



CITY OF BOLIVAR

ACTIVE TRANSPORTATION PLAN

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INTRODUCTION

Active transportation is a mode of transportation that is powered by humans to get them from one place to another, for example through bicycling, walking, and transit. This mode of transportation is affordable, promotes physical health through active living, and is safe for the environment. Active transportation creates a very sustainable and livable environment for the community.

The City of Bolivar is an attractive destination for families, tourists, and businesses. The city has numerous enjoyable and walkable attractions, including the Frisco Highline Trail, the historic downtown, Dunnegan Park, and Southwest Baptist University. The Bolivar Active Transportation Plan aims to develop policies and infrastructure that will improve the area's safety, mobility, and interconnectedness. Such infrastructure can include sidewalks and crosswalks, bicycle lanes, and bicycle amenities. The plan will use the community needs and priorities identified in the planning process to address the area's different active transportation improvements and developments.

Planning Process

Throughout the five-month planning process, the Southwest Missouri Council of Governments worked with city officials, citizens, and the Transportation Planning Committee to develop strategies to enhance the active transportation network

in the City of Bolivar. To ensure this plan reflects community needs the following steps were taken to document and analyze existing conditions, reflect the community's visions, and identify strategies to achieve that vision:

- Engaging the Community
- Review of Past Plans
- Existing Conditions Analysis
- Implementation

THE PLANNING PROCESS



COMMUNITY ENGAGEMENT

Community engagement plays an essential role in the decision-making process for identifying and selecting future transportation goals. Community involvement was identified early on as a high priority for the city, a priority that was considered throughout the entirety of the planning process. There were multiple opportunities for community involvement during the creation of the Bolivar Active Transportation Plan, including a community survey, open house, and Transportation Planning Committee meetings.

Transportation Planning Committee Meetings

The Transportation Planning Committee (TPC) was formed to help provide input for the Active Transportation Plan and help guide the process. The TPC provided input on the plan during the drafting phase and helped in identifying area needs.

This committee was made up of the following members:

Kyle Lee | Community Development Supervisor, City of Bolivar

Lacy Hamby | Planning and Zoning, City of Bolivar

Justin Quinn | Code Inspection Tech, City of Bolivar

Brent Watkins | Fire Chief & Emergency Management Director, City of Bolivar

Gail Noggle | Director of Economic Development, Industrial Development Authority

Jerry Hamby | Public Works Director, City of Bolivar

Brice Flynn - Community Member

Thane Kifer – Developer, Pinecone Developments LLC

Mike Cribbs – Developer, DCBC LLC

Minda Cox - Community Member

Tim Martin - Community Member

Tim Declue - Community Member

Richard Asbill – Superintendent, Bolivar R-1 School District

Ryan Griffith - Community Member

Mike Pitts – Director of Business and Technology, Bolivar R-1 School District

Russ Martin – Representative, Bolivar R-1 School District

Keith Kelly - Community Member

Bill Little - Planning & Zoning Commission

Dan Wahnoutka - Board of Alderman

The TPC met two times throughout the planning process to discuss topics related to the creation of the active transportation plan.

- Orientation & Survey Results Review Meeting: The orientation and survey results review meeting was held on September 15, 2021, to provide overview of the planning process and examine community survey results.

- Needs Analysis Meeting: The needs analysis meeting was held on November 4, 2022, to analyze and rate the most important needs based on community priorities identified by the community and the committee and to also conduct a risk analysis for top pedestrian and bike needs.

Public Outreach

Community Survey

Following the staff kick-off meeting, an online survey was drafted with the help of the city staff and launched to gather community input. The content of the survey included general demographics, methods of transportation, bike, and pedestrian challenges, and public trails.

Members of the Transportation Planning Committee were encouraged to share the survey with other residents. The survey was also promoted by the city of Bolivar in several ways, including social media posts, the city website, distributing paper copies at the Polk County Library, Bolivar Recreational Center, and Bolivar Golf Course. The survey was opened on August 15, 2022, and remained open until September 8, 2022. During this period, the survey received 458 responses, a detailed view of which can be found in Appendix A .

The survey provided valuable insight into the community's perception of the transportation network and perceived issues with the existing infrastructure. Of

the 458 respondents, 444 (97%) reported either living, working, or both living and working in Bolivar.

Respondents were asked to list up to five of the top needs in both pedestrian and biking transportation. The top responses to these questions were Springfield Avenue, Aldrich Road, Broadway Street, and Oakland Avenue. When asked about their transportation habits, 68.6% of respondents said they would like to walk more, 53.1% said they would like to bike more, and 29.5% said they would like to drive less.

The survey also included questions on the current conditions of the transportation network, and respondents were asked to rank the facilities on a scale of 1-5 (with 1 = poor and 5 = excellent). When asked about the walkability of Bolivar, the average score was 2.81. Primary complaints for the sidewalk system were a lack of connectivity, sidewalks in poor condition, unsafe intersections, and a lack of street lighting. Respondents were also asked to score the condition of Bolivar trails, which received an average score of 3.38. When asked about bikeability in the city, the average score was 2.6. Primary complaints about the biking infrastructure included a lack of off-street bike lanes, a general lack of biking infrastructure, unsafe intersections, and rude drivers. When asked if they would let their child walk/bike to school, approximately 80% of parents and guardians who responded to the



survey said they would not be comfortable allowing their child to travel on their own. When asked about their top three destinations to walk/bike to, respondents identified parks/trails, schools, commercial/retail, and community centers as the highest priority. When it comes to priority projects over the next 20 years, respondents noted that they would like to see sidewalk requirements in developing areas, and maintenance/improvements of existing sidewalks.

Popular sources for funding local transportation improvements include impact fees on developers, transportation bonds, and an increased sales tax. However, the most popular option for funding was to restructure funding within the existing annual budget. Safety, congestion, and mobility/convenience were identified as the highest priorities for the city to consider when making decisions on transportation moving forward.

BENEFITS & CASE STUDIES

The development of active transportation in a community such as bike trails/paths, sidewalks, and crosswalks leads to increased economic activities, promotes public safety, and improves health. Developing active transportation infrastructure makes a city more livable therefore attracting people from all areas to access these amenities. The following case studies help illustrate the importance of developing active transportation infrastructure in a community.

Economic Benefits

Active transportation boosts the economy of a region due to easy access to the different businesses along trails and greenways. The communities benefit from increased tourism and recreational activities that attract people from various places. This leads to the creation of new jobs for community members. Trails also increase the property values of surrounding houses. The following trails and greenways provide a major economic impact on the different regions they are located in.

Katy Trail

Katy Trail is the longest developed rail-trail in the country. The trail was built on the former corridor of the Missouri-Kansas-Texas Railroad. The trail is 240 miles long and runs between Clinton and Machens with 26 trailheads and four fully restored railroad depots. The scenic rail-to-trail was built for bicycling, hiking, walking, and running. A 2011 economic study showed that Katy Trail is used by

around 400,000 people annually and brings \$18.5 million in economic impact to the State of Missouri. When adjusted for 2022, Katy Trail's annual economic impact is estimated at \$29 million.

Erie Canalway Trail

The Erie Canalway trail is about 360 miles long connecting various communities like those in New York, Buffalo, Albany, and many others. This trail is part of the longest multi-use trail known as the Empire Trail. It was built for various activities such as biking, walking, inline skating, and mountain biking. The trail has an exceedingly high annual traffic which is estimated to be about 1.6 million visitors annually. According to a 2012 study on the economic impact of the Erie Canalway Trail, visitor spending contributes to about \$253 million in sales, 3,440 jobs, \$28.5 million in taxes, and \$78 million in labor income toward the economy of the surrounding communities.





DEVELOPING ACTIVE TRANSPORTATION INFRASTRUCTURE MAKES A CITY MORE **LIVABLE.**



The Great Allegheny Passage

This is a 150-mile rail trail along the states of Maryland and Pennsylvania. Activities like biking, walking, and mountain biking takes place along this trail. The passage attracts visitors from all over the country to camp and lodge in the small towns because of the beautiful nature and activities carried out along the old railbeds. An economic impact study found that the passage created about \$40 million in revenues and \$7.5 million in wages in 2008. In addition, day visitors spent about \$13 on average and overnight visitors had an average of \$98 per day in spending on the different activities in the communities.

Wolf River Greenway in Memphis

This is a paved pedestrian trail that covers about 26 miles along the Wolf River and connects various neighborhoods. This greenway attracts 5 million biking and walking trips per year. The Wolf River Greenway has various access points which connect to local shops, communities, and people. It has led to a rise in property values and promoted a healthy lifestyle in the community. The greenway has led to reduced crimes and improved quality of life in the surrounding neighborhoods.

Gateway State Trail

The Gateway State Trail is an 18-mile trail located in Minnesota that goes through the cities of Maplewood, North St. Paul, and Oakdale, via Washington county, and ends at Pine Point Regional Park. This trail is built on an old railroad and enables multiple uses such as biking, hiking, horseback riding, and many others. The trail provides a safe and accessible route for users due to the presence of a bridge and underpass which enable easy crossing from one point to another. The trail attracts many people from neighboring communities due to its location and beautiful landscape. A 2019 visitor survey by the Minnesota Department of Natural Resources for state trails reported that tourists spent an average of around \$525 on their visits to the trails for food, beverages, transport, lodging, and other costs. This greatly contributes to the growth of the economy of surrounding communities.

Health Benefits

Trails promote active living among members of a community, therefore, increasing their physical activity. People that live near trails are very likely to use them for different activities like walking and cycling, which improves health. In addition,

trails provide safe transportation routes for cyclists, pedestrians, and others to move from one place to another. The following trails/ greenways provide various health benefits in their communities.

Caperton Trail

This is a paved trail that is about 6 miles long and located in Morgantown, West Virginia. Activities on this trail include walking, biking, inline skating, and many others. A study conducted on this trail reported that after its construction, about one-quarter of the trail users were mainly new exercisers. In addition, 98% of the new exercisers reported that their physical activity increased, and walking on the trail was their form of exercise.

Green River Trail

This trail is found in King County, Washington, and runs for about 19 miles along the Green River and Duwamish River. The trail ranges from different industrial to rural areas connecting all the communities and parks. This trail has a very beautiful landscape and nature which creates a sense of place for the members of this community. Mainly walking and biking activities occur on the Green River trail, therefore, providing users with a safe and very cheap form of exercise. A study on trails in Washington state reported that physical activity from the use of trails

resulted in more than \$390 million of health savings annually for the people. It also states that outdoor exercise on the trails improved mood, and reduced stress and depression of the users.

Ludlam Trail

The Ludlam Trail is a 5.6-mile-long trail in Miami-Dade County. This trail provides a safe mixed-use area for various activities like walking, running, and cycling as well as other forms of non-motorized modes of transportation. This gives trail users the ability to perform different physical activities that improve their health. The trail connects and provides access to parks, shopping areas, schools, restaurants, bus stops, and parks within the community. A case study on this trail revealed that trail users lose or keep off between 32,664 and 109,939 pounds of weight annually through burning between 2.19 million and 7.39 million calories per week due to exercising. In addition, the trail will lead to direct medical savings of approximately \$1.68 million to \$2.25 million per year.

Past Plans and Studies

TEAP Study for South Albany Avenue

In 2020, the City of Bolivar developed a Traffic Engineering Assistance Program (TEAP) study with Cook, Flatt & Strobel (CFS) Engineers. This study focused on

South Albany Avenue between East Walnut Street and South Springfield Avenue and sought to find low-cost, near-term improvements on the road which could be implemented by the City's Street Department. The study found that South Albany Avenue had issues stemming from the nearby 5-way stop, as well as the lack of multimodal infrastructure present to accommodate pedestrians and cyclists.

Recommendations for the improvements along South Albany Avenue :

1. Install signage to make South Albany Avenue a northbound one-way street between S. Springfield Avenue and E. Maupin Street.
2. Construct a pedestrian bump-out at the intersection of South Albany Avenue & S Springfield Avenue to reduce pedestrian crossing distance and reduce the potential of a wrong-way southbound vehicle
3. Use pavement markings and white vertical delineators to reduce the roadway width on South Albany Avenue between E. Van Buren Street and E. Maupin Street
4. Add a pedestrian facility, either a 6 ft sidewalk on the eastern side of South Albany Avenue or a 10 ft multi-use path on the western side of South Albany Avenue which will require stormwater improvements.
5. Along the pedestrian facility, install bike fix-it stations, benches, and pedestrian scale lighting are other ideas to create a welcoming environment

for active transportation.

6. Redesign the uncontrolled access at the shopping center along South Albany Avenue to reduce erratic parking maneuvers.
7. Because of the 40 ft right-of-way constraints, install a 0.5 ft wide straight curb. For Concept 1, include special curb cuts to allow water to flow into the ditch. All new curb returns need to be designed to handle existing truck paths.
8. Add streetlights at intersections along South Albany Avenue
9. Within the new greenspace along the roadway, install street trees, native vegetation, landscaping berms, and "Green Infrastructure" Best Management Practices (BMPs) for increasing stormwater penetration to improve the aesthetics of the roadside area.
10. Pursue a grant through the Surface Transportation Block Grant Program (STBG) as a primary funding resource.
11. The engineers from CFS Engineers estimated the cost of these improvements would be \$624,550.35. The City of Bolivar submitted this report as a part of its Transportation Alternatives Program (TAP) funding application and was notified in October of 2022 that the project would be receiving funds from MoDOT.

