

# SOUTHWEST Missouri



## Regional transportation plan

## **DIRECTOR'S MESSAGE**

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## 1. INTRODUCTION

### Connection to the Planning Framework

In 2003, the Missouri Department of Transportation (MoDOT) initiated a new planning framework that would be more transparent and elicit a greater amount of public participation in creating a vision for the future transportation network in the State of Missouri. In order to achieve these goals, MoDOT established partnerships with local officials around the state using Metropolitan Planning Organizations and Regional Planning Commissions (RPCs) as a conduit to develop a statewide vision when appropriate. RPCs are the vehicle through which cities and counties in Missouri's rural areas come together to work on common transportation issues. State statutes govern the formation and function of RPCs, whose boards of directors are comprised of local officials or their designees. Each RPC also has a Transportation Advisory Committee (TAC), whose membership is appointed by the board of directors. TACs provide a link to citizen involvement through local officials and stakeholders who represent the constituents of rural Missouri. MoDOT coordinates with RPCs to determine regional priorities for transportation. This improved planning process MoDOT exceeds federal and state legal requirements for involving local officials and the public in the planning and decision-making process (MoDOT – Transportation Planning – Planning Framework p.5 March 2004).

### Connection to MoDOT Long Range Transportation Plan (LRTP)

The Regional Transportation Plan (RTP) is a comprehensive, performance based, multi-modal and coordinated regional plan, which develops a basis for future needs by using existing population, employment, and land use data to identify trends critical for the development of accurate forecasts and projections on growth and development that will guide future transportation improvements. The RTP covers all modes of transportation from a regional perspective, including freeways/highways, streets, public mass transit, airports, bicycle and pedestrian facilities, goods movement and special needs transportation. In addition, the RTP addresses key transportation related activities, such as transportation demand management, transportation management systems, safety, environmental justice, and equity issues between disparate social groups. As the authorized RPC for a 10 county region in the State of Missouri, the Southwest Missouri Council of Governments (SMCOG) is responsible for the development of the RTP for the transportation network within its membership boundaries. The purpose of this document is to submit the transportation needs for this region to MoDOT for inclusion in the State Transportation Improvement Program (STIP) and the State's Long Range Transportation Plan (LRTP). The STIP includes near term projects while the LRTP deals with projects scheduled over 7-10 years.

### Study Organization

The Southwest Missouri Council of Governments (SMCOG) was established in April of 1989 in accordance with state statutes as the authorized Regional Planning Commission for a ten county region in Southwest Missouri, including the five counties of the Springfield Metropolitan Statistical Area. The SMCOG jurisdictional boundary includes 77 incorporated villages and cities within the adjacent counties of Barry, Christian, Dade, Dallas, Greene, Lawrence, Polk, Stone, Taney and

Webster. SMCOG is one of 19 active regional planning commissions in the state. As the authorized RPC for a 5,986 square mile area with wide variability in local characteristics, it is SMCOG's mission to enhance the quality of our communities through regional cooperation. One of the main services SMCOG offers is transportation planning to local governments and advisory services to area transportation advisory boards and coalitions. SMCOG also provides coordination with the Missouri Department of Transportation (MoDOT).

Within the SMCOG region is the Ozarks Transportation Planning Organization (OTO), as shown in **Figure 1.1**. This group is the Metropolitan Planning Organization (MPO) covering portions of Greene and Christian Counties. Declared a Transportation Management Area (TMA) by the U.S Department of Transportation after the 2000 Census, OTO gained the benefit of local authority to select transportation projects. According to the Federal Highway Administration, TMAs are "areas designated by the U.S. Secretary of Transportation, having an urbanized area population of over 200,000, or upon special request from the governor and the MPO, or under special circumstances designated for the area. In addition to meeting all the federal requirements for an urbanized area and MPO, TMAs are also responsible for developing congestion management systems, TIP (transportation improvement program) project selection, and are subject to a joint federal certification review of the planning process at least every three years." Due to this designation, the RTP will not be able to make recommendations for the transportation network within OTO's boundaries. At the same time, though, it would be remiss if this plan did not include a discussion of the major thoroughfares in the region that reside within those boundaries. One goal of this plan is to balance the relationship between the outlying areas of the SMCOG region and the use of the road network within OTO's jurisdiction.

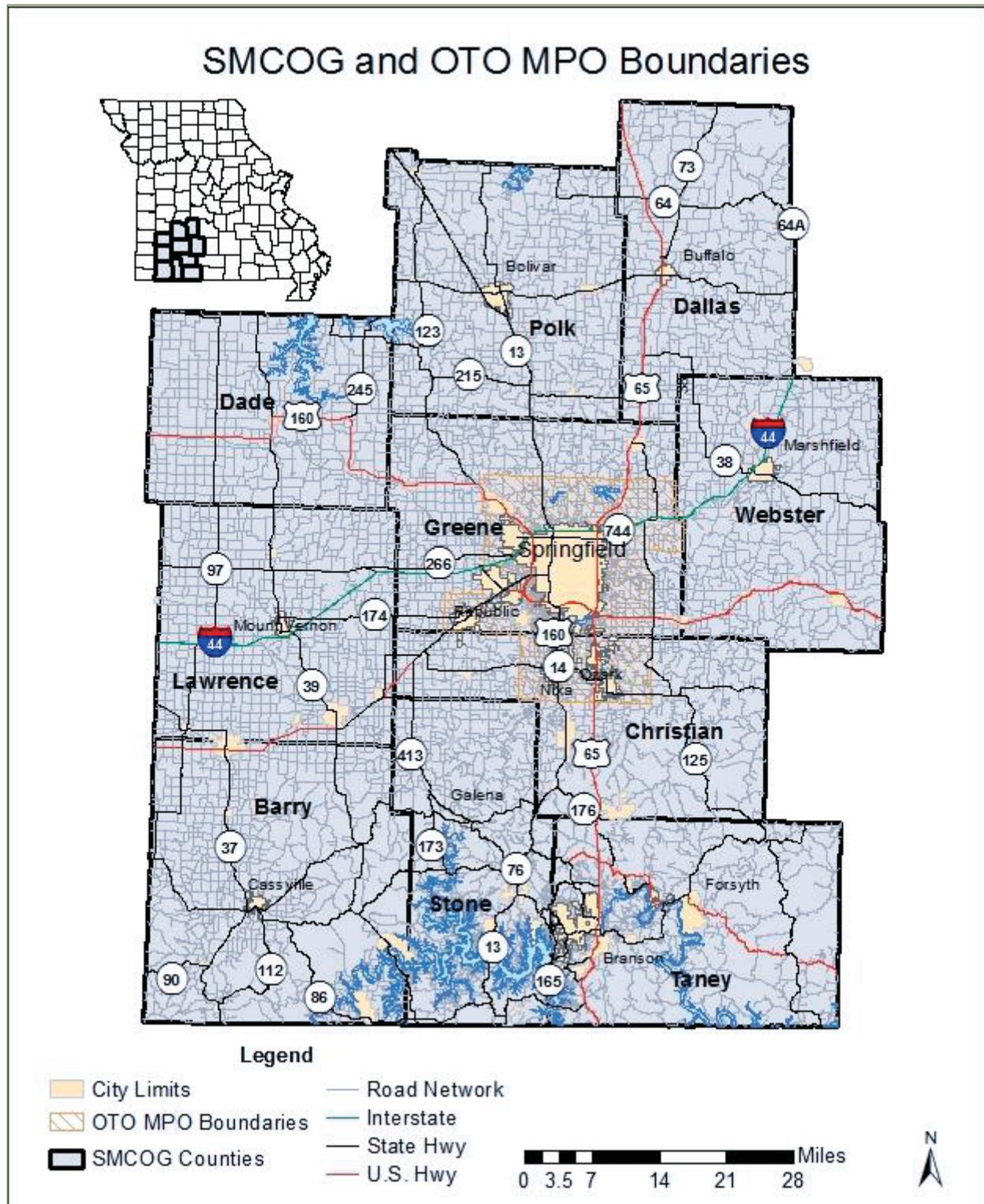


Figure 1.1 SMCOG and OTO Boundaries

### Planning Process

MoDOT's goal of incorporating public participation from local officials and regional organizations into a statewide vision for Missouri's transportation network has occurred in a phased approach. Phase One required the establishment of a Transportation Advisory Committee, joining MoDOT in public transportation meetings, assisting MoDOT in the public participation process, and keeping MoDOT informed of transportation issues in their region, while considering all modes of transportation. SMCOG did some preliminary work on regional transportation activities, but did not fully participate in Phase 1. After some restructuring in the mid-1990s, MoDOT proposed to include RPCs in the needs evaluation and project prioritization process, leading to Phase 2. Phase 2 gave the RPCs increased funding and responsibilities including, an evaluation process of transportation needs, a public involvement process, development of regional data, and professional staff development. SMCOG began full participation of Phase 2 in 1996.

The Missouri Association of Councils of Governments (MACOG) formed a working group to develop a common outline for this plan. Over the course of several meetings and conference calls, the content of the plan was developed. SMCOG staff then compared these elements with plans from other regional planning organizations across the country, and further developed the outline for a regional transportation plan befitting the SMCOG region.

The development of the RTP itself occurs in phases as well. Phase 1 includes the development of a regional plan for the state-maintained roads in Missouri. These include the interstates of the National Highway System, state highways, and the lettered county roads. Phase 2 is the continuation of the plan onto county roads and those city roads for which data exists. Phase 3 finalizes the plan by filling in the gaps for local roads.

Public input has been an important aspect in the development of the SMCOG Regional Transportation Plan. The Transportation Advisory Committee provides a great deal of input from stakeholders and elected officials through frequent meetings and the formation of workgroups. SMCOG staff has also pursued a proactive outreach philosophy by meeting with individual employees and officials of member communities in order to develop a rich picture of transportation issues at the local level. SMCOG also maintains a website where information pertaining to ongoing projects is available to the public as well as feedback mechanisms such as downloadable surveys and electronic mail.

### Goals and Objectives

It is the overarching goal of the SMCOG RPC to create a Regional Transportation Plan that represents an accurate depiction of current and projected population, employment, and land use trends. These data and public involvement will enable us to achieve a clear picture of the future needs of a transportation system for southwest Missouri that balances environmental quality, economic vitality, and equitable accessibility for all segments of the population. Diligence in this matter is imperative to the development of a sustainable transportation network for the SMCOG sub-region and the State of Missouri for the 21st century and beyond. With this in mind, the following

goals and objectives were developed specific to the region served by the Southwest Missouri Council of Governments.

### Goal 1: System Preservation and Safety

Transportation infrastructure that is properly maintained and safe, preserving past investments for the future.

#### Objectives:

- Provide for the continuing preservation and maintenance needs of transportation facilities and services in the region
- Promote and encourage transportation resiliency to prepare the region for the future and reduce the impact of natural or manmade emergencies and disasters.
- Provide a safe and secure environment for the traveling public, addressing roadway hazards as well as pedestrian and bicycle safety
- Create an inventory of critical infrastructure
- Integrate resiliency into planning and project development
- Encourage development of a transportation system, which can safely and efficiently accommodate unusual and unpredictable conditions.
- Promote transportation improvements, facility design and construction standards that withstand extreme demands and unexpected conditions.

### Goal 2: Access and Mobility

Transportation systems and services that provide accessibility, mobility and modal choices for residents, businesses and the economic development of the region.

#### Objectives:

- Maintain an acceptable and reliable level of service on transportation and mobility systems serving the region, taking into account performance by mode and facility type
- Provide residents of the region with access to jobs, shopping, educational, cultural, and recreational opportunities and provide employers with reasonable access to the workforce in the region
- Maintain a reasonable and reliable travel time for moving freight into, through and within the region, as well as provide high-quality access between intercity freight transportation corridors and freight terminal locations, including intermodal facilities for air, rail and truck cargo
- Provide the people of the region with transportation modal options necessary to carry out their essential daily activities and support equitable access to the region's opportunities
- Address the needs of the elderly and other population groups that may have special transportation needs, such as non-drivers or those with disabilities
- Plan and develop temporary and accessible pedestrian facilities to improve connectivity in the event of an emergency situation.

### Goal 3: Sustaining the Environment

Transportation improvements that help sustain our environment and quality of life.

#### Objectives:

- Identify and encourage implementation of mitigation measures that will reduce noise, visual and traffic impacts of transportation projects on existing neighborhoods
- Encourage programs and land use planning that advance efficient tripmaking patterns in the region
- Make transportation decisions that are compatible with air quality conformity and water quality standards, the sustainable preservation of key regional ecosystems and desired lifestyles

### Goal 4: Partnerships

Coordinate the regional transportation planning effort in partnership with MoDOT and represent the region in the development of state wide planning and prioritization processes.

#### Objectives:

- Encourage development of statewide corridors serving the region.
- Bring together elected officials and staff from cities and counties to foster regional cooperation in transportation planning

### Goal 5: Local Outreach

Promote and encourage public involvement in local, regional and statewide transportation planning.

#### Objectives:

- Monitor legislative and regulatory issues that impact transportation.
- Educate the citizens of the region on transportation issues and encourage their input.
- Improve the ability to communicate with transportation users.
- Encourage regional coordination as part of long range transportation planning to include interdependent sectors and stakeholders.

## 2. TRENDS AND CONDITIONS

### Population Growth Trends

According to the 2010 Census, the Southwest Missouri Council of Governments area population was 602,703 people. The overall population growth of the region from 2000 to 2010 was 17.90% percent, a significant decline in the growth rate from the previous decade's 25.70%. This decline may be attributable to the economic downturn that affected the nation in early 2008. Although all ten counties have historically shown positive population growth, with the exception of Dade County which for the first time has lost population, there is a great deal of intra-regional variation, as one would expect in a planning area as large as SMOG's. Substantial growth continues to occur in the northern portion of Christian County due to rapid development in and around Nixa and Ozark, although, this growth has declined significantly from the previous decade. In 2000, Christian County ranked as one of the fastest growing counties in the nation in relation to the 1990 census, with a population increase of over 66%. That rate of growth over the 2000-2010 time period has declined to 42.5%.

In-migration in the area around Branson continues to be a driver of population growth in Taney and Stone counties. While these increases have declined from the previous decade, the 2000-2010 period saw significant growth in both counties. These counties grew at a rate of 30% and 22%, respectively. Significant growth has occurred in Webster and Polk counties, while Barry and Dallas counties experienced steady growth. Both Greene and Lawrence counties continue to have significant growth rates. Only Dade County lost population during the 2000-2010 time period. **Table 2.1** summarizes changes in the population of the Southwest Missouri Counties from 1970 to 2010. Although there was appreciable growth from 1970 to 1990, population growth trends throughout the region accelerated from 1990 to 2000 and have tapered off from 2000-2010 like due in large part to the economic downturn.

**Table 2.1 Southwest Missouri Population Growth, 1970 – 2010 and Change 2000-2010**

County	1970	1980	1990	2000	2010	Change 2000-2010	% Change 2000-2010
Barry	19,597	24,408	27,547	34,010	35,597	1,587	4.67%
Christian	15,124	22,402	32,644	54,295	77,422	23,127	42.60%
Dade	6,850	7,383	7,449	7,923	7,883	-40	-0.50%
Dallas	10,054	12,096	12,646	15,661	16,777	1,116	7.13%
Greene	152,929	185,302	207,949	240,391	275,174	34,783	14.47%
Lawrence	24,585	28,973	30,236	35,204	38,634	3,430	9.74%
Polk	15,415	18,822	21,826	26,992	31,137	4,145	15.36%
Stone	9,921	15,587	19,078	28,658	32,202	6,544	12.37%

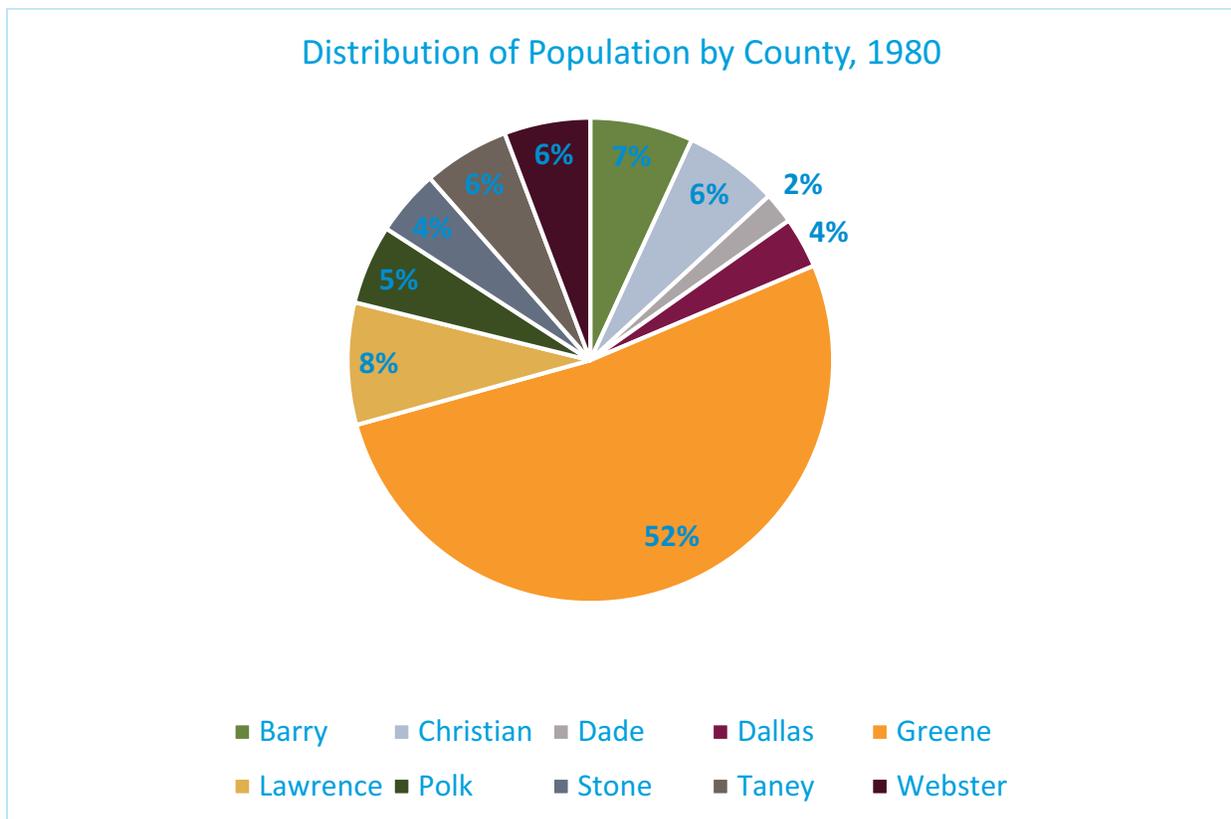
## 2. Trends and Conditions

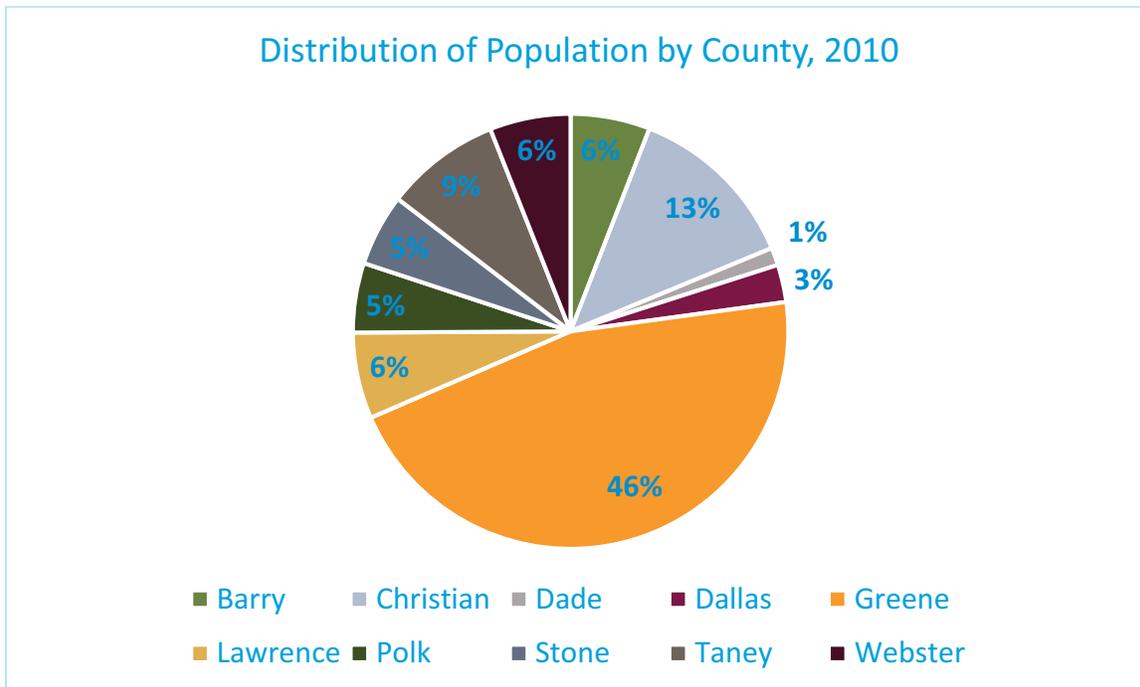
Taney	13,023	20,467	25,561	39,703	51,675	11,972	30.15%
Webster	15,562	20,414	23,753	31,045	36,202	5,157	16.61%
<b>SMCOG</b>	<b>283,060</b>	<b>355,854</b>	<b>408,689</b>	<b>513,882</b>	<b>602,703</b>	<b>91,821</b>	<b>17.28%</b>
<b>Missouri</b>	<b>4,676,501</b>	<b>4,916,686</b>	<b>5,117,073</b>	<b>5,595,211</b>	<b>5,988,927</b>	<b>393,716</b>	<b>7.04%</b>

Source: U.S. Bureau of the Census. 1990 Census of Population and Housing; Census 2000; Census 2010

## Population Distribution

**Figures 2.3** and **2.4** use the data presented in **Table 2.1** to demonstrate a seemingly slight but significant redistribution of the area population from 1980 to 2010 in terms of each county's share of the overall population.





In 1980, Greene County was home to over half of the population in the SMCOG region. This is indicative of Springfield’s preeminence as a central place for employment and services in the region and the predominantly rural character of the outlying counties. Greene County is growing but at a slower rate than some of the surrounding counties. By 2010, Greene County’s share of regional population decreased to 45.6 percent. The preceding decades marked an era of decentralization as the attractiveness of other places in the region have grown in terms of job growth, recreation, shopping, and quality of life. Specifically, the counties of Christian, Stone, and Taney have taken on a greater proportion of population growth in terms of regional share.

### Components of Change

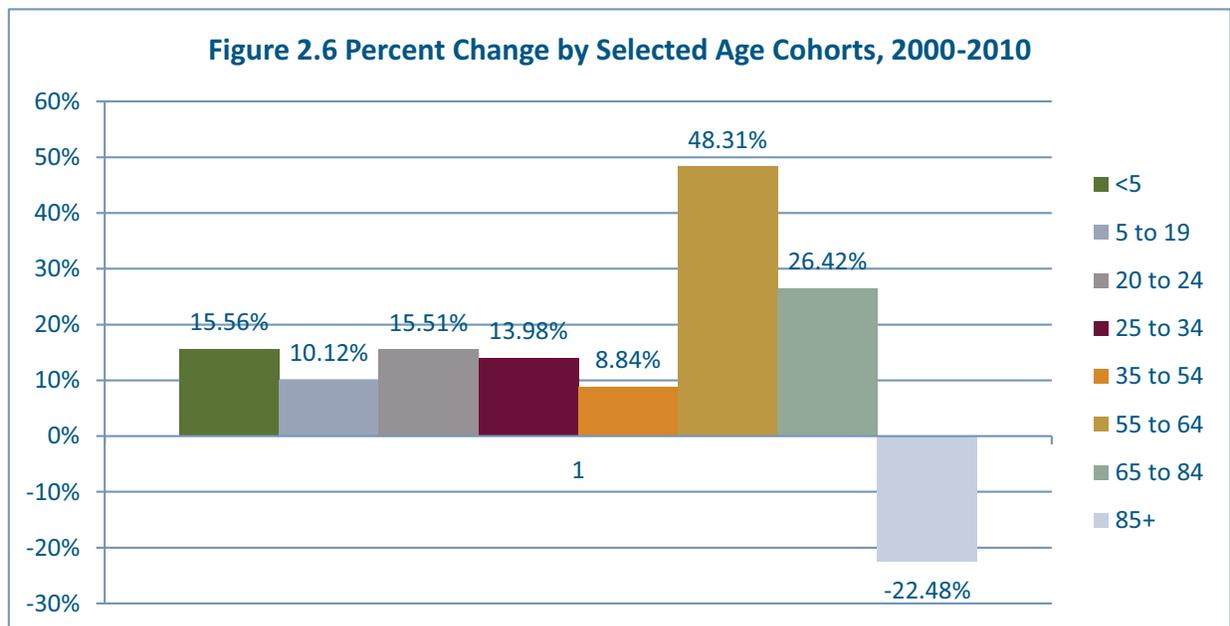
**Table 2.2** depicts the drivers of population change. Natural Increase (NI) is simply the difference between newborns added to the population and the number of deaths occurring during the same period. The majority of counties in the region show a slow moving trend in natural increase slightly above or, as in the case of Dade and Stone Counties, below population replacement levels. This is indicative of top-heavy age structures and aging rural populations. Webster and Christian had the largest natural increase at 7.41 percent and 6.98 percent respectively. While these percentages are significant in identifying younger age groups and the attractiveness of certain places in terms of family-oriented lifestyles, they do not necessarily explain the extent of population growth in the region.

## 2. Trends and Conditions

Jurisdiction	Births	Deaths	Natural Increase (NI)	% Change due to NI	Net Migration (NM)	% Change due to NM
Barry Co.	5,463	4,258	1,205	3.39%	4	0.01%
Christian Co.	10,673	5,266	5,407	6.98%	7,107	9.18%
Dade Co.	916	1,301	-385	-4.88%	-125	-1.59%
Dallas Co.	2,407	1,966	441	2.63%	191	1.14%
Greene Co.	30,126	26,370	3,756	1.36%	7,448	2.71%
Lawrence Co.	4,606	4,539	67	0.17%	17	0.04%
Polk Co.	4,187	3,458	729	2.34%	772	2.48%
Stone Co.	3,285	3,483	-198	-0.61%	1,000	3.11%
Taney Co.	6,665	4,791	1,874	3.63%	2,187	4.23%
Webster Co.	5,799	3,115	2,684	7.41%	854	2.36%
<b>Total</b>	<b>74,127</b>	<b>58,547</b>	<b>15,580</b>	<b>2.59%</b>	<b>19,455</b>	<b>3.23%</b>

Source: Missouri Department of Health – Births and Deaths MICA, Missouri Census Data Center – Single-County IRS Migration Profile

From 2000 to 2010, all counties except Dade and Stone experienced positive, if modest, NI, with Christian County showing the strongest growth at 6.9 percent. Similarly, all counties except Dade experienced positive, modest increases in NM, with Christian county growing the fastest at 9.1 percent. The overall trends indicate that the region is experiencing modest growth due to both NI and NM.



## 3. EXISTING TRANSPORTATION FACILITIES

### State Highways

#### Nationwide Connections

##### EAST/WEST CORRIDORS

**Interstate 44:** This Interstate runs entirely across the central portion of the region. It serves as the primary transportation route from the Southwest Missouri region to the St. Louis metropolitan area in the northeast, and to Oklahoma City, OK in the southwest. It passes by four communities of the region, including Marshfield, Strafford, Springfield, and Mount Vernon. Interstate 44 is a limited access, multilane divided freeway with 25 access points in the region. It is the main road in the area and carries high volumes of cars and trucks. MoDOT data from 2013 shows an Annual Average Daily Traffic (AADT) that varies from 25,649 vehicles entering the area in Webster County, to 48,397 within the City of Springfield in Greene County and 26,167 vehicles exiting the area in Lawrence County. There is a rest area located just south of the northern Webster county line and one located just inside the eastern border of Lawrence County.

**US 60:** Linking the area with Tulsa, OK in the southwest and Louisville, KY in the northeast US 60 also links 4 counties and 10 communities within the region. In the eastern section within Webster and Greene County, Highway 60 is a four-lane divided highway with vehicle traffic volumes from 12,135 to 27,471. Within the City of Springfield, Greene County, this highway has been upgraded to a freeway with 7 access points and carries traffic volumes as high as 54,919 vehicles per day. The western section in Christian and Lawrence County is a two-lane undivided highway with traffic volumes around 12,000 vehicles per day in Christian County and around 5,000 in Lawrence County.

**US 160:** Highway 160 connects the Southwest Missouri area to the southeast of the country through the southern portion of Kansas and Colorado and the northern part of Arizona. It is another significant east-west connector, linking 5 of the 10 counties of the area, and eight communities. Highway 160 is a two-lane facility except in the cities of Springfield and Nixa where it has been upgraded to four lanes. It has shoulders in most areas of the region except in Taney County where the terrain is hilly. It is the main route connecting the cities of Springfield and Nixa, and it is in this section of the road that it presents the highest traffic volume of 9,493 vehicles per day. Other sections around Willard, Highlandville, Spokane, and Forsyth encompass traffic volumes of around 7,000 cars per day. This highway has lower traffic volumes in the rural areas in Dade, Stone and Taney Counties.

##### NORTH/SOUTH CORRIDORS

**US 65:** US 65 is the primary north-south arterial of the region and connects the region to Des Moines, IA in the north and to Little Rock, AR in the south. Highway 65 also provides a linkage for the eastern section of the area with other major routes, including Interstate 44 and Highway 60. It crosses over four counties and eight communities in the region. It is a critical route for movement of the resident population to the Springfield MSA and the Branson Area. Two sections of this highway constitute a two-lane limited access undivided highway with lower traffic volumes that

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fluctuate between 3,772 and 14,988 AADT. These sections are from the northern boundary of the area to just south of Buffalo, the most southern section, from Branson's city limits to the border with Arkansas. The section between Springfield and Branson is a limited access, multilane divided freeway and has 13 access points. This section involves higher traffic volumes of as high as 53,258 vehicles and 7,908 trucks per day in the south section of Greene County Springfield Area, 31,385 vehicles per day in Christian County, and 21,489 vehicles and 2,954 trucks per day in Taney County Branson Area.

## Statewide Connection

### EAST/WEST CORRIDORS

**MO 14:** Is the primary east-west traffic route through Christian County. This two-lane undivided highway connects the cities of Billings, Clever, Nixa, Ozark and Sparta. It carries high traffic volume in the section that corresponds to the MPO area, in Ozark and Nixa with AADT of 16,010 and 11,956 respectively, and lower volumes west of Clever (1,734 AADT) and east of Sparta (1,578 AADT).

**MO 32:** It serves as the primary east-west route for the northern portion of the region, connecting the communities of Fair Play, Bolivar, Halfway, Buffalo, and Long Lane in Polk and Dallas County. This two-lane undivided highway has high traffic volumes in the city of Bolivar (11,342 AADT), decreasing considerably as they go farther to the east and the west of these area in Fair Play (2,808 AADT) and Long Lane (1,656 AADT) respectively.

**MO 38:** It connects Marshfield and other small rural communities from Webster and southern section of Dallas County to I-44 to US 65. It is a two-lane undivided highway with peak traffic volumes in the city of Marshfield as high as 19,808 to low traffic volumes of 512 and 816 AADT in the rural areas.

**MO 76:** It serves as the primary east-west route for the southern portion of the region, connecting 11 communities in Barry, Stone, and Taney Counties. It is one of the main routes in the lakes area linking Reeds Springs, Branson West, Branson, and Forsyth. It has a major concentration of tourist attractions in the Branson area, which makes it very congested. Highway 76 is a two-lane undivided facility, and it lack shoulders in most areas, especially where the terrain is hilly. Traffic levels are very high in the Branson area (28,056 AADT), high in Branson West (14,638 AADT), decreasing considerably as they go farther to the east and the west of these area in Brownbranch (662 AADT) and Ridgeley (1,768 AADT) respectively. Truck volumes in 2002 were 1505 between Branson and Branson West in Stone County, 188 between Ridgeley and Cassville in Barry County, and 370 between Branson and Forsyth in Taney County.

## 4. TRANSPORTATION MANAGEMENT

TMS is MoDOT's Transportation Management Systems software that was first implemented back in 1998. At that time, TMS consisted of four major business areas, which included Safety, Traffic, Bridge and Pavement.

Over the years, TMS has expanded to meet the needs of many business units and users. We continue to build applications and tools that assist MoDOT and our partners with decision making. Most TMS applications/maps are available from the TMS Homepage: <http://tms/home/>. Many of our Metropolitan Planning Organization/Regional Planning Commission (RPC) partners access TMS by using a virtual machine and logging into the MoDOT network.

TMS originated with business areas of Bridge, Pavement, Traffic and Safety but has expanded tremendously over the years.

### Bridge Management System – this system includes:

- Inventory Management
- Media Loader

TMS is the single source for all bridge data in the department. The bridge part of the system includes National Bridge Inventory (NBI) data, inspection information, as well as media for that structure. Media could include things such as photographs, plans, correspondence, inspection reports, and other data related to a bridge.

MoDOT personnel inspect state maintained bridges and culverts and the majority of all of the locally owned (referred to as non-state) bridges and culverts. A small portion of non-state bridges and culverts are inspected by local agency staff or consultant engineers. All bridges and culverts that are part of the NBI are required to have a general inspection done on a two-year inspection cycle. In addition to the general inspection, some structures require fracture critical inspections, underwater inspections, or special inspections to look at specific items. Intervals for these other inspections vary depending on what is being looked at. Structures that are in "poor" or "serious" condition may have inspections done at more frequent intervals.

Bridge and culvert condition ratings have been supplied to the RPCs for the development of their Regional Transportation Plans (RTPs). This data is being provided for the purpose of assisting the RPCs and MoDOT in identifying local needs and priorities for a region. These condition ratings are assessed by inspectors when the various types of inspections are done on a structure. These condition ratings basically describe the in-place condition of a structure. Ratings are assigned for the physical condition of the deck, superstructure and substructure components of a bridge and an overall rating is assigned for culvert structures.

The deck is the portion of the bridge that includes the riding surface. The superstructure is the girders and other span elements of the bridge that support the deck. These superstructure elements may be comprised of structural steel, concrete or timber, depending on the design of the bridge. The substructure is comprised of those elements of the structure that support the superstructure (girders,

span elements, etc.). The substructure elements are the columns, footings and beam caps that the girders rest on. The deck, superstructure and substructure are rated independently; however, the lowest rating of the three is traditionally what is considered the overall rating for a structure. Culverts are typically buried structures built out of concrete or steel. An overall condition rating is assigned for a culvert and takes into account how all of the different elements of the structure are functioning.

The following general condition ratings are used as a guide in evaluating the deck, superstructure, substructure and overall culvert.

### Bridge/Culvert Rating Description

- N NOT APPLICABLE
- 9 EXCELLENT CONDITION
- 8 VERY GOOD CONDITION – no problems noted.
- 7 GOOD CONDITION – some minor problems.
- 6 SATISFACTORY CONDITION – structural elements show some minor deterioration.
- 5 FAIR CONDITION – all primary structural elements are sound but may have minor section loss, cracking, spalling or scour.
- 4 POOR CONDITION – advanced section loss, deterioration, spalling or scour.
- 3 SERIOUS CONDITION – loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
- 2 CRITICAL CONDITION – advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored, it may be necessary to close the bridge until corrective action is taken.
- 1 IMMINENT FAILURE COND – major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic, but corrective action may put back in light service.
- 0 FAILED CONDITION – out of service – beyond corrective action.

# Traffic Management System

## Traffic Data Acquisition System

Previously, traffic data was collected by a variety of methods. All traffic data reporting was done on the mainframe system. With the acquisition of Traffic Data Acquisition System (TRADAS), all traffic data is collected and processed uniformly. The traffic data collected includes such items as traffic volumes (both vehicular traffic and truck traffic), Level of Service (LOS) (congestion condition) and vehicle classifications. This data is used to understand traffic patterns and identify locations of need.

Inventories in the Traffic Management System include:

- Flasher Inventory
- Lighting Inventory
- Signal Inventory
- District Defined Types
- Highway Capacity Interface
- Site ID Maintenance
- Traffic Information Segment Maintenance
- Traffic Segment Hourly Volume

## Congestion Management

Traffic congestion and travel delay are among the most visible signs of transportation problems. Drivers experience congestion for the most part as a personal annoyance, although traffic congestion is a problem that wastes time, consumes energy resources and contributes to poorer air quality.

Traffic congestion in the urban area is typically confined to the morning and evening peak hours of travel. Delays from congestion occur on roadways with inadequate capacity or at specific locations such as interstate ramps and signalized intersections.

Congestion in the rural area can occur at any time when the roadway is unable to handle the traffic flow. This can be related to peak hours of travel, including work and holiday travel. It can also be because the typical two-lane roadway is restricted and traffic is unable to flow freely, often times because of incidents or slow moving vehicles.

Expanding the capacity of roadways is not the sole solution to congestion. The new roadways, bridges, and highways built to relieve congestion satisfy latent and shifted demand for travel. The use of alternate modes, land use regulation, access management, and improvements to intersections and traffic signals can all contribute to an overall program to manage traffic congestion.

There are two major methods of gauging congestion: facility-based measures and travel time. The facility-based congestion method focuses on the road itself and usually is based on traffic volume and capacity comparisons. Such comparisons may include volume-to-capacity ratios and traffic volume per lane mile. The travel time method of measuring congestion indicates the same conclusion, however. These trip-based measures are tied to the individual traveler's congestion problems and oriented to the length of the trip. Average travel time to work is an example of one such measure.

A number of indicators may be used to gauge and manage congestion. These are divided into four categories.

### 1. Facility-based measures:

- Average vehicle speed in peak hour
- Ratio between peak volume & nominal capacity (V/C)
- Total vehicle hours of delay
- Proportion of daily travel by speed or V/C range
- Frequency and duration of incidents
- Average daily traffic (ADT) per freeway lane

### 2. Personal travel effects:

- Proportion of personal travel by speed range
- Delay added to average person's trips by time of day, travel purpose
- Delay added to average person's trip by place of residence
- Delay to transit vehicles
- Number of crashes due to congestion

### 3. Effects on the economy:

- Delay added to average commuter trip by place of work
- Percentage of truck travel by speed or V/C range
- Vehicle hours of delay to trucks/delivery vehicles
- Truck scheduling costs attributable to travel time uncertainty
- Market perceptions of congestion as an influence on economic activity

### 4. Environmental impacts:

- Extra vehicle emissions due to stop-and-go conditions
- Extra gas consumption due to stop-and-go conditions

LOS is defined as conditions within a traffic stream as perceived by the users of a traffic facility. MoDOT's Transportation Management System provides LOS information in the Traffic Segment Browser. In practice, LOS has been defined by measures of effectiveness for each facility type, relating more to speed, delay and density than to qualitative factors or safety. LOS is rated A, representing the best operating condition, to F, representing the worst. The following describes LOS according to the Highway Capacity Manual.

LOS A describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at the boundary intersections is minimal. The travel speed exceeds 80% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.

LOS B describes reasonably unimpeded operations. The ability to maneuver within the traffic stream is only slightly restricted, and control delay at the boundary intersections is not significant. The travel speed is between 67% and 80% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.

LOS C describes stable operation. The ability to maneuver and change lanes at mid-segment locations may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed, and the volume-to-capacity ratio is greater than 1.0.

LOS D indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the boundary intersections. The travel speed is between 40% and 50% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.

LOS E is characterized by unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30% and 40% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.

LOS F is characterized by flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is 30% or less of the base free-flow speed or the volume-to-capacity ratio is greater than 1.0.

### Transportation Demand Management (TDM)

This is a strategic response to roadway capacity deficiencies that involves the construction of new or expanded roadways. TDM actions are calculated to reduce vehicle demand by increasing vehicle capacity or providing an alternate mode. While new construction is the most direct and effective practice to eliminate congestion, this approach may not offer a complete solution. A variety of strategies is available to reduce congestion and may include methods to increase vehicle occupancy and promote alternative modes of transportation. Approaches may include:

- a. Ridesharing programs, local and regional.
- b. Transportation management associations which coordinate opportunities and incentives for a shared travel, usually through employers or business associations.
- c. Cash-out parking subsidies which allow employees to convert employer paid parking subsidies to transit subsidies or cash.
- d. Restricted availability and/or increased parking cost for single occupancy vehicles.
- e. Mixed use development of walking, cycling and transit alternatives.

- f. Transportation enhancements projects such as improved bicycle paths and pedestrian facilities to improve choices available to commuters.
- g. Staggered/flexible work hours to more evenly distribute the number of commuters.
- h. Telecommuting and home-based businesses.
- i. Electronic commerce that allows personal and business transactions electronically without physically making a trip.

### Signalized Intersection Management

Signalized intersections may be necessary to allow the safe movement of vehicles through intersecting roadways. However, there is a physical limit to the number of through movements and turning movements that can be safely accommodated by a signalized intersection. When the demand for any movement at the intersection exceeds the available capacity, congestion and delays ensue, reducing the average travel speed and increasing the travel time. Roundabouts can also be constructed to facilitate the safe movement of vehicles through intersecting roadways. In some cases, roundabouts can accommodate traffic volume and movements more efficiently than traffic signals.

### Safety Management System

Traffic crashes are entered into TMS by staff at the Missouri State Highway Patrol (MSHP). The crashes in the database date back to 1985, and crash images date back to 1997. MSHP enters fatal crashes into the database within 10 days of the crash. Crash data is utilized to identify where crashes occur and includes other information such as type of crash, contributing circumstances and severity of the crash. Applications in this system include:

- Crash Summary
- Crash Browser
- Intersection Expected Crash Values
- Statewide Average Crash Rates

**Travelway Safety Features** – this includes inventories for:

- Guardcable
- Rumblestrips
- Concrete Barrier
- Guardrail
- Soundwall
- Emergency Reference Markers
- Curfews
- Points of Interest
- Controlled Routes

## Travelways Management System

The travelways management system includes applications to manage the following data:

- Asset Management (Functional class, speed limit, access category, federal system class, etc.)
- Travelway Overlapping Browser
- Location Referencing System (Travelway Selection)
- Travelway Lane Inventory

### Functional Classification and Access Management

Functional classification (FC) is the process by which streets and highways are grouped into classes or systems according to the character of service they provide. FC defines the nature of this process by defining the part that any particular road or street should play in serving the flow of trips through a highway network.

Federal legislation requires the FC of roadways to determine the funding eligibility of transportation projects.

Urban and rural areas have fundamentally different characteristics as to density and land use, density of street and highway networks, nature of travel patterns and the way in which all of these elements are related in the definitions of the highway classifications.

There are three such area definitions, and they are the following:

#### AREA DEFINITIONS

Small Urban—Areas designated by the Bureau of the Census having a population of 5,000 (5,000 to 49,999).

Urbanized—Designated as such by the Bureau of the Census with a population of 50,000 or more.

Rural—comprise the areas outside the boundaries of small urban and urbanized.

There are three principal roadway classifications: arterial, collector and local roads. All highways and streets are grouped into one of these classes, depending on the character of the traffic and the degree of land access they allow.

The following information was taken from FHWA's website at

[https://www.fhwa.dot.gov/planning/processes/statewide/related/highway\\_functional\\_classifications/section03.cfm](https://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/section03.cfm).

To assist transportation planners responsible for determining the FC of roadways, the charts below offer a helpful tool that can make the classification process of classifying "borderline" roadways a bit easier. **Table 4-1** illustrates the range of lane width, shoulder width, AADTs, divided/undivided status, access control and access points per mile by FC categories.

Table 4-1: VMT and Mileage Guidelines by Functional Classifications - Arterials

	Arterials			
	Interstate	Other Freeways & Expressway	Other Principal Arterial	Minor Arterial
<b>Typical Characteristics</b>				
<b>Lane Width</b>	12 feet	11 - 12 feet	11 - 12 feet	10 feet - 12 feet
<b>Inside Shoulder Width</b>	4 feet - 12 feet	0 feet - 6 feet	0 feet	0 feet
<b>Outside Shoulder Width</b>	10 feet - 12 feet	8 feet - 12 feet	8 feet - 12 feet	4 feet - 8 feet
<b>AADT<sup>1</sup> (Rural)</b>	12,000 - 34,000	4,000 - 18,500 <sup>2</sup>	2,000 - 8,500 <sup>2</sup>	1,500 - 6,000
<b>AADT<sup>1</sup> (Urban)</b>	35,000 - 129,000	13,000 - 55,000 <sup>2</sup>	7,000 - 27,000 <sup>2</sup>	3,000 - 14,000
<b>Divided/Undivided</b>	Divided	Undivided/Divided	Undivided/Divided	Undivided
<b>Access</b>	Fully Controlled	Partially/Fully Controlled	Partially/Uncontrolled	Uncontrolled
<b>Mileage/VMT Extent (Percentage Ranges)<sup>1</sup></b>				
<b>Rural System</b>				
<b>Mileage Extent for Rural States<sup>2</sup></b>	1% - 3%	0% - 2%	2% - 6%	2% - 6%

#### 4. Transportation Management

<b>Mileage Extent for Urban States</b>	1% - 2%	0% - 2%	2% - 5%	3% - 7%
<b>Mileage Extent for All States</b>	1% - 2%	0% - 2%	2% - 6%	3% - 7%
<b>VMT Extent for Rural States<sup>2</sup></b>	18% - 38%	0% - 7%	15% - 31%	9% - 20%
<b>VMT Extent for Urban States</b>	18% - 34%	0% - 8%	12% - 29%	12% - 19%
<b>VMT Extent for All States</b>	20% - 38%	0% - 8%	14% - 30%	11% - 20%
<b>Urban System</b>				
<b>Mileage Extent for Rural States<sup>2</sup></b>	1% - 3%	0% - 2%	4% - 9%	7% - 14%
<b>Mileage Extent for Urban States</b>	1% - 2%	0% - 2%	4% - 5%	7% - 12%
<b>Mileage Extent for All States</b>	1% - 3%	0% - 2%	4% - 5%	7% - 14%
<b>VMT Extent for Rural States<sup>2</sup></b>	17% - 31%	0% - 12%	16% - 33%	14% - 27%
<b>VMT Extent for Urban States</b>	17% - 30%	3% - 18%	17% - 29%	15% - 22%

#### 4. Transportation Management

VMT Extent for All States	17% - 31%	0% - 17%	16% - 31%	14% - 25%
<b>Qualitative Description (Urban)</b>	<ul style="list-style-type: none"> <li>• Serve major activity centers, highest traffic volume corridors, and longest trip demands</li> <li>• Carry high proportion of total urban travel on minimum of mileage</li> <li>• Interconnect and provide continuity for major rural corridors to accommodate trips entering and leaving urban area and movements through the urban area</li> <li>• Serve demand for intra-area travel between the central business district and outlying residential areas</li> </ul>			<ul style="list-style-type: none"> <li>• Interconnect with and augment the principal arterials</li> <li>• Serve trips of moderate length at a somewhat lower level of travel mobility than principal arterials</li> <li>• Distribute traffic to smaller geographic areas than those served by principal arterials</li> <li>• Provide more land access than principal arterials without penetrating identifiable neighborhoods</li> <li>• Provide urban connections for rural collectors</li> </ul>
<b>Qualitative Description (Rural)</b>	<ul style="list-style-type: none"> <li>• Serve corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel</li> <li>• Serve all or nearly all urbanized areas and a large majority of urban clusters areas with 25,000 and over population</li> <li>• Provide an integrated network of continuous routes without stub connections (dead ends)</li> </ul>			<ul style="list-style-type: none"> <li>• Link cities and larger towns (and other major destinations such as resorts capable of attracting travel over long distances) and form an integrated network providing interstate and inter-county service</li> <li>• Spaced at intervals, consistent with population density, so that all developed areas within the State are within a reasonable distance of an arterial roadway</li> <li>• Provide service to corridors with trip lengths and travel density greater than those served by rural collectors and local roads and with relatively high travel speeds and minimum interference to through movement</li> </ul>

1- Ranges in this table are derived from 2011 HPMS data.

2- For this table, Rural States are defined as those with a maximum of 75 percent of their population in urban centers.

**Table 3-6: VMT and Mileage Guidelines by Functional Classifications - Collectors and Locals**

	Collectors		Local
	Major Collector <sup>2</sup>	Minor Collector <sup>2</sup>	
<b>Typical Characteristics</b>			
<b>Lane Width</b>	10 feet - 12 feet	10 - 11 feet	8 feet - 10 feet
<b>Inside Shoulder Width</b>	0 feet	0 feet	0 feet
<b>Outside Shoulder Width</b>	1 feet - 6 feet	1 feet - 4 feet	0 feet - 2 feet
<b>AADT<sup>1</sup> (Rural)</b>	300 - 2,600	150 - 1,110	15 - 400
<b>AADT<sup>1</sup> (Urban)</b>	1,100 - 6,300 <sup>2</sup>		80 - 700
<b>Divided/Undivided</b>	Undivided	Undivided	Undivided
<b>Access</b>	Uncontrolled	Uncontrolled	Uncontrolled
<b>Mileage/VMT Extent (Percentage Ranges)<sup>1</sup></b>			
<b>Rural System</b>			
<b>Mileage Extent for Rural States<sup>3</sup></b>	8% - 19%	3% - 15%	62% - 74%

#### 4. Transportation Management

<b>Mileage Extent for Urban States</b>	10% - 17%	5% - 13%	66% - 74%
<b>Mileage Extent for All States</b>	9% - 19%	4% - 15%	64% - 75%
<b>VMT Extent for Rural States<sup>3</sup></b>	10% - 23%	1% - 8%	8% - 23%
<b>VMT Extent for Urban States</b>	12% - 24%	3% - 10%	7% - 20%
<b>VMT Extent for All States</b>	12% - 23%	2% - 9%	8% - 23%
<b>Urban System</b>			
<b>Mileage Extent for Rural States<sup>3</sup></b>	3% - 16%	3% - 16% <sup>2</sup>	62% - 74%
<b>Mileage Extent for Urban States</b>	7% - 13%	7% - 13% <sup>2</sup>	67% - 76%
<b>Mileage Extent for All States</b>	7% - 15%	7% - 15% <sup>2</sup>	63% - 75%
<b>VMT Extent for Rural States<sup>3</sup></b>	2% - 13%	2% - 12% <sup>2</sup>	9% - 25%
<b>VMT Extent for Urban States</b>	7% - 13%	7% - 13% <sup>2</sup>	6% - 24%

#### 4. Transportation Management

<b>VMT Extent for All States</b>	5% - 13%	5% - 13% <sup>2</sup>	6% - 25%
<b>Qualitative Description (Urban)</b>	<ul style="list-style-type: none"> <li>• Serve both land access and traffic circulation in higher density residential, and commercial/industrial areas</li> <li>• Penetrate residential neighborhoods, often for significant distances</li> <li>• Distribute and channel trips between local streets and arterials, usually over a distance of greater than three-quarters of a mile</li> </ul>	<ul style="list-style-type: none"> <li>• Serve both land access and traffic circulation in lower density residential, and commercial/industrial areas</li> <li>• Penetrate residential neighborhoods, often only for a short distance</li> <li>• Distribute and channel trips between local streets and arterials, usually over a distance of less than three-quarters of a mile</li> </ul>	<ul style="list-style-type: none"> <li>• Provide direct access to adjacent land</li> <li>• Provide access to higher systems</li> <li>• Carry no through traffic movement</li> </ul>
<b>Qualitative Description (Rural)</b>	<ul style="list-style-type: none"> <li>• Provide service to any county seat not on an arterial route, to the larger towns not directly served by the higher systems, and to other traffic generators of equivalent intra-county importance such as consolidated schools, shipping points, county parks, important mining and agricultural areas</li> <li>• Link these places with nearby larger towns and cities or with arterial routes</li> <li>• Serve the most important intra-county travel corridors</li> </ul>	<ul style="list-style-type: none"> <li>• Be spaced at intervals, consistent with population density, to collect traffic from local roads and bring all developed areas within reasonable distance of a minor collector</li> <li>• Provide service to smaller communities not served by a higher class facility</li> <li>• Link locally important traffic generators with their rural hinterlands</li> </ul>	<ul style="list-style-type: none"> <li>• Serve primarily to provide access to adjacent land</li> <li>• Provide service to travel over short distances as compared to higher classification categories</li> <li>• Constitute the mileage not classified as part of the arterial and collectors systems</li> </ul>

1- Ranges in this table are derived from 2011 HPMS data.

2- Information for Urban Major and Minor Collectors is approximate, based on a small number of States reporting.

3- For this table, Rural States are defined as those with a maximum of 75 percent of their population in urban centers.

## Pavement Management System

Currently, MoDOT's emphasis is on keeping good roads good and doing the best we can with the resources available. Because resources are scarce and MoDOT desires to provide the best service possible to the most customers, we have stratified our roadways into three tiers: Major Roads, Minor Roads and Low Volume Roads. Major Roads account for almost 80% of the Vehicle Miles Traveled (VMT) on state-owned roadways. Minor Roads are other routes that are not Major but have an AADT greater than 400. Low Volume routes are all other routes with an AADT less than 400. We track performance on these routes by category. Our resulting measures are "Good" and "Not Good". They are calculated as follows:

- Major Roads speed limit > 45                      Good: IRI < 100
- Major Roads speed limit < 50                      Good: Condition\_Index >=7 (visual surface distress rating)
- Minor Roads    Good: IRI < 140
- Minor Roads    Good: IRI between 140 and 170 and Condition\_Index >=6
- Low Volume    Good: IRI < 170
- Low Volume    Good: IRI between 170 and 220 and Condition\_Index >=6

In our state of the system tables, this measurement has been calculated, and the results are maintained in the column *Tracker Condition* with the values of "Good", "Not Good" and "NA" or null.

## Additional Business Areas with TMS include the following:

**Outdoor Advertising** – this system includes:

- Adopt A Highway
- Outdoor Advertising Billboard
- Junkyard
- Transfer Permit
- Media for billboards and junkyards

### Routine Maintenance

- Travelway Routine Maintenance is an application containing job numbers for routes and bridges throughout the state. This application enables Routine Maintenance job numbers from the Financial Management System (FMS) to be tied to a location in TMS.

### Intelligent Transportation System

**SIMS** (five-year Statewide Transportation Improvement Program)

### Realty Asset/RW Parcel Acquisition

**State of the System** (yearly summarized roadway, bridge, crash and pavement data)

**Traffic Permitting for Right-of-Way** – this application tracks the status of permits issued for conducting work on MoDOT right-of-way.

### Traveler Information System

These applications are used to keep information current on MoDOT's Traveler Information Map. The Traveler Information Map is essential to the safety of Missouri's traveling public. Traffic Impact

- Work Zone
- Winter Road Conditions
- Flood Condition
- OSOW Restrictions
- Traveler Information Map (TIM) Auto Editor  
This application is used to choose and update layers which will display on the TIM. This application is used only by MoDOT Communications staff.
- TIM Alert Management  
This application will assist users in changing the alert message for the desktop TIM and the mobile TIM apps for iOS/Android mobile phones. The desktop web application only allows one message to be displayed in the upper left corner of the map. The mobile apps allow multiple messages and will display them in a list for the user. This application is used only by MoDOT Communications staff.

The following is a list of newer applications in TMS:

#### Stormwater

- This application helps MoDOT regulate under a National Pollutant Discharge Elimination System storm water permit. The permit requires MoDOT to develop and implement a comprehensive program to prevent pollution of surface waters resulting from storm water run-off from MODOT's system.

#### Local Program Application (LPA) Locations

- The LPA is used to manage jobs located on our city streets and county roads. There is a federal mandate to assign locations to these local projects.

#### Emergency Operations Map

- This map is for internal use only should a natural disaster occur. It tracks the status of MoDOT roads and bridges during and after a disaster.

#### TMS Data Zone

This is an internal web page containing maps and other tools that allow MoDOT customers to easily retrieve data and statistics. It contains data in the following areas: Traffic, Safety, Planning, Bridge, Design, Map-21, Construction and Multimodal. The Data Zone also houses the Pavement Tool which is used for planning pavement maintenance activities and surface treatments. The intent is to eventually open this tool to the public.

For detailed information regarding MoDOT business and engineering policy, visit the Engineering Policy Guide at [http://epg.modot.org/index.php?title=Main\\_Page](http://epg.modot.org/index.php?title=Main_Page).

## 5. NEEDS IDENTIFICATION

### Surveys

At the beginning of each year's prioritization process, SMCOG staff prepare a needs survey to distribute across the region. A transportation needs letter and survey is mailed to each incorporated jurisdiction and county. The survey is also placed on the SMCOG website for online entry or printing and a press release is sent to area media. This provides local officials as well as the general public the opportunity to submit any needs within their respective areas.

Existing needs are posted on the SMCOG website, broken down by county, so that individuals may review what is already on the list prior to submitting a survey.

### County Meetings

After any new needs have been collected, SMCOG staff updates each county's list. Staff then schedules meetings with each of the ten counties. Staff attend a County Commission or Transportation Advisory Board meeting to discuss the current list of needs. Each incorporated jurisdiction is also notified of this meeting and invited to attend to provide comments or feedback. The existing list is reviewed, and the commissioners prioritize the list of needs. MoDOT staff also often attend these meetings.

### Prioritization

SMCOG staff compiles the top three road and bridge needs and the top two bike and pedestrian needs from each county. These lists are then pre-scored with MoDOT staff for the quantitative measurements used during MoDOT Southwest District prioritization. The criteria is based on MoDOT's Long Range Transportation Plan and Blue Print for Safety.

SMCOG staff then presents the top needs during a TAC meeting. Each TAC member can expand on information pertaining to the needs, but each need may only be discussed for a maximum of two minutes. The TAC then ranks the top 10 regional needs for road and bridge and bike and pedestrian.

This process resulted in the following needs list:

SMCOG Road and Bridge						Keep Customers and Ourselves Safe						Operate a Reliable and Convenient Transportation System					Advance Economic Development					
						Long-Range Plan Goal: Safety						Long-Range Plan Goal: Connection and Choices					Long-range Plan Goal: Economic Development					
						Number and rate of fatalities and serious injuries (max. 10 points)						Cost and Impact of Traffic Congestion (max. 5 points)					National Ranking of Transportation Infrastructure; Truck Reliability Index (max. 5 points)					
Priority #	County	City	Need	Route	Location	Addresses a location in the Southwest District Safety Plan (+5)	Improves run-off-road crashes, not in a curve (+1)	Improves run-off-road crashes, in a curve (+1)	Reduce collisions with roadside objects (+1)	Reduce head-on collisions (+1)	Improve intersection safety (signalized and unsignalized) (+1)	Improves capacity on Route > 10,000 AADT	Improves capacity on Route > 5,000 AADT	Improves capacity on a Route > 2,500 (+1)	Improves capacity on a Principal Arterial (+2)	Improves capacity on a Minor Arterial (+1)	Improves a Tier 1 freight corridor (+2)	Improves a Tier 2 or Tier 3 freight corridor (+1)	Improves access to an industrial park, downtown, business park or tourist attraction (+1)	Addresses a structurally or functionally deficient bridge (+1)	Addresses a highway/railroad grade separation (+1)	Total
1	Barry, Greene, Lawrence	County Wide	Safety and Capacity Improvements	US 60, Rte. 37	US 60 from Republic (OTO Boundary) to Monett and Route 37 from Monett to Gateway, AR.	3	1	1	1	1	1	1	1	1	2	0	0	1	1	1	0	16
2	Greene & Webster	County Wide	Safety, Capacity, & Intersection improvements	on US Hwy 60	Hwy 60 Corridor; Greene county into Webster county to Wright county	3	1	1	1	0	1	1	1	1	2	0	2	0	1	0	0	15
3	Christian, Taney	County Wide	Safety and Intersection Improvements	On Rte. 65	Upgrade to freeway status throughout Christian and Taney. Address intersections such as Saw Mill, State Hwys A & BB; at Hopkins Rd.; At	5	1	1	1	1	1	1	1	1	2	0	0	1	1	1	0	18

5. Needs Identification

					Saddlebrooke exit, and more																	
4	Taney	Hollister/ Kirbyville	Capacity Improvements	NEW	Phase I: From Birch Street/ 65 Interchange to BB Hwy	0	0	1	1	0	1	0	1	1	0	1	0	0	1	0	0	7
5	Polk	Stockton, Bolivar	Capacity and geometric improvements	MO 32	from Rte. 97 in Cedar County to Rte. 13 in Polk County.	0	1	1	1	0	1	0	1	1	0	1	0	0	1	1	0	9
6	Dallas	County Wide	Safety, Capacity, and Intersection Improvements	on Rte. 65	Through county; including at Kelly Rd; at Truman Rd; at 64; S of MO32	0	1	0	1	1	1	0	1	1	2	0	0	1	1	0	0	10
7	Dade	Greenfield/ County wide	Alignment & Safety Improvements	on Rte. 160 & 39	From Barton County line to Rtes. MM/FF, and intersection at Rte. 39 in Greenfield	0	1	1	1	1	1	0	0	1	0	1	0	0	1	0	0	8
8	Christian	County/ Highlandville	Safety and Capacity Improvements	on Rte. EE	from Rte. 65 to Rte. 160/13	3	1	1	1	0	1	0	0	1	0	0	0	0	1	0	0	9
9	Stone	Indian Point	Intersection Improvements	MO 76	at Indian Point Road	0	0	0	0	0	1	1	1	1	2	0	0	0	1	0	0	7
10	Greene	Countywide	Safety and Capacity Improvements	on Rte. 125	Hwy 125 through County	0	1	1	1	1	1	0	0	1	0	1	0	0	0	0	0	7

SMCOG Bike and Pedestrian						Keep Customers and Ourselves Safe					Operate a Reliable and Convenient Transportation System			Advance Economic Development			Total
						Long-range Plan Goal: Safety					Long-range Plan Goals: Connections and Choices, Maintenance			Long-range Plan Goals: Economic Development, Connections and Choices			
Priority #	County	City	Need	Route	Location	Number and rate of fatalities and serious injuries (max. 10 points)					Bike/pedestrian and ADA Transition Plan Improvements (max. 5 points)			Economic Return from Transportation Investment (max. 5 points)			
						Separates pedestrian traffic from vehicular traffic (+2)	Separates bike traffic from vehicular traffic (+2)	Grade separated road or railroad crossing for bicyclists/pedestrians (+5)	Pedestrian signal at road crossing (HAWK, LED Flasher, ped push buttons, etc. (+3)	Includes Traffic calming features (+1)	Addresses Elements of MoDOT's ADA Transition Plan (+3)	Preserves a Bike/Ped Facility (+1)	Safe Routes to School (connects directly to a school) (+1)	Locally Significant Trail or Bike Route (Tourism, Health) (+1)	Statewide Significant Trail or Bike Route (Tourism, Health) (+2)	Implements a complete street concept (Tourism, Talent Attraction) (+3)	
1	Greene	Fair Grove	Bike/Ped	on Rte. 125	in Fair Grove, Main St. & eastward	2	0	0	0	0	0	0	0	0	0	1	3
2	Taney	Hollister	Bike/Ped	on BU 65 S	from Birch Street to College of the Ozarks	2	0	0	3	0	1	0	1	0	0	1	8
3	Webster	Marshfield	Bike/Ped	Courthouse Square	Downtown Marshfield	2	0	0	0	0	0	1	0	0	0	1	4
4	Stone	Crane	Bike/Ped	on Rte. 413	through Crane	2	0	0	0	0	0	0	0	0	0	0	2
5	Polk	Bolivar	Bike/Ped	on Rte. 83	from Jackson to Mt. Gilead Rd	2	2	0	0	0	0	0	0	0	0	1	5
6	Christian	Clever	Bike/Ped	on Rte. 14	in Clever	2	0	0	0	0	0	0	1	0	0	0	3

5. Needs Identification

7	Dade	Greenfield	Bike/Ped	on Rte. 160/39	From Pennington Seed to Simmons along 160	2	0	0	0	0	0	0	0	0	0	0	2
8	Lawrence	Miller	Bike/Ped	on Rte. 39	from 6th to DD	2	0	0	0	0	0	0	0	0	0	0	2
9	Barry	Cassville	Bike/Ped	on Rte. 76/86	over Flat Creek	2	0	0	0	0	0	0	0	1	0	0	3
10	Dallas	Buffalo	Bike/Ped	on Rte. 32	from Hwy 65 to Maple, south side	2	0	0	0	0	0	0	0	0	0	0	2

## 6. FUTURE PROJECT PLAN

The Southwest Missouri Council of Governments is working with cities and counties in the region to identify and prioritize transportation needs that affect the regional transportation network. The process has included multiple meetings with each county's commission in order to identify the most current needs within that county. In addition to meetings, surveys are sent each year to cities and counties. In addition, during at least one Transportation Advisory Committee meeting during the year, each TAC member presents his/her county's needs to the group for informational purposes. This process helps TAC members to make more informed decisions when prioritizing projects.

## 7. FINANCE

### 7.1 Federal Funding Sources

Federal revenue sources include the 18.4 cents per gallon tax on gasoline and 24.4 cents per gallon tax on diesel fuel. Other sources include various taxes on tires, truck and trailer sales, and heavy vehicle use.

#### Federal Funding - FAST Act

According to the US Department of Transportation, the Fixing America's Surface Transportation (FAST) Act is a \$305 Billion five-year bill to improve the Nation's surface transportation infrastructure, including roads, bridges, transit systems, and rail transportation network. The bill, which was signed by President Obama on Dec. 4, 2015, is the first long-term transportation bill to be passed in 10 years. Since the 2012 expiration of the previous bill, MAP-21, 36 extensions had been filed to maintain transportation funding. The following information, according to the U.S. House of Representative's Committee on Transportation and Infrastructure, provides a summary of the bill:

#### Roads and Bridges

- Facilitates commerce and the movement of goods by refocusing existing funding for a National Highway Freight
- Program and a Nationally Significant Freight and Highway Projects Program
- Expands funding available for bridges off the National Highway System
- Converts the Surface Transportation Program (STP) to a block grant program, increases flexibility for states and local governments, and rolls the Transportation Alternatives Program into the STP Block Grant
- Streamlines the environmental review and permitting process to accelerate project approvals
- Eliminates or consolidates at least six separate offices within the Department of Transportation and establishes a National Surface Transportation and Innovative Finance Bureau to help states, local governments, and the private sector with project delivery
- Increases transparency by requiring the Department of Transportation to provide project-level information to Congress and the public
- Promotes private investment in our surface transportation system
- Promotes the deployment of transportation technologies and congestion management tools
- Encourages installation of vehicle-to-infrastructure equipment to improve congestion and safety
- Updates research and transportation standards development to reflect the growth of technology

#### Public Transportation

- Increases dedicated bus funding by 89 percent over the life of the bill

- Provides both stable formula funding and a competitive grant program to address bus and bus facility needs
- Reforms public transportation procurement to make federal investment more cost effective and competitive
- Consolidates and refocuses transit research activities to increase efficiency and accountability
- Establishes a pilot program for communities to expand transit through the use of public-private partnerships
- Eliminates the set aside for allocated transit improvements
- Provides flexibility for recipients to use federal funds to meet their state of good repair needs
- Provides for the coordination of public transportation services with other federally assisted transportation services to aid in the mobility of seniors and individuals with disabilities
- Requires a review of safety standards and protocols to evaluate the need to establish federal minimum safety standards in public transportation and requires the results to be made public

### **Highway and Motor Vehicle Safety**

- Focuses funding for roadway safety critical needs
- Increases percentage of National Priority Safety Program states can spend on traditional safety programs
- Ensures more states are eligible for safety incentive grant funds and encourages states to adopt additional safety improvements
- Encourages states to increase safety awareness of commercial motor vehicles
- Increases funding for highway-railway grade crossings
- Requires a feasibility study for an impairment standard for drivers under the influence of marijuana
- Improves the auto safety recall process to better inform and protect consumers
- Increases accountability in the automobile industry for safety-related issues

### **Truck and Bus Safety**

- Overhauls the rulemaking process for truck and bus safety to improve transparency
- Consolidates truck and bus safety grant programs and provides state flexibility on safety priorities
- Incentivizes the adoption of innovative truck and bus safety technologies
- Requires changes to the Compliance, Safety, Accountability program to improve transparency in the FMCSA's oversight activity
- Improves truck and bus safety by accelerating the introduction of new transportation technologies

### **Hazardous Materials**

- Grants states more power to decide how to spend training and planning funds for first responders
- Requires Class I railroads to provide crude oil movement information to emergency responders
- Reforms an underutilized grant program for state and Indian tribe emergency response efforts
- Better leverages training funding for hazmat employees and those enforcing hazmat regulations
- Requires real-world testing and a data-driven approach to braking technology
- Enhances safety for both new tank cars and legacy tank cars

- Speeds up administrative processes for hazmat special permits and approvals
- Cuts red tape to allow a more nimble federal response during national emergencies

### **Railroads**

- Provides robust reforms for Amtrak, including reorganizing the way Amtrak operates into business lines
- Gives states greater control over their routes, by creating a State-Supported Route Committee
- Speeds up the environmental review process for rail projects
- Creates opportunities for the private sector through station and right-of-way development
- Consolidates rail grant programs for passenger, freight, and other rail activities
- Establishes a Federal-State Partnership for State of Good Repair grant program
- Strengthens Northeast Corridor planning to make Amtrak more accountable and states equal partners
- Allows competitors to operate up to three Amtrak long-distance lines, if at less cost to the taxpayer
- Strengthens passenger and commuter rail safety, and track and bridge safety
- Preserves historic sites for rail while ensuring that safety improvements can move forward
- Unlocks and reforms the Railroad Rehabilitation and Improvement Financing (RRIF) loan program
- Includes reforms to get RRIF loans approved more quickly with enhanced transparency
- Provides commuter railroads with competitive grants and loans to spur timely Positive Train Control implementation
- Provides competitive opportunities for the enhancement and restoration of rail service

### **Additional Provisions**

- Includes strongly bipartisan measures to simplify rules and regulations, aid consumers, enhance our capital markets, assist low-income housing residents, and help build a healthier economy
- Includes bipartisan provisions to provide energy infrastructure and security upgrades
- Streamlines the review process for infrastructure, energy, and other construction projects

### **Financing Provisions**

- Includes fiscally responsible provisions to ensure the bill is fully paid for
- Ensures the Highway Trust Fund is authorized to meet its obligations through FY 2020
- Directs offsets from the FAST Act into the Highway Trust Fund to ensure fund solvency
- Reauthorizes the dedicated revenue sources to the Highway Trust Fund, which periodically expire

## 7.2 What the Fast Act Means for Missouri

In early January 2016, MoDOT produced an executive summary that provides an overview of the impact of the FAST Act on Missouri's transportation system. The following information is taken from that executive summary:

From Fiscal Year 2016 to Fiscal Year 2020, the availability of federal funds Missouri will be able to match will be approximately \$1 billion, which is an increase of 9.8 percent over the previous federal bill – MAP 21. Federal dollars represent the largest source of funds in MoDOT's budget. With current state revenue projections, it is anticipated that MoDOT will be able to fully match its available federal funds. The best news for Missouri is the FAST Act allows for a five-year period of funding certainty which will allow for effective project planning.

