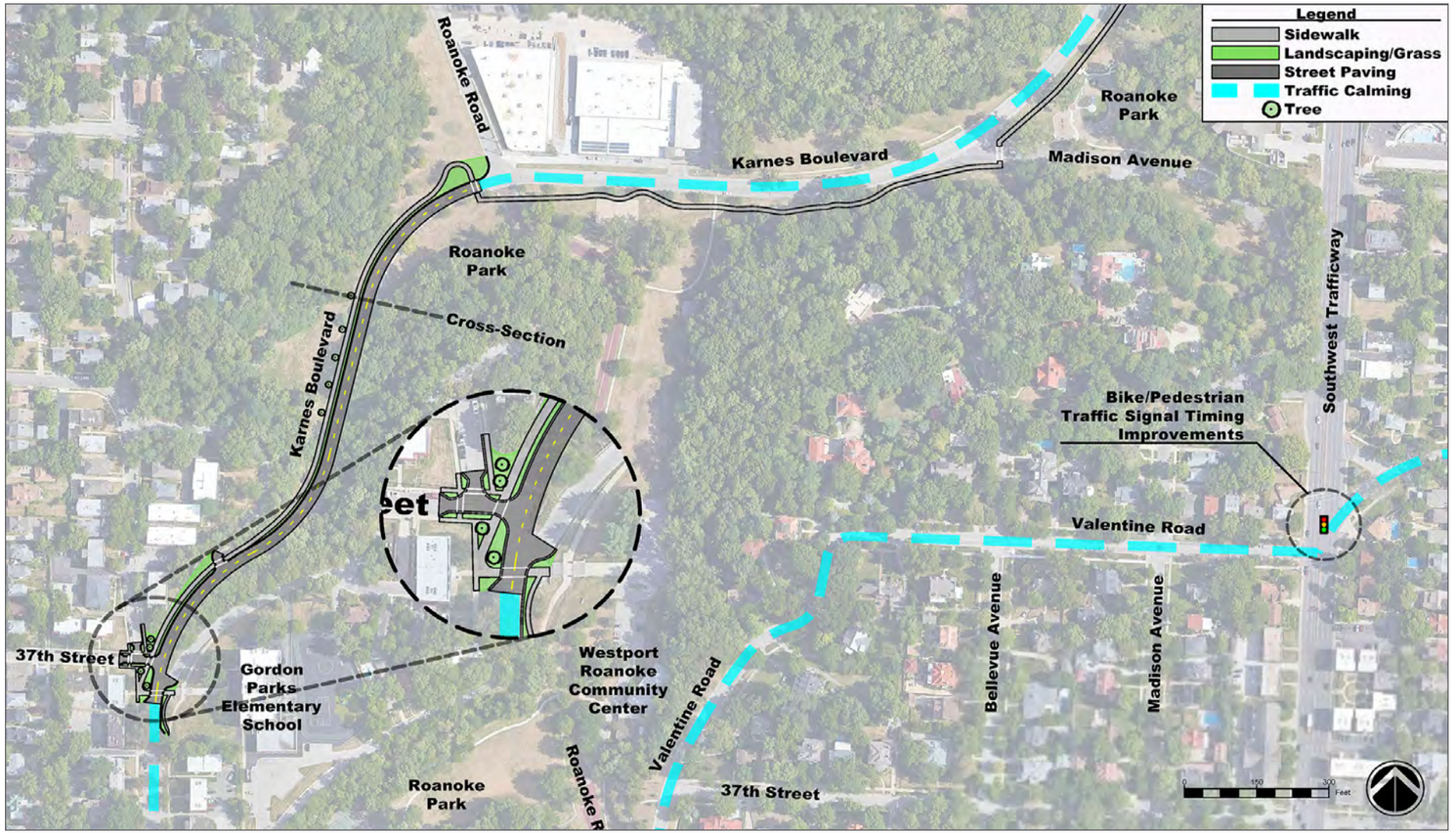


Figure 6.3 - Roanoke Park Area: Plan Rendering on Wyoming Avenue / Karnes Boulevard and Valentine Road

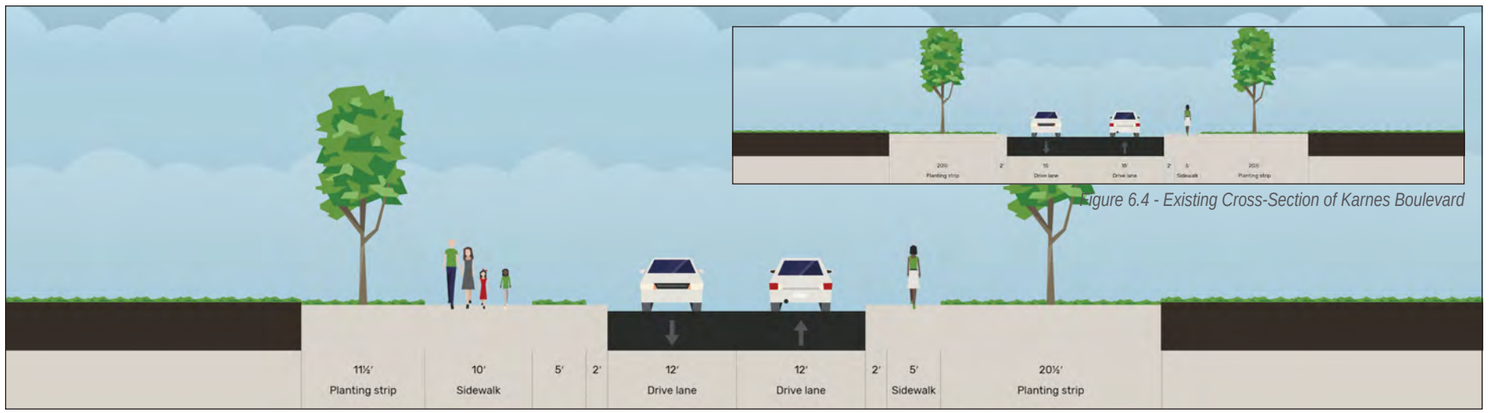


Figure 6.4 - Existing Cross-Section of Karnes Boulevard

Figure 6.5 - Proposed Cross-Section of Karnes Boulevard

Coleman Highlands Area

This section continues the two paths for cyclists—Valentine Road, Pennsylvania Avenue—and for pedestrians—Karnes Boulevard, 33rd Street. Minor improvements (see Figure 6.6) are planned on these roads in the form of modified traffic calming measures on Pennsylvania Avenue and improved sidewalks on Karnes Boulevard and 33rd Street. The sidewalks along Karnes Boulevard currently have curbs across the sidewalk at each driveway making it difficult or impossible for handicapped users and other wheeled users such as kids on bicycles or adults pushing strollers to use the sidewalks. Reconstructing the sidewalks will improve mobility in this area.

This section also includes proposed improvements to the traffic signal at Southwest Trafficway to improve the safety and comfort of crossings of this major thoroughfare.

Starting on 33rd Street at Pennsylvania Avenue more substantial improvements are recommended. In this section, it is recommended the curb line be modified to provide space for a 14’ wide shared use path on the south side of the street. This 14’ wide shared use path will extend from Pennsylvania Avenue to Gillham Plaza.

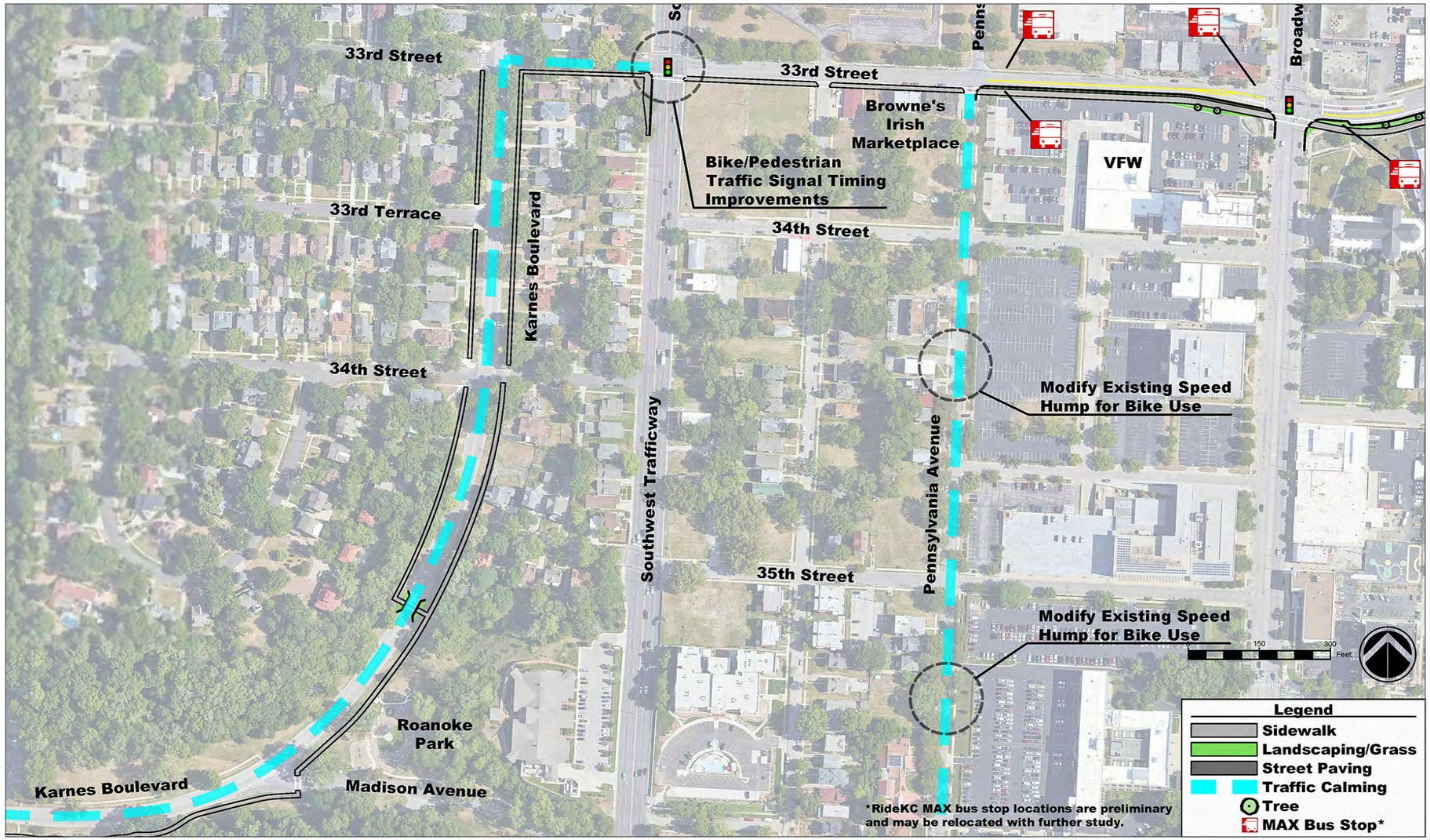
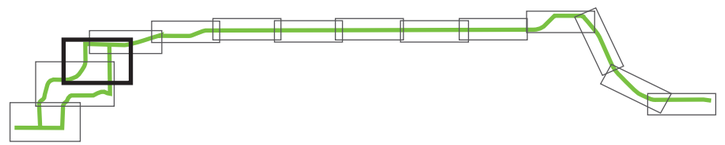


Figure 6.6 - Coleman Highlands Area: Plan Rendering on Wyoming Avenue / Karnes Boulevard and Valentine Road

Locator Map



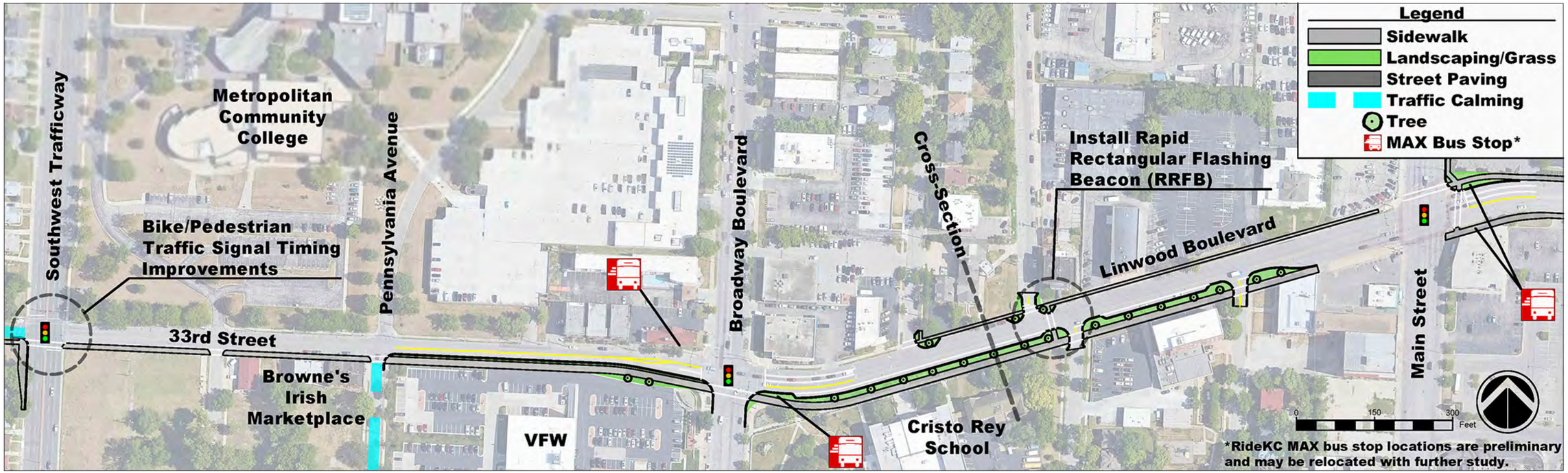
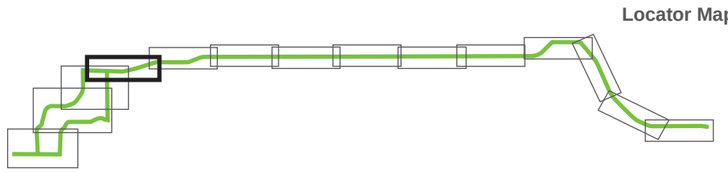


Figure 6.7 - Plan Rendering of 33rd Street and Linwood Boulevard from Southwest Trafficway to Main Street



33rd Street and Linwood Boulevard: Southwest Trafficway to Main Street

In this section (see Figure 6.7), Linwood Boulevard is narrowed from the current 4-lane configuration (see Figure 6.8) with parking to a 3-lane configuration (see Figure 6.9) with parking to accommodate a new 14' wide shared use path on the south side of the road, expanded landscaping areas for trees, and shortened crossing distances for pedestrians. Traffic modeling indicates this change will not impact vehicle operations on the corridor. The rendering (see Figure 6.10) on the following page depicts these improvements. This section is also where a future Linwood MAX transit line could potentially begin/end, either at Pennsylvania Avenue or Broadway Boulevard. Potential stop locations have been noted, but are subject to change after the KCATA completes the upcoming feasibility study (planned to start in late 2020).