2020 Bolivar Comprehensive Plan:

In 2020, Bolivar developed a Comprehensive Plan that would serve as a guiding document until 2040. The Comprehensive Plan includes information on a variety of topics, including housing, economic development, land use, transportation, and more. The transportation section included sections on a variety of topics, including transportation demographics, traffic safety, parking, trails, and more. Through this process, the following goal and objectives were identified:

Goal 1: Develop a safe, efficient transportation network that connects and accommodates a variety of modes and users.

Objective 1: Accommodate a variety of transportation choices, modes, and users.

Objective 2: Enhance connections between where people live and where they work and play.

Objective 3: Improve the efficiency and safety of the transportation network.

City of Bolivar Sidewalk Inventory

In 2017, the City of Bolivar partnered with the Southwest Missouri Council of Governments (SMCOG) to conduct a sidewalk inventory. This involved locating all sidewalks and assessing the overall condition. Every segment of the sidewalk was located and mapped by referencing existing plans, utilizing Google Earth, and carrying out a windshield survey. Sidewalks were categorized into three conditions:

good, fair, and poor. Sidewalk conditions were determined by analyzing cracks or buckling, aesthetic value, presence of debris or vegetation, adequate width, and accessibility. The table below shows a detailed breakdown of different ratings.

Rating	Miles	Percentage
Good	13.38 mi	64%
Fair	4.34 mi	21%
Poor	3.17 mi	15%
Total	20.89 mi	100%



AREA PROFILE

Demographics

Population affects the demand for different modes of transportation in a community. An increase in the population may lead to the need for the expansion of existing roads or the addition of multimodal transportation infrastructure. The expansion of the existing roads may be costly, therefore, providing community members with cheaper transportation modes like walking, cycling, and others will help accommodate the population's needs. Additionally, the new modes of active transportation will provide the community with economic and health benefits as well as more interconnectedness of different facilities or services.

THE CITY OF BOLIVAR IS EXPERIENCING STEADY POPULATION GROWTH.

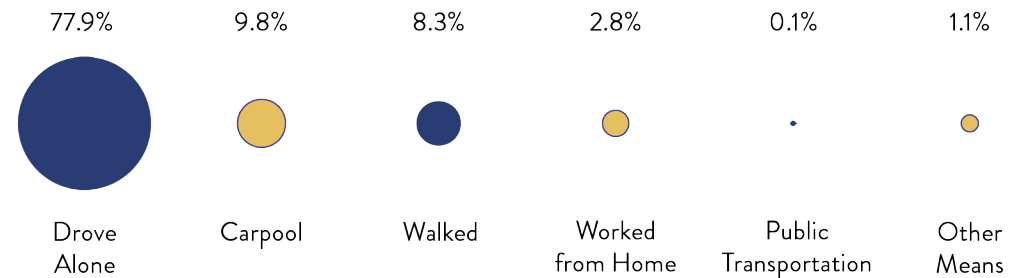
According to the ACS 5-years estimates, the population of Bolivar increased from about 10,222 people in 2010 to 10,507 people in 2015 and to 11,000 people in 2020, which is a **7.61% growth** in the population of the city.

Transportation Methods and Accessibility

Transportation demographics can help provide a better understanding of the current conditions of the transportation network to inform future development.

It takes Bolivar residents an average of 19.9 minutes to travel from home to work.

The breakdown of how residents traveled to work can be seen below:



These numbers show a dependence on cars within the area, with driving alone outweighing any other method of transportation. While this is understandable given the current conditions of the Bolivar transportation network, it is important for the city to work toward providing residents with alternative modes of transportation to help reduce traffic and improve the quality of life for residents. Ensuring that all residents can access reliable transportation, not just car owners, is a key step in improving community equity and improving the transportation system in Bolivar.

Housing and Transportation Costs

It is important to consider the costs of transportation and housing when analyzing the transportation needs of a given area. The Housing and Transportation Index, a tool created by the Center for Neighborhood Technology (CNT), shows that Bolivar has a relatively healthy housing supply, with approximately 94.6% of residents spending less than 30% of their annual income on rent. The average monthly housing cost in Bolivar is currently at \$754, meaning that residents spend an average of 21% of their annual income on Housing.

Transportation accounts for a higher percentage of income than housing in Bolivar, with the average resident spending 29% of their annual income on transportation costs.

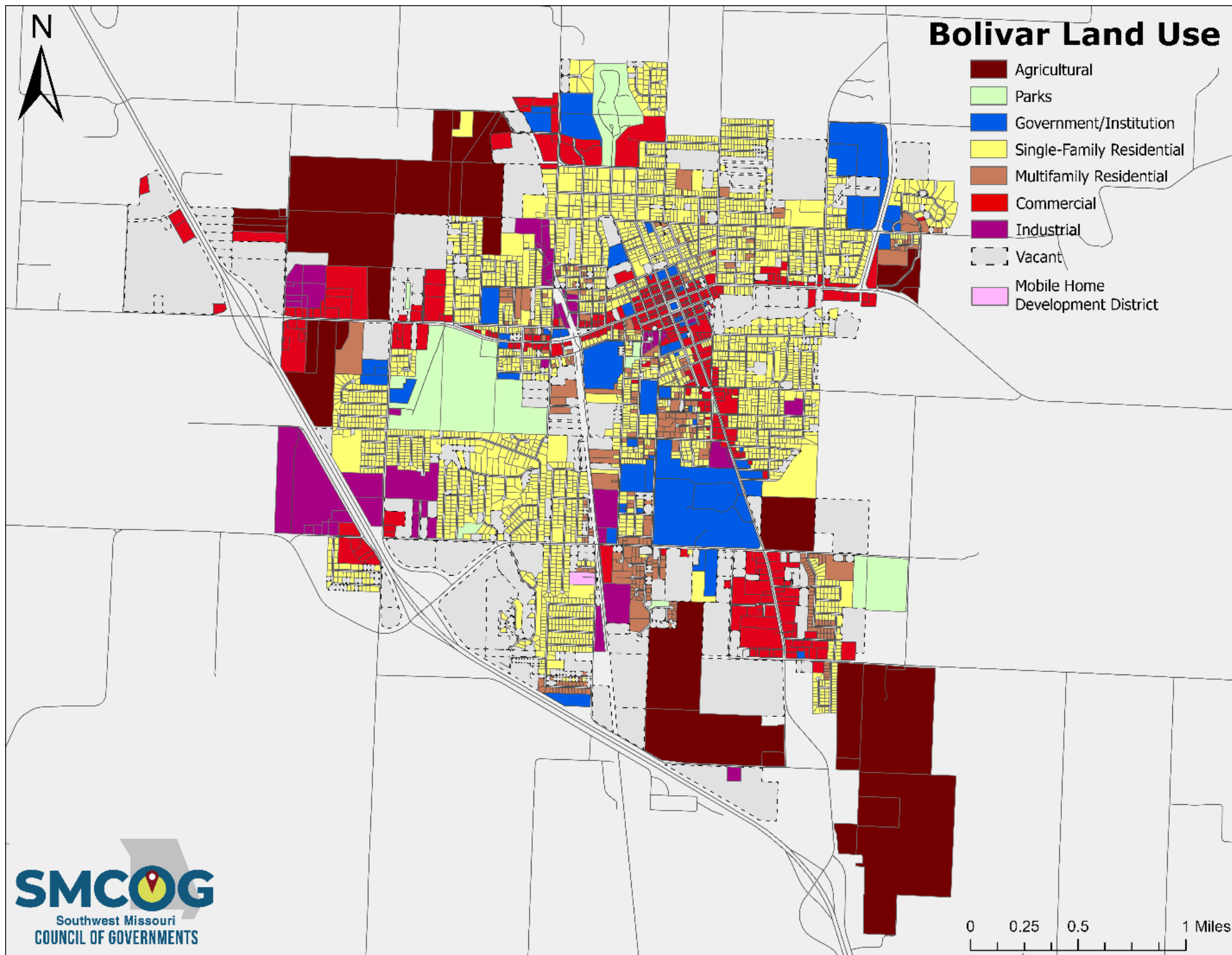
According to CNT, the average household owns 1.75 automobiles with each vehicle traveling an average of 22,521 miles per year. This equates to an annual transportation cost of \$12,690, taking a significant portion of resident income. These figures show that the average Bolivar resident spends 50% of their annual income on housing and transportation alone, a figure which could be reduced with a decrease in transportation costs resulting from the implementation of active transportation facilities. Providing cheaper transportation alternatives through biking and walking

facilities can help reduce the cost of living and improve the quality of life for Bolivar residents. The city should work with the community to educate residents on the many benefits, both financial and physical, that active transportation facilities can provide residents.

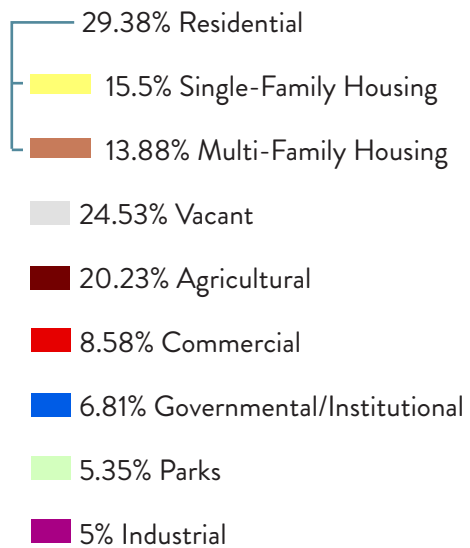
Land Use

Land Use is a term that describes how a piece of land is presently being used. There are several designations for land use in the city of Bolivar, including residential, commercial, industrial, government/institutional, agricultural, parks, and vacant. Although often confused with zoning, land use is a different distinction from a parcel's zoning. Zoning is the designation of a parcel by the city, whereas land use is the current usage of the land, regardless of zoning. For example, if a single-family home is torn down it may still be considered residential according to the zoning even though its land use would be considered vacant.

It is important to analyze the existing land uses in Bolivar to locate high-demand destinations and better understand the needs of the city transportation network. The land-use map for Bolivar can be seen on the following page.



The City of Bolivar consists of the following land uses:



The land use map can help show some key areas in need of connection to the active transportation network, including the commercial corridor on Springfield Avenue, the commercial district in downtown, the industrial area along Killingsworth, and the multiple schools and government buildings around the city. Using the land use map in tandem with the existing sidewalk segment map can help identify areas in need of additional segments, as well as help create a better understanding of the broader transportation network of Bolivar.



EXISTING FACILITY CONDITIONS

While the words “transportation network” traditionally conjure images of the roadway network which facilitates travel by motor vehicle, there are additional elements that play a pivotal role in providing an efficient transportation system to residents. Multimodal transportation facilities are paramount in maintaining a diverse transportation system that accommodates the needs of all residents. The multimodal transportation network is made up of alternative travel methods which are often overlooked, including pedestrian facilities (sidewalks), bike infrastructure, public transportation, and railways. While the modern-day transportation network in the region is made up of overwhelmingly of roads for motor vehicles, multimodal travel methods can diversify a city’s transportation infrastructure and provide numerous benefits to residents by allowing for a variety of options.

It is important to understand the impact of the local transportation network on the pedestrian and biking network to properly plan for active transportation improvements. There are a variety of factors to consider in this process, including the roadway network, connectivity, and the state of existing multimodal facilities. The purpose of this section is to identify gaps in the multimodal transportation network and find practical improvements to the Bolivar transportation network.

Active Transportation Facility Overview

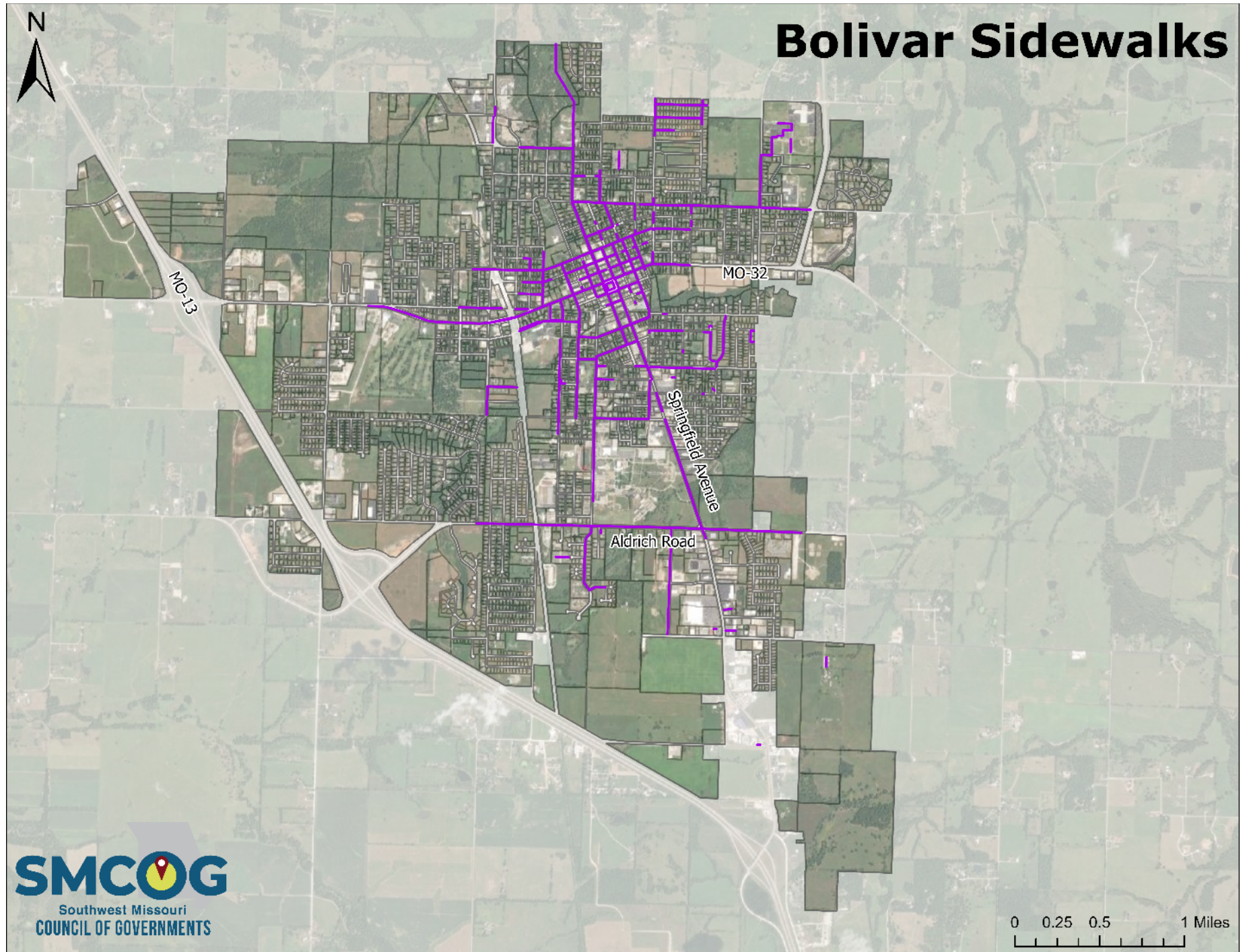
Sidewalks

Bolivar has approximately 46.6 miles of sidewalks within city limits. The majority of these sidewalks exist alongside roads in high-use areas like the Bolivar downtown, with most residential areas having few to no sidewalk facilities in the area. While the current facilities allow residents in and around the Bolivar downtown to travel by foot, most residents living outside of this area have no multimodal options and must drive to their destination. Implementation of additional sidewalk segments, bike paths, safe crossings, and general infrastructure improvements can help increase community safety and allow for a more efficient transportation network. See the following page for a map showing existing sidewalk pathways.