### Safety

The Office of Highway Safety will be required to conduct a survey every two years of all automated traffic enforcement systems to include red light running cameras and speed enforcement camera systems. The legislation requires a separate grant application for states to implement the 24-7 sobriety programs.

A study will be conducted on marijuana impaired driving including the issues of methods used to detect and measure marijuana levels and identify the role and extent of marijuana impairment in motor vehicle accidents.

States will be allowed to submit a multi-year plan detailing motor carrier safety efforts. These reports will include annual updates. States will undertake efforts to emphasize and improve enforcement of state and local traffic safety laws and regulations.

### Freight

The bill establishes a new competitive grant program for very large, predominantly highway projects that benefit the national freight network. One condition of this program is a project estimated cost of \$100 million or 30 percent of a state's annual federal appropriation. The minimum grant is \$25 million. However, there are some reserves (10 percent) for smaller projects of less than \$5 million and 25 percent for rural areas (population less than 200,000).

A local match will be required for funds used to support the capital needs of public ferries. FAST revises the formula for apportionment. The biggest change is the minimum fiscal year allocation of \$100,000.

Performance metrics will be developed on the nation's top 25 ports in each category of tonnage, containers and dry bulk. The St. Louis port is the only one that qualifies as a mandate on the list.

New funding is designated to improve the freight highway network. The language includes requirements to be designated as a "freight project." MoDOT will need to add these elements to its planning processes. Missouri has more than two percent of the national freight mileage so its apportionment must be spent on the primary freight network, critical urban and critical rural freight corridors instead of the broader freight system.

State Freight Plans are now mandated and must be in place within two years for Missouri to be able to access the freight funds. State Freight Advisory Committees remain as an encouraged activity, but not mandated.

### Transit

The FAST Act provides transit increases of 9 to 11 percent over five years and also increases the annual statewide allocation for buses and bus facilities.

Based on the estimated apportionments, the new surface transportation bill provides modest increases of approximately 3.5 percent in the first year and approximately 2 percent per year increase through Fiscal Year 2020.

The statewide allocation for the Bus & Bus Facilities program has increased from \$1.25 million to \$1.75 million per year. This is an increase for much needed capital projects. This program also includes a new competitive grant program.

Rural Area Funding program appears to remain the same with no significant changes. The funding in Missouri appears to increase modestly in each year based in preliminary estimates from \$17.7 million in 2016 to \$19.4 million in 2020 (8.7 percent).

Enhanced Mobility of Seniors and Individuals with Disabilities program will see modest increased funding from \$4.86 million in 2016 to \$5.37 million in 2020 (9 percent). There is a provision added for a new "pilot program for innovative coordinated access and mobility." Grant money could be available for eligible entities.

### Environment

The environmental provisions of the bill are intended to streamline the project delivery process and ensure interagency cooperation. New language under Efficient Environmental Review for Project Decision making changes definition of “project” to include multimodal projects and “lead federal agency” to “operating administration” so that projects benefit from review efficiencies; takes into account any source of federal funding. This should be helpful to multimodal projects. Similar streamlining of rail projects can be achieved once regulatory procedures are put in place.

Integration of Planning and Environmental Review: Clarifies and defines the planning products that can be adopted during National Environmental Policy Act development. Includes: Financing, modal choice, purpose and need, preliminary screening of alternatives, description of the environmental setting, methodology for analysis and programmatic level mitigation.

DOT and Heads of Federal Agencies will develop coordinated and concurrent environmental review and permitting process for Environmental Impact Statements.

### Planning

The FAST Act expands the scope of the planning process to include addressing resiliency and reliability of the transportation system, mitigating storm water impacts of surface transportation and enhancing travel and tourism of the transportation system.

The act requires state DOTs to incorporate the performance measures for rural transit agencies into its planning documents. In addition, the FAST Act requires states to establish a state freight plan in order to receive National Highway Freight Program funds. The state freight plan may be part of the state’s long-range transportation plan, but is more granular in requirements than a long-range transportation plan.

### Performance Management

If a state DOT does not achieve or make significant progress toward achieving targets after one reporting cycle (instead of two reporting cycles), then the state DOT must include a description of the actions they plan to take to achieve their targets in the future in a report.

The penalty for falling below the minimum condition levels for pavements on the interstate system is imposed after the first reporting cycle (instead of after two reporting cycles); eliminates the need to collect safety data and information on unpaved or gravel roads.

USDOT will now assess if the state DOT has made significant progress toward the achievement of freight performance targets. If the state DOT has not made significant progress, then there are additional reporting requirements but not penalties associated with obligating freight funds.

Establishes a performance management data support program to enable the USDOT to better support state DOTs, Metropolitan Planning Organizations and the Federal Highway Administration in the collection and management of data for performance-based planning and programming.

### Motor Carrier Services

Changes language to make sure that a tow vehicle is equal to or exceeds the gross vehicle weight of the disabled vehicle it is towing.

The act will allow emergency vehicles that travel the interstate to weigh 86,000 pounds.

The act increases the length limit of some automobile transport trucks; this will require legislative action.

### Research

Every Day Counts Program has been continued.

The FAST Act establishes a new National Surface Transportation and Innovative Finance Bureau. Highway Research, Technology and Education Authorization Program funding mostly stays the same or has small increases.

The Innovative Pavement Research and Deployment Program have been expanded. It now requires the Secretary to develop a program to stimulate deployment of advanced transportation technologies to improve system safety, efficiency and performance.

The goals for the Intelligent Transportation System have been expanded, but are mostly freight-related.

ITS program funds for operational tests can't be used for building physical surface infrastructure unless the construction is incidental and critically necessary to implement the ITS project.

The new Assistant Secretary for Research and Technology's responsibilities would include coordinating departmental Research & Technology activities, advancing innovative technologies, developing comprehensive statistics and data and coordinating multimodal and multidisciplinary research. The Secretary can enter into cooperative contracts with federal, state and local and other agencies to conduct departmental research on a 50/50 cost share basis.

The Transportation Research Board will be required to do a study (\$5 million; report due in 3 years) on how to restore the interstate highway system to premier status.

University Transportation Center funding has been increased; funding levels within ranges will be flexible instead of fixed. No change in matching requirements.

### Rail

This is the first surface transportation bill to include a rail title; passenger rail and other rail investments total \$10.4 billion over the five-year life of the legislation. Federal funding for intercity passenger rail does not begin until Federal Fiscal Year 2017.

FAST Act's most significant language to Missouri pertains to operating assistance. For the first time, Congress has provided states a chance to compete for \$20 million per year to offset costs for state-sponsored service. This primarily targets states' new cost from the Passenger Rail Investment and Improvement Act of 2009 (PRIIA).

In Missouri's case, costs were relatively the same after PRIIA. Therefore, it is uncertain how much Missouri will be able to obtain from this new funding source. States can compete for this funding to improve infrastructure and vehicles used in the delivery of intercity passenger rail. This is similar to what Congress did through ARRA and the creation of the High Speed and Improved Passenger Rail Program – which delivered much needed projects like the Osage River Railroad Bridge.

Grade crossing safety remained a distinct safety program targeting improvements at highway rail grade crossings.

Congress also put funding towards a committee currently working on costs. This committee stems is made up of the Federal Railroad Administration, states, and Amtrak. The committee continues to work to help ensure states are paying only their fair share of costs. For example, this committee is addressing call center costs.

Missouri has identified to Amtrak for years that its call center costs are too high and they need a better system to track where these costs are allocated. It seems they are primarily allocated to states, instead of Amtrak, where appropriate. This should continue to help lower costs to Missouri and other states.

### Highway and Bridge Revenue Sources

#### State motor fuel tax

The largest source of revenue from Missouri user fees is the state fuel tax. Assessed at a rate of 17-cents per gallon, it produced over 45 percent of state transportation revenues in 2016. However, the motor fuel tax is not indexed to keep pace with inflation, and there has been no rate increase since 1996. History shows that even when fuel prices rise dramatically, Missourians are generally unwilling or unable to turn to other modes of transportation, continuing to drive their

personal vehicles and to purchase fuel to do so. Trends show motor fuel tax revenues increase about one percent annually. However, if fuel prices rise and stay at higher rates, more Missourians may turn to more fuel-efficient vehicles, make fewer trips or seek other transportation options they had previously avoided. While good for the environment, these actions erode motor fuel tax revenues.

### Motor vehicle sales and use taxes

Motor vehicle sales and use taxes provided approximately 26 percent of state transportation revenues in 2016. This is the one source of state revenue that has recently provided substantial additional resources for transportation. In November 2004, Missouri voters passed Amendment 3. This set in motion a four-year phase in, redirecting motor vehicle sales taxes previously deposited in the state's General Revenue Fund to a newly created State Road Bond Fund. In accordance with this constitutional change, MoDOT began selling bonds to fund road improvements. From 2000-2010, MoDOT sold bonds that provided additional resources for highway improvements. Bonds are debt and similar to a home mortgage – this debt must be repaid over time. The total debt payment in fiscal year 2016 totaled \$280 million.

MoDOT has three kinds of bonds: senior bonds that were authorized by the Missouri General Assembly in 2000; Amendment 3 bonds that were authorized by Missouri voters in 2004; and federal GARVEE (Grant Anticipation Revenue Vehicle) bonds that financed specific projects. Borrowing accelerated construction and allowed MoDOT to avoid inflation in labor and materials costs. It gave Missourians improvements that would not have been built for many years with pay-as-you-go funding. Without borrowing, many of those projects still would not be completed. Senior bonds will be paid off by 2023, Amendment 3 bonds will be paid off by 2029 and GARVEE bonds will be paid off by 2033. The average interest rate on all outstanding debt combined is 2.98 percent.

### Motor vehicle and driver's licensing fees

Motor vehicle and driver's licensing fees also provided approximately 21 percent of Missouri's state transportation revenue in 2016. Similar to motor fuel tax, these fees are not indexed to keep pace with inflation, and there have been no annual registration fee increases since 1984. This revenue source increases at a rate of about 2.5 percent annually.

### Transportation revenues are shared

It is important to remember that cities and counties receive a substantial portion of these state transportation revenues. For example, cities and counties receive approximately 4.5 cents of the state's 17-cent per gallon fuel tax. They also receive approximately 14 percent of the remaining state transportation revenues discussed earlier. These funds go directly to cities and counties to fund local transportation.

### Interest earned on invested funds and other miscellaneous collections

The remaining 8 percent of state transportation revenues comes from interest earned on invested funds and other miscellaneous collections in 2016. During the Amendment 3 bonding program, cash balances in state transportation funds have been unusually high. Bond proceeds are received in large increments and are paid out over time as project costs are incurred. When the Amendment 3 projects are completed, the balance of state transportation funds will be substantially less, and interest income will also decline.

### **Funding for Alternative Modes of Transportation**

Transportation funding for alternative modes has historically been less than 5 percent of all MoDOT transportation revenue (approximately \$96 million annually). Funding for alternate modes of transportation comes from a variety of sources including motor vehicle sales taxes, aviation fuel and sales taxes, railroad regulation fees, state general revenue funds and federal grants. MoDOT Multimodal Operations is responsible for supporting alternative transportation programs within the state. The division functions to continue the advancement and strategic planning for Aviation, Rail,

Transit, Waterways, and Freight Development initiatives designed to expand Missouri's infrastructure and facilitate travel and commerce. Through the integration of the various modes, the traveling public enjoys greater accessibility to the resources of the state while industry capitalizes on improved transportation efficiencies.

### Multimodal Operations Functional Overview

- Assists in the development of port authorities through the distribution of capital and administrative funding while championing the efficiencies of waterborne transportation to industry and the general public.
- Administers federal and state capital improvement funding for Missouri's eligible public aviation facilities.
- Conducts airports safety inspections.
- Provides financial and technical assistance to public transit and specialized mobility providers across the state.
- Partners with industry and local communities to promote economic development and improved freight traffic efficiency by examining existing infrastructure obstructions and proactively assessing potential obstacles.
- Regulates freight and passenger rail operations, oversees rail crossing safety and construction projects, conducts railroad safety inspections, and provides outreach educational opportunities.
- Supports the continued operation of Amtrak in the state and provides direction for the development of expanded passenger rail service.

The amalgamation of the non-highway transportation modes into a single regulatory division traces its lineage back to the formation of the Missouri Highways and Transportation Department in 1980. With the subsequent merger and reorganization, Multimodal Operations assumed charge of consolidated authority over Aviation, Rail, Transit, and Waterway operations within the state as the definitive administrative body. The division has since evolved into a very specialized organization, centered on engaging partnership participation that focuses on safe, accessible, efficient, and environmentally responsible alternative transportation solutions. In fiscal year 2012, Multimodal Operations functioned with an operating budget of \$2.5 million and a staff of 31, maintained over 4,000 internal and external partnership contacts, and cumulatively delivered over \$79 million in multimodal projects with partners across the state (nearly \$47 million federal funds, over \$14 million in state funds, and over \$18 million in local match funds).

### Multimodal Operations Profile – Activities by Mode

- Aviation
  - Administer grants and provide guidance for public use airports (State Block Grant Program & State Aviation Trust Fund Program)
  - Conduct airport safety inspections
  - Publish Aeronautical Chart, Airport Directory, and Show Me Flyer
  - Maintain State Airport System Plan (SASP)
  - Approve Airport Master Plans (AMP) and Airport Layout Plans (ALP)
  - Maintain Automated Weather Observing System (AWOS) equipment
  - Promote education to the aviation community and other enthusiasts
- Rail
  - Conduct railroad infrastructure safety inspections (including track, grade crossing signals, and operating practices)
  - Support Amtrak passenger rail service through Missouri and promote ridership both through operations and project delivery
  - Maintain Statewide Rail Plan to identify the framework for freight and passenger rail development in Missouri for the next twenty years (including High Speed Intercity Passenger Rail (HSPiR))
  - Regulate safety for freight rail and passenger rail in Missouri
  - Enforce safety regulations for light rail operations (Metrolink)
  - Administer the Missouri Highway/Rail Crossing Safety Program

- Plan and administer funding for rail/highway construction projects
- Present outreach seminars on railroad grade crossing safety in conjunction with Missouri Operation Lifesaver
- Catalog freight and passenger rail maps of Missouri
- Transit
  - Administer federal grant funding under Section 5310 Agencies Serving Seniors and Persons with Disabilities
  - Transportation Assistance Vehicle Program
  - Administer federal grant funding under Section 5311 Non-Urbanized Transit Assistance Formula Grant Program, Section 5311(b) Rural Transit Assistance Program (RTAP), and 5311(f) Intercity Bus Program
  - Administer federal grant funding under Section 5316 Job Access and Reverse Commute Program (JARC)
  - Administer federal grant funding under Section 5317 New Freedom Program
  - Administer federal grant funding under Section 5309 Discretionary Transit Capital Program
  - Administer federal grant funding under Section 5305 Statewide Transit Planning Grant Program
  - Administer federal grant funding under Section 5339 Bus & Bus Facilities Grant Program
  - Administer state funded Missouri Elderly and Handicapped Transportation Assistance Program (MEHTAP)(RSMo 208.250-208.265)
  - Administer state funded Missouri State Transit Assistance Program (RSMo 226.195)
  - Administer federal grant funding consistent with the new MAP-21 transportation funding provisions
  - Provide technical support and program assistance to partners and external customers
- Waterways
  - Assist in the formation and operation of port authorities in Missouri
  - Provide technical assistance and promote use of Missouri's navigable rivers
  - Represent port interests in industry and governmental bodies
  - Assist in distributing capital and administrative funding for port improvements
  - Provide financial assistance to two ferryboat operations
  - Maintain waterways map of port authorities
- Freight Development
  - Encourage freight initiatives that promote economic development and efficient movement of goods
  - Conduct studies to determine opportunities for enhanced system capacity
  - Evaluate performance of state infrastructure to improve efficiencies
  - Host public forums and outreach opportunities for public comment and contribution

Unlike highways, MoDOT does not own multimodal facilities. Instead, MoDOT's role is to administer funding and provide an oversight role for multimodal improvements. Many of the multimodal entities receive local tax revenue and direct federal funding, which are not included in these amounts. MoDOT administered \$35 million of aviation funds in fiscal year 2016. Missouri has dedicated taxes on aviation fuel to fund improvements to public use airports in Missouri. MoDOT also administers federal funding to improve airfield pavement conditions and lighting systems, eliminate obstructions and for expansion projects.

In fiscal year 2016, MoDOT administered \$34 million of transit funds. The majority of these funds are from federal programs that support operating costs and bus purchases for transit agencies across the state. There is a small amount of state and General Revenue funding to support operating costs for transit agencies. MoDOT administered \$19 million of rail funds in fiscal year 2016. These funds are used to support two programs – the Amtrak passenger rail service between St. Louis and Kansas City, and safety improvements at railroad crossings. The Amtrak funding is from General Revenue, and safety improvements at railroad crossings are from state and federal sources.

Waterways funding totaled \$6 million in fiscal year 2016. These funds provided operating and capital assistance to Missouri's river ports and ferry boat operators. MoDOT also administers a \$1 million freight enhancement program that provides assistance to public, private or not-for-profit entities for non-highway capital projects that improve the efficient flow of freight in Missouri.

Internal operating costs to administer the various multimodal programs totaled \$3 million, including salaries, wages and fringe benefits. In fiscal year 2016, MoDOT administered \$98 million for multimodal needs. Since only \$96 million was available, MoDOT used \$2 million of cash balances dedicated by law to multimodal activities to provide these projects and services.

Missouri's transportation needs are substantial, and the costs of the needs are enormous. Yet, the sources that have traditionally provided transportation funding in Missouri and in the nation are not adequate. They do not keep pace with the rising cost of construction and maintenance, and they provide little for alternative modes of transportation. Another complicating factor is that Missouri's transportation revenues are small in comparison to many other states. Missouri's revenue per mile of state highway is one of the lowest in the region and in the country. Missouri ranks 47<sup>th</sup> nationally in revenue per mile which leads to significant unfunded transportation needs across the state. Missouri receives both state and federal transportation funds. Much of the funding comes with strings attached, limiting the activities for which it can be used. For example, the state motor fuel tax can only be spent on highways and bridges. It is not available for alternative modes of transportation. Federal funds may be earmarked for specific projects or limited to specific types of construction such as interstate maintenance. Some federal and state funds are allocated to specific modes of transportation such as transit or passenger rail.

### 7.3 Funding Tools for the Local or Regional Level

Funding for local county and municipal roadway maintenance and construction comes primarily from the state-distributed motor fuel tax, individual city and county capital improvement sales taxes and transportation sales taxes. Additional potential revenue options are available for local or regional transportation projects.

#### Economic Development Administration - Public Works and Economic Development Program

Through the Public Works and Economic Development Act of 1965, the United States Department of Commerce, through its EDA branch, offers project grants to enhance regional competitiveness and promote long-term economic development in regions experiencing substantial economic distress. EDA provides Public Works investments to help distressed communities and regions revitalize, expand, and upgrade their physical infrastructure to attract new industry, encourage business expansion, diversify local economies and generate or retain long-term private sector jobs and investment. Current priorities include proposals that help support existing industry clusters, develop emerging new clusters or attract new economic drivers.

Project grants may be used for investments in facilities such as water and sewer systems, industrial access roads, industrial and business parks, port facilities, railroad sidings, distance learning facilities, skill-training facilities, business incubator facilities, redevelopment of brownfields, eco-industrial facilities and telecommunications infrastructure improvements needed for business retention and expansion. Eligible activities include the acquisition or development of public land and improvements for use for a public works, public service or development facility, and acquisition, design and engineering, construction, rehabilitation, alteration, expansion, or improvement of publicly-owned and operated development facilities, including related machinery and equipment. A project must be located in a region that, on the date EDA receives an application for investment assistance, satisfies one or more of the economic distress criteria set forth in 13 C.F.R. 301.3(a). In addition the project must fulfill a pressing need of the region and must:

1. Improve the opportunities for the successful establishment or expansion of industrial or commercial plants or facilities in the region;
2. Assist in the creation of additional long-term employment opportunities in the region; or
3. Primarily benefit the long-term unemployed and members of low-income families.

In addition, all proposed investments must be consistent with the currently approved Comprehensive Economic Development Strategy (CEDS) for the region in which the project will be located, and the applicant must have the required local share of funds committed, available and unencumbered. Also, the project must be capable of being started and completed in a timely manner.

### USDA Rural Development

Community Programs, a division of the Housing and Community Facilities Programs, is part of the United States Department of Agriculture's Rural Development mission area. Community Programs administers programs designed to develop essential community facilities for public use in rural areas. These facilities include schools, libraries, childcare, hospitals, medical clinics, assisted living facilities, fire and rescue stations, police stations, community centers, public buildings and transportation. Through its Community Programs, the Department of Agriculture is striving to ensure that such facilities are readily available to all rural communities. Community Programs utilizes three flexible financial tools to achieve this goal: the Community Facilities Guaranteed Loan Program, the Community Facilities Direct Loan Program, and the Community Facilities Grant Program.

Community Programs can make and guarantee loans to develop essential community facilities in rural areas and towns of up to 20,000 in population. Loans and guarantees are available to public entities such as municipalities, counties, and special-purpose districts, as well as to non-profit corporations and tribal governments. Applicants must have the legal authority to borrow and repay loans, to pledge security for loans, and to construct, operate and maintain the facilities. They must also be financially sound and able to organize and manage the facility effectively. Repayment of the loan must be based on tax assessments, revenues, fees, or other sources of money sufficient for operation and maintenance, reserves and debt retirement. Feasibility studies are normally required when loans are for start-up facilities or existing facilities when the project will significantly change the borrower's financial operations. The feasibility study should be prepared by an independent consultant with recognized expertise in the type of facility being financed.

Community Programs can guarantee loans made and serviced by lenders such as banks, savings and loans, mortgage companies which are part of bank holding companies, banks of the Farm Credit System or insurance companies regulated by the National Association of Insurance Commissioners. Community Programs may guarantee up to 90percent of any loss of interest or principal on the loan. Community Programs can also make direct loans to applicants who are unable to obtain commercial credit. Loan funds may be used to construct, enlarge, or improve community facilities for health care, public safety and public services. This can include costs to acquire land needed for a facility, pay necessary professional fees and purchase equipment required for its operation. Refinancing existing debts may be considered an eligible direct or guaranteed loan purpose if the debt being refinanced is a secondary part of the loan, is associated with the project facility and if the applicant's creditors are unwilling to extend or modify terms in order for the new loan to be feasible.

Additionally, Community Programs also provides grants to assist in the development of essential community facilities in rural areas and towns of up to 20,000 in population. Grants are authorized on a graduated scale. Applicants located in small communities with low populations and low incomes will receive a higher percentage of grants. Grants are available to public entities such as municipalities, counties, and special-purpose districts, as well as non-profit corporations and tribal governments. In addition, applicants must have the legal authority necessary for construction, operation, and maintenance of the proposed facility and also be unable to obtain needed funds from commercial sources at reasonable rates and terms.

Grant funds may be used to assist in the development of essential community facilities. Grant funds can be used to construct, enlarge, or improve community facilities for health care, public safety and community and public services. This can include the purchase of equipment required for a facility's operation. A grant may be made in combination with other Community Facilities financial assistance such as a direct or guaranteed loan, applicant contributions or loans and grants from other sources. The Community Facilities Grant Program is typically used to fund projects under special initiatives, such as Native American community development efforts, child

care centers linked with the Federal government's Welfare-to-Work initiative, Federally-designated Enterprise and Champion Communities and the Northwest Economic Adjustment Initiative area.

### Statewide Transportation Assistance Revolving (STAR) Fund

The STAR Fund, authorized by the Missouri General Assembly in 1997, provides loans to local entities for non-highway projects such as rail, waterway and air travel infrastructure. The STAR fund can also provide loans to fund rolling stock for transit and the purchase of vehicles for elderly or handicapped persons. The STAR fund can assist in the planning, acquisition, development and construction of facilities for transportation by air, water, rail or mass transit; however, STAR fund monies cannot fund operating expenses. The local district engineer must endorse projects in cooperation with MoDOT's Multimodal Team. The Cost Share Committee evaluates STAR applications and provides a recommendation to the Missouri Highways and Transportation Commission (MHTC), which is the deciding body.

### Delta Regional Authority - Delta Development Highway System

The Delta Regional Authority (DRA) was established by Congress in 2000 to enhance economic development and improve the quality of life for residents of this region. The DRA encompasses 252 counties and parishes in Alabama, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri and Tennessee.

There are 29 counties in Missouri that are a part of the DRA region. The counties are in the southeast part of the state and make up the Eighth Congressional District. They are: Bollinger, Butler, Cape Girardeau, Carter, Crawford, Dent, Douglas, Dunklin, Howell, Iron, Madison, Mississippi, New Madrid, Ozark, Pemiscot, Perry, Phelps, Oregon, Reynolds, Ripley, Scott, Shannon, St. Francois, Ste. Genevieve, Stoddard, Texas, Washington, Wayne and Wright. There are a total of 566 DDHS miles identified in Missouri, which constitutes 14.7 percent of the total DDHS miles, of which 346 miles are 2-lane facilities. The Missouri DDHS improvements consist of widening and upgrading portions of US 60, US 63, US 67, US 412 and MO 8.

As a key part of its effort to improve the lives of Delta residents, the DRA operates a grant program in the eight states it serves. The DRA works closely with local development districts, which provide technical assistance to grant applicants. Once grant applications are submitted each year, the federal co-chairman determines which applications are eligible for funding and which are ineligible. There is an appeals process for those applicants whose submissions are deemed ineligible. From the list of eligible applicants, the governors of the eight states then make recommendations to the full board. The board decides which projects are funded based on the funds available. Congress has mandated that transportation and basic public infrastructure projects must receive at least 50 percent of appropriated funds. The authority may provide matching funds for other state and federal programs.

During a planning retreat in February 2005, the Delta Regional Authority board voted to make transportation one of the authority's three major policy development areas. The DRA Highway Transportation Plan/Delta Development Highway System Plan (DDHS) was developed following input from transportation executives and local organizations in the eight states covered by the DRA. Public meetings were held throughout the region in the fall of 2006. The plan was presented to the President and Congress. The DDHS consists of 3,843 miles of roads throughout the region. The estimated cost to complete the planned improvement projects for these roads is \$18.5 billion. Of the roads in the plan, 27 percent provide four or more travel lanes already and the remainder is two-lane roads.

### Missouri Department of Economic Development - Community Development Block Grants

Through the Missouri Department of Economic Development, the Community Development Block Grant Program (CDBG), a federal program through HUD, offers grants to small Missouri communities to improve local facilities, address critical health and safety concerns and develop a greater capacity for growth. The program offers funds for projects that can range from housing and street repairs to industrial loans and job training. State CDBG funds are only available to non-

entitlement areas (incorporated municipalities under 50,000 and counties under 200,000 in population).

Larger cities receive funds directly through the Entitlement Communities Grants program. The entitlement program provides annual grants on a formula basis to entitled cities and counties to develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for low-income and moderate-income persons. HUD awards grants to entitlement community grantees to carry out a wide range of community development activities directed toward revitalizing neighborhoods, economic development and providing improved community facilities and services. Entitlement communities develop their own programs and funding priorities. However, grantees must give maximum feasible priority to activities which benefit low- and moderate-income persons. A grantee may also carry out activities which aid in the prevention or elimination of slums or blight. Additionally, grantees may fund activities when the grantee certifies that the activities meet other community development needs having a particular urgency because existing conditions pose a serious and immediate threat to the health or welfare of the community where other financial resources are not available to meet such needs. CDBG funds may not be used for activities which do not meet these broad national objectives.

### Sales Tax

The 4.225 percent state sales/use tax rate in Missouri is lower than the rates in 38 other states, as of Jan. 1, 2017, according to Taxfoundation.org. Missouri communities have the option of adopting a local sales tax, generally ranging from one-half to one percent. Counties may also adopt a sales tax generally ranging from one-fourth to one percent that can be used for transportation.

### Use Tax

Use tax is similar to sales tax, but is imposed when tangible personal property comes into the state and is stored, used or consumed in Missouri. Communities have the option of adopting a local use tax equal to the local sales tax for that community to use for transportation expense.

### Local Option Economic Development Sales Tax

The Local Option Economic Development Sales Tax, approved by the Missouri General Assembly in 2005, allows citizens to authorize a supplemental sales tax dedicated exclusively for certain economic development initiatives in their home municipality. The state statute governing this program is found at 67.1305 RSMo. The voter-approved tax of not more than one half per cent is charged on all retail sales made in the municipality that are subject to sales taxes under Ch.144 RSMo. Missouri statutes define “municipality” as an incorporated city, town, village or county. Revenues generated by the tax may not be used for retail developments unless such retail projects are limited exclusively to the redevelopment of downtown areas and historic districts. A portion of the revenues may be used for project administration, staff and facilities, and at least twenty per cent of the funds raised must be used for projects directly related to long-term economic preparation, such as land acquisition, installation of infrastructure for industrial or business parks, water and wastewater treatment capacity, street extensions and for matching state or federal grants related to such long-term projects. Any remaining funds may also be used for marketing, training for advanced technology jobs, grants and loans to companies for employee training, equipment and infrastructure and other specified uses.

### Neighborhood Improvement District

A Neighborhood Improvement District (NID) may be created in an area desiring certain public-use improvements that are paid for by special tax assessments to property owners in the area in which the improvements are made. The kinds of projects that can be financed through an NID must be for facilities used by the public, and must confer a benefit on property within the NID. An NID is created by election or petition of voters and/or property owners within the boundaries of the proposed district. Election or petition is authorized by a resolution of the governing body of the municipality in which the proposed NID is located. Language contained in the petition narrative or ballot question must include certain information including, but not limited to a full disclosure of the

scope of the project, its cost, repayment and assessment parameters to affected property owners within the NID.

### Community Improvement District

A Community Improvement District (CID) may be either a political subdivision or a not-for-profit corporation. CIDs are organized for the purpose of financing a wide range of public-use facilities and establishing and managing policies and public services relative to the needs of the district. By request petition, signed by property owners owning at least 50 percent of the assessed value of the real property, and more than 50 percent per capita of all owners of real property within the proposed CID, presented for authorizing ordinance to the governing body of the local municipality in which the proposed CID would be located. Unlike a Neighborhood Improvement District, a CID is a separate legal entity, and is distinct and apart from the municipality that creates the district. A CID is, however, created by ordinance of the governing body of the municipality in which the CID is located, and may have other direct organizational or operational ties to the local government, depending upon the charter of the CID.

### Tax Increment Financing

Local Tax Increment Financing (Local TIF) permits the use of a portion of local property and sales taxes to assist funding the redevelopment of certain designated areas within your community. Areas eligible for Local TIF must contain property classified as a "Blighted", "Conservation" or an "Economic Development" area, or any combination thereof, as defined by Missouri Statutes. The idea behind Local TIF is the assumption that property and/or local sales taxes (depending upon the type of redevelopment project) will increase in the designated area after redevelopment, and a portion of the increase of these taxes collected in the future (up to 23 years) may be allocated by the municipality to help pay the certain project costs, partially listed above.

### Transportation Development Districts

Transportation Development Districts (TDDs) are organized under the Missouri Transportation Development District Act, Sections 238.200 to 238.275 of the Missouri State Statutes. The district may be created to fund, promote, plan, design, construct, improve, maintain and operate one or more projects or to assist in such activity.

### Transportation Development Corporations

Transportation Development Corporations (TDCs) are organized under the Missouri Transportation Corporation Act, Sections 238.300 to 238.367 of the Missouri State Statutes. TDCs act in promoting and developing public transportation facilities and systems and in promoting economic development. Demands for transportation improvements have greatly outpaced the funds available to meet them. In response to this demand, the Missouri Department of Transportation has established various mechanisms for successful public/public and public/private partnerships. These expand financing options for transportation projects that serve a public purpose, including: highway and rail projects, transit equipment, air and water transportation facilities and elderly/handicapped vehicles. The benefits to a project assisted by these partnerships may include: inflation cost savings, early economic and public benefits, financing tailored to the project's needs and a reduced cost of project financing.

### Partnership Debt-Financing Programs

Debt-financing programs make loans to a project that has to be repaid. The Missouri Transportation Finance Corporation's (MTFC) authority to form and operate is initially derived from the Transportation Equity Act for the 21st Century (TEA-21). The MTFC incorporated in August 1996, adopted bylaws and subsequently entered into a Cooperative Agreement with the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Federal Railroad Administration (FRA), agencies of the United States Department of Transportation (USDOT) and the Missouri Highways and Transportation Commission (Commission). Under the authority granted initially by TEA-21, as amended by 23 U.S.C. 610, the Missouri Non Profit Corporation Act, Chapter 355, RSMo, and pursuant to the Cooperative Agreement, the Commission organized the MTFC to assist in financing transportation improvements.

The MTFC provides direct loans for transportation projects within the state of Missouri. Loans are funded from available MTFC resources. The MTFC assistance may be any type authorized by 23

U.S.C. 610. The following are examples of potential financing options included in 23 U.S.C. 610: Primary or subordinated loans, Credit enhancements, Debt reserve financing, Subsidized interest rates, Purchase and lease agreements for transit projects, and Bond security. These direct loans must help assist the Commission to achieve continued economic, social and commercial growth of Missouri, act in the public interest, or promote the health, safety and general welfare of Missouri citizens.

### Bridge Replacement Off-System (BRO)

The Off-System Bridge Replacement and Rehabilitation (BRO) program provides funding to counties for replacement and rehab of bridges. A minimum amount of approach roadway construction may be allowed under the program. Federal Funds are available to finance up to 80% of the eligible project cost, but may be increased with the use of credit earned from replacing an eligible bridge that is not on the federal-aid system. It will be necessary for the local agency to provide the necessary matching funds. The fair market value of donated right-of-way may be credited to the local agency's matching share with the amount not to exceed the local agency's share. Both Missouri Department of Economic Development CDBG funds and EDA Local Public Works funds can be used to match BRO funds, if used on the project.

BRO Funds are administered according to the following policy:

- The current Highway Act requires that at least 15% and no more than 35% of the state's total bridge appropriation be allocated to the counties and the City of St. Louis for use on off-system bridges (BRO). The Missouri Highway and Transportation Commission approves the amount of bridge funds allocated to this program. Off-system bridges are bridges that are on roads that are functionally classified as a local road or street and rural minor collectors.

### Federal Aviation Administration - Airport Improvement Program

The Airport Improvement Program (AIP) provides grants to public agencies - and, in some cases, to private owners and entities - for the planning and development of public-use airports that are included in the [National Plan of Integrated Airport Systems \(NPIAS\)](#). For large and medium primary hub airports, the grant covers 75 percent of eligible costs (or 80 percent for noise program implementation). For small primary, reliever, and general aviation airports, the grant covers 95 percent of eligible costs. AIP grants for planning, development or noise compatibility projects are at or associated with individual public-use airports (including heliports and seaplane bases). A public-use airport is an airport open to the public that also meets the following criteria:

1. Publicly owned, or
2. Privately owned but designated by the FAA as a reliever, or
3. Privately owned but having scheduled service and at least 2,500 annual enplanements.

Further, to be eligible for a grant, an airport must be included in the NPIAS. The NPIAS, which is prepared and published every two years, identifies public-use airports that are important to public transportation and contribute to the needs of civil aviation, national defense, and the postal service. The description of eligible grant activities is described in the authorizing legislation and relates to capital items serving to develop and improve the airport in areas of safety, capacity and noise compatibility. In addition to these basic principles, a grantee must be legally, financially and otherwise able to carry out the assurances and obligations contained in the project application and grant agreement.

Eligible projects include those improvements related to enhancing airport safety, capacity, security and environmental concerns. In general, sponsors can use AIP funds on most airfield capital improvements or repairs except those for terminals, hangars, and non-aviation development. Any professional services that are necessary for eligible projects - such as planning, surveying and design - are eligible as is runway, taxiway and apron pavement maintenance. Aviation demand at the airport must justify the projects, which must also meet Federal environmental and procurement requirements. Projects related to airport operations and revenue-generating improvements are typically not eligible for funding. Operational costs - such as salaries, maintenance services, equipment and supplies - are also not eligible for AIP grants.

### FAA Airport and Airway Trust Fund (AATF)

The Airport and Airway Trust Fund (AATF), created by the Airport and Airway Revenue Act of 1970, provides funding for the federal commitment to the nation's aviation system through several aviation-related excise taxes. Funding currently comes from collections related to passenger tickets, passenger flight segments, international arrivals/ departures, cargo waybills, aviation fuels and frequent flyer mile awards from non-airline sources like credit cards.

### Transportation Alternatives Program (TAP) Funding

Transportation Alternatives Program (TAP) was authorized under the Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21) to provide for a variety of alternative transportation projects, including many that were previously eligible activities under separately funded programs. The TAP replaces the funding from pre-MAP-21 programs including Transportation Enhancements, Recreational Trails, Safe Routes to School, and Scenic Byways, wrapping them into a single funding source. The TAP remains in place with the 2015 passage of the FAST ACT. The mission of the Transportation Alternatives Program is to improve our nation's communities through leadership, innovation, and program delivery. The funds are available to develop a variety of project types located in both rural and urban communities to create safe, accessible, attractive, and environmentally sensitive communities where people want to live, work, and recreate. The Transportation Alternatives Program consists of: Transportation Enhancement (TE) activities, Recreational Trails Program (RTP), Safe Routes to School (SRTS) activities, and Boulevards from Divided Highways.

### Traffic Engineering Assistance Program (TEAP)

The Traffic Engineering Assistance Program (TEAP) allows local public agencies (LPA) to receive engineering assistance for studying traffic engineering problems. Typical traffic engineering related projects include: corridor safety and/or operational analysis, intersection(s) safety and/or operational analysis, speed limit review, sign inventory, pedestrian/bike route analysis, parking issues, and other traffic studies, etc. Local public agencies are reimbursed for eligible project costs at a rate of 80 percent with the local agency providing a 20-percent match. Funds administered by MoDOT, will provide 80 percent of the TEAP project costs, up to \$8,000 per project. If the total cost is greater than \$10,000, the local agency can pay more than 20 percent to complete the TEAP project, if desired.

### Federal Lands Access Program (FLAP)

The Federal Lands Access Program (FLAP) provides funds for projects on Federal Lands Access Transportation Facilities that are located on or adjacent to, or that provide access to Federal lands as provided for in the FAST Act. The FLAP, as an adjunct to the Federal-Aid Highway Program, covers highway programs in cooperation with federal-land managing agencies. It provides transportation-engineering services for planning, design, construction and rehabilitation of the highways and bridges providing access to federally owned lands. The Federal Highway Administration (FHWA) also provides training, technology, deployment, engineering services and products to other customers. The FHWA administers the Federal Lands Access Program, including survey, design and construction of forest highway system roads, parkways and park roads, Indian reservation roads, defense access roads and other federal-lands roads. The FHWA, through cooperative agreements with federal-land managing agencies such as the National Park Service, Forest Service, Military Traffic Management Command, Fish and Wildlife Service and the Bureau of Indian Affairs, administers a coordinated federal-lands program consisting of forest highways, public-lands highways, park roads and parkways, refuge roads and Indian reservation roads. This program provides support for approximately 30,000 miles of public roads serving Federal and Indian lands to support the economic vitality of adjacent communities and regions.

### Cost Share Program Guidelines

The purpose of the Cost Share Program is to build partnerships with local entities to pool efforts and resources to deliver state highway and bridge projects. The Missouri Department of Transportation (MoDOT) allocates Cost Share funds based on the Missouri Highways and Transportation Commission's (MHTC) approved funding distribution formula. At least 10 percent is set-aside for projects that demonstrate economic development through job creation. Projects are selected by the Cost Share Committee, which consists of the Chief Engineer, Chief Financial

Officer and the Assistant Chief Engineer. They are then recommended for approval by the MHTC via a STIP amendment.

MoDOT participates up to 50 percent of the total project costs on the state highway system. While contributions are expected on economic development projects, the Cost Share Committee may increase MoDOT's participation up to 100 percent for economic development projects that create new jobs. Job creation will be verified by the Department of Economic Development. The project agreement will identify requirements for returning funds if jobs are not created as planned. Retail development projects do not qualify as economic development.

MoDOT's participation includes the amount of Cost Share funds allocated to the project, District STIP or Operating Budget funds and activities performed by MoDOT such as preliminary engineering, right of way incidentals and construction engineering.

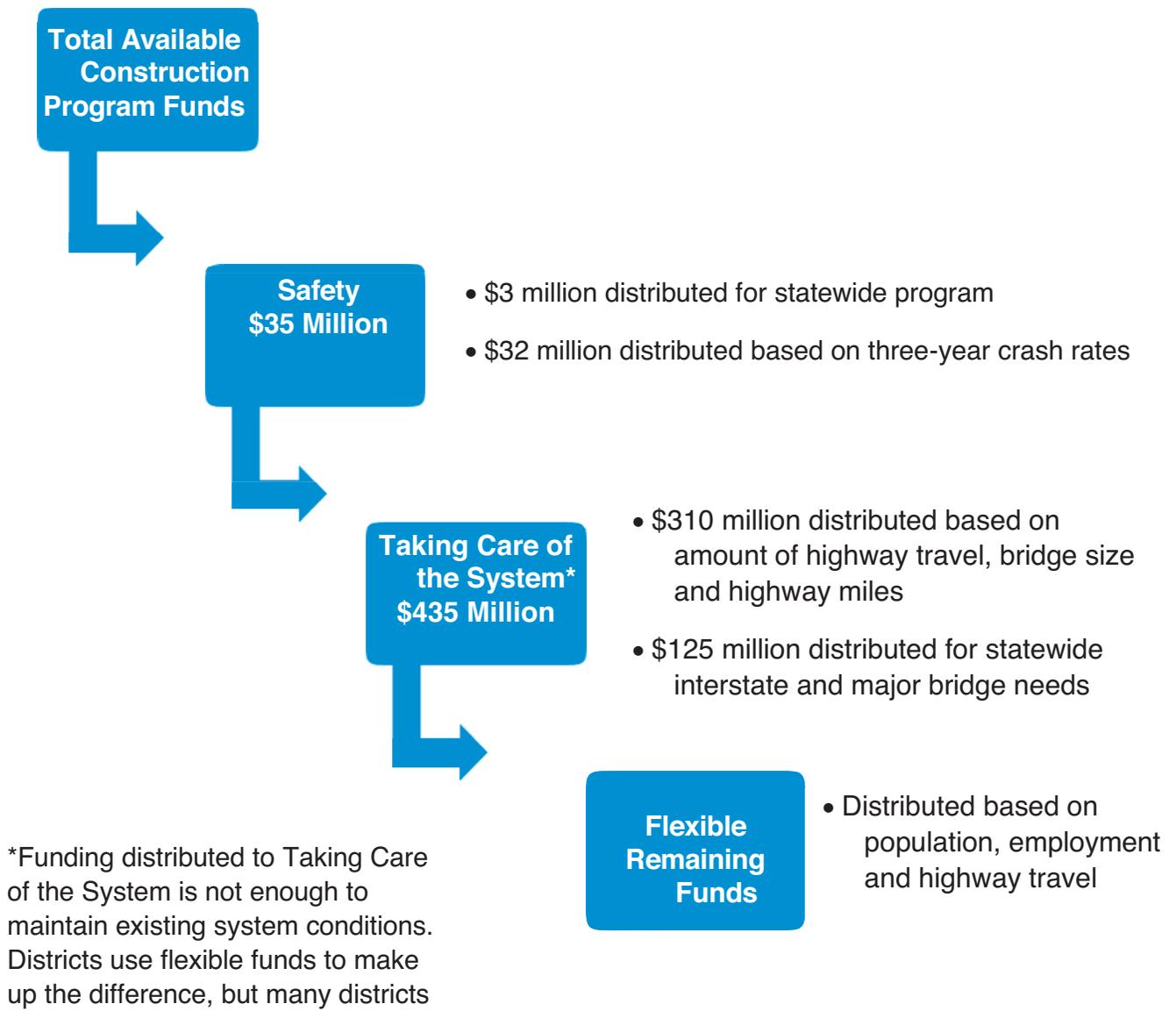
Generally, the Cost Share funding per project is limited to \$10 million in total and \$2.5 million per year. However, projects exceeding this limit can be considered based on factors such as project need, the opportunity for economic development and the willingness of the local partners to be flexible and bring resources to the table. Project applications should not expand the state highway system or increase maintenance costs for MoDOT. Project applications that significantly expand the state highway system or increase maintenance costs for MoDOT must seek pre-approval by the Chief Engineer prior to submittal.

### 7.5 Funding Distribution

On Jan. 10, 2003, the Missouri Highways and Transportation Commission adopted an objective method to distribute transportation funds using factors reflecting system size and usage and where people live and work. The distribution of funds has been the subject of debate for over a decade. The method for determining where and on what to spend limited transportation dollars has changed several times. Changes have been a result of both long-term project plans and political pressure centered on dividing funds between the urban and rural areas of the state. This method goes beyond the narrow discussions of geography and allows for allocation of funding based on objective, transportation-related factors that are representative indicators of physical system needs.

Since 2003, the Missouri Highways and Transportation Commission has used a formula to distribute construction program funds for road and bridge improvements to each of its districts (seven since 2011). This is the largest area of MoDOT's budget that provides funding for safety improvements, taking care of the system and flexible funds that districts can use to take care of the system or invest in major projects that relieve congestion and spur economic growth. In many districts, taking care of the system funds are not sufficient to maintain current system conditions. Districts use flexible funds to make up the difference, but often times still fall short. Figure 7.1 identifies how construction program funds are allocated annually to districts using the following formula:

Figure 7.1 MoDOT Funding Distribution for Construction Funds

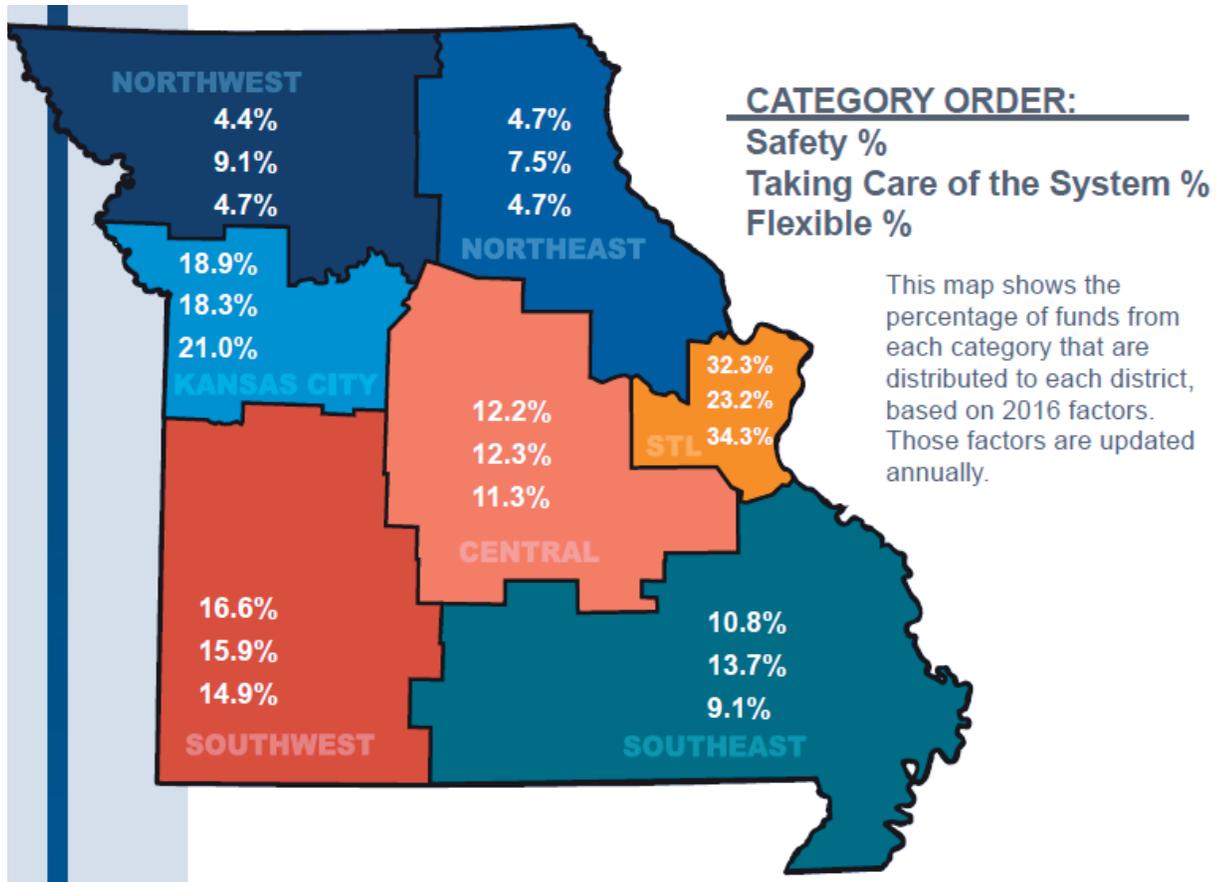


Source: MoDOT's Citizen's Guide to Transportation Funding in Missouri, 2016

**Funding Distribution Overview**

Once construction program funds are distributed to districts, MoDOT collaborates with regional planning groups to identify local priorities based on projected available funding. The regional transportation improvement plans are brought together to form the department’s Statewide Transportation Improvement Program, which outlines five years of transportation improvements. As one year of the plan is accomplished, another year is added.

**Figure 7.2 MoDOT Funding Distribution by District**



Source: MoDOT’s Citizen’s Guide to Transportation Funding in Missouri, 2016

When adding the construction program, operations, administration and highway safety programs together, the following amounts were spent in districts based on the three-year average from fiscal years 2014 through 2016:

**Table 7.1 MoDOT Funding Distribution – Total by District (\$ Millions)**

District	Construction Program	Operations	Admin	HWY Safety Programs	Total
Northwest	\$46	\$57	\$2	-	\$105
Northeast	\$41	\$50	\$2	-	\$93
Kansas City	\$217	\$52	\$3	-	\$272
Central	\$90	\$65	\$2	-	\$157
St. Louis	\$229	\$62	\$3	-	\$293
Southwest	\$132	\$80	\$2	-	\$214
Southeast	\$84	\$76	\$2	-	\$162
Statewide	\$36	\$67	\$35	\$16	\$154
<b>Total</b>	<b>\$875</b>	<b>\$509</b>	<b>\$51</b>	<b>\$16</b>	<b>\$1,450</b>

Source: MoDOT's Citizen's Guide to Transportation Funding in Missouri, 2016

## 8. PLAN IMPLEMENTATION

The Southwest Missouri Council of Government's Regional Transportation Plan conforms MoDOT's planning framework. The process of creating the prioritized lists is an exhaustive exercise to include the community at large, commissioners, local community leaders, and members of the TAC. Through surveys, numerous meetings and the SMCOG website, the community has been engaged in an attempt to produce a list that is both publically driven and useful to MoDOT in their decision-making process. The process of prioritizing needs is guided by the investment goals put forth in the Framework for Transportation Planning and Decision Making:

- Safety
- Taking Care of the System
- Congestion
- Access to Opportunity
- Efficient Movement of Goods
- Economic Competitiveness
- Environmental Protection
- Quality of Communities

### Environmental Justice

The SMCOG Regional Transportation Plan includes projects that have the potential to help those who are at a disadvantage either economically or physically. With a large region, the percentage of disadvantaged population varies. The rural elderly population in SMCOG greater than 64 is an average of 14%; although, there are pockets where that percentage is dramatically higher. The disabled population ranges between 16% and 59%. The number of zero car households also varies per county with the high being 7.5% in Dallas County to 4% in Christian County. With the population of our region only expected to grow in the next 10 years, it is important that this plan take into account projects that will help these often-overlooked populations. We must find a way to expand public transportation into the rural areas of Southwest Missouri.

### Social and Economic Impacts

Many of the needs included in this plan may reduce the number of fatalities on Missouri's roadways. Projects such as adding shoulders, better striping, guard cables, reducing the number of at-grade crossings and improving site distance issues will make thousands of Missourians travelling the roadways of Southwest Missouri safer. Upgrading and redesigning major corridors in our region will make the transportation system not only safer but also more efficient. Due to the high rate of growth in our region, working with local communities and land use and zoning authorities to accommodate higher densities for both residential and commercial uses near major arterials makes the transition from lower travelled, lower speed rural routes to higher speed corridors smoother and safer by redesigning key intersections and including merge and turn lanes. Additionally, SMCOG promotes an increase in public transit funds for the increasing numbers of disadvantaged persons.

### Conclusion

The Southwest Missouri Council of Governments recognizes that the Regional Transportation Plan is a static document attempting to describe ever-changing conditions. Considering the changes in land use and development and the overall dynamic nature of transportation planning, makes it necessary to make continual updates to this document. As conditions change, so do the needs of our region and it is the intent of this document to stay as current as possible by working with local communities, local zoning and planning authorities, and the TAC in creating a meaningful planning tool.

## APPENDIX A – SIDEWALK INVENTORIES & ASSESSMENTS

### **Bolivar Sidewalk Inventory & Assessment**

### **Greenfield Sidewalk Inventory**

### **Marshfield Sidewalk Inventory**

### **Strafford Sidewalk Inventory**

### **Willard Sidewalk Inventory**

### **Monett Sidewalk Inventory**

### **Battlefield Sidewalk Inventory**

### **Mt. Vernon Sidewalk Inventory**

### **Morrisville Sidewalk Inventory**

# CITY OF BOLIVAR SIDEWALK INVENTORY

May 2017



Southwest Missouri Council of Governments

*Enhancing the quality of our communities through regional cooperation.*

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## STUDY INTRODUCTION

The City of Bolivar contracted with Southwest Missouri Council of Governments (SMCOG) to conduct a complete sidewalk inventory of the city. The contracted period ran from February 1<sup>st</sup> to June 30<sup>th</sup>, 2017. This involved locating all sidewalks and assessing overall condition. Sidewalk sections were categorized into three conditions: good, fair, or poor. A manual pedestrian count was also conducted at four separate locations. SMCOG staff met with city officials to discuss methodology and known issues regarding sidewalk infrastructure. Data collection occurred on 5 separate occasions which included taking several photos. A draft report was presented to the City of Bolivar Planning and Zoning Commission on May 18<sup>th</sup>, 2017.

## SIDEWALKS

A well-connected, diverse, and organized transportation network in any city is vital to its productivity and success. The personal vehicle is the dominant form of transportation in the United States, however, several people still utilize sidewalk infrastructure to walk from place to place. Sidewalks provide a safe pathway for pedestrians and promote healthy lifestyles. They also provide people options and diversify the transportation system making for a more dynamic city. When the infrastructure is implemented effectively, it benefits the city and everyone in the community.

Encouraging citizens to walk by having good sidewalks can create a lively and healthy city. When there are more people walking, this reduces the amount of cars on the road. Not only does this promote a healthy lifestyle, but it also decreases the dependence on cars, reducing traffic and pollution levels. With an increase people walking, face-to-face, social interactions become more frequent, thus building a sense of community. Sidewalks may also increase property values which economically benefits home owners and the city.

Communities should continually strive to increase walkability and create a pedestrian-friendly environment. This can be achieved in many ways such as actively maintaining current sidewalk infrastructure, increasing connectivity, accommodating for the disabled and elderly, and being aware of safety concerns.

## ASSESSMENT

To get a clearer picture of the state of sidewalk infrastructure in the City of Bolivar, every segment of sidewalk was located and mapped. This revealed a total of 21 miles of sidewalk. This was done by referencing existing plans or studies, utilizing Google Earth, and surveying the area by car. After completing the inventory, every sidewalk was walked and/or visually assessed by SMCOG staff. By using a map and color designations, sidewalk segments were given one of three ratings which was determined by its overall condition. The three ratings were good, fair, and poor. To determine the condition of each sidewalk several elements were taken into account including: amount of cracks or buckling, aesthetic value, presence of debris or vegetation, adequate width, and accessibility. The results can be seen in

## Assessment

**Table 1** showing the miles and percent of sidewalks in each rating. A summary of criteria for each rating is provided in the following sections.

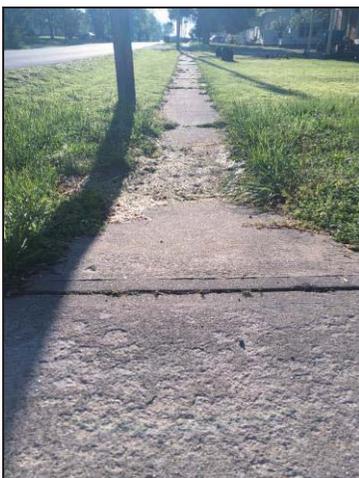
### Good

The rating of “good” was given to segments that showed the best condition. Good sidewalks were usually recently built and showed no signs of cracking, buckling, overgrowth of vegetation, and minimal debris. The width of the sidewalk is adequate and can easily fit multiple people and/or a wheelchair. Good ramps are also present, allowing for improved accessibility for the elderly and disabled. Good sidewalks were visually pleasing. Pedestrians would have no problems traversing these sidewalks.



### Fair

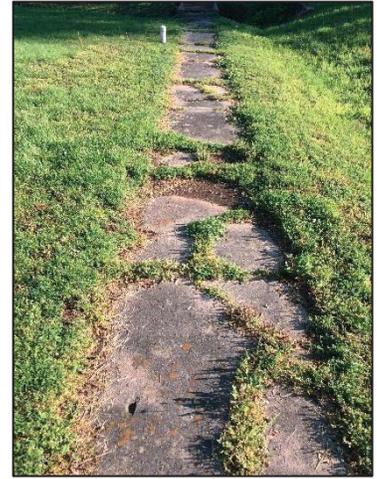
A fair rating was given to segments that were determined to be in a medium condition. Fair sidewalks were generally older and showed signs of slight cracking, some vegetation, debris, and inadequate width. Ramps may be present but could be improved to provide adequate accessibility. Aesthetically, fair sidewalks were average, but not visually unpleasing to look at. Pedestrians would have some issues using these sidewalks.



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## Poor

A poor rating was given to segments that possessed the worst conditions. Poor sidewalks were generally older segments that have been severely neglected. They showed signs of major cracking and buckling, and many were barely visible due to extreme vegetation overgrowth. Poor sidewalks were completely inaccessible to the disabled and the elderly due to non-existent ramps and occasional steps. All pedestrians would find it difficult to traverse these sidewalks. These sidewalks are unpleasing to look at and diminish the aesthetics of the community.

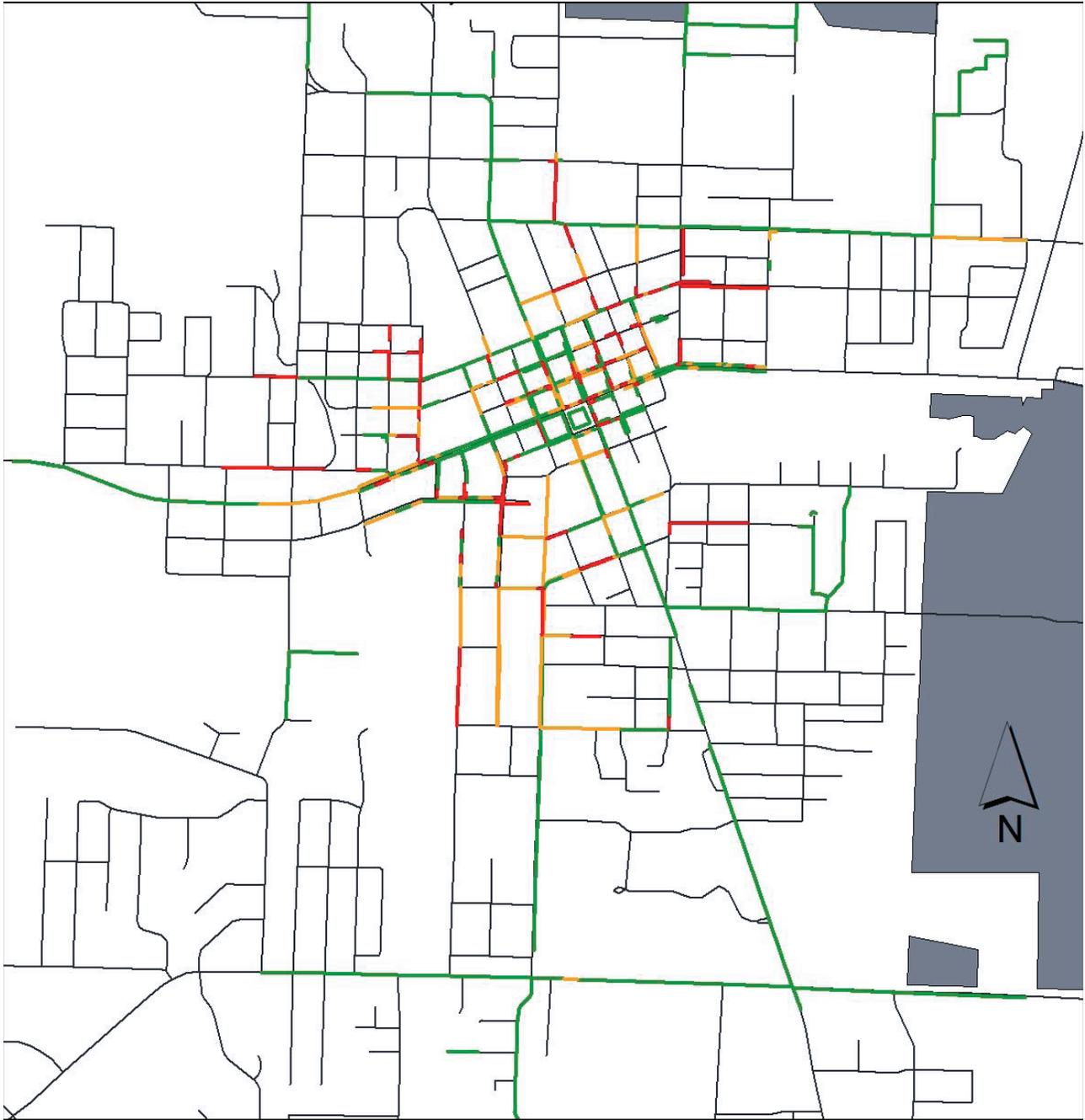


The table below shows a detailed breakdown of the different ratings.

<i>Rating</i>	<i>Miles</i>	<i>Percentage</i>
Good	13.38	64%
Fair	4.34	21%
Poor	3.17	15%
Total	20.89	100%

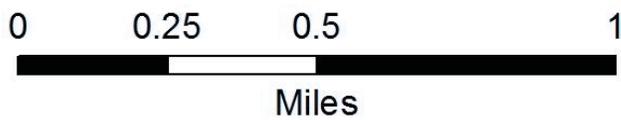
The sidewalk conditions map on the following page displays assessment results. This shows every sidewalk in the City of Bolivar with its respective condition rating. Pictures were taken around the community to highlight problems and provide examples for each rating, “good” condition is in green, “fair” in yellow, and “poor” in red.

# SIDEWALK CONDITIONS MAP



## Bolivar Sidewalk Conditions

Prepared by the Southwest Missouri Council of Governments  
2017



## Sidewalk Condition

- Good
- Fair
- Poor

# SIDEWALK CONDITIONS MAP – DOWNTOWN



## Bolivar Sidewalk Conditions Downtown

Prepared by the Southwest Missouri Council of Governments  
2017



### Sidewalk Condition

-  Good
-  Fair
-  Poor

## ANALYSIS

Overall sidewalk conditions vary greatly depending on the location in the city and the age of the sidewalk. Newly built sidewalks have a good condition and have great accessibility in regards to ramps and width. Fair and poor sidewalks need improvements to be considered adequate for pedestrian traffic and accessibility, but the sidewalk system as a whole has several issues that need to be addressed at all condition levels.

### Location

Most new sidewalks are large segments that connect distant parts of the city and are located on major roads or new neighborhoods. A majority of sidewalks downtown are in good condition, however, the condition is not consistent. The majority of fair and poor sidewalks in the city are located in the older neighborhoods around the downtown area. Those who wish to walk from their homes to other parts of the city likely find it difficult to do so due to the poor conditions in their neighborhood. This ultimately discourages people from walking.

There is also several locations around town that lack sidewalk infrastructure. As you can see from the sidewalk map, several neighborhoods lack sidewalks and ultimately disconnect them from the rest of town. More specifically, neighborhoods in the south, southwest, and northwest areas of Bolivar have no sidewalk infrastructure. Constructing sidewalks in current neighborhoods and requiring them in all future residential developments would be highly beneficial.

### Connectivity

Several segments of sidewalks have limited connectivity. In every part of the community, sidewalks are disconnected and do not allow for pedestrians to consistently stay on a pathway. Several examples can be seen on the maps provided on pages 5 & 6. Poor connectivity discourages potential pedestrians from walking to their destination as it is an inconvenience and unsafe. In several locations, pedestrians must either walk on the side of the street or the street itself, which was observed several times. Other times, several locations lack a crosswalk to connect sidewalks. For example on Springfield Road, the sidewalk changes sides of street, but no crosswalk connects the two sides. Crossing this major road without a crosswalk is dangerous and discourages walkability. Filling the gaps in the sidewalk infrastructure and implementing crosswalks should be a top priority to ensure the safety of pedestrians and enhance the sidewalk network.

### Accessibility

A number of issues have been noted that would make transportation on the sidewalks especially difficult for elderly and disabled pedestrians. Several portions of the sidewalk network exhibit these issues. Issues present at a given location can be found in the ArcMap data. These issues include cracks, unevenness, potholes, missing ramps, obstructions, steep grade changes, missing tactile paving, overgrown plants and grass, dead ends, narrow portions, and gaps in the system. Each of these presents a hurdle for anyone

## Pedestrian Counts

trying to navigate the sidewalk system, and becomes especially burdensome for those with mobility impairment. We noted the most pressing of these issues by photo-documenting the problem and noting its location. That information is included in an ArcGIS map and the corresponding table displays the photo and issue at that location.

## Downtown Streetscape

Downtown sidewalks, although in fairly good condition, are unaesthetically pleasing and in need of repairs. While the issues listed in the accessibility section are major problems for navigating the system, those same problems are what makes the system unpleasing. Around the courthouse, the sidewalks are in great condition; however across the streets, on any side of the square, the sidewalks are in fair condition. There are cracks and potholes that make for an uninviting square. If a restaurant wanted to put tables outside its storefront, it may not be feasible because the tables may be located on uneven ground.

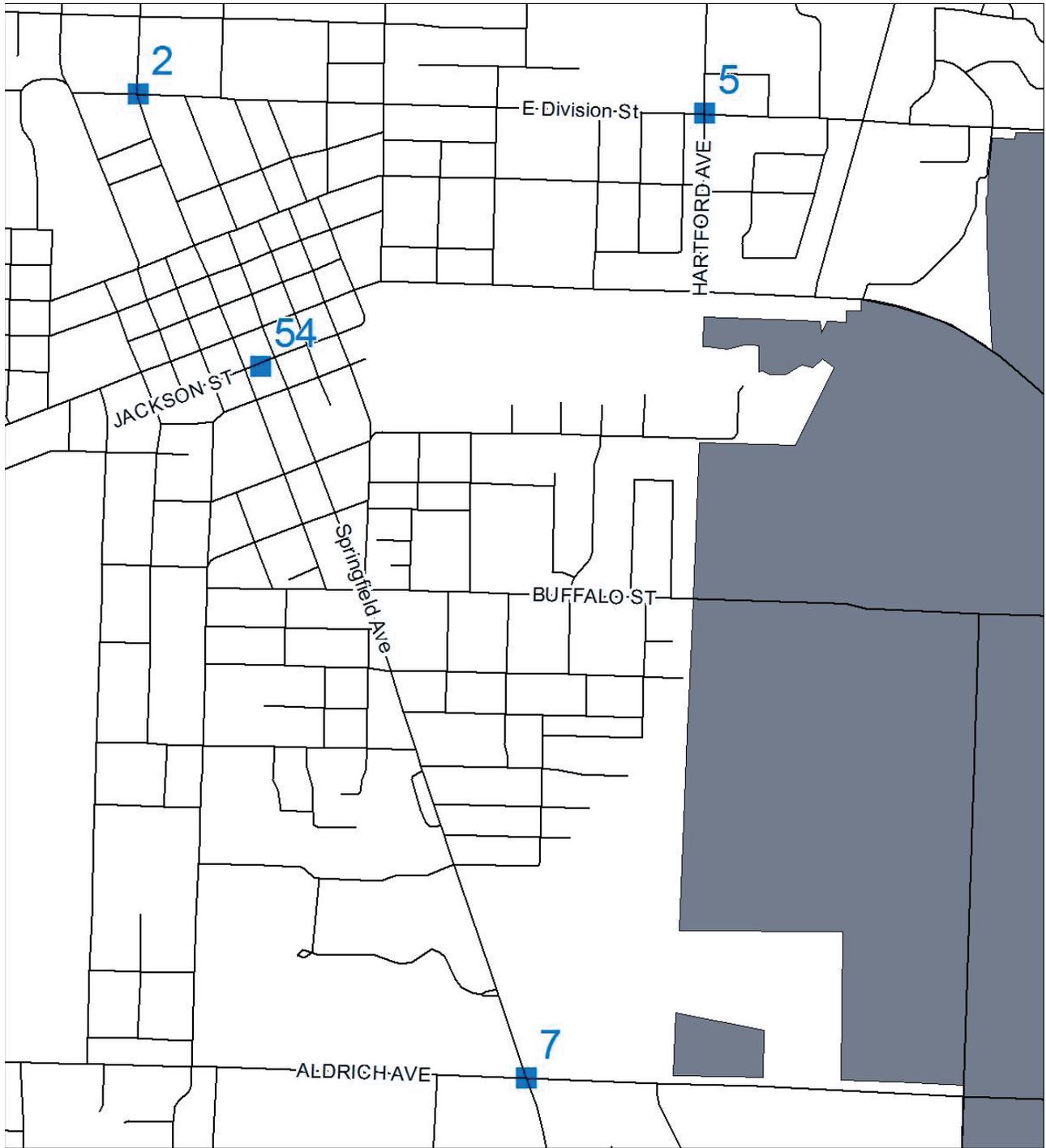
Around downtown, some blocks do not have sidewalks, and others are missing portions. Gaps in a sidewalk system diminish the likelihood that someone would utilize sidewalks for their transportation needs. Another issue is maintenance. Many of the sidewalks downtown are overgrown: grass and weeds have taken root in the cracks of the sidewalk. If this is not addressed from the onset, the plant growth will deteriorate the condition of the sidewalk – exacerbating cracks, unevenness, and other accessibility problems. Finally, because of the age of other infrastructure systems, some obstructions are noted. Telephone poles, fire hydrants, and street signs are located, in some cases, in the middle of the sidewalk. To have a functioning sidewalk system, it is imperative that these other infrastructure systems are relocated outside of the sidewalk right of way. Addressing the problems listed in the accessibility section will help make the sidewalk system more accessible, and also make for a system that is appealing to everyone to use.