Figure 6.8 - Existing Cross-Section of Linwood Boulevard between Broadway Boulevard and Main Street

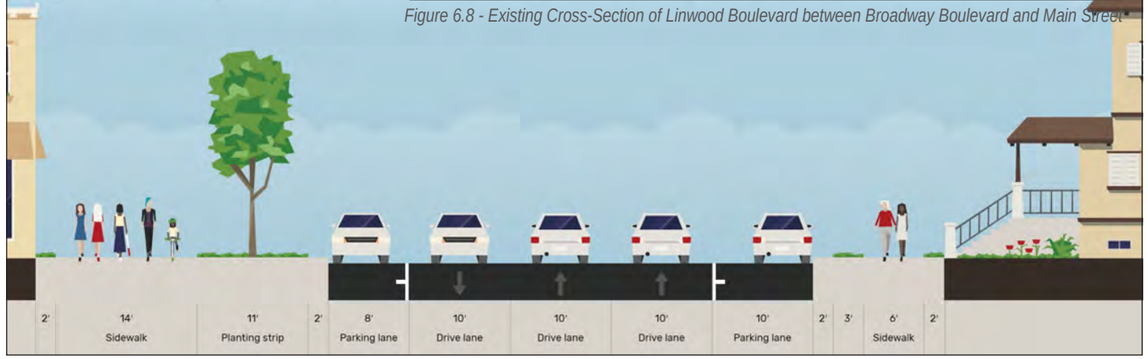


Figure 6.9 - Proposed Cross-Section of Linwood Boulevard between Broadway Boulevard and Main Street

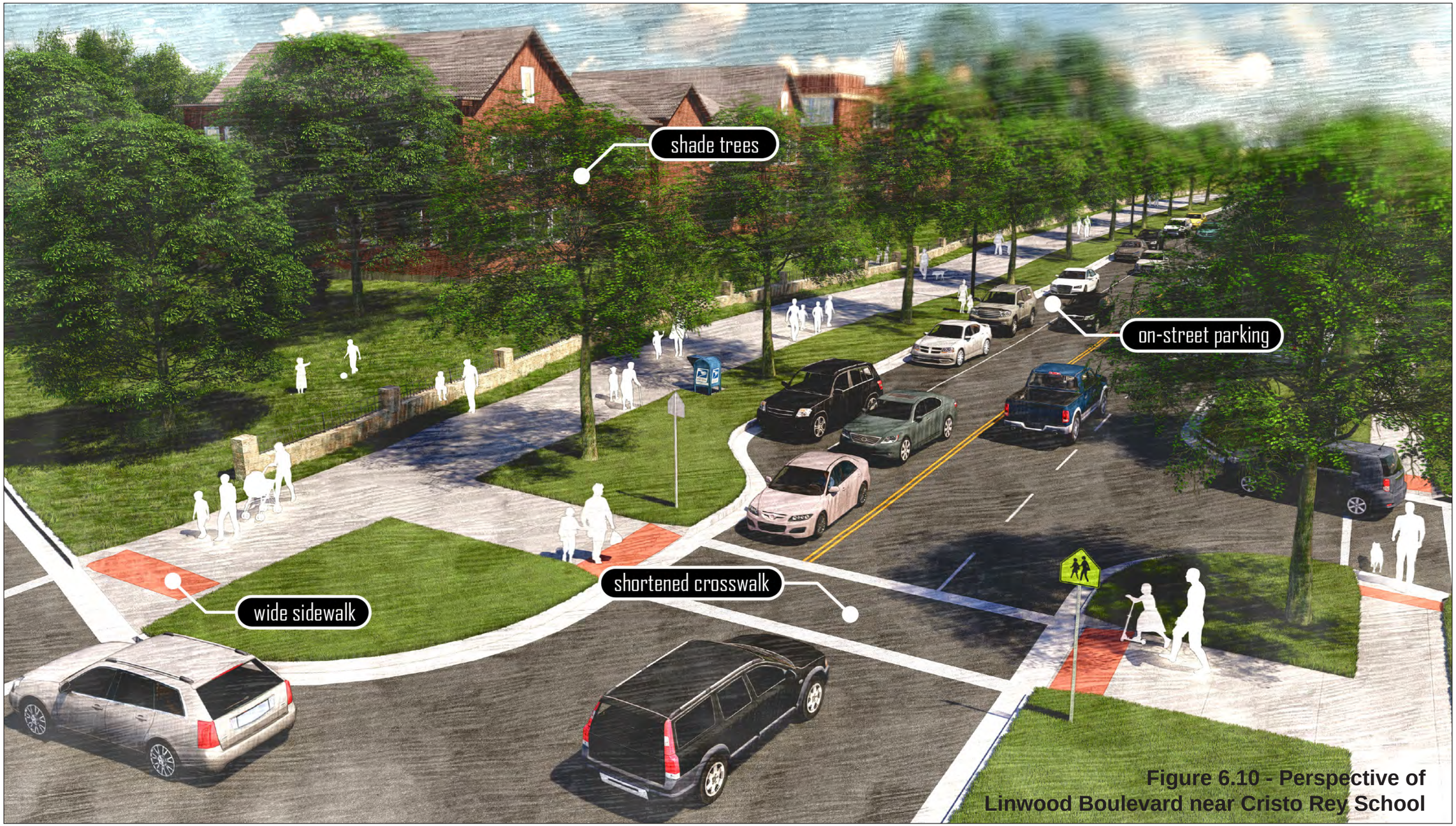


Figure 6.10 - Perspective of Linwood Boulevard near Cristo Rey School

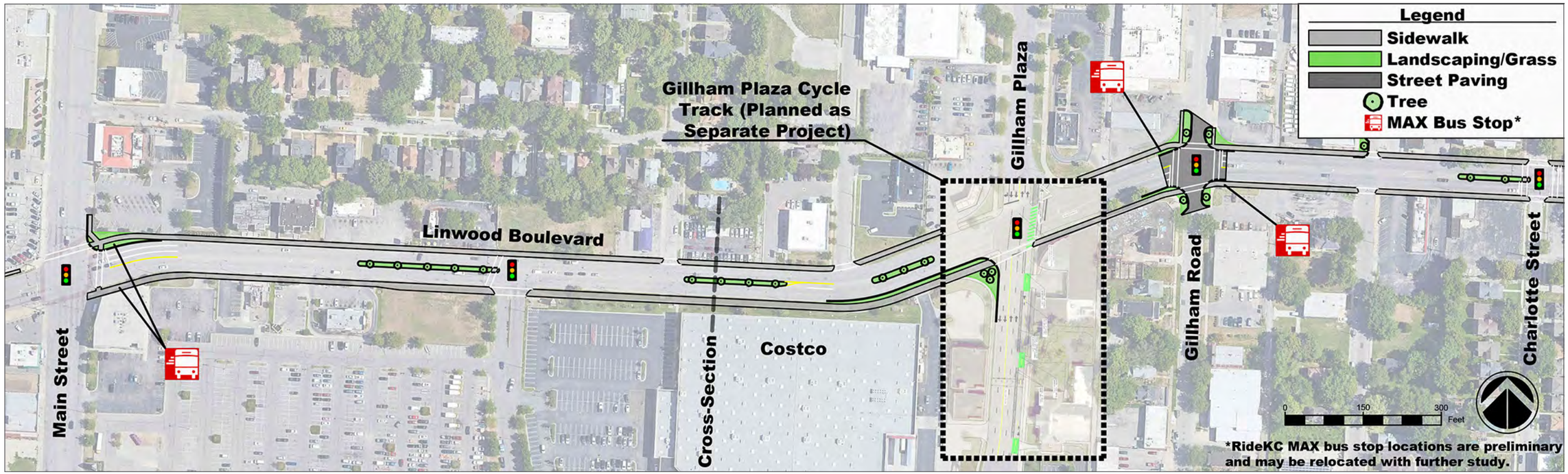
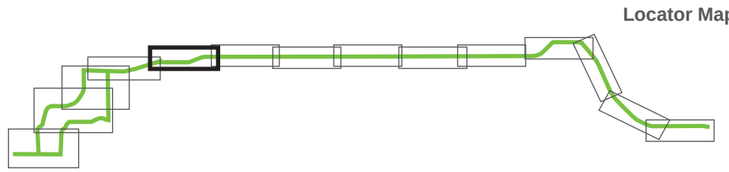


Figure 6.11 - Plan Rendering of Linwood Boulevard from Main Street to Charlotte Street



Linwood Boulevard: Main Street to Charlotte Street

Because of higher traffic volumes and the narrow overall width of Linwood Boulevard (see Figure 6.11 and 6.12) between Main Street and Troost Avenue, no reduction of lanes is proposed. A lane reduction would severely impact travel time adding approximately five minutes of additional travel time between Main Street and Troost Avenue, and narrowing the street could impact the future streetcar extension. However, improvements (see Figure 6.13) are planned for this corridor in the form of reconstructed sidewalks, a widened 12' - 14' wide shared use path on the south side of the street, improved intersection geometries, and median islands. These improvements are intended to slow cars, improve bicycle and pedestrian safety at intersections, and provide sufficient space for bicyclists and pedestrians to operate together off the street. A rendering (see Figure 6.14) showing these improvements is included on the following page.

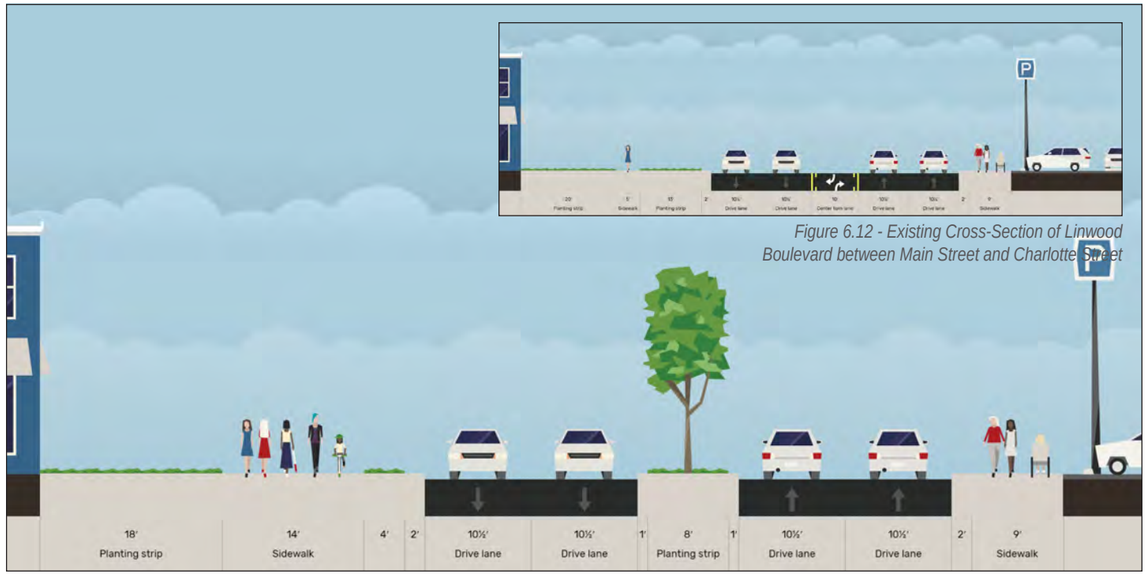


Figure 6.12 - Existing Cross-Section of Linwood Boulevard between Main Street and Charlotte Street

Figure 6.13 - Proposed Cross-Section of Linwood Boulevard between Main Street and Charlotte Street