Network Connectivity

Network connectivity is a key element in creating an efficient transportation system for all, regardless of age, ability, or method of transportation. Increasing mobility by ensuring path connectivity allows pedestrians and cyclists to have an option that connects them to all high-priority areas within the city, creating a more accommodating network for all.

Bolivar Sidewalks



As the city has expanded over the years, the sidewalk and biking facilities have not grown in tandem. Multimodal infrastructure is lacking in most areas around the city and needs expansion. However, completion of the entire network is not feasible, so high-priority locations for improvements must be identified and implemented as resources become available. One of the largest issues with expanding this connectivity is accommodating pedestrians and cyclists on high-speed arterial roads, which are key corridors that facilitate much of the travel through the city. While these corridors are high priorities for the addition of active transportation infrastructure, safety in these areas should be a top priority. Arterial roads typically see high speeds and high congestion, increasing the difficulty of implementing multimodal infrastructure that is both safe and accommodates the needs of residents.

Connectivity should also be encouraged through the use of city policies and zoning codes. Several developments in the city have poor connectivity due to a lack of sidewalks and street designs which frequently use cul-de-sacs and other road designs which limit the connectivity of roadways and pedestrian infrastructure. Another element of the multimodal network that should be considered is the inclusion of bike lanes. Bike lanes provide yet another alternative to motor transportation, improving the local transportation network while also helping improve

community health by promoting physical activity. Just like the sidewalk network, safety for the bike network is paramount. Residents and city officials have identified the need for separated bike paths instead of on-road bike lanes to improve the safety of both cyclists and drivers by removing cyclists from accident-prone roadways. The most effective way to implement these changes is to increase the width of sidewalks alongside roads with identified bike needs to 10' to accommodate both cyclists and foot traffic. The Federal Highway Administration (FHWA) recommends 10' paths two-directional paths under most conditions, with 8' being adequate in rare instances (areas with low pedestrian/cyclist density, areas with good horizontal and vertical alignment that provides frequent and safe passing opportunities, etc.).

Trails

There are two main trails in Bolivar, the Dunnegan Park trail and the Frisco Highline Trail. Dunnegan Park trail is a local trail less than a mile in length which is commonly used by residents in the surrounding neighborhoods. Dunnegan Park trail is made of gravel and has very little lighting, making many residents uncomfortable with using the trail at night. Although the park is only open from dawn to dusk users are still able to access the trail after those hours. Frisco Highline Trail is a regional biking and walking trail that provides a connection between Bolivar and

Springfield, passing through several other towns in the process including Walnut Grove, and Willard. Spanning 35 miles total, the Frisco Highline Trail acts as a great transportation thoroughfare for cyclists looking to travel through the region. While this trail sees high ridership and could be used to attract visitors to Bolivar, there is currently no way for cyclists taking the trail to easily cross Highway 13 to enter the town. As of now, cyclists are forced to either take an on-road detour on Prairie Lane and Aldrich Avenue or attempt to cross Highway 13 without any proper crossings, putting themselves and others at risk. A third trail was also opened on October 15th, 2022, known as the Osage Hills Connection Route (OHCR), which connects the north end of the Frisco Highline Trail to Clinton's Katy Trail, creating a path from Springfield to St. Louis for pedestrians and cyclists. This new trail will likely bring an influx of cyclists through Bolivar, increasing the need for cyclist infrastructure in the city.

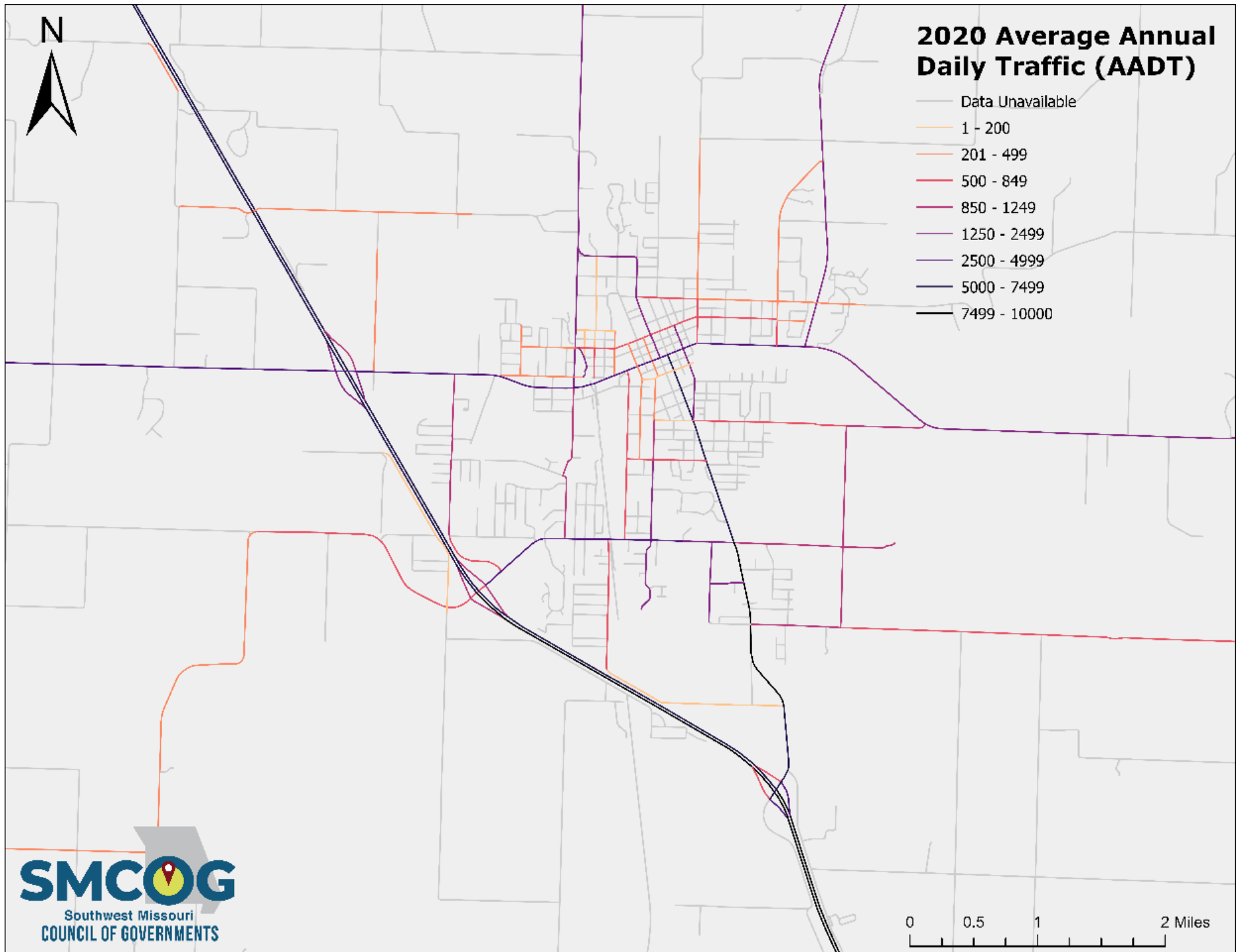
Roadway Network Analysis

Roadways with lower traffic density and speeds create a more accommodating transportation corridor for cyclists, as well as provide a safer environment for pedestrians. Several elements can be incorporated into the street design to provide a safer experience for residents using active transportation methods, including proper use of traffic signals, speed limits, signage, and pedestrian crossings. Analysis of

the roadway network in Bolivar can help identify areas that would be best suited for cycling and pedestrian infrastructure, as well as provide a deeper understanding of how improper use of automobile infrastructure can create significant barriers and safety hazards for those using methods of active transportation.

Traffic Volume

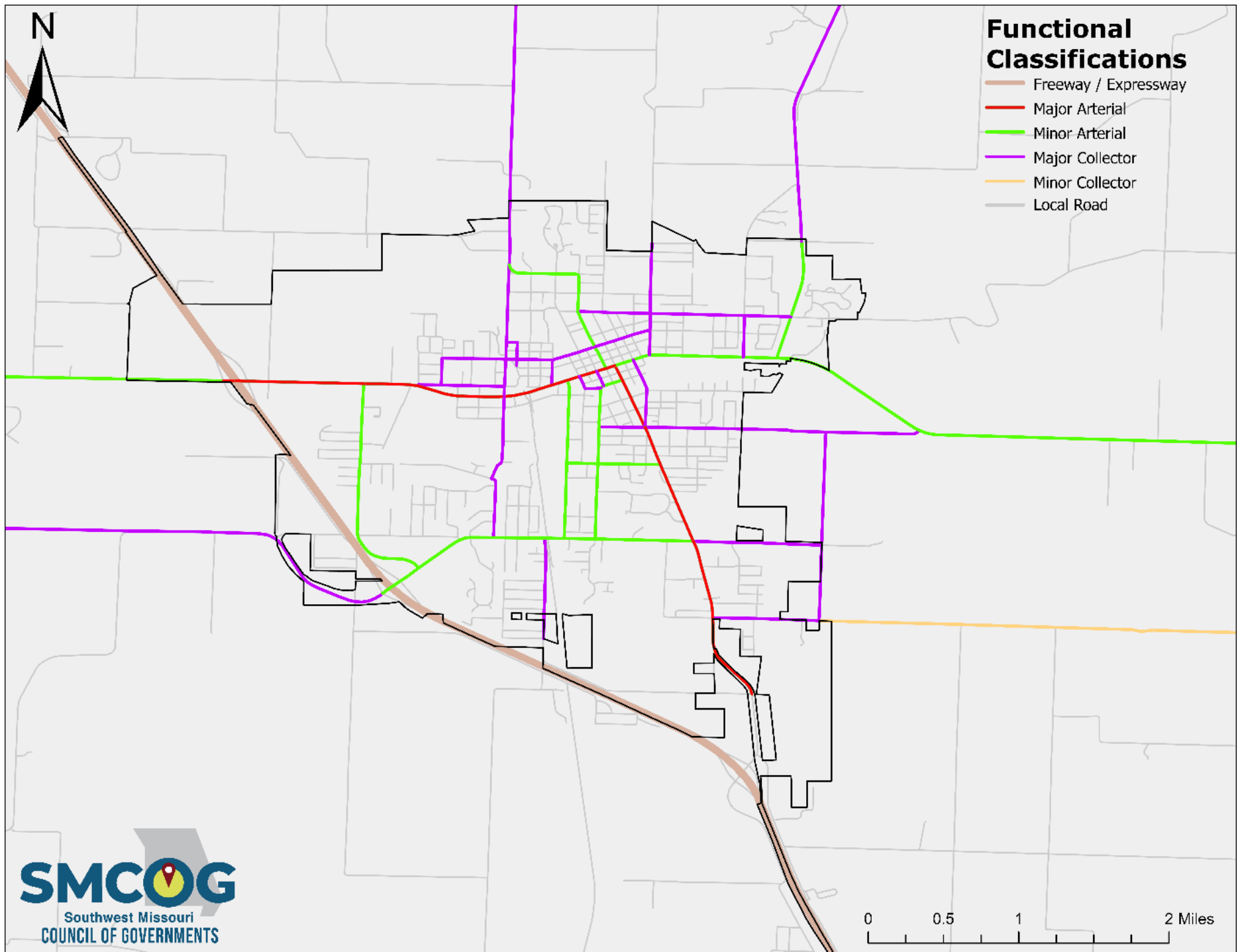
Average Annual Daily Traffic, also known as AADT, is the most common metric used to measure traffic volume. This value provides a standardized value that expresses the level of usage and relative importance of a roadway. AADT values are calculated by taking the total number of vehicles that traversed a segment of road within a year and dividing by 365 to determine how many vehicles use the road on average each day. AADT values are one of the main metrics that should be considered when considering the implementation of cyclist and pedestrian facilities. Cyclists typically prefer riding in areas with fewer motor vehicles, and pedestrians are typically safer on roads with lower AADT values.