## PEDESTRIAN COUNTS

Pedestrian counts were conducted at four locations to get an idea of how often the community utilizes the city sidewalks. All locations were monitored for two hours at different times of day and were conducted on sidewalks that were in good condition. A breakdown of count locations and results is shown in **Table 2** and the map below.

Date	Time	Location	Count
Thursday, April 18th	9:30 a.m. - 11:30 a.m.	E. Jackson Street (Southside)	54
Thursday, April 18th	9:30 a.m. - 11:30 a.m.	S Springfield & E Aldrich	7
Thursday, April 27th	7:35 a.m. - 9:35 a.m.	N Hartford & E Division	5
Saturday, May 13th	12:40 p.m. - 2:40 p.m.	N Main & W Division	2

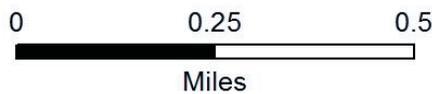
# PEDESTRIAN COUNT MAP



## Pedestrian Count Locations

Prepared by the Southwest Missouri Council of Governments  
2017

■ Pedestrian Count Locations



## Moving forward

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All counts but in one location received a low number of pedestrians in the span of two hours. The sidewalk on E Jackson Street is located downtown, across from the courthouse to the south. High volumes of pedestrians are a common characteristic of downtown areas. S Springfield & E Aldrich is a major intersection, located at the southeast corner of the SBU campus. Although the sidewalk was in good condition, it is located along a major thoroughfare, which may deter potential pedestrians. N Hartford & E Division is a high traffic, 4-way intersection next to the public schools. Several cars and school busses use this intersection to get to and from school and pedestrians must cross to continue on the sidewalk to school. There is a large pedestrian sign and clear crosswalk present, however, the high vehicle traffic may be the cause for low foot traffic. N Main & E Division had the lowest pedestrian count. This sidewalk runs north and south, connecting the north side of Bolivar to the downtown area.

## MOVING FORWARD

An effective sidewalk network in any city is vital to its health and success. From the assessment, several miles of sidewalk are in inadequate condition and several concerns have been noted regarding location, connectivity, and accessibility. Due to these issues, pedestrian counts are low and people are not using the sidewalks to get to their destinations. The sidewalk infrastructure is in need of improvement to become an effective and reliable form of transportation for the city.

In moving forward, the following are steps the city may take to improve upon its sidewalks:

- Require sidewalks in new residential developments
- Prioritize maintaining sidewalks in good condition. As funding comes available, repair sidewalks in fair or poor condition.
- Expand sidewalk network to connect areas of town with minimal sidewalk infrastructure.
- Build sidewalks where gaps or dead ends are present to allow pedestrians to consistently stay on a pathway.
- Require all crosswalks to have a pedestrian sign and painted walkway
- Ensure that ADA guidelines are followed to accommodate the disabled and elderly.
- Conduct routine maintenance on current sidewalk infrastructure to fill cracks, remove vegetation, and remove debris and/or enforce maintenance.
- Work to make downtown sidewalks accessible and aesthetically pleasing to enhance the value of the area.

These are just a few steps the city can take to improve the sidewalk network in Bolivar.

City of Greenfield

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inventory

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## INTRODUCTION

The City of Greenfield contracted with the Southeast Missouri Council of Governments (SMCO) to conduct a sidewalk inventory and assessment. The contracted period was from August 1 – September 15, 2018. The project involved locating all sidewalks and assessing overall conditions. Sidewalk sections were rated as one of three conditions: good, fair, or poor. Data collection occurred over two days (August 31, 2018 and September 1, 2018) which included taking several photos. A final report and maps were provided to the City of Greenfield on September 28, 2018 and presented on October 2, 2018.

## SIDEWALKS

Sidewalks are a major asset to a community. They not only provide opportunities for recreation and travel, but also work to create a sense of community as neighbors greet each other as they pass. A well-connected sidewalk network can also provide alternatives to auto-oriented transportation as citizens can walk to their intended destination in a safe manner.

Sidewalks have also been shown to improve the overall health of the community. It is known that walking is one of the most practical ways to increase physical activity for residents (Ltman, 2018). Citizens may be leery to walk on a poorly-maintained sidewalk system, but one that is well-kept and connected should encourage active participation with the network. A healthy city should increase morale and provide a strong sense of community.

Research shows a correlation between walkability and environmental benefits. Walking on a well-connected sidewalk system can provide a substitute for relatively short vehicle trips. The energy consumption and pollution emissions are much higher than average for short trips when engines are cold (Ltman, 2018). This reduction in the vehicle emissions for the city could help purify the air and provide citizens with a healthier environment than one dominated by vehicle transportation.

## CONDITION ASSESSMENT

SMCO staff assessed every segment of existing sidewalk in Greenfield. This totaled 5.16 miles of sidewalks. Condition assessments were completed using existing maps, surveying the area by car, and walking existing sidewalks. Each sidewalk segment was rated for condition, given one of three ratings – good, fair, or poor. Sidewalk condition was determined by considering several elements, including: amount of cracks or buckling, aesthetic value, presence of debris or vegetation, adequate width, and accessibility. The results are shown in [Table 1](#), with the miles and percent of sidewalks in each rating. A summary criteria for each rating is provided following the table. [Figure 1](#) and [Figure 2](#) display the existing

sidewalk network and condition for each identified segment. [Figure 1](#) shows the entire city boundaries, and [Figure 2](#) provides a closer look at the central part of town with sidewalks.

**Table 1. Sidewalk Conditions**

Rating	Miles	Percentage
Good	1.18	23%
Fair	1.49	29%
Poor	2.49	48%
<b>Total</b>	<b>5.16</b>	<b>100%</b>

### Good

- Best condition
- Recently built
- No signs of cracking, buckling, substantial overgrowth of vegetation, and minimal debris
- Width is adequate
- Pedestrians would have no issues traversing



### Fair

- Medium condition
- Older
- Signs of slight cracking, some vegetation and debris
- Pedestrians might have issues traversing



### Poor

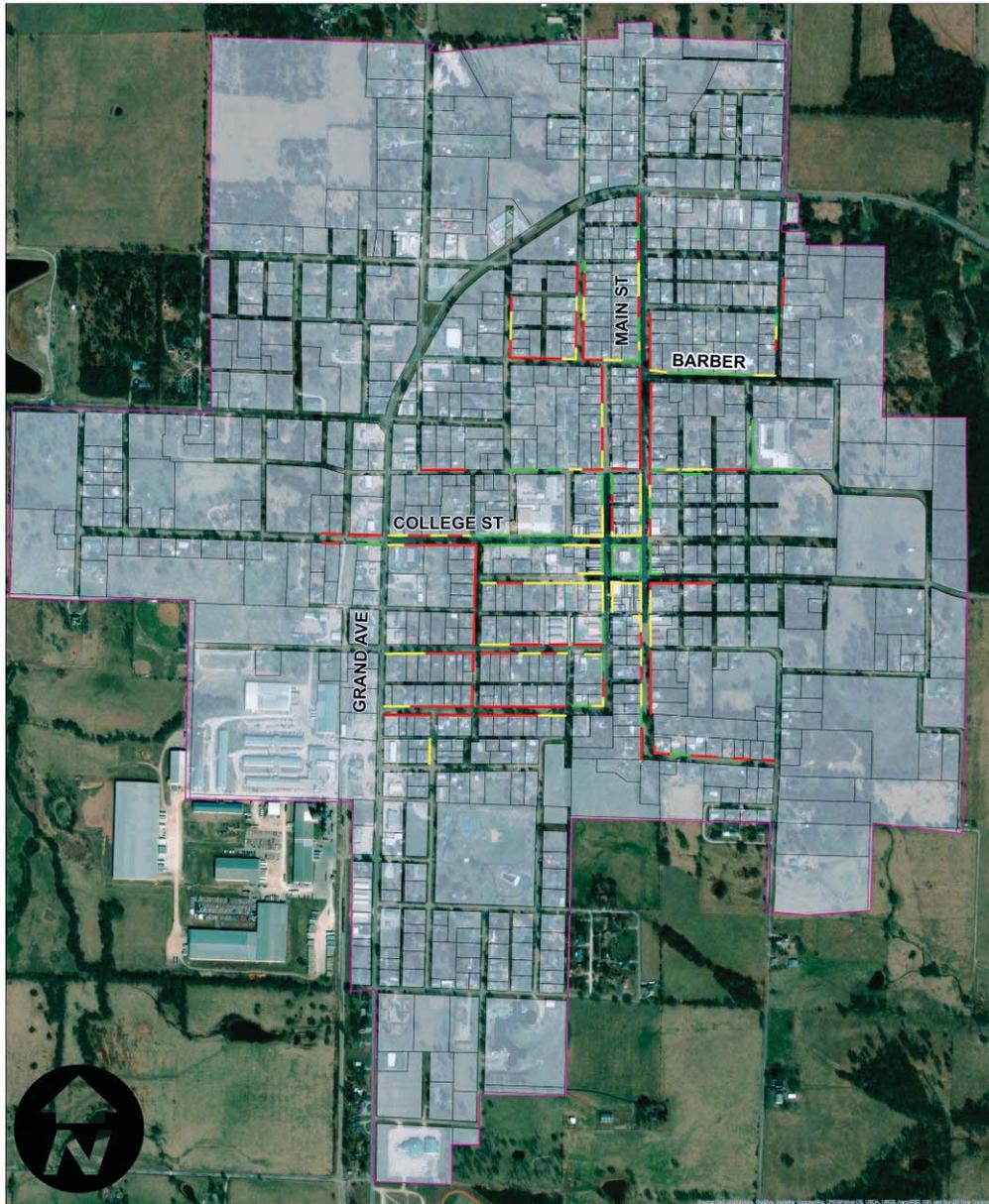
- Worst condition
- Oldest
- Major cracking and buckling, nearly covered by vegetation
- Completely inaccessible



# SIDEWALK CONDITIONS MAPS

Figure 1. Sidewalk Conditions

## Greenfield Sidewalks Overview



### Sidewalk Condition

- Good
- Fair
- Poor

-  City Limits
-  No Sidewalk

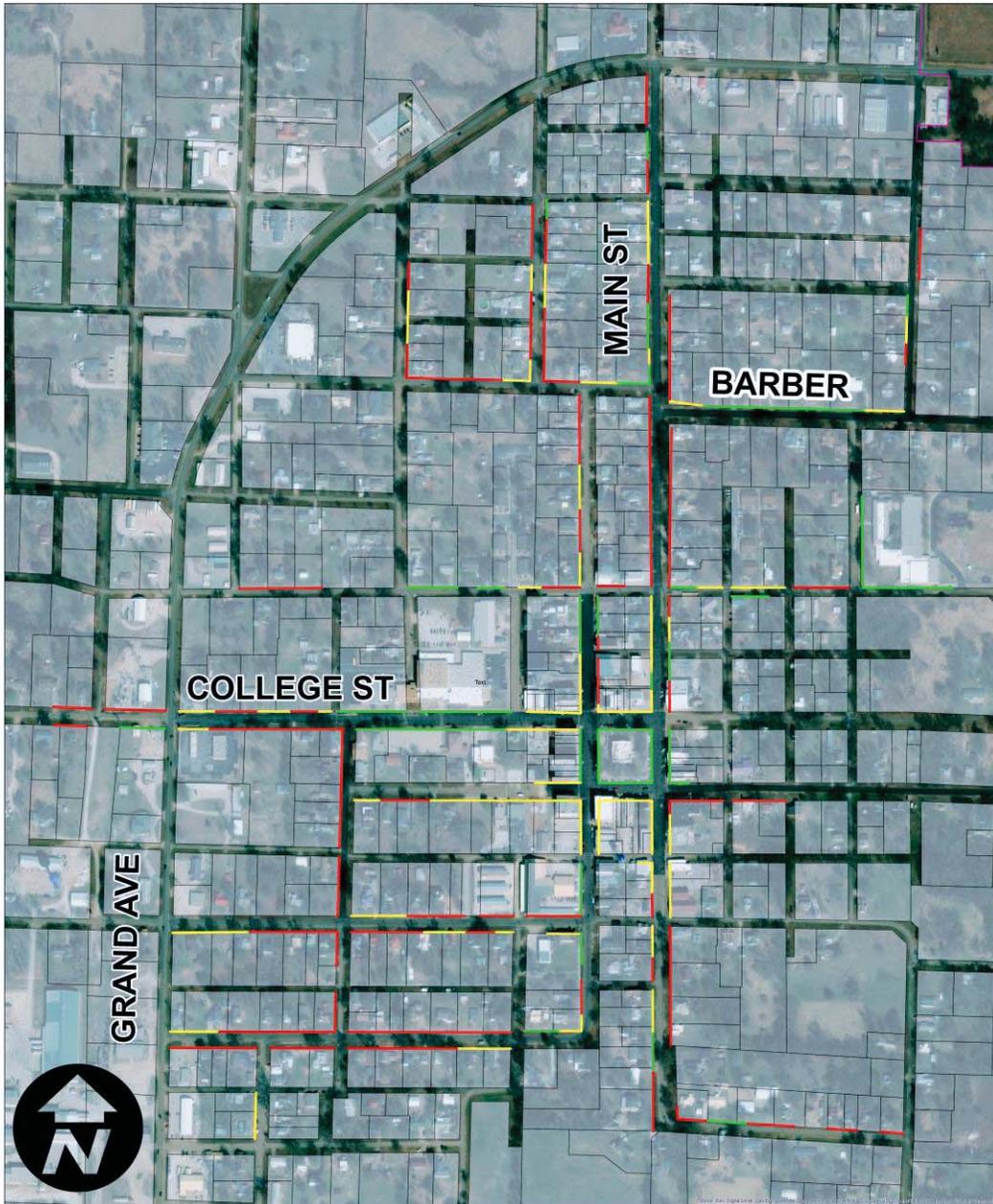


Prepared by:



Figure 2. Sidewalk Conditions- Focused

# Greenfield Sidewalks Conditions



**Sidewalk Condition** 0 0.075 0.15 0.3 Miles

- Good
- Fair
- Poor
- City Limits
- No Sidewalk

Prepared by:



# ANALYSIS

Overall, Greenfield's sidewalks are in fair-poor condition throughout the city. Many of the sidewalks are older and show evidence of severe cracking, damaged structural integrity, and present a need for investment due to the aging infrastructure. Crosswalks in the city also show deterioration and need for improvement. There are three primary considerations when evaluating the current system: location, connectivity, and accessibility.

## Location

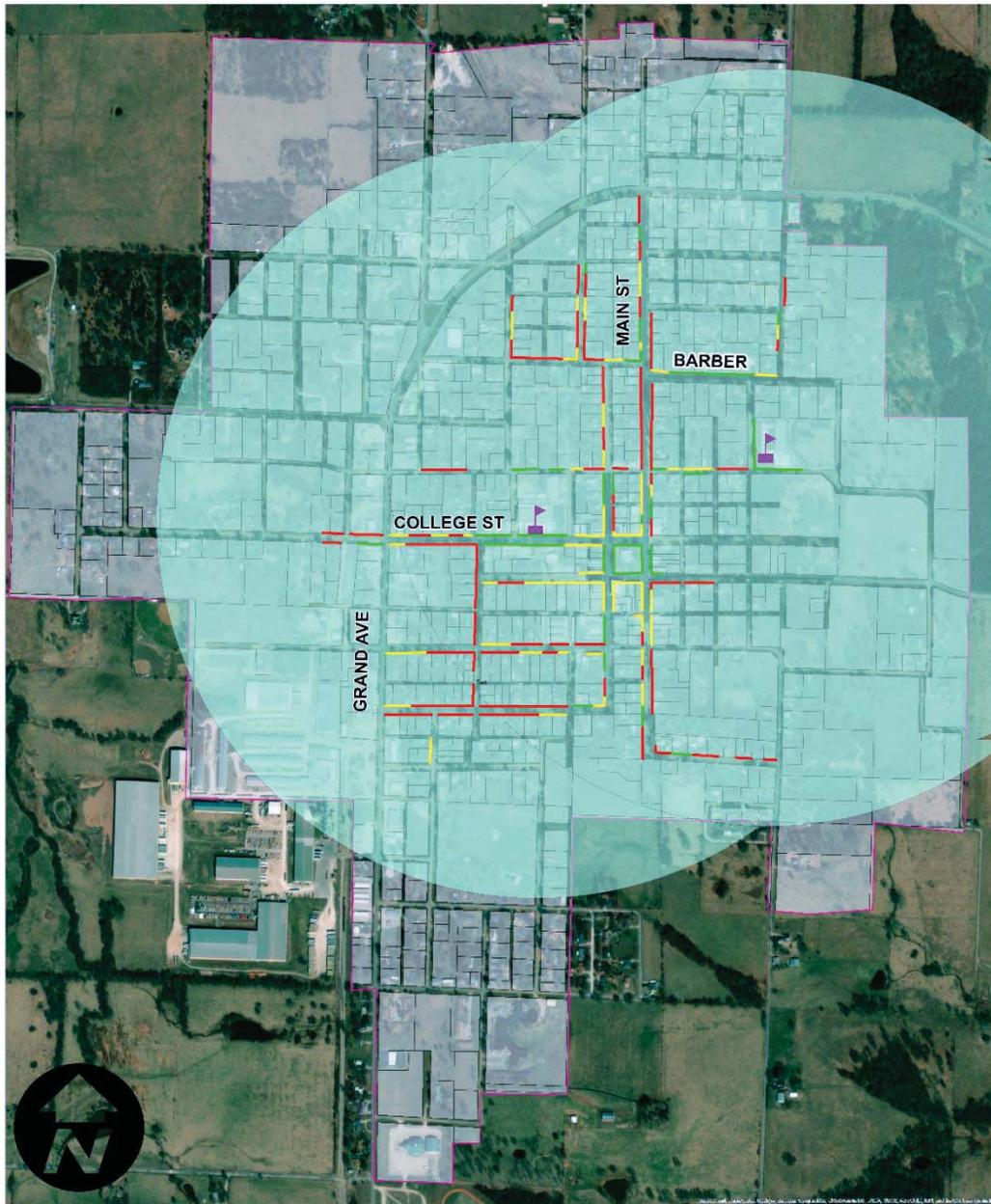
The majority of sidewalks in Greenfield are located within the center of town. The courthouse square and surrounding areas, such as the schools and police department have sidewalks which connect to the center of town. A noticeable trend in sidewalk condition is that the good condition sidewalks are located in the town center and in front of schools, and other public buildings. [Figure 3](#) shows the location of schools in Greenfield and the condition of sidewalks adjacent to those buildings. Sidewalks are provided for most routes to community schools and all sidewalks within the city are located within 1/2 mile of the schools. Most of the current sidewalk system is in the older, more established neighborhood areas. It is apparent that many of the existing sidewalks were constructed within homes several years ago, thus contributing to the poor condition.

## Connectivity

A well connected sidewalk system is important for safe pedestrian travel. General community connectivity is diminished by the poor quality of existing sidewalks. The sidewalk system is connected with minimal gaps in sidewalk, but due to poor condition the actual accessibility is limited. [Figure 4](#) displays sidewalk infrastructure and recommended new segments that would improve connectivity. New segments are proposed between existing sidewalks in order to fill in gaps in the existing system. Additional segments on the north end of Shouse Street (approx 292 feet) and along Hwy 160 or Grand Avenue (approx 375 feet) in front of the new Dollar General store are recommended in order to provide a safe pedestrian route for residents from the primary residential areas. Replacing and repairing existing sidewalk infrastructure from residential areas to the town center and local businesses will substantially increase connectivity and accessibility.

Figure 3. Sidewalks and Schools

# Greenfield Sidewalks w/ School Buffer



## Sidewalk Condition

- Good
- Fair
- Poor
- City Limits
- No Sidewalk
- 0.5 Mile School Buffer

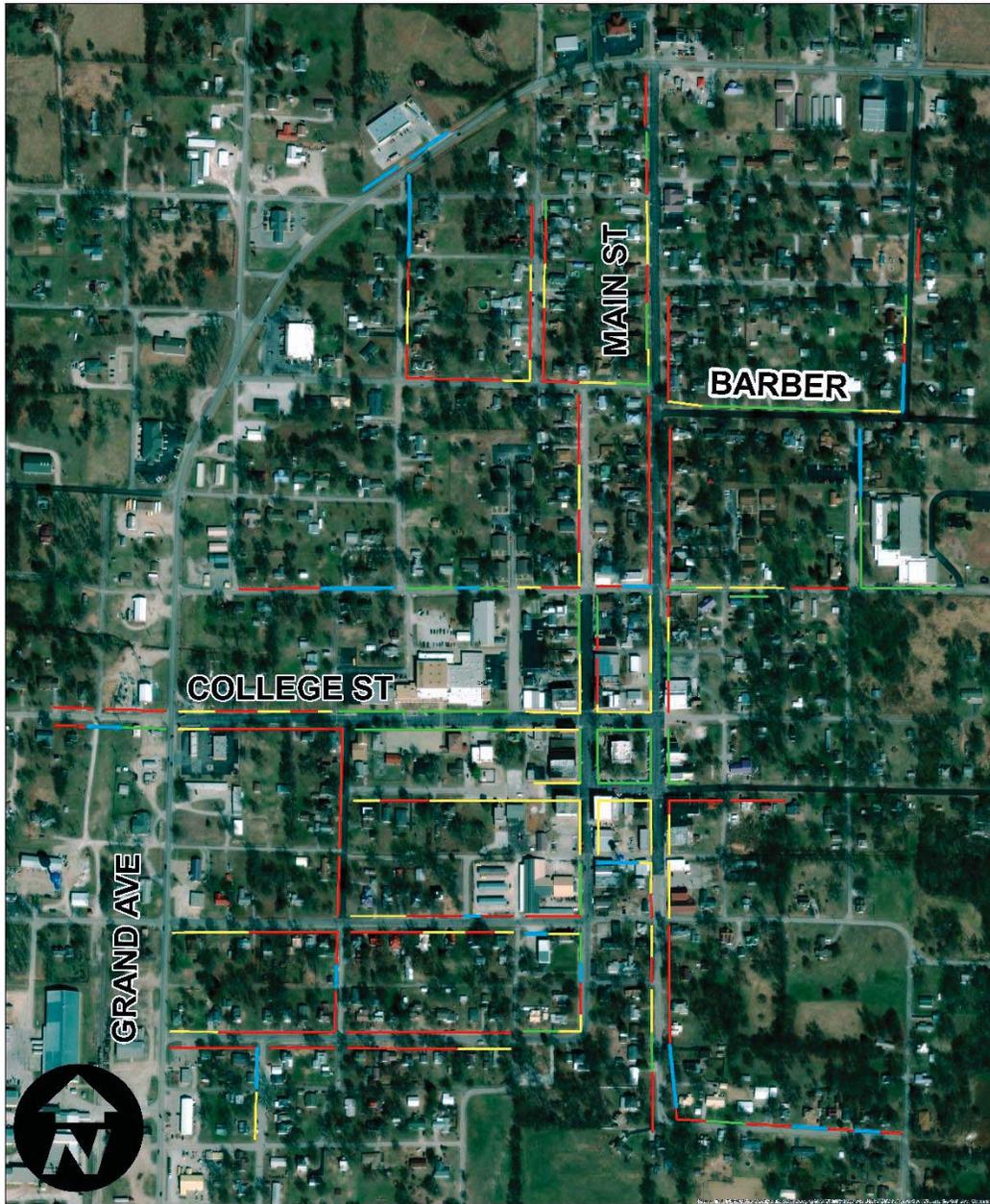


Prepared by:



Figure 4. Future Sidewalks Connectivity

# Greenfield Future Sidewalks



## Sidewalk Condition

- Good
- Fair
- Poor
- City Limits
- No Sidewalk
- Future Sidewalks

0 0.075 0.15 0.3 Miles

Prepared by:



## Accessibility

The overall accessibility of Greenfield's sidewalk infrastructure is poor and should be addressed in order to create a more usable system for residents. Sidewalks in poor condition with cracks, unevenness, missing ramps or detectable warnings, overgrowth, and gaps are a concern for individuals that may attempt to utilize the Greenfield sidewalk system. The 2.49 miles of poor condition sidewalks should be addressed first and the fair sidewalks should be programmed for future replacement. Sidewalks intersecting roadways and crosswalks generally do not necessarily meet the 2010 Americans with Disabilities Act (ADA) standards. As poor and fair condition sidewalks are replaced or repaired all sidewalk infrastructure should come into compliance with ADA standards (Department of Justice, 2010).

## MOVING FORWARD

This report is intended to provide an analysis of existing conditions as of August and September 2018. Based on the assessment, several miles of sidewalk are in need of improvement. Moving forward, Greenfield will need to focus on repair and replacement of the existing system. Additionally, new sidewalks may be necessary in order to improve overall community connectivity, but priority should be placed on sustainment of the existing infrastructure. If the City is having difficulty funding maintenance of the current system, then it may be difficult to rationalize the cost of new infrastructure.

In the future, the following items may assist in improving City sidewalks:

- Maintain good conditioned sidewalks.
- Focus on replacement of poor condition sidewalks and filling gaps moving from the central part of town outwards.
- Require all crosswalks to have appropriate signage, painted walkway, and detectable warnings from the adjacent sidewalks.
- Budgeting at least \$5,000 each year for sidewalk repairs and replacement over the next 25 years. This is based on an average estimated cost of \$5.58 per square foot to replace a sidewalk but does not include any surveying or engineering costs (Homeyse, 2018). Greenfield has 2.49 miles of poor and 1.49 miles of fair condition sidewalk, which equates to approximately 52,589 square feet and 31,468 square feet respectively. The City may look at opportunities to cost-share the replacement with property owners. It may be prudent to save up money and do large projects every few years.
- Apply for Transportation Alternative Program (TAP) funding through the Missouri Department of Transportation to fund sidewalk improvements and installation. These funds are available every two years and take the following items into consideration: number of project partners, public involvement, right-of-way ownership acquisition, addressing ADA barriers, inclusion in local plan, project cost, and local match contribution.

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## INTRODUCTION

The City of Marshfield engaged the Southwest Missouri Council of Governments (SMCOG) to conduct a sidewalk inventory and assessment. The contracted period was from August 15, 2018 to September 30, 2018. The project involved locating all sidewalks, assessing overall condition, and noting general Americans with Disabilities Act (ADA) accessibility concerns. Sidewalk sections were rated into three conditions: good, fair, or poor. Data collection occurred over four days (August 17<sup>th</sup> and 31<sup>st</sup>, 2018 and September 7<sup>th</sup> and 12<sup>th</sup>, 2018) which included taking photos.

## SIDEWALKS

Sidewalks are an important asset to a sustainable community. Sidewalks provide opportunities for walkable transportation as well as recreational options for citizens. A well-maintained sidewalk system can encourage citizens to utilize the most basic form of exercise, walking. Inadequate physical activity is a primary contributor to health issues such as heart disease, obesity, stroke, and diabetes (Litman, 2018). When residents are able to safely walk to places they might normally drive it increases physical activity and can improve individuals' health. A good condition, well-connected sidewalk system provides a safe opportunity for residents to walk for everyday tasks and get necessary exercise.

Enabling residents to walk instead of drive also increases overall public health by reducing congestion and carbon emissions within the city. A thoroughly connected sidewalk system can also provide recreational opportunities for citizens to stroll through neighborhoods and commercial centers. Additionally, sidewalks increase equity in a community by offering safe transportation opportunities to individuals who may not want to drive or do not own a personal vehicle (Litman, 2018).

With the recent push towards healthy and vibrant communities, walkability is a key factor. Pedestrian activity within a city has shown to increase the sense of community and overall quality of life for residents. As more citizens walk along the sidewalks, they interact with the city and their neighbors in a way that those in their cars do not. Providing pedestrian access to all parts of the city through a sidewalk network helps to create a cohesive image of the community for residents and visitors alike.

Sidewalks and pedestrian connections were identified as a resident priority during Marshfield's Vision Casting process in early 2018. The community would like to see new sidewalk infrastructure that provides better connectivity around the city and to community facilities. In addition to constructing new sidewalks, there needs to be a focus on maintenance and repair of existing sidewalks.

# CONDITION ASSESSMENT

SMCOG staff assessed every segment of existing sidewalk in Marshfield. This totaled 11.57 miles of sidewalks. Marshfield has approximately 60 miles of roadway. Of those 60 miles, approximately 9 miles of road, or 15%, currently have sidewalks. Condition assessments were completed using existing maps, surveying the area by car, and walking existing sidewalks. Each sidewalk was rated for condition, given one of three ratings: good, fair, or poor. Sidewalk condition was determined by considering several elements, including: amount of cracks or buckling, aesthetic value, presence of debris or vegetation, adequate width (4 ft. minimum), and accessibility. The results are shown in [Table 1](#), with the miles and percent of sidewalks in each rating. A summary of criteria for each rating is provided below.

**Table 1. Sidewalk Conditions**

Rating	Miles	Percentage
Good	7.29 mi	63.1%
Fair	3.11 mi	26.9%
Poor	1.16 mi	10.0%
<b>Total</b>	<b>11.57 mi</b>	<b>100%</b>

## Good

- Best condition
- Recently built
- No signs of cracking, buckling, substantial overgrowth of vegetation, and minimal debris
- Width is adequate
- Pedestrians would have no issues traversing



## Fair

- Medium condition
- Older
- Signs of slight cracking, some vegetation and debris
- Pedestrians might have issues traversing



## Poor

- Worst condition
- Oldest
- Major cracking and buckling, nearly covered by vegetation
- Partially or completely inaccessible



# SIDEWALK CONDITIONS MAP

Figure 1. Overall Sidewalk Conditions & Proposed Segments

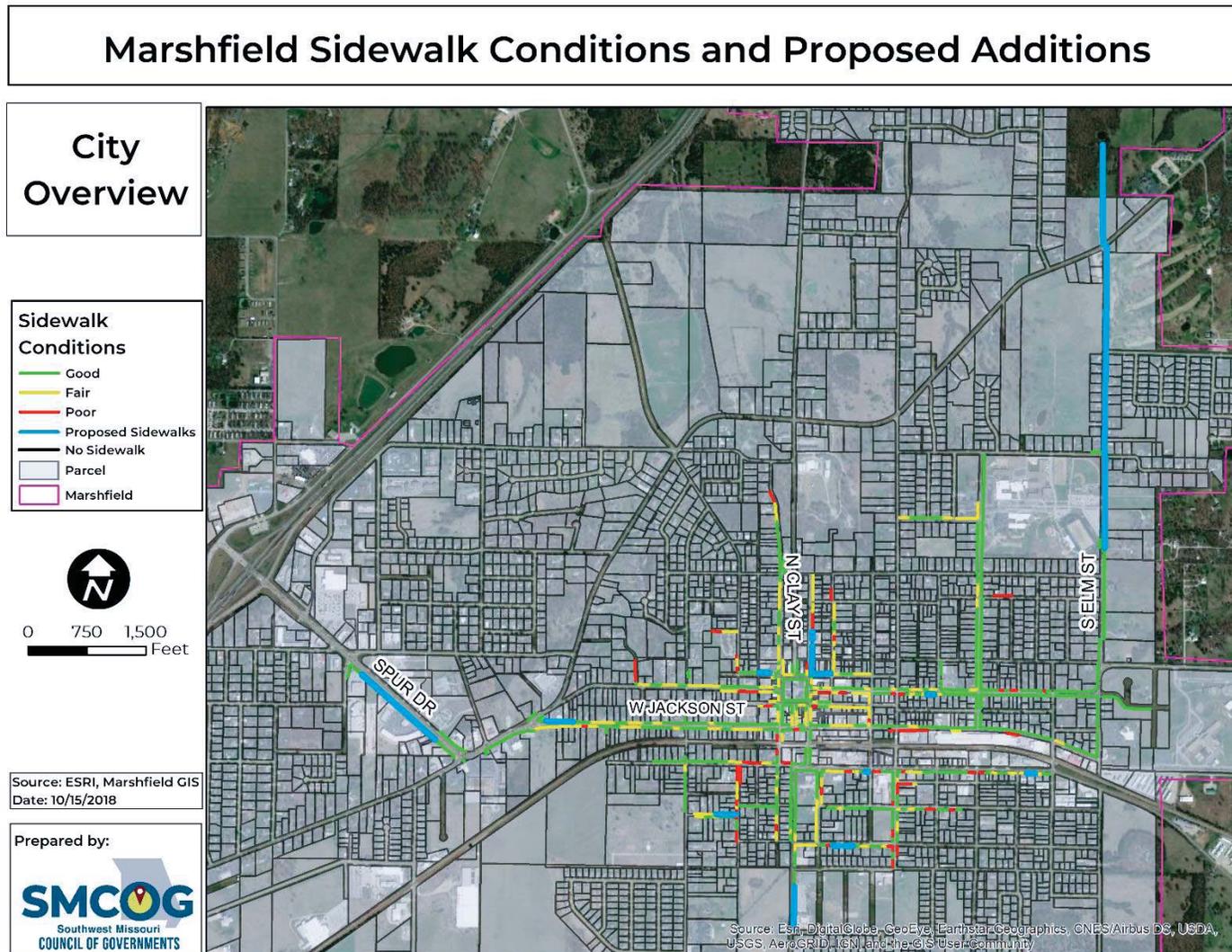


Figure 2. Central Conditions & Proposed Segments

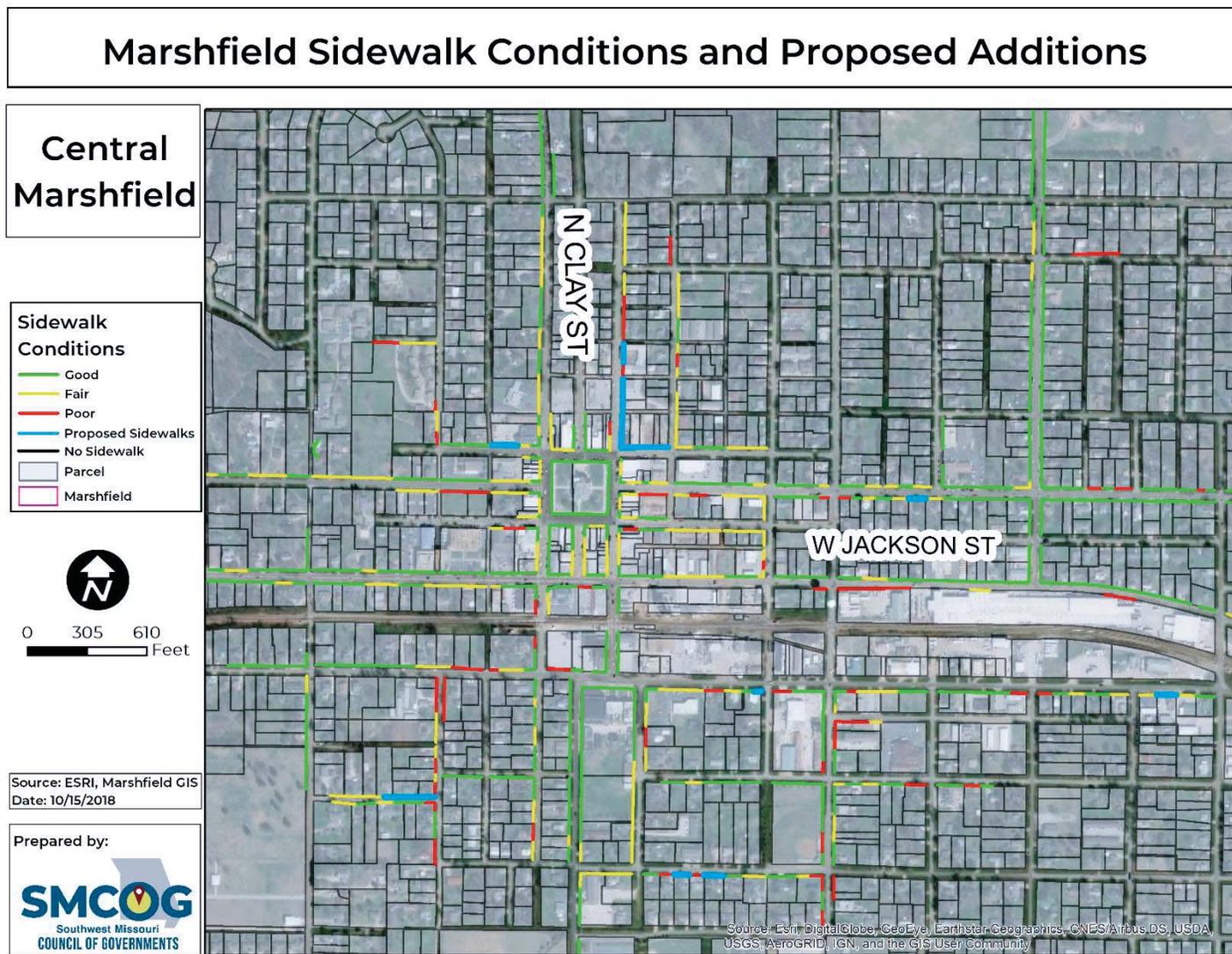


Figure 3. Sidewalk Conditions and Proposed Segments

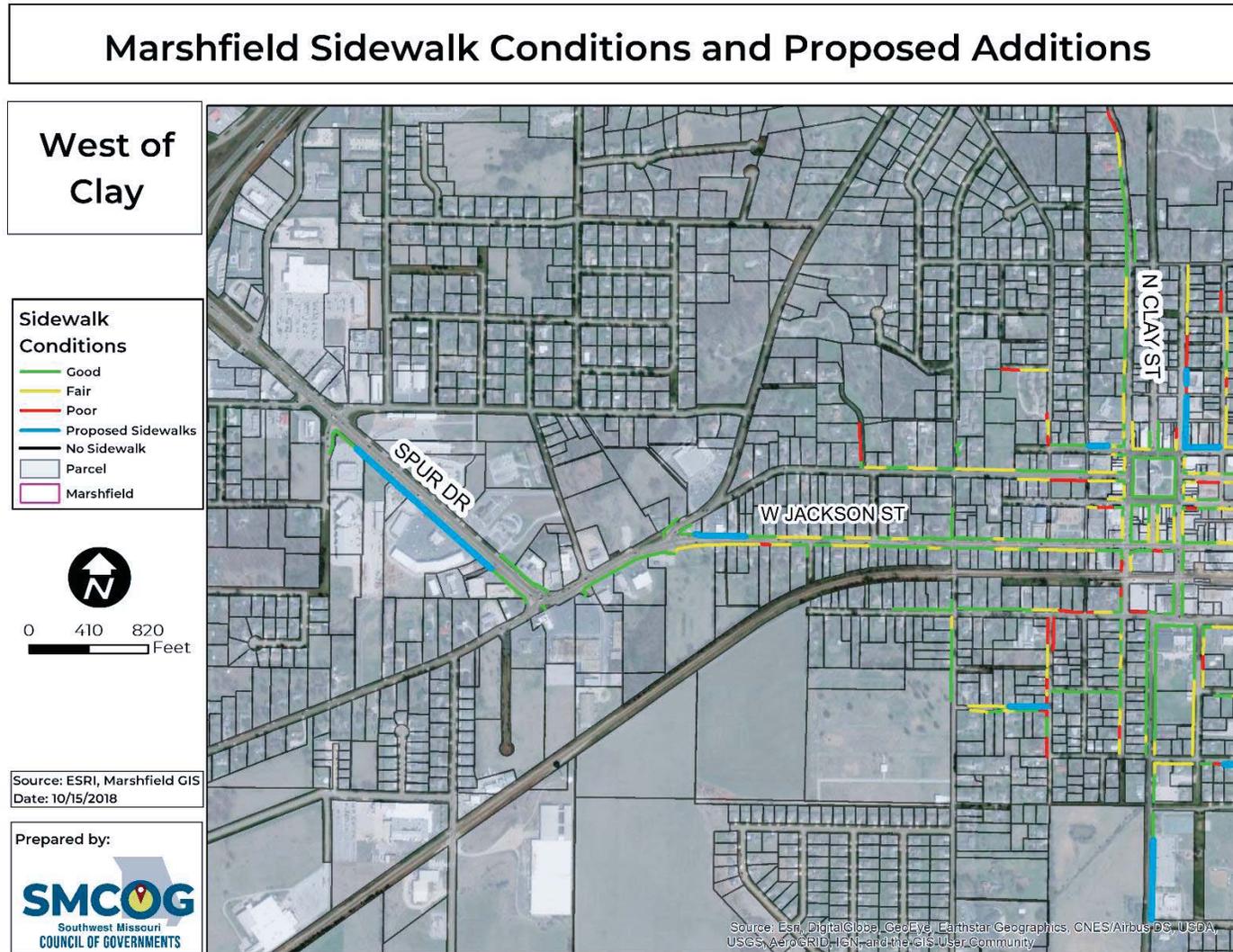
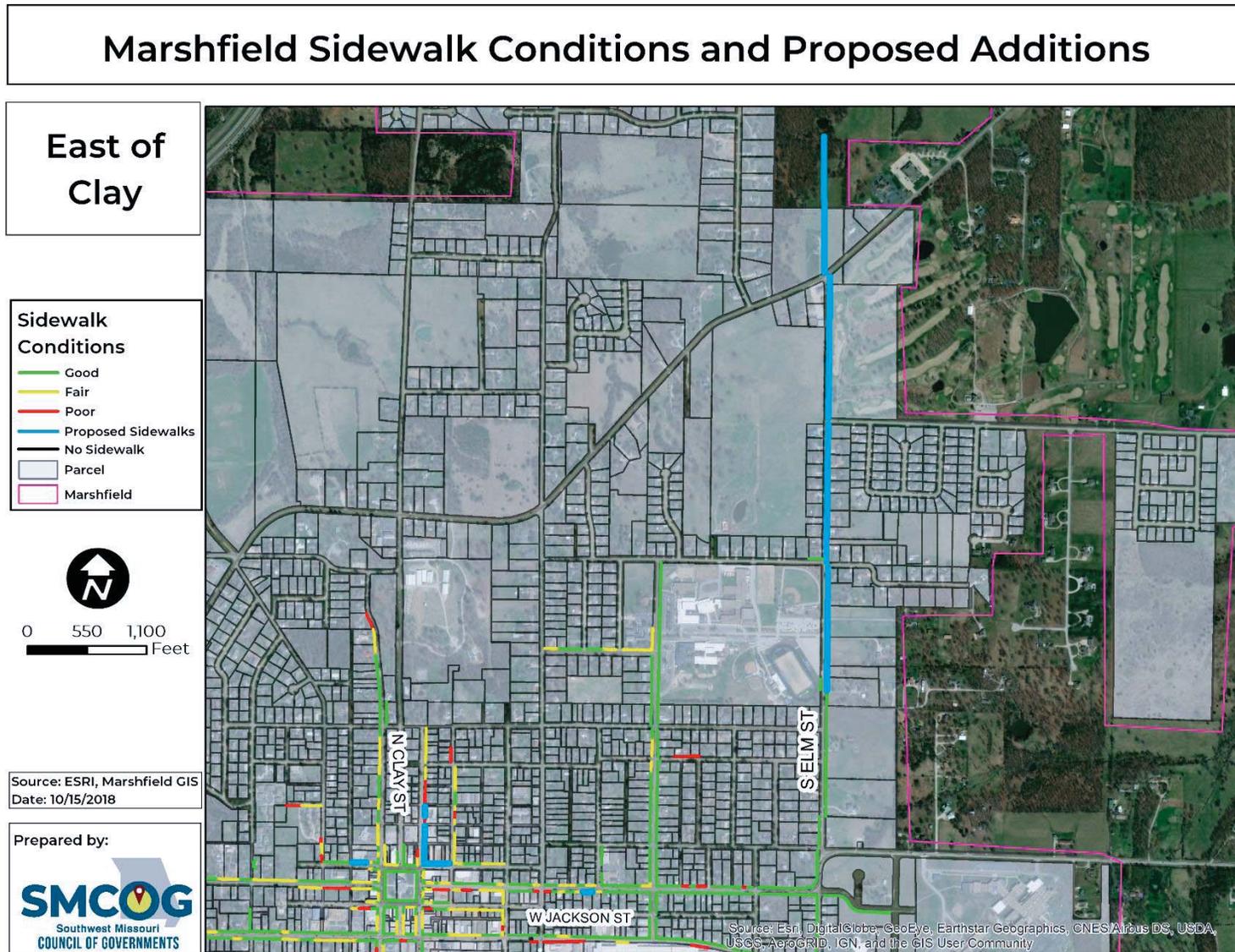


Figure 4. Sidewalk Conditions and Proposed Segments



# ANALYSIS

In general, Marshfield's sidewalks are unevenly maintained throughout the city. Long stretches of good sidewalk are interrupted with a section that is either fair or poor. Likewise, crosswalks that seem to have been updated recently will connect to a deteriorating sidewalk segment. The city should focus on repairing its fair and poor sidewalks in order to provide a network that is easily traversable by all citizens. When evaluating the current sidewalk system, there are three primary considerations that are taken into account:

- Location
- Connectivity
- Accessibility

## Location

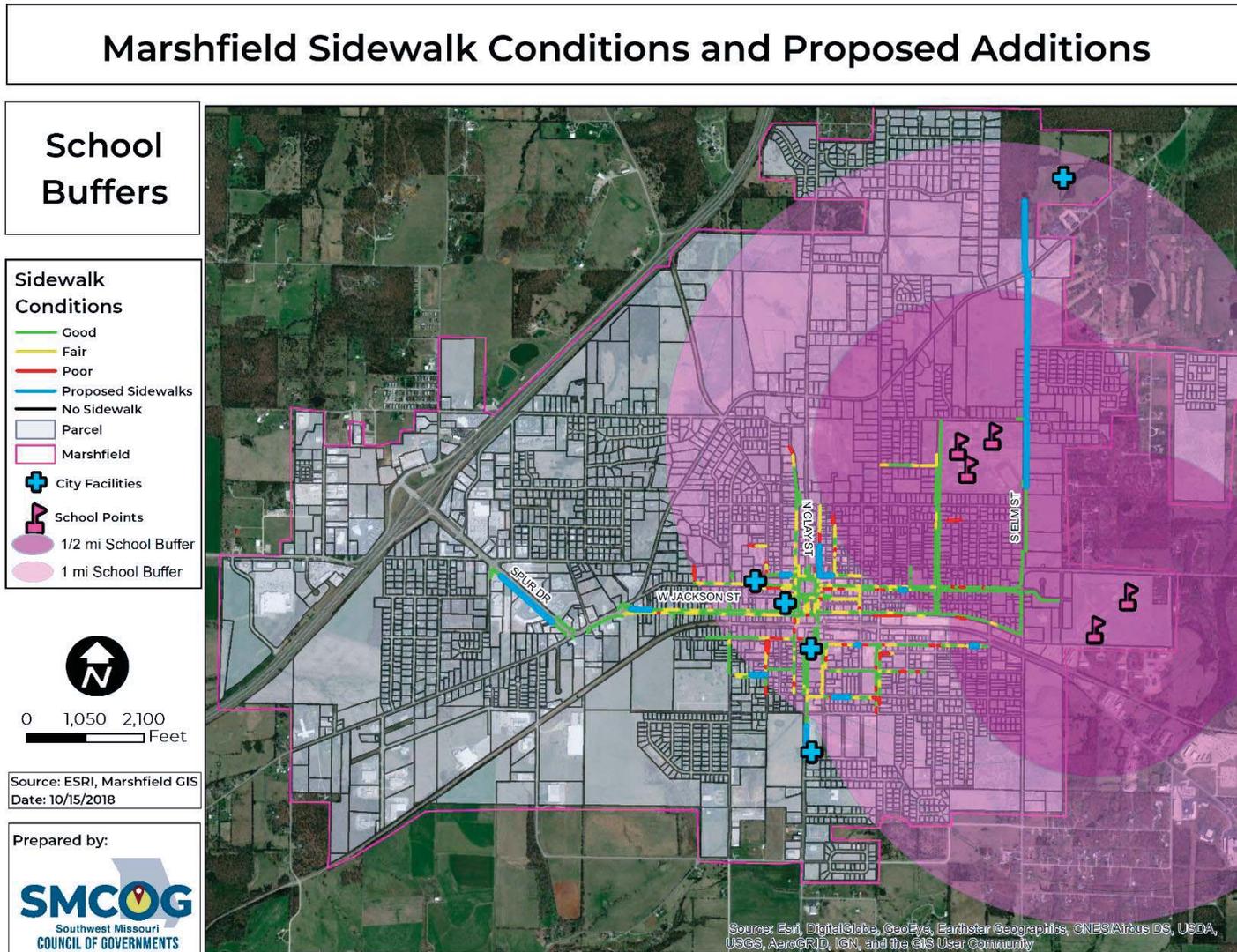
Sidewalks seem to be located almost exclusively within the center of town. [Figure 1](#) displays the overall community sidewalk system. Emanating from the square, the sidewalk system appears to have been built prior to Marshfield experiencing suburban development. None of the newer subdivisions have sidewalks, indicative of the lack of code requirements for sidewalks in new development. This hinders the connectivity of the sidewalk network throughout town. Residents residing on the outside perimeter of the city have no way to access the commercial center of town without driving or walking on streets.

Another concern within the sidewalk system is the topography of the area. Marshfield's hills provide a barrier to access as some streets have a very steep grade. While there is no way to correct the topography, the city can work to strategically develop paths that minimize steep walking grades and provide a sidewalk system that is traversable.

## Connectivity

Good connectivity of a sidewalk system is vital to the use of sidewalks as a transportation option. Connectivity can be inhibited by a lack of sidewalks and by sidewalks in poor condition. Most schools and community facilities such as the community center, library, courthouse, and senior center are connected via the existing sidewalk system or with minimal extensions. [Figure 5](#) shows the location of schools and community facilities in relation to the sidewalk system and proposed new segments. City Hall and the new aquatic center could be connected with the addition of new sidewalk segments. The overall existing sidewalk system is well connected, but poor conditioned sidewalks will continue to limit accessibility unless improvements are made.

Figure 5. Schools & Community Facilities



## Accessibility

Accessibility is a common concern for many communities and Marshfield is no exception. Cracks, uneven sidewalks, missing ramps, overgrowth, and gaps in the sidewalk system cause barriers for individuals attempting to navigate the sidewalk system. The 1.16 miles of poor condition sidewalks should be addressed in order to improve overall community accessibility. Additionally, the fair conditioned sidewalks will need to be monitored annually and should be improved to good condition.

The downtown area has several fair condition segments that will need addressed in the near future. Sidewalks are uneven and showing signs of weatherization. Additionally, the location of light poles reduces the width of the travel way and minimizes accessibility. Due to the high number of pedestrians in the downtown area, the City may want to look at replacing these sidewalks earlier than some of the others in worse condition.

Barriers to accessibility will need to be addressed in order to be in compliance with the Americans with Disabilities Act (ADA). These concerns can be addressed over the next ten to fifteen years as resources become available, but identification is a necessary first step. The 2010 ADA standards do not require communities to immediately modify infrastructure or facilities built prior to March 15, 2012 if it is in compliance with the 1991 standards (Department of Justice, 2010). The intent is to not create an undue burden on communities and allow time to bring items into compliance. Specific locations with ADA compliance concerns are provided in Appendix A.

# MOVING FORWARD

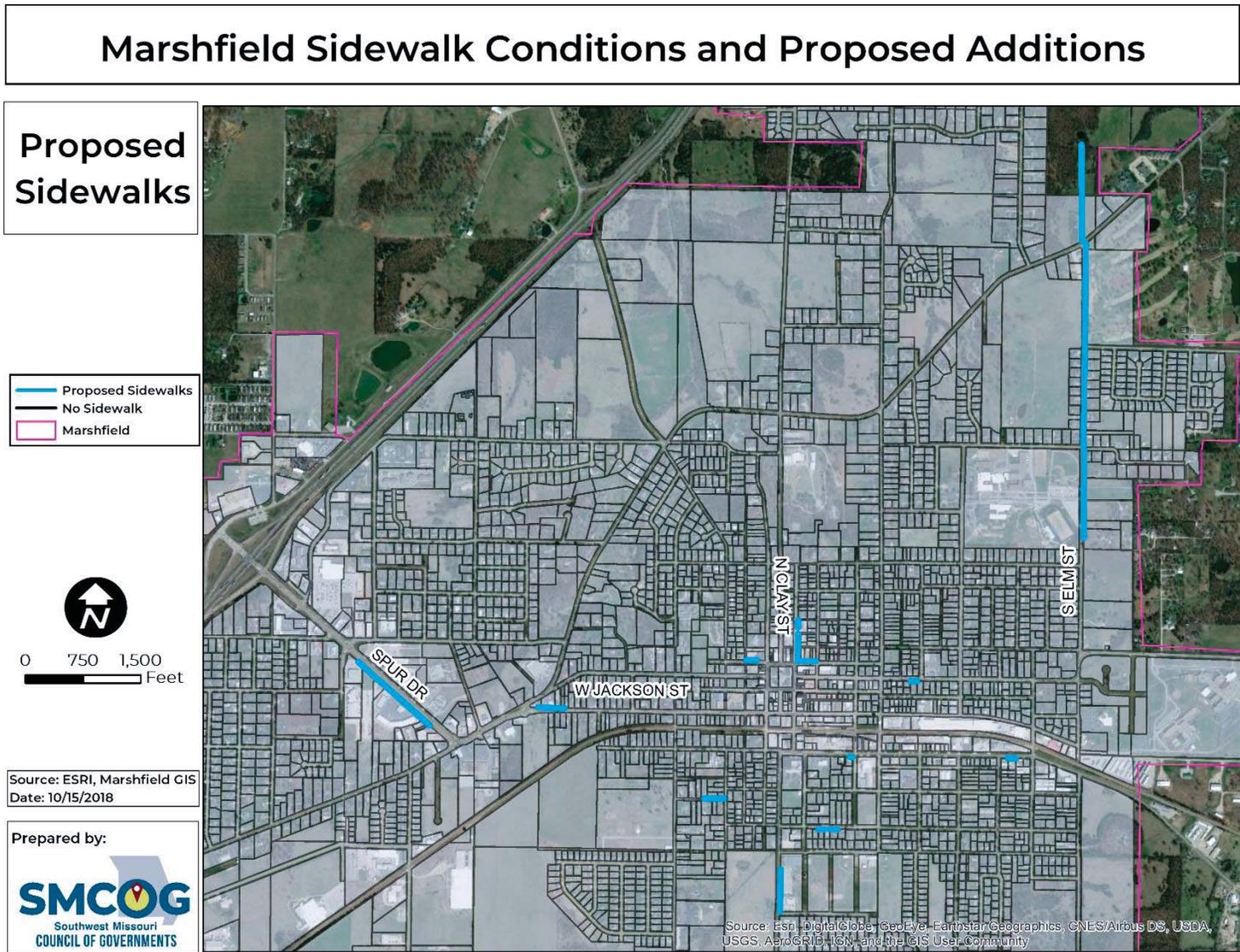
This report is intended to provide an analysis of existing conditions as of August and September 2018. In the future, Marshfield should work to address the poor condition sidewalks in the existing system as first priority. It is important to maintain the existing sidewalk system and the cost of new sidewalks should be weighed with the cost of maintenance. The City will need to consider the financial resources required to correct current sidewalk concerns and may need to increase the annual budget for sidewalk improvements when possible. Improvements may be targeted first in the higher pedestrian areas such as the downtown and then along routes that provide connection to community facilities.

New sidewalks should be installed as new development occurs to increase overall community connectivity. There are approximately 1.25 miles of proposed new sidewalks throughout the entire city. [Table 2](#) provides an overview of the proposed sidewalk segments including length and estimated cost. [Figure 6](#) is a map displaying the proposed location of new sidewalks.

**Table 2. Proposed Sidewalk Segments**

Proposed Sidewalk Segment	Description	Estimated Cost
Extension of Sidewalk to City Hall- from existing sidewalk to Elizabeth St.	Approx. 549 ft.	Driveway sections (thicker concrete) = 72' = \$4,320 Curb Ramps needed = 2 @ \$800 = \$1,600 Normal 5' sidewalk = 477' @ \$45/ft = \$21,465 <b>TOTAL : \$27,380</b>
North Elm, connection to new Aquatic Center/Pool- from across from track to Route CC	Approx. 3,705 ft. from existing sidewalk to Route CC  Approx. 1,250 ft. from Route CC to new Activity Center/Aquatic Center	TO CC: Driveway sections (thicker concrete) = 667 sq yds = \$40,020 Curb Ramps needed = 5 @ \$800 = \$4,000 Storm pipe = 20' @ \$55/ft = \$110 3' Tall Block Wall 250' @ \$25/sq ft = \$18,750 Normal 5' sidewalk, = 3,450' @ \$45/ft = \$155,250 <b>TOTAL \$226,730</b>  FROM CC TO ACTIVITY CENTER: Curb Ramps needed = 2 @ \$800 = \$1,600 Normal 5' sidewalk = 1250' @ \$45/ft = \$56,250 <b>TOTAL \$57,850</b>
Jackson Connection, infill- from existing sidewalk to Hubble Dr.	Approx. 341 ft.	Driveway rebuild (7) (thicker concrete) = 401 sq yds = \$24,060 Curb Ramps needed = 1 @ \$800 = \$800 Normal 5' sidewalk = 171' @ \$45/ft = \$7,695 <b>TOTAL : \$32,555</b>

Figure 6. Proposed Sidewalks



Proposed Sidewalk Segment	Description	Estimated Cost
Spur Drive- from Antique Mercantile to Walgreens	Approx. 1,239 ft.	Driveway sections (thicker concrete) = 995 sq yds = \$59,700 Fill dirt needed = 1,000 cy @ \$10 = \$10,000 Inlets needed = 8 @ \$4,000 = \$32,000 Storm water pipe = 1,272' @ \$55/ft = \$69,960 Seed and mulch = \$2,500 Normal 5' sidewalk, = 597' @ \$45/ft = \$26,865 <b>TOTAL \$195</b>
Sidewalks around new Judicial Building- along Jefferson and Crittenden	Approx. 600 ft.	Curb Ramps needed = 6 @\$800 = \$4,800 Normal 5' sidewalk = 600' @ \$45/ft = \$27,000 <b>TOTAL \$318</b>
Various Infill	Approx. 880 ft.	Normal 5' sidewalk = 880' @ \$45/ft = \$39,600 <b>TOTAL \$396</b>
Repairs to Existing System	Description	Estimated Cost
Poor condition sidewalks	1.16 miles (6,125 ft.)	Removal of old sidewalk = 6,125' @ \$10 = \$61,250 Normal 5' sidewalk = 6,125 @ \$45/ft = \$275,625 <b>TOTAL \$336,875</b>

The city should implement a development requirement for new construction to include sidewalks. As an alternative a payment in lieu of construction could be made to the city for future sidewalk installation if the developer is not able to construct the required sidewalks. Additionally, the city may review options for cost-sharing sidewalk improvements with the adjacent property owner.

Funding may also be sought through the Missouri Department of Transportation (MoDOT) Transportation Alternative Program (TAP). These funds are available every two years and consider factors such as: number of project partners, public involvement, right-of-way ownership/acquisition, addressing ADA barriers, inclusion in a local plan, project cost, and local match contribution.

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Homewyse. (2018, March). Retrieved from Cost to Install a Concrete Sidewalk:  
[https://www.homewyse.com/services/cost\\_to\\_install\\_concrete\\_sidewalk.html](https://www.homewyse.com/services/cost_to_install_concrete_sidewalk.html)

Litman, T. (2018, July 24). *Economic Value of Walkability*. Retrieved from Victoria Transport Policy Institute:  
<http://www.vtpi.org/walkability.pdf>

# APPENDIX A

Location	Issue	Picture	Corner (pt(s)) were taken at				DG	PDV
			N	W	SE	SW		
Washington + Spur	overgrowth, dirt				x		Maintenance	Maintenance
Washington + Spur	overgrowth, dirt					x	Maintenance	Maintenance

Location	Issue	Picture	Corner (pts) were taken at				D/G	P/W
			N	W	SE	SW		
Jackson + Hyde	No detectable warnings.				x	x	705.1	PROWAG R305
Jackson + Mill	No detectable warnings and steep slope of sidewalk.		x				705.1 403.3	PROWAG R305 & PROWAG R302

Location	Issue	Picture	Corner points were taken at				D.G.	P.W.
			N	W	SE	SW		
Jackson + Marshall (Poor)	The SW corner has no detectable warnings and is in poor condition.					x	705.1	PROWAG R305
Jackson + Pitts	Detectable warnings offset from the sidewalk and hang over the edge.		x					PROWAG R305

Location	Issue	Picture	Corner (pt(s)) were taken at				D/G	P/W
			N	W	SE	SW		
Jackson + Pine	No detectable warnings on the NW, SE, and SW corners.			x			705.1	PROWAG R305
Jackson + Walnut	The sidewalk leading up to the corner is gravel and not slip-resistant.			x			302.1	PROWAG R302

Location	Issue	Picture	Corner points were taken at				DGS	P/W
			N	W	SE	SW		
Washington + Walnut	No detectable warnings on the NW corner.			X				PROWAG R305
Washington + Vine	There are no detectable warnings with steep curb and slight overgrowth.		X				705.1 406.2	PROWAG R302 & PROWAG R305 & PROWAG R304

Location	Issue	Picture	Corner (pt(s)) were taken at				D/G	P/W
			N	W	SE	SW		
Washington + Vine	There are no detectable warnings with steep curb and slight overgrowth.			X			705.1 406.2	PROWAG R302 & PROWAG R305 & PROWAG R304
Washington + Young	There are no detectable warnings with steep curb and slight overgrowth.			X			705.1 406.2	PROWAG R302 & PROWAG R305 & PROWAG R304

Location	Issue	Picture	Corner point(s) were taken at				AS	PW
			N	W	SE	SW		
Washington + Locust	No detectable warnings, steep slope on the NW corner, and no crossing to the SW corner. Connection of sidewalk to curb is also needed.			X			705.1 406.2	PROWAG R302 & PROWAG R305 & PROWAG R304
Washington + Olive	No detectable warnings			X			705.1	PROWAG R305

Station	Issue	Picture	Corner points were taken at				D/G	P/W
			N	W	SE	SW		
Washington + Cherry	No detectable warnings and cracked ramp.		x				705.1	PROWAG R305
Washington + Pine	No detectable warnings and high grade slope.					x	705.1 406.2	PROWAG R305 & PROWAG R304

Station	Issue	Picture	Corner (pt(s)) were taken at				D/G	P/W
			NE	W	SE	SW		
Washington + Pine	No detectable warnings, no curb ramp and substantial overgrowth.			X			705.1 406.2	PROWAG R304 & PROWAG R305 & PROWAG R302
Washington + Pitts	No detectable warnings on NE, SW, and SE corners and no curb ramps		X				705.1 406	PROWAG R305 & PROWAG R304

Location	Issue	Picture	Corner (pt(s)) were taken at				D/G	P/W
			N	W	SE	SW		
Madison + Pitts	Uneven surface of sidewalk and no detectable warnings.		x				705.1	PROWAG R305 & PROWAG R302
Washington + Fulton	No detectable warnings and no curb ramps on the North side.			x			705.1 406	PROWAG R305 & PROWAG R304

Station	Issue	Picture	Corner point(s) were taken at				D/G	P/W
			N	W	SE	SW		
Antique (store) + Spur	No detectable warnings.		x				705.1	PROWAG R305
Antique (store) + Spur	No detectable warnings.			x			705.1	PROWAG R306

Station	Issue	Picture	Corner points were taken at				DAS	P/W
			N	W	SE	SW		
Aquamaster (store) + Spur	No detectable warnings.		x				705.1	PROWAG R305
Casey's (store) + Spur	No detectable warnings and curb grade too steep.		x				705.1 406.2	PROWAG R305 & PROWAG R304

Station	Issue	Picture	Corner (to) were taken at				DAS	P/W
			N	W	SE	SW		
Casey's (store) + Spur	No detectable warnings and curb grade too steep.			X			705.1 406.2	PROWAG R305 & PROWAG R305
Madison + Fulton	No detectable warnings.			X			705.1	PROWAG R305

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City of Monett

sidewalk  
inventory

May 2019



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## INTRODUCTION

The City of Monett employed the Southwest Missouri Council of Governments (SMCOG) to conduct a sidewalk inventory and assessment. The contracted period was from March 1, 2019 to June 1, 2019. The project involved locating all sidewalks, assessing overall condition, and noting general Americans with Disabilities Act (ADA) accessibility concerns. Sidewalk sections were categorized into three conditions: good, fair, or poor. Data collection occurred over a period of approximately one month, starting on March 15 and ending on April 26, included taking photos of identified ADA concerns and sidewalk sections that typified each condition category. This report was presented to the City Council on May 8, 2019.

## SIDEWALKS

Sidewalks play an important role in any community and provide a variety of benefits. A well-maintained and connected sidewalk system can provide opportunity for recreation as well as travel, improved community health benefits, add to a sense of community and place, and improve overall social equity. A thoroughly connected, well-constructed sidewalk system can provide recreational opportunities for citizens of all ages and abilities to stroll through neighborhoods and commercial centers. Increased access to sidewalks for recreational purposes also benefits the overall health of a community, since safe routes encourage more use for exercise. Sidewalks also work to create a sense of community with the people utilizing them through connections with fellow walkers as well as by allowing for a closer interaction with local shops and businesses. Additionally, sidewalks increase equity in a community by offering safe transportation opportunities to individuals who may not want to drive, are not able to drive, or do not own a personal vehicle (Litman, 2018).

A well-maintained sidewalk system can encourage citizens to enjoy the most basic form of exercise – walking. Inadequate physical activity is a primary contributor to health issues such as heart disease, obesity, stroke, and diabetes (Litman, 2018). When residents are able to safely walk to a place they might normally drive, it increases physical activity and can improve an individual’s health. A well-connected sidewalk system in good condition provides a safe opportunity for residents to walk for everyday tasks and get necessary exercise. This encouragement towards walking rather than driving also increases overall public health by reducing congestion and carbon emissions within the city.

As communities move towards healthier lifestyles and practices, the importance of walkability continues to increase. Pedestrian activity within a city can improve the sense of community and overall quality of life for residents. As more citizens walk along the sidewalks, they interact with the city and their neighbors in a way that those in their cars do not. Providing pedestrian access to all parts of the city through a sidewalk network helps to create a cohesive image of the community for residents and visitors alike.

# CONDITION ASSESSMENT

During the inventory, every existing segment of sidewalk within Monett city limits was noted and analyzed. The current network consists of approximately 28.4 miles. There are roughly 245 roads in Monett, 67 of which have sidewalks on one or both sides. The inventory was conducted by locating existing sidewalk segments via maps and vehicles. Data was collected while walking each segment of the existing network. Each segment was categorized as being in either good, fair, or poor condition based on several factors, including damage like cracking or buckling, overgrowth of vegetation, presence of debris, and accessibility. The total amount of sidewalks in each category is presented in **Table 1**.