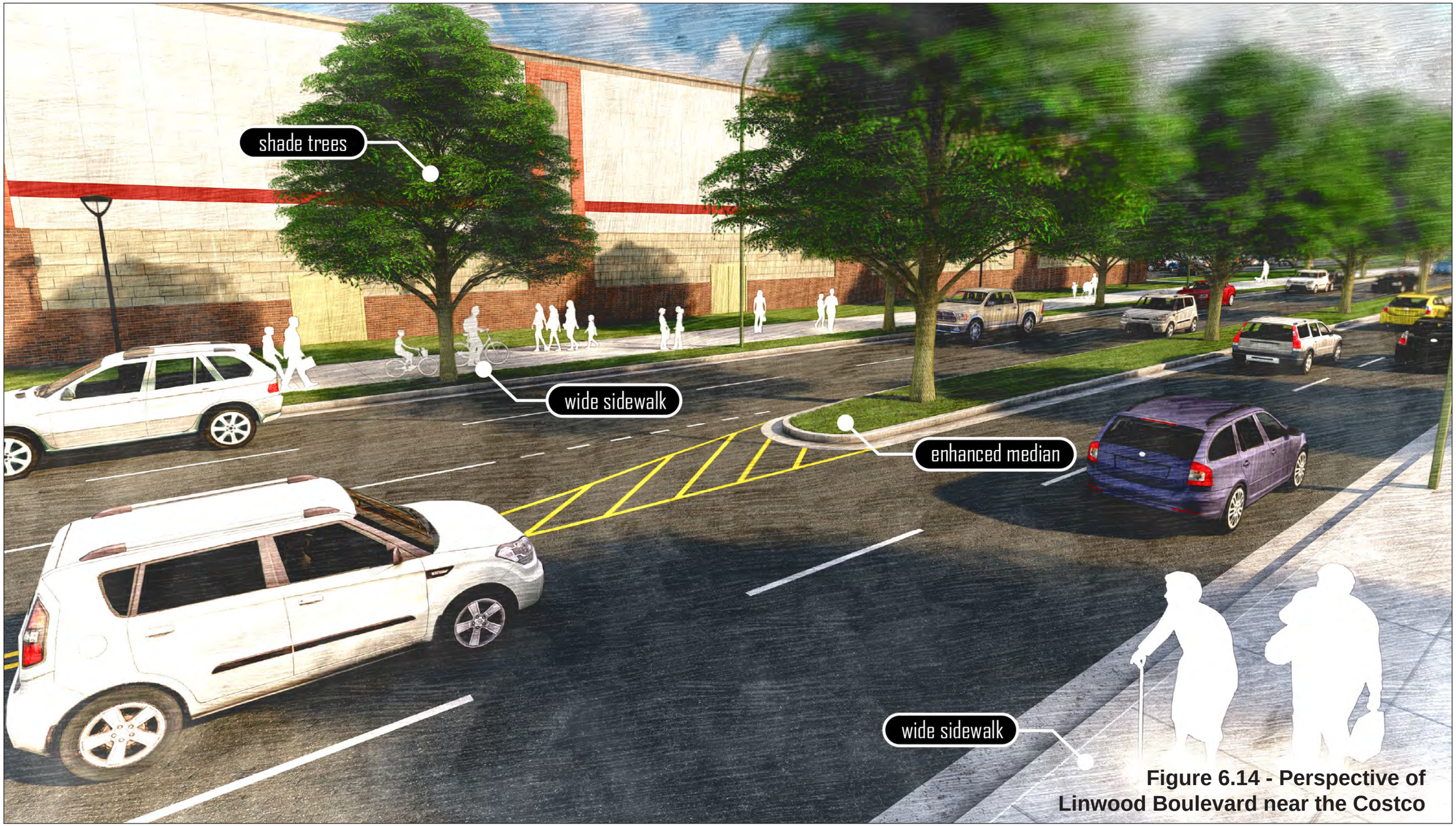


Figure 6.14 - Perspective of Linwood Boulevard near the Costco

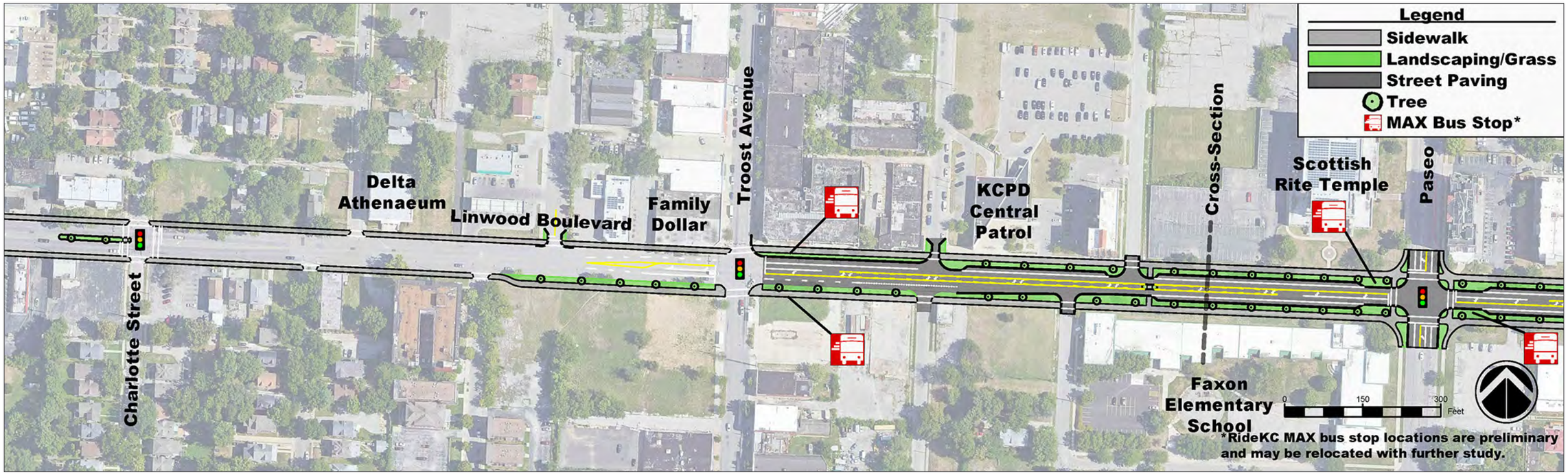
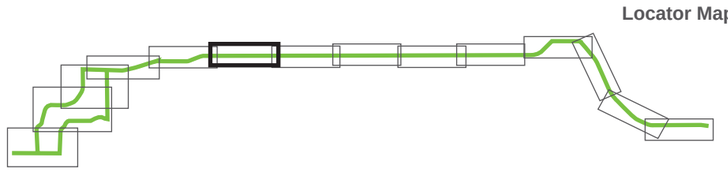


Figure 6.15 - Plan Rendering of Linwood Boulevard from Charlotte Street to Paseo



Linwood Boulevard: Charlotte Street to Paseo

At Troost Avenue, the traffic volume on Linwood Boulevard (see Figure 6.15) decreases and the overall roadway width and right of way (see Figure 6.16) increases, allowing for a reduction in the number of lanes without impacting traffic operations or the ability to construct streetcar in the future. Starting east of Troost, the roadway (see Figure 6.17) is narrowed to 3-lanes wide (two lane road with a center turn lane) with parking on either side. This allows space to add 12' wide shared use paths on both sides of the street, room for high quality transit stops for a future Linwood MAX bus, expanded landscaping areas wide enough to grow mature trees, and safer pedestrian/bike crossing of the street. No demolition of existing buildings or acquisition of private property is needed for this modification.

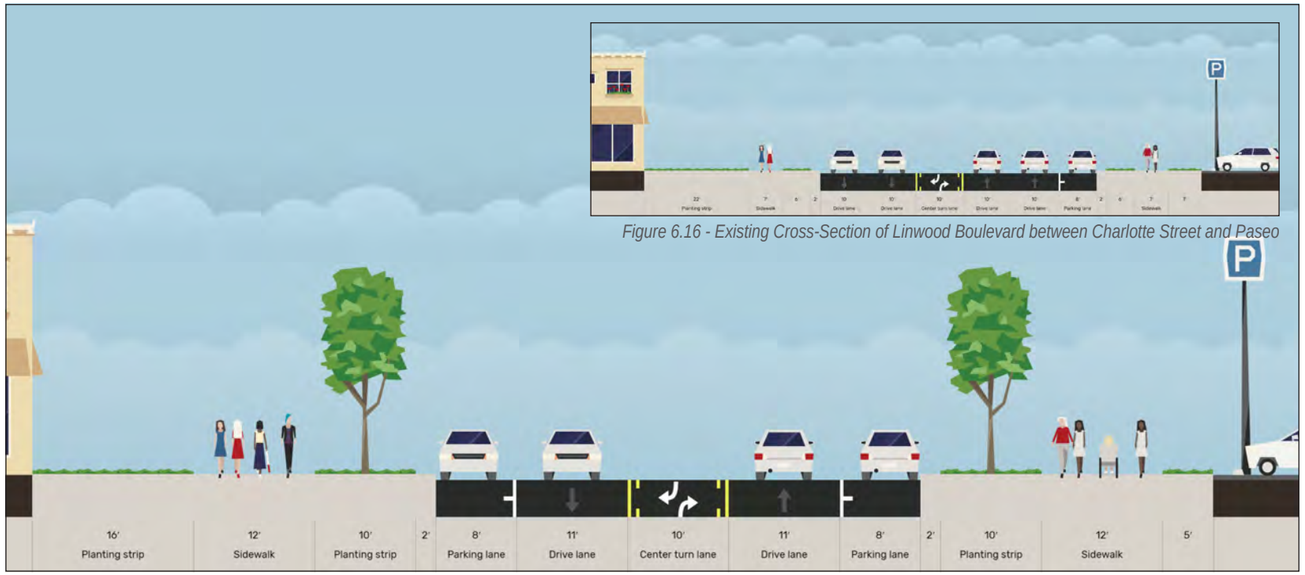


Figure 6.16 - Existing Cross-Section of Linwood Boulevard between Charlotte Street and Paseo

Figure 6.17 - Proposed Cross-Section of Linwood Boulevard between Charlotte Street and Paseo

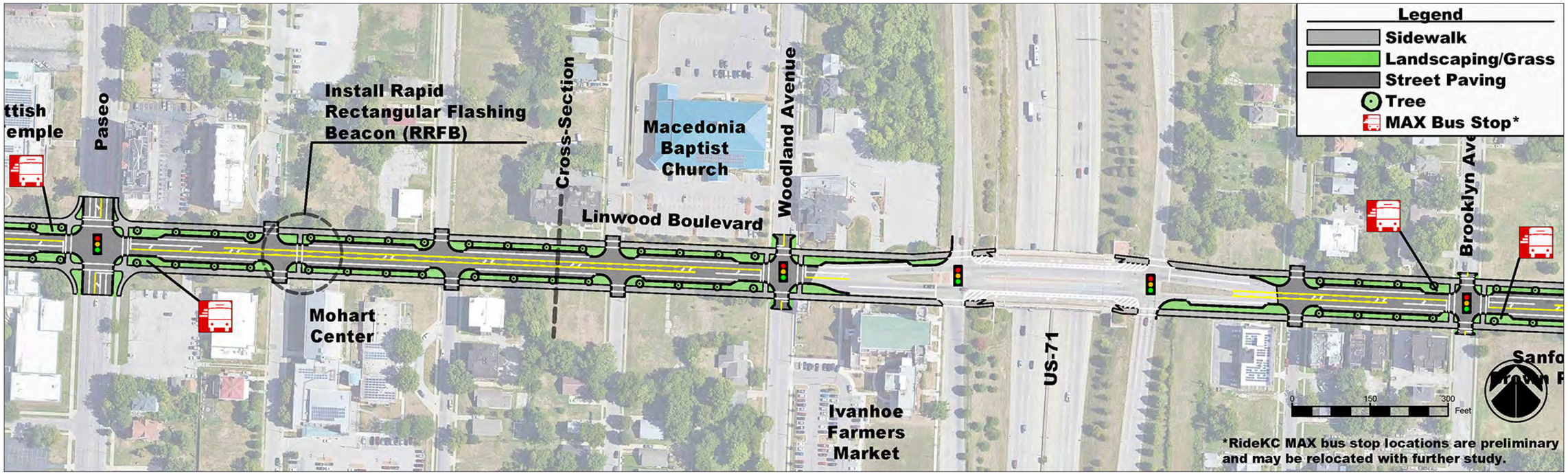
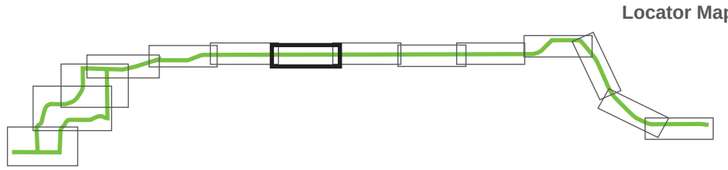


Figure 6.18 - Plan Rendering of Linwood Boulevard from Paseo to Brooklyn Avenue



Linwood Boulevard: Paseo to Brooklyn Avenue

The same basic cross section is envisioned from Troost Avenue (see Figure 6.18 and 6.19) all the way to 31st Street, with some modifications at the US-71 Hwy interchange to avoid reconstruction of the bridge. This layout (see Figure 6.20) will dramatically improve safety on the corridor by reducing vehicle speeds, introducing a continuous turn lane to avoid cars turning left from a through-lane, decreasing the distance that pedestrians and cyclists are exposed to cars when crossing the street and providing ample space for cyclists and pedestrians to comfortably travel off the street. A rendering (see Figure 6.21) showing the concept improvements from Troost Avenue to 31st Street is included on the following page.