Functional Classifications

Functional classification is the process by which streets, roads, and highways are grouped into classes based on several characteristics of the road, including the Average Annual Daily Traffic (AADT), road width, general use, and several other factors. There are six classifications relevant to Bolivar as determined by MoDOT and federal guidelines. More information on functional classifications can be found on the Federal Highway Administration (FHWA)'s website.

1. **Freeway / Expressway:** Freeways and Expressways are roads that have directional travel lanes and are typically separated by a physical barrier of some kind. These roads have limited access points, mostly limited to on- and off-ramps with very few at-grade intersections. These roadways serve the purpose of facilitating long-distance travel, typically connecting cities.
2. **Major Arterial:** These roadways act as the main thoroughfare through a city, providing a high level of mobility through a city. Primary arterials do not have controlled access points, instead serving surrounding parcels directly. Rural areas typically have a single principal arterial road with other minor arterials and collector roads branching out from the main road. Unlike freeways and expressways, principal arterials typically have multiple at-grade intersections with other roadways.
3. **Minor Arterial:** Minor arterials offer connectivity to principal arterials and act as another type of main thoroughfare. These roads provide relatively high travel speeds and have minimum interference to through movement. The main difference between minor arterials and principal arterials is typically seen in AADT values, with minor roads having an AADT of 3,000 – 14,000 and principal roads having an AADT of 7,000 – 27,000.
4. **Collector:** The main purpose of a collector road is to “collect” traffic from local roads and funnel them to arterial roads. In addition to serving this role of connecting local roads to arterial roadways, collectors often help circulate traffic within residential neighborhoods and commercial/industrial districts.
5. **Local Road:** Local roads provide direct access to properties and connect residential areas to roadways with a higher functional classification. Local roads are often lined with several intersecting roadways and other access points like driveways and crosswalks. Speed limits on local roads are often low to help ensure traffic operations are safe due to the frequency of intersections. Local roads typically see the lowest AADT volumes of any road type but account for the largest percentage of roadways in terms of mileage.



Bicycle facilities are best suited to minor arterial, collector, and local roads, as the higher speeds and traffic volumes of major arterial roads create dangerous conditions for cyclists. The only roads classified as major arterial in Bolivar are Broadway Street and South Springfield Avenue. Some of the minor arterial roads within Bolivar include Main Avenue, Killingsworth Avenue, Aldrich Road, and South Pike Avenue.

Traffic Signals

Bolivar has approximately eight traffic signals within the city, generally located at the intersections of arterial and collector roads. Traffic signals are an important tool to utilize when implementing pedestrian and cyclist infrastructure, as traffic signals act not just as a method of mitigating traffic at an at-grade intersection, but also as a primary location for pedestrian crossings. Pedestrian crossings are a vital element of an active transportation network and should be a high priority for high-use thoroughfares to ensure pedestrians and cyclists can safely traverse transportation corridors. Three intersections are equipped with pedestrian crossing lights.

Speed Limits

In addition to traffic volume and proper use of traffic signals, speed limits are another important factor to consider when designing active transportation routes.



Transportation corridors with higher speed limits are generally not preferred locations for cyclist infrastructure, as bicyclists tend to be more comfortable in areas with slower-moving vehicles. Major arterial roads and other high-speed corridors are dangerous for cyclists, with minor arterial, collector, and local roads being better candidates for cyclist/pedestrian infrastructure improvements.

Crosswalks

Proper implementation of crosswalks is essential to creating a safe network for pedestrians and cyclists. Residents have identified multiple roadways throughout Bolivar in need of crosswalks, including Broadway Street, Aldrich Road, and Springfield Avenue. Safe crossings must be provided near schools, intersections, and high-use areas.

In general, there are two main types of crosswalks, those placed at intersections and those placed along a roadway (also known as mid-block crossings). While there are many intersections throughout Bolivar that provide crossings for pedestrians, mid-block crossings are underutilized throughout the city. Implementation of mid-block crossings can decrease the number of pedestrians who attempt to cross the road without a marked crossing by decreasing the distance pedestrians must travel to reach the nearest crosswalk. Additional crossings could help increase safety on several roads throughout Bolivar, including Springfield Avenue, Broadway Street, and Aldrich Road.

Mid-block crossings come in many forms, from something as simple as in-street signage to a strip of pavement and/or grass that acts as a safe place for pedestrians to stop and wait for traffic to pass (also known as a pedestrian refuge). The city should look to implement more mid-block crossings and improve existing crosswalks to create a safer environment for all pedestrians and cyclists.



ACTION PLAN

Decision-Making Process

A decision-making process was developed to help the city determine higher priority active transportation needs to pursue. For each need, a goals analysis was completed based on community priorities identified through the community survey and committee meetings, and risk analysis was completed to assess the ease of implementation. Each listed need includes a matrix table that outlines these two analysis processes to guide the city to determine the best course of action when prioritizing active transportation projects. An overview of the methodology on which projects were analyzed is shown below.

Goal Analysis

Community goals were identified through a combination of the results of the community survey and input from the transportation planning committee. The four goals listed below provide a foundation for decision-making to maintain and enhance the active transportation system for the City of Bolivar.

- **Safety:** Promotes safety and security for all users of the transportation network.
- **Health:** Improves the health of all users by encouraging physical activity such as walking and biking.
- **Economic Impact:** Encourages economic growth by providing transportation

infrastructure that ensures job accessibility and opportunities, and provides connectivity to commercial areas.

- **Mobility and Convenience:** Supports an efficient transportation system that addresses access to places necessary for a quality life and in a timely and affordable manner.

Risk Analysis

It is important to assess the ease of implementation for each need. While all these needs are feasible, some can be implemented more easily than others for a variety of reasons. The following factors should be assessed when considering the feasibility of new projects or needs.

- **Right-of-Way: Right-of-Way (ROW)** is a type of easement granted over land for transportation purposes. ROW acquisition may involve many participants. The cost and duration of ROW acquisitions are influenced by various factors such as related laws and regulations, project characteristics, relationships with property owners, and parcel characteristics.
- **Financing Partnerships:** Depending on the project type and location, there are a variety of potential funding and financing options that are available through federal and state programs, and grants. Lack of funding opportunities may impact the city's financial ability to complete a project.

- **Phasing Options:** Many projects can be implemented over time to align with the city's financial capacity. However, a lack of phasing options due to construction or design may influence the city's ability to implement a project.

Permitting: The city may be required to complete environmental clearances and receive state or other permits. Permitting process may impact the length of time for project implementation.

Decision-Making Matrix

A matrix table was created to evaluate each need brought forward by the community survey and the Transportation Planning Committee (TPC) to assess how well they meet community goals and consider possible risks for each transportation need. Each need is given a numerical score in each section, which is then used to create a composite score. This score gives each project a value denoting how well it meets the goals of the community and the likelihood of the project being implemented easily. This total score should not be the only thing considered when evaluating a need, as some needs that best address the goals of the community may have risks involved. This score is meant to help guide decision-making by providing a value that combines these factors to help the city make an informed decision on what projects or needs to pursue.

Needs should be reevaluated over time, as some needs which may be considered a risk now, due to a lack of financial partnerships or issues with permitting, may change with time as more financing options open and policies change. This table provides a basic metric with which to evaluate needs and is subject to change as the city continues to grow and evolve. Additional comments on reasonings for scores are provided when necessary. An example of a matrix table is provided below.

Example Project		
Safety	1	History of accidents at this intersection. Decreases pedestrian and vehicle conflict.
Health	1	Improves health of the community.
Economic Impact	1	Provides access to jobs and opportunities.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/ Easements	1	City has the ROW on this road.
Financing Partnerships	0	No financing partnerships are available.
Phasing Options	0.5	Could be implemented over time.
Permitting	1	Does not require any permits.

Goals Analysis Values:

0: Doesn't meet the goal

0.5: Partially meets the goal

1: Meets the goal

Risk Analysis Values:

0: Difficult to implement

0.5: Partially easier to implement

1: Easier to implement

Springfield Avenue

Springfield Avenue is a three-lane major arterial road under the jurisdiction of MoDOT which facilitates a majority of north-south travel through Bolivar. Springfield Avenue provides a connection between Bolivar's downtown, Southwest Baptist University, and the southern commercial district before meeting Highway 13 at an interchange. The posted speed limit is 20-50 MPH.

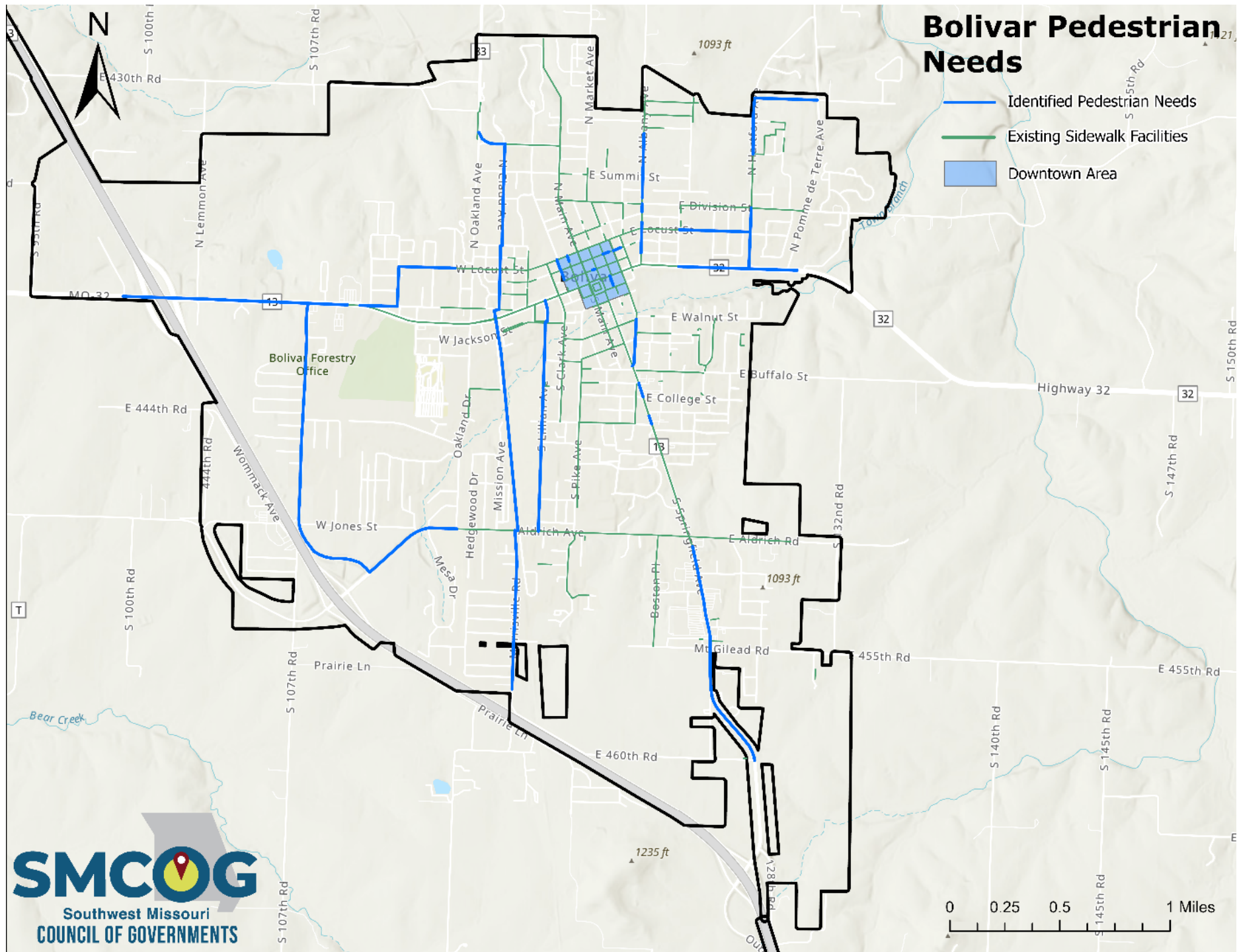
Candidate Pedestrian Needs Assessment:

The following high-priority pedestrian needs were based on the community survey and TPC meetings. Below is a matrix that outlines the top ten pedestrian needs.

An explanation of the needs that includes description, goals analysis, and risk analysis is available after the matrix.

The lack of sidewalks south of Aldrich and missing segments between E South Street and E Austin Street decreases connectivity and makes it difficult for pedestrian travel. Implementation of additional sidewalks from Aldrich to E 460th Rd and filling in missing segments between E South Street and E Austin Street would

Pedestrian Needs										
	Needs	Goal Analysis				Risk Analysis				Outcome
		Safety	Health	Economic Impact	Mobility and Convenience	Right-Of-Way/Easements	Financing Partnerships	Phasing Options	Permitting	Score
1	Springfield Avenue	1	1	1	1	1	1	1	0.5	7.5
2	Aldrich Avenue	1	1	1	1	1	1	1	1	8
3	Claud Avenue	1	1	0.5	1	0.5	1	1	1	7
4	Killingsworth Avenue	1	1	1	1	1	1	1	1	8
5	Lillian Avenue	1	1	0.5	1	1	1	1	1	7.5
6	Downtown	1	1	1	1	1	1	1	1	8
7	Broadway Street	1	1	1	1	1	1	1	0.5	7.5
8	Albany Avenue	1	1	0.5	1	1	1	1	1	7.5
9	Hartford Avenue/Locus	1	1	0.5	1	1	1	1	1	7.5
10	Morrisville Road	1	1	0.5	1	1	1	1	1	7.5



help accommodate foot traffic to the southern commercial district of Bolivar. It should be noted that Springfield Avenue has a large number of curb cuts providing access to commercial developments along both sides of the road, increasing the frequency of interactions between pedestrians and motorists. The high frequency of interactions increases the likelihood of an accident, making it difficult to properly implement a safe bicycle route along Springfield Avenue. One possible solution to this issue is to reduce the number of curb cuts, which would both limit the interactions between pedestrians and motorists while also providing an increase in parking supply in the area. This solution does not come without difficulties, as it would require cooperation between the city and local businesses, but it would substantially improve cyclist and pedestrian safety in the area.