**Table 1. Sidewalk Conditions**

Rating	Miles	Percentage
Good	16.72	59%
Fair	6.84	24%
Poor	4.89	17%
<b>Total</b>	<b>28.45</b>	<b>100%</b>

## Good

- Best condition
- Recently built
- No signs of cracking, buckling, substantial overgrowth of vegetation, and minimal debris
- Width is adequate
- Pedestrians would have no issues traversing



Figure 1. A "good" sidewalk located along Eisenhower St. Source: SMCOG

## Fair

- Medium condition
- Older
- Signs of slight cracking, some vegetation and debris
- Pedestrians might have issues traversing



Figure 2. A "fair" sidewalk on east Bond St. Source: SMCOG

## Poor

- Worst condition
- Oldest
- Major cracking and buckling, nearly covered by vegetation
- Partially or completely inaccessible

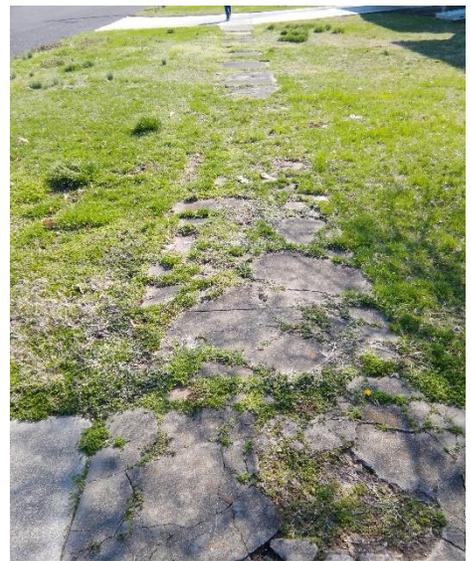


Figure 3. A "poor" sidewalk located near the intersection of Park and Fifth St. Source: SMCOG

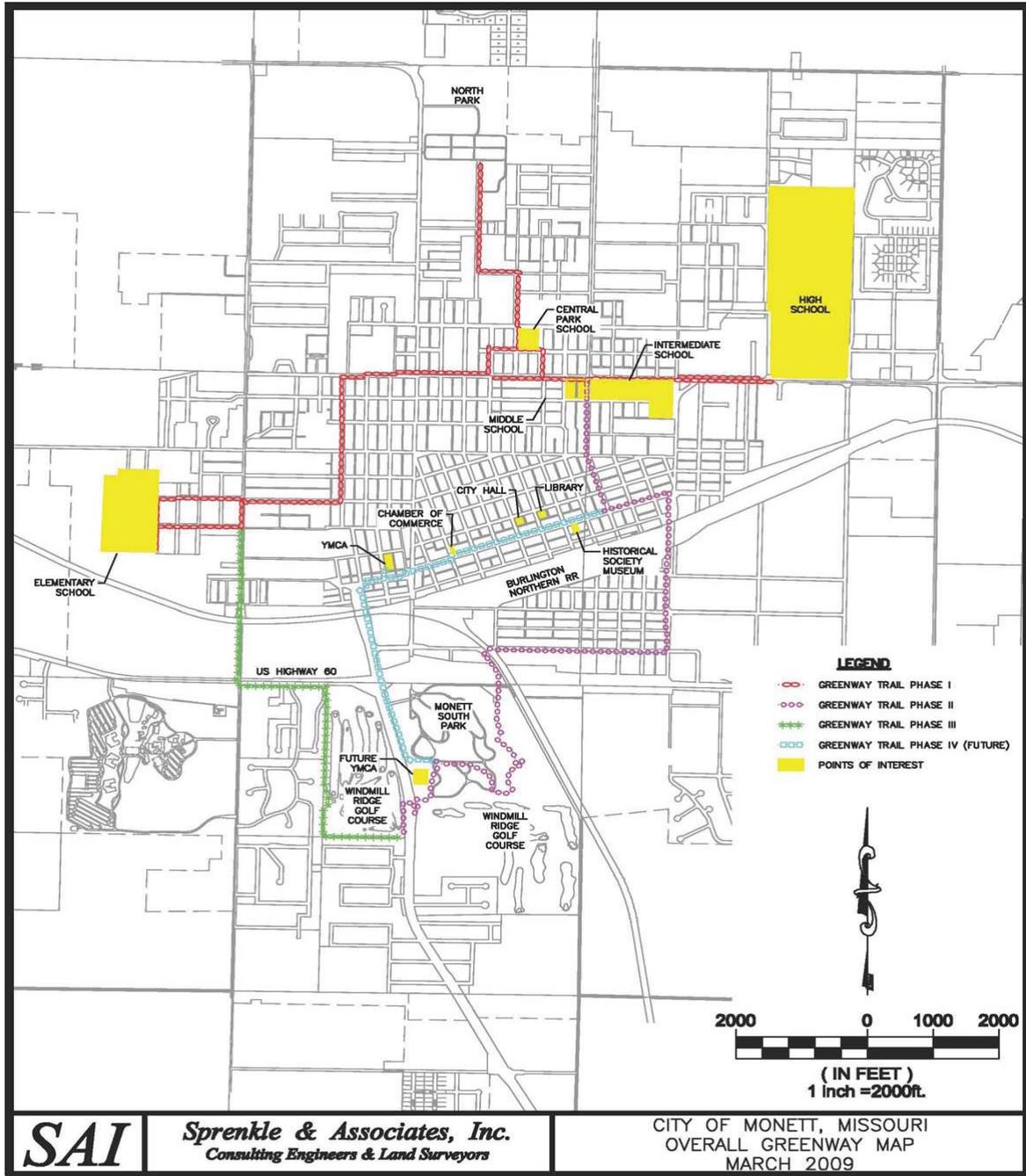
## Brick Construction

There are many segments of brick sidewalk throughout the city. Upon request of city officials, these segments have been noted. Though brick sidewalks are not typically considered ADA violations, most of the brick segments in Monett exhibit severe accessibility issues. Many of these sidewalks are extremely uneven, overgrown or damaged, and are difficult for users without disabilities to traverse; the majority of these sidewalks are undoubtedly impassible to users with disabilities.

# GREENWAY TRAIL

An extensive trail network has been in development and covers a substantial portion of the city. This trail provides the opportunity to highlight points of interest like schools and recreational facilities. The Greenway serves as an excellent walking route for both citizens and visitors to easily get around the city and its attractions, showing the importance of the Greenway Trail to the rest of the city.

Figure 4. Greenway Trail Development



# SIDEWALK CONDITIONS MAP

Figure 5. Current Sidewalk Conditions

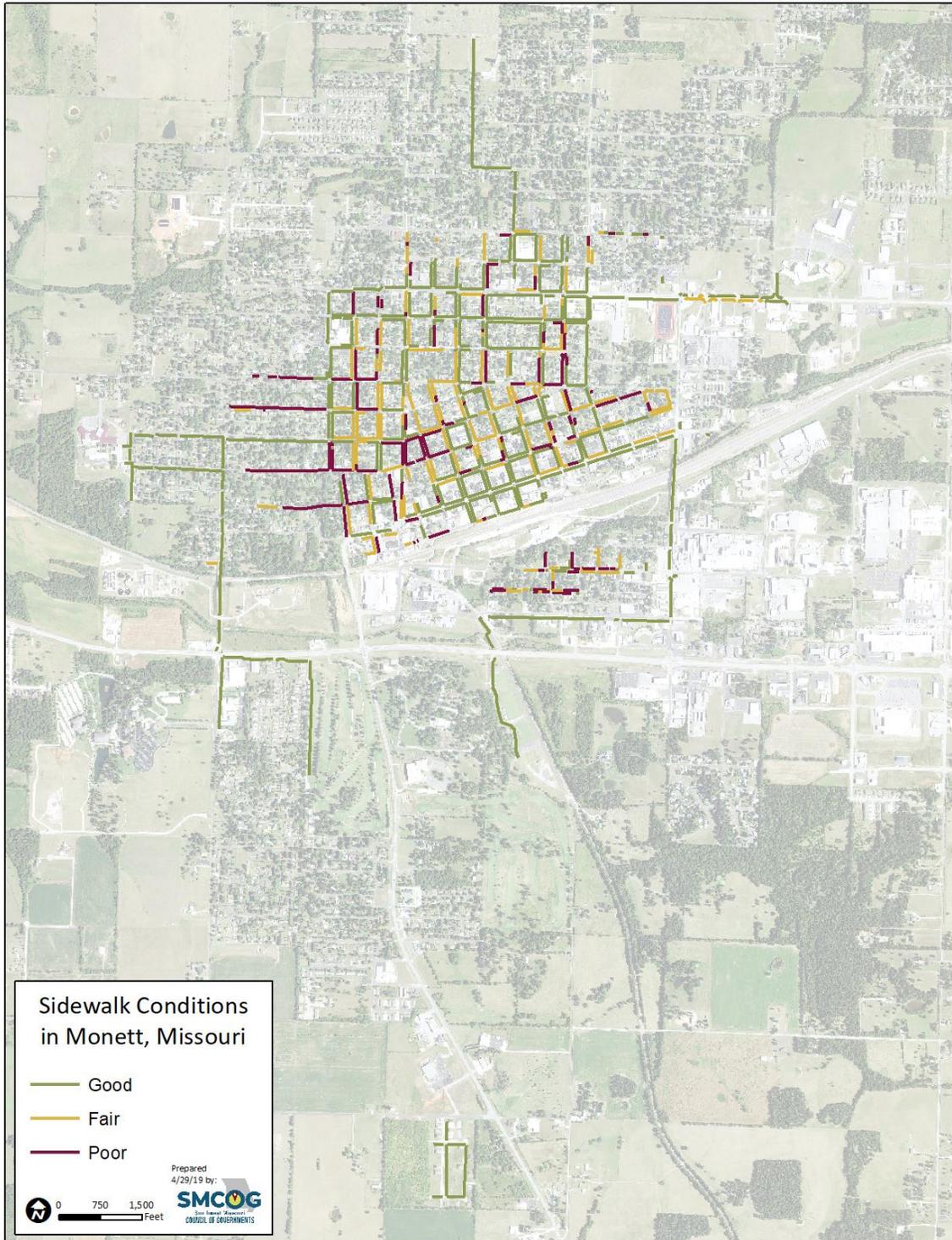


Figure 6. Current Center City Conditions

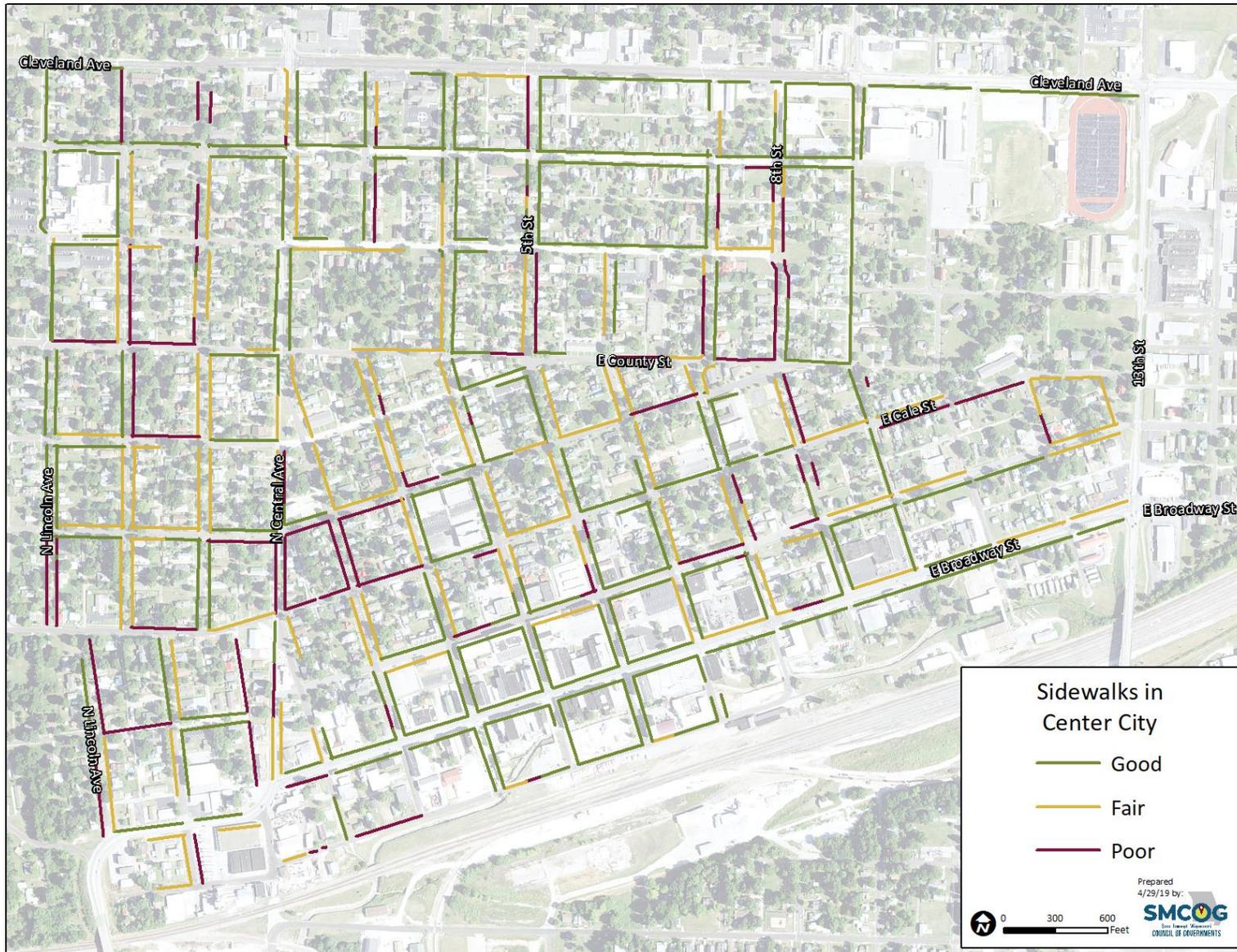


Figure 7. Current Conditions West of Lincoln Avenue

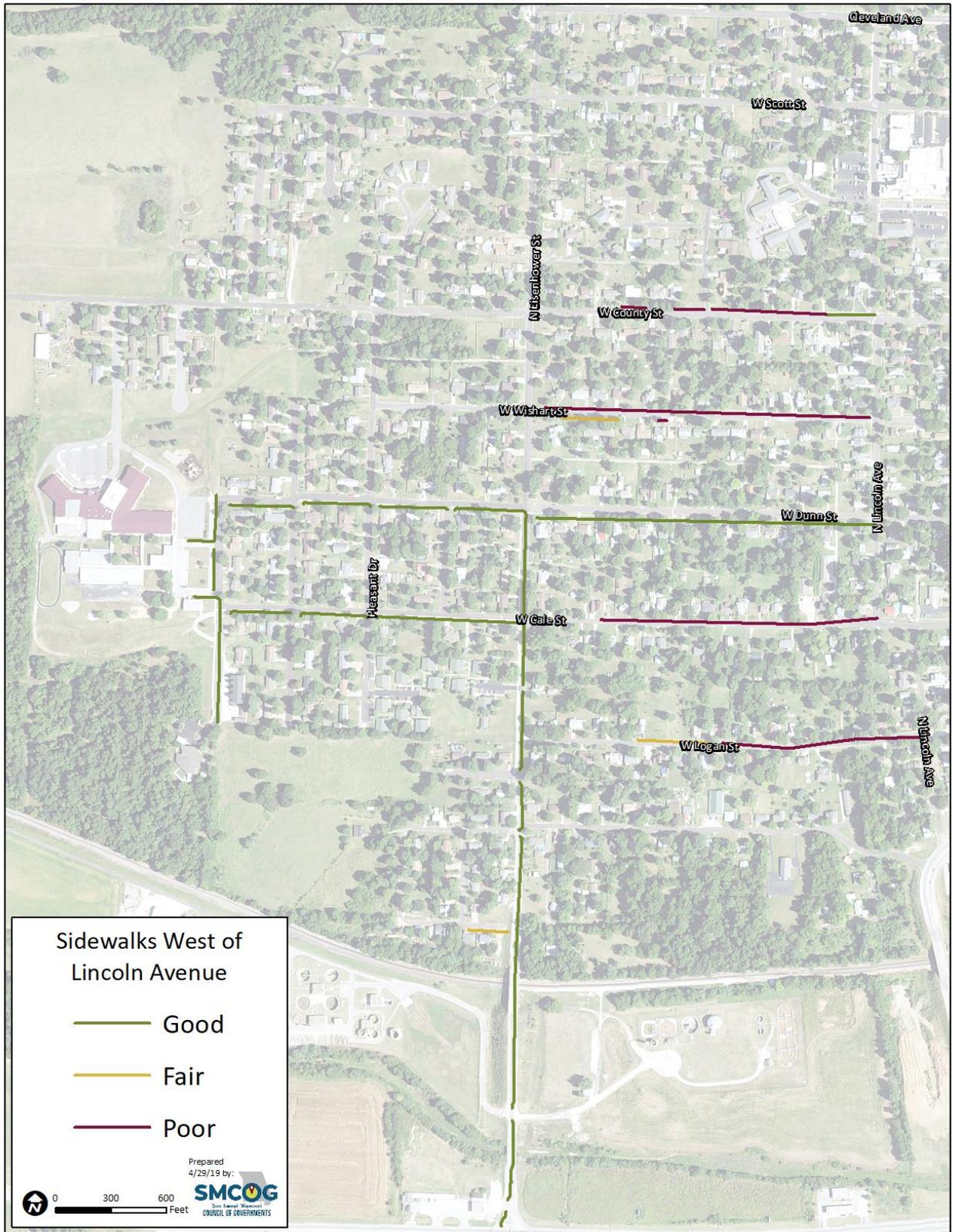


Figure 8. Current Conditions South of Front Street

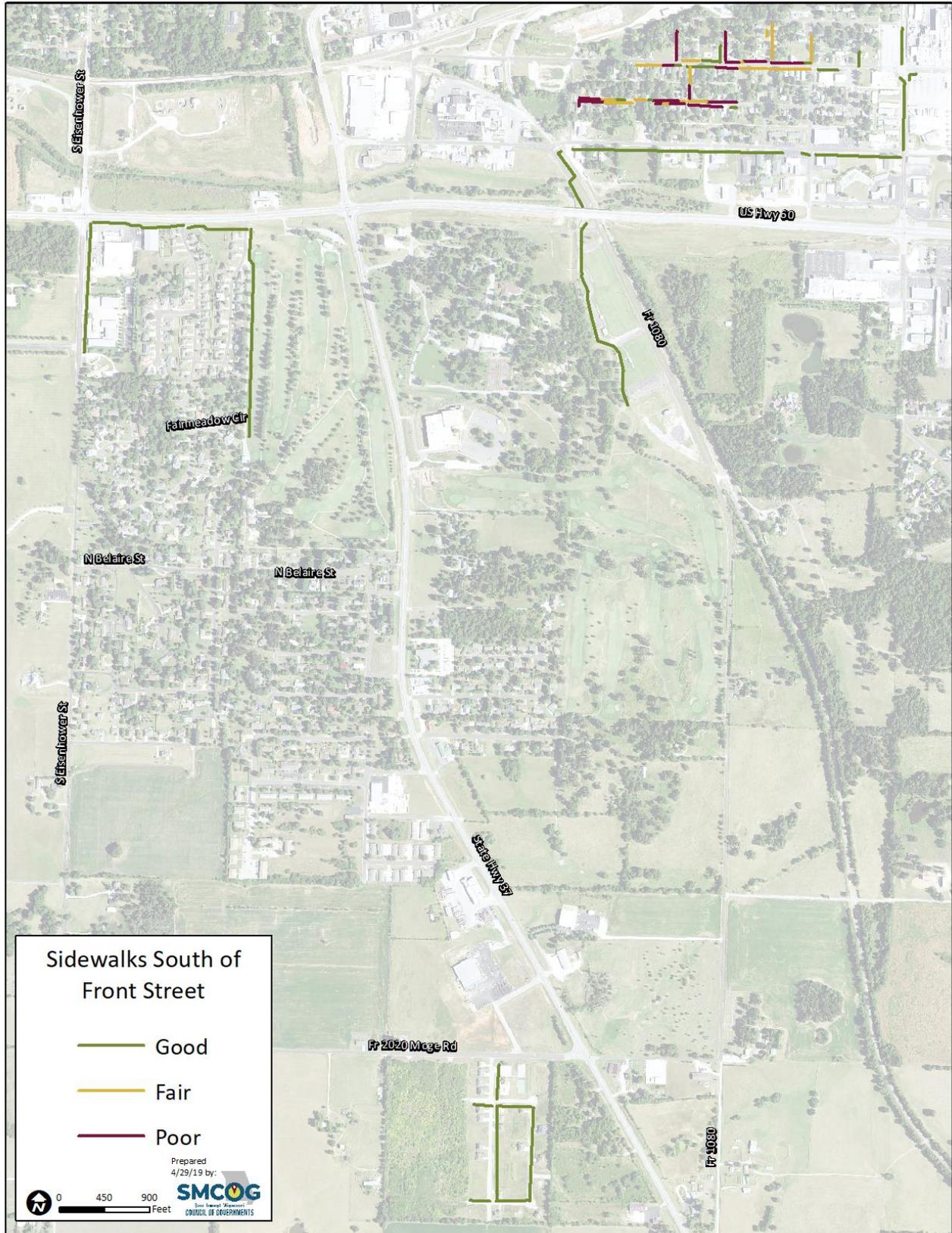
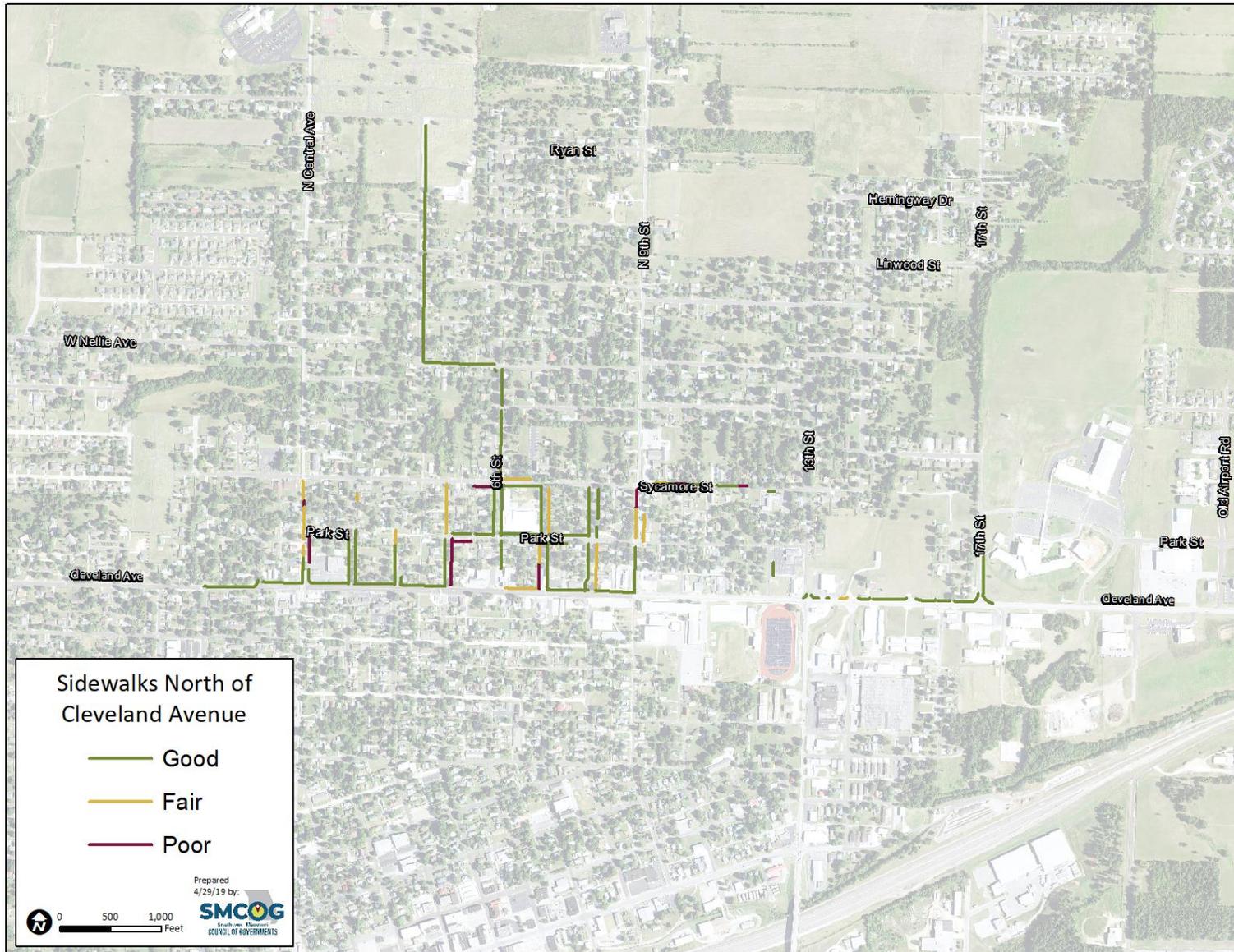


Figure 9. Current Conditions North of Cleveland Avenue



# ANALYSIS

In general, Monett’s sidewalks are unevenly maintained throughout the city. Long stretches of good sidewalk are interrupted with a section that is either fair or poor. Likewise, crosswalks that seem to have been updated recently will connect to a deteriorating sidewalk segment. The city should focus on repairing its fair and poor sidewalks in order to provide a network that is easily traversable by all citizens. When evaluating the current sidewalk system, there are three primary considerations taken into account:

- Location
- Connectivity
- Accessibility

## Location

The majority of sidewalks in Monett are located in older neighborhoods near the center of the city, especially in the downtown area. Networks have been extended outward over the years, likely to accommodate for expanding city limits and relocation of schools to the outskirts. With the presence of high-quality sidewalks near Monett’s schools, it is evident that special attention has been given to providing safe routes for children who walk to school. Signs, as shown in **Figure 10** have also been posted along these routes to help guide parents and children.

Moving outward from the center of the city, sidewalks become increasingly rare. Many of Monett’s residential subdivisions do not have an existing sidewalk network. The lack of sidewalks in the northeastern, western, and southern parts of the city could prove to be dangerous to those who enjoy exercising or taking leisurely walks outside; these users are forced to share the road with passing vehicles.

## Connectivity

A connected sidewalk system is one of the most beneficial transportation options a city can offer. The connectivity of a city’s sidewalk network can be negatively affected either by gaps in the system or segments in poor condition. These issues can create obstacles for those with disabilities but can also become dangerous when gaps in connectivity force pedestrians to walk in the street.

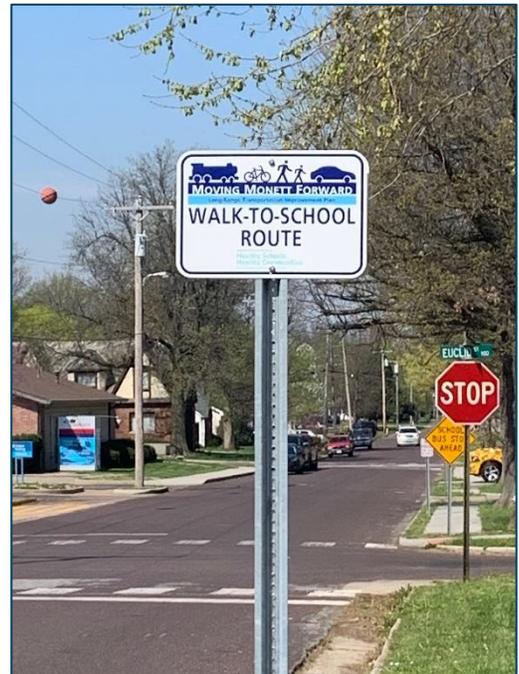


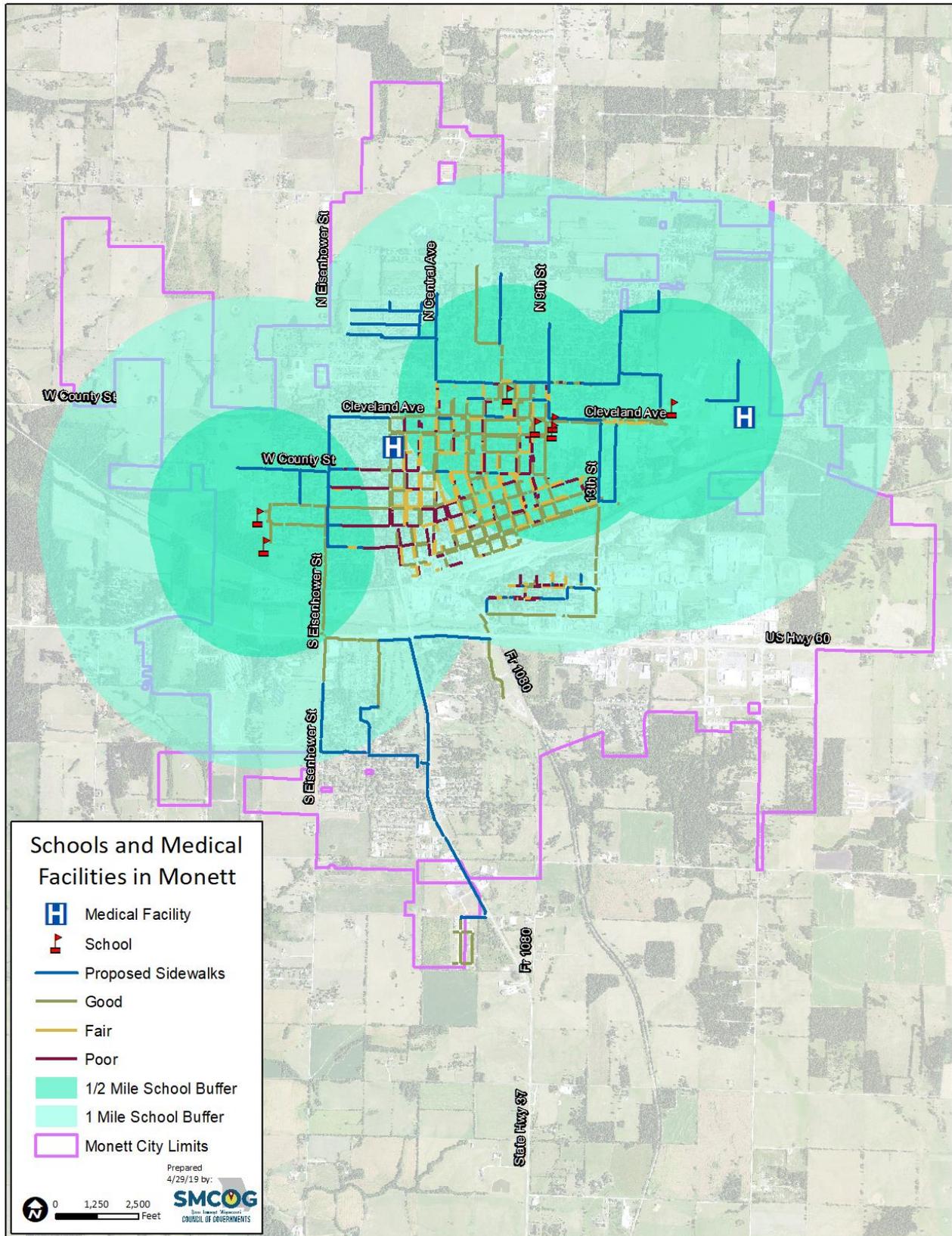
Figure 10. A sign marking one of the city’s “Walk-To-School” routes

## Analysis

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The City of Monett's sidewalk network should be replaced or expanded in four different areas to improve connectivity: North Monett, West Monett, South Monett, and the center city. The center city area extends south from Cleveland Avenue to Front Street between Lincoln Avenue and Thirteenth Street. The sidewalks in this area were primarily built in the 1940s by the Works Progress Administration (TranSystems, 2015). Currently, almost half of the sidewalks in this area are in fair or poor condition and will most likely need repaired or replaced within the next three to five years in order to maintain a well-connected network. As the sidewalks in the center city area are replaced, the City should shift its focus to repairs and replacement of existing sidewalks in the north, west, and south sides of Monett, and then expansion of the network. Construction in these areas will serve the purpose of connecting outlying subdivisions without sidewalks to the existing network. Priority should be given to expanding the City's current "Walk-to-School Route" in these areas to provide safe passage for children. The proposed expansion in the southern portion of Monett could be considered an extension of the greenway trail system.

Figure 11. Schools and Medical Facilities



## Accessibility

Accessibility is a common concern for many communities and Monett is no exception. Cracks, uneven sidewalks, missing ramps, overgrowth, and gaps in the sidewalk system cause barriers for individuals attempting to navigate the sidewalk system. The 4.89 miles of poor condition sidewalks should be addressed in order to improve overall community accessibility. Additionally, action should be taken to significantly increase the presence of accessible ramps across the city. The fair-conditioned sidewalks will need to be monitored annually and should be improved to good condition as funds become available. **Table 2** below shows examples of each ADA concern, as well as the frequency of each concern along sidewalks in fair and poor condition. Maps showing the location of each observed ADA concern are provided in Appendix A.

The downtown area has several fair condition segments that will need addressed in the near future. Sidewalks are uneven and showing signs of weatherization. Additionally, the location of light poles reduces the width of the travel way and minimizes accessibility. Due to the high number of pedestrians in the downtown area, the City may want to look at replacing these sidewalks earlier than some of the others in worse condition.

Barriers to accessibility will need to be addressed in order to comply with the Americans with Disabilities Act (ADA). These concerns can be addressed over the next ten to fifteen years as resources become available, but identification is a necessary first step. The 2010 ADA standards do not require communities to immediately modify infrastructure or facilities built prior to March 15, 2012 if in compliance with the 1991 standards (Department of Justice, 2010). The intent is to not create an undue burden on communities and allow time to bring items into compliance.

**Table 2. ADA Concern Examples and Frequencies**

Issues	Picture	Location	Number of Occurrences	Poor	Fair
Brick 		718 E Broadway Ave	18	14	4
Cracks 		304 Frisco Ave	72	35	21
Dead End 		Near 8 <sup>th</sup> and Benton St	33	13	9

Analysis

Issues	Picture	Location	Number of Occurrences	Poor	Fair
<p>Narrow Portions</p> 		<p>Intersection of Euclid and Main St</p>	<p>8</p>	<p>6</p>	<p>1</p>
<p>No Ramp</p> 		<p>Intersection of 3<sup>rd</sup> and Dunn St</p>	<p>95</p>	<p>35</p>	<p>34</p>
<p>No Truncated Domes</p> 		<p>1455 Cleveland Ave</p>	<p>69</p>	<p>1</p>	<p>20</p>

Analysis

Issues	Picture	Location	Number of Occurrences	Poor	Fair
<p>Obstruction</p> 		<p>Near 8<sup>th</sup> and County St</p>	<p>27</p>	<p>12</p>	<p>9</p>
<p>Overgrowth</p> 		<p>504 4<sup>th</sup> St</p>	<p>103</p>	<p>62</p>	<p>29</p>
<p>Pothole</p> 		<p>Near 7<sup>th</sup> and County St</p>	<p>11</p>	<p>2</p>	<p>4</p>

Analysis

Issues	Picture	Location	Number of Occurrences	Poor	Fair
<p>Steep Grade Change</p> 		<p>404 E Bond St</p>	<p>3</p>	<p>1</p>	<p>0</p>
<p>Tree Root Damage</p> 		<p>602 E Bond St</p>	<p>79</p>	<p>30</p>	<p>37</p>
<p>Uneven Surface</p> 		<p>601 3<sup>rd</sup> St</p>	<p>109</p>	<p>63</p>	<p>36</p>

# MOVING FORWARD

This report is intended to provide an analysis of existing conditions as of March and April 2019. In the future, Monett should work to address the poor condition sidewalks in the existing system as first priority. It is important to maintain the existing sidewalk system and the cost of new sidewalks should be weighed with the cost of maintenance. The City will need to consider the financial resources required to correct current sidewalk concerns and may need to increase the annual budget for sidewalk improvements when possible. Improvements may be targeted first in the higher pedestrian areas such as the downtown and then along routes that provide connection to community facilities.

New sidewalks should be installed as new development occurs to increase overall community connectivity. There are approximately 10.3 miles of proposed new sidewalks throughout the entire city. **Figures 12-16** show the locations of the proposed new sidewalks. **Table 3** provides an overview of the proposed sidewalk segments including length and estimated cost. The provided estimates do not include costs for potentially necessary stormwater management projects. Anderson Engineering of Monett compiled an itemized list of costs per proposed segment, which is available in Appendix B.

**Table 3. Proposed Sidewalk Segments**

Project ID	Proposed Sidewalk Segment	Approximate Length	Estimated Cost
A	Extension of sidewalk from Plum St. to Ryan St. along 6 <sup>th</sup> St.	1,629 ft.	<b>\$128,130</b>
B	17 <sup>th</sup> St. from Hemingway Dr. to Linwood St., along Linwood St. to 14 <sup>th</sup> St., along 14 <sup>th</sup> St. to Sycamore St.	2,907 ft.	<b>\$234,820</b>
C	Completion of Sycamore St. between Central Avenue and 14 <sup>th</sup> St.	2,959 ft.	<b>\$234,904</b>
D	9 <sup>th</sup> St. from Hillcrest Dr. to Cleveland Ave.	2,031 ft.	<b>\$163,244</b>
E	Twin Hills Dr. from 14 <sup>th</sup> St. to 17 <sup>th</sup> St., along 17 <sup>th</sup> St. from Twin Hills Dr. to connect to existing sidewalk	1,629 ft.	<b>\$144,830</b>

Moving Forward

F	Old Airport Dr. from Woodland Ridge Dr. to Park St., along Park St. to the high school	1,725 ft.	<b>\$145,284</b>
G	Central Ave from Douglas St. to Sycamore St.	1,989 ft.	<b>\$147,380</b>
H	Nellie Ave from Central Ave to Ridgemont Ave	2,126 ft.	<b>\$173,832</b>
I	Penzance St. from Ridgemont Ave to Frisco Ave, along Frisco Ave from Prairie Ln to Nellie Ave	2,078 ft.	<b>\$170,450</b>
J	Prairie Ln from Ridgemont Ave to Frisco Ave, along Lincoln Ave from Kingsley Dr to Prairie Ln, along Frisco Ave from Kingsley Dr to Prairie Ln	2,042 ft.	<b>\$171,670</b>
K	Park St. from 8 <sup>th</sup> St. to 9 <sup>th</sup> St., from 4 <sup>th</sup> St. to 5 <sup>th</sup> St.	662 ft.	<b>\$63,738</b>
L	Cleveland Ave from Eisenhower St. to Lincoln Ave, from Central Ave to 3 <sup>rd</sup> St., from 5 <sup>th</sup> to 6 <sup>th</sup> St., from 9 <sup>th</sup> to 13 <sup>th</sup> St.	3,378 ft.	<b>\$311,702</b>

Moving Forward

M	14 <sup>th</sup> St. from Cleveland Ave to Broadway St., along Broadway from 14 <sup>th</sup> St. to 13 <sup>th</sup> St.	2,000 ft.	<b>\$178,742</b>
N	13 <sup>th</sup> St. from Cleveland Ave to Broadway St.	1,870 ft.	<b>\$148,034</b>
O	Completion of County St. from 6 <sup>th</sup> St. to Learning Ln, along Pleasant Dr. from County St. to Dunn St.	3,682 ft.	<b>\$293,176</b>
P	Eisenhower St. from Cleveland Ave to Logan St., Cale St. connection, Logan St. connection	5,037 ft.	<b>\$378,114</b>
Q	Kay Dr. from Dairy St. to Pearl St., Pearl St. completion, Pearl St. to County Rd., County Rd. completion, Maple St. completion	1,963 ft.	<b>\$167,616</b>
R	Greenway connection along US 60 from Miller Way to Waldensian Rd, along State Highway 37 from US 60 to FR 2020, along FR 2020 from State Highway 37 to Aaron Ave	9,851 ft.	<b>\$1,307,316</b>

**Moving Forward**

S	Southern Heights from State Highway 37 to Meadowlark, along Meadowlark from S Belaire Dr. to N Belaire Dr., along N Belaire Dr. from Meadowlark to Eisenhower, along Eisenhower from N Belaire Dr. to existing sidewalk near Countryside Care Center	4,238 ft.	<b>\$601,334</b>
T	Southgate Ave from N Belaire Dr. to E Plymouth Hills Dr., along E Plymouth Hills Dr. from Southgate Ave to Fairmeadow Circle, along Fairmeadow Circle to existing greenway near the golf course	1,645 ft.	<b>\$125,284</b>

The city should implement a development requirement for new construction to include sidewalks. As an alternative a payment in lieu of construction could be made to the city for future sidewalk installation if the developer is not able to construct the required sidewalks. Additionally, the city may review options for cost-sharing sidewalk improvements with the adjacent property owner.

Funding may also be sought through the Missouri Department of Transportation (MoDOT) Transportation Alternative Program (TAP). These funds are available every two years and consider factors such as: number of project partners, public involvement, right-of-way ownership/acquisition, addressing ADA barriers, inclusion in a local plan, project cost, and local match contribution.

Figure 12. Proposed Sidewalk Segments

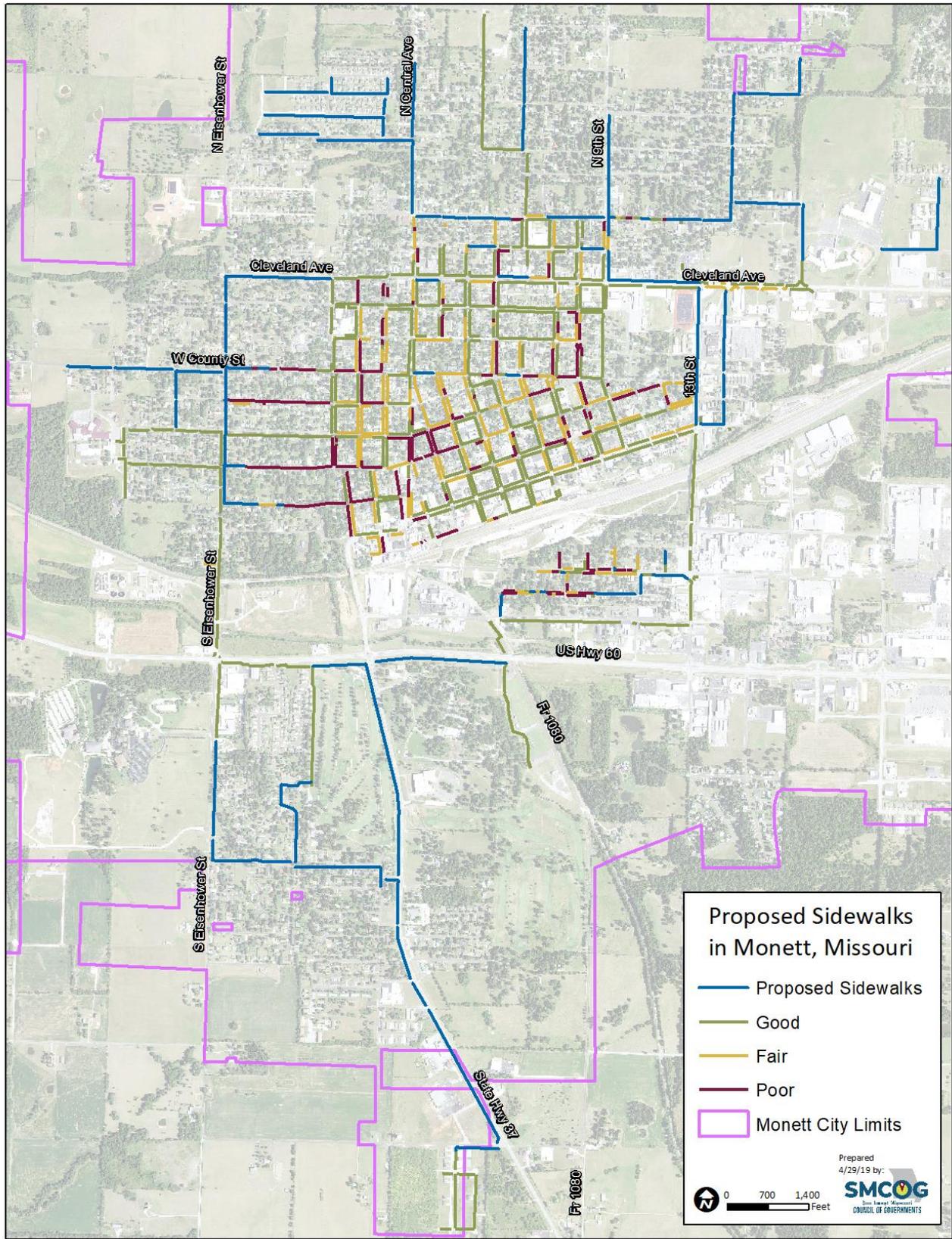


Figure 13. Proposed Sidewalks in the Center City Area

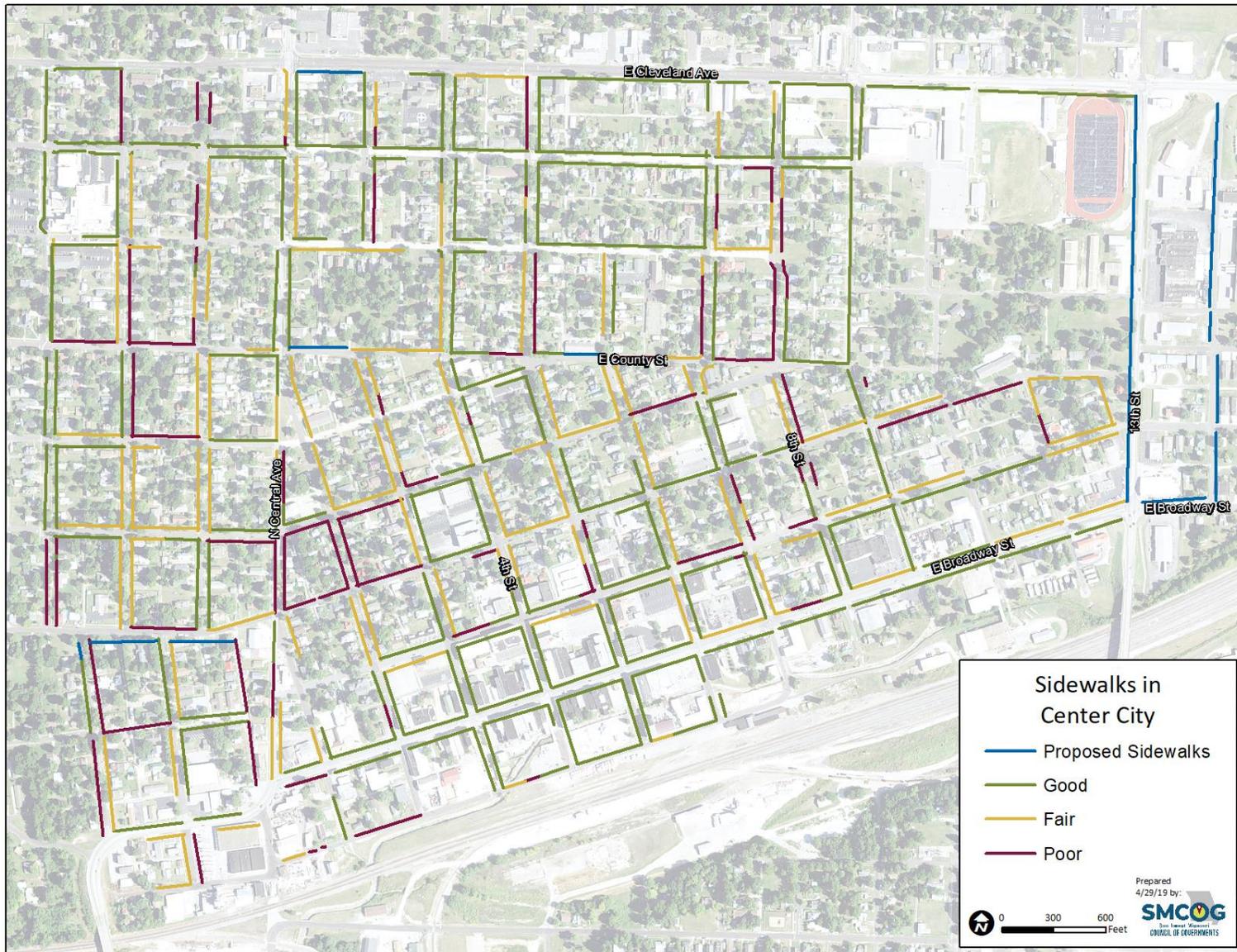


Figure 14. Proposed Segments West of Lincoln Avenue

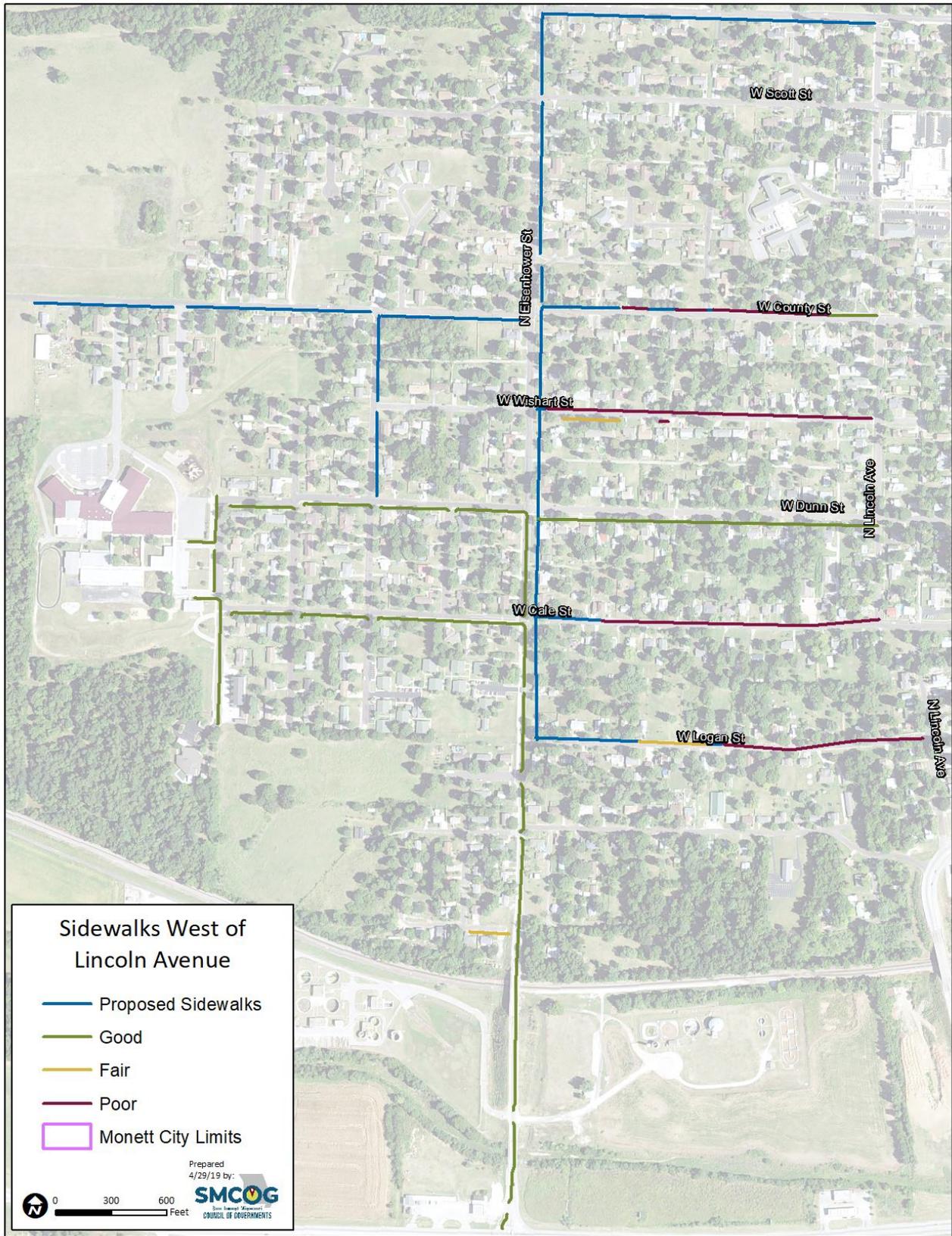


Figure 15. Proposed Segments South of Front Street

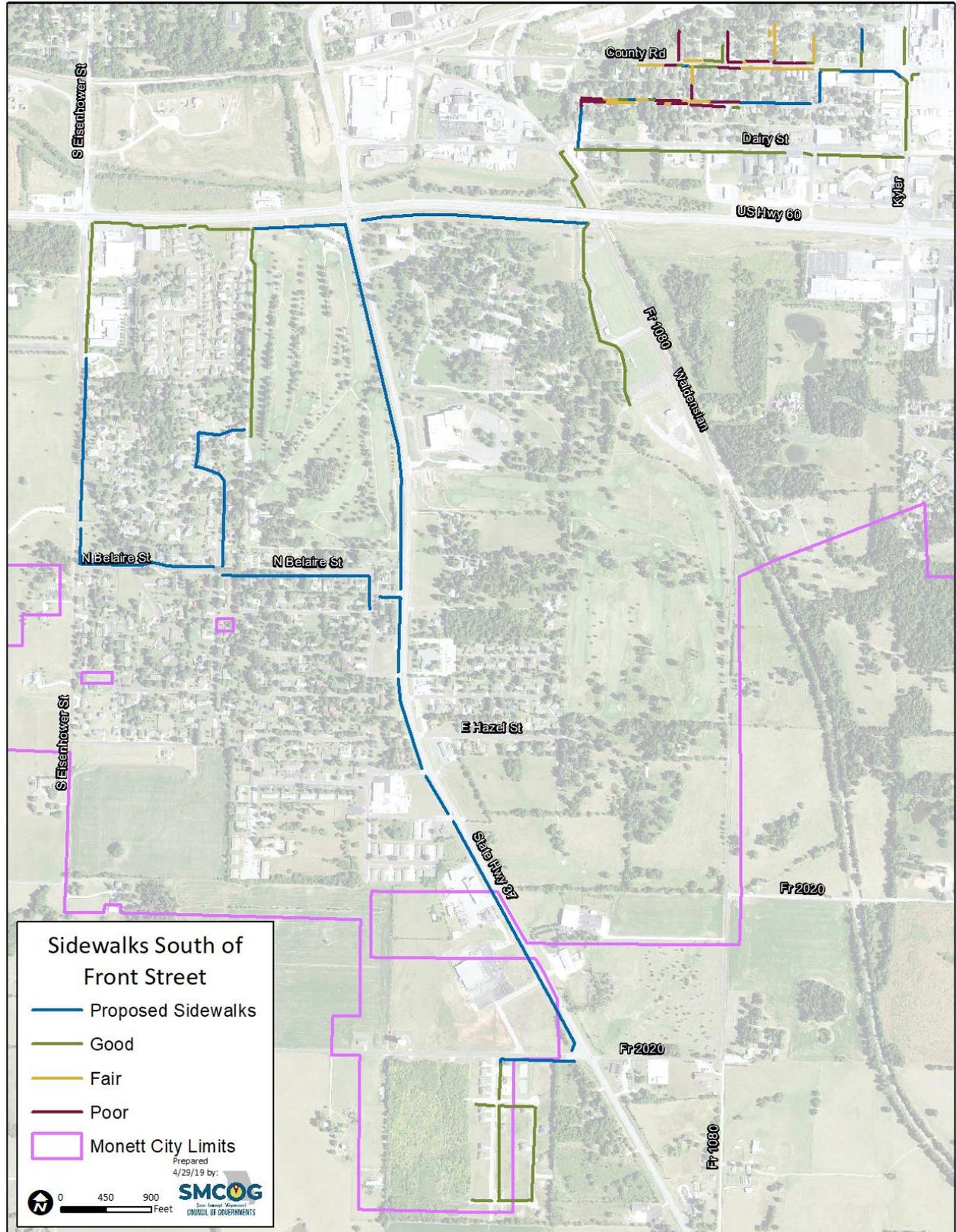
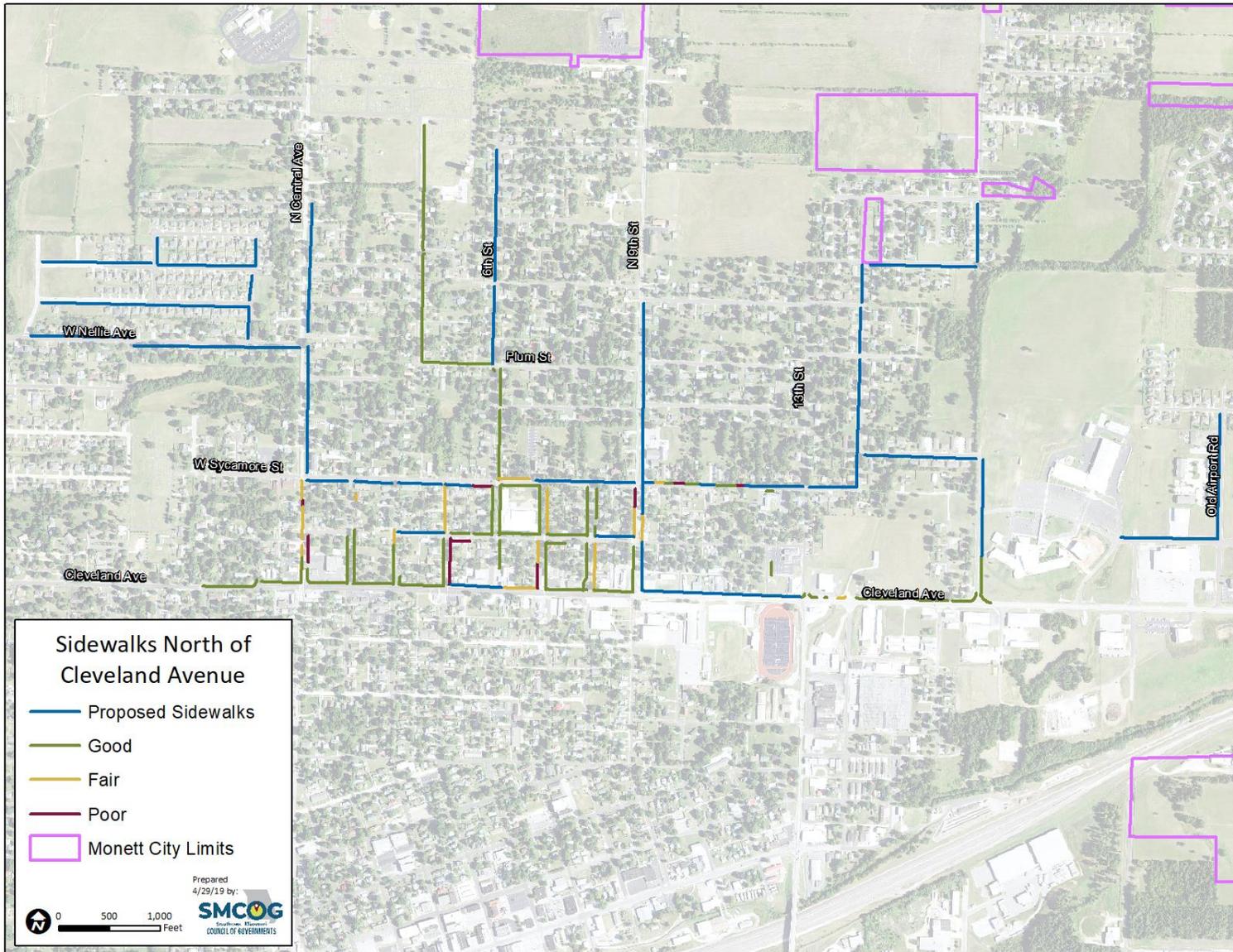


Figure 16. Proposed Sidewalks North of Cleveland Avenue

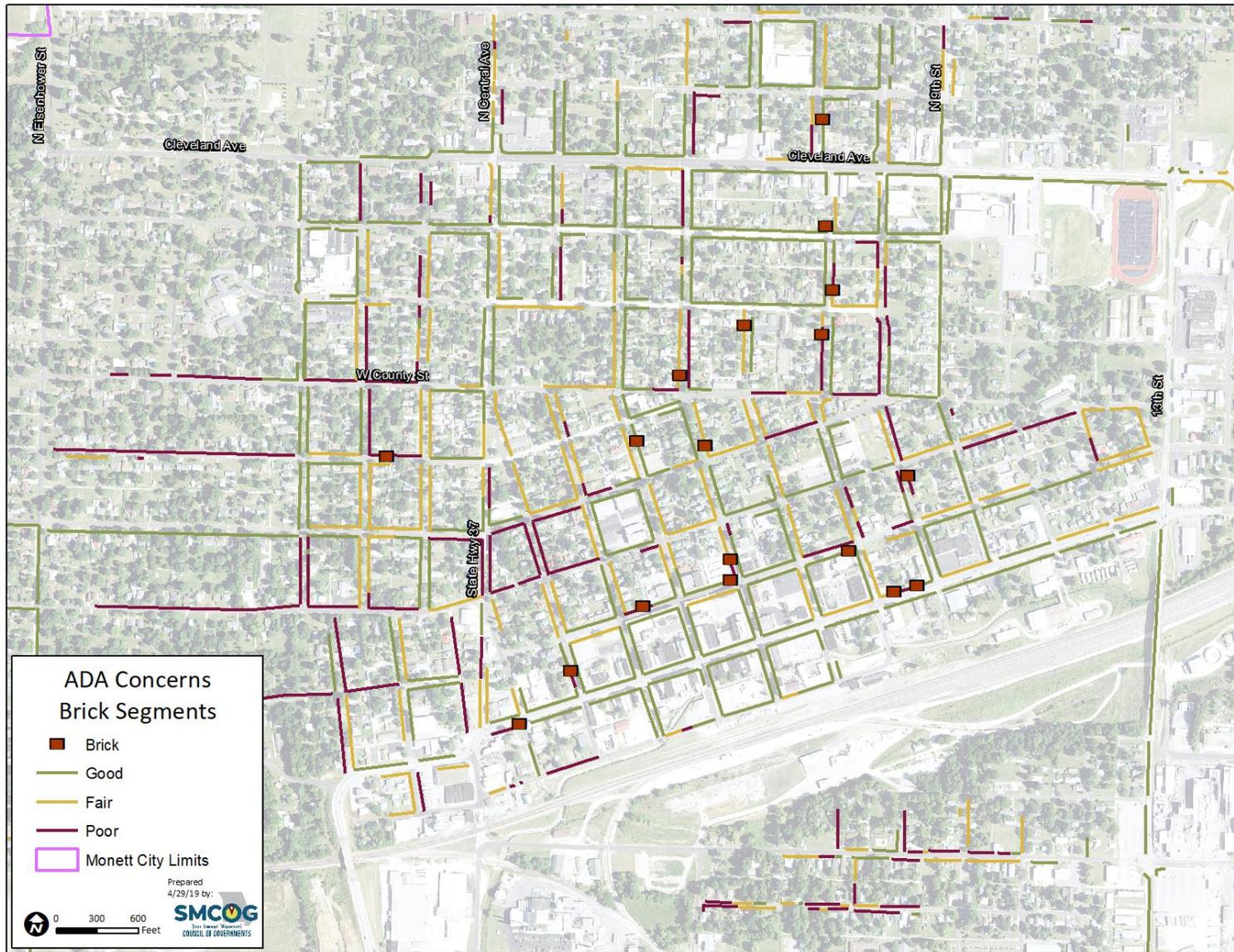


## REFERENCES

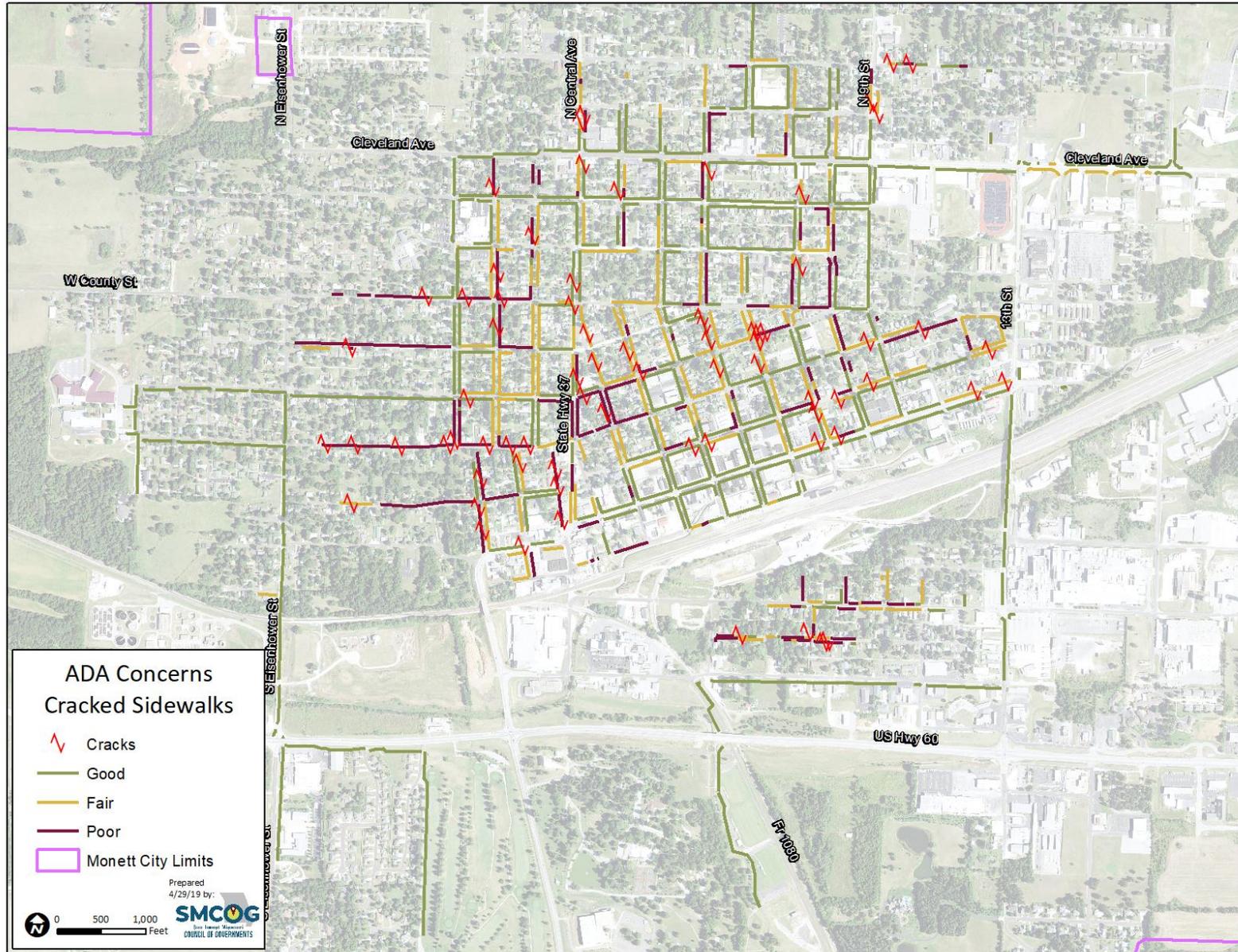
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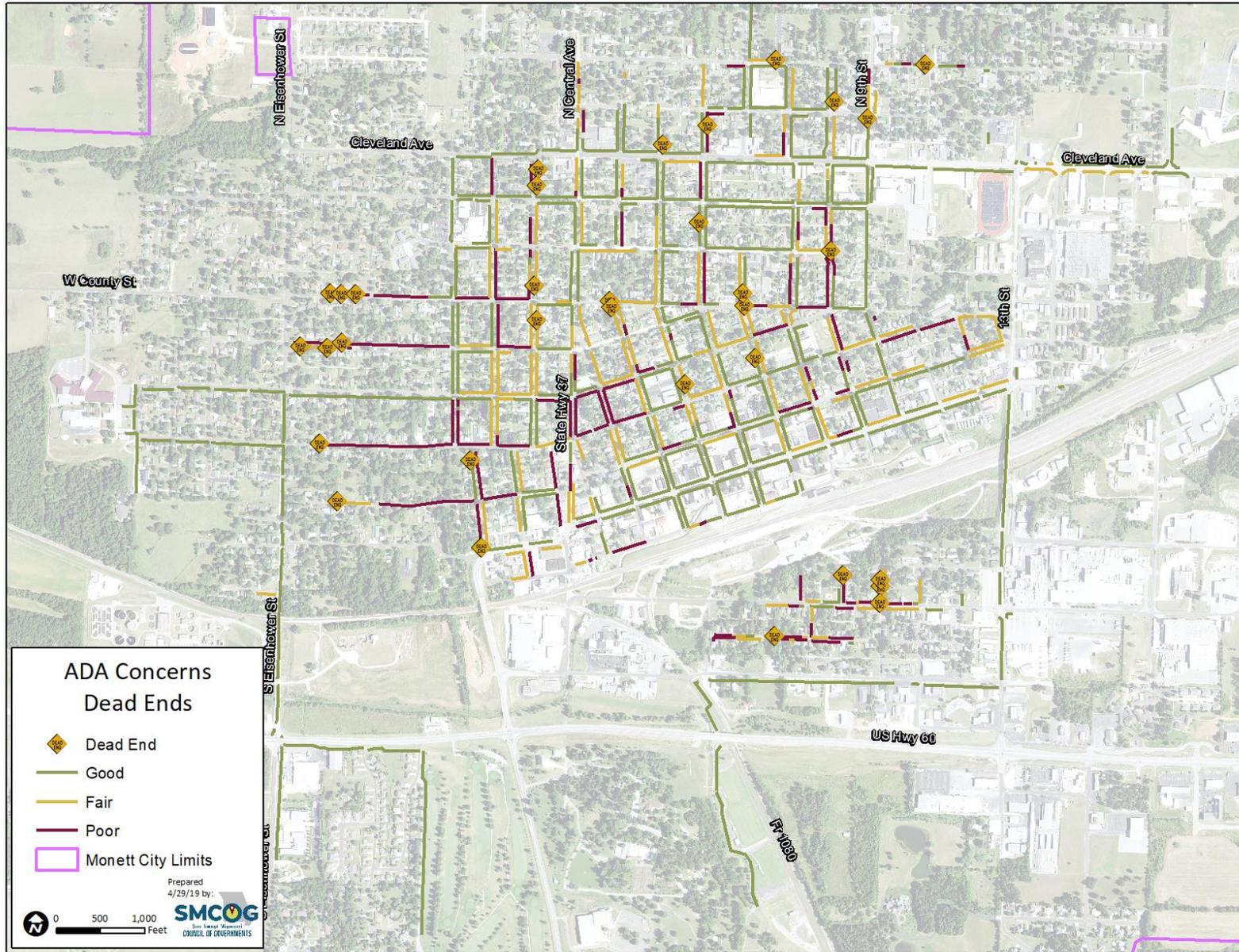
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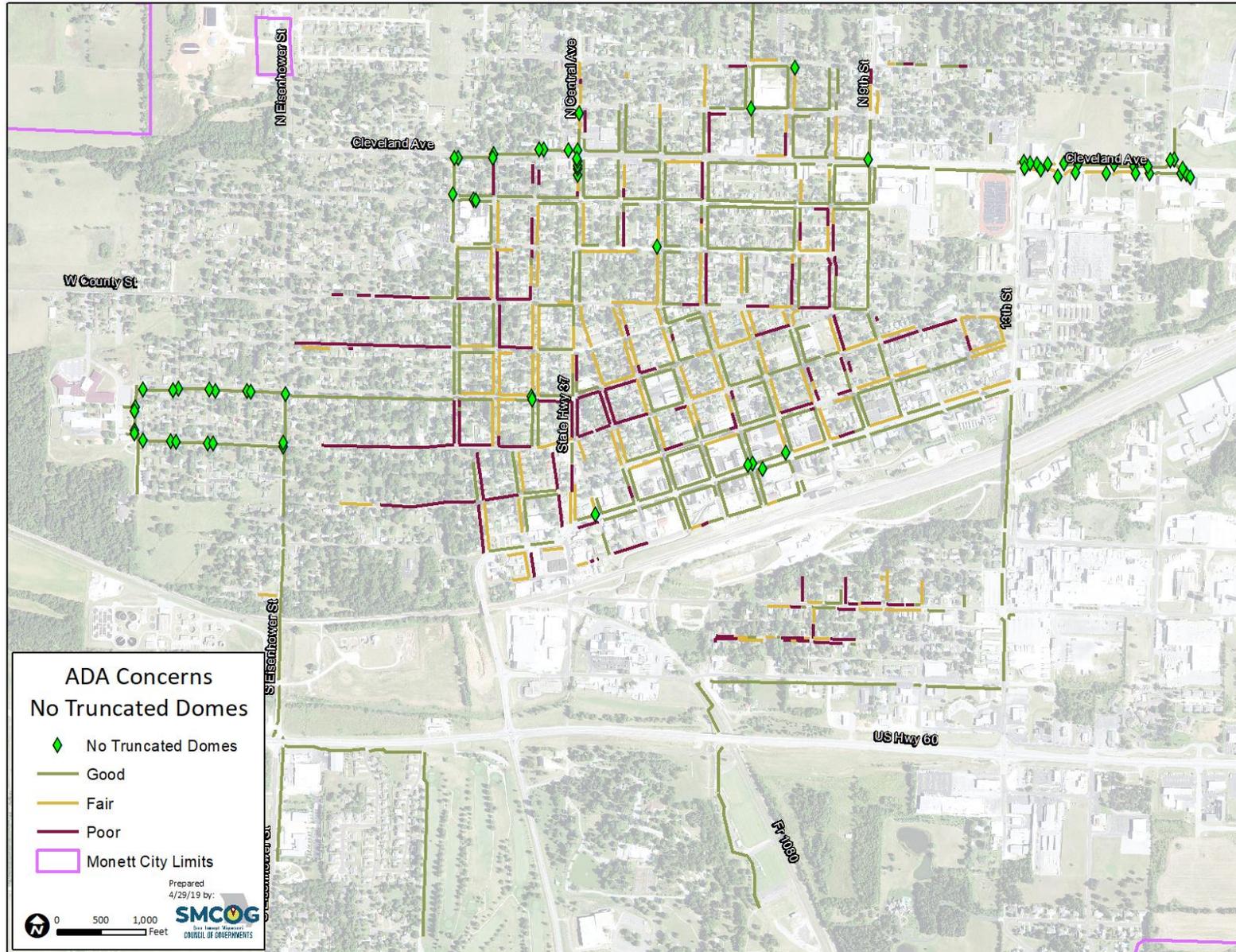
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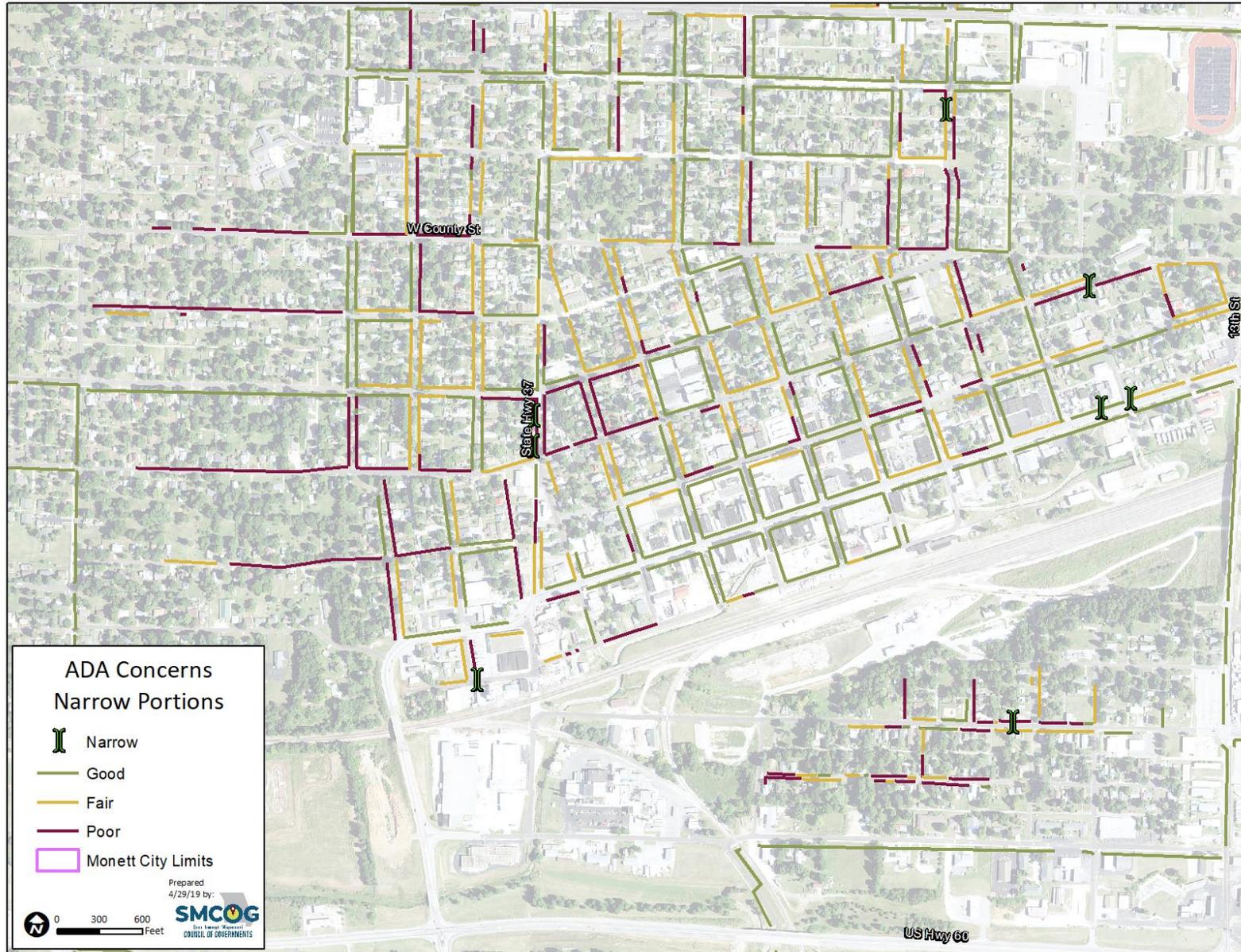