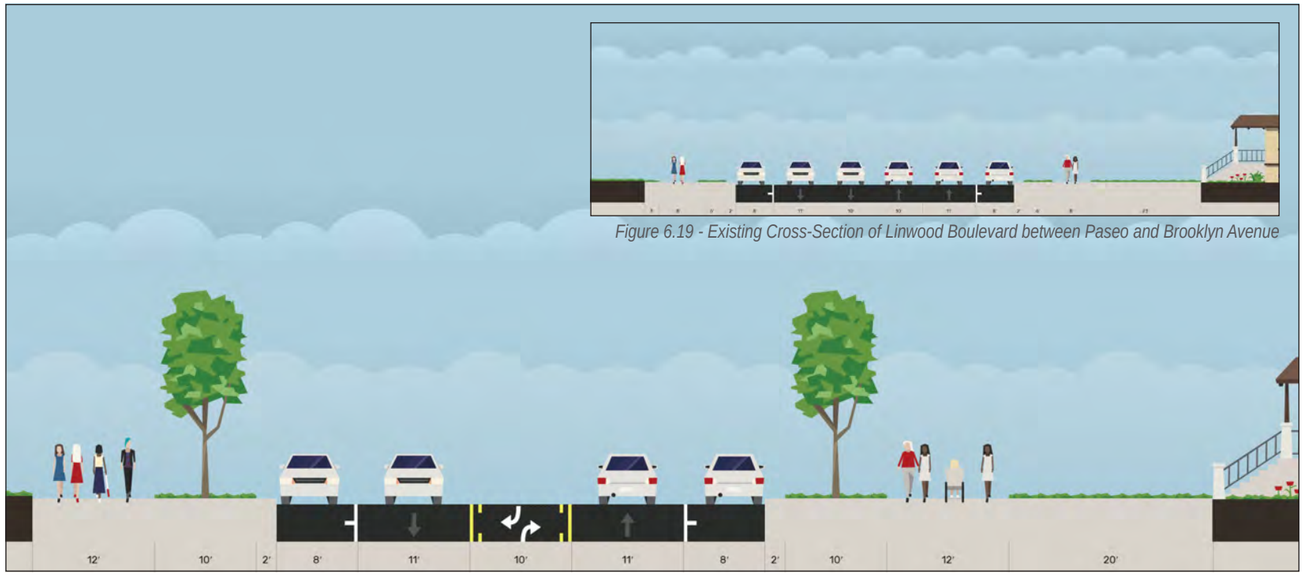


Figure 6.19 - Existing Cross-Section of Linwood Boulevard between Paseo and Brooklyn Avenue

Figure 6.20 - Proposed Cross-Section of Linwood Boulevard between Paseo and Brooklyn Avenue

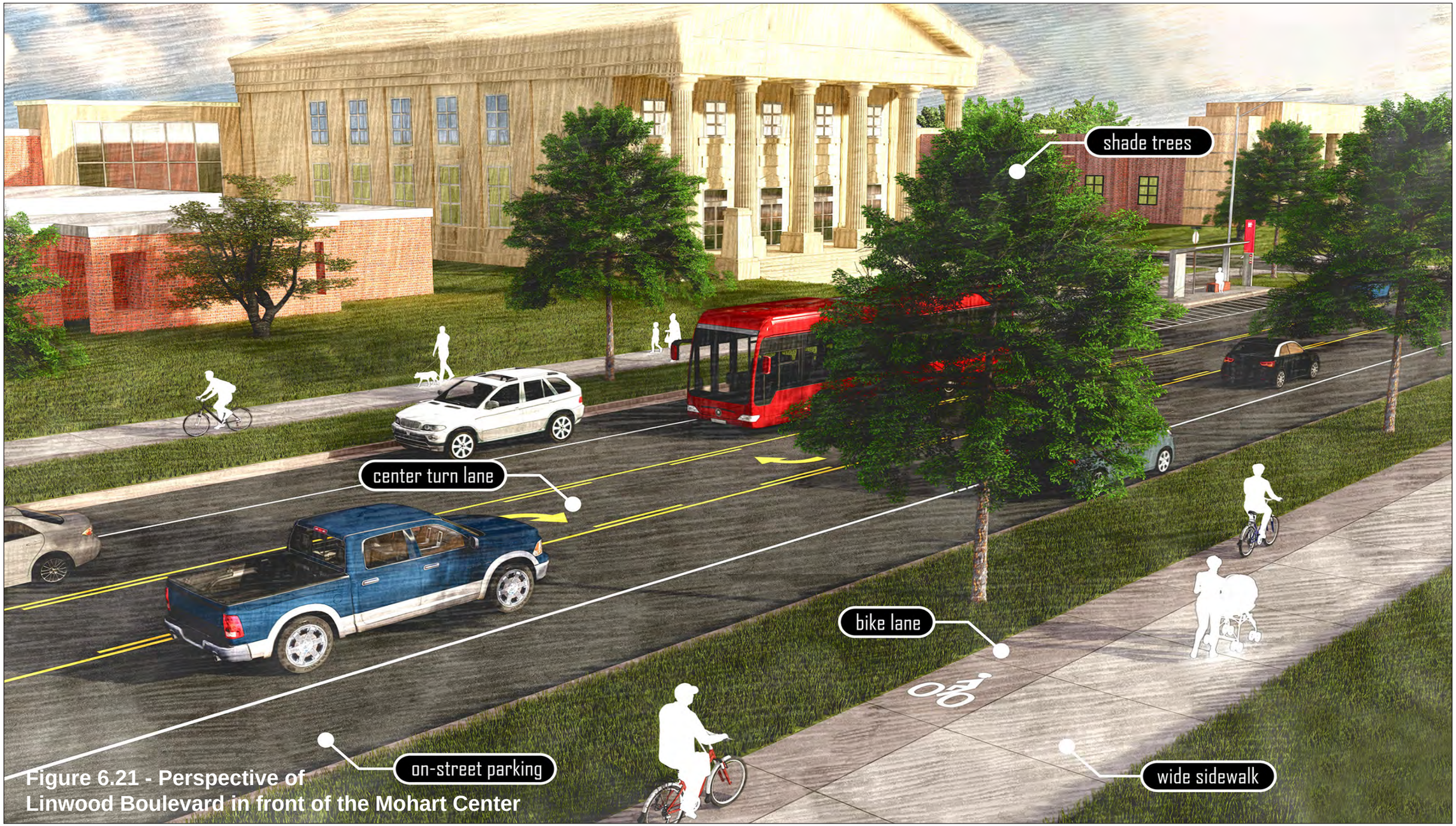


Figure 6.21 - Perspective of Linwood Boulevard in front of the Mohart Center

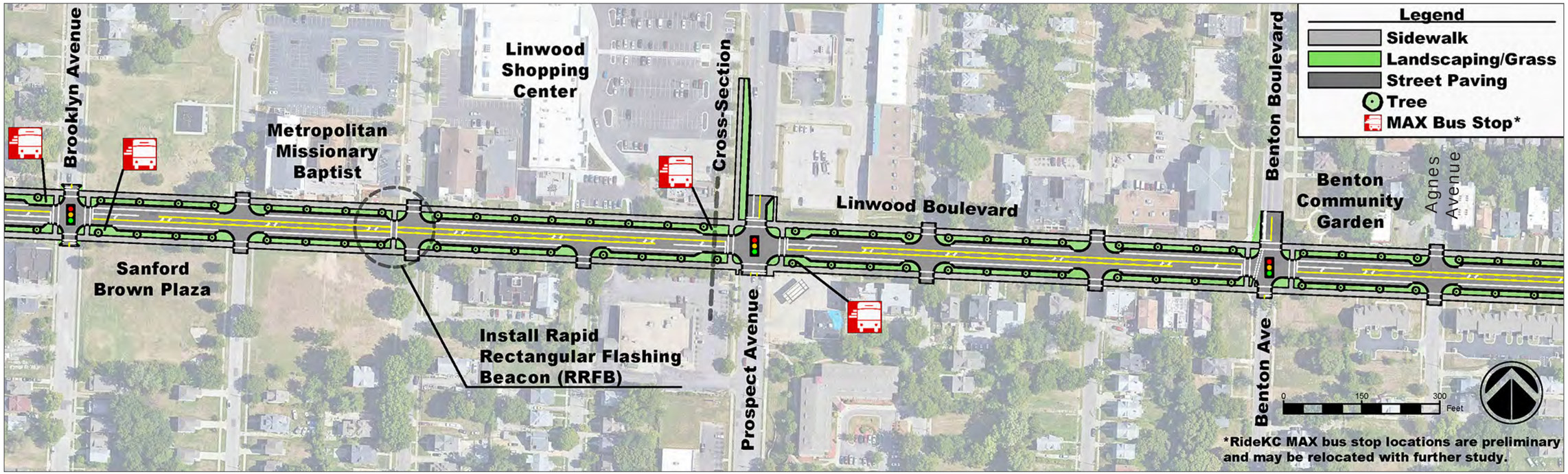
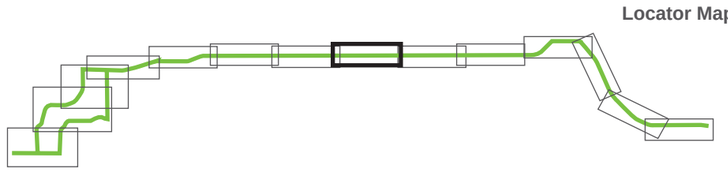


Figure 6.22 - Plan Rendering of Linwood Boulevard from Brooklyn Avenue to Agnes Avenue



Linwood Boulevard: Brooklyn Avenue to Agnes Avenue

The concept design from Troost Avenue (see Figure 6.22 and 6.23) to 31st Street includes ample space for future high quality transit stops that could be constructed if a Linwood MAX bus rapid transit line were implemented on Linwood Boulevard. Possible stop locations are noted on the plans and the cross-section on this page (see Figure 6.24) depicts how those stops could look. With the narrowed roadway, there is ample room for shelters, seating, bike racks, lighting, landscaping, and other streetscaping elements. The Kansas City Area Transportation Authority (also known as RideKC) is planning a feasibility study for a Linwood MAX bus rapid transit like in 2020 - 2021.