Springfield Avenue		
Safety	1	The addition of sidewalks and crosswalks would lower the risk of pedestrian and vehicle interaction and would provide pedestrians with safe crossings.
Health	1	Encourages people to be physically active by enabling them to walk to their destinations.
Economic Impact	1	Provides direct access to the dense commercial corridor.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	MoDOT has ROW but is not difficult to acquire.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	0.5	There might be issues with acquiring permits.



ALDRICH ROAD >

Aldrich Road

Aldrich Road is a three-lane minor arterial road under the jurisdiction of the City of Bolivar which facilitates a large amount of east-west travel through Bolivar. Starting as Route T on the west side of the city, Aldrich Road connects to many prominent roads in Bolivar, including Killingsworth Avenue, Oakland Avenue, and Springfield Avenue. The posted speed limit is 40 MPH. While there are currently wide sidewalk segments in good condition surrounding SBU, additional sidewalks should be constructed from Oakland Avenue to Killingsworth Avenue. This additional segment would connect the neighborhoods along Killingsworth to the commercial district in the southeast, as well as connect more residents to the planned commercial development between Aldrich, Orchard, and Highway 13. Additional crosswalks and signage should also be implemented along the entirety of the road to improve pedestrian safety in the area.

Aldrich Road		
Safety	1	The addition of sidewalks and crosswalks would lower the risk of pedestrian and vehicle interaction and would provide pedestrians with safe crossings.
Health	1	Encourages people to be physically active by enabling them to walk to their destinations.
Economic Impact	1	Provides direct access to the dense commercial area.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	City has ROW.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issues in acquiring permits.



Claud Avenue

Claud Avenue is a low-density two-lane local road under the jurisdiction of the City of Bolivar which connects local connector roads to resident homes. Claud Avenue does not currently have any sidewalks, leaving pedestrians with no option but to walk along the narrow road, putting themselves and other drivers at risk. Implementation of sidewalks from the Frisco Highline Trailhead to W Forest Street would help connect many households in western Bolivar to the broader sidewalk network, as well as provide pedestrian access to medical care facilities and Dunnegan Park in the north. While Oakland Avenue could also be used to accomplish this goal, Claud Avenue is a wider road with lower traffic density, making it a better fit for new pedestrian facilities. Connecting this new sidewalk segment to the Frisco Highline Trail would also act as an extension to the trail, allowing pedestrians to easily travel from the north side of Bolivar to the south using a single pathway.

Claud Avenue		
Safety	1	The addition of sidewalks would lower the risk of pedestrian and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to walk to their destinations.
Economic Impact	0.5	Doesn't provide direct access to a commercial area.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	0.5	Not enough ROW.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issues in acquiring permits.

Killingsworth Avenue

Killingsworth Avenue is a minor arterial road under the jurisdiction of the City of Bolivar which provides an alternative connection between Broadway Street and Aldrich Road. The posted speed limit is 35 MPH. One of Bolivar's largest employers, Tracker Marine, is also located on this road. There are currently no sidewalks along Killingsworth, forcing workers traveling by foot and other pedestrians to walk along the road, putting themselves and others at risk. Implementation of sidewalks along Killingsworth from Broadway Street to Aldrich Road would help improve safety in the area, as well as connect Tracker Marine to the broader sidewalk network.

Killingsworth Avenue		
Safety	1	The addition of sidewalks would lower the risk of pedestrian and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to walk to their destinations.
Economic Impact	1	Provides direct access to a major employer.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	City has ROW.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issues in acquiring permits.



Lillian Avenue

Lillian Avenue is a two-lane collector street under the jurisdiction of the City of Bolivar which provides an alternative connection between Aldrich and downtown, acting as a direct route between SBU and Bolivar's downtown. The posted speed limit is 30 MPH. There are existing segments along part of Lillian, but the implementation of additional segments would provide a pedestrian corridor for students to travel to and from the Bolivar downtown. Pedestrians currently have to alternate between walking on the sidewalk and the road, decreasing safety and increasing the likelihood of an accident. Sidewalks should be added on Lillian from Aldrich Road to W Colgate Street, as well as a connection between the existing segments from W Maupin Street to W Madison Street.

Lillian Avenue		
Safety	1	The addition of sidewalks would lower the risk of pedestrian and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to walk to their destinations.
Economic Impact	0.5	Doesn't provide direct access to a commercial area.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	City has ROW.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issues in acquiring permits.



Downtown

The downtown is a significant commercial district within the City of Bolivar. Many sidewalks on and surrounding the square are in poor condition and need repair. The downtown is also in need of additional signage and crosswalks to increase safety for pedestrians. It is important to ensure that pedestrian facilities in the downtown are well maintained to ensure a safe experience for all who travel to Bolivar's primary commercial district. The city should work to replace and maintain sidewalks that are currently in poor condition and implement new signage to alert drivers of increased pedestrian activity.

Downtown		
Safety	1	The addition of sidewalks and crosswalks would lower the risk of pedestrian and vehicle interaction and would provide pedestrians with safe crossings.
Health	1	Encourages people to be physically active by enabling them to walk to their destinations.
Economic Impact	1	Provides direct access to a dense commercial area.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	No issues in acquiring ROW from private properties.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issues in acquiring permits.



Broadway Street

Broadway Street is a three-lane major arterial road under the jurisdiction of MoDOT which facilitates the bulk of the east-west travel through Bolivar. The posted speed limit is 35 MPH. Also known as MO-32, Broadway travels directly through the Bolivar downtown and provides connections to several important community facilities, including the Bolivar Recreation & Aquatic Center, the Bolivar Library, and Bolivar Middle School. While there are sidewalks along the majority of Broadway in Bolivar, extending the sidewalk network by implementing additional sidewalks from Sunset Avenue to the west of 13 and from Chicago Avenue to Redel Place would expand resident connectivity and provide a major improvement to the pedestrian facilities of Bolivar. Implementation of the eastern section from Chicago to Redel would also help provide a connection to Bolivar schools on Hartford Avenue. Adding additional signage and crosswalks would also increase pedestrian safety along this high-traffic corridor.

Broadway Street		
Safety	1	The addition of sidewalks would lower the risk of pedestrian and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to walk to their destinations.
Economic Impact	1	Provides direct access to a dense commercial corridor.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	MoDOT has ROW but is not difficult to acquire.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	0.5	There might be issues in acquiring permits.

Albany Avenue

Albany Avenue is a two-lane major collector road under the jurisdiction of the City of Bolivar which connects many neighborhoods in northern Bolivar to Broadway Street. The posted speed limit is 30 MPH. While there are a few sections of Albany Avenue with sidewalks, the majority of the road has no pedestrian facilities, forcing pedestrians to walk along the road, and putting themselves and others at risk. Implementation of sidewalks from Broadway to Bolivar city limits would increase safety and connect a large number of households to the broader sidewalk network.

Albany Avenue		
Safety	1	The addition of sidewalks would lower the risk of pedestrian and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to walk to their destinations.
Economic Impact	0.5	Doesn't provide direct access to a commercial area.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	City has ROW.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issues in acquiring permits.

Hartford Avenue/Locust Street

North Hartford Avenue is a four-lane collector road from E Division St to E Laird St (two lanes elsewhere)- that's under the jurisdiction of the City of Bolivar which provides connections to Bolivar Intermediate School, Bolivar High School, Bolivar Primary School, and the Early Childhood Development Center. The posted speed limit is 30 MPH (except where otherwise posted near schools). While there are currently sidewalk facilities from E Forest Street to E Division Street, this section is entirely disconnected from the rest of the sidewalk network. This lack of connections forces students to walk on the road when walking to or from school, putting themselves and others in danger and increasing the likelihood of an accident. Implementation of new sidewalk segments from Broadway Street to E Division Street, E Forest Street to Laird Road, and an additional segment wrapping around the high school on Laird from Hartford Avenue to N Pomme de Terre Avenue would increase student safety and help provide safe routes to schools for all.



Locust Street is a two-lane major collector road under the jurisdiction of the City of Bolivar which connects many neighborhoods in northern Bolivar to major roads like Main Avenue. The posted speed limit is 20 MPH. As a major east-west collector road, Locust also acts as one of the main connections to Hartford Avenue. Locust Street currently has sidewalks in and around the downtown area but is lacking connections to other parts of the city. Implementing new segments from N Chicago Avenue to Hartford Avenue, Oakland Avenue to Russel Avenue, and an additional segment on N Russel Avenue from Locust Street to Broadway Street would increase connectivity for residents and help connect students to the schools on the eastern side of town.

Hartford Avenue/Locust Street		
Safety	1	The addition of sidewalks would lower the risk of pedestrian and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to walk to their destinations.
Economic Impact	1	Provides direct access to a dense commercial area.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	City has ROW.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issues in acquiring permits.

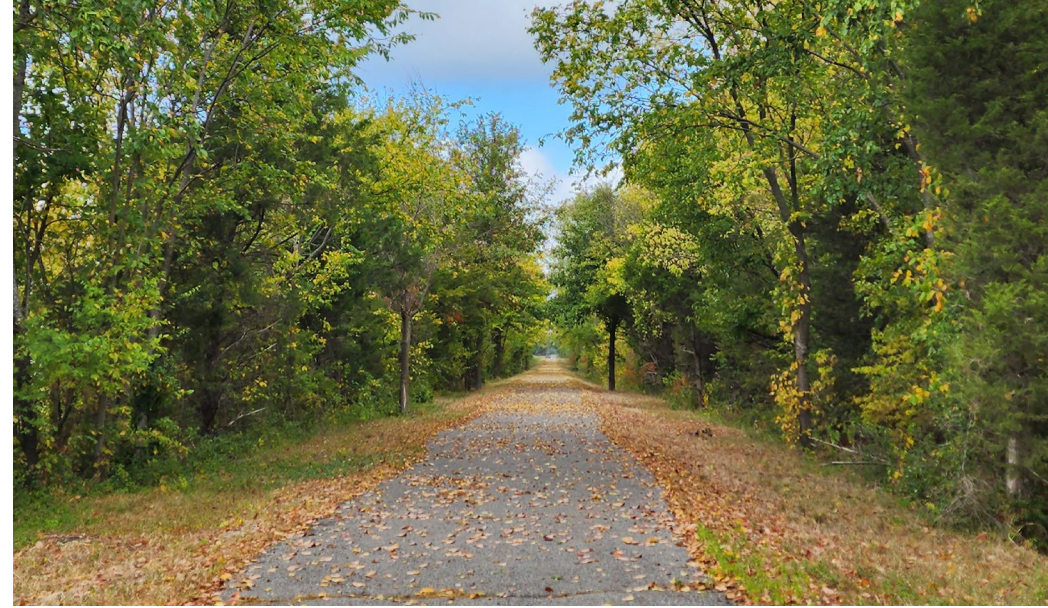
Morrisville Road

Morrisville Road is a two-lane collector road under the jurisdiction of the City of Bolivar which connects numerous households in southern Bolivar to Aldrich Avenue. The posted speed limit is 30 MPH. There are currently no sidewalks along Morrisville Road, leaving residents in these southern developments without a connection to the broader sidewalk network. Without sidewalks present along the road, residents are forced to walk in the street, putting themselves and others at risk. Implementing sidewalks along Morrisville would increase safety in the area, as well as provide the benefits of increased connectivity.