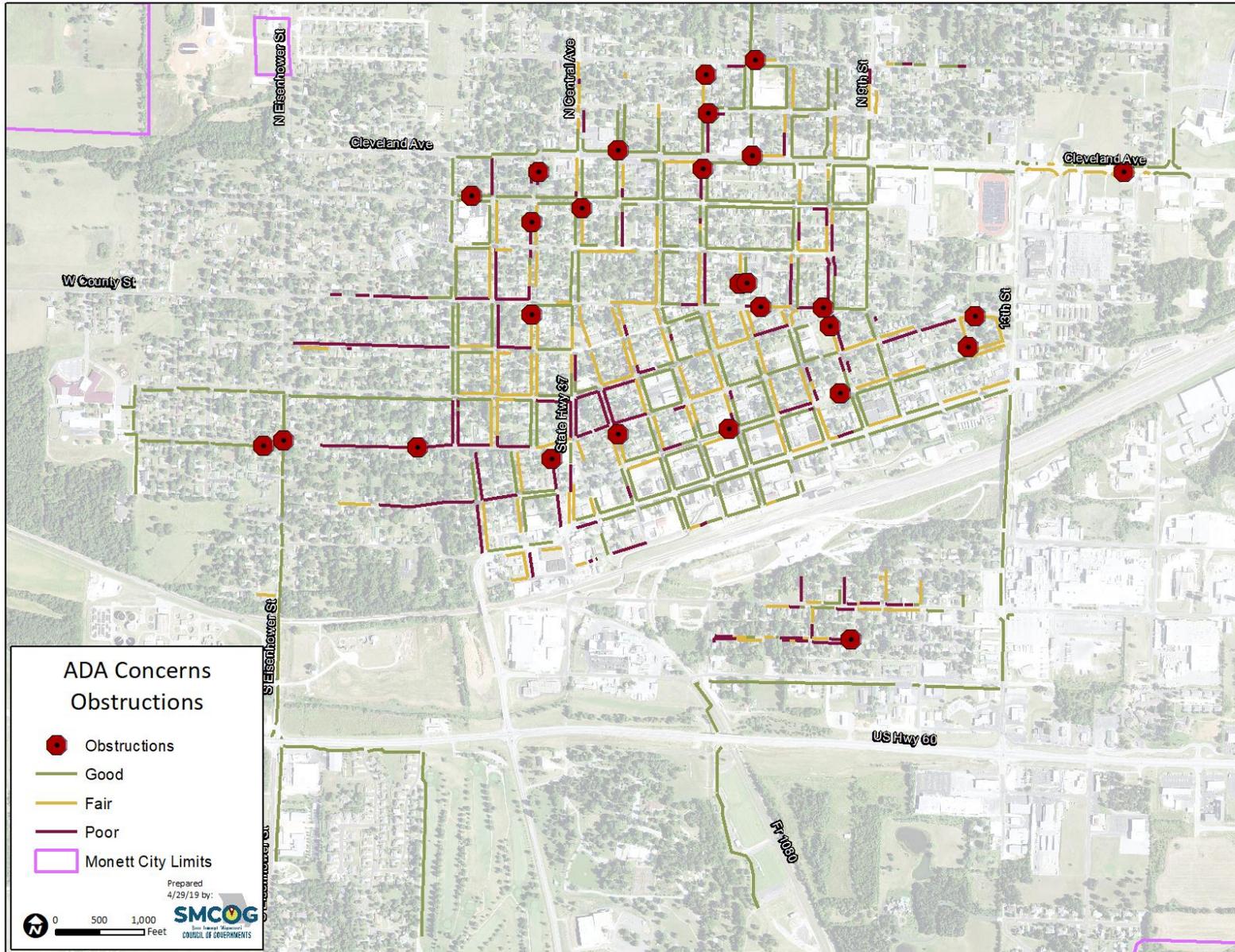
## APPENDIX A – ADA CONCERN LOCATIONS BY TYPE

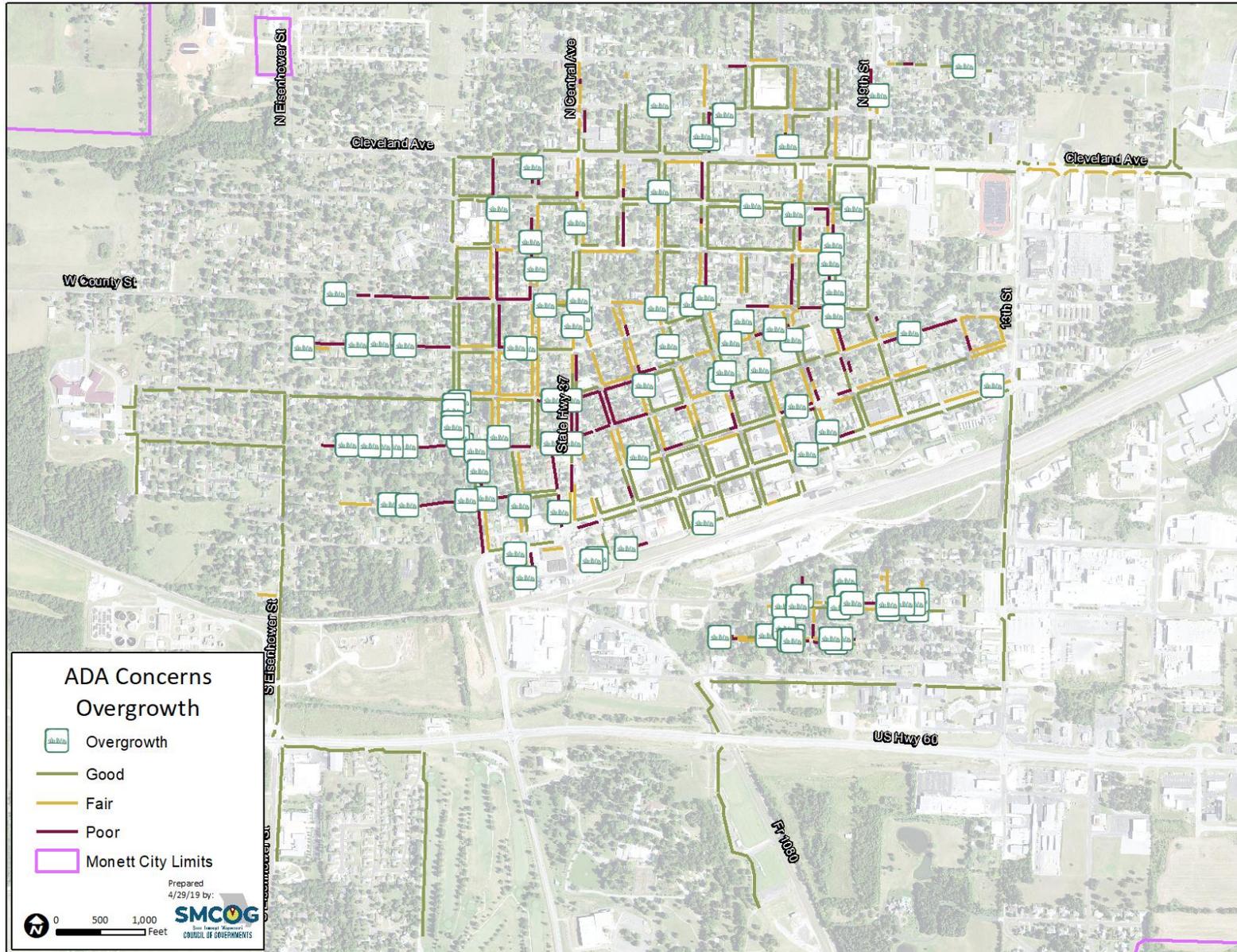


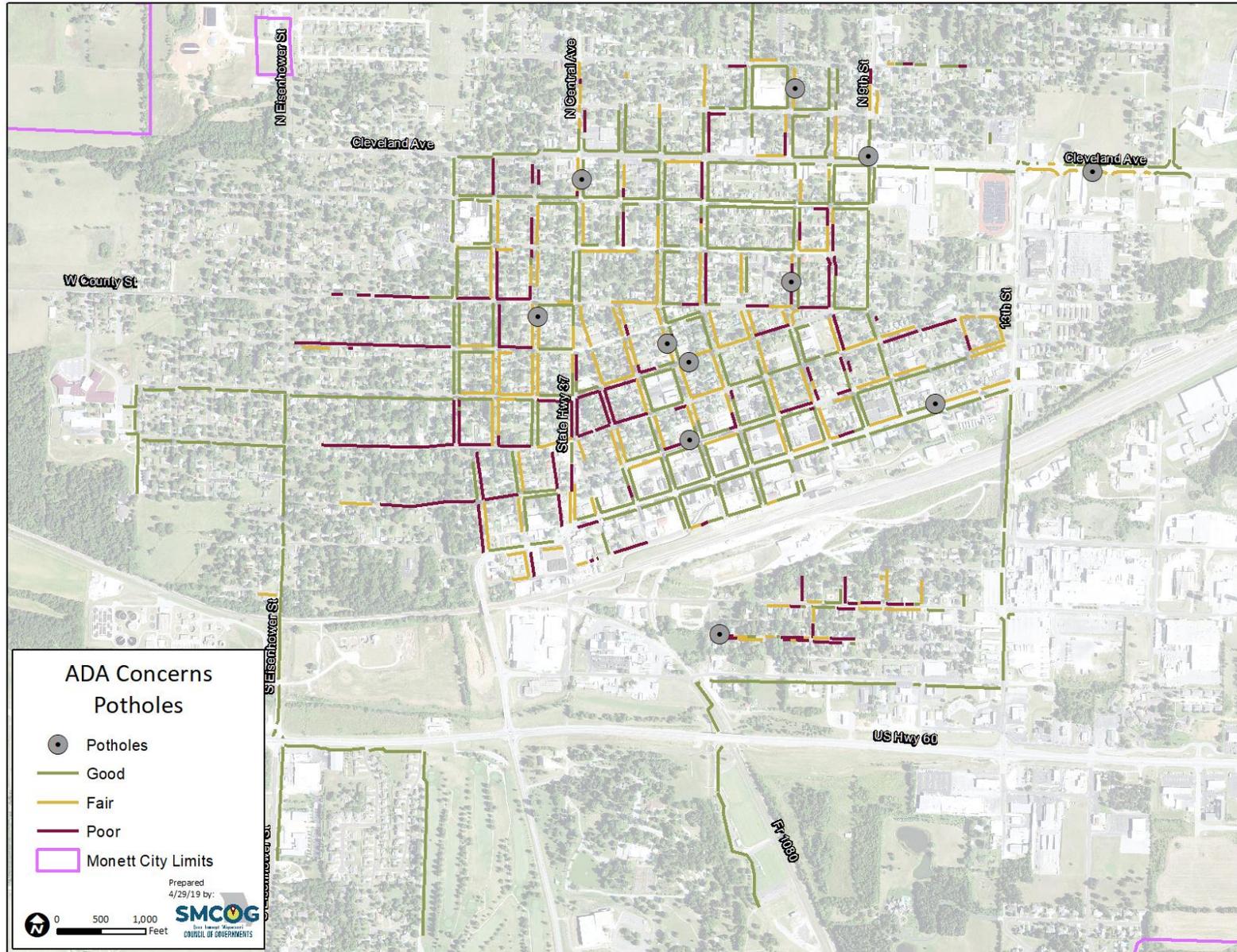




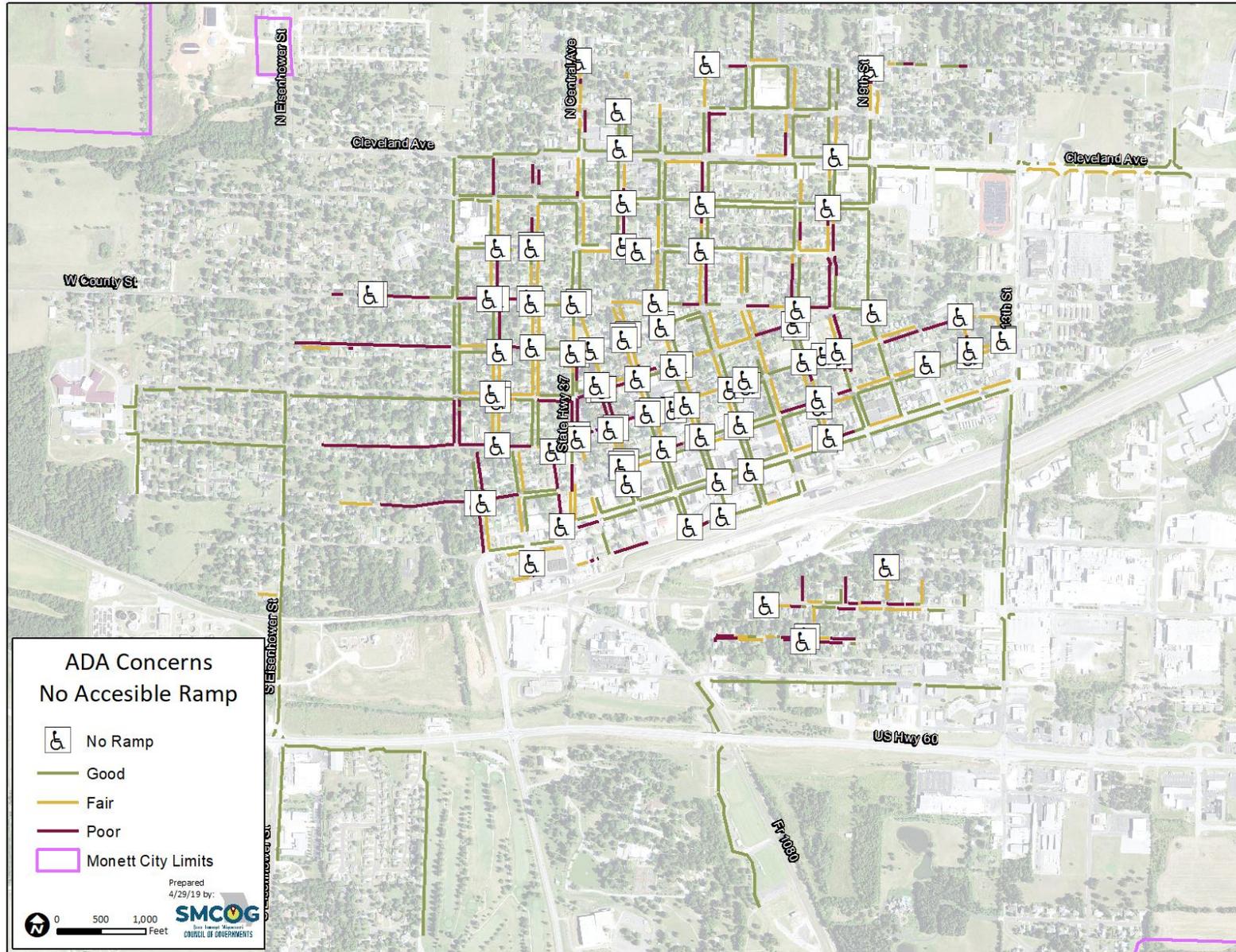


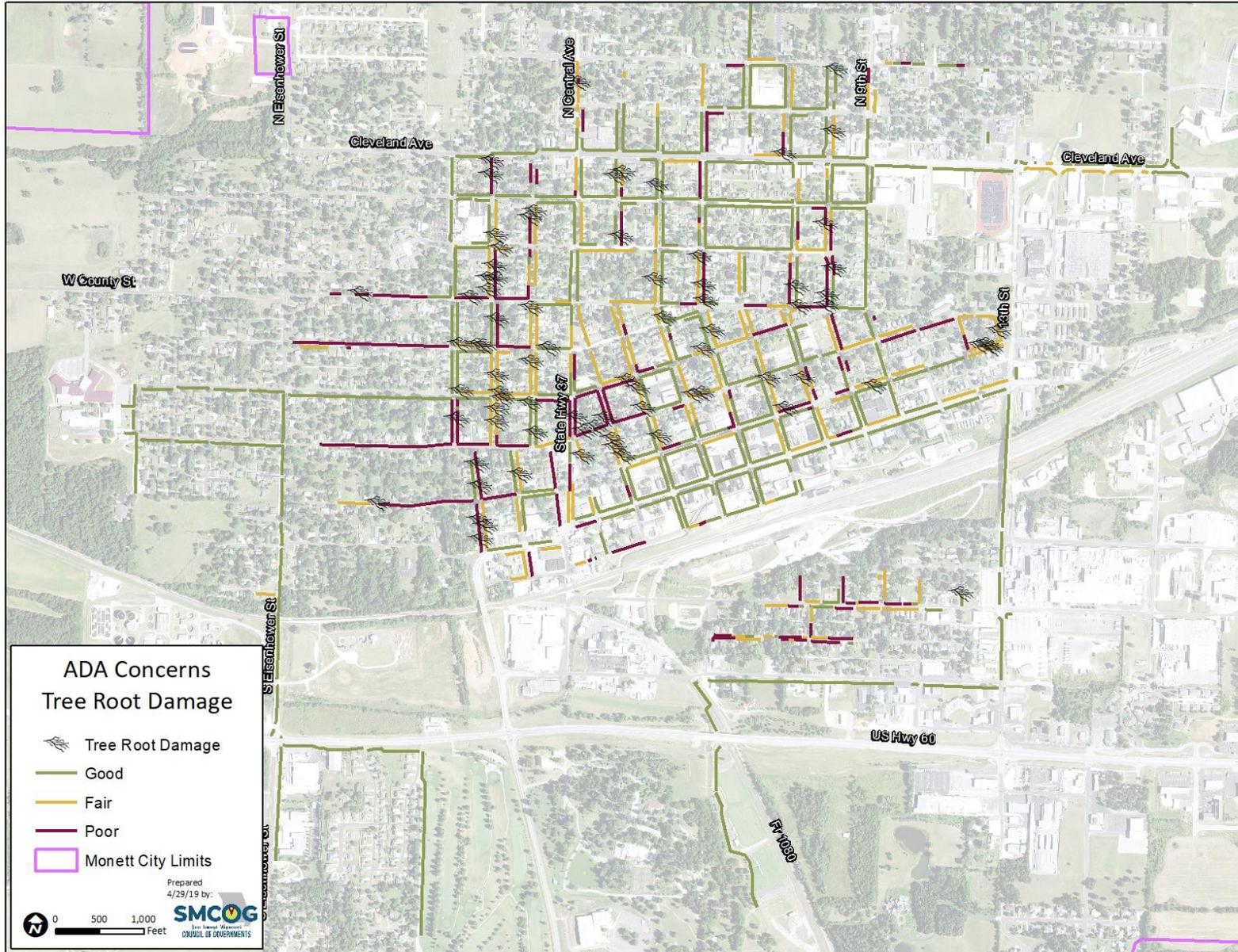


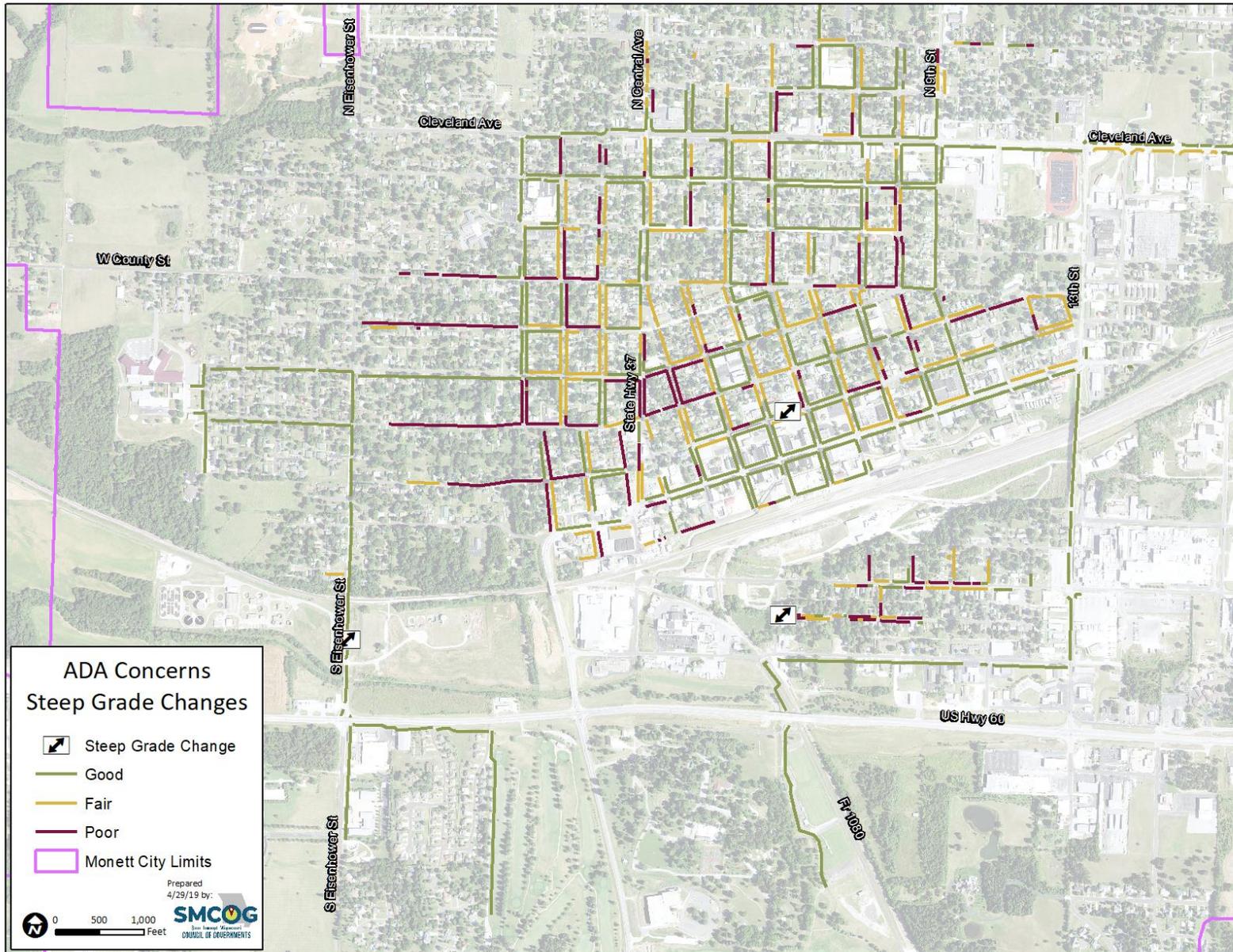


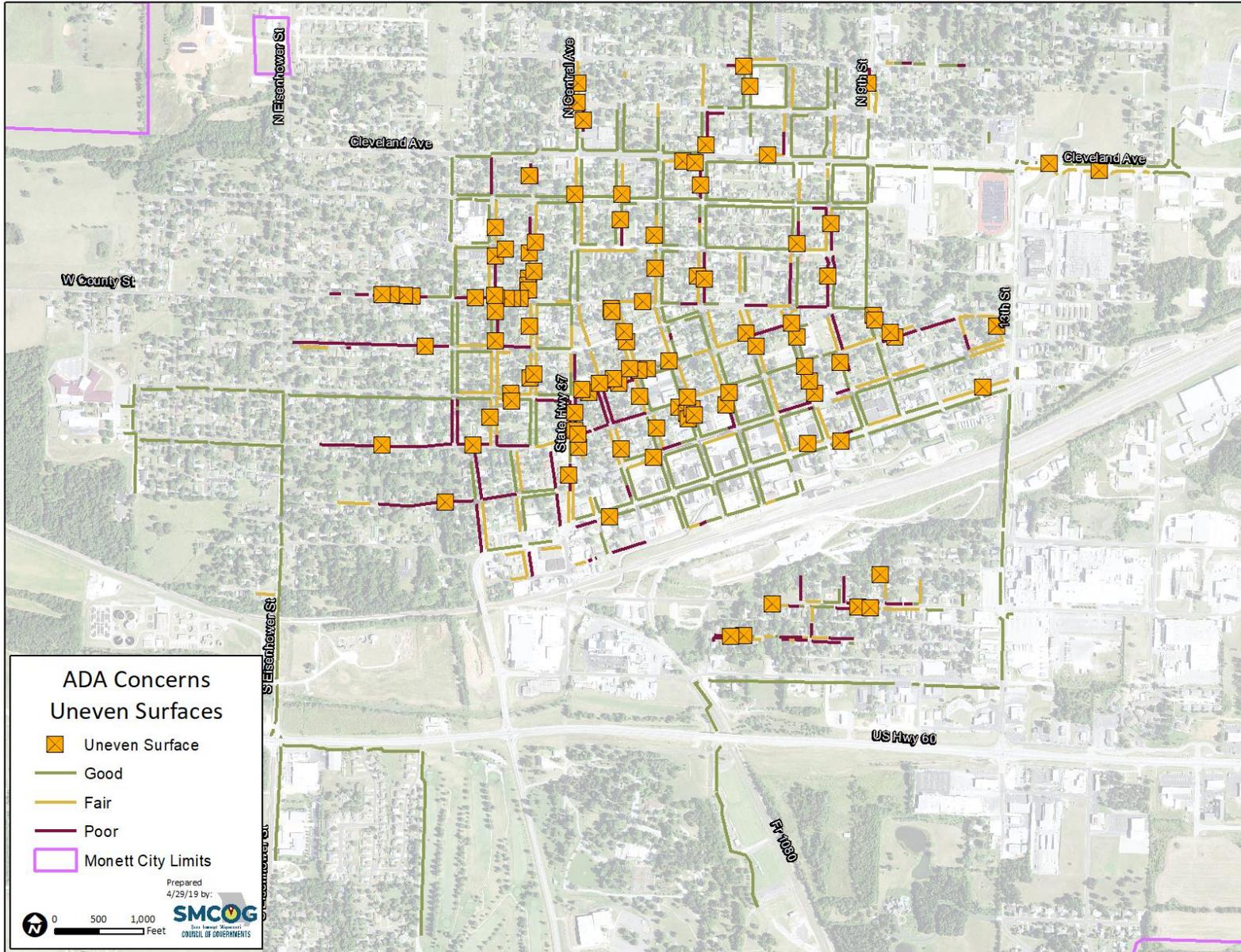


Appendix A – ADA Concern Locations by Type









**APPENDIX B – PROJECT COST ESTIMATES**

Appendix B – Project Cost Estimates

Project Designation	Proposed Sidewalk Segment	Approximate Length (ft)	Ramps	Approximate # of Driveways	Driveways Width	Path Width (ft)	Comments	Estimated Project Cost
A	Extension of sidewalk from Plum St. to Ryan St. along W 6 <sup>th</sup> St.	1,629	4	13	168.03	5		<b>\$128,130.00</b>
B	(W) 16 <sup>th</sup> St. from Hemingway Dr. to Linwood St., along (N) Linwood St. to 14 <sup>th</sup> St., along (E) 14 <sup>th</sup> St. to Sycamore St.	2,907	9	16	384.33	5		<b>\$234,820.00</b>
C	Completion of S Sycamore St. between Central Avenue and 6.5 St, N 7th to 14 <sup>th</sup> St.	2,959	12	16	280.49	5		<b>\$234,904.00</b>
D	E 9 <sup>th</sup> St. from Hillcrest Dr. to Cleveland Ave.	2,031	8	6	116.26	5		<b>\$163,244.00</b>
E	S Twin Hills Dr. from 14 <sup>th</sup> St. to 17 <sup>th</sup> St., along E 17 <sup>th</sup> St. from Twin Hills Dr. to connect to existing sidewalk	1,629	5	18	440.6	5		<b>\$144,830.00</b>
F	W Old Airport Dr. from Woodland Ridge Dr. to Park St., along N Park St. to the high school	1,725	2	6	390.96	5		<b>\$145,284.00</b>
G	(E) Central Ave from Douglas St. to Sycamore St.	1,989	4	13	186.81	5		<b>\$147,380.00</b>

Appendix B – Project Cost Estimates

Project Designation	Proposed Sidewalk Segment	Approximate Length (ft)	Ramps	Approximate # of Driveways	Driveways Width	Path Width (ft)	Comments	Estimated Project Cost
H	(S) Nellie Ave from Central Ave to North St, (N) from North St to Ridgemont Ave	2,126	4	20	415.32	5		<b>\$173,832.00</b>
I	(S) Penzance St. from Ridgemont Ave to Frisco Ave, along (W) Frisco Ave from Prairie Ln to Nellie Ave	2,078	5	21	393.15	5	16 existing driveways, predicting future construction of 5 driveways	<b>\$170,450.00</b>
J	(N) Prairie Ln from Ridgemont Ave to Frisco Ave, along (E) Lincoln Ave from Kingsley Dr to Prairie Ln, along (W) Frisco Ave from Kingsley Dr to Prairie Ln	2,042	10	17	138.97	5	14 existing driveways, predicting future construction of 3 driveways	<b>\$171,670.00</b>
K	(N) Park St. from 8 <sup>th</sup> St. to 9 <sup>th</sup> St., from (N) 4 <sup>th</sup> St. to 5 <sup>th</sup> St.	662	4	3	106.84	5		<b>\$63,738.00</b>
L	(N) Cleveland Ave from Eisenhower St. to Lincoln Ave, (N) from Central Ave to 3 <sup>rd</sup> St., (N) from 5 <sup>th</sup> to 6 <sup>th</sup> St., (N) from 9 <sup>th</sup> to 13 <sup>th</sup> St.	3,378	13	28	978.52	5		<b>\$311,702.00</b>

Appendix B – Project Cost Estimates

Project Designation	Proposed Sidewalk Segment	Approximate Length (ft)	Ramps	Approximate # of Driveways	Driveways Width	Path Width (ft)	Comments	Estimated Project Cost
M	(W) 14 <sup>th</sup> St. from Cleveland Ave to Broadway St., along (S) Broadway from 14 <sup>th</sup> St. to 13 <sup>th</sup> St.	2,000	7	10	511.04	5		<b>\$178,742.00</b>
N	(W) 13 <sup>th</sup> St. from Cleveland Ave to Broadway St.	1,870	7	3	123.89	5		<b>\$148,034.00</b>
O	Completion of (S) County St. from 6 <sup>th</sup> St. to Learning Ln, along (E) Pleasant Dr. from County St. to Dunn St.	3,682	12	18	345.05	5		<b>\$293,176.00</b>
P	(E) Eisenhower St. from Cleveland Ave to Logan St., (N) Cale St. connection, (N) Logan St. connection	5,037	11	20	431.67	5		<b>\$378,114.00</b>
Q	(E) Kay Dr. from Dairy St. to Pearl St., Pearl St. completion, (E) Pearl St. to County Rd., County Rd. completion, Maple St. completion	1,963	10	8	155.24	5		<b>\$167,616.00</b>

Appendix B – Project Cost Estimates

Project Designation	Proposed Sidewalk Segment	Approximate Length (ft)	Ramps	Approximate # of Driveways	Driveways Width	Path Width (ft)	Comments	Estimated Project Cost
R	(S) Greenway connection along US 60 from Miller Way to Waldensian Rd, along (W) State Highway 37 from US 60 to FR 2020, along (S) FR 2020 from State Highway 37 to Aaron Ave	9,851	12	8	447.23	10	Extension of greenway trail	<b>\$1,307,316.00</b>
S	(S) Southern Heights from State Highway 37 to Meadowlark, along (W) Meadowlark from S Belaire Dr. to N Belaire Dr., along (S) N Belaire Dr. from Meadowlark to Eisenhower, along (N) N Belaire Dr from Eisenhower to Marion Ave, (E) Eisenhower from N Belaire Dr. to existing sidewalk near Countryside Care Center	4,238	11	23	551.46	10	Connection to greenway trail	<b>\$601,334.00</b>

Appendix B – Project Cost Estimates

Project Designation	Proposed Sidewalk Segment	Approximate Length (ft)	Ramps	Approximate # of Driveways	Driveways Width	Path Width (ft)	Comments	Estimated Project Cost
T	(E) Southgate Ave from N Belaire Dr. to E Plymouth Hills Dr., along (E) E Plymouth Hills Dr. from Southgate Ave to Fairmeadow Circle, along (S) Fairmeadow Circle to existing greenway near the golf course	1,645	3	9	196.19	5		<b>\$125,284.00</b>
<b>Total</b>		<b>55,441.00</b>	<b>153.00</b>	<b>276.00</b>	<b>6,762.05</b>			<b>\$5,289,600.00</b>

Appendix B – Project Cost Estimates

Project A					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 4,360.00	\$ 4,360.00
2	Removal of Improvements	SY	905	\$ 5.00	\$ 4,525.00
3	Excavate and recompact subgrade (6" depth)	SY	905	\$ 12.00	\$ 10,860.00
4	Type 5 Aggregate Base, 4" Thick	SY	905	\$ 9.00	\$ 8,145.00
5	Concrete Sidewalks, 4" Thick	SY	905	\$ 50.00	\$ 45,250.00
6	Driveway Entrances, 7" Thick	SY	94	\$ 70.00	\$ 6,580.00
7	Concrete Curb Ramp, 7" Thick	EA	4	\$ 400.00	\$ 1,600.00
8	ADA Detectable Warning Strips	SF	32	\$ 30.00	\$ 960.00
9	Type 2 Preformed Marking Tape	LF	60	\$ 100.00	\$ 6,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.2	\$ 5,000.00	\$ 1,150.00
	<b>Estimated Construction Cost</b>				<b>\$ 90,280.00</b>
	Contingencies				\$ 13,550.00
	Engineering				\$ 13,500.00
	Construction Administration & Inspection				\$ 10,800.00
	<b>Total Estimated Project Cost</b>				<b>\$ 128,130.00</b>

Appendix B – Project Cost Estimates

<b>Project B</b>					
<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Unit Price</b>	<b>Extended Total</b>
1	Mobilization	LS	1	\$ 7,980.00	\$ 7,980.00
2	Removal of Improvements	SY	1615	\$ 5.00	\$ 8,075.00
3	Excavate and recompact subgrade (6" depth)	SY	1615	\$ 12.00	\$ 19,380.00
4	Type 5 Aggregate Base, 4" Thick	SY	1615	\$ 9.00	\$ 14,535.00
5	Concrete Sidewalks, 4" Thick	SY	1615	\$ 50.00	\$ 80,750.00
6	Driveway Entrances, 7" Thick	SY	214	\$ 70.00	\$ 14,980.00
7	Concrete Curb Ramp, 7" Thick	EA	9	\$ 400.00	\$ 3,600.00
8	ADA Detectable Warning Strips	SF	72	\$ 30.00	\$ 2,160.00
9	Type 2 Preformed Marking Tape	LF	120	\$ 100.00	\$ 12,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.4	\$ 5,000.00	\$ 2,050.00
	<b>Estimated Construction Cost</b>				<b>\$ 165,460.00</b>
	Contingencies				\$ 24,820.00
	Engineering				\$ 24,740.00
	Construction Administration & Inspection				\$ 19,800.00
	<b>Total Estimated Project Cost</b>				<b>\$ 234,820.00</b>

Appendix B – Project Cost Estimates

<b>Project C</b>					
<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Unit Price</b>	<b>Extended Total</b>
1	Mobilization	LS	1	\$ 7,980.00	\$ 7,980.00
2	Removal of Improvements	SY	1644	\$ 5.00	\$ 8,220.00
3	Excavate and recompact subgrade (6" depth)	SY	1644	\$ 12.00	\$ 19,728.00
4	Type 5 Aggregate Base, 4" Thick	SY	1644	\$ 9.00	\$ 14,796.00
5	Concrete Sidewalks, 4" Thick	SY	1644	\$ 50.00	\$ 82,200.00
6	Driveway Entrances, 7" Thick	SY	156	\$ 70.00	\$ 10,920.00
7	Concrete Curb Ramp, 7" Thick	EA	12	\$ 400.00	\$ 4,800.00
8	ADA Detectable Warning Strips	SF	96	\$ 30.00	\$ 2,880.00
9	Type 2 Preformed Marking Tape	LF	120	\$ 100.00	\$ 12,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.4	\$ 5,000.00	\$ 2,050.00
	<b>Estimated Construction Cost</b>				<b>\$ 165,524.00</b>
	Contingencies				\$ 24,830.00
	Engineering				\$ 24,750.00
	Construction Administration & Inspection				\$ 19,800.00
	<b>Total Estimated Project Cost</b>				<b>\$ 234,904.00</b>

Project D					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 5,550.00	\$ 5,550.00
2	Removal of Improvements	SY	1129	\$ 5.00	\$ 5,645.00
3	Excavate and recompact subgrade (6" depth)	SY	1129	\$ 12.00	\$ 13,548.00
4	Type 5 Aggregate Base, 4" Thick	SY	1129	\$ 9.00	\$ 10,161.00
5	Concrete Sidewalks, 4" Thick	SY	1129	\$ 50.00	\$ 56,450.00
6	Driveway Entrances, 7" Thick	SY	65	\$ 70.00	\$ 4,550.00
7	Concrete Curb Ramp, 7" Thick	EA	8	\$ 400.00	\$ 3,200.00
8	ADA Detectable Warning Strips	SF	64	\$ 30.00	\$ 1,920.00
9	Type 2 Preformed Marking Tape	LF	120	\$ 100.00	\$ 12,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.3	\$ 5,000.00	\$ 1,400.00
	<b>Estimated Construction Cost</b>				<b>\$ 115,024.00</b>
	Contingencies				\$ 17,260.00
	Engineering				\$ 17,200.00
	Construction Administration & Inspection				\$ 13,760.00
	<b>Total Estimated Project Cost</b>				<b>\$ 163,244.00</b>

Project E					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 4,920.00	\$ 4,920.00
2	Removal of Improvements	SY	905	\$ 5.00	\$ 4,525.00
3	Excavate and recompact subgrade (6" depth)	SY	905	\$ 12.00	\$ 10,860.00
4	Type 5 Aggregate Base, 4" Thick	SY	905	\$ 9.00	\$ 8,145.00
5	Concrete Sidewalks, 4" Thick	SY	905	\$ 50.00	\$ 45,250.00
6	Driveway Entrances, 7" Thick	SY	245	\$ 70.00	\$ 17,150.00
7	Concrete Curb Ramp, 7" Thick	EA	5	\$ 400.00	\$ 2,000.00
8	ADA Detectable Warning Strips	SF	40	\$ 30.00	\$ 1,200.00
9	Type 2 Preformed Marking Tape	LF	60	\$ 100.00	\$ 6,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.2	\$ 5,000.00	\$ 1,150.00
	<b>Estimated Construction Cost</b>				<b>\$ 102,050.00</b>
	Contingencies				\$ 15,310.00
	Engineering				\$ 15,260.00
	Construction Administration & Inspection				\$ 12,210.00
	<b>Total Estimated Project Cost</b>				<b>\$ 144,830.00</b>

Appendix B – Project Cost Estimates

Project F					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 4,940.00	\$ 4,940.00
2	Removal of Improvements	SY	959	\$ 5.00	\$ 4,795.00
3	Excavate and recompact subgrade (6" depth)	SY	959	\$ 12.00	\$ 11,508.00
4	Type 5 Aggregate Base, 4" Thick	SY	959	\$ 9.00	\$ 8,631.00
5	Concrete Sidewalks, 4" Thick	SY	959	\$ 50.00	\$ 47,950.00
6	Driveway Entrances, 7" Thick	SY	218	\$ 70.00	\$ 15,260.00
7	Concrete Curb Ramp, 7" Thick	EA	2	\$ 400.00	\$ 800.00
8	ADA Detectable Warning Strips	SF	16	\$ 30.00	\$ 480.00
9	Type 2 Preformed Marking Tape	LF	60	\$ 100.00	\$ 6,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.2	\$ 5,000.00	\$ 1,200.00
	<b>Estimated Construction Cost</b>				<b>\$ 102,364.00</b>
	Contingencies				\$ 15,360.00
	Engineering				\$ 15,310.00
	Construction Administration & Inspection				\$ 12,250.00
	<b>Total Estimated Project Cost</b>				<b>\$ 145,284.00</b>

Appendix B – Project Cost Estimates

<b>Project G</b>					
<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Unit Price</b>	<b>Extended Total</b>
1	Mobilization	LS	1	\$ 5,020.00	\$ 5,020.00
2	Removal of Improvements	SY	1105	\$ 5.00	\$ 5,525.00
3	Excavate and recompact subgrade (6" depth)	SY	1105	\$ 12.00	\$ 13,260.00
4	Type 5 Aggregate Base, 4" Thick	SY	1105	\$ 9.00	\$ 9,945.00
5	Concrete Sidewalks, 4" Thick	SY	1105	\$ 50.00	\$ 55,250.00
6	Driveway Entrances, 7" Thick	SY	104	\$ 70.00	\$ 7,280.00
7	Concrete Curb Ramp, 7" Thick	EA	4	\$ 400.00	\$ 1,600.00
8	ADA Detectable Warning Strips	SF	32	\$ 30.00	\$ 960.00
9	Type 2 Preformed Marking Tape	LF	30	\$ 100.00	\$ 3,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.3	\$ 5,000.00	\$ 1,400.00
	<b>Estimated Construction Cost</b>				<b>\$ 103,840.00</b>
	Contingencies				\$ 15,580.00
	Engineering				\$ 15,530.00
	Construction Administration & Inspection				\$ 12,430.00
	<b>Total Estimated Project Cost</b>				<b>\$ 147,380.00</b>

Appendix B – Project Cost Estimates

Project H					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 5,910.00	\$ 5,910.00
2	Removal of Improvements	SY	1182	\$ 5.00	\$ 5,910.00
3	Excavate and recompact subgrade (6" depth)	SY	1182	\$ 12.00	\$ 14,184.00
4	Type 5 Aggregate Base, 4" Thick	SY	1182	\$ 9.00	\$ 10,638.00
5	Concrete Sidewalks, 4" Thick	SY	1182	\$ 50.00	\$ 59,100.00
6	Driveway Entrances, 7" Thick	SY	231	\$ 70.00	\$ 16,170.00
7	Concrete Curb Ramp, 7" Thick	EA	4	\$ 400.00	\$ 1,600.00
8	ADA Detectable Warning Strips	SF	32	\$ 30.00	\$ 960.00
9	Type 2 Preformed Marking Tape	LF	60	\$ 100.00	\$ 6,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.3	\$ 5,000.00	\$ 1,500.00
	<b>Estimated Construction Cost</b>				<b>\$ 122,472.00</b>
	Contingencies				\$ 18,380.00
	Engineering				\$ 18,320.00
	Construction Administration & Inspection				\$ 14,660.00
	<b>Total Estimated Project Cost</b>				<b>\$ 173,832.00</b>

Appendix B – Project Cost Estimates

Project I					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 5,790.00	\$ 5,790.00
2	Removal of Improvements	SY	1155	\$ 5.00	\$ 5,775.00
3	Excavate and recompact subgrade (6" depth)	SY	1155	\$ 12.00	\$ 13,860.00
4	Type 5 Aggregate Base, 4" Thick	SY	1155	\$ 9.00	\$ 10,395.00
5	Concrete Sidewalks, 4" Thick	SY	1155	\$ 50.00	\$ 57,750.00
6	Driveway Entrances, 7" Thick	SY	219	\$ 70.00	\$ 15,330.00
7	Concrete Curb Ramp, 7" Thick	EA	5	\$ 400.00	\$ 2,000.00
8	ADA Detectable Warning Strips	SF	40	\$ 30.00	\$ 1,200.00
9	Type 2 Preformed Marking Tape	LF	60	\$ 100.00	\$ 6,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.3	\$ 5,000.00	\$ 1,450.00
	<b>Estimated Construction Cost</b>				<b>\$ 120,100.00</b>
	Contingencies				\$ 18,020.00
	Engineering				\$ 17,960.00
	Construction Administration & Inspection				\$ 14,370.00
	<b>Total Estimated Project Cost</b>				<b>\$ 170,450.00</b>

Appendix B – Project Cost Estimates

Project J					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 5,830.00	\$ 5,830.00
2	Removal of Improvements	SY	1135	\$ 5.00	\$ 5,675.00
3	Excavate and recompact subgrade (6" depth)	SY	1135	\$ 12.00	\$ 13,620.00
4	Type 5 Aggregate Base, 4" Thick	SY	1135	\$ 9.00	\$ 10,215.00
5	Concrete Sidewalks, 4" Thick	SY	1135	\$ 50.00	\$ 56,750.00
6	Driveway Entrances, 7" Thick	SY	78	\$ 70.00	\$ 5,460.00
7	Concrete Curb Ramp, 7" Thick	EA	10	\$ 400.00	\$ 4,000.00
8	ADA Detectable Warning Strips	SF	80	\$ 30.00	\$ 2,400.00
9	Type 2 Preformed Marking Tape	LF	150	\$ 100.00	\$ 15,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.3	\$ 5,000.00	\$ 1,450.00
	<b>Estimated Construction Cost</b>				<b>\$ 120,950.00</b>
	Contingencies				\$ 18,150.00
	Engineering				\$ 18,090.00
	Construction Administration & Inspection				\$ 14,480.00
	<b>Total Estimated Project Cost</b>				<b>\$ 171,670.00</b>

Appendix B – Project Cost Estimates

Project K					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 2,170.00	\$ 2,170.00
2	Removal of Improvements	SY	368	\$ 5.00	\$ 1,840.00
3	Excavate and recompact subgrade (6" depth)	SY	368	\$ 12.00	\$ 4,416.00
4	Type 5 Aggregate Base, 4" Thick	SY	368	\$ 9.00	\$ 3,312.00
5	Concrete Sidewalks, 4" Thick	SY	368	\$ 50.00	\$ 18,400.00
6	Driveway Entrances, 7" Thick	SY	60	\$ 70.00	\$ 4,200.00
7	Concrete Curb Ramp, 7" Thick	EA	4	\$ 400.00	\$ 1,600.00
8	ADA Detectable Warning Strips	SF	32	\$ 30.00	\$ 960.00
9	Type 2 Preformed Marking Tape	LF	60	\$ 100.00	\$ 6,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.1	\$ 5,000.00	\$ 500.00
	<b>Estimated Construction Cost</b>				<b>\$ 44,898.00</b>
	Contingencies				\$ 6,740.00
	Engineering				\$ 6,720.00
	Construction Administration & Inspection				\$ 5,380.00
	<b>Total Estimated Project Cost</b>				<b>\$ 63,738.00</b>

Appendix B – Project Cost Estimates

Project L					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 10,580.00	\$ 10,580.00
2	Removal of Improvements	SY	1877	\$ 5.00	\$ 9,385.00
3	Excavate and recompact subgrade (6" depth)	SY	1877	\$ 12.00	\$ 22,524.00
4	Type 5 Aggregate Base, 4" Thick	SY	1877	\$ 9.00	\$ 16,893.00
5	Concrete Sidewalks, 4" Thick	SY	1877	\$ 50.00	\$ 93,850.00
6	Driveway Entrances, 7" Thick	SY	544	\$ 70.00	\$ 38,080.00
7	Concrete Curb Ramp, 7" Thick	EA	13	\$ 400.00	\$ 5,200.00
8	ADA Detectable Warning Strips	SF	104	\$ 30.00	\$ 3,120.00
9	Type 2 Preformed Marking Tape	LF	180	\$ 100.00	\$ 18,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.5	\$ 5,000.00	\$ 2,350.00
	<b>Estimated Construction Cost</b>				<b>\$ 219,632.00</b>
	Contingencies				\$ 32,950.00
	Engineering				\$ 32,840.00
	Construction Administration & Inspection				\$ 26,280.00
	<b>Total Estimated Project Cost</b>				<b>\$ 311,702.00</b>

Appendix B – Project Cost Estimates

Project M					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 6,070.00	\$ 6,070.00
2	Removal of Improvements	SY	1112	\$ 5.00	\$ 5,560.00
3	Excavate and recompact subgrade (6" depth)	SY	1112	\$ 12.00	\$ 13,344.00
4	Type 5 Aggregate Base, 4" Thick	SY	1112	\$ 9.00	\$ 10,008.00
5	Concrete Sidewalks, 4" Thick	SY	1112	\$ 50.00	\$ 55,600.00
6	Driveway Entrances, 7" Thick	SY	284	\$ 70.00	\$ 19,880.00
7	Concrete Curb Ramp, 7" Thick	EA	7	\$ 400.00	\$ 2,800.00
8	ADA Detectable Warning Strips	SF	56	\$ 30.00	\$ 1,680.00
9	Type 2 Preformed Marking Tape	LF	90	\$ 100.00	\$ 9,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.3	\$ 5,000.00	\$ 1,400.00
	<b>Estimated Construction Cost</b>				<b>\$ 125,942.00</b>
	Contingencies				\$ 18,900.00
	Engineering				\$ 18,830.00
	Construction Administration & Inspection				\$ 15,070.00
	<b>Total Estimated Project Cost</b>				<b>\$ 178,742.00</b>

Appendix B – Project Cost Estimates

Project N					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 5,030.00	\$ 5,030.00
2	Removal of Improvements	SY	1039	\$ 5.00	\$ 5,195.00
3	Excavate and recompact subgrade (6" depth)	SY	1039	\$ 12.00	\$ 12,468.00
4	Type 5 Aggregate Base, 4" Thick	SY	1039	\$ 9.00	\$ 9,351.00
5	Concrete Sidewalks, 4" Thick	SY	1039	\$ 50.00	\$ 51,950.00
6	Driveway Entrances, 7" Thick	SY	69	\$ 70.00	\$ 4,830.00
7	Concrete Curb Ramp, 7" Thick	EA	7	\$ 400.00	\$ 2,800.00
8	ADA Detectable Warning Strips	SF	56	\$ 30.00	\$ 1,680.00
9	Type 2 Preformed Marking Tape	LF	90	\$ 100.00	\$ 9,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.3	\$ 5,000.00	\$ 1,300.00
	<b>Estimated Construction Cost</b>				<b>\$ 104,304.00</b>
	Contingencies				\$ 15,650.00
	Engineering				\$ 15,600.00
	Construction Administration & Inspection				\$ 12,480.00
	<b>Total Estimated Project Cost</b>				<b>\$ 148,034.00</b>

Appendix B – Project Cost Estimates

Project O					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 9,960.00	\$ 9,960.00
2	Removal of Improvements	SY	2046	\$ 5.00	\$ 10,230.00
3	Excavate and recompact subgrade (6" depth)	SY	2046	\$ 12.00	\$ 24,552.00
4	Type 5 Aggregate Base, 4" Thick	SY	2046	\$ 9.00	\$ 18,414.00
5	Concrete Sidewalks, 4" Thick	SY	2046	\$ 50.00	\$ 102,300.00
6	Driveway Entrances, 7" Thick	SY	192	\$ 70.00	\$ 13,440.00
7	Concrete Curb Ramp, 7" Thick	EA	12	\$ 400.00	\$ 4,800.00
8	ADA Detectable Warning Strips	SF	96	\$ 30.00	\$ 2,880.00
9	Type 2 Preformed Marking Tape	LF	180	\$ 100.00	\$ 18,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.5	\$ 5,000.00	\$ 2,550.00
	<b>Estimated Construction Cost</b>				<b>\$ 206,576.00</b>
	Contingencies				\$ 30,990.00
	Engineering				\$ 30,890.00
	Construction Administration & Inspection				\$ 24,720.00
	<b>Total Estimated Project Cost</b>				<b>\$ 293,176.00</b>

Appendix B – Project Cost Estimates

Project P					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 12,860.00	\$ 12,860.00
2	Removal of Improvements	SY	2799	\$ 5.00	\$ 13,995.00
3	Excavate and recompact subgrade (6" depth)	SY	2799	\$ 12.00	\$ 33,588.00
4	Type 5 Aggregate Base, 4" Thick	SY	2799	\$ 9.00	\$ 25,191.00
5	Concrete Sidewalks, 4" Thick	SY	2799	\$ 50.00	\$ 139,950.00
6	Driveway Entrances, 7" Thick	SY	240	\$ 70.00	\$ 16,800.00
7	Concrete Curb Ramp, 7" Thick	EA	11	\$ 400.00	\$ 4,400.00
8	ADA Detectable Warning Strips	SF	88	\$ 30.00	\$ 2,640.00
9	Type 2 Preformed Marking Tape	LF	150	\$ 100.00	\$ 15,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.7	\$ 5,000.00	\$ 3,500.00
	<b>Estimated Construction Cost</b>				<b>\$ 266,424.00</b>
	Contingencies				\$ 39,970.00
	Engineering				\$ 39,840.00
	Construction Administration & Inspection				\$ 31,880.00
	<b>Total Estimated Project Cost</b>				<b>\$ 378,114.00</b>

Project Q					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 5,700.00	\$ 5,700.00
2	Removal of Improvements	SY	1091	\$ 5.00	\$ 5,455.00
3	Excavate and recompact subgrade (6" depth)	SY	1091	\$ 12.00	\$ 13,092.00
4	Type 5 Aggregate Base, 4" Thick	SY	1091	\$ 9.00	\$ 9,819.00
5	Concrete Sidewalks, 4" Thick	SY	1091	\$ 50.00	\$ 54,550.00
6	Driveway Entrances, 7" Thick	SY	87	\$ 70.00	\$ 6,090.00
7	Concrete Curb Ramp, 7" Thick	EA	10	\$ 400.00	\$ 4,000.00
8	ADA Detectable Warning Strips	SF	80	\$ 30.00	\$ 2,400.00
9	Type 2 Preformed Marking Tape	LF	150	\$ 100.00	\$ 15,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.3	\$ 5,000.00	\$ 1,400.00
	<b>Estimated Construction Cost</b>				<b>\$ 118,106.00</b>
	Contingencies				\$ 17,720.00
	Engineering				\$ 17,660.00
	Construction Administration & Inspection				\$ 14,130.00
	<b>Total Estimated Project Cost</b>				<b>\$ 167,616.00</b>

Appendix B – Project Cost Estimates

Project R					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 44,200.00	\$ 44,200.00
2	Removal of Improvements	SY	10946	\$ 5.00	\$ 54,730.00
3	Excavate and recompact subgrade (6" depth)	SY	10946	\$ 12.00	\$ 131,352.00
4	Type 5 Aggregate Base, 4" Thick	SY	10946	\$ 9.00	\$ 98,514.00
5	Concrete Sidewalks, 4" Thick	SY	10946	\$ 50.00	\$ 547,300.00
6	Driveway Entrances, 7" Thick	SY	249	\$ 70.00	\$ 17,430.00
7	Concrete Curb Ramp, 7" Thick	EA	12	\$ 400.00	\$ 4,800.00
8	ADA Detectable Warning Strips	SF	96	\$ 30.00	\$ 2,880.00
9	Type 2 Preformed Marking Tape	LF	180	\$ 100.00	\$ 18,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	1.4	\$ 5,000.00	\$ 6,800.00
	<b>Estimated Construction Cost</b>				<b>\$ 921,206.00</b>
	Contingencies				\$ 138,190.00
	Engineering				\$ 137,730.00
	Construction Administration & Inspection				\$ 110,190.00
	<b>Total Estimated Project Cost</b>				<b>\$ 1,307,316.00</b>

<b>Project S</b>					
<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Unit Price</b>	<b>Extended Total</b>
1	Mobilization	LS	1	\$ 20,320.00	\$ 20,320.00
2	Removal of Improvements	SY	4709	\$ 5.00	\$ 23,545.00
3	Excavate and recompact subgrade (6" depth)	SY	4709	\$ 12.00	\$ 56,508.00
4	Type 5 Aggregate Base, 4" Thick	SY	4709	\$ 9.00	\$ 42,381.00
5	Concrete Sidewalks, 4" Thick	SY	4709	\$ 50.00	\$ 235,450.00
6	Driveway Entrances, 7" Thick	SY	307	\$ 70.00	\$ 21,490.00
7	Concrete Curb Ramp, 7" Thick	EA	11	\$ 400.00	\$ 4,400.00
8	ADA Detectable Warning Strips	SF	88	\$ 30.00	\$ 2,640.00
9	Type 2 Preformed Marking Tape	LF	150	\$ 100.00	\$ 15,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.6	\$ 5,000.00	\$ 2,950.00
	<b>Estimated Construction Cost</b>				<b>\$ 423,734.00</b>
	Contingencies				\$ 63,570.00
	Engineering				\$ 63,350.00
	Construction Administration & Inspection				\$ 50,680.00
	<b>Total Estimated Project Cost</b>				<b>\$ 601,334.00</b>

Appendix B – Project Cost Estimates

Project T					
Item No.	Description	Unit	Quantity	Unit Price	Extended Total
1	Mobilization	LS	1	\$ 4,260.00	\$ 4,260.00
2	Removal of Improvements	SY	914	\$ 5.00	\$ 4,570.00
3	Excavate and recompact subgrade (6" depth)	SY	914	\$ 12.00	\$ 10,968.00
4	Type 5 Aggregate Base, 4" Thick	SY	914	\$ 9.00	\$ 8,226.00
5	Concrete Sidewalks, 4" Thick	SY	914	\$ 50.00	\$ 45,700.00
6	Driveway Entrances, 7" Thick	SY	109	\$ 70.00	\$ 7,630.00
7	Concrete Curb Ramp, 7" Thick	EA	3	\$ 400.00	\$ 1,200.00
8	ADA Detectable Warning Strips	SF	24	\$ 30.00	\$ 720.00
9	Type 2 Preformed Marking Tape	LF	30	\$ 100.00	\$ 3,000.00
10	Construction Signs	SF	100	\$ 20.00	\$ 2,000.00
11	Seeding & Mulch	Ac	0.2	\$ 5,000.00	\$ 1,150.00
	<b>Estimated Construction Cost</b>				<b>\$ 88,274.00</b>
	Contingencies				\$ 13,250.00
	Engineering				\$ 13,200.00
	Construction Administration & Inspection				\$ 10,560.00
	<b>Total Estimated Project Cost</b>				<b>\$ 125,284.00</b>

City of Battlefield

sidewalk  
inventory

September 2019



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## INTRODUCTION

The City of Battlefield employed the Southwest Missouri Council of Governments (SMCOG) to conduct a sidewalk inventory and assessment between the dates of July 1, 2019 and September 30, 2019. The project involved locating and assessing the condition of all sidewalks and noting general Americans with Disabilities Act (ADA) accessibility concerns. Sidewalk conditions were categorized into three categories: good, fair, and poor. Data collection, which occurred over a one-week period starting on July 2 and ended on July 8, included taking photos of identified ADA concerns and sidewalk sections that typified each condition category. This report was presented to the Board of Aldermen on September 17, 2019.

## SIDEWALKS

Sidewalks play an important role in any community and provide a variety of benefits. A well-maintained and connected sidewalk system can provide opportunity for recreation as well as travel, improved community health benefits, add to a sense of community and place, and improve overall social equity. Sidewalks, then, provide further freedom and liberation of the pedestrian. By improving existing sidewalks and expanding networks people gain further ability to take part in their community. An improved system will increase accessibility as those unable or unwilling to commute by automobile gain access to safe routes leading to local resources. Similarly, improvements can be made in the connectedness of communities as additional routes promote interaction and activity between people, neighborhoods, and districts.

Increased mobility benefits not only individual autonomy and recreation but also health and economic opportunity. Increased access to sidewalks for recreational purposes also benefits the overall health of a community, as safe routes encourage more use for exercise. Furthermore, the installation of sidewalk routes helps to remove travelers from the road, improving safety for pedestrians and motorists alike. Sidewalks create a sense of community with the people utilizing them through connections with fellow walkers, as well as by allowing for a closer interaction with local shops and businesses. Improved foot traffic to and through commercial areas gives businesses further opportunity to attract customers and improve their image. A thoroughly connected, well-constructed pedestrian system can provide opportunities for citizens of all ages and abilities to travel through neighborhoods and commercial centers if properly maintained (FHA, 2019).

The importance of walkability continues to increase as communities move towards efficient, economical, and equitable lifestyles and practices. Pedestrian activity within a city can improve the sense of community and overall quality of life for residents. As more citizens walk along the sidewalks, they interact with the city and their neighbors in a way that those in their cars do not. Providing pedestrian access to all parts of the city through a sidewalk network helps to create a cohesive image of the community for residents and visitors alike.

# CONDITION ASSESSMENT

During the inventory, every existing segment of sidewalk within Battlefield city limits was noted and analyzed. The current network consists of approximately 16.66 miles of sidewalk. There are roughly 132 roads in Battlefield, 89 of which have sidewalks on one or both sides. The inventory was conducted by locating existing sidewalk segments via maps and vehicles. Data was collected while walking each segment of the existing network. Each segment was categorized as being in either good, fair, or poor condition based on several factors, including damage like cracking or buckling, overgrowth of vegetation, presence of debris, and accessibility. The total amount of sidewalks in each category is presented in **Table 1**.