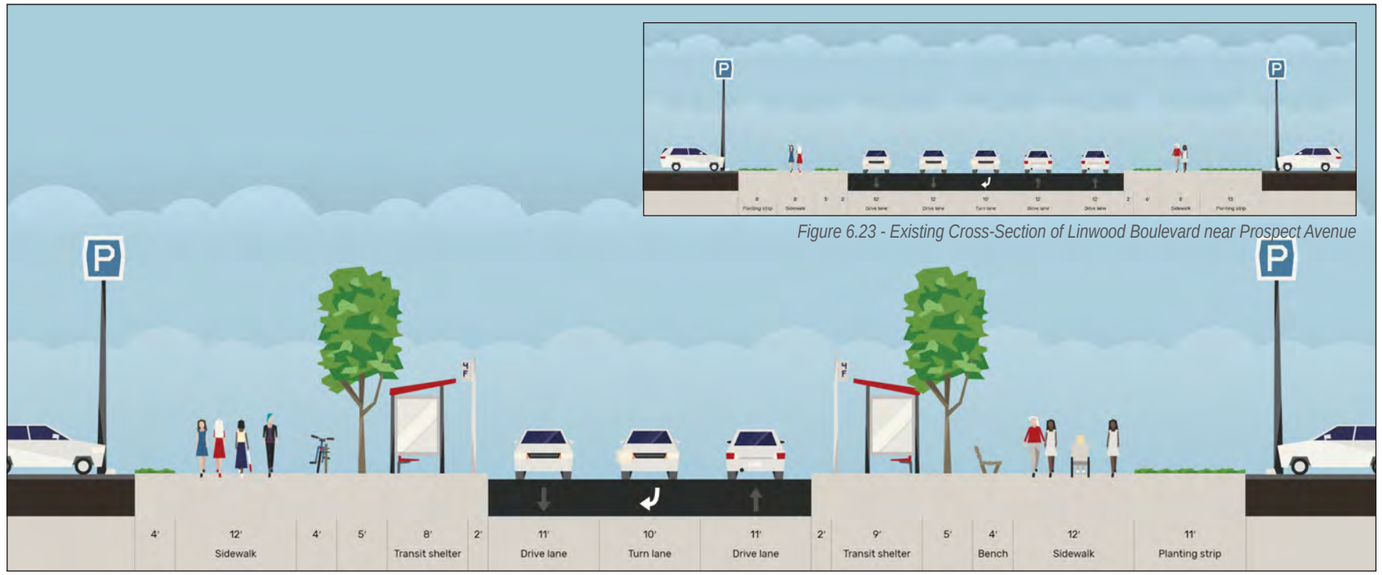


Figure 6.23 - Existing Cross-Section of Linwood Boulevard near Prospect Avenue

Figure 6.24 - Proposed Cross-Section of Linwood Boulevard near Prospect Avenue

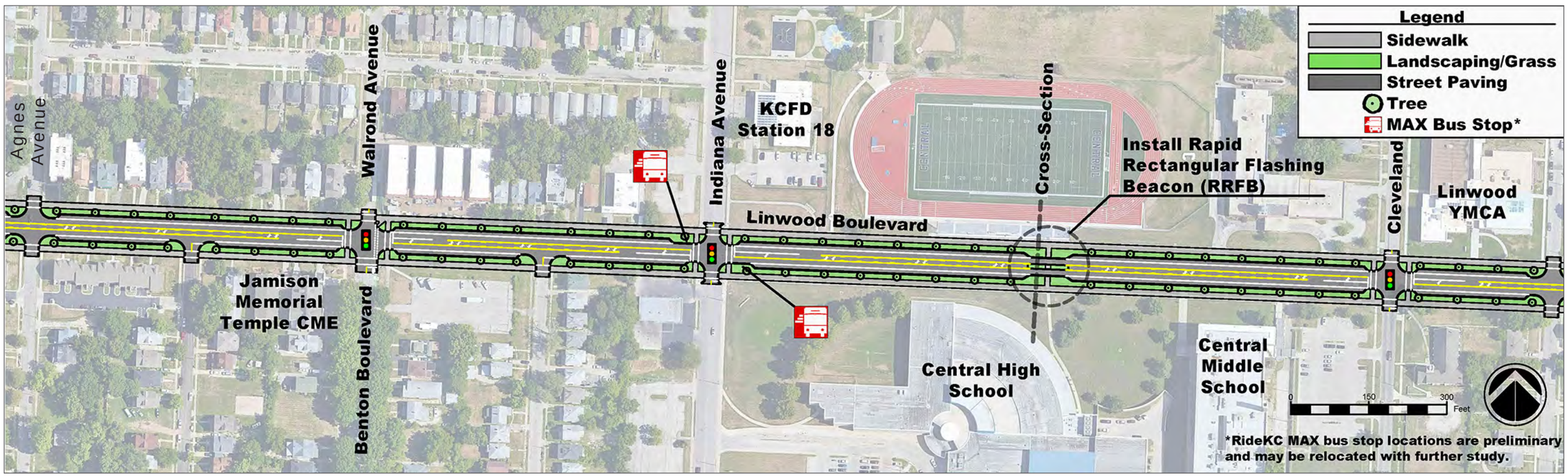
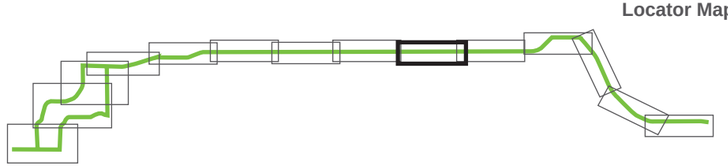


Figure 6.25 - Plan Rendering of Linwood Boulevard between Agnes Avenue and Cleveland Avenue



Linwood Boulevard: Agnes Avenue to Cleveland Avenue

The corridor segments adjacent to Central High School and Central Middle School (see Figure 6.26) have the highest rates of traffic crash injuries and deaths of anywhere on the corridor. The concept design (see Figure 6.25 and 6.27) is projected to greatly improve traffic safety in this area. Special attention was paid to the crossing between the schools and the sports facilities. This crossing currently has a Pedestrian Hybrid Beacon (PHB), but students must still cross a very wide, multi-lane street with high speed traffic. The concept design replaces this PHB with a crossing of a drastically narrowed street with a pedestrian refuge island and a Rapid Rectangular Flashing Beacon (RRFB). This will slow down cars, improve safety and the expanded street-side area could provide room for any number of amenities such as seating, wayfinding or event signing, bike racks, and more. This layout is depicted in the cross-section (see Figure 6.27) on this page.

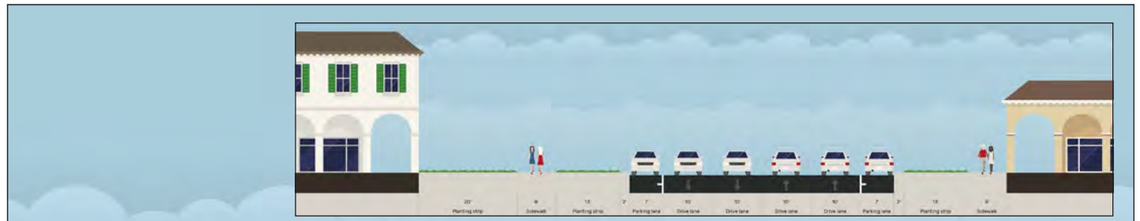


Figure 6.26 - Existing Cross-Section of Linwood Boulevard at Central High School

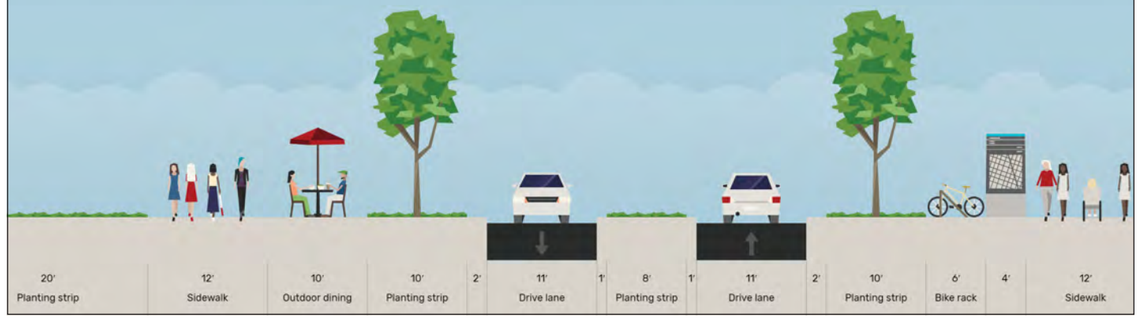


Figure 6.27 - Proposed Cross-Section of Linwood Boulevard at Central High School

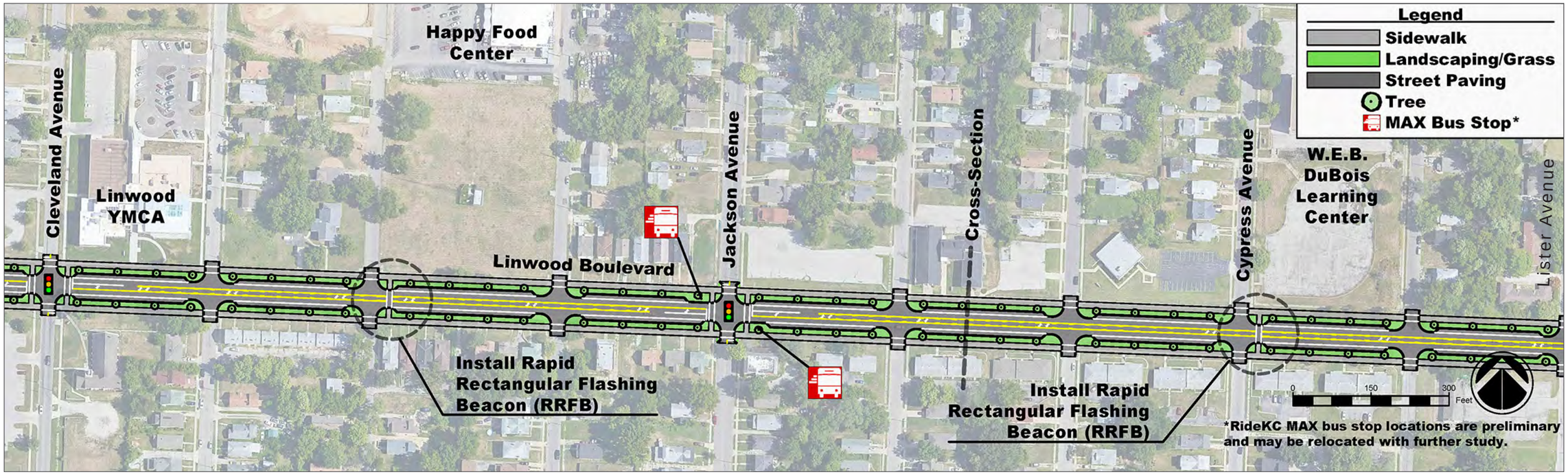
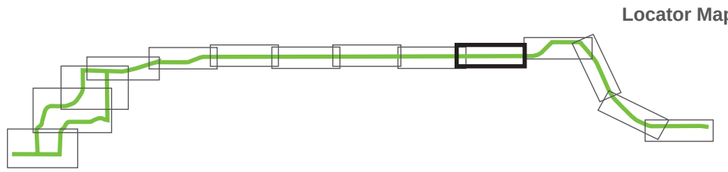


Figure 6.28 - Plan Rendering of Linwood Boulevard from Cleveland Avenue to Lister Avenue



Linwood Boulevard: Cleveland Avenue to Lister Avenue

This segment (see Figure 6.28, 6.29, and 6.30) continues the concept from Troost Avenue to 31st Street. Additional pedestrian crossings are planned using the Rapid Rectangular Flashing Beacons (RRFBs) intermittently between the traffic signals. As part of this plan, it is also recommended that each traffic signal have safety improvements applied to them. This includes upgrading the signals so that all have handicapped accessible amenities, changing the timing of the signals to more safely accommodate pedestrians and cyclists, enhancing the crosswalk signing and pavement marking, and installing other safety devices such as retroreflective backplates.

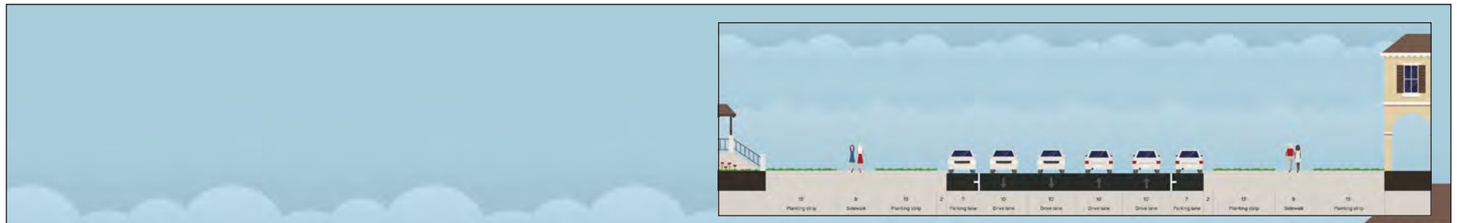


Figure 6.29 - Existing Cross-Section of Linwood Boulevard between Jackson Avenue and Lister Avenue

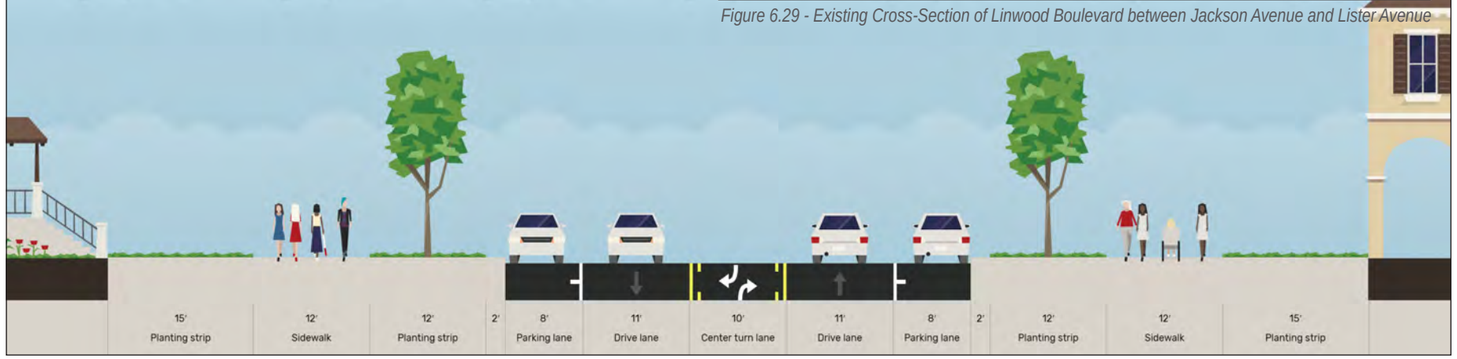


Figure 6.30 - Proposed Cross-Section of Linwood Boulevard between Jackson Avenue and Lister Avenue

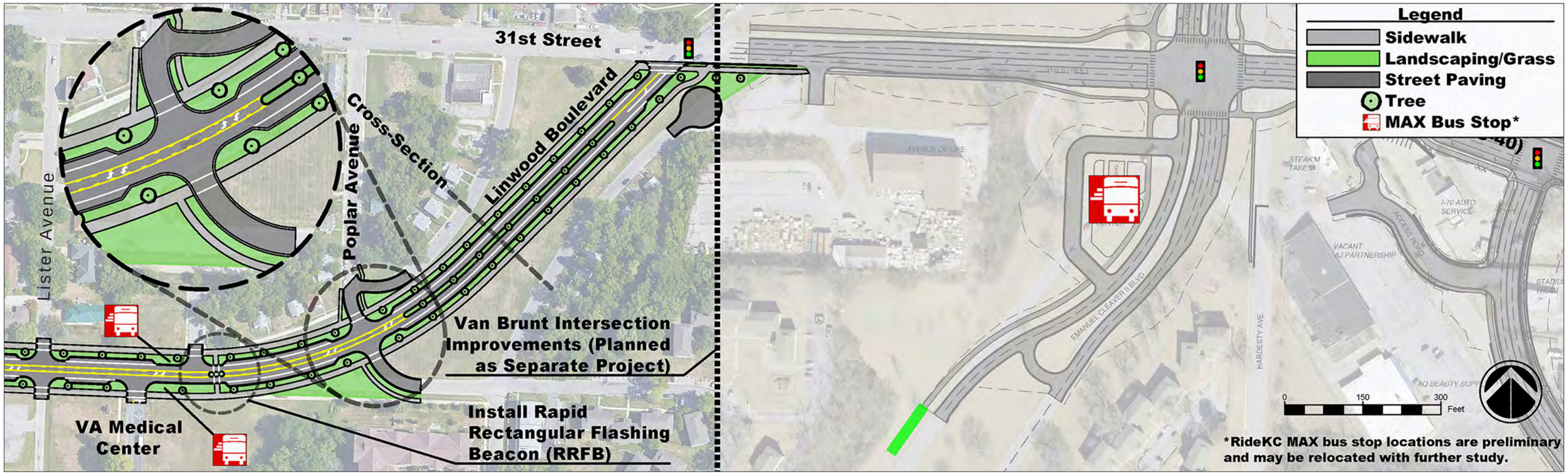
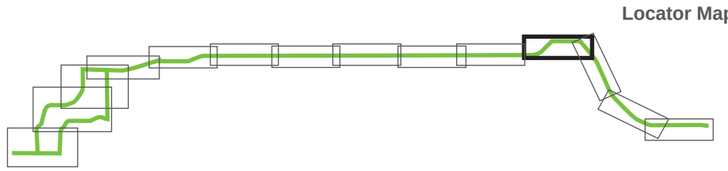