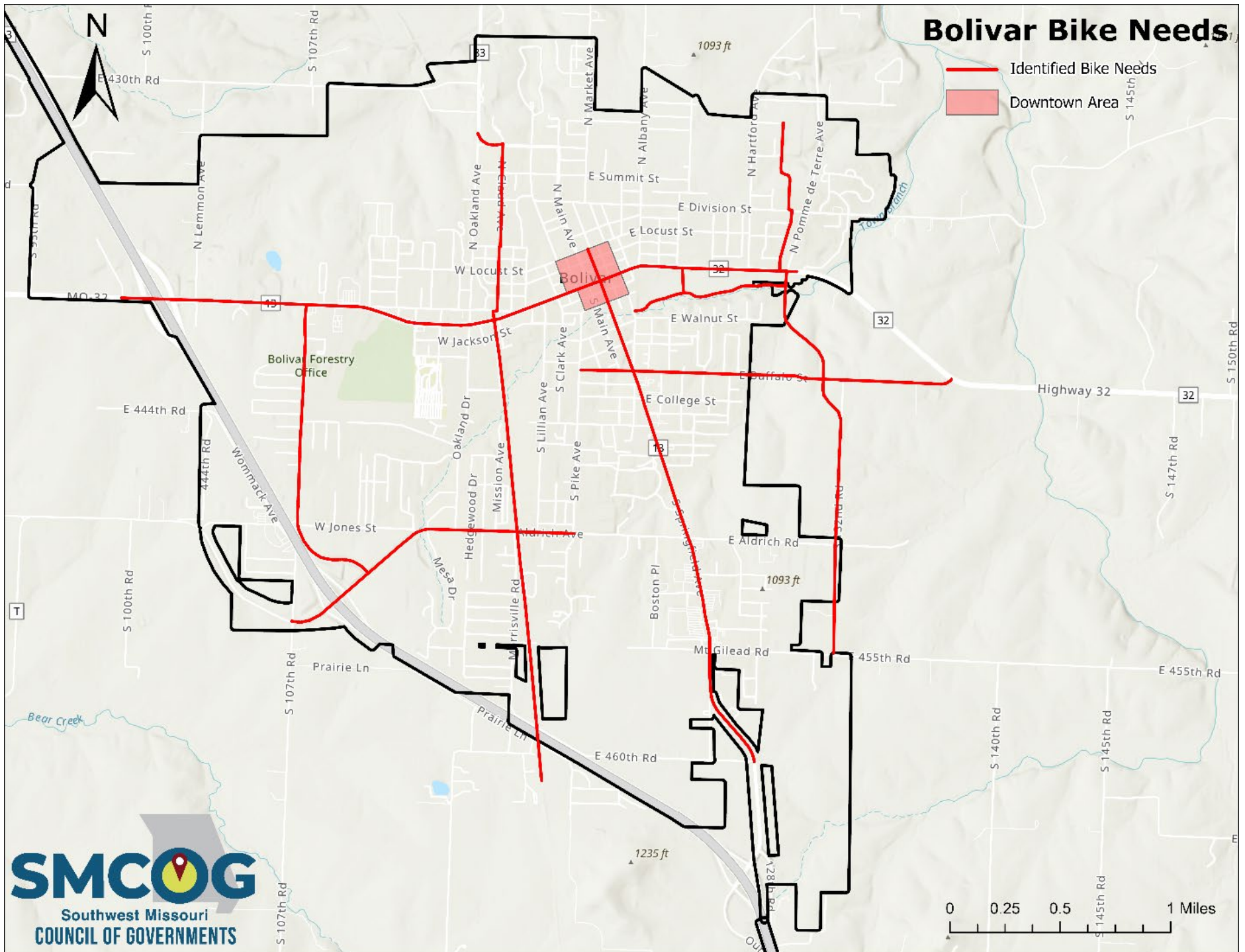
Morrisville Road		
Safety	1	The addition of sidewalks would lower the risk of pedestrian and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to walk to their destinations.
Economic Impact	0.5	Doesn't provide direct access to a commercial area.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	City has ROW.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issues in acquiring permits.

Candidate Bike Needs Assessment:

The following high-priority bike needs were based on the community survey and TPC meetings. Below is a matrix that outlines the top ten bike needs. An explanation of the needs that includes description, goals analysis, and risk analysis is available after the matrix.



Bike Needs										
	Needs	Goal Analysis				Risk Analysis				Outcome
		Safety	Health	Economic Impact	Mobility and Convenience	Right-Of-Way/ Easements	Financing Partnerships	Phasing Options	Permitting	Score
1	Springfield Avenue	1	1	1	1	1	1	1	0.5	7.5
2	Frisco Highline Trail	1	1	1	1	0.5	0.5	1	0.5	6.5
3	Aldrich Avenue	1	1	1	1	1	1	1	1	8
4	Broadway Avenue	1	1	1	1	1	1	1	0.5	7.5
5	Claud Avenue	1	1	1	1	1	1	1	1	8
6	Downtown	1	1	1	1	0.5	0.5	1	0.5	6.5
7	Killingsworth Avenue	1	1	1	1	1	1	1	1	8
8	East Loop Road	1	1	1	1	1	0.5	1	1	7.5
9	Buffalo Street	1	1	1	1	1	1	1	1	8
10	City of Bolivar Park Tra	1	1	1	1	0	1	1	1	7



Springfield Avenue

Springfield Avenue is a three-lane principal arterial road under the jurisdiction of MoDOT which facilitates a majority of north-south travel through Bolivar. Springfield Avenue provides a connection between Bolivar's downtown, Southwest Baptist University, and the southern commercial district before meeting Highway 13 at an interchange. The posted speed limit is 20-55 MPH. There are currently no bike lanes running down Springfield Avenue, making it very dangerous for cyclists trying to navigate on the road. Implementation of off-street bike lanes would help increase safety for cyclists traveling by giving them their own space instead of being forced to bike alongside vehicular traffic. It should be noted that Springfield Avenue has a large number of curb cuts providing access to commercial developments along both sides of the road, increasing the frequency of interactions between cyclists and motorists. The high frequency of interactions increases the likelihood of an accident, making it difficult to properly implement a safe bicycle route along Springfield Avenue. One possible solution to this issue is to reduce the number of curb cuts, which would both limit the interactions between cyclists and motorists while also providing an increase in parking supply in the area. This solution does not come without difficulties, as it would require cooperation between the city and local businesses, but it would substantially improve cyclist and pedestrian safety in the area.

Springfield Avenue		
Safety	1	Off-street bike lanes would lower the risk of bicyclist and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to bike to their destinations.
Economic Impact	1	Provides direct access to the dense commercial corridor.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	MoDOT has ROW but is not difficult to acquire.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	0.5	There might be issues with acquiring permits.

Frisco Highline Trail

The Frisco Highline Trail is a major trail that starts in Bolivar and leads south through Walnut Grove, and Willard before ending in Springfield. While the trail works well during the day, a lack of lighting and signage makes it difficult for some to travel at night, with many considering the trail to be unsafe. The implementation of lighting along the trail could help make the area safer and allow residents to use the trail during all times of the day. Adding signage is also important, as there are currently few indications of where the trail starts and leads. Constructing signage could help increase usage of the trail by the community, as well as help visitors to Bolivar navigate from the trail. This trail sees a high number of cyclists each day, but there is currently no way for pedestrians or cyclists traveling on the trail to easily cross Highway 13. Cyclists and pedestrians are currently forced to take an on-road detour on Aldrich Avenue across 13 before connecting back with the trail on Prairie Lane. The only alternative to this is to cross Highway 13 without any kind of crossing or signage, which is very dangerous on a major highway with cars traveling upwards of 65+ MPH. This seems to be a common occurrence, as an informal crossing path can be seen through the grass in aerial imagery. The addition of a bridge over Highway 13 connecting the two sides of the trail would allow for easier access for cyclists and hikers, potentially bringing new travelers to Bolivar and increasing safety on the trail.

Frisco Highline Trail		
Safety	1	The overpass would lower the risk of bicyclist and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to bike to their destinations.
Economic Impact	1	Provides direct access to the commercial area and helps bring new consumers/visitors to Bolivar from other areas.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	0.5	MoDOT has ROW.
Financing Partnerships	0.5	There are funding sources available for an overpass.
Phasing Options	1	This project can be phased.
Permitting	0.5	There might be issues with acquiring permits.

Aldrich Road

Aldrich Road is a three-lane minor arterial road under the jurisdiction of the City of Bolivar which facilitates a large amount of east-west travel through Bolivar. Starting as Route T on the west side of the city, Aldrich Road connects to many prominent roads in Bolivar, including Killingsworth Avenue, Oakland Avenue, and Springfield Avenue. The posted speed limit is 40 MPH. While there are currently wide sidewalk segments in good condition surrounding SBU, off-street bike lanes along Aldrich from 132nd Road to S 107th Road would improve safety and provide more connectivity for cyclists. The extension to S 107th Road would also improve safety for cyclists taking the on-road detour to reconnect to Frisco Highline Trail. The lack of road shoulders along the road should also be noted; there are no shoulders on Aldrich Road from Highland Terrace in the west to the eastern city border. This creates a number of issues for cyclists traveling west along Aldrich after passing Pike Avenue, where there are no longer 10' separated bike paths. This lack of a bike path forces cyclists onto the road, putting themselves and others at risk. 10' separated bike paths should continue along Aldrich from Pike Avenue to Highland Terrace, where the path can either continue with an additional path segment or be transferred to on-road bike lanes.

Aldrich Road		
Safety	1	Off-street bike lanes would lower the risk of bicyclist and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to bike to their destinations.
Economic Impact	1	Provides direct access to the dense commercial corridor.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	City has ROW.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issues in acquiring permits.

Broadway Street

Broadway Street is a three-lane major arterial road under the jurisdiction of MoDOT which facilitates the bulk of the east-west travel through Bolivar. The posted speed limit is 20-50 MPH. Also known as MO-32, Broadway travels directly through the Bolivar downtown and provides connections to several important community facilities, including the Bolivar Recreation & Aquatic Center, the Bolivar Library, and Bolivar Middle School. There are currently no bike lanes on Broadway Street, forcing cyclists to either ride on the shoulder or stay on the road. Implementation of off-street bike lanes from Pomme de Terre Avenue to the Kum and Go west of Highway 13 can help increase safety for cyclists and allow for more connectivity to key community facilities.

Broadway Street		
Safety	1	Off-street bike lanes would lower the risk of bicyclist and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to bike to their destinations.
Economic Impact	1	Provides direct access to the dense commercial corridor.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	MoDOT has ROW but is not difficult to acquire.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	0.5	There might be issues with acquiring permits.

Claud Avenue

Claud Avenue is a low-density two-lane local road under the jurisdiction of the City of Bolivar which connects local connector roads to residential areas. Claud Avenue does not currently have bike lanes, forcing cyclists to bike on the road, putting themselves and others at risk. Implementation of signage informing motorists of cyclist activity from the Frisco Highline trailhead to Forest Street would increase the safety of cyclists and provide more connectivity of the bike network to medical care facilities on the north side of Bolivar and the broader bike path network. While Oakland Avenue could also be used to accomplish this, Claud Avenue has seen lower traffic density and has a wider roadway, making it a better option for additional bike infrastructure. Connecting this segment to the Frisco Highline trail would also act as an extension to the path, allowing residents to easily travel from north to south in Bolivar by bike.

Claud Avenue		
Safety	1	Off-street bike lanes would lower the risk of bicyclist and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to bike to their destinations.
Economic Impact	1	Provides direct access to the dense commercial area.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	City has ROW.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issues in acquiring permits.

Downtown

The downtown is a significant commercial district within the City of Bolivar. The area does not accommodate cyclists well with its lack of cyclist infrastructure, such as the lack of bike racks. Additional bike racks and wayfinding signage around the downtown area can help make the area more friendly to cyclists and potentially attract more visitors. The current lack of infrastructure in the area deters cyclists from traveling to the area, an issue that will only grow as the regional trail network continues to expand.

Downtown		
Safety	1	The addition of bike lanes would lower the risk of bicyclist and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to bike to their destinations.
Economic Impact	1	Provides direct access to the dense commercial area.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	0.5	City has partial ROW.
Financing Partnerships	0.5	There are funding sources available for on-street bike lanes.
Phasing Options	1	The project can be phased.
Permitting	0.5	There might be issues with acquiring permits with MoDOT.



KILLINGWORTH AVE >

Killingsworth Avenue

Killingsworth Avenue is a minor arterial road under the jurisdiction of the City of Bolivar that provides an alternative connection between Broadway Street and Aldrich Road. The posted speed limit is 35 MPH. One of Bolivar's largest employers, Tracker Marine, is also located on this road. Killingsworth does not currently have a bike lane, forcing cyclists to travel on the road and putting themselves and others at risk. Implementing off-street bike lanes on Killingsworth from Broadway Street to Aldrich Road would increase the safety of workers traveling to work via bike and help protect other cyclists traveling on Killingsworth.

Killingsworth Avenue		
Safety	1	Off-street bike lanes would lower the risk of bicyclist and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to bike to their destinations.
Economic Impact	1	Provides direct access to the dense commercial area.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	City has ROW.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issues in acquiring permits.

East Loop Road

The East Loop Road is a proposed project that would add two new segments of roadway, creating a continuous north-south road on the east side of Bolivar. The road is being added to help alleviate congestion, as well as connect to new developments along Highway 83. The addition of an off-street bike path along this new roadway would create a new connection between south Bolivar and the schools to the north, as well as connect residents to the broader bike path network.

East Loop Road		
Safety	1	The addition of bike lanes would lower the risk of bicyclist and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to bike to their destinations.
Economic Impact	1	Provides direct access to a commercial area.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	City has ROW.
Financing Partnerships	0.5	There are funding sources available for on-street bike lanes.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issues in acquiring permits.

Buffalo Street

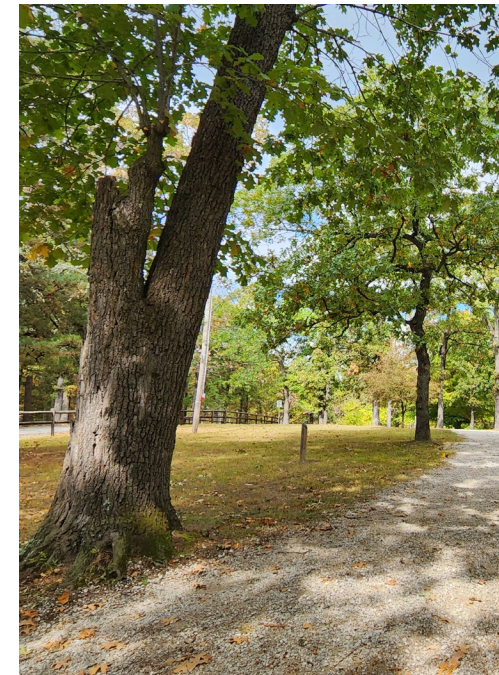
East Buffalo Street is a two-lane collector road under the jurisdiction of the City of Bolivar which connects several neighborhoods to major roads like Springfield Avenue and MO-32. The road has a posted speed limit of 30 MPH. The road does not currently have any bike lanes, making it unsafe for cyclists. Implementation of off-street bike lanes from Pike Avenue could help increase safety for cyclists and improve connectivity in the area.