**Table 1. Sidewalk Conditions**

Rating	Miles	Percentage
Good	16.07	96.5%
Fair	0.54	3.2%
Poor	0.05	0.3%
<b>Total</b>	<b>16.66</b>	<b>100.00%</b>

## Good

- Best condition
- Recently built
- No signs of cracking, buckling, substantial overgrowth of vegetation, and minimal debris
- Width is adequate
- Pedestrians would have no issues traversing



Figure 1. A "good" sidewalk located on Hemlock Ave.  
Source: SMCOG

## Fair

- Medium condition
- Older
- Signs of slight cracking, some vegetation and debris
- Pedestrians might have issues traversing



Figure 2. A "fair" sidewalk on Aspen Dr. Source: SMCOG

## Poor

- Worst condition
- Oldest
- Major cracking and buckling, nearly covered by vegetation
- Partially or completely inaccessible



Figure 3. A "poor" sidewalk located on 1st near Hwy FF. Source: SMCOG

# SIDEWALK CONDITIONS MAPS

Figure 4. Current Sidewalk Conditions

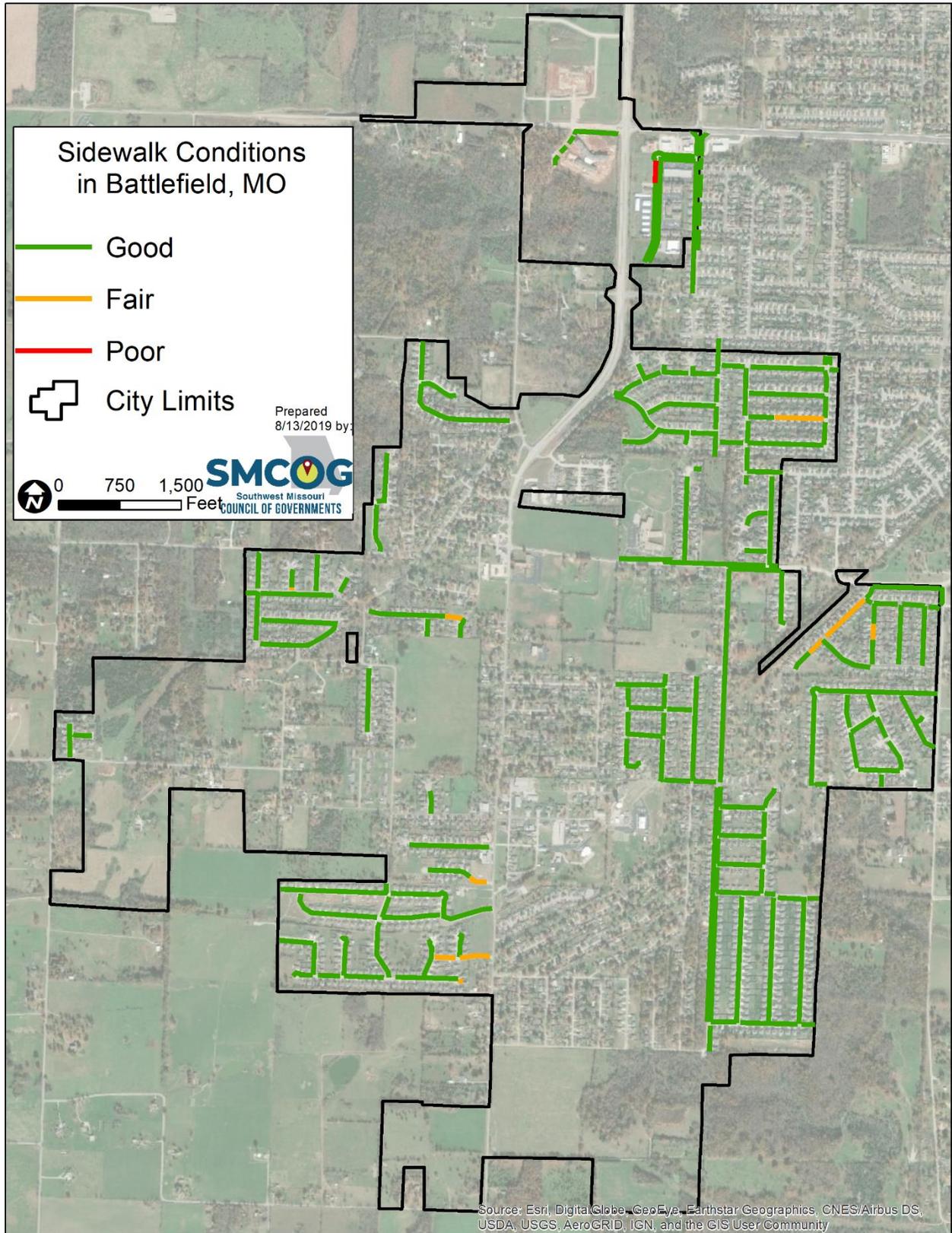


Figure 5. Current Southeast Battlefield Conditions

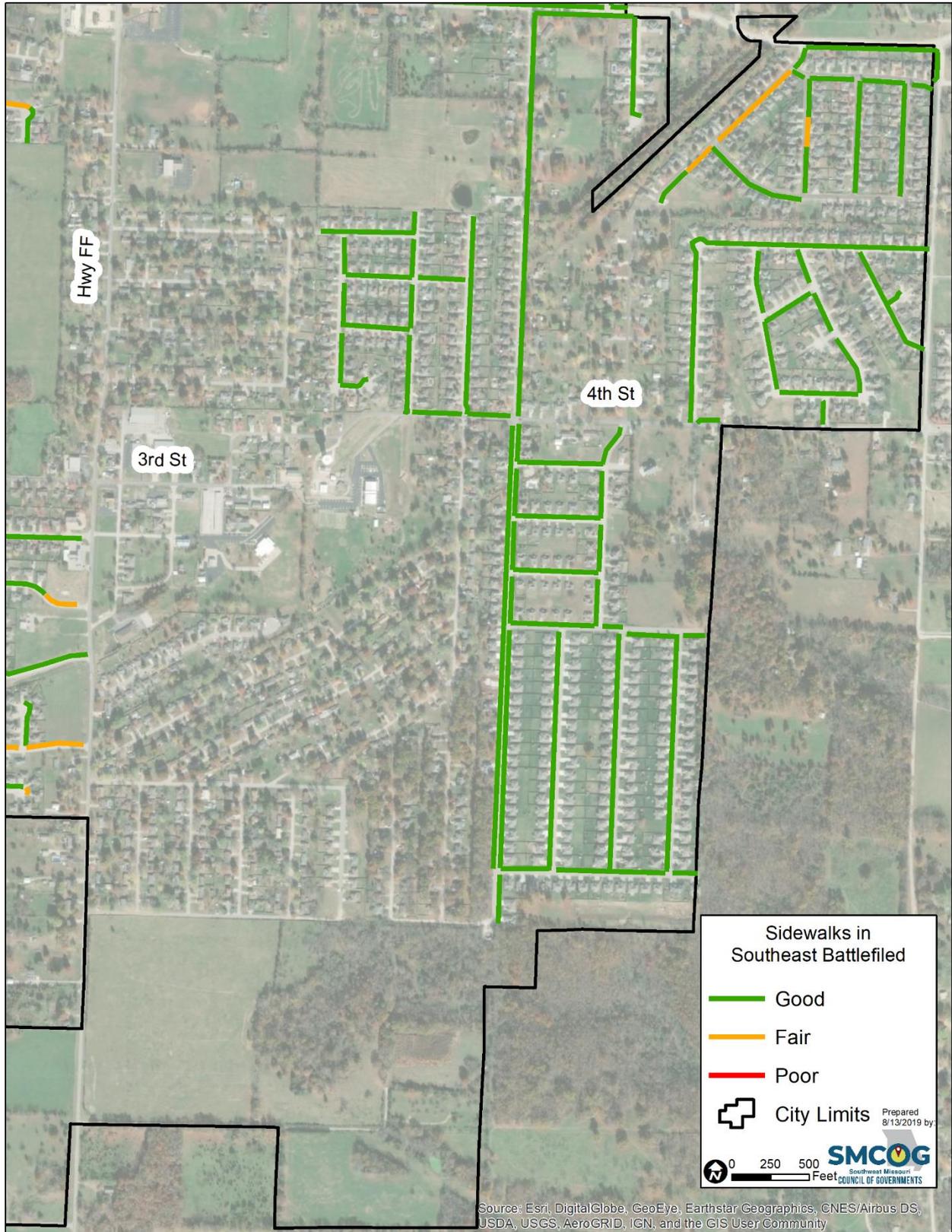


Figure 6. Current Conditions North of Weaver Road

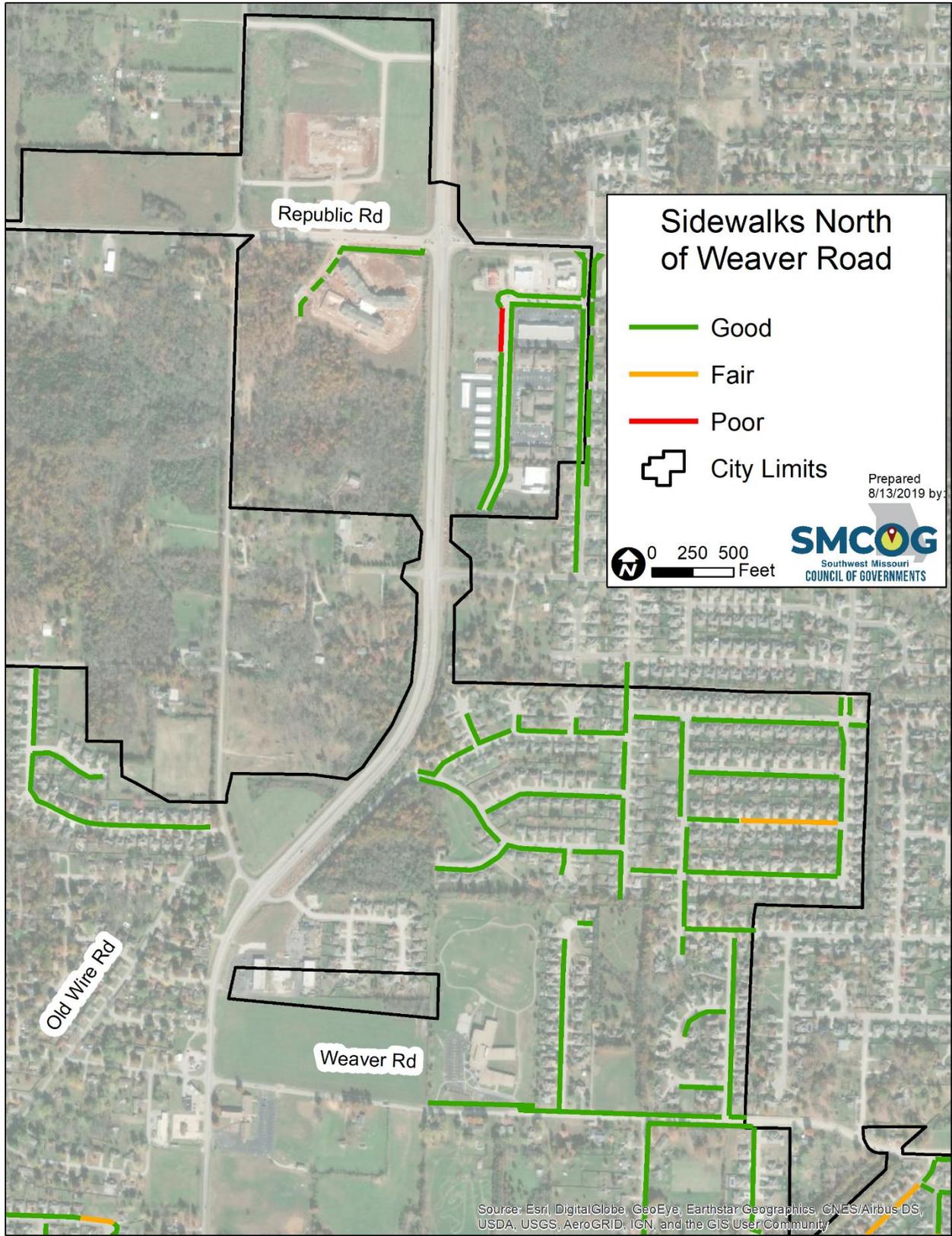
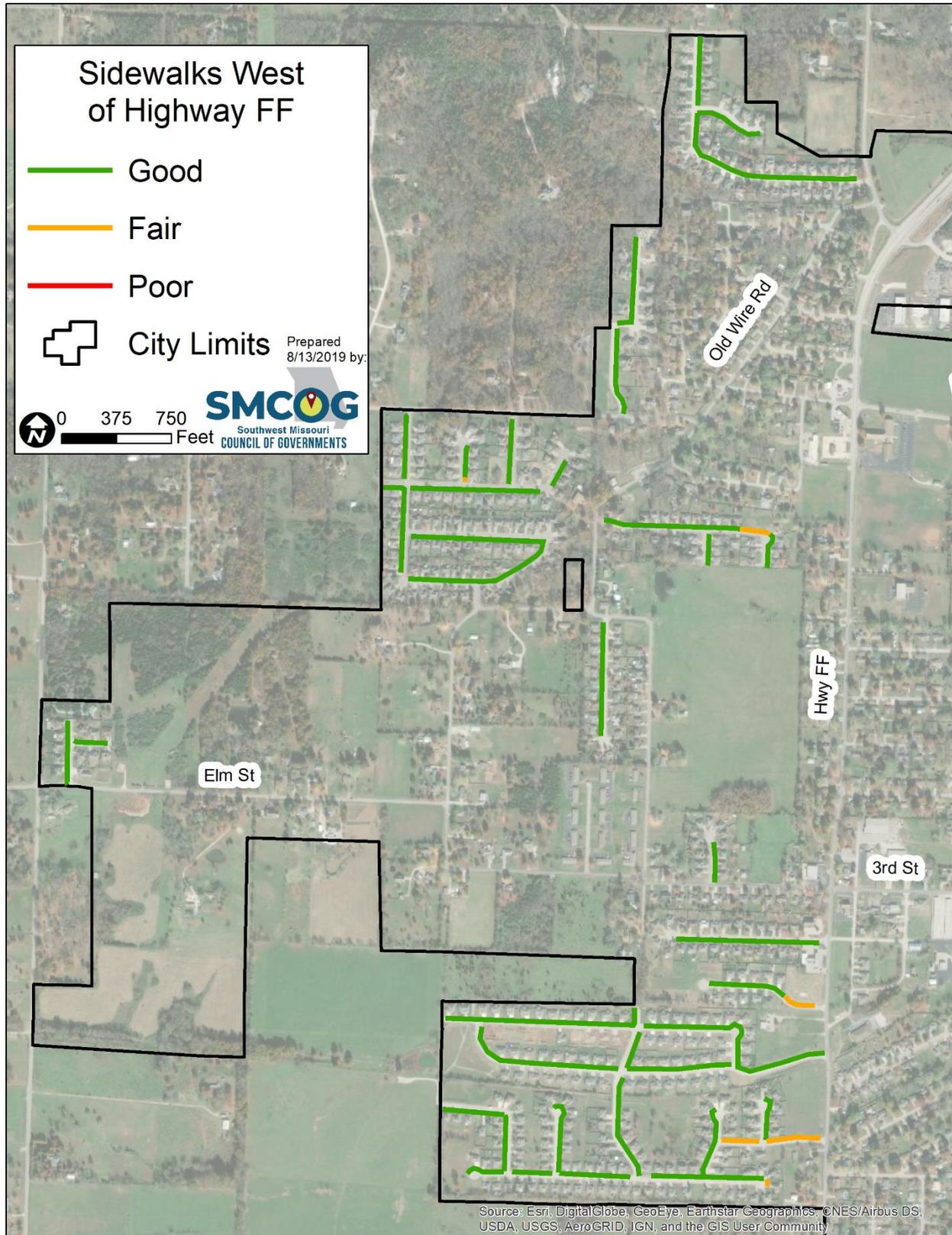


Figure 7. Current Conditions West of Highway FF



## ANALYSIS

In general, the vast majority of sidewalks in Battlefield are in good condition. This is likely due to the strict enforcement of subdivision regulations during the new development of the past twenty years. Many of the fair sidewalks in Battlefield have little to no structural damage, and instead were downgraded due to overgrowth that could be corrected with minor property maintenance. The city should focus on enforcing property maintenance codes and repairing the structurally deficient stretches of sidewalks in order to provide a network that is easily traversable by all citizens. When evaluating the current sidewalk system, there are three primary considerations taken into account:

- Location
- Connectivity
- Accessibility

### Location

Sidewalks in Battlefield are noticeably separated by subdivision. The majority of sidewalks in Battlefield are located in newer subdivisions on the edges of town. Older neighborhoods, which are closer to the geographic center of town, do not have sidewalks. This is likely because of the more rural identity of Battlefield when these older homes were built, as opposed to the new suburban construction of today. The lack of sidewalks in the central part of the city could prove to be dangerous to those who enjoy exercising or taking leisurely walks outside, as these users are either forced to share the road with passing vehicles or walk in drainage ditches next to the road.

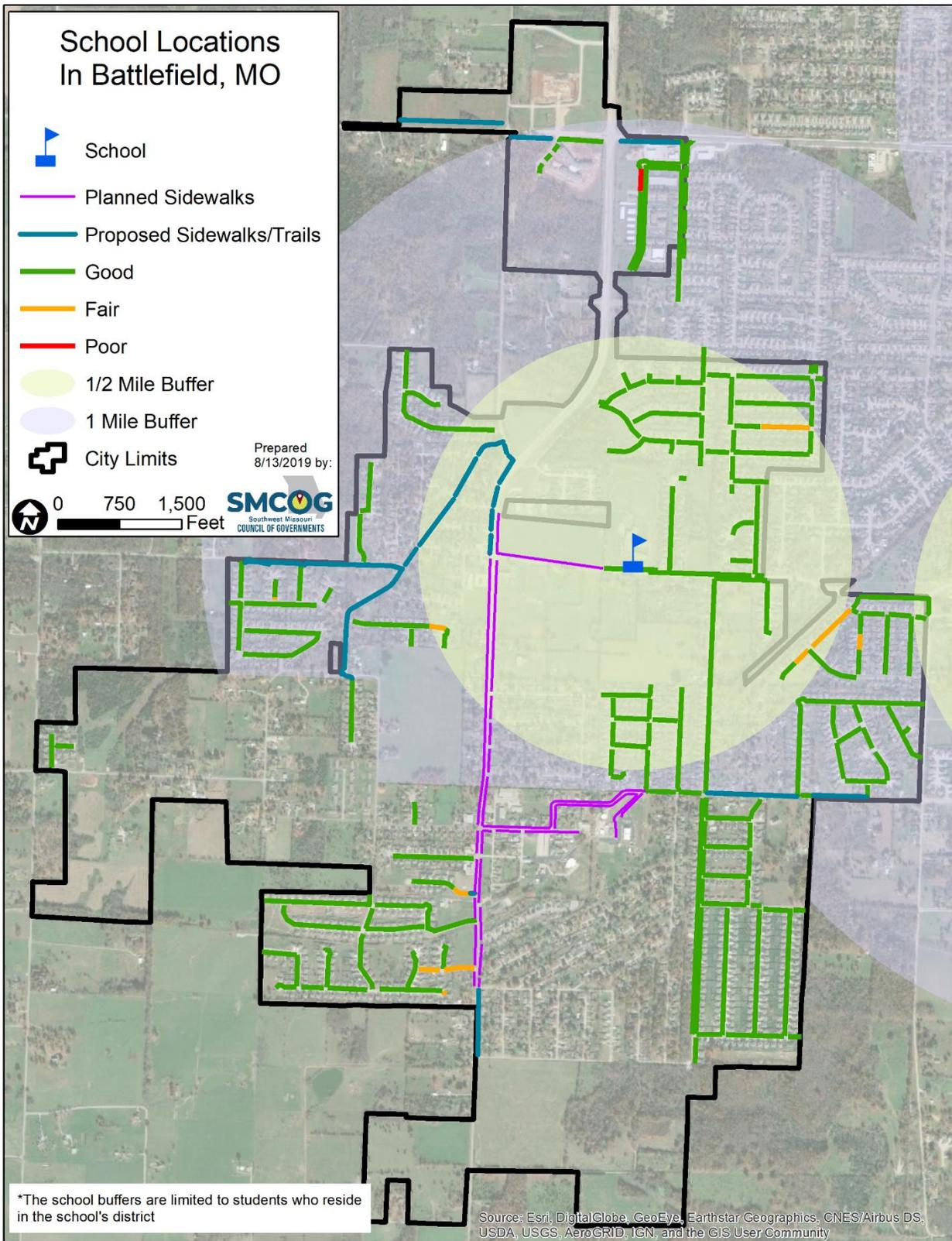
The new sidewalks being constructed on Weaver Rd, Highway FF, and the 3<sup>rd</sup>/4<sup>th</sup> St corridor exhibit the City's attempts to make public facilities like City Hall, Battlefield City Park, and Wilson's Creek Middle School more accessible to foot traffic for all residents.

### Connectivity

A connected sidewalk system is often the most overlooked transportation option, as walking is good for personal health and the environment. The connectivity of a city's sidewalk network can be negatively affected either by gaps in the system or segments in poor condition. Not only could these issues create problems for citizens with disabilities but can also become dangerous for other pedestrians when gaps in connectivity force them to walk in the street or on deficient sidewalk.

Battlefield's sidewalk system is not substantially connected, however, the coming additions along Highway FF, Weaver Rd., and the Third St./Clairborne St./Fourth St./Elm St. corridor will help improve the connectivity. Additionally, the construction of sidewalks along Old Wire Rd. and Coach Dr. on the west side of Battlefield and along Elm St. on the southeast side of Battlefield would help improve the connectivity for residents across the City.

Figure 8. Schools



Battlefield only has one school located inside City Limits (Wilson's Creek Middle School, Springfield Public Schools), yet it is currently not well connected by sidewalks to the rest of the community. This will change, however, once the new sidewalks are constructed in 2020, as Weaver Road will have sidewalks that connect with Highway FF. The Southern and Western sections of the city pose less of a concern with sidewalk connectivity to the school, as they are within Republic R-III School District, which does not operate any schools in Battlefield.

## TRAILS

Trails are a valuable community asset and becoming a highly desired community amenity. Battlefield is fortunate to be in close proximity to numerous existing or planned trails. The metropolitan planning organization for the Springfield region, the Ozarks Transportation Organization, completed a regional trails investment study in 2017 (OTO, 2017). This study outlined several regional trails that would connect Springfield and the surrounding communities, including Battlefield.

The only trail currently in the City of Battlefield is the loop within Battlefield City Park. This trail sees large amounts public use, as its location and terrain are appealing to casual exercisers, however, it does not function as a transportation corridor. The OTO Trail Study has a planned trail which will enter on the east side of town as an extension of the current Trail of Tears trail (**Figure 9**). The installation of this trail will likely open the possibility to the development of more trails throughout the City.

Figure 9. OTO Trail of Tears Extension  
 Source: OTO Regional Trails Study

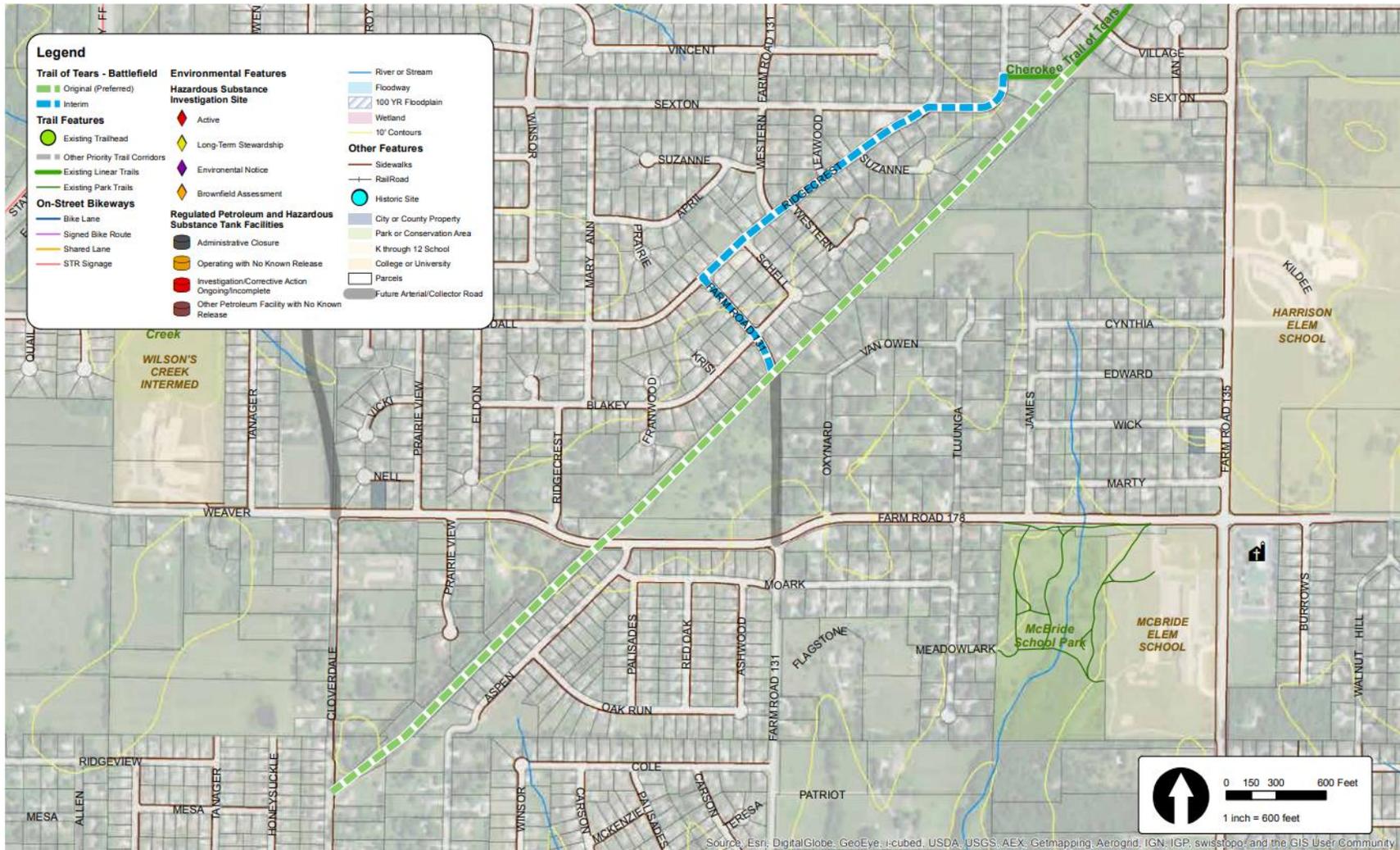
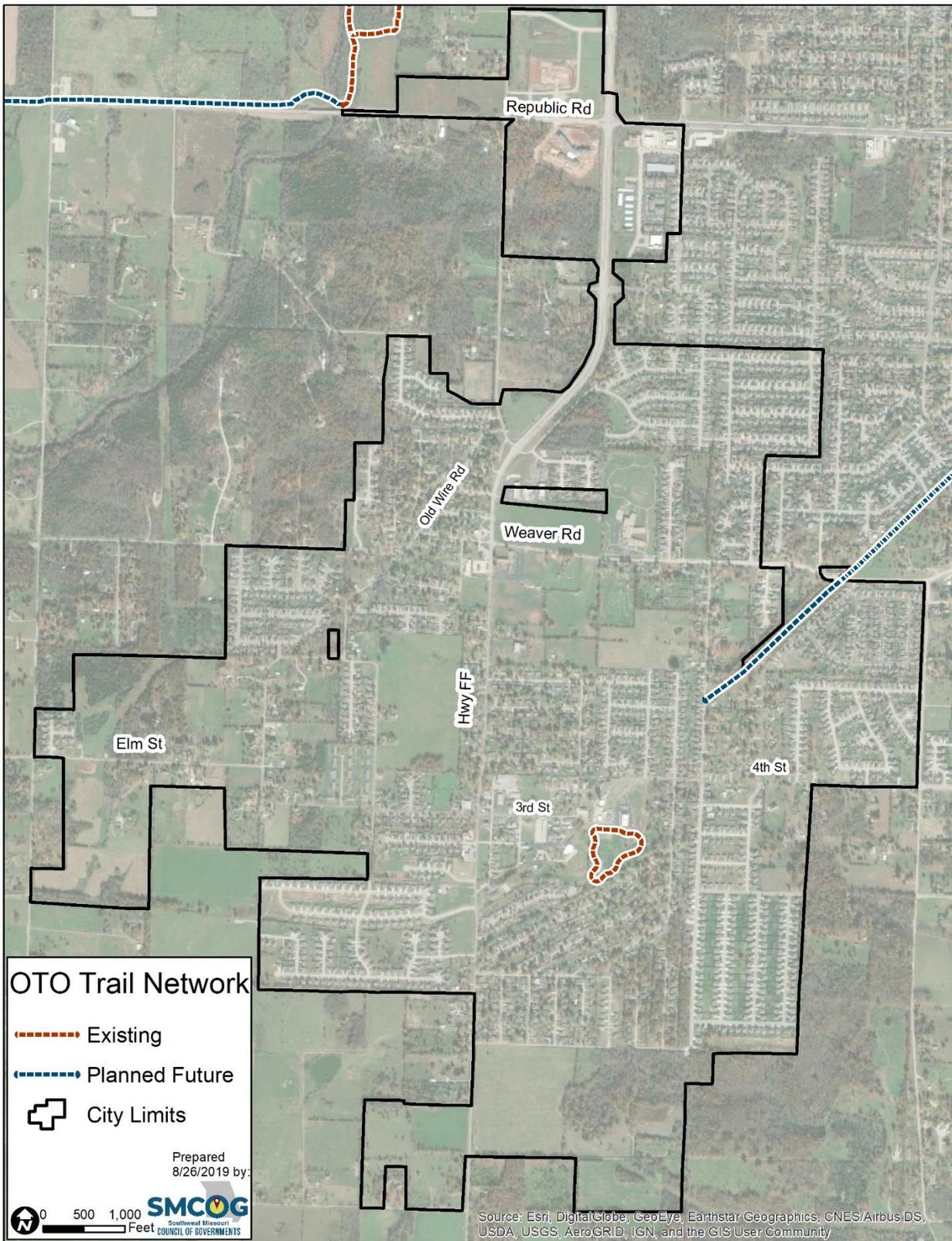


Figure 10. OTO Trail Network



## Accessibility

Accessibility is a common concern for many communities. Cracks, uneven sidewalks, missing ramps, overgrowth, and gaps in the sidewalk system cause barriers for individuals attempting to navigate the sidewalk system. While there are not many poor condition sidewalks in the community, there are a number of smaller ADA concerns throughout the City that should be addressed in order to improve overall community accessibility. Additionally, action should be taken to significantly increase the presence of accessible ramps across the city. The fair and poor conditioned sidewalks will need to be monitored annually and should be improved to good condition as funds become available. **Table 2** below shows examples of each ADA concern, as well as the frequency of each concern along sidewalks. Maps showing the location of each observed ADA concern are provided in [Appendix A](#).

Barriers to accessibility will need to be addressed in order to comply with the Americans with Disabilities Act (ADA). These concerns can be addressed over the next ten to fifteen years as resources become available, but identification is a necessary first step. The 2010 ADA standards do not require communities to immediately modify infrastructure or facilities built prior to March 15, 2012 if in compliance with the 1991 standards (Department of Justice, 2010). The intent is to not create an undue burden on communities and allow time to bring items into compliance.

Battlefield’s ADA concerns are scattered throughout the community, with no real pattern as to where the sidewalk deficiencies have developed.

**Table 2. ADA Concern Examples and Frequencies**

Issues	Picture	Location	Number of Occurrences
<p>Cracks</p> 		<p>5053 Fieldstone Rd.</p>	<p>16</p>

Analysis

Issues	Picture	Location	Number of Occurrences
<p>Dead End</p> 		<p>SW corner of Elm St. &amp; Tanager Ave.</p>	<p>52</p>
<p>No Ramp</p> 		<p>NE corner of Cole St. and Carson St.</p>	<p>2</p>
<p>No Truncated Domes</p> 		<p>SE corner of Carson St. &amp; Cole St.</p>	<p>127</p>

Analysis

Issues	Picture	Location	Number of Occurrences
<p>Obstruction</p> 		<p>4339 W Bull Run Battle St.</p>	<p>14</p>
<p>Overgrowth</p> 		<p>Near 4311 S Timbercreek Ave</p>	<p>16</p>
<p>Steep Grade Change</p> 		<p>NW corner of Cloverleaf Ter. &amp; Aspen Dr.</p>	<p>1</p>

Moving Forward

Issues	Picture	Location	Number of Occurrences
<p>Tree Root Damage</p> 		<p>5128 Aspen Dr.</p>	<p>1</p>
<p>Uneven Surface</p> 		<p>Across the street from 4654 S Winsor Dr.</p>	<p>27</p>

## MOVING FORWARD

This report is intended to provide an analysis of existing conditions as of July 2019. In the future, Battlefield should work to address the poor and fair condition sidewalks and ADA concerns in the existing system as first priority. It is important to maintain the existing sidewalk system and the cost of new sidewalks should be weighed with the cost of maintenance. The City will need to consider the financial resources required to correct current sidewalk concerns and may need to increase the annual budget for sidewalk improvements when possible.

New sidewalks should be installed as new development occurs to increase overall community connectivity. There are approximately 2.36 miles of proposed new sidewalks throughout the entire city, and another 3.1 miles of sidewalk slated to be constructed in 2020. If the city were to implement all recommendations included in this report, the sidewalk system would be 22.12 miles. **Figures 10-13** show the locations of the proposed new sidewalks, while **Table 3** provides an overview of the proposed sidewalk segments including length and estimated cost. Anderson Engineering compiled an itemized list of costs per proposed segment using 2019 materials pricing. Each project should be designed and estimated when the City is ready to fund and construct an identified segment. These costs will likely vary and change over time.

On June 27, 2019, the City of Battlefield posted on Facebook regarding the sidewalk inventory project. This allowed citizens to give feedback about potential sidewalk construction/improvements. The most suggested item was the installation of a sidewalk along Old Wire Rd. This has been identified as Project A in **Table 3** and would cost an estimated \$865,470.

**Table 3. Proposed Sidewalk Segments**

Project ID	Proposed Sidewalk Segment	Approximate Length	Estimated Cost
A	Along the south side of Farm Rd. 123 from Hwy FF to Old Wire Rd., then along the west side of Old Wire Rd. to Hutchinson Ct.	3,780 ft.	Curb Ramps, 17@ \$310 each = \$5,270 5' Sidewalk, 313 LF @ \$50 ft = \$15,650 10' Sidewalk, 3,467 LF @ \$98ft = \$339,766 Concrete Approaches (Driveways) 464 SY @ \$115 SY = \$53,360 100 LF 15" HDPP (Pipe) 2 @ \$45 ft = \$4,500 6" Curb Edge, 1,500' @ \$31 ft = \$46,500 Embankment (Grading) 1852 CY @ \$30CY = \$55,556 Contingency @ 10% = \$59,688 Professional Fees (PE, CE) = \$182,211 <b>Total= \$865,470</b>
B	Along the south side of Coach Dr. from Fieldstone Rd to Old Wire Rd.	1,971 ft.	Curb Ramps, 6@ \$160 ea. = \$960 5' Sidewalk, 1,971 LF @ \$50 ft = \$98,550 Concrete Approaches (Driveways) 160 SY @ \$115 SY = \$18,400 50 LF 15" HDPP (Pipe) @ \$45ft = \$2,250 6" Curb Edge, 500' @ \$31 ft = \$15,500 Embankment (Grading) 222 CY @ \$30CY = \$6,667 Contingency @ 10% = \$14,233 Professional Fees (PE, CE) = \$49,814 <b>Total = \$206,374</b>
C	Along the north side of Elm St. between Cloverdale Ln. and Heritage St.	1,996 ft.	Curb Ramps, 6@ \$160 ea. = \$960 5' Sidewalk, 1,996 LF @ \$50 ft = \$99,800 Concrete Approaches (Driveways) 304 SY @ \$115 SY = \$34,960 48 LF 15" HDPP (Pipe) @ \$45ft = \$2,160 Concrete Box Culvert Extension = \$3,000 6" Curb Edge, 600' @ \$31 ft = \$18,600 Embankment (Grading) 444 CY @ \$30CY = \$13,333 Contingency @ 10% = \$17,281 Professional Fees (PE, CE) = \$60,485 <b>Total = \$250,579</b>

Moving Forward

D	Connect 1st St. sidewalk to FF.	43 ft.	<p>Curb Ramps, 1@\$160 ea. = \$160                      5' Sidewalk, 43 LF @ \$50 ft = \$2,150                      15 LF 18" HDPP (Pipe) @\$55ft = \$825                      6" Curb Edge, 15' @ \$31 ft = \$465                      Embankment (Grading) 17 CY@ \$30CY = \$500                      Contingency @ 10% = \$410                      Professional Fees (PE, CE) = \$1,148  <b>Total = \$5,658</b></p>
E	Along the north side of Republic Rd. from western city limits to S Marketplace Ave, existing sidewalk just west of Hwy FF	2,817 ft.	<p>Curb Ramps, 7@\$160 ea. = \$1,120                      10' Sidewalk 2,817 LF @ \$120 ft = \$338,040                      Concrete Approaches (Driveways) 160 SY @ \$115 SY = \$18,400                      75 LF 15" HDPP (Pipe) @\$45ft = \$3,375                      6" Curb Edge, 900' @ \$31 ft = \$27,900                      Embankment (Grading) 3,958 CY@ \$30CY = \$118,750                      Contingency @ 10% = \$50,759                      Professional Fees (PE, CE) = \$177,655  <b>Total = \$735,998</b></p>
F	FF (West Side) from FR 123 to Weaver Road	1,025 ft.	<p>Curb Ramps, 9@\$160 ea. = \$1,440                      5' Sidewalk, 1,025 LF @ \$50 ft = \$51,250                      Concrete Approaches (Driveways) 32 SY @ \$115 SY = \$3,680                      40 LF 15" HDPP (Pipe) @\$45ft = \$1,800                      Concrete Box Culvert Extension (10') = \$3,000                      6" Curb Edge, 500' @ \$31 ft = \$15,500                      Embankment (Grading) 607 CY@ \$30CY = \$18,222                      Contingency @ 10% = \$9,489                      Professional Fees (PE, CE) = \$33,212  <b>Total = \$137,594</b></p>
G	FF from Rose Terrace to Azalea (Green Ridge Sub.)	850 ft.	<p>Curb Ramps, 8@\$160 ea. = \$480                      5' Sidewalk, 4,400 LF @ \$50 ft = \$42,500                      Concrete Approaches (Driveways) 192 SY @ \$115 SY = \$22,080                      40 LF 15" HDPP (Pipe) @\$45ft = \$1,800                      6" Curb Edge, 250' @ \$31 ft = \$7,750                      Embankment (Grading) 378 CY@ \$30CY = \$11,333                      Contingency @ 10% = \$8,594                      Professional Fees (PE, CE) = \$30,080  <b>Total = \$124,618</b></p>

Moving Forward

Project ID	Improved Sidewalk Segment	Approximate Length	Estimated Cost
H	West side of Timbercreek Ave from the northern property line of 4311 S Timberview to Lark St	274 ft.	5' Sidewalk, 274 LF @ \$50 ft = \$13,700 Removal of Exist. 274 LF @ \$20 ft = \$5,480 Embankment (Grading) 41 CY@ \$30CY = \$1,218 Contingency @ 10% = \$2,040 Professional Fees (PE, CE) = \$5,711 <b>Total = \$28,149</b>
I	April St from driveway of 3819 April St to Winsor Dr	588 ft.	Curb Ramps, 1@\$160 ea. = \$160 5' Sidewalk, 588 LF @ \$50 ft = \$29,400 Removal of Exist. 588 LF @ \$20 ft = \$11,760 Concrete Approaches (Driveways) 64 SY @ \$115 SY = \$7,360 Embankment (Grading) 76 CY@ \$30CY = \$2,287 Contingency @ 10% = \$5,097 Professional Fees (PE, CE) = \$17,838 <b>Total = \$73,902</b>
J	Aspen Dr from southern property line of 5128 Aspen to Moark St	962 ft.	Curb Ramps, 2@\$160 ea. = \$320 5' Sidewalk, 962 LF @ \$50 ft = \$48,100 Removal of Exist. 962 LF @ \$20 ft = \$19,240 Concrete Approaches (Driveways) 128 SY @ \$115 SY = \$14,720 Embankment (Grading) 143 CY@ \$30CY = \$4,276 Contingency @ 10% = \$8,666 Professional Fees (PE, CE) = \$30,329 <b>Total = \$125,651</b>
K	Palisades Ave from northern property line of 5032 Palisades to southern property line of 5100 Palisades	215 ft.	5' Sidewalk, 215 LF @ \$50 ft = \$10,750 Removal of Exist. 215 LF @ \$20 ft = \$4,300 Concrete Approaches (Driveways) 16 SY @ \$115 SY = \$1,840 Embankment (Grading) 32 CY@ \$30CY = \$956 Contingency @ 10% = \$1,785 Professional Fees (PE, CE) = \$6,246 <b>Total = \$25,876</b>
L	1st street from eastern property line of 4341 1st to end near FF	338 ft.	Curb Ramps, 1@\$160 ea. = \$160 5' Sidewalk, 338 LF @ \$50 ft = \$16,900 Removal of Exist. 338 LF @ \$20 ft = \$6,760 6" Curb Edge, 15' @ \$31 ft = \$465 Embankment (Grading) 50 CY@ \$30CY = \$1,502 Contingency @ 10% = \$2,579 Professional Fees (PE, CE) = \$9,026 <b>Total = \$37,391</b>

**Moving Forward**

M	Wilson Creek Battlefield St from Vicksburg Battle Ct to Hwy FF	680 ft.	<p>Curb Ramps, 4@\$160 ea. = \$640  Removal of Exist. 650 LF@ \$20 ft = \$13,000  5' Sidewalk, 680 LF @ \$50 ft = \$34,000  20 LF 15" HDPP (Pipe) @\$45ft = \$900  6" Curb Edge, 30' @ \$31 ft = \$930  Embankment (Grading) 101 CY@ \$30CY = \$3,022  Contingency @ 10% = \$5,249  Professional Fees (PE, CE)= \$18,372  <b>Total = \$76,114</b></p>
---	--	---------	---

The above estimates total 2.36 miles of new sidewalk and half of a mile in improvements at a cost of almost \$2.7 million, with over \$367,000 being for sidewalk improvements. In order to ensure that the current system stays in good repair, the City should set aside funds annually for sidewalk improvements or repairs.

An estimated average replacement cost may be assumed at \$115 per linear foot, not including a 10% contingency. With a 22-mile system (116,793 linear feet) this would equate to \$13,431,264 for replacement costs of the entire system. The life of a concrete sidewalk may be estimated between 40 and 50 years (FHA, 2019), and that could be extended with regular general maintenance. The City should plan for a sidewalk program and budget annually for improvements. It should be noted that the City may not want to undertake a sidewalk project each year and may want to combine multiple years of sidewalk funding for a larger project. This should be considered during the annual budget process or capital improvement program development each year.

It is important that the city continue to enforce its development requirement for new construction to include sidewalks. Funding may also be sought through the Missouri Department of Transportation (MoDOT) Transportation Alternative Program (TAP), through the Ozarks Transportation Organization. These funds are available every two years and consider factors such as: number of project partners, right-of-way ownership/acquisition, enhancing connection between jurisdictions, addressing ADA barriers, inclusion of new sidewalk installation versus replacement, enhancement of multimodal connections, promotion of redevelopment, inclusion in a local plan, and promoting safe routes to schools. Additionally, Battlefield might review options for a transportation sales tax which could help fund the sidewalk system, but with limited commercial uses sales tax may not generate the necessary revenue. The City could also look at a parks and recreation property tax which could help develop the trail connections both to regional trails, but within the City limits.

There are likely additional opportunities for sidewalk system expansion, but recommendations were done with an attempt to keep the burden on the City for installation and maintenance at a reasonable level.

Figure 11. Proposed Sidewalk Segments

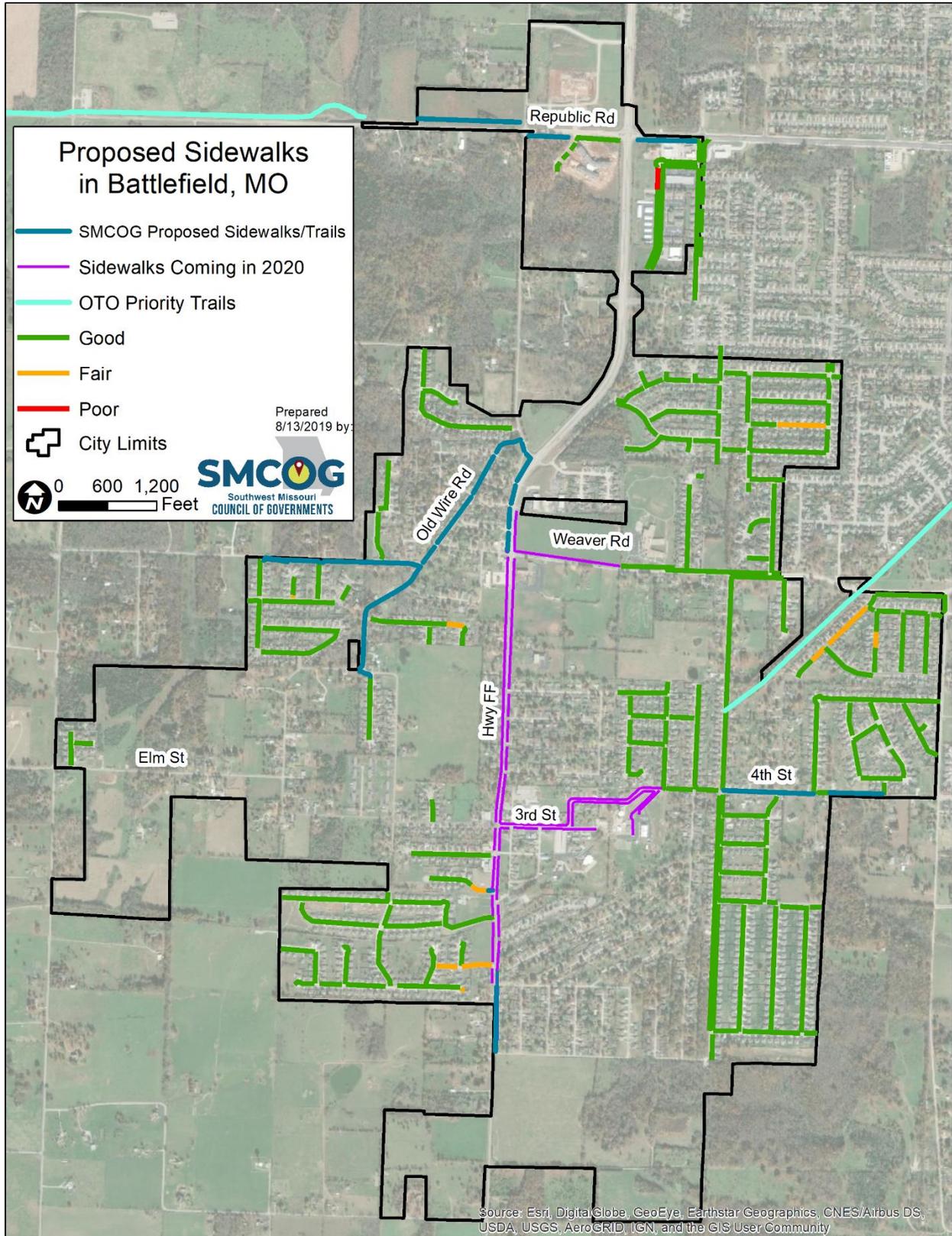


Figure 12. Proposed Sidewalks in Southeast Battlefield

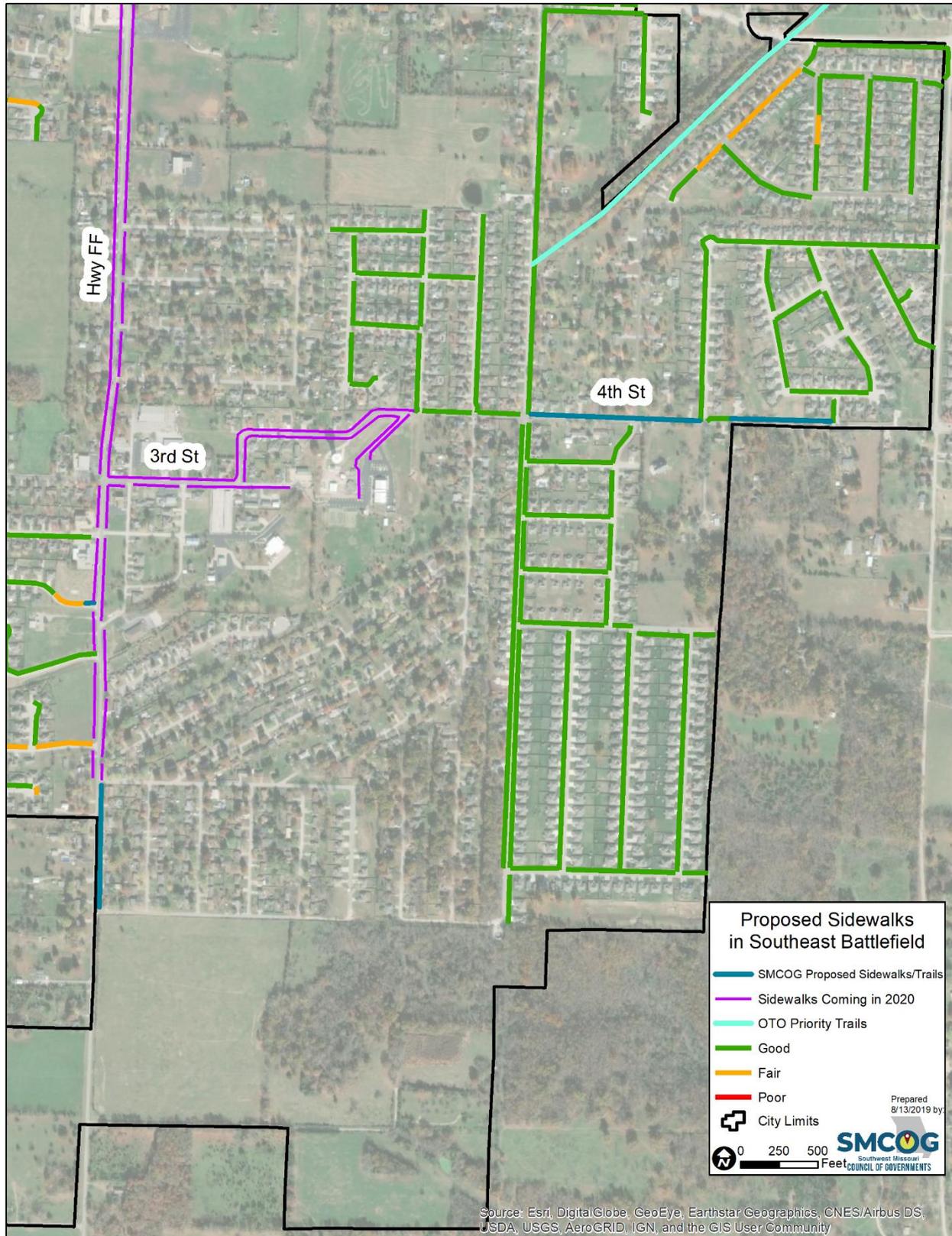
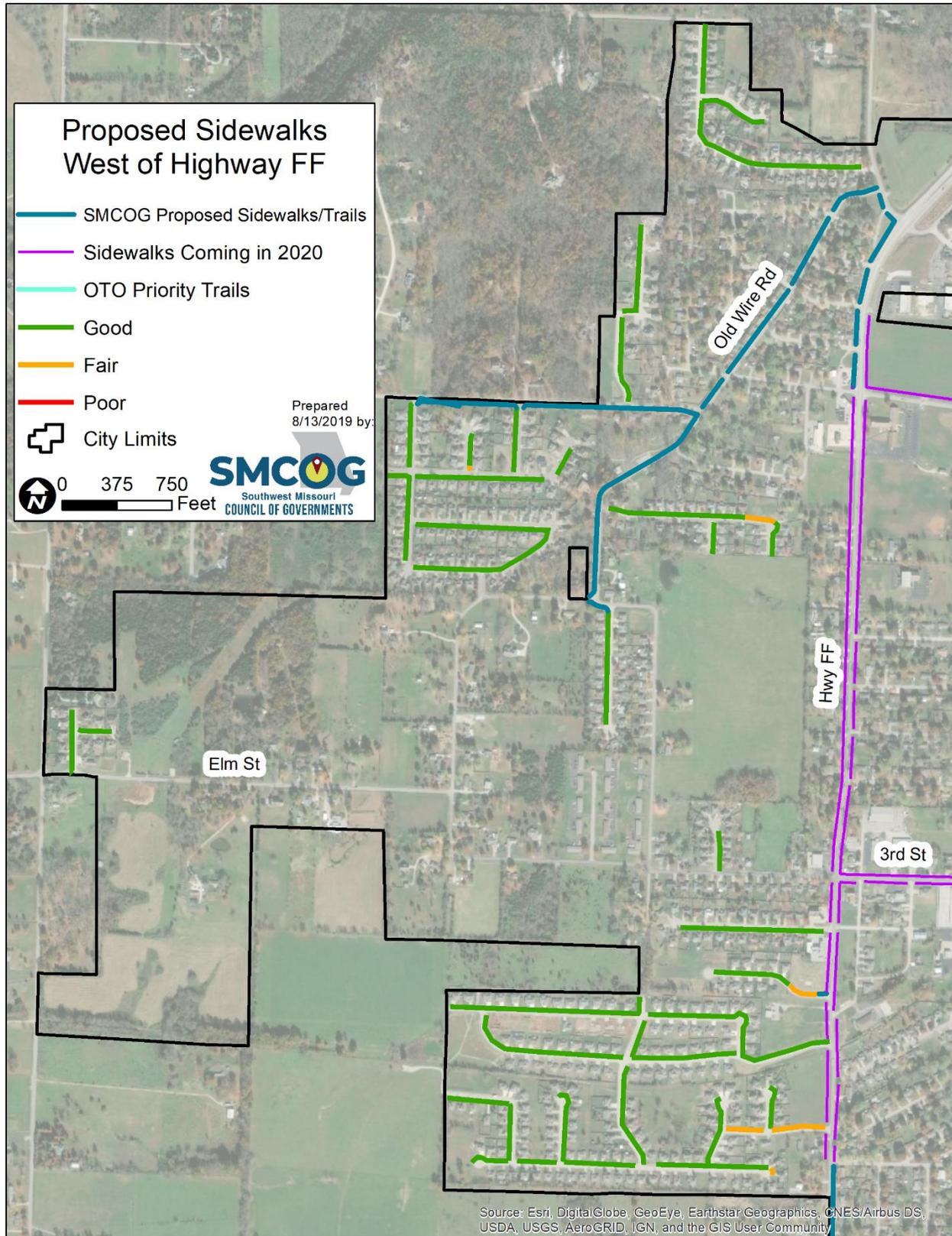


Figure 13. Proposed Sidewalks North of Weaver Road



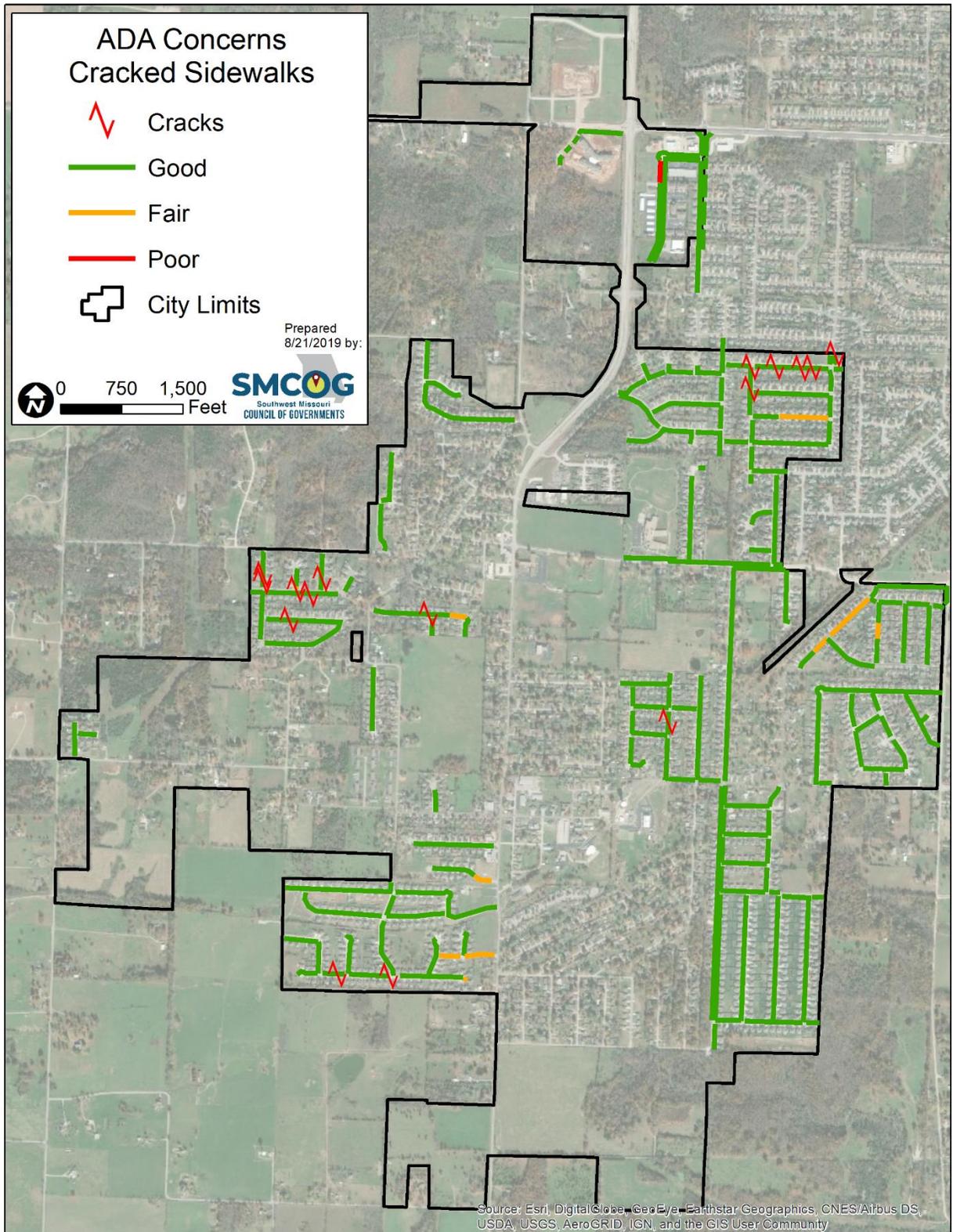
Figure 14. Proposed Sidewalks West of Highway FF

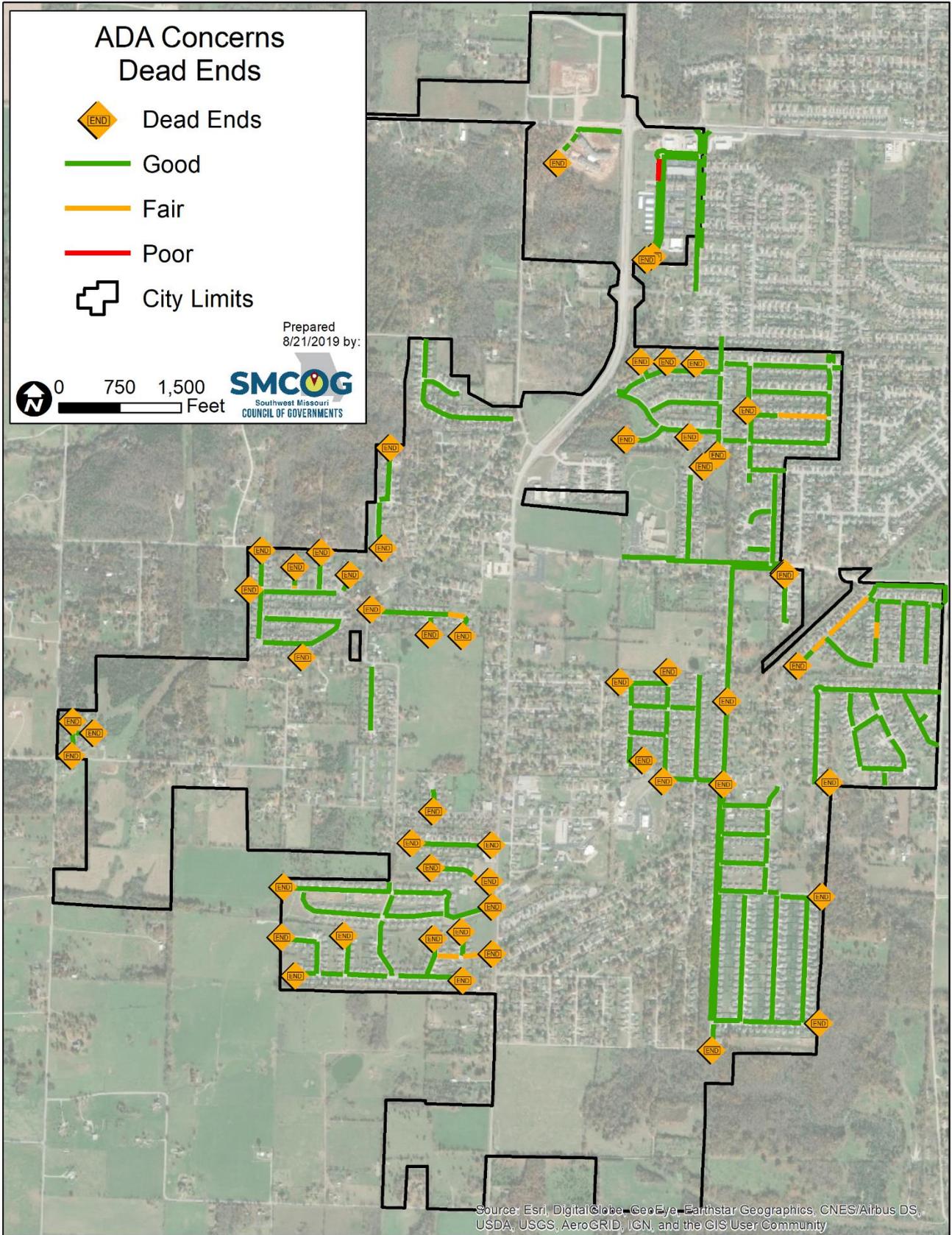


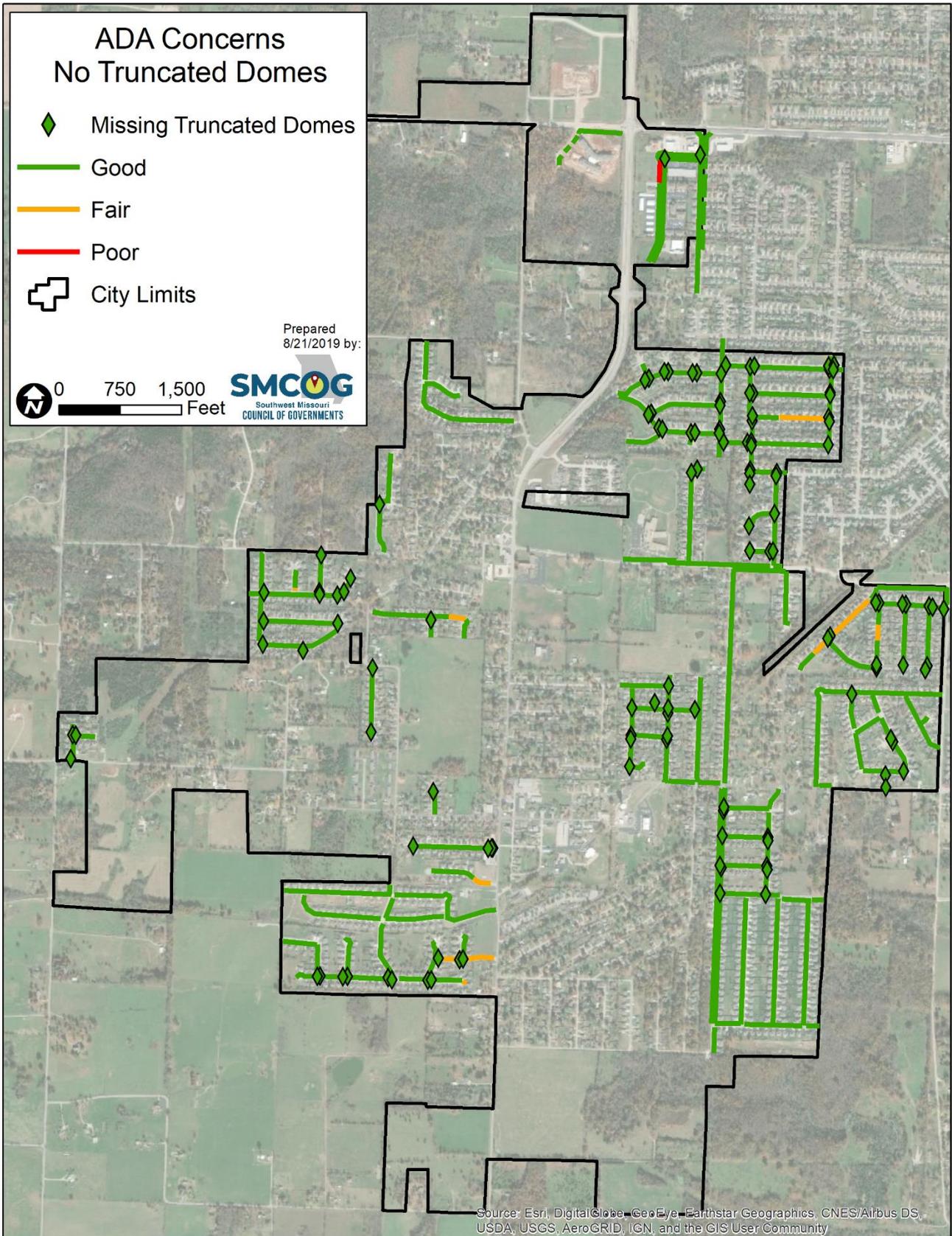
## REFERENCES

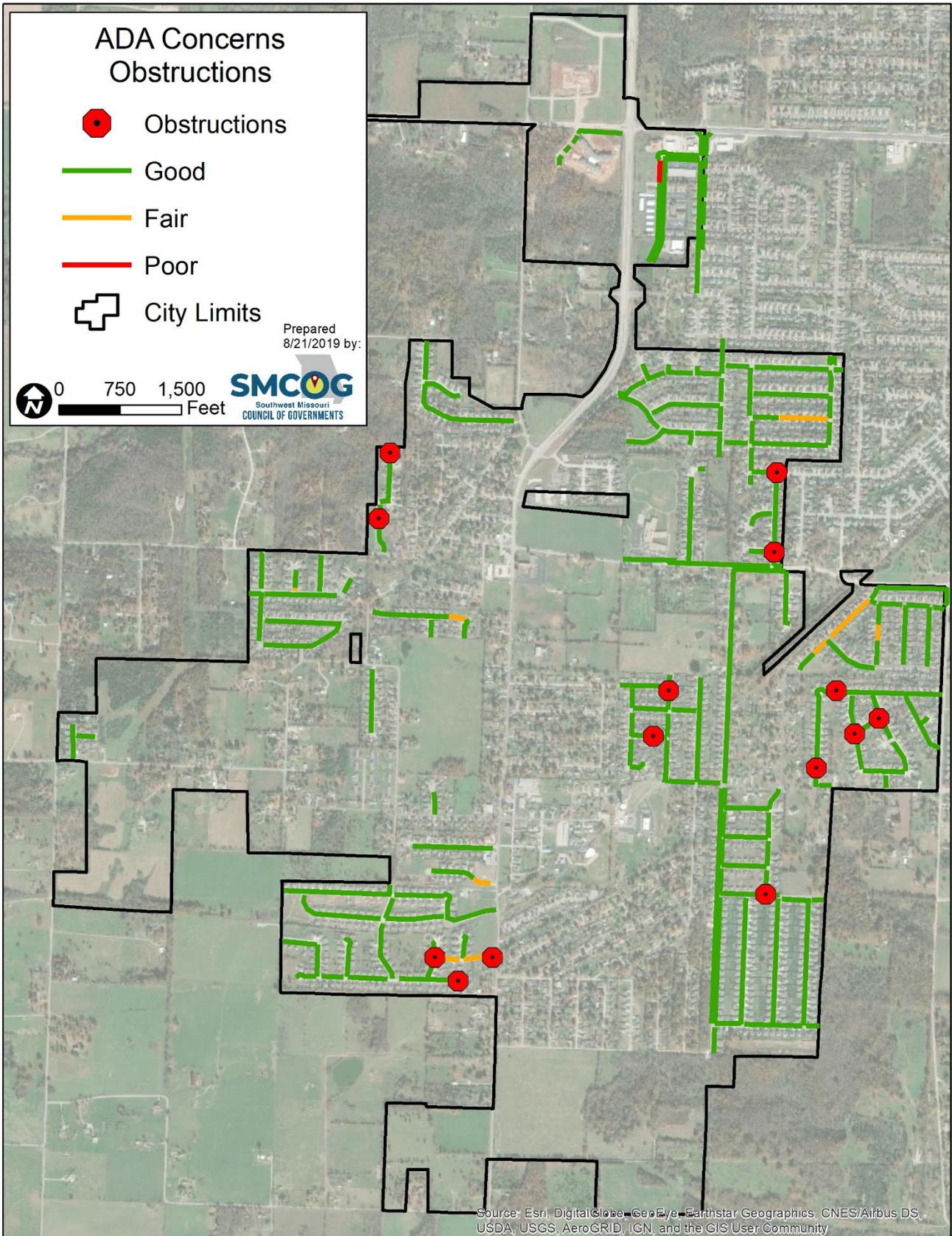
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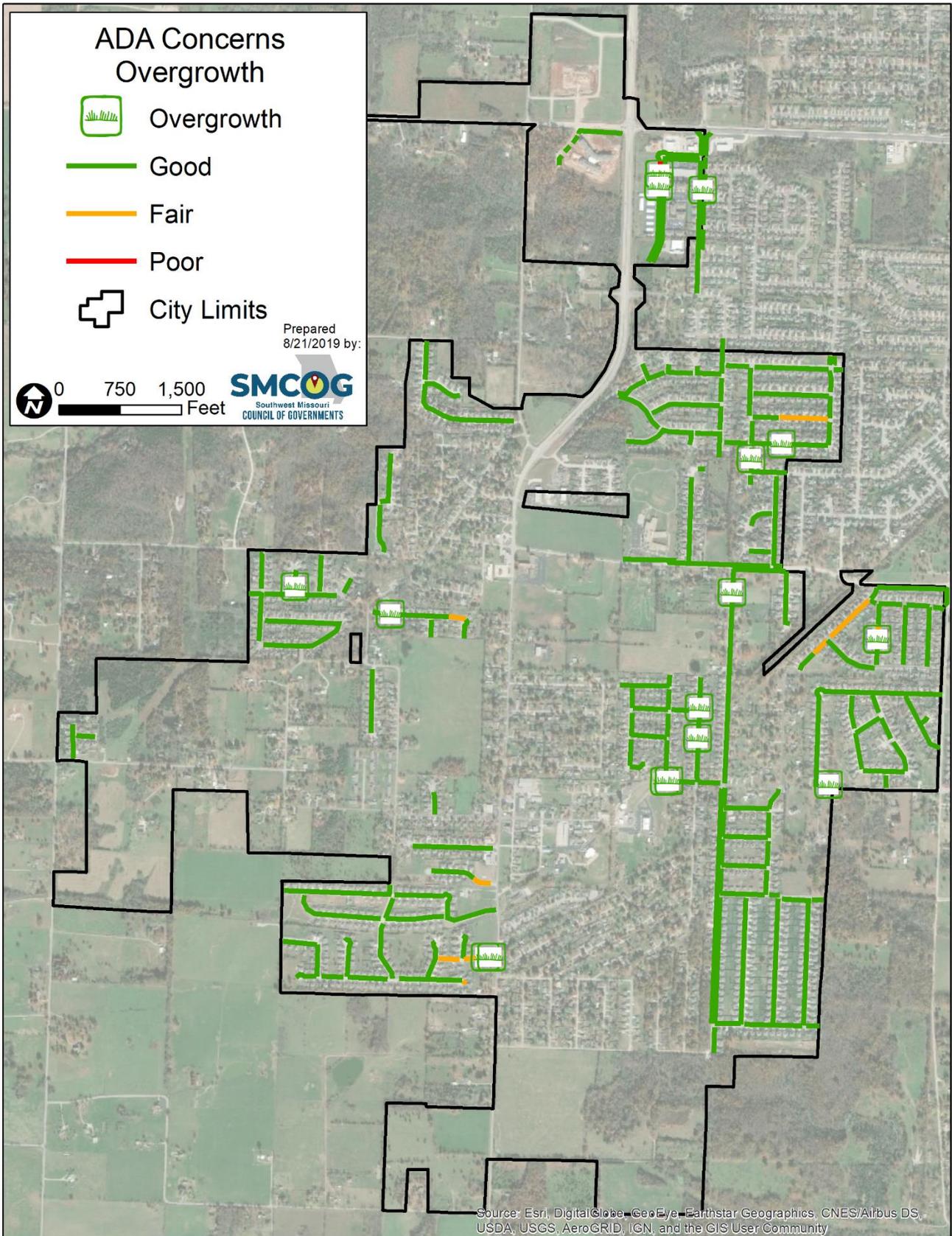
# APPENDIX A – ADA CONCERN LOCATIONS BY TYPE