Figure 6.31 - Plan Rendering of Linwood Boulevard between Lister Avenue and 31st Street and 31st Street to Stadium Drive



Linwood Boulevard: Lister Avenue to 31st Street and 31st Street: Linwood Boulevard to Stadium Drive

Improvements (see Figure 6.32 and 6.33) on Linwood Boulevard end at 31st Street with this plan. A reconstructed intersection (see Figure 6.31) with 32nd Street & Poplar is noted to improve safety of this intersection and make it less confusing for drivers, pedestrians, and cyclists. The intersection of Van Brunt Boulevard and 31st Street was commonly noted by the public and Steering Committee as a problematic intersection. This intersection is being studied for improvement as a separate project and the teams worked together to ensure that the concept plans are consistent with each other. The concept design from this project is included on this plan for reference.

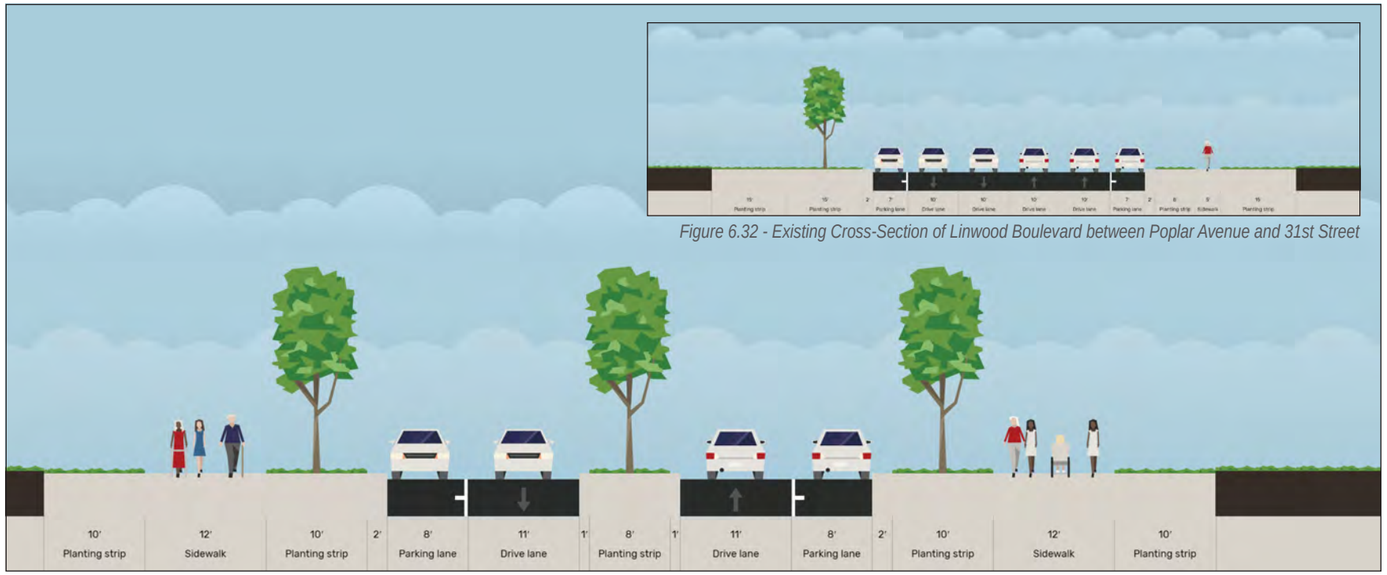


Figure 6.32 - Existing Cross-Section of Linwood Boulevard between Poplar Avenue and 31st Street

Figure 6.33 - Proposed Cross-Section of Linwood Boulevard between Poplar Avenue and 31st Street

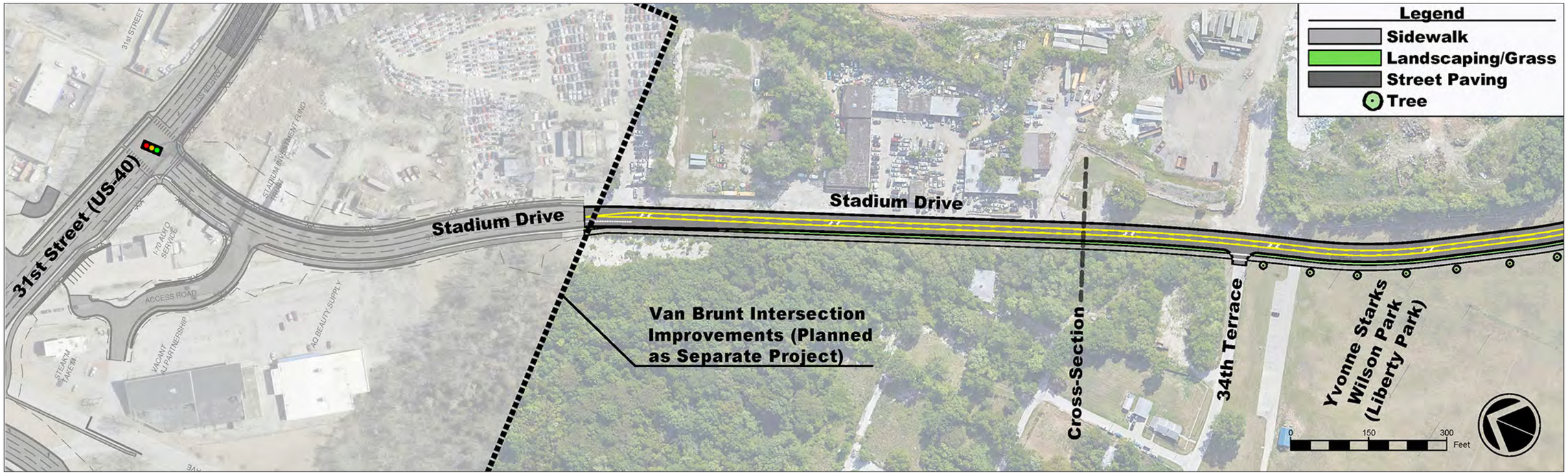
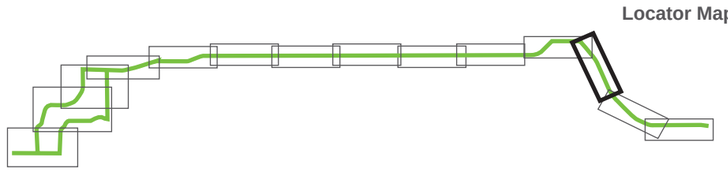


Figure 6.34 - Plan Rendering of Stadium Drive from 31st Street to 34th Terrace



Stadium Drive: 31st Street to 34th Terrace

Stadium Drive currently exists as a 4-lane road with narrow lanes (see Figure 6.35). There is a low volume of traffic on this road, but a high percentage of truck traffic. The 9' wide lanes are not wide enough currently to accommodate most semi-trucks and freight trucks which need a minimum of 10' lane width. Due to this condition, it is not possible to drive next to these trucks which effectively makes the roadway operate as a 2-lane road today. The concept design recommends this road be converted to a 3-lane road, similar to Linwood Boulevard. No parking is shown on this concept (see Figure 6.34 and 6.36) from the Van Brunt improvements to the Blue River, but ample parking exists on the east side of the street right of way. Narrowing the street to 3-lanes allows the construction of a 10' wide shared use path on the west side of the street and should provide safer, more comfortable car and truck access through the area.

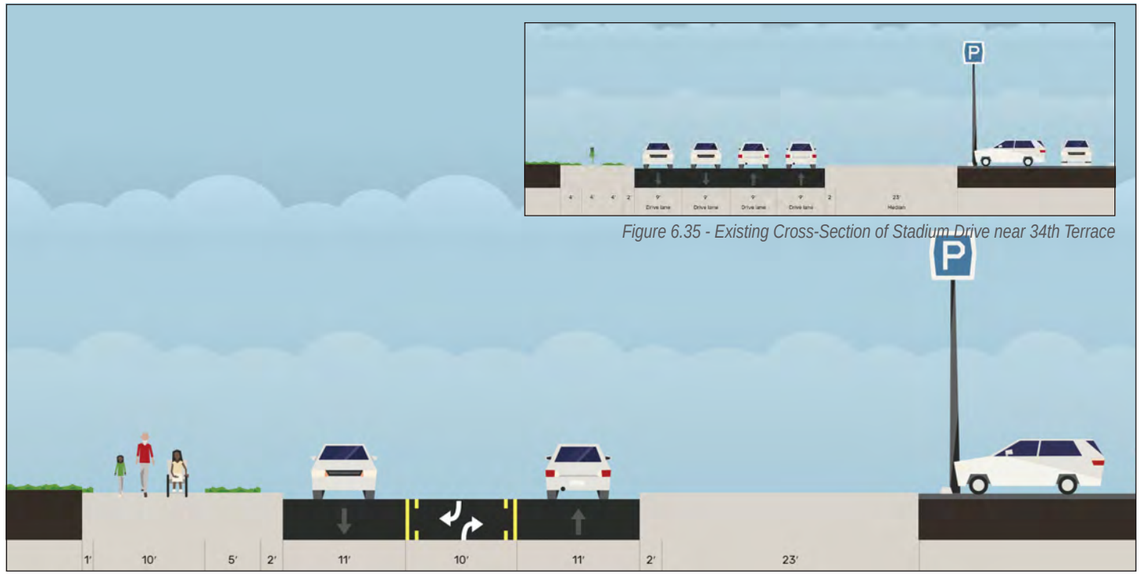


Figure 6.35 - Existing Cross-Section of Stadium Drive near 34th Terrace

Figure 6.36 - Proposed Cross-Section of Stadium Drive near 34th Terrace

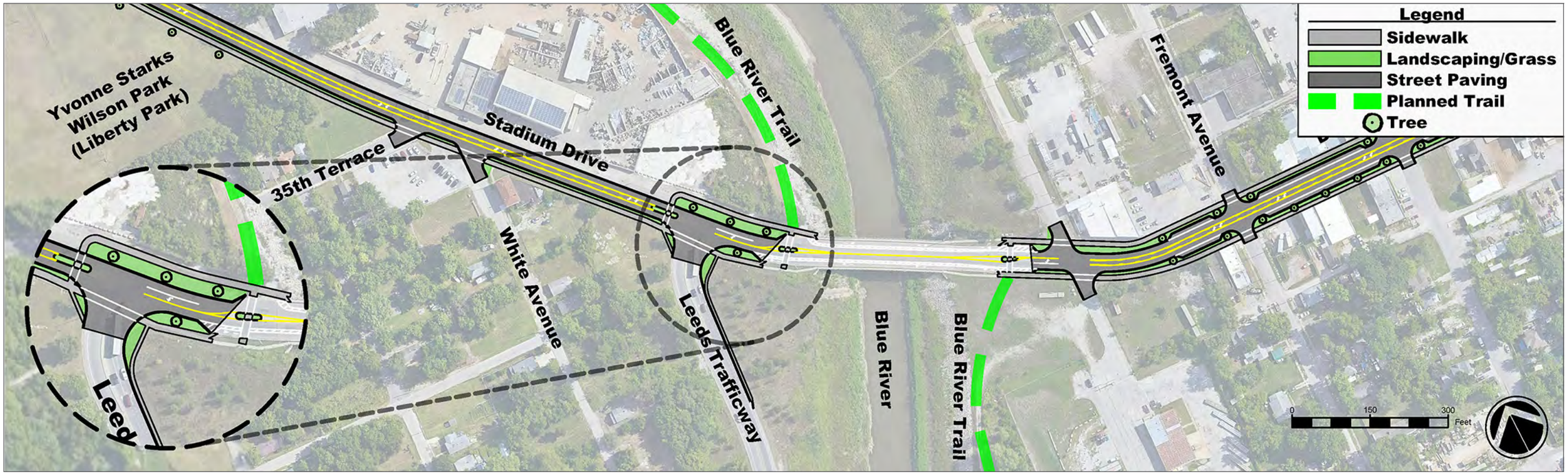
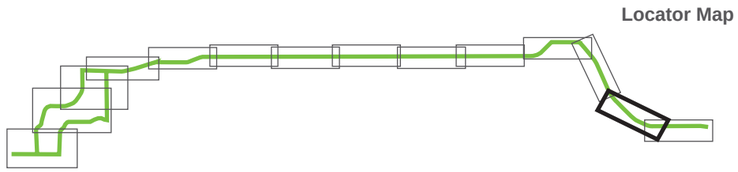


Figure 6.37 - Plan Rendering of Stadium Drive from 35th Terrace to Fremont Avenue



Stadium Drive: 35th Terrace to Fremont Avenue

The shared use path on the west side of Stadium Drive (see Figure 6.37) will provide bicycle and pedestrian access to the Yvonne Starks Wilson Park, the bicycle lanes recently constructed on Leeds Trafficway, and the future Blue River Trail. It will also provide access from the Rock Island Trail (see Figure 6.38) through the Leeds Industrial District, and up to the trail facilities planned on Linwood Boulevard and beyond. This continuous trail will provide comfortable access long-distance cyclists on the Katy Trail to ride from downtown St. Louis all the way to downtown Kansas City. The connection to the Rock Island Trail can be seen on the following page.