Buffalo Street		
Safety	1	Off-street bike lanes would lower the risk of bicyclist and vehicle interaction.
Health	1	Encourages people to be physically active by enabling them to bike to their destinations.
Economic Impact	1	Provides direct access to a commercial area.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	1	City has ROW.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issues in acquiring permits.

The City of Bolivar Park Trail

The City of Bolivar is currently looking to create a new nature trail along Town Brach between S Albany Avenue and the proposed East Loop Road. This prospective path would act as a nature trail for residents but would also serve the role of an east-west connecting path for residents, improving local connectivity for further commercial development along Broadway Street and the proposed East Loop development.

The City of Bolivar Park Trail		
Safety	1	The addition of lighting and signage would help keep residents safe while using the trail.
Health	1	Encourages people to use the trail regardless of the time of day.
Economic Impact	1	Provides direct access to the commercial area and helps bring new consumers/visitors to Bolivar from other areas.
Mobility and convenience	1	Provides safe and cheap alternative mode of transportation.
Right-Of-Way/Easements	0	City does not have partial ROW.
Financing Partnerships	1	Many funding sources are available for alternative modes of transportation.
Phasing Options	1	The project can be phased.
Permitting	1	There will be no issue in acquiring permits.



PLAN IMPLEMENTATION

Implementation of solutions for high-priority needs will require the time and commitment of city leadership, city staff, and the support of the community. Projects will require additional studies, partnerships, funding, and public outreach.

Local Funding

The City of Bolivar already has multiple revenue sources in place which can help finance large transportation projects. The first funding source is the City Transportation Tax, which was passed in 1986. With a split of 89% for streets and 11% for the airport, the tax provided an estimated \$1.11 million in 2022 for the street department. Bolivar also has vehicle fees and vehicle sales tax, which provided an estimated \$45,000 and \$116,000 respectively in 2022. The final, and most recent, tax is the new revenue provided by the statewide increase in the fuel tax. The fuel tax provided an estimated \$250,000 in 2022, but this figure is likely to grow year-over-year until 2025 as the tax continues to increase to the full 12.5 cents. While a portion of this funding is already devoted to existing infrastructure maintenance, the remaining funds are available for transportation projects and improvements.

Potential Funding Sources

A key component of the Plan is determining available and potential funding sources that can be used to implement solutions for high-priority needs. Active transportation improvements can be funded through a variety of funding sources, i.e., federal, state, local, foundation, and private sources. Below is a non-comprehensive list of funding sources that the city may pursue. This information is subject to change, as programs and program criteria can change regularly.

Transportation Alternatives Program

The Transportation Alternatives Program (TAP) is federally funded and focuses on the improvement of non-motorized transportation projects. Eligible projects include the construction of on-road and off-road facilities for pedestrians, and other non-motorized forms of transportation to provide them with safer routes. In addition, construction of infrastructure-related projects for students to walk and bicycle to school, sidewalk improvements, and pedestrian and bicycle crossing improvements are also eligible activities.

Safe Streets and Roads for All

This program helps to prevent roadway deaths and serious injuries by providing grants to fund various regional, local, and Tribal initiatives. Projects eligible for this

program include the development or update of a comprehensive safety action plan, conduct planning, design and development of activities that will support the action plan, and carry out the strategies identified in the plan.

[Rebuilding American Infrastructure with Sustainability and Equity \(RAISE\)](#)

The Rebuilding American Infrastructure with Sustainability and Equity provides state and local governments with funding to support multimodal and multi-jurisdictional projects. These funds can be provided directly to different public entities like counties, municipalities, port authorities, tribal governments, and many others. This program uses a merit-based process in the selection of the projects that led to the achievement of national objectives. Eligible projects include roads, bridges, rail, transit, ports, and intermodal transportation.

[Traffic Engineering Assistance Program \(TEAP\)](#)

This program provides different local public agencies (LPAs) with engineering assistance to study traffic engineering problems. The different traffic studies provide solutions to engineering problems as well as funding. Examples of engineering-related projects include speed limit review, sign inventory, pedestrian/bike route analysis, parking issues, and other related traffic studies.

[Recreational Trails Program \(RTP\)](#)

The Recreational Trails Program funds local and state governments, nonprofit organizations, and school districts for projects that aim toward the development and improvement of recreational trails. These projects include the restoration of existing recreational trails, assessment of trail conditions for accessibility and maintenance, construction of new recreational trails, and acquisition of easements and property for recreational trails or recreational corridors.

[Land and Water Conservation Fund \(LWCF\)](#)

The Land and Water Conservation Fund provides a 50 percent match on a variety of projects up to a maximum of \$500,000 per project and is open to any local government, city and county, and public school. Eligible projects include playgrounds, pools and water parks, camping facilities, picnic areas, trails, golf courses, and more. Guidelines on grant requests can be found on the Missouri State Parks Website.

[Congestion Mitigation and Air Quality Improvement Program \(CMAQ\)](#)

This program provides funding to state and local governments for surface transportation projects that contribute towards the requirements of the Clean Air Act such as reducing congestion and improving air quality. Funding is provided as a lump



sum amount to the state and divided among the various transportation programs. Eligible projects include shared micro-mobility such as bike sharing and shared scooter systems. In addition to the purchase of diesel replacements or heavy-duty zero-emission vehicles and similar charging equipment, this program also provides operating assistance for transit systems in certain areas.

Highway Safety Improvement Program (HSIP)

The Highway Safety Improvement Program helps fund projects whose main objective is to reduce traffic fatalities and serious injuries on all public roads such

as those on Tribal lands or owned by the state. This program focuses on improving highway safety by using data-driven and strategic approaches for better performance of public roads. Activities for this program include intersection safety improvements that provide safety for all road users, pedestrian security features designed to slow or stop motor vehicles, and roadway improvements that separate motor vehicles and bicyclists.

People For Bike Community Grant Program

This program provides funds for communities that are promoting bike use. These funds are mainly used for the development and construction of bicycle infrastructure needs. The funding is available for non-profit organizations, cities, counties, or departments that support or focus on active transportation, bicycling, and community development.

Rivers, Trails, and Conservation Assistance Program

This program provides support for conservation and outdoor recreation projects. It provides assistance for the development or restoration of parks, conservation of areas, and outdoor recreation activities that lead to community engagement. Various community groups, tribal governments, nonprofit organizations, and local, state, and federal agencies are eligible for this grant.

Educating Residents on Active Transportation

While the implementation of new sidewalk segments and bike paths is a good first step to improving the transportation network, the city must work to educate residents and shift away from the auto-dependent culture that has taken precedence for so long.

As people increase their use of the multimodal transportation network, there will be a growing number of interactions between motorists and those using the active transportation network. Educating drivers and active transportation users about best practices when traveling is critical to maintaining a safe network for all. Educating residents on the financial and physical benefits that come with walking and biking can also increase active transportation users. Some resources may include:

- Classes that teach bike and pedestrian safety to children in schools
- Public education campaigns to raise awareness of safe practices for residents
- Implementing new bike amenities like bike racks near businesses
- Law enforcement training on bike and pedestrian laws
- Implementing biking/pedestrian signage (both wayfinding signage and signage notifying motorists of cyclist/pedestrian activity)

In addition to the mentioned education programs, the city should consider putting on events and informing residents of local activities involving active transportation (such as cycling events, community runs/walks, etc.) to get more residents involved in active transportation.



APPENDIX A: SURVEY RESULTS

Bolivar Transportation Plan Survey

458

Responses

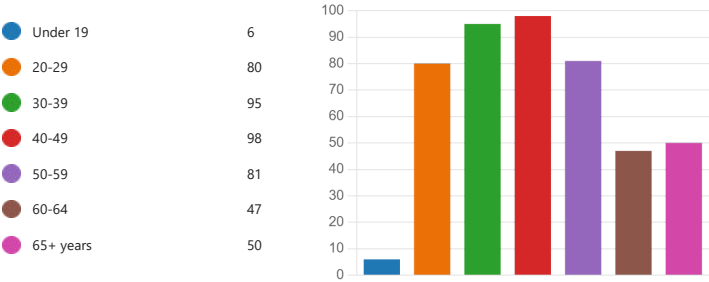
20:03

Average time to complete

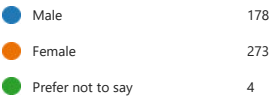
Active

Status

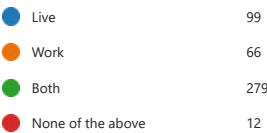
1. What is your age?



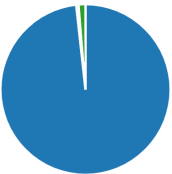
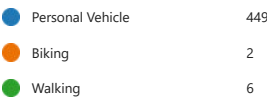
2. What is your gender?



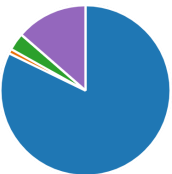
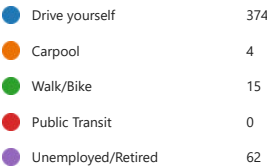
3. Do you work/live in Bolivar?



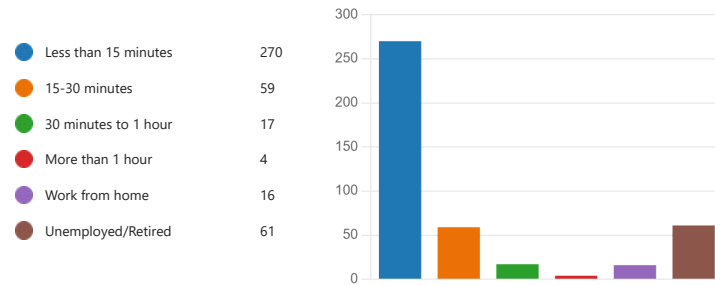
4. What is your primary mode of transportation?



5. How do you get to work?



6. If you live and work in Bolivar, how long does it take for you to get to work?



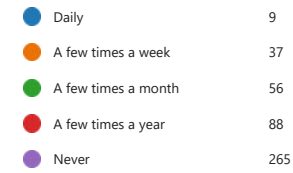
7. How often do you drive a car?



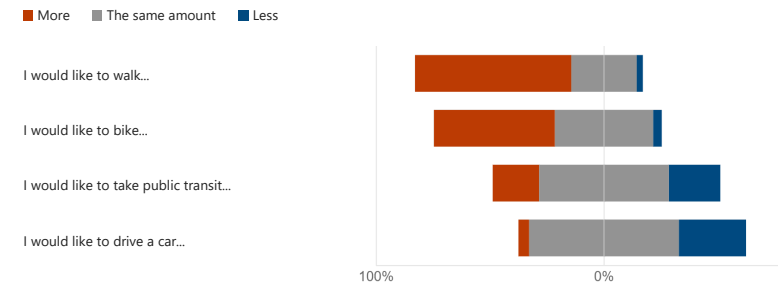
8. How often do you use sidewalks/trails for walking?



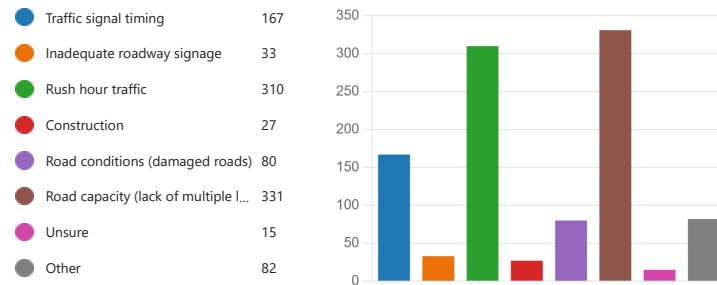
9. How often do you bike?



10. Are there any changes you would like to make to your transportation habits?



11. What do you think are the main causes of the congestion you might experience in Bolivar? (select all that apply)



12. List up to 5 roadway improvements you would like to see in Bolivar (example: "traffic congestion at Broadway Street and Main Avenue," or "better traffic signal synchronization at Springfield Avenue and Aldrich Road"). Please be as specific/detailed as possible.

370
Responses

Latest Responses

"We need more than just Springfield Avenue to get through town..."
"Add signals to the square, people stop in the middle of the road..."

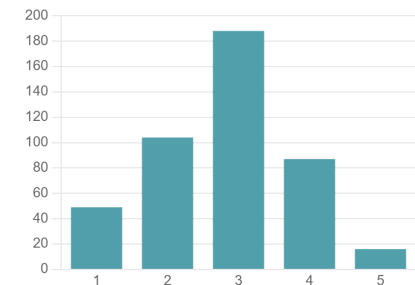
[Update](#)

159 respondents (43%) answered **square** for this question.