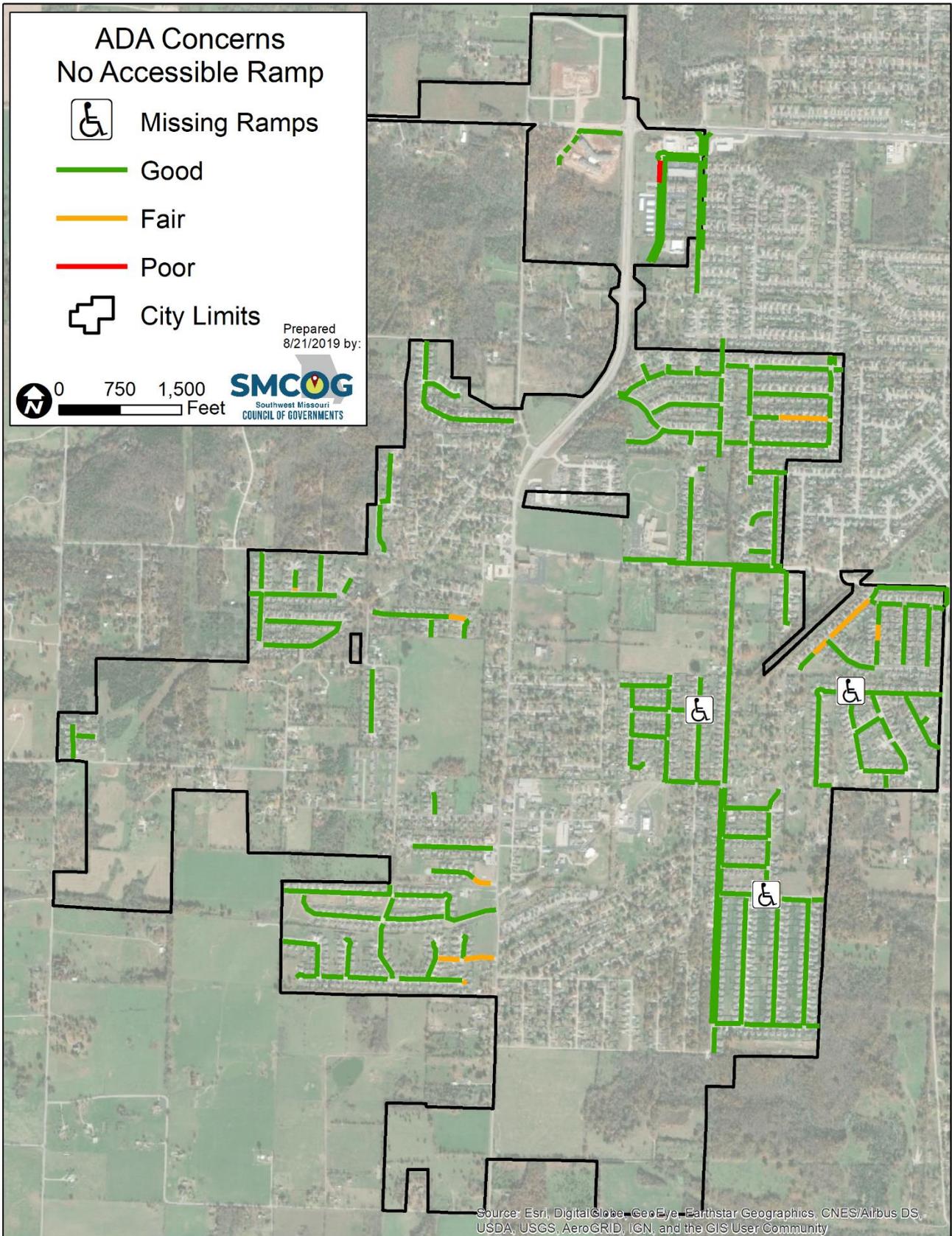


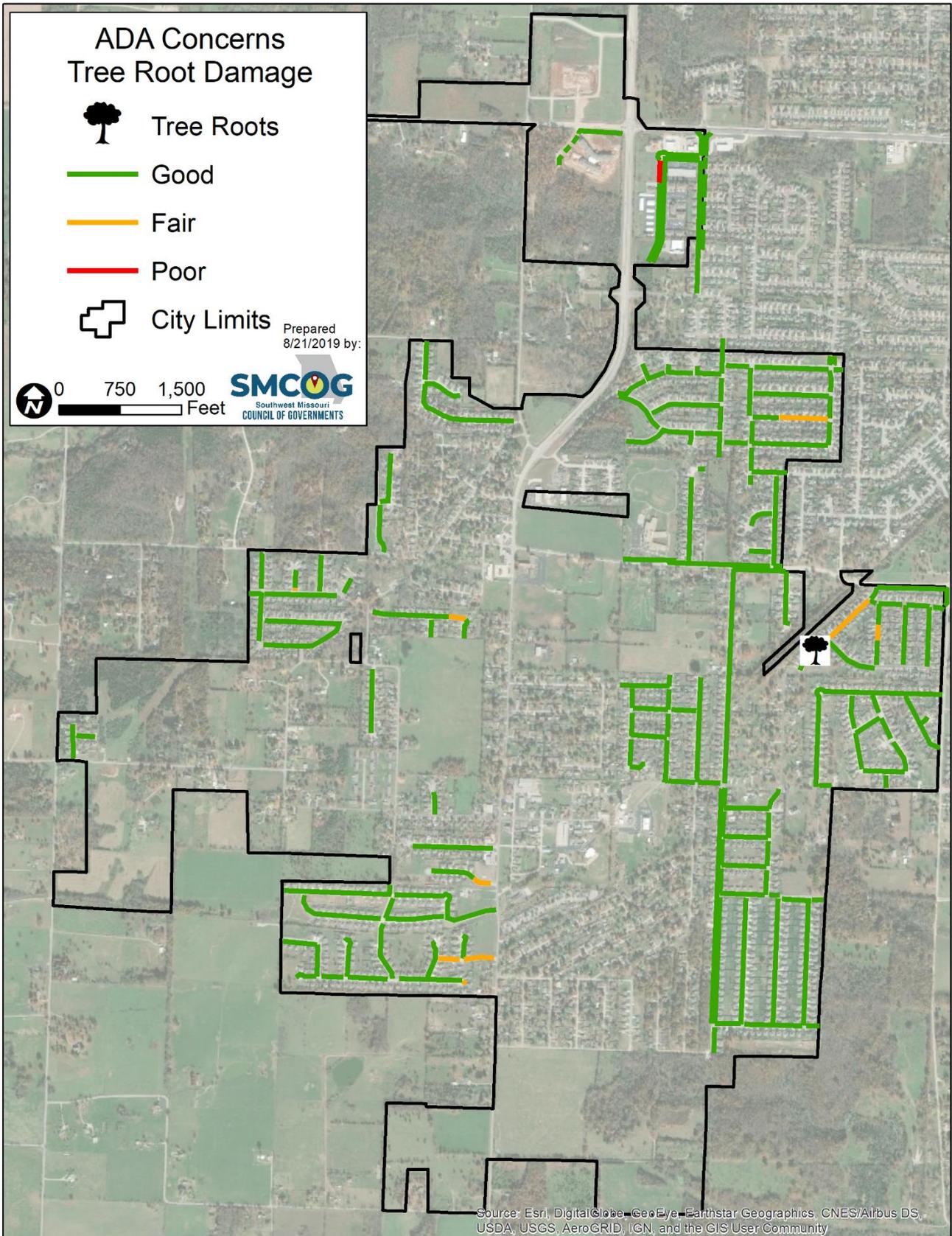


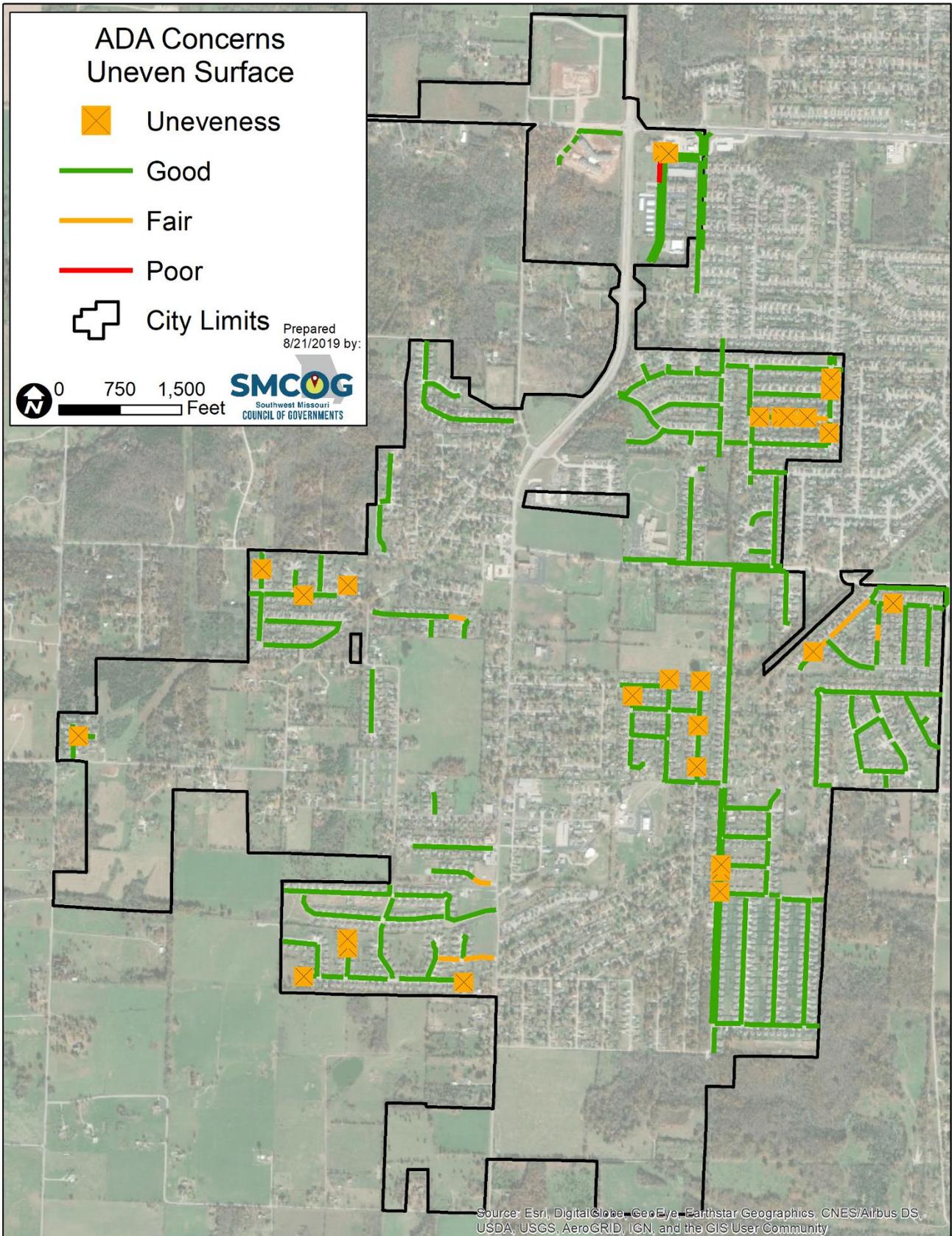












City of Mt Vernon

sidewalk  
inventory

October 2019



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## INTRODUCTION

The City of Mt Vernon contracted with the Southwest Missouri Council of Governments to conduct a complete count and assessment of current sidewalks throughout the city. The contract period was August 1<sup>st</sup> through October 31<sup>st</sup>. Sidewalks were assessed on condition and ranked as good, fair, or poor. On-site data collection ran from August 5<sup>th</sup> through August 14<sup>th</sup> and included taking line data for existing sidewalks and marking ADA concern locations with photos.

## SIDEWALKS

Sidewalks provide many benefits to communities and residents. Traffic can be decreased by promoting walkability and the overall health of a community may be improved with increased resident physical activity. Mt. Vernon has the benefit of existing sidewalk connections throughout the community. This may be particularly important to the older population as a transportation option from a residence to the city's amenities. According to the US Census Bureau, Mt. Vernon has 4,575 residents, when compared to the rest of Lawrence County Mt. Vernon has the third highest percent of residents over the age of 65 at 25.7%. The community also has a thriving young population, 20.5% of Mt. Vernon's residents are under the age of 19. This is a large portion of the community that could be utilizing sidewalks for transportation too and from school instead of riding busses or using individual vehicles for drop off and pick up. It has also been shown that students who walk to school are overall more active than students who are driven (Cooper, Anderson, Wedderkopp, Page, & Froberg, 2005).

Good condition sidewalks are important in order to allow for easy mobility. Persons who have physical disabilities or injuries may struggle on poor condition or otherwise neglected sidewalks. Poor sidewalks will force people to walk in the street, or to use a vehicle to travel even short distances as the sidewalk may not be a viable option. During the data collection process, numerous residents were noted using

the existing sidewalk infrastructure, indicating that people are interested in walking throughout the community.

## CONDITION ASSESSMENT

SMCOG staff assessed all sidewalks throughout Mt Vernon and ranked the general condition. Condition was identified as one of three general categories: good, fair, and poor. Elements such as cracks, buckling, overgrowth, obstructions, and missing sections were used in determining overall conditions. In total 13.17 miles of sidewalk was traversed and cataloged. Data was collected primarily by walking; however, surveying by vehicle and analyzing existing map data was used to supplement as needed to ensure the most accurate assessment.

**Table 1: Sidewalk Conditions**

Rating	Miles	Percentage
Good	7.07	53.7%
Fair	3.55	27%
Poor	2.55	19.3%
Total	13.17	100%

### GOOD

- Little or no cracking, unevenness, overgrowth, or otherwise obstructed
- Flat, smooth, continuous concrete construction
- Easily traversable by pedestrians and the disabled



Figure 1: Good Condition Sidewalk South of the Square on Main Street

## FAIR

- Light to moderate cracking, unevenness, and overgrowth
- Relatively flat and smooth concrete with minor buckling
- Sections may be moderately overgrown with good concrete structure
- May be easily traversable by foot, but difficult for those with disabilities



Figure 2: Fair Condition Sidewalk on South St, East of West St.

## POOR

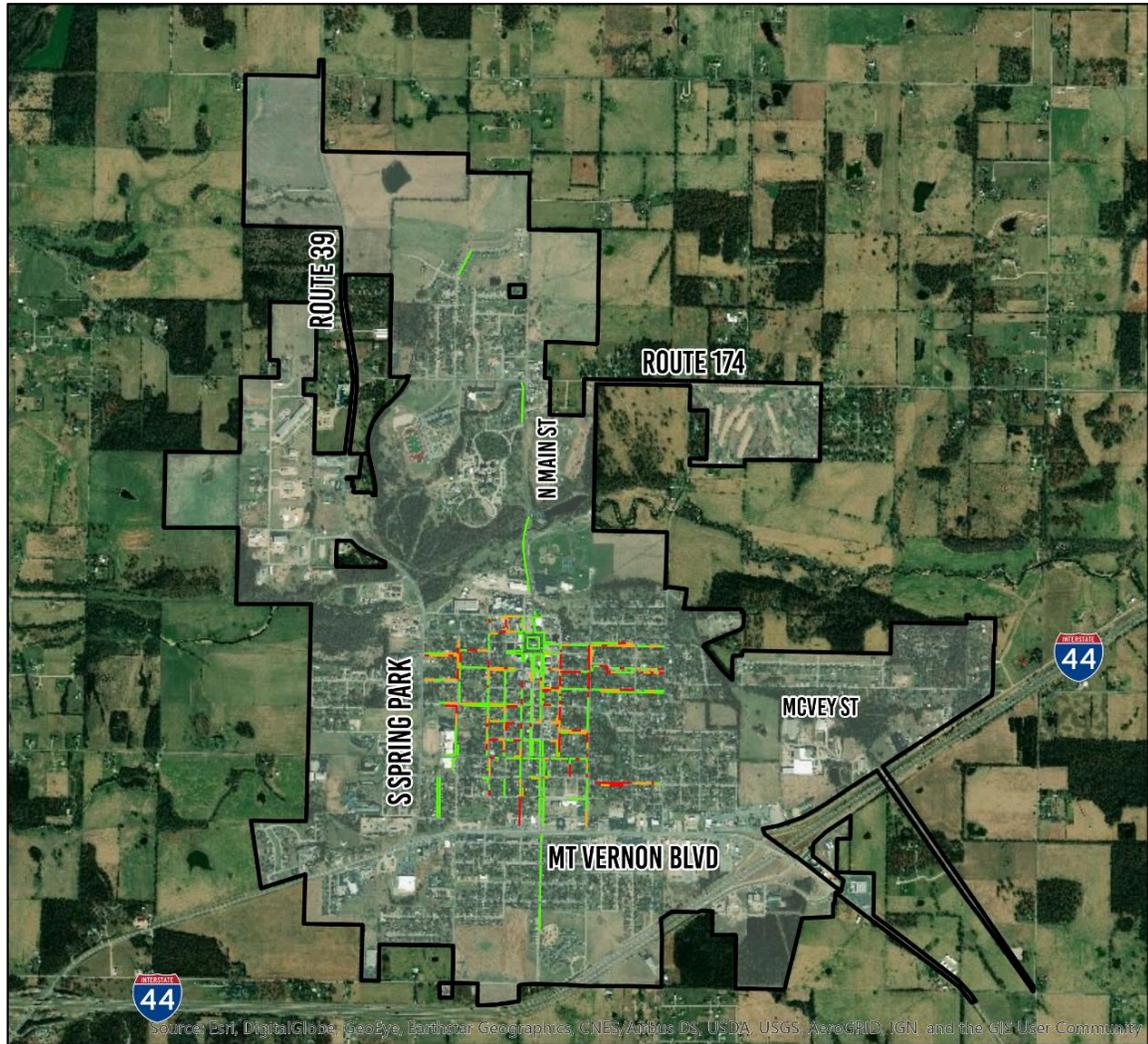
- Moderate to severe cracking and unevenness
- Major overgrowth and obstructions
- Concrete buckling in multiple places throughout a block
- Concrete missing in some portions
- Path is generally not traversable by those with disabilities



Figure 3: Poor Condition Sidewalk Between Water and Dallas Along Landrum St.

# SIDEWALK CONDITIONS MAPS

## MT. VERNON SIDEWALK OVERVIEW



### SIDEWALK CONDITIONS

- GOOD
- FAIR
- POOR

▭ MT. VERNON CITY BOUNDARY



PREPARED BY:



8/28/2019

Figure 4: Map of Mt. Vernon's Overall Sidewalk Conditions

# MT. VERNON SIDEWALK NORTH



**SIDEWALK CONDITIONS**

- GOOD
- FAIR
- POOR

MT. VERNON CITY BOUNDARY



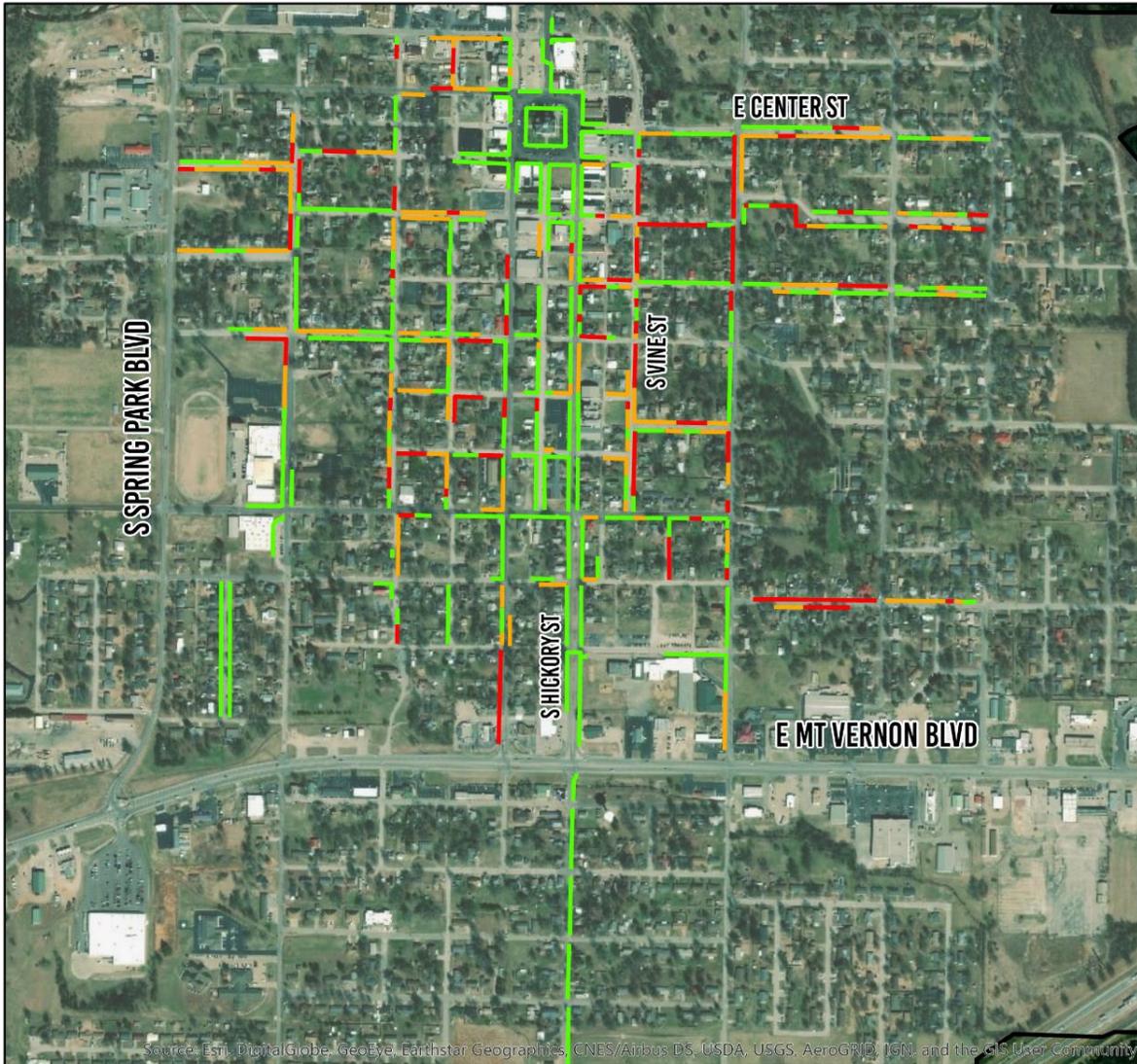
PREPARED BY:



8/28/2019

Figure 5: Mt Vernon Sidewalk Conditions Map North

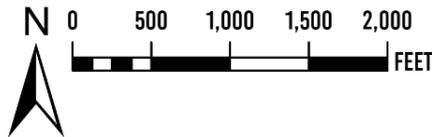
# MT VERNON SIDEWALK SOUTH



## SIDEWALK CONDITIONS

- GOOD
- FAIR
- POOR

MT. VERNON CITY BOUNDARY



PREPARED BY:



8/28/2019

Figure 6: Mt Vernon Sidewalk Condition Map South

## ANALYSIS

Overall Mt Vernon's sidewalks are aged and in deteriorating condition. It will take considerable maintenance and repair efforts to bring existing infrastructure back to a generally usable and ADA compliant state. The city's focus moving forward should be on repairing and maintaining existing infrastructure. There are three overarching factors to consider when analyzing sidewalk systems: location, connectivity, and accessibility.

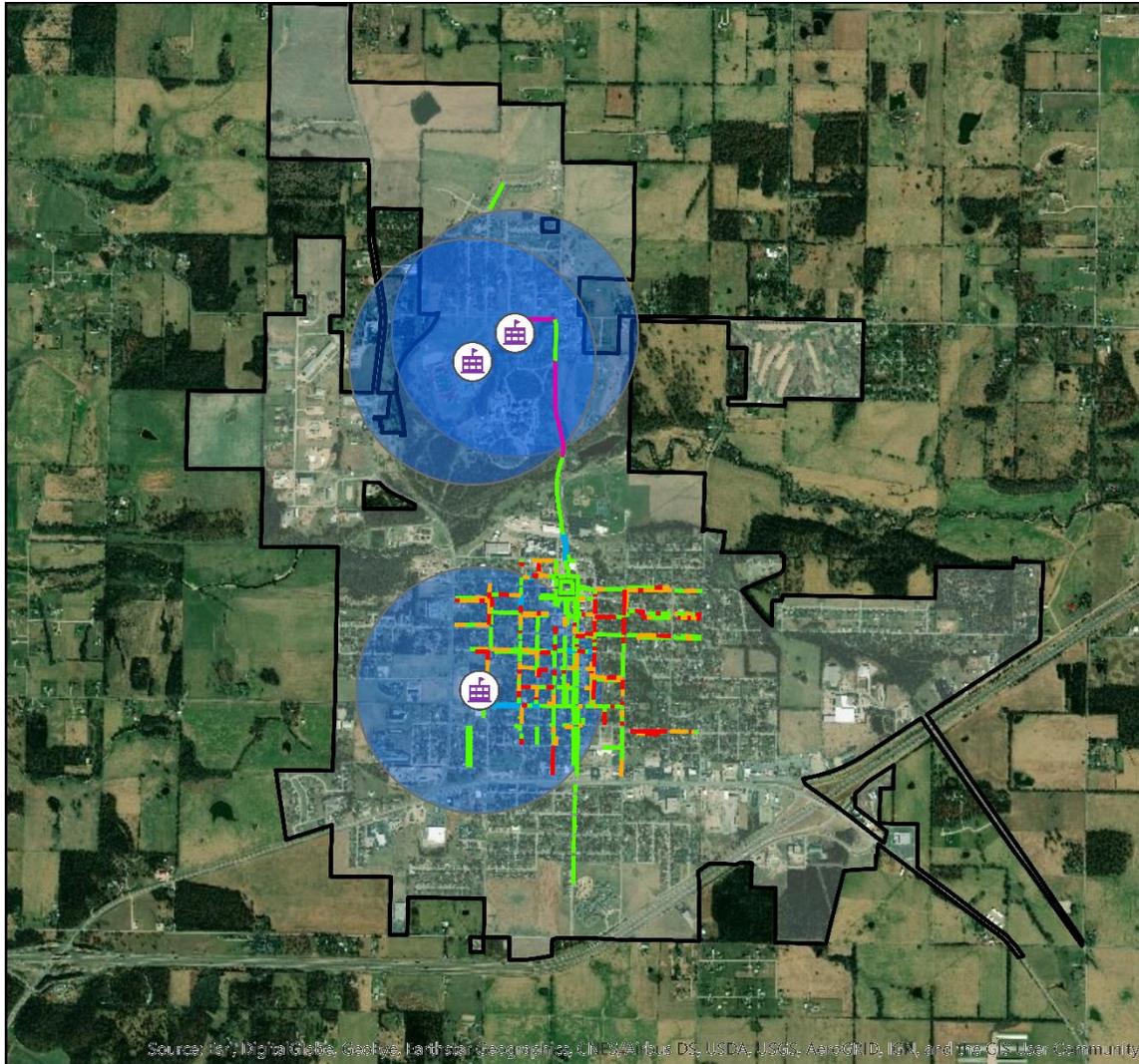
### LOCATION

A substantial portion of the good condition sidewalks are around the square, as well as along both sides of Hickory Street. This is good as it provides an easy way around much of the commercial locations throughout downtown. Outside of those areas, conditions begin deteriorating. Although a substantial portion of neighborhood sidewalks are in poor condition, the general location creates an extensive existing network from which to build from for future improvements.

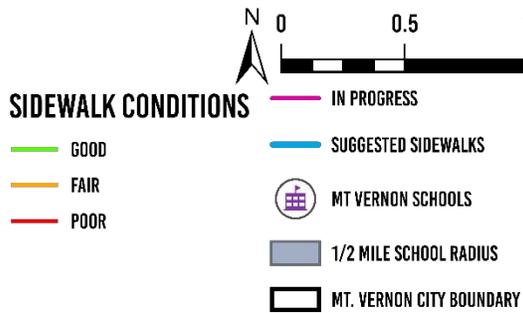
### CONNECTIVITY

Although 46.3% of existing infrastructure is in fair or poor condition there are existing high-quality connections and great opportunity for new connections. Existing sidewalks between Mt. Vernon Blvd and the square along Hickory Street provide excellent connectivity to the south side of the square. The planned new construction along N Main Street, just east of the old VA Hospital, will provide a much needed connection between the north and south parts of town. Construction of a small section north of the square would prove beneficial, completing the connection between the two parts. A small connection on West Street and a crosswalk by the library along Water Street would efficiently tie the local library into existing infrastructure. Connecting the elementary school to the neighborhoods by adding new sections along either Cherry Street or Sloan Street would also add beneficial new walking paths for students.

# MT VERNON SCHOOLS HALF MILE RADIUS



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNR/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



PREPARED BY:



Figure 7. Mt. Vernon Schools

## ACCESSIBILITY

Many of the existing ADA concerns throughout town would best be resolved during the process of repairing and replacing existing sidewalk. There is a considerable amount of cracking and unevenness as a result of time and vegetation throughout the existing network. Many of the fair condition sidewalks have minor cracking and may only need one section replaced to be considered good. Fair condition paths also show moderate signs of overgrowth along control joints and edges. This could be easily corrected and not only improve sidewalk conditions but prevent further degradation of the infrastructure.

The majority of intersections are lacking truncated domes and ramps. In addition to this many of the sections dead end just before reaching the roadway. Extending the sidewalks to the roadway, or adding ramps where needed, would include truncated domes and bring sidewalk crossing up to ADA standards. Appendix A will include more detailed maps showing each ADA concerns location.

**Table 2: ADA Concern Breakdown**

ISSUE	OCCURRENCES	EXAMPLE	LOCATION
Missing Truncated Domes	104		NW Corner of Water & Market

ISSUE	OCCURRENCES	EXAMPLE	LOCATION
Missing Ramps	75		SE Corner of Center & vine
Dead Ends	70		203 Water
Gaps / Missing Sidewalk	69		435 W Dallas

ISSUE	OCCURRENCES	EXAMPLE	LOCATION
Overgrowth	67		Crawford between Hickory & Main
Unevenness	67		South St between West & Hazel
Cracking	56		123 Water

ISSUE	OCCURRENCES	EXAMPLE	LOCATION
Obstruction	16		317 McCanse
Steep Grade	12		Dallas Just W of Market
Potholes	11		505 Hickory

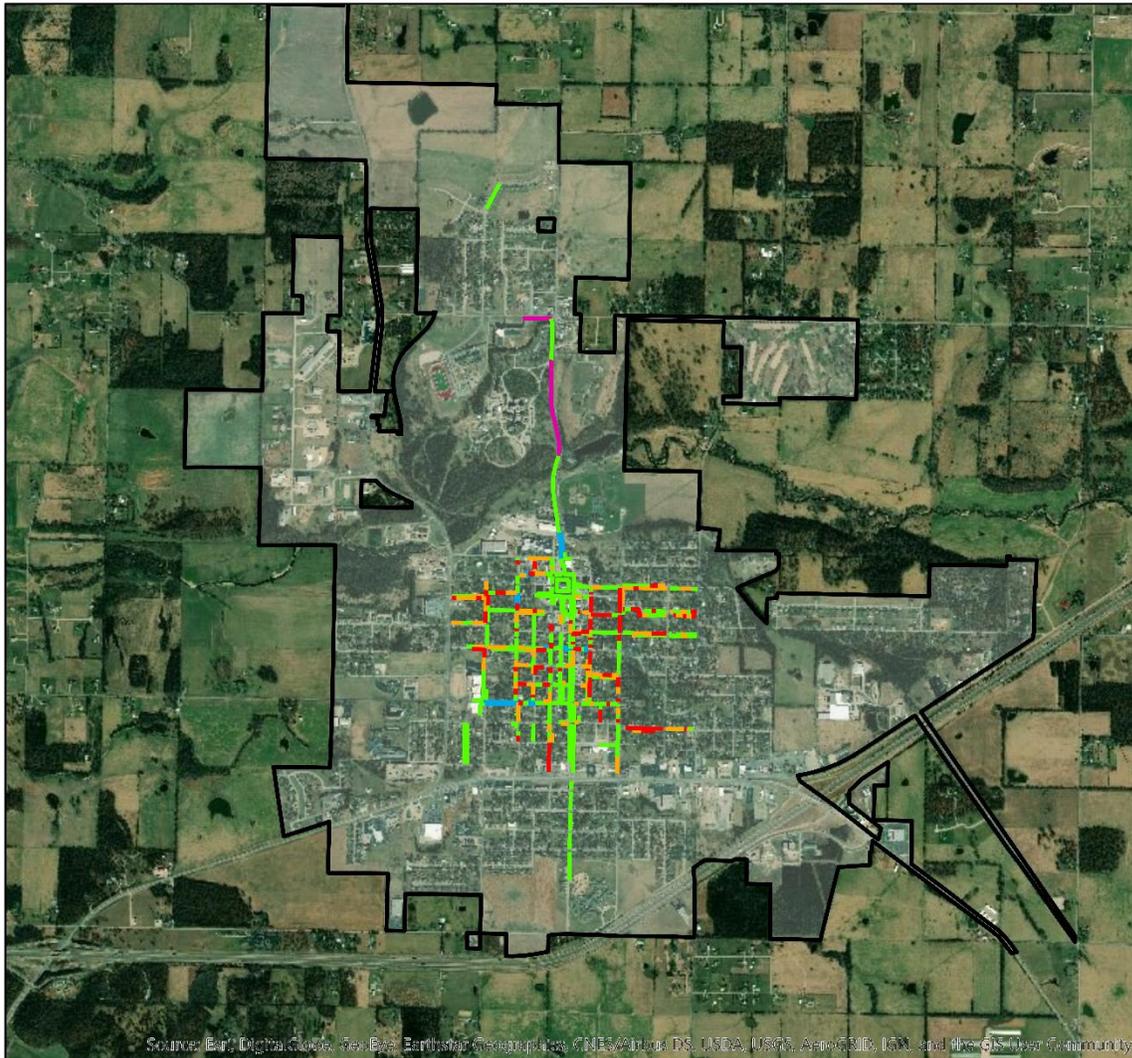
ISSUE	OCCURRENCES	EXAMPLE	LOCATION
Tree Roots	11		Outside Market Apartments
Narrow	5		McCanse & Kirby

## MOVING FORWARD

This document is intended to provide a snapshot of Mt. Vernon’s sidewalks as of August 2019. In the future the City should focus on improving old and deteriorating infrastructure over adding new. However, there are four locations where new construction has the potential to greatly increase the connectivity throughout the community. The currently in progress segments along N Main Street will be a needed addition to the infrastructure.

The following estimates were provided by Anderson Engineering in October 2019. As such pricing in this document will reflect the costs of that time, with a 15% contingency to account for unknowns. The projects also assume no storm water improvements, retaining walls, hand railing, or mid-block crosswalk signs or striping, but does include curb ramps with ADA warning strips every 150 feet. Appendix B will include a more detailed cost breakdowns for each project.

# MT VERNON PROPOSED SIDEWALKS



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

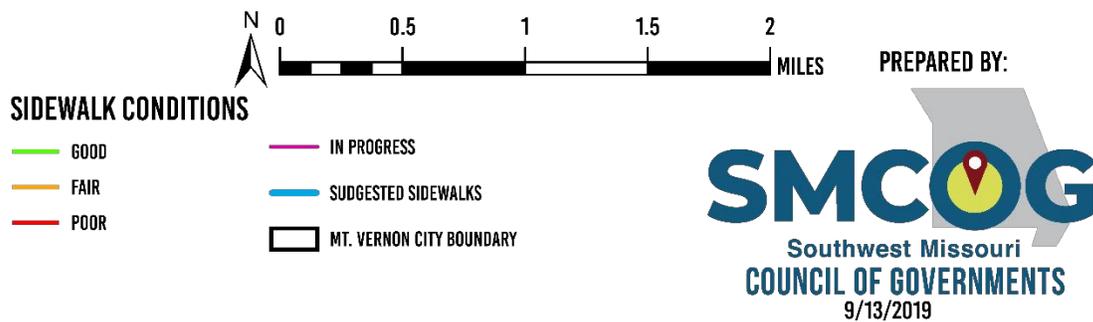


Figure 8: Mt Vernon Proposed Sidewalk Additions

**Table 3. Proposed Sidewalk Segments**

PROJECT	PROPOSED SEGMENT	LENGTH	COST ESTIMATE
A	S of Sloan between Landrum & McCanse	<u>983ft Total</u> 789ft New 194ft Replace	\$78,245.00
B	N side of Cherry between Landrum & Vine	<u>591ft Total</u> 416ft New 175ft Replace	\$47,731.00
C	Improved Library Access: Between West & Main on Water, Between Water & South on West	<u>562ft Total</u> 211ft New 309ft Replace 42ft Crosswalk	\$49,311.00
D	North Side Connection: W side of N Main St, Directly N of the Square.	<u>709ft Total</u> 709ft New	\$56,626.00
E	S Market Between Mt. Vernon Blvd & Blaze, S West Between Blaze & 920 West St, W Sloan St in front of 216 Sloan	<u>853ft Total</u> 853ft Replace	\$76,331.00
F	S Landrum between Middle School & Dallas, W Cherry Directly N of Middle School, W Center Between 318 Center & N West St	<u>2038ft Total</u> 2038ft Replace	\$181,455.00
G	S West Between South and North, Landrum Between 212 Landrum & W Dallas	<u>1337ft Total</u> 1337 Replace	\$119,031.00
H	Hazel Between North & Water, Hazel Between Sloan & Clay, Market Between Crawford & Cherry	<u>1143ft Total</u> 1143ft Replace	\$101,924.00
I	Main Between 617 Main & Clay, Hickory next to Post Office Parking Lot, Lynn Between Division & 808 Lynn, Vine Between 622 Vine & 600 Vine	<u>1025ft Total</u> 1025ft Replace	\$91,446.00
J	Vine Between College & Center	<u>1697ft Total</u> 1697ft Replace	\$151,359.00
K	McCanse Between Division & Center	<u>1982ft Total</u> 1982ft Replace	\$176,287.00
L	Kirby Between McCanse & S E St, Pleasant Between 539 Pleasant and Walnut, South Between 510 South & 517 South	<u>2779ft Total</u> 2779ft Replace	\$247,024.00

PROJECT	PROPOSED SEGMENT	LENGTH	COST ESTIMATE
M	South Between 544 South & East, Center Between McCanse & Walnut	<u>2355ft Total</u> 2355ft Replace	\$209,024.00
N	South Between 315 South & McCanse, College Between Vine & McCanse, Sloan in front of 413 E Sloan, Pleasant Between Hickory & Vine	<u>1733ft Total</u> 1733ft Replace	\$154,166.00
O	Crawford Between West & Market, Clay Between Hazel & Market, Cherry Between Hazel & Market, South in front of Givvy Park	<u>1194ft Total</u> 1194ft Replace	\$106,227.00
P	Dallas Between Spring Park BLVD and West, Cherry Between 419 Cherry & Landrum	<u>1480ft Total</u> 1480ft Replace	\$131,833.00

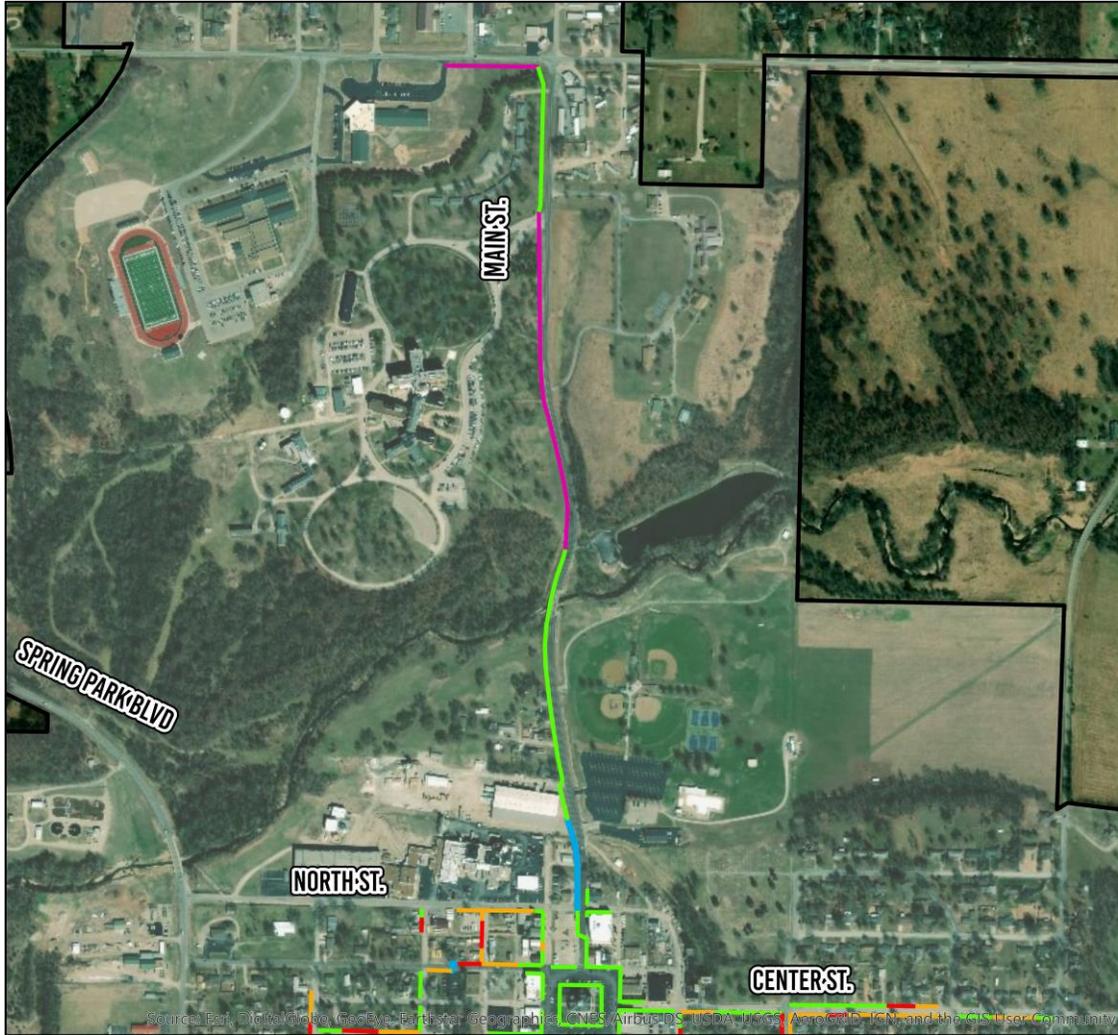
There are 22,461ft of proposed projects (4.25 miles). A total of 2,125ft (.40 mile) is new sidewalk and the remaining 20,336ft (3.85 miles) is replacing existing infrastructure. The recommended new segments account for \$231,913 and is split into four projects. A total cost of \$1,746,487 would be for replacing existing infrastructure split into 12 projects. This brings the total estimated cost to \$1,978,400 for all potential projects, divided into 16 potential projects.

In total Mt Vernon has 13.17 miles of sidewalk which is 69,537.6 linear feet. Given the cost to replace one foot of sidewalk has been estimate at about \$90 it would cost nearly \$6,300,000 to replace all existing city sidewalk infrastructure.

Mt. Vernon should consider adding a requirement for new construction to include sidewalks as it is substantially easier and more cost effective to build sidewalks during construction than going back and retrofitting the area.

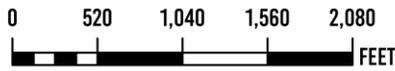
The Missouri Department of Transportation (MoDOT) provides Transportation Alternative Program (TAP) funding, which is an opportunity to apply for money to make the recommended improvements. These funds, which are available every two years, include factors such as: addressing ADA concerns, promotion of redevelopment, promoting safe routes to schools, and new versus replacement sidewalk. The City may also review options for raising revenue in the form of a dedicated transportation tax that could help fund an annual sidewalk program.

# PROPOSED SIDEWALK SEGMENTS NORTH



**SIDEWALK CONDITIONS**

- GOOD
- FAIR
- POOR
- IN PROGRESS
- SUGGESTED SIDEWALKS
- MT. VERNON CITY BOUNDARY



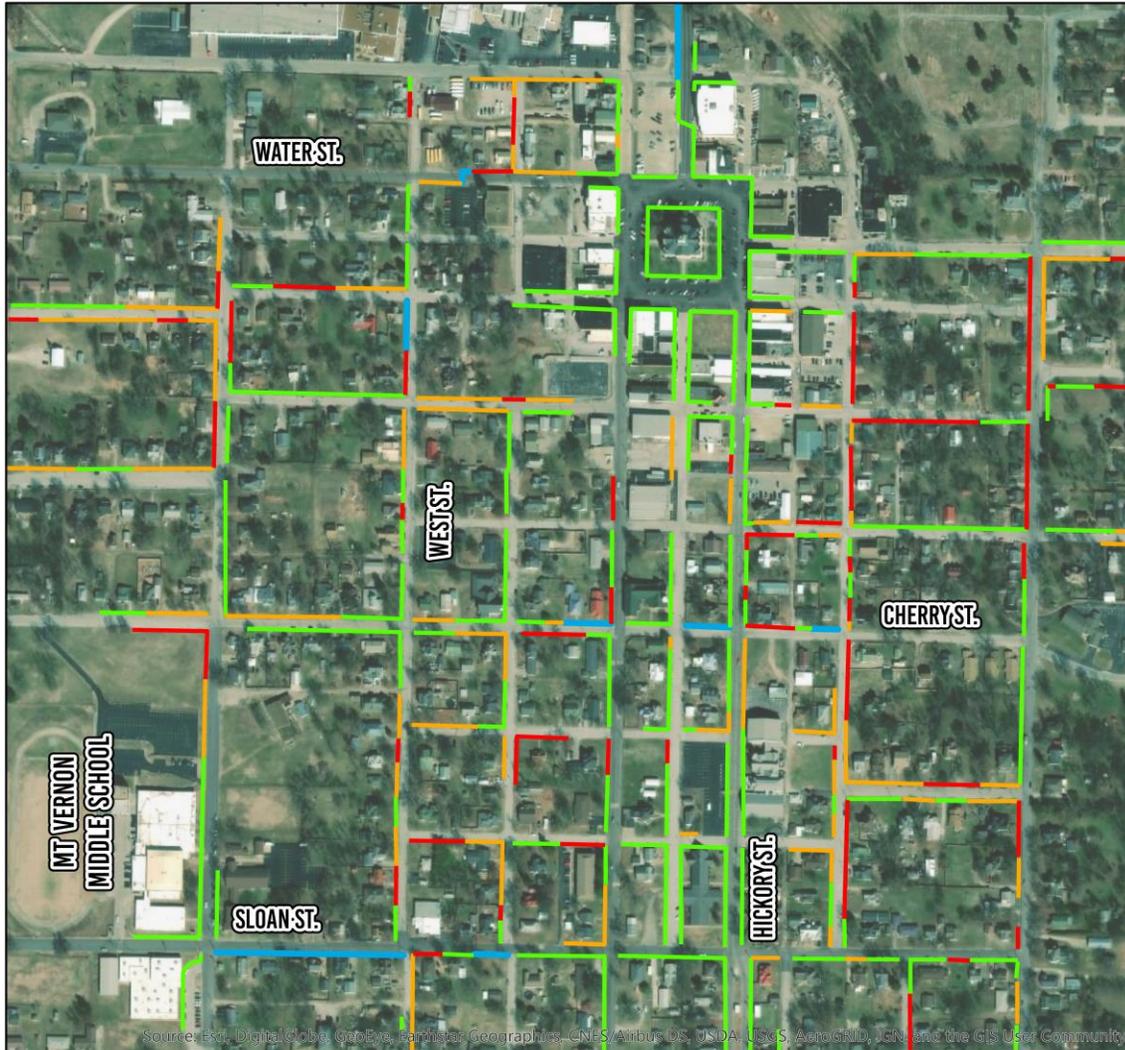
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Figure 9: Mt Vernon Proposed Sidewalk Additions North

# PROPOSED SIDEWALK SEGMENTS SOUTH

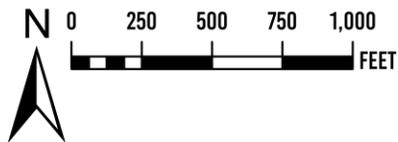


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

## SIDEWALK CONDITIONS

- GOOD
- FAIR
- POOR

- SUGGESTED SIDEWALKS
- MT. VERNON CITY BOUNDARY



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Figure 10: Mt Vernon Proposed Sidewalk Additions South

## REFERENCES

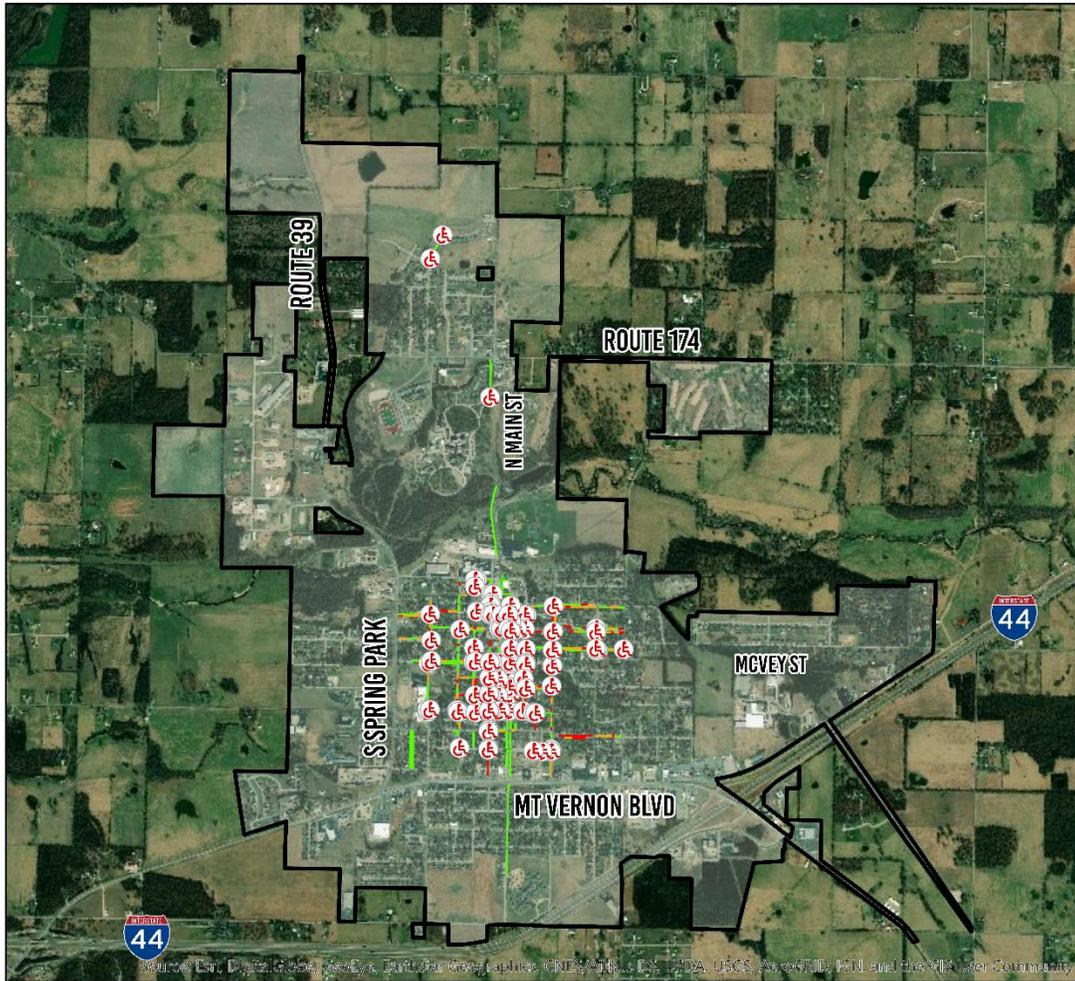
Cooper, A. R., Anderson, L. B., Wedderkopp, N., Page, A. S., & Froberg, K. (2005, October). Retrieved from science direct: <https://www.sciencedirect.com/science/article/abs/pii/S0749379705002242>

Department of Justice. (1994, July 1). Retrieved from Information and Technical Assistance on the Americans with Disabilities Act: <https://www.ada.gov/1991standards/adastd94-archive.pdf>

Department of Justice. (2010, September 15). *Information and Technical Assistance on the Americans with Disabilities Act*. Retrieved from <https://www.ada.gov/regs2010/2010ADAStandards/2010ADAStandards.pdf>

United States Access Board. (2011, July 26). *Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way*. Retrieved from <https://www.access-board.gov/attachments/article/743/nprm.pdf>

# MT. VERNON ADA CONCERN - NO TRUNCATED DOMES

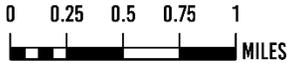


**SIDEWALK CONDITIONS**

- GOOD
- FAIR
- POOR

▭ MT. VERNON CITY BOUNDARY

♿ NO DOMES

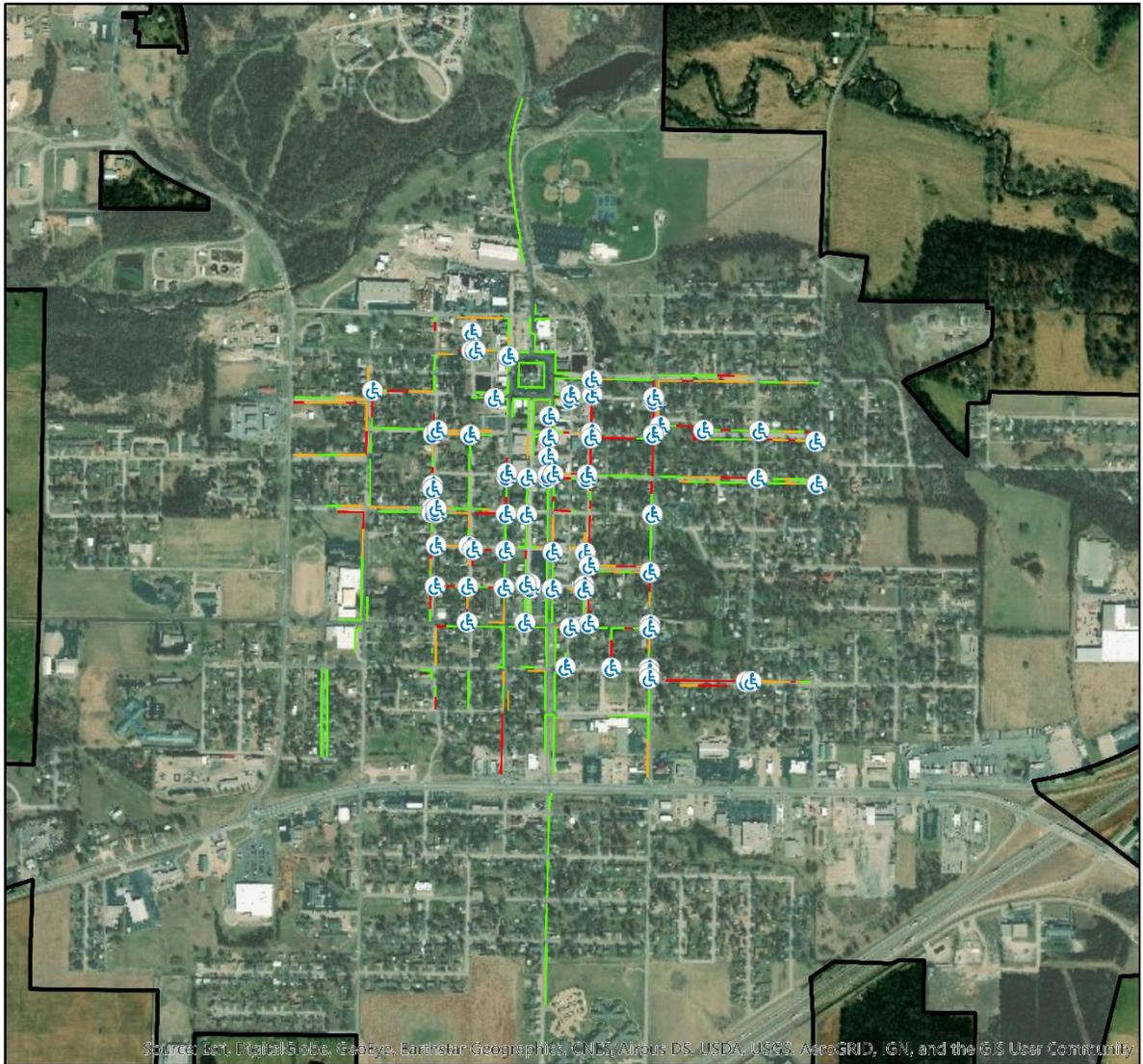


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# MT VERNON ADA CONCERN - MISSING RAMP



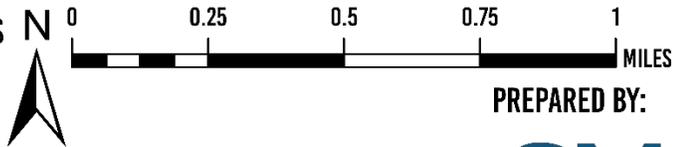
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

## SIDEWALK CONDITIONS

- GOOD
- FAIR
- POOR

MISSING RAMP

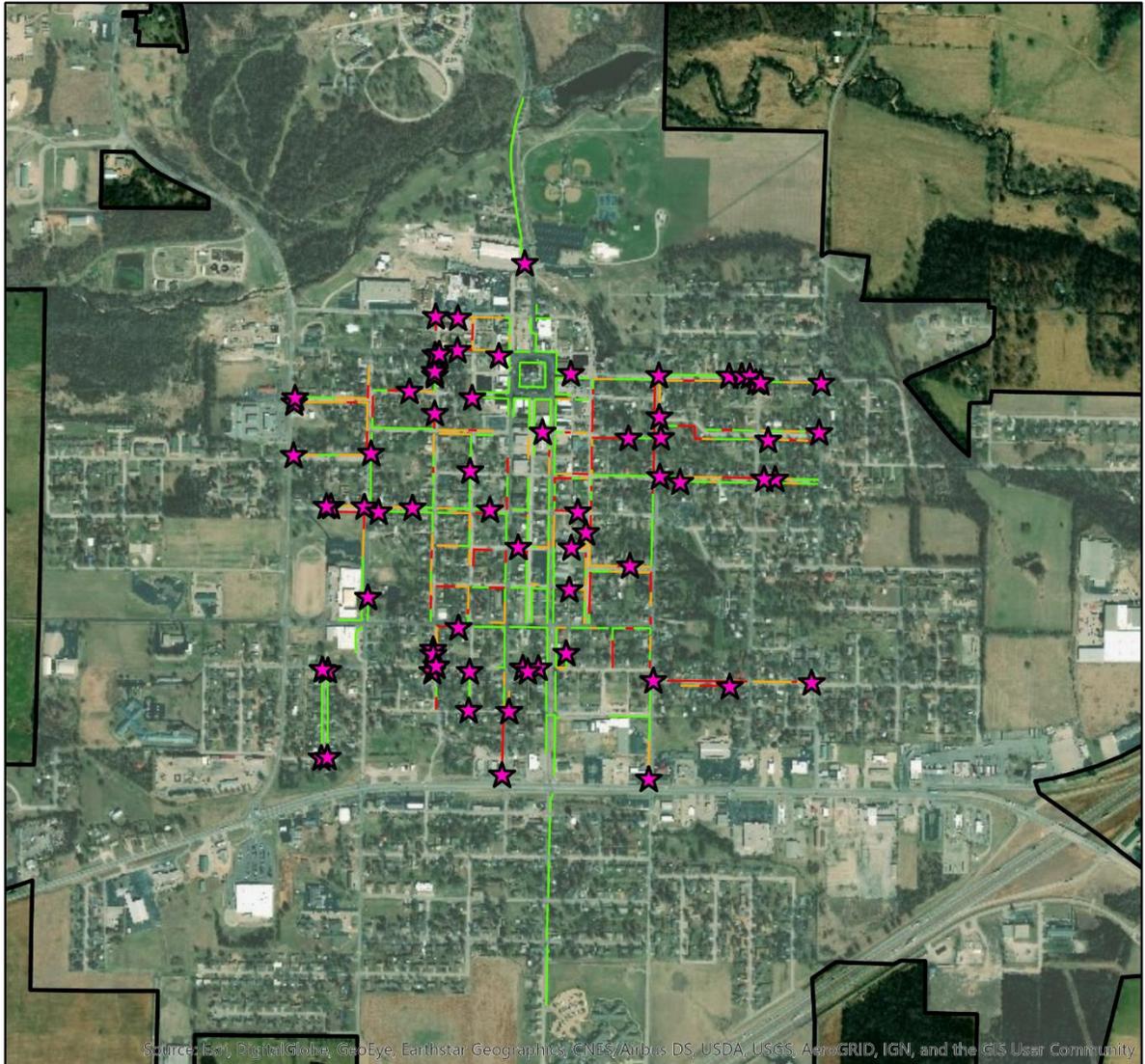
MT. VERNON CITY BOUNDARY



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Southwest Missouri  
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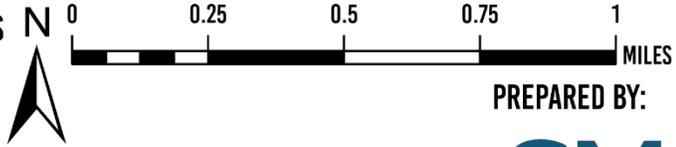
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

## SIDEWALK CONDITIONS

- GOOD
- FAIR
- POOR

★ DEAD ENDS

▭ MT. VERNON CITY BOUNDARY



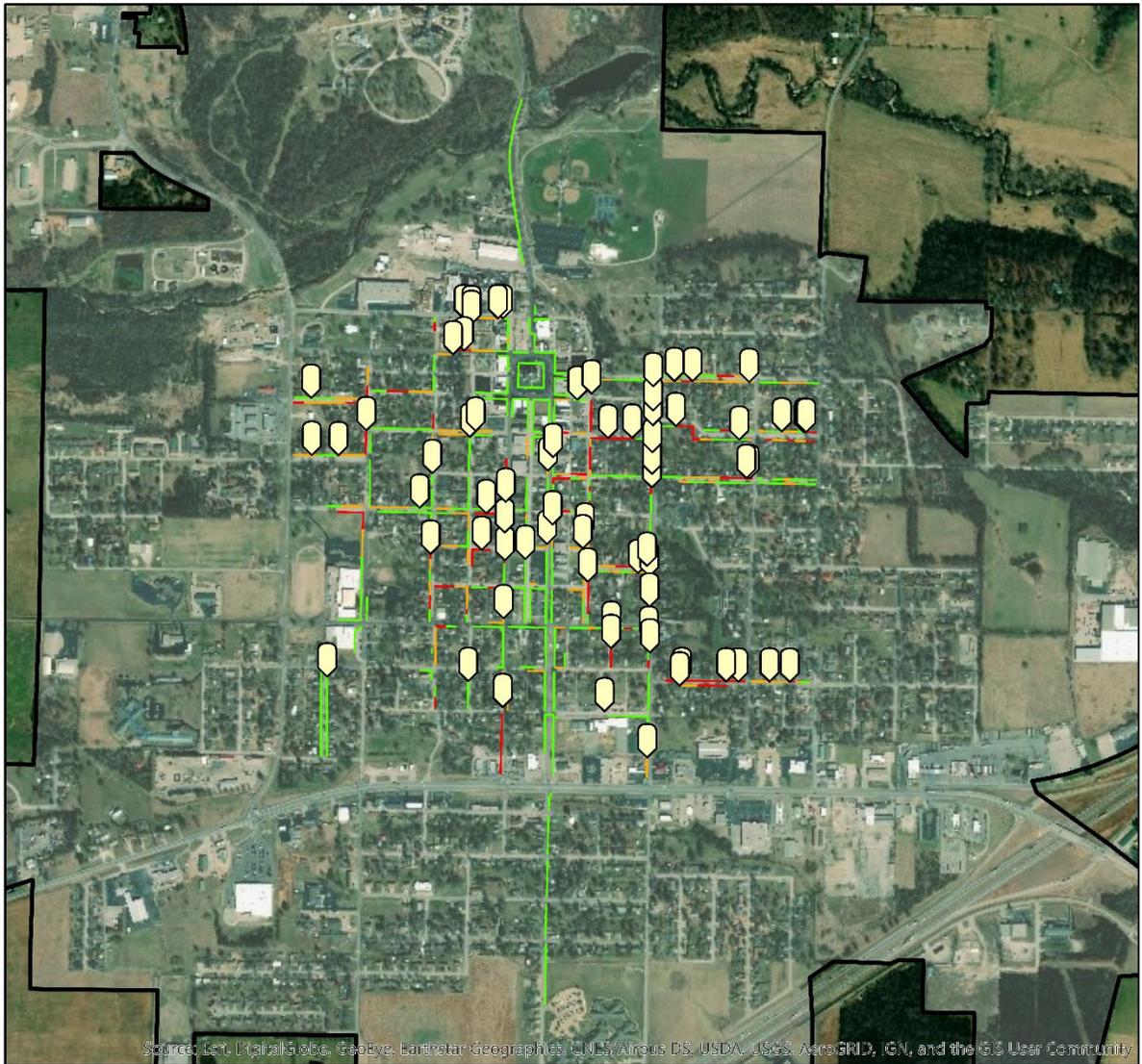
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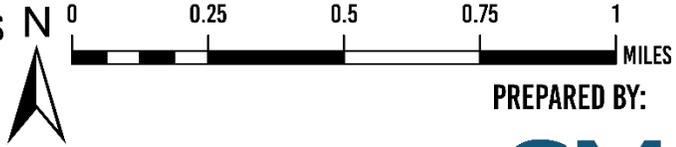
# MT VERNON ADA CONCERN - GAPS / MISSING SIDEWALK



## SIDEWALK CONDITIONS

- GOOD
- FAIR
- POOR

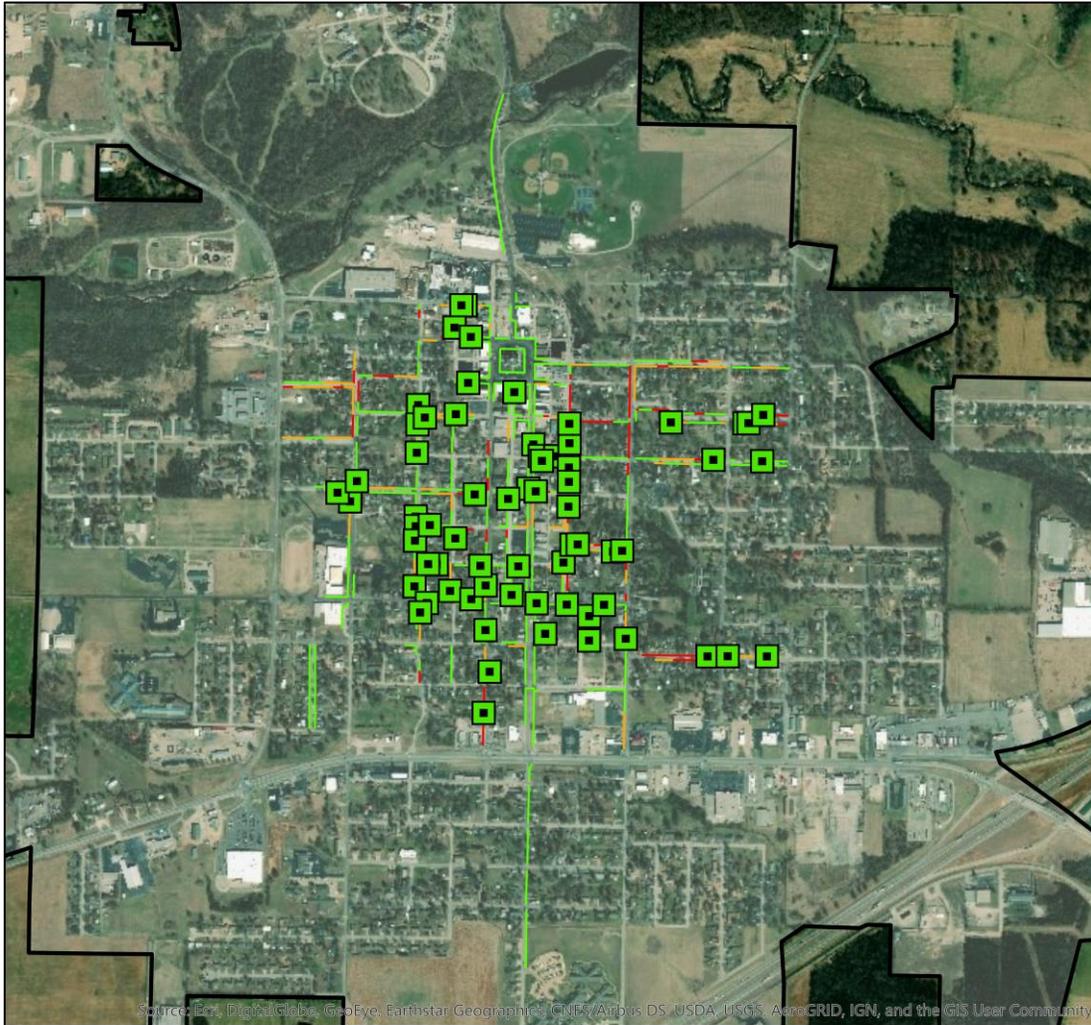
- GAPS MISSING SIDEWALK
- MT. VERNON CITY BOUNDARY