ROCK ISLAND TRAIL

In the spring of 2016, Jackson County purchased 17.7 miles of the Rock Island Railroad Corridor running from the Truman Sports Complex to southeastern Lee's Summit for $50.1 million. The corridor is planned for multimodal transportation options including the potential for future commuter rail service. The immediate plan for the corridor is to construct a trail along the length of the corridor to connect the heart of Jackson County ultimately to the Katy Trail, which is a continuous trail from Pleasant Hill to St. Louis.

The 6.5 mile long Phase 1 trail project from Jefferson Street in Lee's Summit to Brickyard Road in Kansas City is complete. The 7.1 mile long Phase 2 trail project from the end of Phase 1 to the Truman Sports Complex is currently under construction and expected to open in 2021. Planning is underway to extend the trail from the end of the Phase 2 terminus at the Truman Sports Complex to the Blue River. The Truman Connected trails would connect to the Rock Island Trail in this section near the intersection of Stadium Drive and Raytown Road/Manchester Trafficway. When completed, the Truman Connected project would provide a continuous connection through the heart of Midtown Kansas City all the way to St. Louis.

For further information see:
https://bikerockisland.com/
https://rockislandtrail.org/
https://mostateparks.com/rockislandlinecorridor

Figure 6.38 - Additional Information on Rock Island Trail

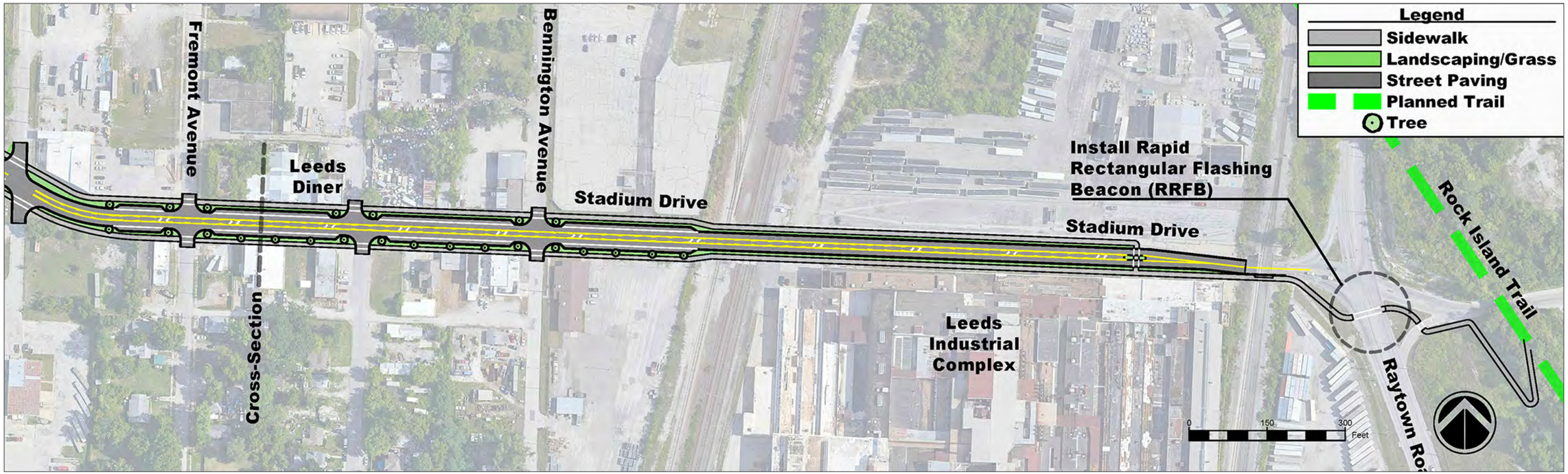
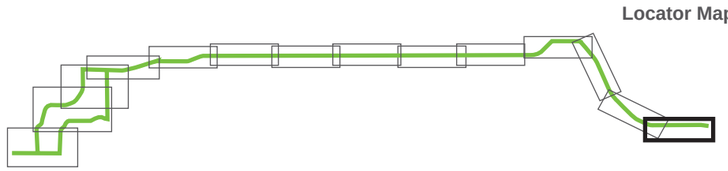


Figure 6.39 - Plan Rendering of Stadium Drive from Fremont Avenue to Raytown Road



Stadium Drive: Fremont Avenue to Raytown Road

Similar to Stadium Drive further west, the current configuration (see Figure 6.40) of the street through the Leeds Industrial District has drive lanes and parking lanes too narrow to accommodate parked cars and semi-truck access, so the street effectively operates as a 2-lane road with parking today. Converting the street to a 3-lane street with parking and wider lanes (see Figure 6.39 and 6.41) will provide improved car and truck access and greatly expanded street-side areas. This area is shown having expanded shared use paths, landscaping area, and area for the Leeds Diner or other establishments to have outdoor dining.

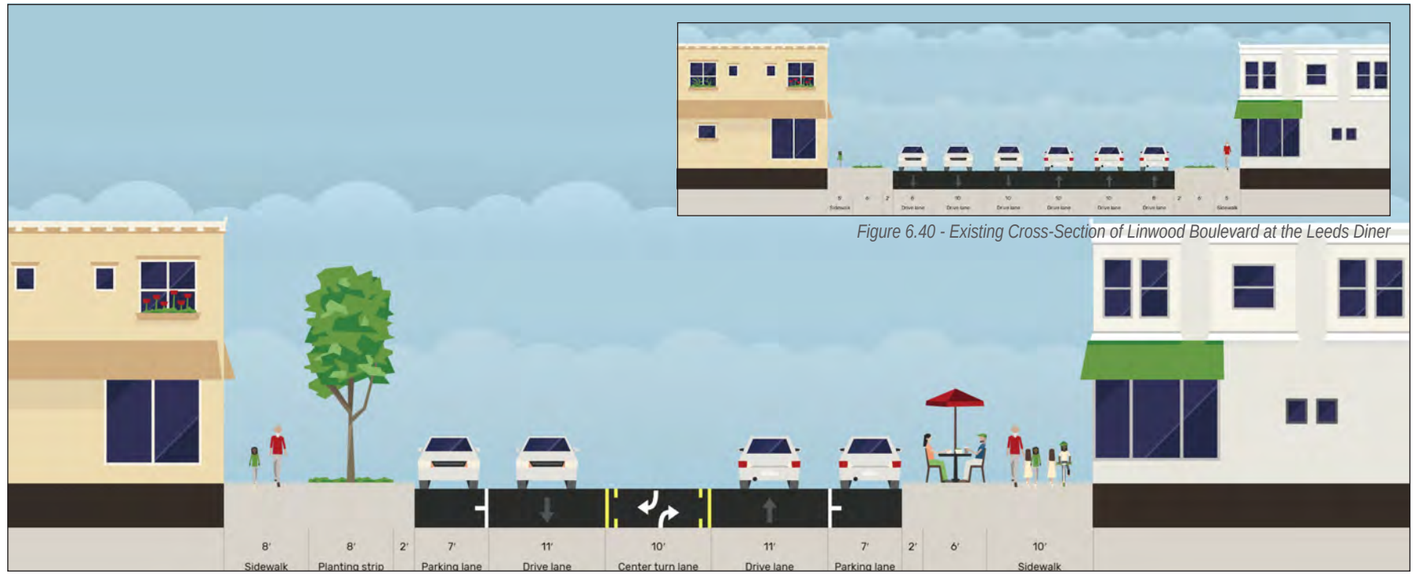


Figure 6.40 - Existing Cross-Section of Linwood Boulevard at the Leeds Diner

Figure 6.41 - Proposed Cross-Section of Linwood Boulevard at the Leeds Diner

7.0 PLACEMAKING

Placemaking is an important aspect of any active transportation project because it combines livability and user sensitivity to make an experience truly memorable and grounds the project in the community. Placemaking features also provide users with a sense of safety, comfort, and delight which is important to help the infrastructure investment maintain sustainable levels of use and additional mode shifting.

The placemaking features identified in this plan should be utilized during the design phase to the extent there is available budget for improvements, available right of way, and sufficient operations and maintenance funds. The features include:

- Expanded parks and green space amenities
- Trees and landscaping
- Pedestrian and cyclist amenities
- Street lighting and pedestrian-scaled lighting
- Transit-rider amenities

Figure 7.3 - Example Tree -Lined Street

Figure 7.4 - Example Raingarden

TREES AND LANDCAPING

When it comes to the return on investment in infrastructure, elements such as street and median trees, natural landscaping, and environmental features provide the most “bang for your buck”. Street trees enhance the walking experience by adding a sense of protection and enclosure through vertical canopy and the creation of the “outdoor room”. Landscaping and raingardens are not only good for the environment, they provide a sense of protection, add beauty to the street, and provide visual cues to calm traffic. It is important that landscaped areas are sustainable and maintainable, while also ensuring that pedestrians can cross them and that improvements do not block the view shed of bicycles and vehicles. See examples of these features in Figure 7.3 and 7.4.

Figure 7.7 - Example Pedestrian Path Lighting

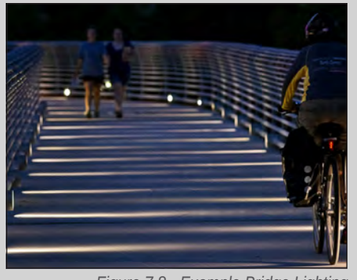


Figure 7.8 - Example Bridge Lighting

STREET LIGHTING AND PEDESTRIAN-SCALED LIGHTING

Lighting along the Linwood Corridor will be important for many reasons, but primarily it will ensure that spaces look and feel safe for users during the early morning, evening, and nighttime hours when lighting levels are low and visibility is reduced. Lighting should be utilized that fully illuminates the pathways and sidewalks for pedestrians and cyclist, as well as street crossings and bridges. Lighting should also be evaluated through the lens of traffic safety to ensure that street crossings, intersections, and other conflict points are well lit so that pedestrians and cyclists can be seen at night by drivers. See examples of these features in Figure 7.7 and 7.8.

Figure 7.1 - Example Public Space

Figure 7.2 - Example Dog Park

EXPANDED PARKS AND GREEN SPACE AMENITIES

Multi-use trails and greenways are important connections to our parks, open spaces, and natural amenities because they serve as destinations and experiences along the route. It is important to ensure that these spaces have elements such as dog parks, playgrounds, gathering spaces, shelters, tables, benches, trash cans, and other placemaking features that will provide users with amenities and add activity and life to the public realm. These features are consistent with the original vision of the Parks and Boulevard System to improve quality of life and give “rare opportunities for enjoyment” to residents along the corridor. See examples of these features in Figure 7.1 and 7.2.

Figure 7.5 - Example Bike Racks

Figure 7.6 - Example Benches

PEDESTRIAN AND CYCLIST AMENITIES

To make the experience along the Linwood Corridor more comfortable and delightful, it is important to include key pedestrian and cyclist amenities along the route. These features should include resting spaces, benches, shade structures, wayfinding signage, drinking water fountains, public art, bicycle racks, and other components that will provide users with the opportunity to pause their journey and enjoy the experience. These features should be consistently placed along the route to provide a cohesive experience and correlated with areas of local activity such as commercial centers or civic areas. See examples of these features in Figure 7.5 and 7.6.

Figure 7.9 - Example Route Information Signage

Figure 7.10 - Example Bus Shelter

TRANSIT-RIDER AMENITIES

With the potential Bus Rapid Transit (BRT) service under consideration for Linwood Boulevard/31st Street, it will be important to ensure that riders will have the essential amenities that make the transit experience more safe and enjoyable. These features may include bus shelters with shading elements, benches and waiting areas, public art and district branding elements, route identification and schedule signage, bike racks and scooter parking areas, and other transit amenities. A typical bus stop should consist of an accessible paved area with a shelter and clear signage. It is important that transit stops are safe, easily identifiable, accessible, and comfortable places to wait for the bus. See examples of these features in Figure 7.9 and 7.10.

Figure 8.1 - Sample of NACTO Design Guides

8.0 IMPLEMENTATION

The Linwood Corridor Complete Street Study is a roadmap to improving safety, multimodal access, and the quality of life of street users. The recommendations are conceptual improvements that the public and Steering Committee have determined to be desirable and appropriate for the area. Due to the nature of the improvements, there is more work needed before a final design is completed and ready for construction. This section details the next steps on design refinement, funding, and phasing priorities.