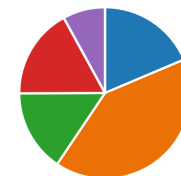
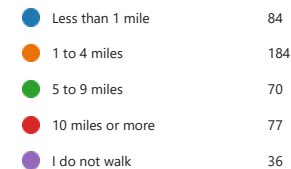
traffic on the square synchronization at Springfield Road and
traffic flow congestion on Springfield
Aldrich & Springfield way stops Traffic signal Springfield Av
Springfield and aldrich traffic light **square**
square when traffic lanes down Springfield turn lane Traffic congestion light S
lights back on the square congestion on the s
traffic on Spr

13. How would you rate the walkability (how easy it is to walk around town) of Bolivar? (One a scale of 1-5, 1 = Poor and 5 = Excellent)

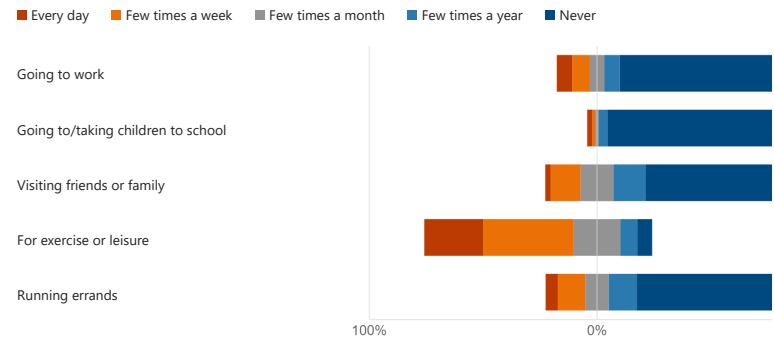
2.81
Average Rating



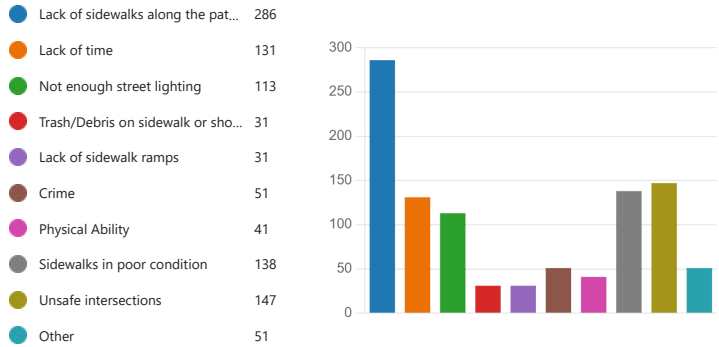
14. How far do you walk in an average week?



15. How often and for what purpose do you walk?



16. What prevents you from walking more in Bolivar? (select all that apply)



17. List up to 5 changes you would like to see to be able to walk more often? Are there any streets that are particularly difficult to walk on? Please be as detailed as possible. (Example: "improved sidewalks in downtown" or "sidewalks to connect to schools")

258

Responses

Latest Responses

"We need more side walks and cross walks. We need sidewalks..."

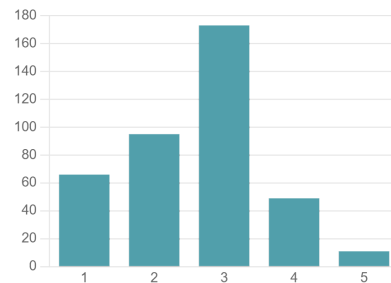
Update

170 respondents (66%) answered **sidewalk** for this question.

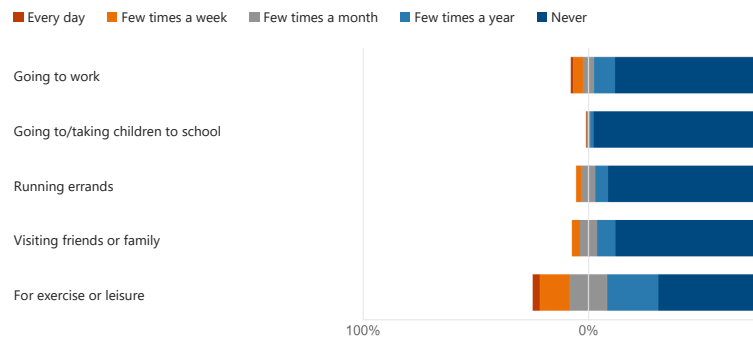
roads without sidewalks
walk down a sidewalk
sidewalks all over town
sidewalk:
walking
Not enough sic
need more sidewalks
Improved sidewalks
sidewalk:
Sidev
Better sidewalks
sidewalks north
sidewalks downtown
sidewalks along Springfield
no sidewalks
Lack of sidewalks
Sidewalk on Oakland
Sidewalks on both sides
sidewalk

18. How would you rate the bikeability (how accessible it is for biking) of Bolivar? (On a scale of 1-5, 1 = Poor and 5 = Excellent)

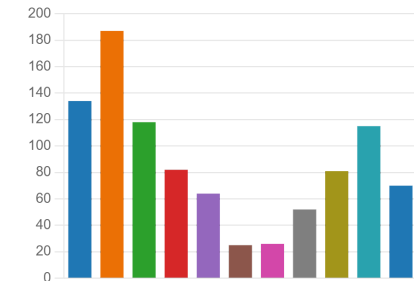
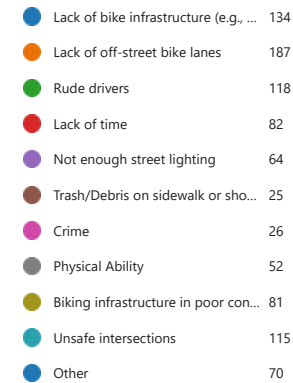
2.60
Average Rating



19. How often and for what purpose do you ride a bicycle?



20. What prevents you from bicycling more in Bolivar? (select all that apply)



21. List up to 5 changes you would like to see to bike more often? Are there any streets you know of which are particularly difficult to bike on? Please be as detailed as possible. (Example: "safe bicycle path to connect to schools")

162
Responses

Latest Responses

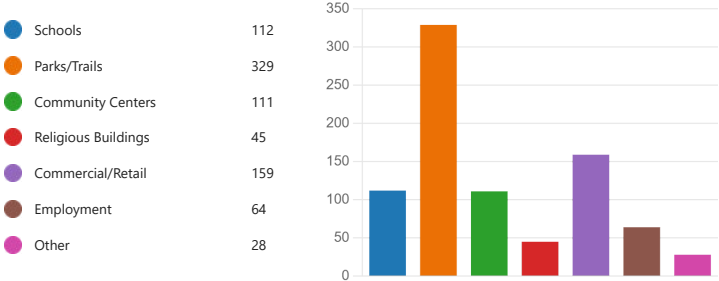
"We need biking lanes and ways for bikers to get around town ..."

[Update](#)

47 respondents (29%) answered **bike lanes** for this question.

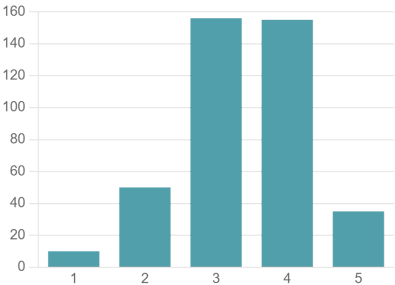
traffic from bikes bicycle lanes n't be a bike Bike bridge unsafe
bike around town bike racks bike lanes safe people
lane for bikes Bike trails Frisco trail bike
bikes on sidewalks Highline Trail Bike only paths road bike
bike infrastructure

22. What are the top three destinations you would like to bike or walk to in Bolivar?

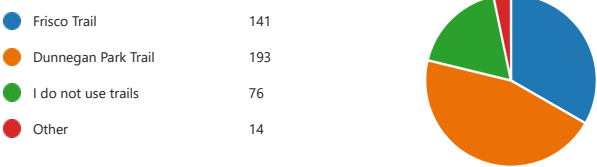


23. How would you rate the condition of trails in Bolivar (On a scale of 1-5, 1 = Poor and 5 = Excellent)

3.38
Average Rating



24. What trails do you use most often (if any) in Bolivar?



25. List up to 5 changes you would like to see that would increase your use of trails?

213
Responses

Latest Responses
"Could be longer!"

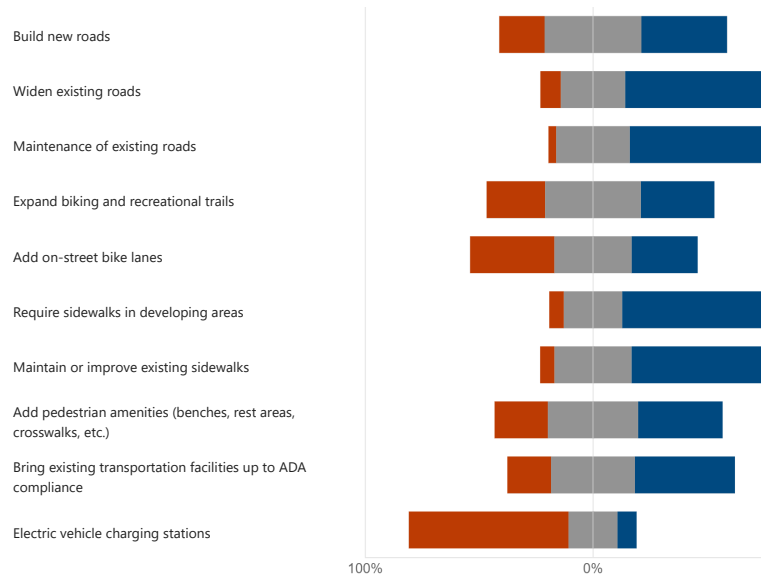
[Update](#)

26 respondents (12%) answered **Frisco Trail** for this question.



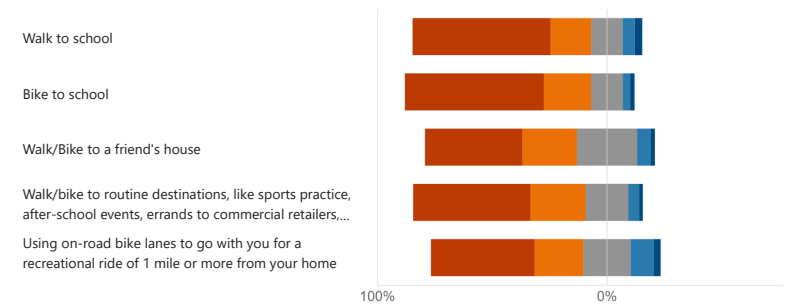
26. How high of a priority should the following improvements to transportation facilities be over the next 20 years?

Low Medium High



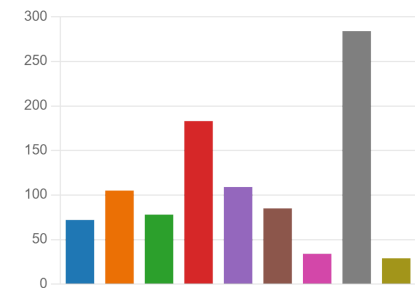
27. If you are a parent or guardian, on a scale of 1-5 (1 = least comfortable, 5 = most comfortable), what is your comfort level with allowing your child to...

1 2 3 4 5

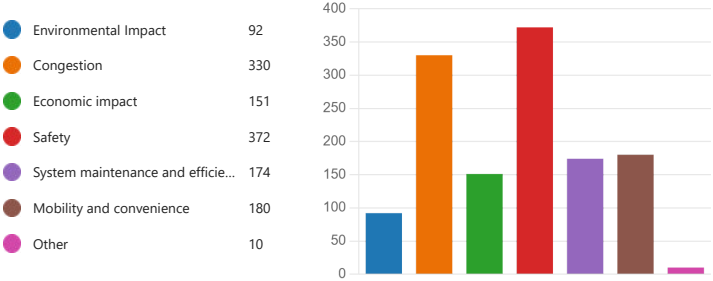


28. Which of the following sources would you support to fund transportation improvements? (check all that apply)

Increased gas tax	72
Increased sales tax	105
Property tax	78
Impact fees on developers	183
Transportation bonds (borrowing)	109
Transportation/Community Impr...	85
I do not support additional fund...	34
Restructure within the annual b...	284
Other	29



29. What are the top three factors the city should consider when making transportation decisions?



30. Do you have any other comments or suggestions?

86 Responses Latest Responses

Update

18 respondents (21%) answered **needed** for this question.

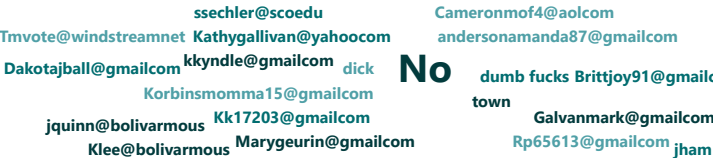


31. If you would like to receive information about future surveys and community input opportunities, please provide your email address.

124 Responses Latest Responses

Update

4 respondents (3%) answered **No** for this question.



32. If you would like to be included in the weekly prize drawing, please provide your email address.

213
Responses

Latest Responses
"Nsaylor04@yahoo.com "

Update

4 respondents (2%) answered **No** for this question.

purple_bug@msncom kkyndle@gmailcom Maggie1027@1027gmailco
Brittjoy91@gmailcom town dot com No dumb Kk17203@gmailco
Galvanmark@gmailcom @ fuck fuckin surveys
Acarneal828@gmail com Bolivar leaders Wildhair
Kathygallivan@yahooocom Korbinsmomma15@gmailcom rp656
torridclover85@gmailcom andersonamand

APPENDIX B: ACRONYMS

AADT	Average Annual Daily Traffic	OHCR	Osage Hills Connection Route
ACS	American Community Survey	RAISE	Rebuilding American Infrastructure with Sustainability and Equity
BMP	Best Management Practices	ROW	Right-Of-Way
CMAQ	Congestion Mitigation and Air Quality Improvement Program	RTP	Recreational Trails Program
CNT	Center for Neighborhood Technology	SBU	Southwest Baptist University
FHWA	Federal Highway Administration	SMCOG	Southwest Missouri Council of Governments
HSIP	Highway Safety Improvement Program	STBG	Surface Transportation Block Grant Program
LPA	Local Public Agencies	TAP	Transportation Alternatives Program
LWCF	Land and Water Conservation Fund	TEAP	Traffic Engineering Assistance Program
MoDOT	Missouri Department of Transportation	TPC	Transportation Planning Committee
MPH	Mile Per Hour		

APPENDIX C: REFERENCES

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