8.1 NEXT STEPS

A detailed concept plan has been created for the project, but more detailed preliminary design work and final design work need to be completed. Specifically, more investigation must be made into utility coordination. Efforts have been made to place the Linwood Corridor improvements in locations to minimize the need for utility relocation and reconstruction, but some will be necessary. Modifications to the locations of curbs will impact storm water drainage and storm inlet locations. Overhead power lines and streetlights also exist along many parts of the alignment that may require relocation.

Many design guides (see Figure 8.1) and standard engineering documents were referenced were to refine the conceptual designs for the recommendations in this report. These include the Manual on Uniform Traffic Control Devices (MUTCD) and the Americans with Disabilities Act Proposed Rights-of-Way Accessibility Guidelines (PROWAG) requirements. Beyond those standard guides, the National Association of City Transportation Officials (NACTO) Urban Street Design Guide and Urban Bikeway Design Guide should be referenced for pedestrian and bicycle infrastructure. These design guidelines/best practices should be referenced to create the safest and highest quality Linwood Corridor facility.

8.2 ONGOING MAINTENANCE

A particular concern for the public, Steering Committee, and City staff was to create improvements that would not incur additional ongoing maintenance costs. There was a strong desire to create a high-quality experience on the corridor, but also the need for facilities that could remain in good repair well into the future. This was a concern for all aspects of the project, but in particular for the pavement quality, the amenities, and the landscaping.

The nature of the construction of the improvements planned on the Linwood Corridor, for the most part, will not significantly increase maintenance costs over what the city currently incurs and, in some cases, will actually reduce the existing maintenance burden. This is particularly true in areas along Linwood Boulevard and Stadium Drive where the existing pavement width is being narrowed, lessening the needs for various maintenance activities. Less pavement means less street sweeping, less snow removal, less pavement resurfacing, and less stormwater runoff. The reconstruction of the sidewalks and trails through the area to the Kansas City Parks & Recreation Department standard of 6” thick reinforced concrete (rather than the typical 4” thick non-reinforced concrete) will provide a long life for the new facilities.

When not planned properly, landscaping can require extensive maintenance. By using a mixed perennial planting scheme, positive effects can be achieved within the aesthetics, maintenance, and even ecology of the green spaces within the corridor. Perennials (see Figure 8.2) offer a variety of color, texture, and variation from early Spring through late Fall and

Figure 8.2 - Example of Native Landscaping that Includes Perennials and Ornamental Grasses

even into winter, and many are drought tolerant once established, requiring little or no irrigation. Groundcover type perennials and grasses can spread, fill in gaps, and help to suppress weeds. Instead of putting the burden of weed control on maintenance staff, a mixed perennial scheme utilizes the plant’s abilities to compete and limit weed growth. Furthermore, most perennials and ornamental grasses require only a once-yearly mowing/cutting back, further reducing the need for regular, high-intensity maintenance inputs. The 2010 Kansas City Boulevard and Parkway Standards should be consulted for additional guidance.

8.3 PROJECT COST AND BENEFITS

High level cost estimates were prepared for all segments of the concept plan. It is anticipated that this project would not be constructed in one single phase but may be constructed in multiple phases as separate projects. There are many natural breaks in the corridor that could easily be broken into individual projects. The predicted safety benefits have also been calculated and funding mechanisms have been noted. A detailed technical memorandum related to the safety analysis and detailed cost estimates are contained in the appendix of this plan.

Project Segment	Implementation Cost	Safety Benefit	Benefit-to-Cost Ratio
Roanoke Park Area (39th Street to Southwest Trfwy)	$ 2,308,000.00	$ 1,095,000.00	0.5
33rd Street/Linwood Blvd (Southwest Trfwy to Main Street)	$ 1,136,000.00	$ 11,022,000.00	9.7
Linwood Blvd (Main Street to Troost Ave)	$ 2,862,000.00	$ 4,992,000.00	1.7
Linwood Blvd (Troost Ave to Garfield Ave/US-71)	$ 2,688,000.00	$ 15,600,000.00	5.8
Linwood Blvd (Garfield Ave/US-71 to Jackson Ave)	$ 6,423,000.00	$ 43,088,000.00	6.7
Linwood Blvd (Jackson Ave to 31st St)	$ 2,802,000.00	$ 3,969,000.00	1.4
Stadium Drive (31st to Rock Island Trail)	$ 3,572,000.00	$ 1,799,000.00	0.5
Total Project Cost	$ 21,791,000.00	$ 81,565,000.00	3.7

Figure 8.3 - High-Level Cost Estimate of Cost Benefits for Implementation

Project Costs

The costs of the project have been estimated by each individual segment, and safety benefits for these segments are also estimated individually. These costs are conceptual but are expected to represent the full cost of design, construction, and construction services for each segment. Costs for each segment are noted in the table on this page (see Figure 8.3).

These estimates for the construction and maintenance cost are based on WSP's professional experience and judgment and shall be deemed to represent the company's opinion. WSP has no control over the cost of labor, material, equipment, and other relevant factors that could influence the ultimate construction costs. Thus, our company does not guarantee that proposals, bids, or the actual facility cost will be the same as the estimate of probable construction cost or that construction costs will not vary from its opinions of probable cost.

Project Benefits

The methodology from the Highway Safety Manual was utilized to predict the crash reduction potential resulting from the planned improvements along the corridor. This methodology utilizes predictive models based on empirical studies to determine how many and what kind of crashes could be prevented if certain changes were made to the roadway.

Based on the reduced number of crashes, a reduced cost of crashes to society can be calculated. As noted in the Data Analysis chapter, the cost of crashes on a yearly basis on the Linwood Corridor tops $10 million in crash cost to society every year based on factors like property damage, medical bills, insurance claims, lost productivity, lawsuits, and mental pain and anguish. Even a small reduction in crashes on some parts of the corridor lead the major benefits when estimated over the 20-year lifecycle of the recommended improvements.

By combining the safety benefits with the estimated project costs, a benefit-to-cost ratio can be calculated. The predicted benefits and benefit-to-cost ratio is noted in the table with the project costs. A benefit-to-cost ratio of greater than 1.0 is typically considered a valuable project. The benefit-to-cost ratio for the Linwood Corridor project is much higher than this at 3.7 to 1.

It should also be noted that this benefit-to-cost analysis only represents the cost savings to society resulting from improved safety. This project is predicted to have many other quantitative and qualitative anticipated benefits with very little dis-benefits. For instance, it does not factor in real estate development or other property improvements and the subsequent increase in property taxes to the city or sales tax revenues to the state. As a result, the benefit-to-cost ratio shown here is considered conservative and would likely be higher with a full economic benefit-to-cost analysis.

Figure 8.4 - Public Improvements Advisory Committee (PIAC) Process Timeline

8.4 PROJECT FUNDING

A major concern for the public throughout this plan process has been funding of the improvements. There is a strong aversion along the corridor to special assessment/special benefit districts like Transportation Development Districts (TDDs) or Community Improvement Districts (CIDs) that levee special assessments or additional taxes on property owners and/or retail establishments. Fortunately, there are many other funding sources available to fund this project.

Local Funding Sources

Traditional sources exist within the City of Kansas City budget, primarily allocated through the Public Improvements Advisory Committee (PIAC). The PIAC process (see Figure 8.4) starts with input from citizens, organizations, institutions, and City departments. The PIAC then reviews applications and determines funding allocations. The infographic on the opposite page details this process. More information can be found at https://www.kcmo.gov/programs-initiatives/public-improvements-advisory-committee-piac.

A second source of City funding is from the General Obligation Bond (GO Bond) approved by voters in April 2017 for infrastructure improvements. The $800 million in bonds issued are intended to fund a capital improvements program for streets, sidewalks, flood control and other infrastructure needs over the next 20 years. Regarding street infrastructure, the GO Bonds were intended specifically to target complete street improvements like the Linwood Corridor project. Linwood Boulevard is also listed as a Priority 1 street for sidewalk replacement. This sidewalk replacement funding could be leveraged as part of the Linwood Corridor project. An infographic (see Figure 8.5) is included on this page detailing the GO Bond program. More information can be found at https://www.kcmo.gov/programs-initiatives/go-kc.

Federal Funding Sources Administered by MARC

In addition to these funding sources, many Federal Aid funding sources exist from the Federal Government. Federal funding sources including the Surface Transportation Program (STP), the Transportation Alternates Program (TAP), the Congestion Mitigation and Air Quality (CMAQ) program, and Highway Safety Improvement Program (HSIP) among other programs. These funding sources are applied for by the City in a competitive process administered by the Mid-America Regional Council (MARC). The federal funds will pay for approximately 80% of the total construction cost, with the City providing the remaining 20% of the project funds. It should be noted that the City of Kansas City has agreed to dedicate all of the STP funding it may otherwise receive to the Buck O'Neill Bridge project until 2022, so this funding source would not be available for the Linwood Corridor project until after that commitment is completed.

Federal Funding Sources Awarded Directly by USDOT

A separate Federal funding program exists that is separate from City funding or Federal funding administered by MARC. The Better Utilizing Investments to Leverage Development (BUILD) discretionary grants program is applied for directly to the United States Department of Transportation (USDOT) and awarded directly to local agencies. The BUILD grant program is designed for medium sized transportation projects (typically in the $5M - $25M range) and for projects with demonstrated benefits and support from the community. The Linwood Corridor plan would be an excellent candidate for the program given the high benefit-to-cost ratio and the high public support of the project. A BUILD grant would be applied for directly by the City of Kansas City, typically with support from a consulting firm that specializes in preparing the complex economic analysis and grant application. Other Federal discretionary grants exist, but are less applicable to the Linwood Corridor project.

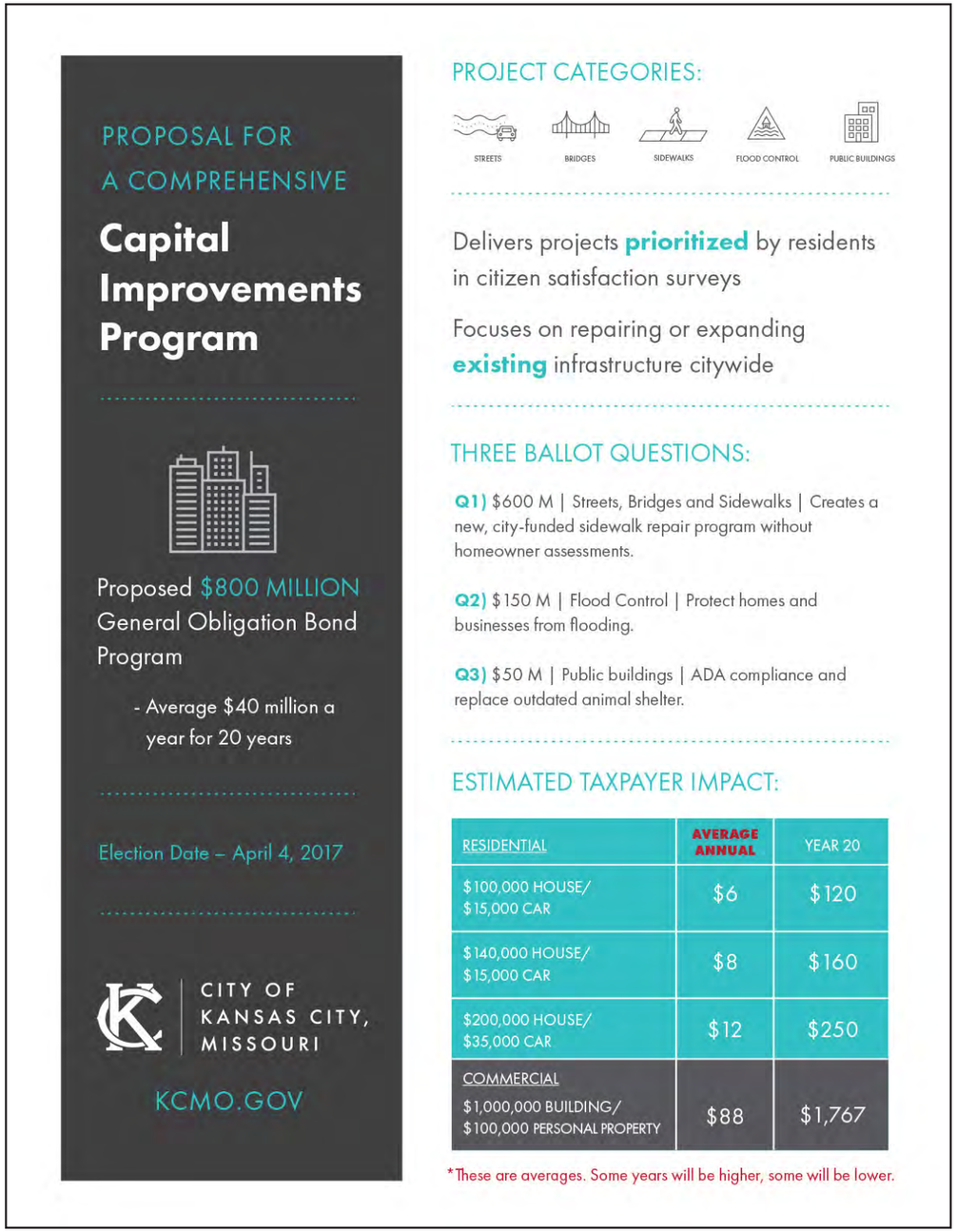


Figure 8.5 - Overview of the GO Bond Program

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