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# MT VERNON ADA CONCERN - OVERGROWN



## SIDEWALK CONDITIONS

- GOOD
- FAIR
- POOR

- OVERGROWN
- MT. VERNON CITY BOUNDARY

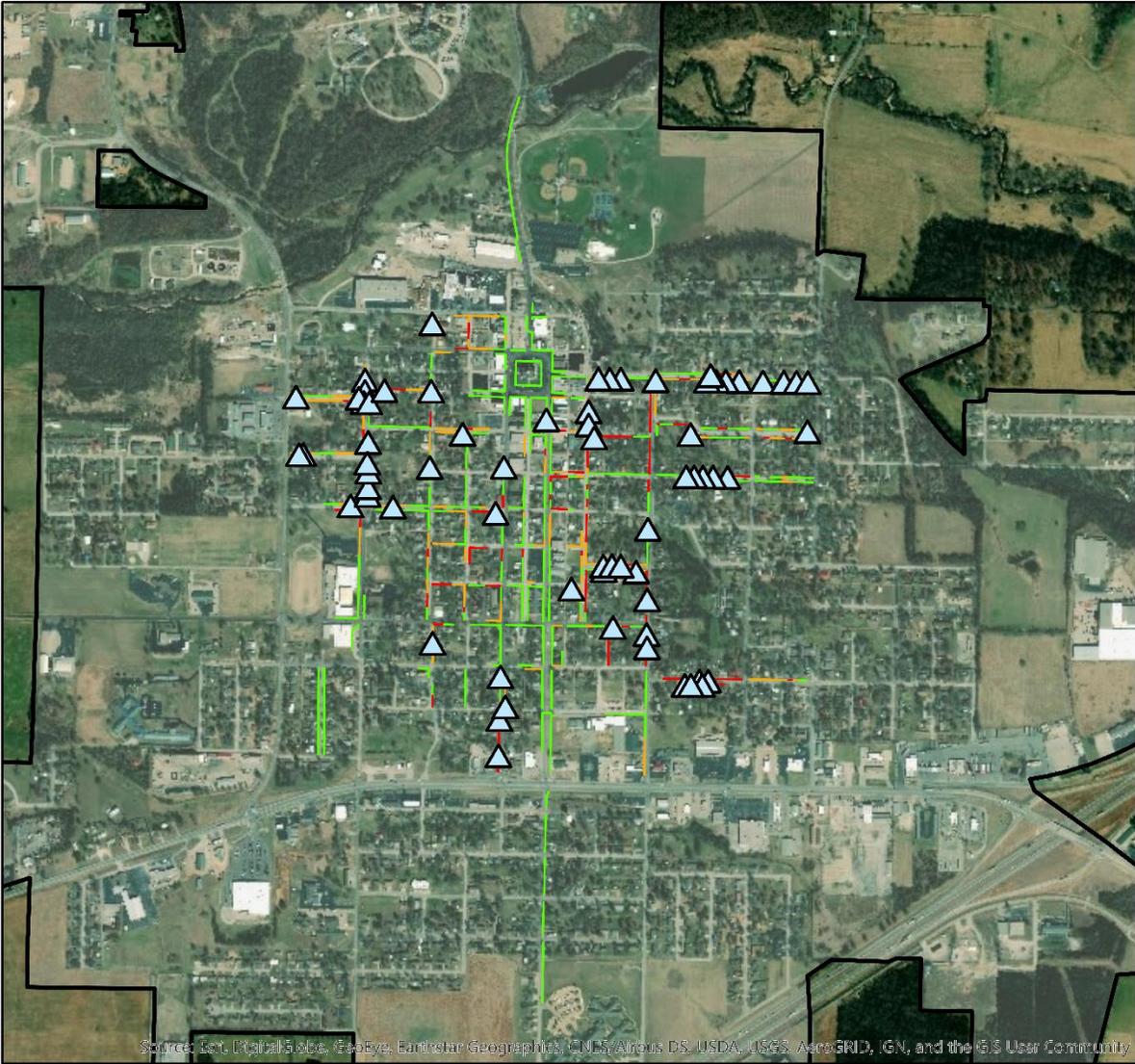


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# MT VERNON ADA CONCERN - UNEVENNESS



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**SIDEWALK CONDITIONS**

- GOOD
- FAIR
- POOR

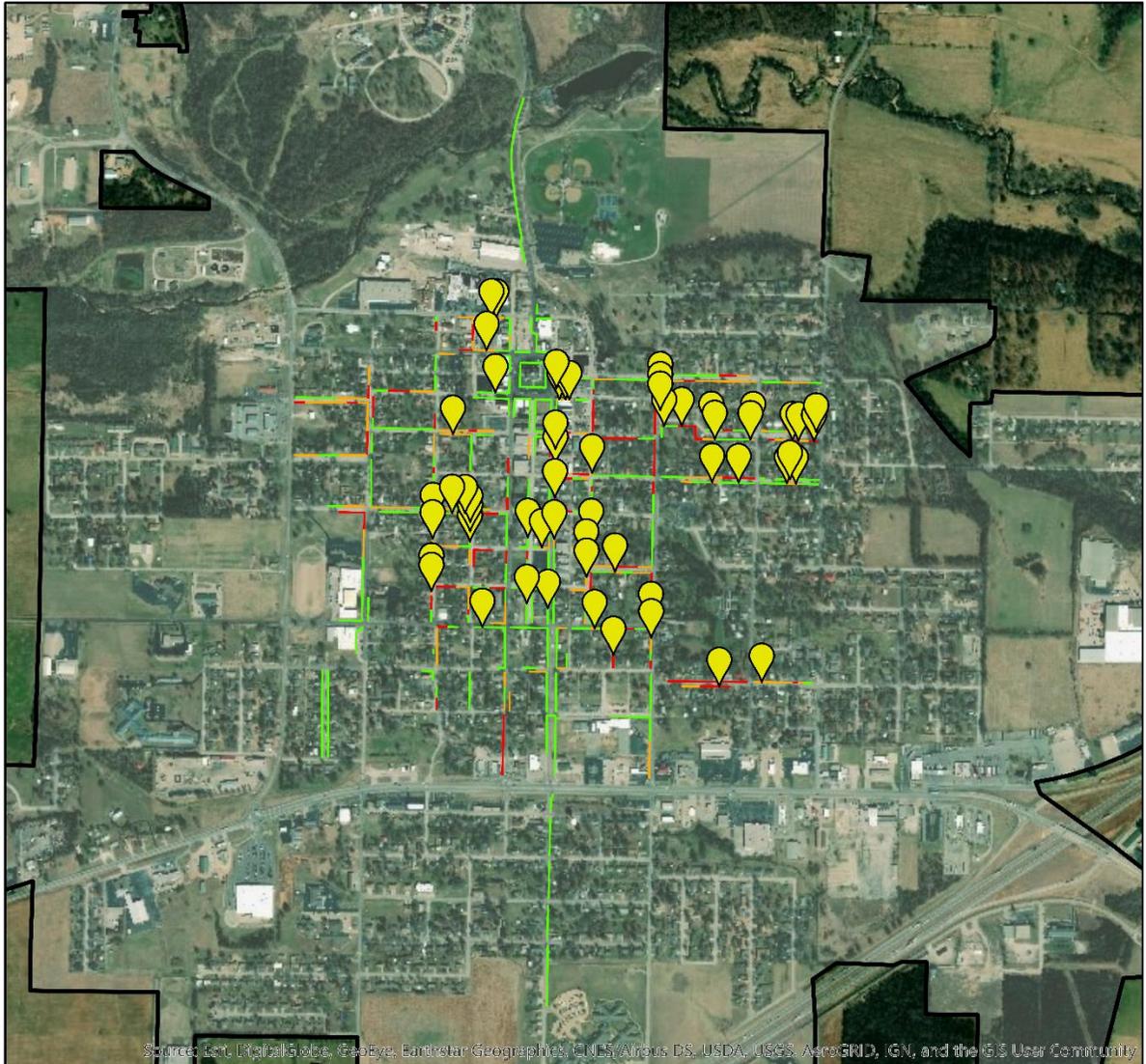
- UNEVENNESS
- MT. VERNON CITY BOUNDARY



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# MT VERNON ADA CONCERN - CRACKING

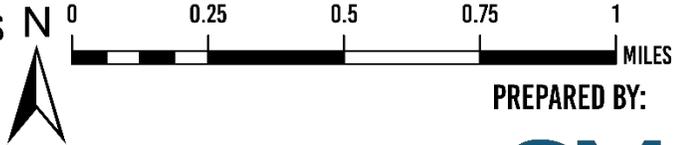


## SIDEWALK CONDITIONS

- GOOD
- FAIR
- POOR

 CRACKING

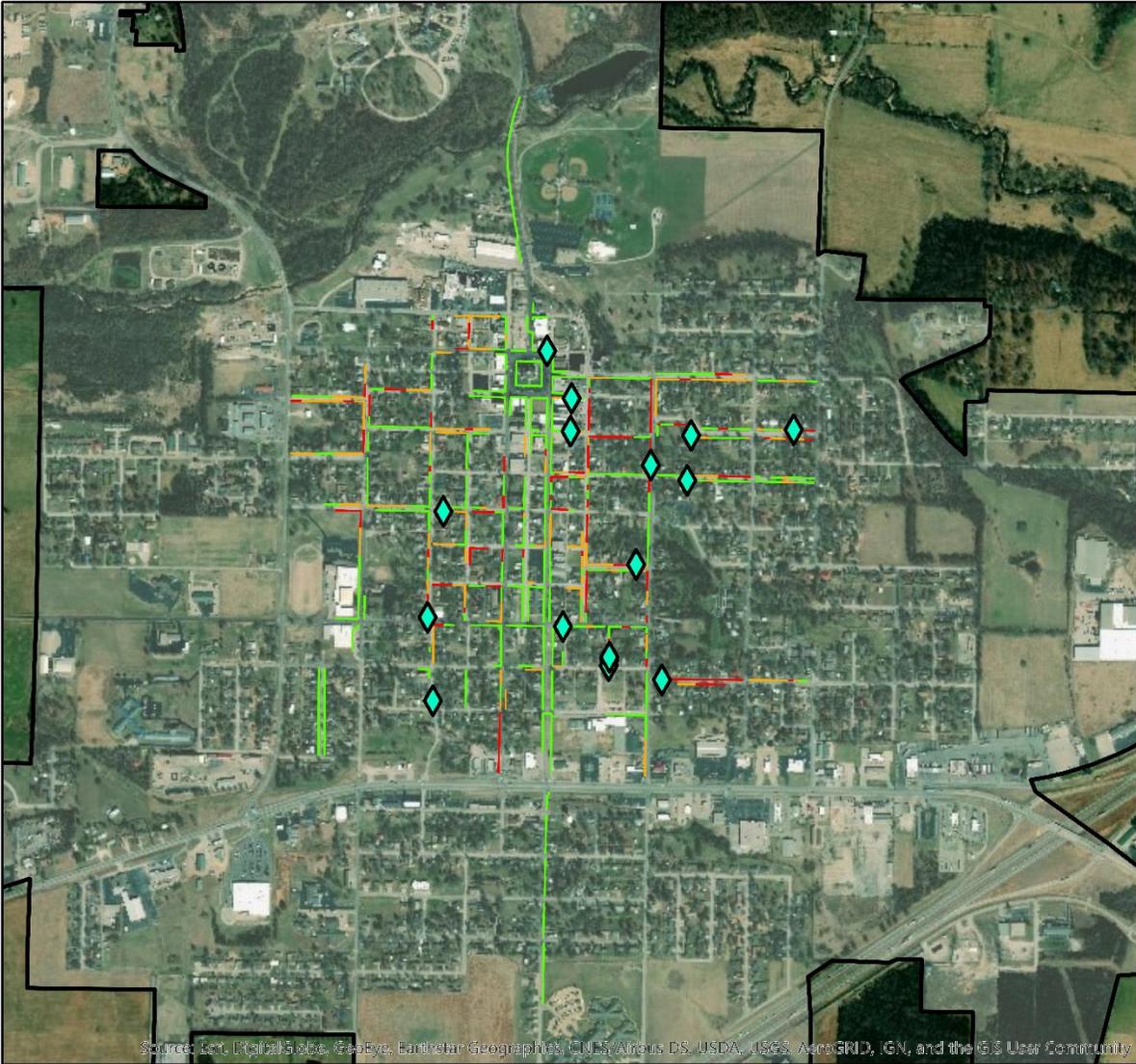
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# MT VERNON ADA CONCERN - OBSTRUCTIONS



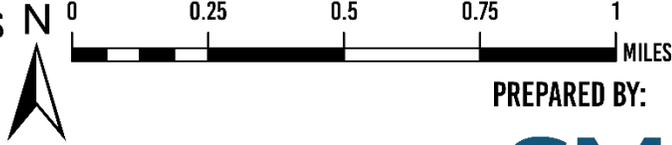
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**SIDEWALK CONDITIONS**

- GOOD
- FAIR
- POOR

OBSTRUCTION

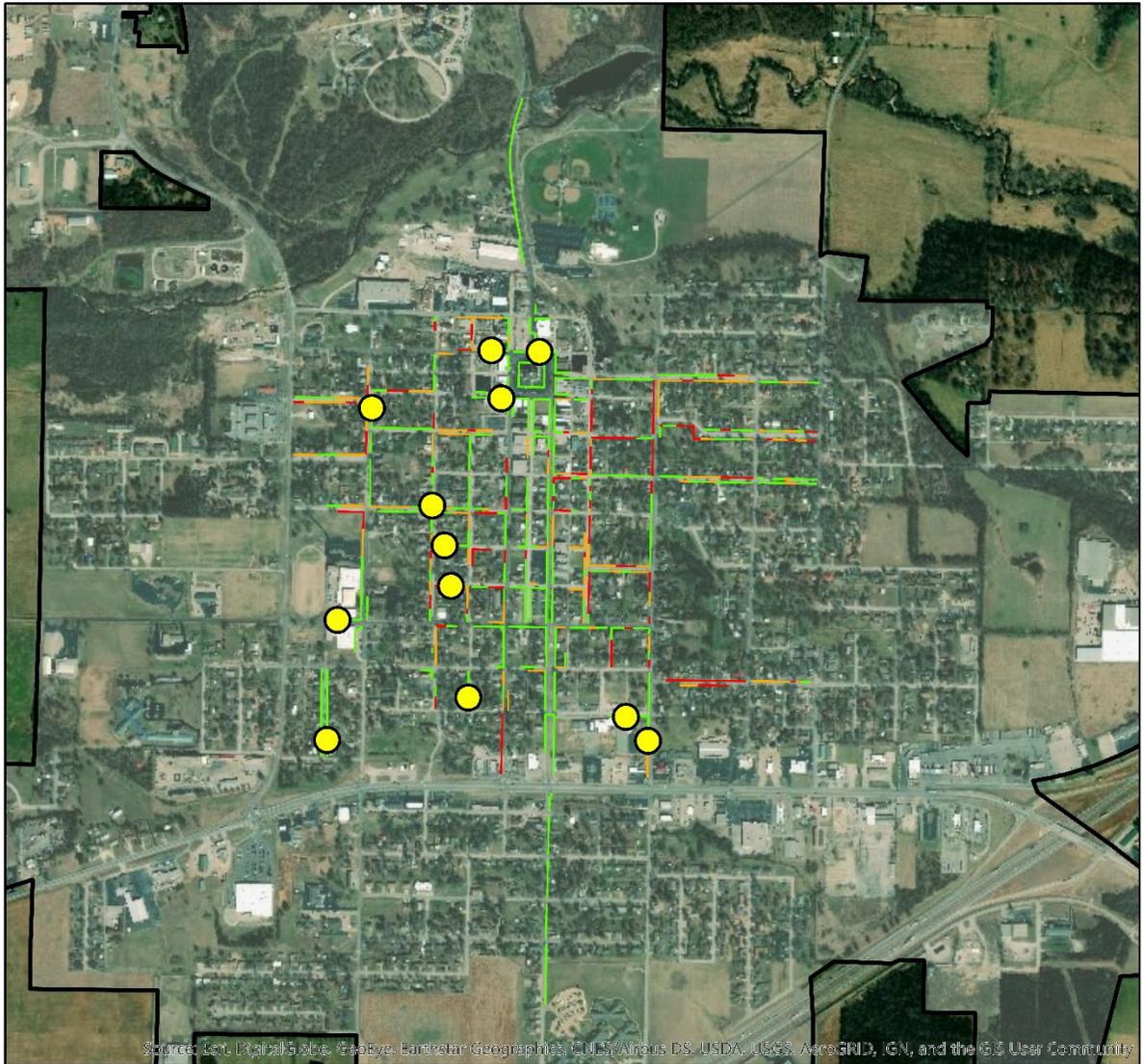
MT. VERNON CITY BOUNDARY



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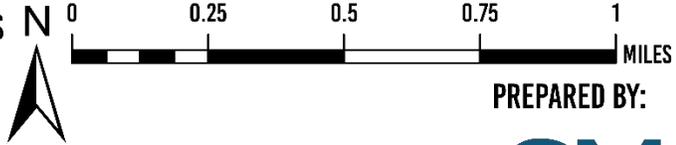
# MT VERNON ADA CONCERN - STEEP GRADES



## SIDEWALK CONDITIONS

- GOOD
- FAIR
- POOR

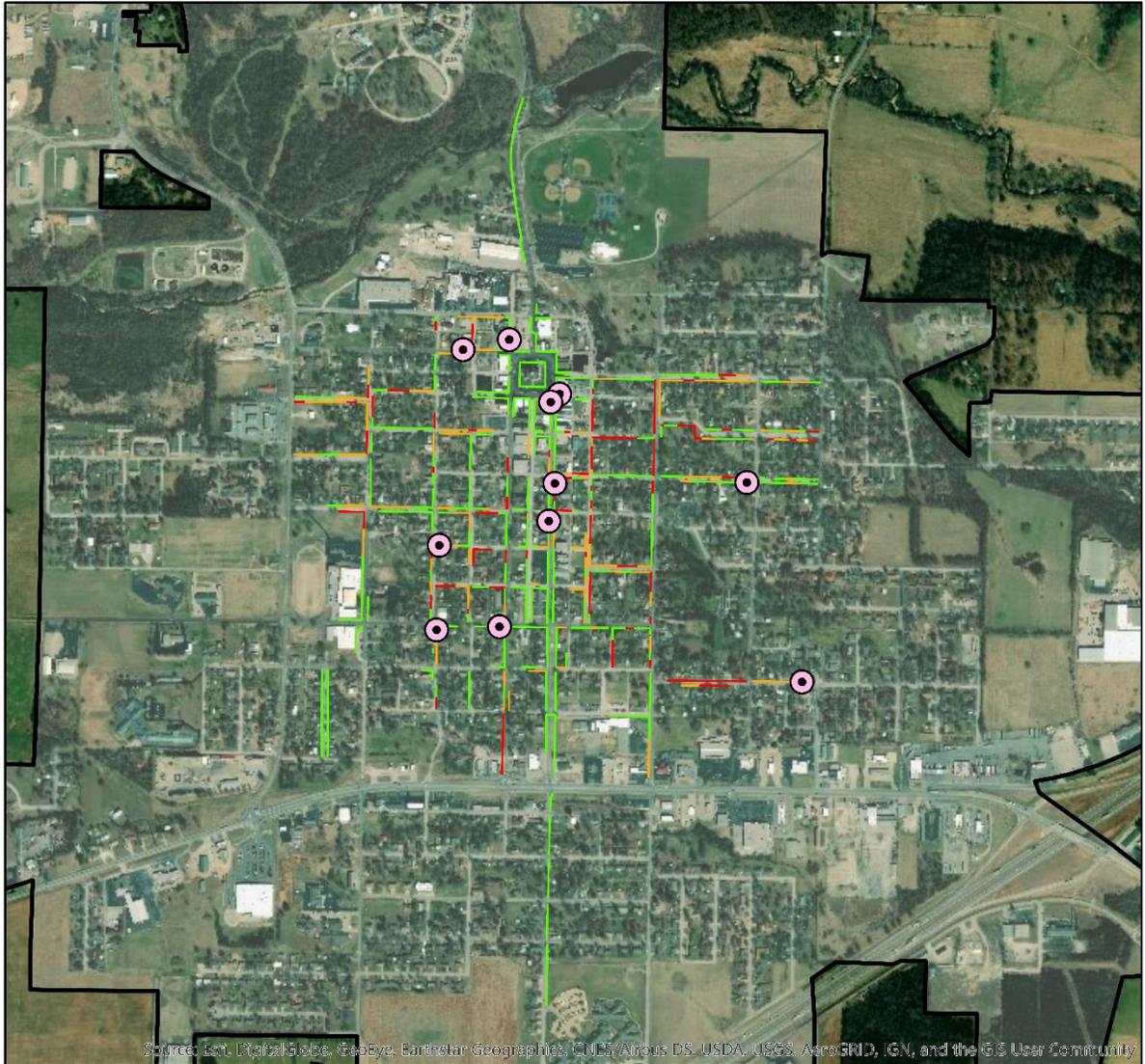
- STEEP GRADE
- ▭ MT. VERNON CITY BOUNDARY



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# MT VERNON ADA CONCERN - POT HOLES

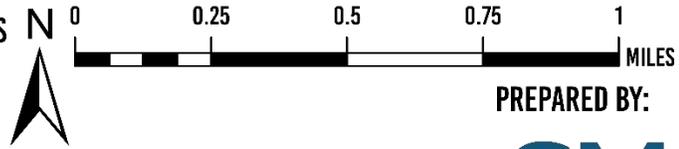


## SIDEWALK CONDITIONS

- GOOD
- FAIR
- POOR

○ POTHOLES

▭ MT. VERNON CITY BOUNDARY



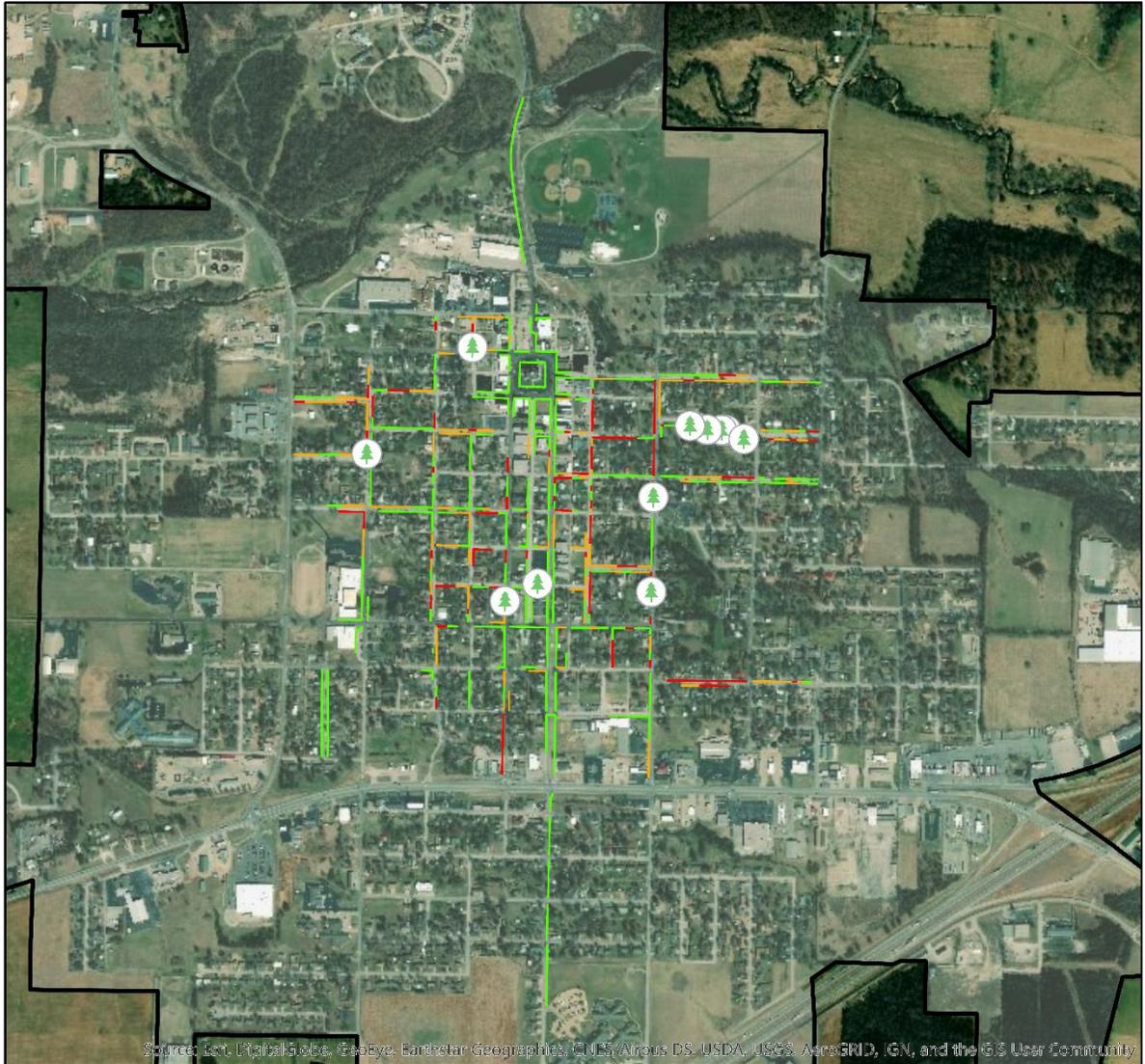
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# MT VERNON ADA CONCERN - TREE ROOTS

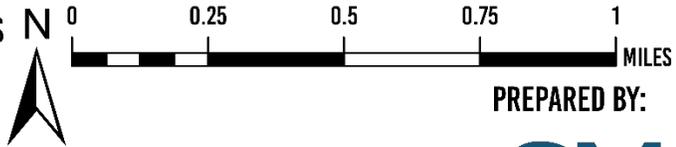


## SIDEWALK CONDITIONS

- GOOD
- FAIR
- POOR

TREE ROOTS

MT. VERNON CITY BOUNDARY



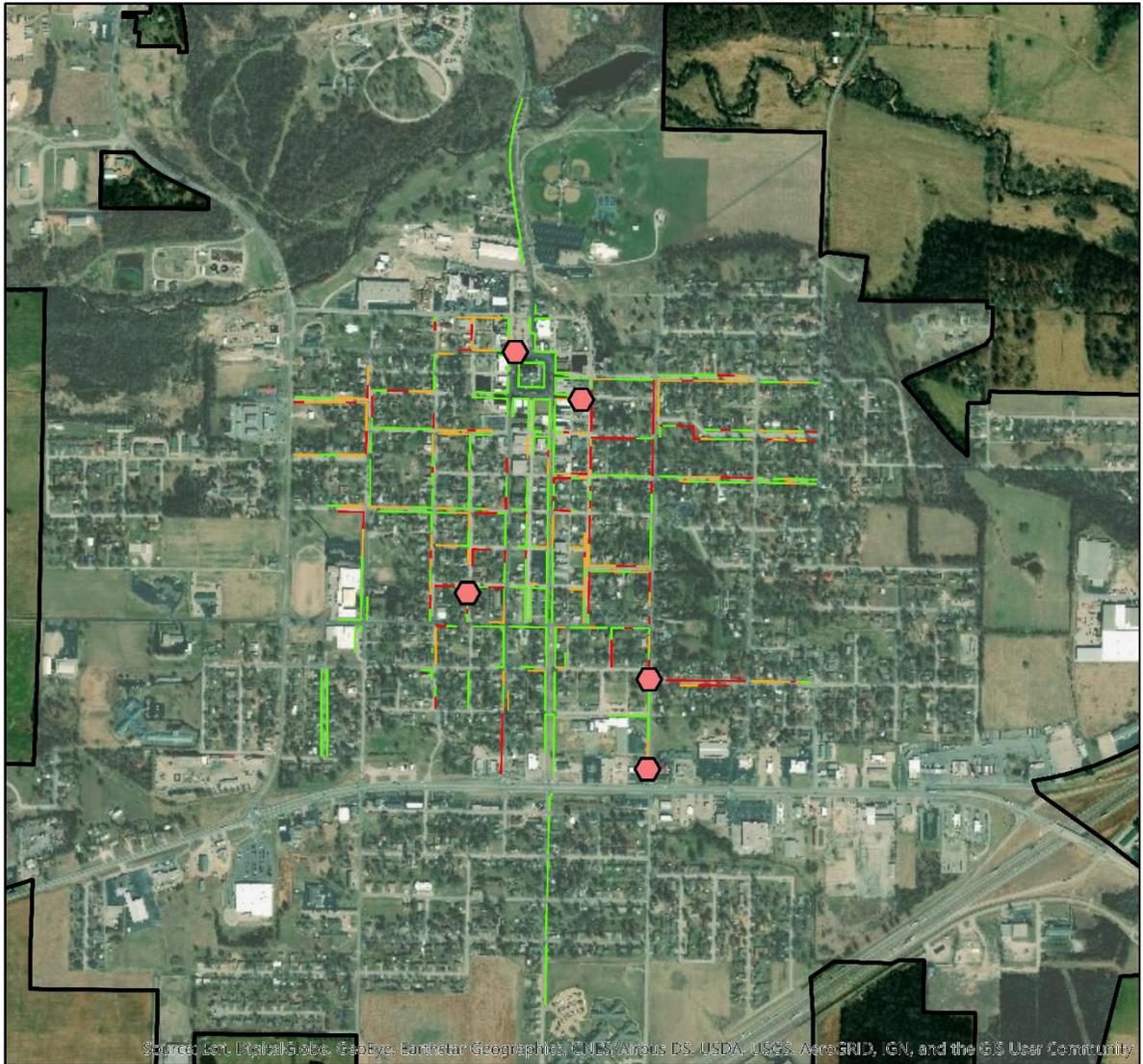
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# MT VERNON ADA CONCERN - NARROW



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## SIDEWALK CONDITIONS

- GOOD
- FAIR
- POOR

- NARROW
- MT. VERNON CITY BOUNDARY



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## APPENDIX B – COST BREAKDOWN FOR SIDEWALK IMPROVEMENT & REPAIR

### PROJECT A: \$78,245.00

Item No.	Description	Unit	Quantity	Unit Price	Amount
1	MOBILIZATION	LS	1	\$ 2,800.00	\$ 2,800.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	108	\$ 15.00	\$ 1,617.00
3	LINEAR GRADING	LF	983	\$ 7.00	\$ 6,881.00
4	SEEDING AND MULCH	AC	0.05	\$ 12,500.00	\$ 625.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 1,300.00	\$ 1,300.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 800.00	\$ 800.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	464	\$ 50.00	\$ 23,210.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	115	\$ 75.00	\$ 8,602.00
9	ADA DETECTABLE WARNING STRIPS	SF	70	\$ 30.00	\$ 2,100.00
10	TYPE 5 AGGREGATE BASE	SY	579	\$ 9.00	\$ 5,210.00

### PROJECT B: \$47,731.00

Item No.	Description	Unit	Quantity	Unit Price	Amount
1	MOBILIZATION	LS	1	\$ 1,700.00	\$ 1,700.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	97	\$ 15.00	\$ 1,459.00
3	LINEAR GRADING	LF	591	\$ 7.00	\$ 4,137.00
4	SEEDING AND MULCH	AC	0.03	\$ 12,500.00	\$ 375.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 800.00	\$ 800.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 500.00	\$ 500.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	279	\$ 50.00	\$ 13,955.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	69	\$ 75.00	\$ 5,172.00
9	ADA DETECTABLE WARNING STRIPS	SF	40	\$ 30.00	\$ 1,200.00
10	TYPE 5 AGGREGATE BASE	SY	348	\$ 9.00	\$ 3,133.00

### PROJECT C: \$49,311.00

Item No.	Description	Unit	Quantity	Unit Price	Amount
1	MOBILIZATION	LS	1	\$ 1,600.00	\$ 1,600.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	172	\$ 15.00	\$ 2,575.00
3	LINEAR GRADING	LF	562	\$ 7.00	\$ 3,934.00
4	SEEDING AND MULCH	AC	0.03	\$ 12,500.00	\$ 375.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 800.00	\$ 800.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 500.00	\$ 500.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	265	\$ 50.00	\$ 13,270.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	66	\$ 75.00	\$ 4,918.00
9	ADA DETECTABLE WARNING STRIPS	SF	40	\$ 30.00	\$ 1,200.00
10	TYPE 5 AGGREGATE BASE	SY	331	\$ 9.00	\$ 2,979.00
11	TYPE 2 PREFORMED MARKING TAPE - CROSSWALK	LF	84	\$ 15.00	\$ 1,260.00

**PROJECT D: \$56,626.00**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	MOBILIZATION	LS	1	\$ 2,000.00	\$ 2,000.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	0	\$ 15.00	\$ -
3	LINEAR GRADING	LF	709	\$ 7.00	\$ 4,963.00
4	SEEDING AND MULCH	AC	0.04	\$ 12,500.00	\$ 500.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 900.00	\$ 900.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 600.00	\$ 600.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	335	\$ 50.00	\$ 16,741.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	83	\$ 75.00	\$ 6,204.00
9	ADA DETECTABLE WARNING STRIPS	SF	50	\$ 30.00	\$ 1,500.00
10	TYPE 5 AGGREGATE BASE	SY	418	\$ 9.00	\$ 3,758.00
11	TYPE 2 PREFORMED MARKING TAPE - CROSSWALK	LF	84	\$ 15.00	\$ 1,260.00

**PROJECT E: \$76,311.00**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	MOBILIZATION	LS	1	\$ 2,400.00	\$ 2,400.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	474	\$ 15.00	\$ 7,109.00
3	LINEAR GRADING	LF	853	\$ 7.00	\$ 5,971.00
4	SEEDING AND MULCH	AC	0.05	\$ 12,500.00	\$ 625.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 1,100.00	\$ 1,100.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 700.00	\$ 700.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	403	\$ 50.00	\$ 20,141.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	100	\$ 75.00	\$ 7,464.00
9	ADA DETECTABLE WARNING STRIPS	SF	60	\$ 30.00	\$ 1,800.00
10	TYPE 5 AGGREGATE BASE	SY	502	\$ 9.00	\$ 4,521.00

**PROJECT F: \$181,455.00**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	MOBILIZATION	LS	1	\$ 5,700.00	\$ 5,700.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	1,132	\$ 15.00	\$ 16,984.00
3	LINEAR GRADING	LF	2,038	\$ 7.00	\$ 14,266.00
4	SEEDING AND MULCH	AC	0.10	\$ 12,500.00	\$ 1,250.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 2,600.00	\$ 2,600.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 1,600.00	\$ 1,600.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	962	\$ 50.00	\$ 48,120.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	238	\$ 75.00	\$ 17,833.00
9	ADA DETECTABLE WARNING STRIPS	SF	140	\$ 30.00	\$ 4,200.00
10	TYPE 5 AGGREGATE BASE	SY	1,200	\$ 9.00	\$ 10,802.00

**PROJECT G: \$119,031.00**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	MOBILIZATION	LS	1	\$ 3,700.00	\$ 3,700.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	743	\$ 15.00	\$ 11,142.00
3	LINEAR GRADING	LF	1,337	\$ 7.00	\$ 9,359.00
4	SEEDING AND MULCH	AC	0.07	\$ 12,500.00	\$ 875.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 1,700.00	\$ 1,700.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 1,100.00	\$ 1,100.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	631	\$ 50.00	\$ 31,569.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	156	\$ 75.00	\$ 11,699.00
9	ADA DETECTABLE WARNING STRIPS	SF	90	\$ 30.00	\$ 2,700.00
10	TYPE 5 AGGREGATE BASE	SY	787	\$ 9.00	\$ 7,087.00

**PROJECT H: \$101,924.00**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	MOBILIZATION	LS	1	\$ 3,200.00	\$ 3,200.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	635	\$ 15.00	\$ 9,525.00
3	LINEAR GRADING	LF	1,143	\$ 7.00	\$ 8,001.00
4	SEEDING AND MULCH	AC	0.06	\$ 12,500.00	\$ 750.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 1,500.00	\$ 1,500.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 900.00	\$ 900.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	540	\$ 50.00	\$ 26,988.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	133	\$ 75.00	\$ 10,002.00
9	ADA DETECTABLE WARNING STRIPS	SF	80	\$ 30.00	\$ 2,400.00
10	TYPE 5 AGGREGATE BASE	SY	673	\$ 9.00	\$ 6,058.00

**PROJECT I: \$91,446.00**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	MOBILIZATION	LS	1	\$ 2,900.00	\$ 2,900.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	569	\$ 15.00	\$ 8,542.00
3	LINEAR GRADING	LF	1,025	\$ 7.00	\$ 7,175.00
4	SEEDING AND MULCH	AC	0.05	\$ 12,500.00	\$ 625.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 1,300.00	\$ 1,300.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 800.00	\$ 800.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	484	\$ 50.00	\$ 24,202.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	120	\$ 75.00	\$ 8,969.00
9	ADA DETECTABLE WARNING STRIPS	SF	70	\$ 30.00	\$ 2,100.00
10	TYPE 5 AGGREGATE BASE	SY	604	\$ 9.00	\$ 5,433.00

**PROJECT J: \$151,359.00**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	MOBILIZATION	LS	1	\$ 4,700.00	\$ 4,700.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	943	\$ 15.00	\$ 14,142.00
3	LINEAR GRADING	LF	1,697	\$ 7.00	\$ 11,879.00
4	SEEDING AND MULCH	AC	0.09	\$ 12,500.00	\$ 1,125.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 2,200.00	\$ 2,200.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 1,300.00	\$ 1,300.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	801	\$ 50.00	\$ 40,069.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	198	\$ 75.00	\$ 14,849.00
9	ADA DETECTABLE WARNING STRIPS	SF	120	\$ 30.00	\$ 3,600.00
10	TYPE 5 AGGREGATE BASE	SY	999	\$ 9.00	\$ 8,995.00

**PROJECT K: \$176,287.00**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	MOBILIZATION	LS	1	\$ 5,500.00	\$ 5,500.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	1,101	\$ 15.00	\$ 16,517.00
3	LINEAR GRADING	LF	1,982	\$ 7.00	\$ 13,874.00
4	SEEDING AND MULCH	AC	0.10	\$ 12,500.00	\$ 1,250.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 2,500.00	\$ 2,500.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 1,500.00	\$ 1,500.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	936	\$ 50.00	\$ 46,798.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	231	\$ 75.00	\$ 17,343.00
9	ADA DETECTABLE WARNING STRIPS	SF	140	\$ 30.00	\$ 4,200.00
10	TYPE 5 AGGREGATE BASE	SY	1,167	\$ 9.00	\$ 10,505.00

**PROJECT L: \$247,024.00**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	MOBILIZATION	LS	1	\$ 7,700.00	\$ 7,700.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	1,544	\$ 15.00	\$ 23,159.00
3	LINEAR GRADING	LF	2,779	\$ 7.00	\$ 19,453.00
4	SEEDING AND MULCH	AC	0.14	\$ 12,500.00	\$ 1,750.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 3,500.00	\$ 3,500.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 2,100.00	\$ 2,100.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	1,312	\$ 50.00	\$ 65,616.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	324	\$ 75.00	\$ 24,317.00
9	ADA DETECTABLE WARNING STRIPS	SF	190	\$ 30.00	\$ 5,700.00
10	TYPE 5 AGGREGATE BASE	SY	1,637	\$ 9.00	\$ 14,729.00

**PROJECT M: \$209,404.00**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	MOBILIZATION	LS	1	\$ 6,500.00	\$ 6,500.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	1,308	\$ 15.00	\$ 19,625.00
3	LINEAR GRADING	LF	2,355	\$ 7.00	\$ 16,485.00
4	SEEDING AND MULCH	AC	0.12	\$ 12,500.00	\$ 1,500.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 3,000.00	\$ 3,000.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 1,800.00	\$ 1,800.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	1,112	\$ 50.00	\$ 55,605.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	275	\$ 75.00	\$ 20,607.00
9	ADA DETECTABLE WARNING STRIPS	SF	160	\$ 30.00	\$ 4,800.00
10	TYPE 5 AGGREGATE BASE	SY	1,387	\$ 9.00	\$ 12,482.00

**PROJECT N: \$154,166.00**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	MOBILIZATION	LS	1	\$ 4,800.00	\$ 4,800.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	963	\$ 15.00	\$ 14,442.00
3	LINEAR GRADING	LF	1,733	\$ 7.00	\$ 12,131.00
4	SEEDING AND MULCH	AC	0.09	\$ 12,500.00	\$ 1,125.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 2,200.00	\$ 2,200.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 1,300.00	\$ 1,300.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	818	\$ 50.00	\$ 40,919.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	202	\$ 75.00	\$ 15,164.00
9	ADA DETECTABLE WARNING STRIPS	SF	120	\$ 30.00	\$ 3,600.00
10	TYPE 5 AGGREGATE BASE	SY	1,021	\$ 9.00	\$ 9,185.00

**PROJECT O: \$106,227.00**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	MOBILIZATION	LS	1	\$ 3,300.00	\$ 3,300.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	663	\$ 15.00	\$ 9,950.00
3	LINEAR GRADING	LF	1,194	\$ 7.00	\$ 8,358.00
4	SEEDING AND MULCH	AC	0.06	\$ 12,500.00	\$ 750.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 1,500.00	\$ 1,500.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 900.00	\$ 900.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	564	\$ 50.00	\$ 28,192.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	139	\$ 75.00	\$ 10,448.00
9	ADA DETECTABLE WARNING STRIPS	SF	80	\$ 30.00	\$ 2,400.00
10	TYPE 5 AGGREGATE BASE	SY	703	\$ 9.00	\$ 6,329.00

**PROJECT P: \$131,833.00**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	MOBILIZATION	LS	1	\$ 4,100.00	\$ 4,100.00
2	REMOVAL OF EXISTING IMPROVEMENTS	SY	822	\$ 15.00	\$ 12,334.00
3	LINEAR GRADING	LF	1,480	\$ 7.00	\$ 10,360.00
4	SEEDING AND MULCH	AC	0.08	\$ 12,500.00	\$ 1,000.00
5	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 1,900.00	\$ 1,900.00
6	TEMPORARY SEDIMENT & EROSION CONTROL	LS	1	\$ 1,200.00	\$ 1,200.00
7	CONCRETE SIDEWALKS, 4" THICK, 5' WIDE, INCLUDING RAMPS	SY	699	\$ 50.00	\$ 34,945.00
8	CONCRETE SIDEWALKS @ DRIVEWAY ENTRANCES, 8" THICK, VARYING WIDTH	SY	173	\$ 75.00	\$ 12,950.00
9	ADA DETECTABLE WARNING STRIPS	SF	100	\$ 30.00	\$ 3,000.00
10	TYPE 5 AGGREGATE BASE	SY	872	\$ 9.00	\$ 7,844.00

City of Morrisville

sidewalk  
inventory

December 2019



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## INTRODUCTION

The City of Morrisville contracted with the Southwest Missouri Council of Governments (SMCOG) to conduct a sidewalk inventory and assessment between the dates of October 1, 2019 and January 31, 2020. The project involved locating and assessing the condition of all sidewalks and noting general ADA (Americans with Disabilities Act) concerns. Sidewalk conditions were assessed and ranked either good, fair, or poor. Data collection was completed on October 3<sup>rd</sup>, 2019. Data collection involved taking photos of identified ADA concerns and sidewalk sections that typified each condition category.

## SIDEWALKS

Sidewalks play an important role in any community and provide a variety of benefits. A well-maintained and connected sidewalk system can provide opportunity for recreation as well as travel, improved community health benefits, add to a sense of community and place, and improve overall social equity. Sidewalks, then, provide further freedom and liberation of the pedestrian. Through the improvement and expansion of sidewalk networks, people gain further ability to take part in their community. An improved system will increase accessibility as those unable or unwilling to commute by automobile gain access to safe routes leading to local resources. Similarly, improvements can be made in the connectedness of communities as additional routes promote interaction and activity between people, neighborhoods, and districts.

Increased mobility benefits individual autonomy, recreational access, health, and economic opportunity. Increased access to sidewalks for recreational purposes benefits the overall health of a community, as safe routes encourage more use for exercise. Furthermore, the installation of sidewalk routes helps to remove travelers from the road, improving safety for pedestrians and motorists alike. Sidewalks create a sense of community for the people utilizing them through connections with fellow walkers, as well as by allowing for a closer interaction with local shops and businesses. Improved foot traffic to and through commercial areas gives businesses further opportunity to attract customers and improve their image. A thoroughly connected, well-constructed pedestrian system can provide opportunities for citizens of all ages and abilities to travel through neighborhoods and commercial centers if properly maintained (FHA, 2019).

The importance of walkability continues to increase as communities move towards efficient, economical, and equitable lifestyles and practices. Pedestrian activity within a town can improve the sense of community and overall quality of life for residents. As more citizens use sidewalks, they interact with the city and their neighbors in a way that those in cars do not. Providing pedestrian access to all parts of the community through a sidewalk network helps to create a cohesive image of the city for residents and visitors alike.

# CONDITION ASSESSMENT

During the inventory, every existing segment of sidewalk within Morrisville city limits was noted and analyzed. The current network consists of approximately 1.47 miles of sidewalk. There are roughly 14 roads in Morrisville, seven of which have sidewalks on one or both sides. The inventory was conducted by locating existing sidewalk segments via maps and vehicles. Data was collected while walking each segment of the existing network. Each segment was categorized as being in either good, fair, or poor condition based on several factors, including damage like cracking or buckling, overgrowth of vegetation, presence of debris, and accessibility. The total amount of sidewalks in each category is presented in **Table 1**.

**Table 1. Sidewalk Conditions**

Rating	Miles	Percentage
Good	0.38	25.75%
Fair	0.46	31.37%
Poor	0.63	42.88%
<b>Total</b>	<b>1.47</b>	<b>100.00%</b>

## Good

- Best condition
- Recently built
- No signs of cracking, buckling, substantial overgrowth of vegetation, and minimal debris
- Width is adequate
- Pedestrians would have no issues traversing



**Figure 1. A "good" sidewalk located on west side of S Main St. Source: SMCOG**

## Fair

- Medium condition
- Older
- Signs of slight cracking, some vegetation and debris
- Pedestrians might have issues traversing



**Figure 2. A "fair" sidewalk on S Main Ave.  
Source: SMCOG**

## Poor

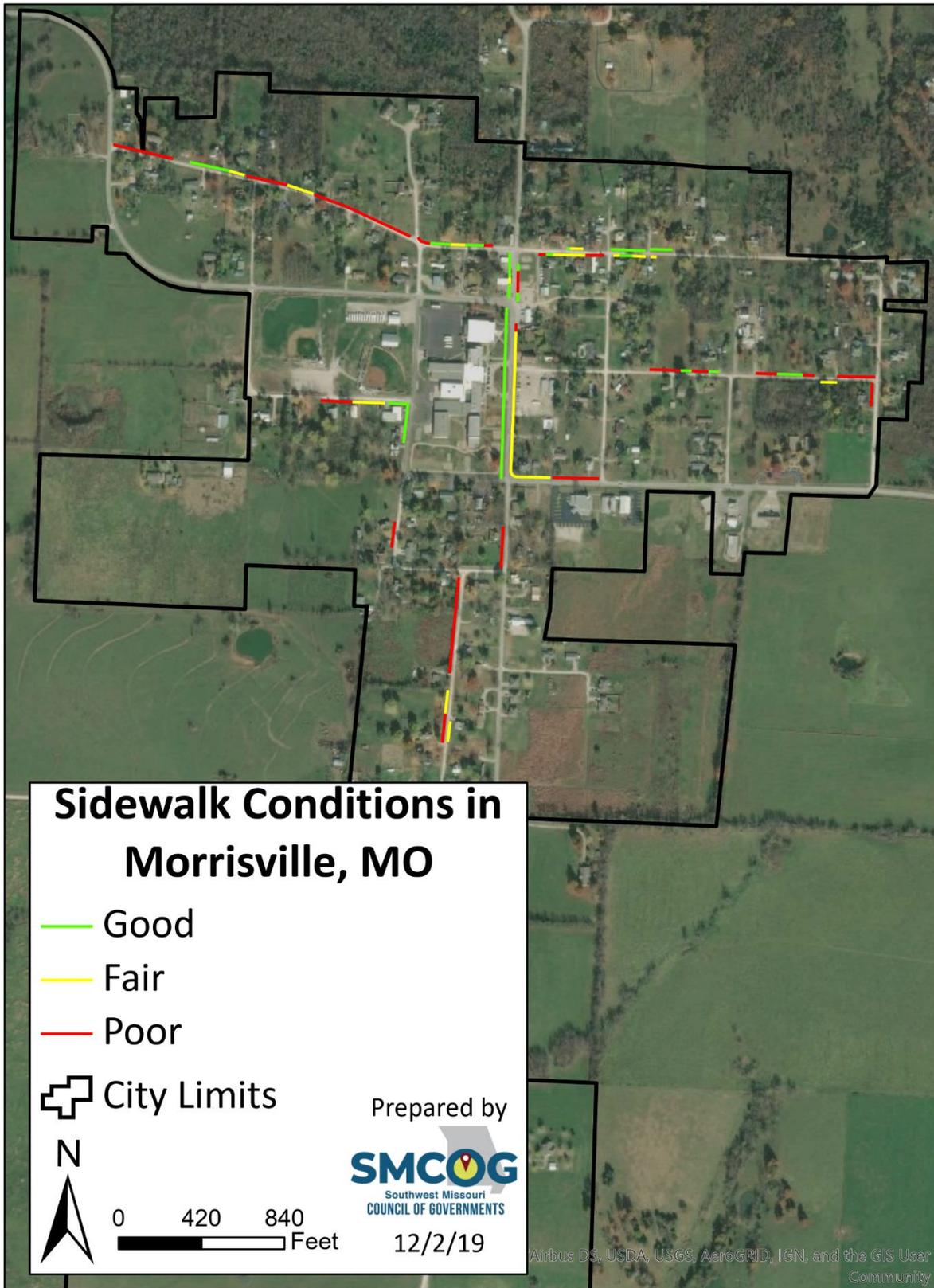
- Worst condition
- Oldest
- Major cracking and buckling, nearly covered by vegetation
- Partially or completely inaccessible



**Figure 3. A "poor" sidewalk located on Walnut St. Source: SMCOG**

# SIDEWALK CONDITIONS MAPS

Figure 4. Current Conditions North of Weaver Road



## ANALYSIS

In general, the majority of sidewalks in Morrisville are in poor or fair condition making up 42.88% and 31.37% of the entire sidewalk network respectively. This could likely be attributed to lack of use by citizens and minimal maintenance. Sections of sidewalks considered in good condition appear to be recent improvements or installations and are primarily located on the west side of S Main avenue. Many of the fair sidewalks in Morrisville have noticeable structural damage and overgrowth while sidewalks rated poor were often crumbling or buried under inches of soil and vegetation. The city should focus on repairing the deficient stretches of sidewalks as well as enforcing sidewalk maintenance in order to provide a network that is easily traversable by all citizens. More specifically, sections of sidewalks that connect residential areas to other areas of the city. When evaluating the current sidewalk system, there are three primary considerations:

- Location
- Connectivity
- Accessibility

### Location

Sidewalks in Morrisville are noticeably fragmented. South Main Ave, Morrisville's main corridor sees only slight connection to surrounding neighborhoods. Due to this fragmentation, only a few residential sidewalks connect users from their homes to the city's center. Difficulties with sidewalks in fair or poor condition could make for dangerous conditions as pedestrians may be forced to share the road with passing vehicles.

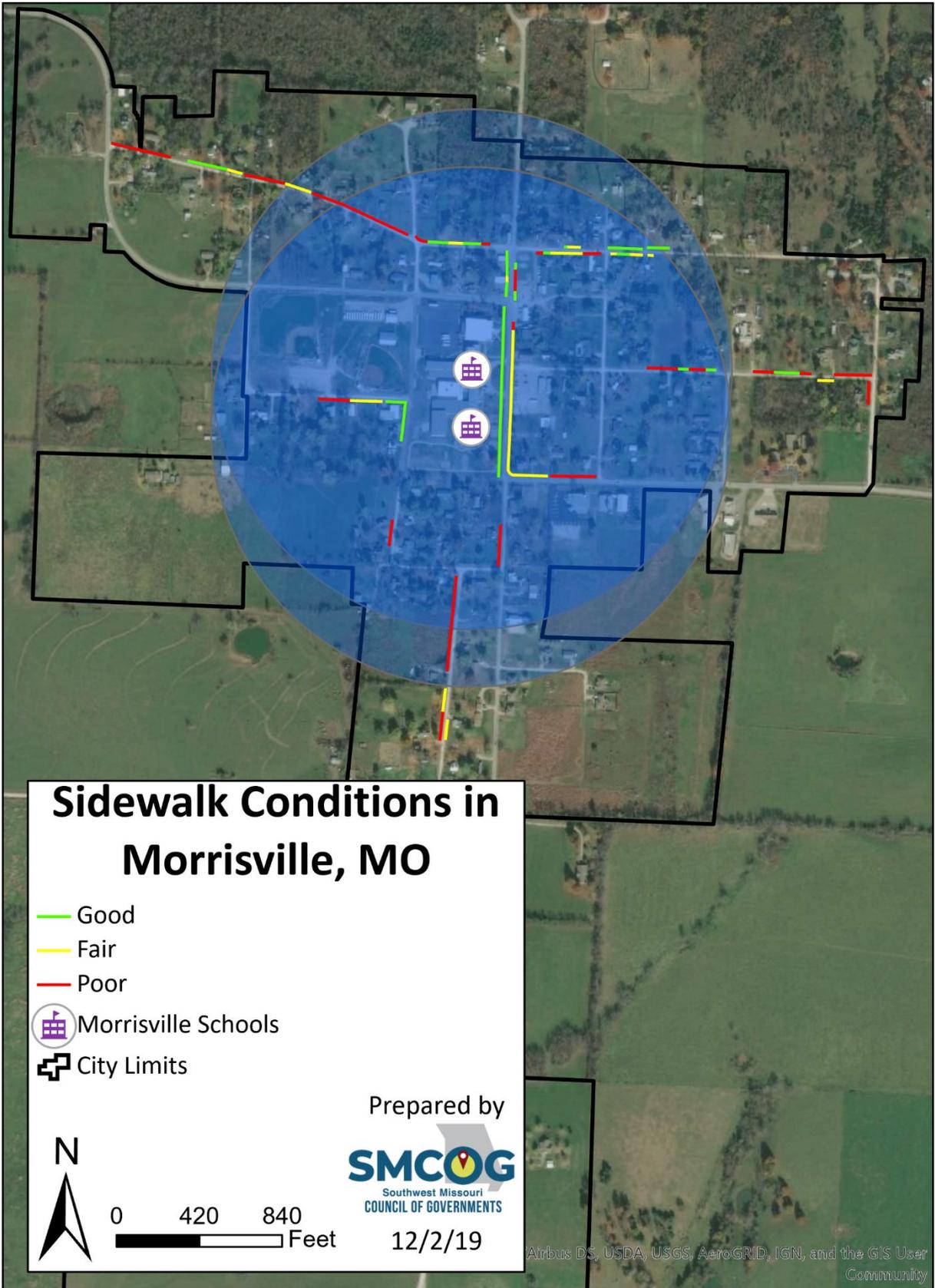
### Connectivity

A connected sidewalk system can often be overlooked as a transportation option. Walking can serve personal health, create social and physical connection, and the benefit environment. The connectivity of a city's sidewalk network can be negatively affected by gaps in the system or segments in poor condition. Not only could these issues create problems for citizens with disabilities but can also become dangerous for other pedestrians when gaps in connectivity force them to walk in the street or on deficient sidewalk.

Morrisville's sidewalk system is not substantially connected. There is disconnect within and between residential neighborhoods as sidewalks are segmented by both lack of infrastructure and poor conditions. Northern Elm St. nearly connects to South Main while all other sidewalk systems do not fully integrate into the network. These conditions likely impede citizens who may use sidewalks, resulting in higher use of automobiles to make short trips.

Due to its size, Morrisville has the potential for great walkability. Proposed sidewalks aim to connect segments into a cohesive network. What this network would allow is greater access for pedestrians to schools, businesses and other. Sufficient sidewalk infrastructure would increase access for more citizens as well as further connect the city.

Figure 5. Schools



## Accessibility

Accessibility is a common concern for many communities. Cracks, uneven sidewalks, missing ramps, overgrowth, and gaps in the sidewalk system cause barriers for individuals attempting to navigate the sidewalk system. Within Morrisville there are numerous poor condition sidewalks and ADA concerns that should be addressed in order to improve overall community accessibility. Additionally, action should be taken to significantly increase the presence of accessible ramps across the city. Fair and poor conditioned sidewalks will need to be monitored annually and should be improved to good condition as funds become available. **Table 2** below shows examples of each ADA concern, as well as the frequency of each concern along sidewalks. Maps showing the location of each observed ADA concern are provided in [Appendix A](#).

Barriers to accessibility should be addressed in order to comply with the Americans with Disabilities Act (ADA). These concerns can be addressed over the next ten to fifteen years as resources become available, but identification is a necessary first step.

Morrisville’s ADA concerns are scattered throughout the community, the majority of which are located on older sidewalks within residential areas.

**Table 2. ADA Concern Examples and Frequencies**

Issues	Picture	Location	Number of Occurrences
Cracks 		1132 Early St.	12

Analysis

Issues	Picture	Location	Number of Occurrences
<p>Dead End</p> 		<p>SW corner of Maple and S Main Ave.</p>	<p>33</p>
<p>No Ramp</p> 		<p>SW corner of Elm St. and S Main Ave.</p>	<p>10</p>
<p>No Truncated Domes</p> 		<p>SE corner of S Main and Walnut St.</p>	<p>4</p>

Analysis

Issues	Picture	Location	Number of Occurrences
<p>Obstruction</p> 		<p>100 N Main St</p>	<p>11</p>
<p>Overgrowth</p> 		<p>1116 Elm St.</p>	<p>26</p>
<p>Steep Grade Change</p> 		<p>Early St. near greenhouse</p>	<p>1</p>

Moving Forward

Issues	Picture	Location	Number of Occurrences
Uneven Surface 		1163 Walnut W. side	9

## MOVING FORWARD

This report is intended to provide an analysis of existing conditions as of October 2019. Morrisville should prioritize addressing sidewalks that are in poor and fair condition as well as ADA concerns in the existing network. It is important to maintain the existing sidewalk system and the cost of new sidewalks should be weighed with the cost of maintenance. The city will need to consider the financial resources required to correct current sidewalk concerns and may need to increase the annual budget for sidewalk improvements when possible.

New sidewalks should be installed as new development occurs to increase overall community connectivity. **Figure 7** shows the locations of the proposed new sidewalks, while **Table 3** provides an overview of the proposed sidewalk segments including length and estimated cost. Anderson Engineering compiled an itemized list of costs per proposed segment using 2019 materials pricing. Each project should be designed and estimated when the City is ready to fund and construct an identified segment. These costs will likely vary and change over time. [Appendix B](#) will include more detailed cost breakdowns for each project.

**Table 3. Proposed Sidewalk Segments**

Project ID	Proposed Sidewalk Segment	Approximate Length	Estimated Cost
A	N side of W Elm St between Hwy 215 & N Main Ave	<b><u>1595.38ft Total</u></b> 202.68ft New 1392.7ft Replace	\$216,610.18
B	E Elm St between Hwy 215 & East Ave, then continuing down Main to Dixie Ln	<b><u>1031.39ft Total</u></b> 457.81ft New 573.58 Replace	\$152,812.26
C	S Main between Dixie Ln & Maple St and on Maple St between S Main Ave & East Ave	<b><u>1489.8ft Total</u></b> 321.71ft New 1168.09ft Replace	\$191,906.26
D	Early St and College St	<b><u>431.79ft Total</u></b> 431.79ft Replace	\$50,666.78
E	S Main between Maple St & Sheridan St, Sheridan St between S Main & S 110th Rd, and S 110th Rd between Sheridan and E 535th Rd	<b><u>1725.74ft Total</u></b> 710.77ft New 1014.97ft Replace	\$216,692.45
F	Walnut St between S Main Ave & S Elm St and S Elm St south of Walnut St	<b><u>1714.47ft Total</u></b> 975.75 New 738.72 Replace	\$231,262.29

There are 7,988.58 feet (1.5 miles) of proposed projects. A total of 2,669 feet (0.5052 miles) is new sidewalk, the remaining 5,319 feet (1 miles) is replacing existing sidewalk. The total estimated cost is \$1,081,739.54, divided into 6 potential projects.

Morrisville has 7,761.6 linear feet (1.47 miles) of sidewalk. Given an average replacement cost of \$115 per linear foot, not including a 10% contingency, it would cost approximately \$892,584 to replace all existing sidewalk infrastructure. The life of a concrete sidewalk may be estimated between 40 and 50 years (FHA, 2019), which could be extended with regular general maintenance. The City should plan for a sidewalk program and budget annually for improvements. It should be noted that the City may not want to undertake a sidewalk project each year and may want to combine multiple years of sidewalk

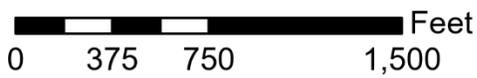
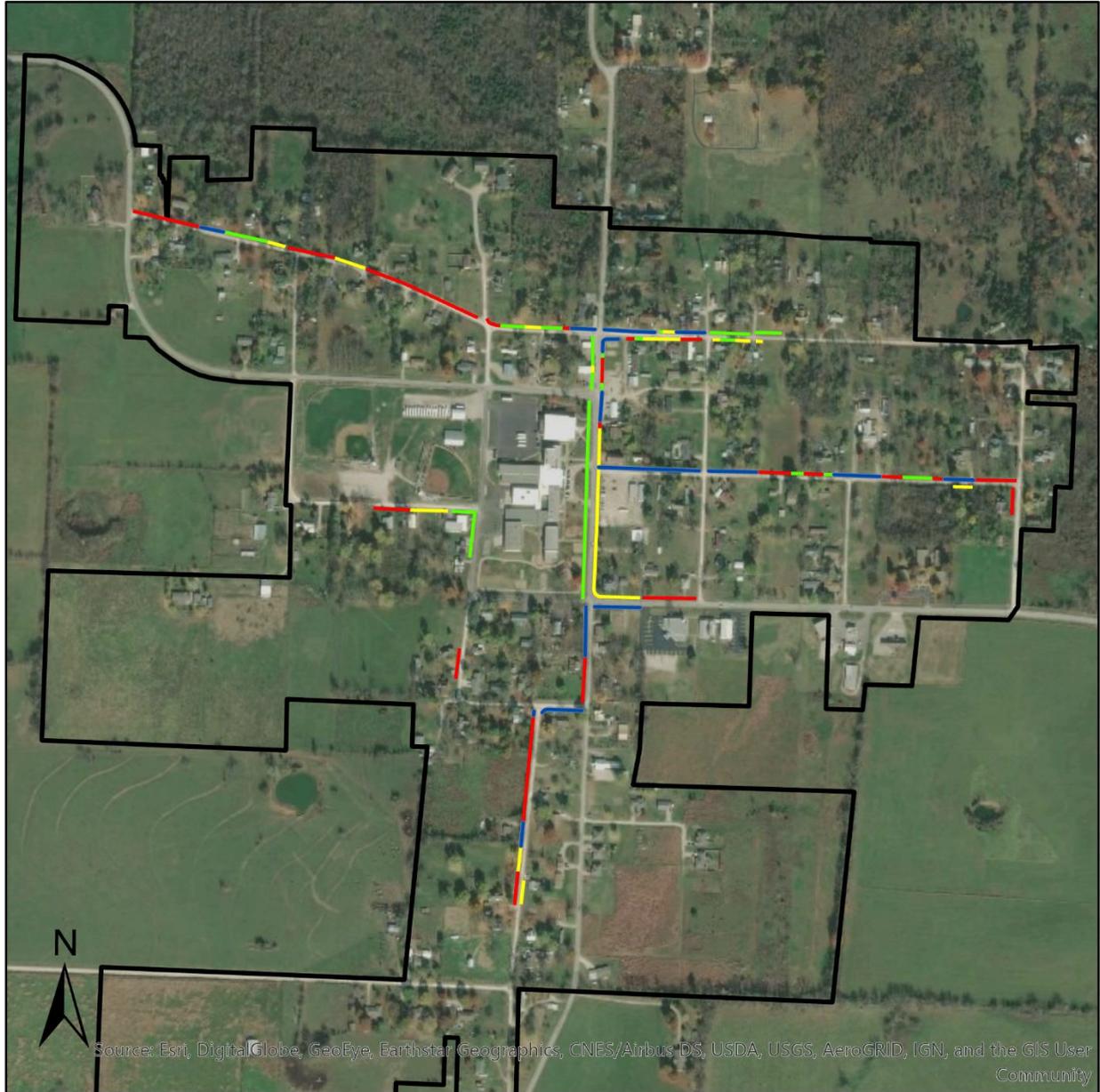
## Moving Forward

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funding for a larger project. This should be considered during the annual budget process or capital improvement program development each year.

The Missouri Department of Transportation (MoDOT) offers funding through the Transportation Alternative Program (TAP). These funds are available every two years and consider factors such as: number of project partners, right-of-way ownership/acquisition, addressing ADA barriers, inclusion of new sidewalk installation versus replacement, enhancement of multimodal connections, inclusion in a local plan, and promoting safe routes to schools. Additionally, Morrisville might review options for a transportation sales tax which could help fund the sidewalk system, but with limited commercial uses sales tax may not generate the necessary revenue.

Figure 7. Proposed Sidewalk Segments



Sidewalk Condition

- Good
- Fair
- Poor
- SMCOG Proposed Sidewalks
- City Limits

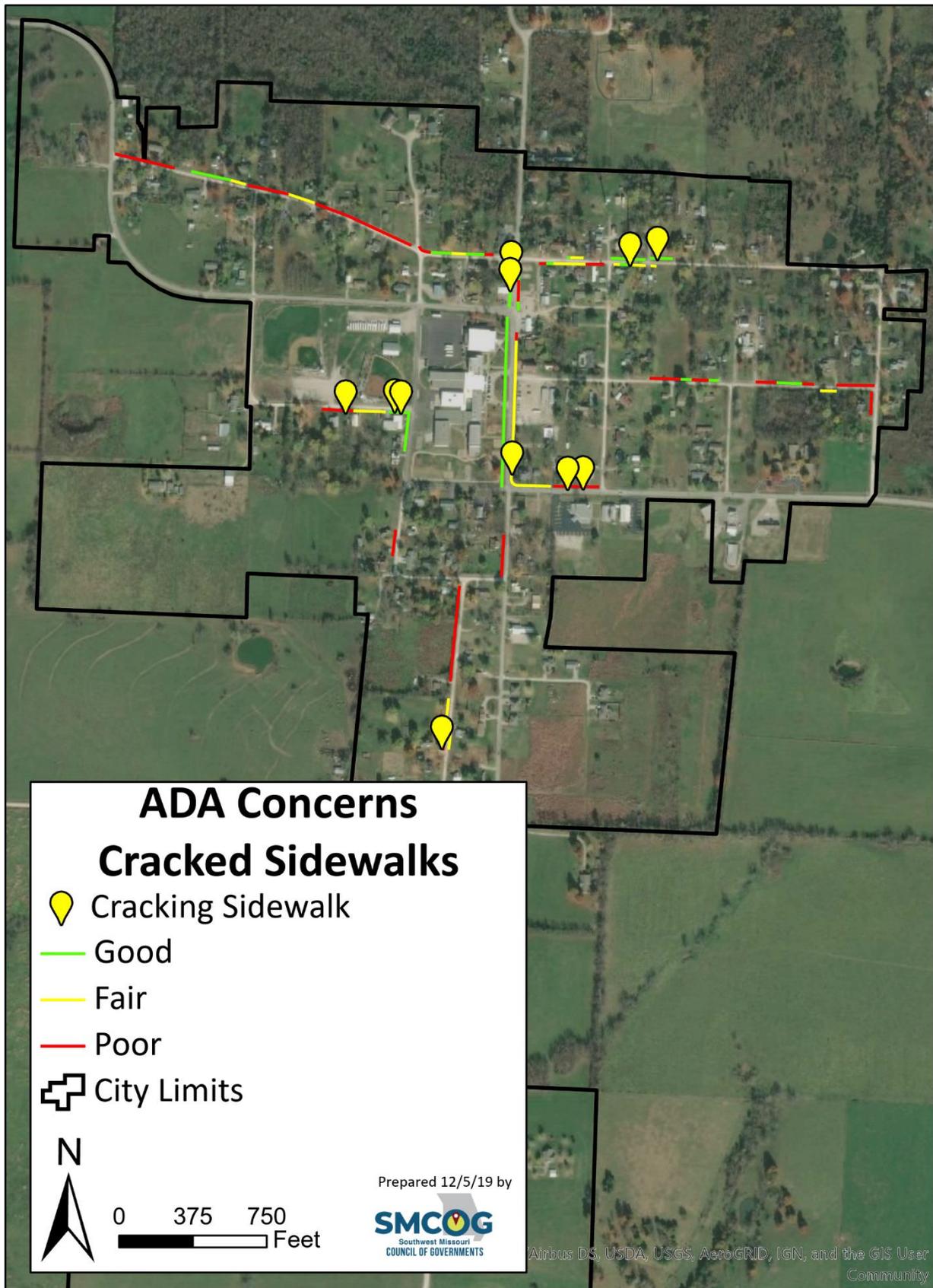
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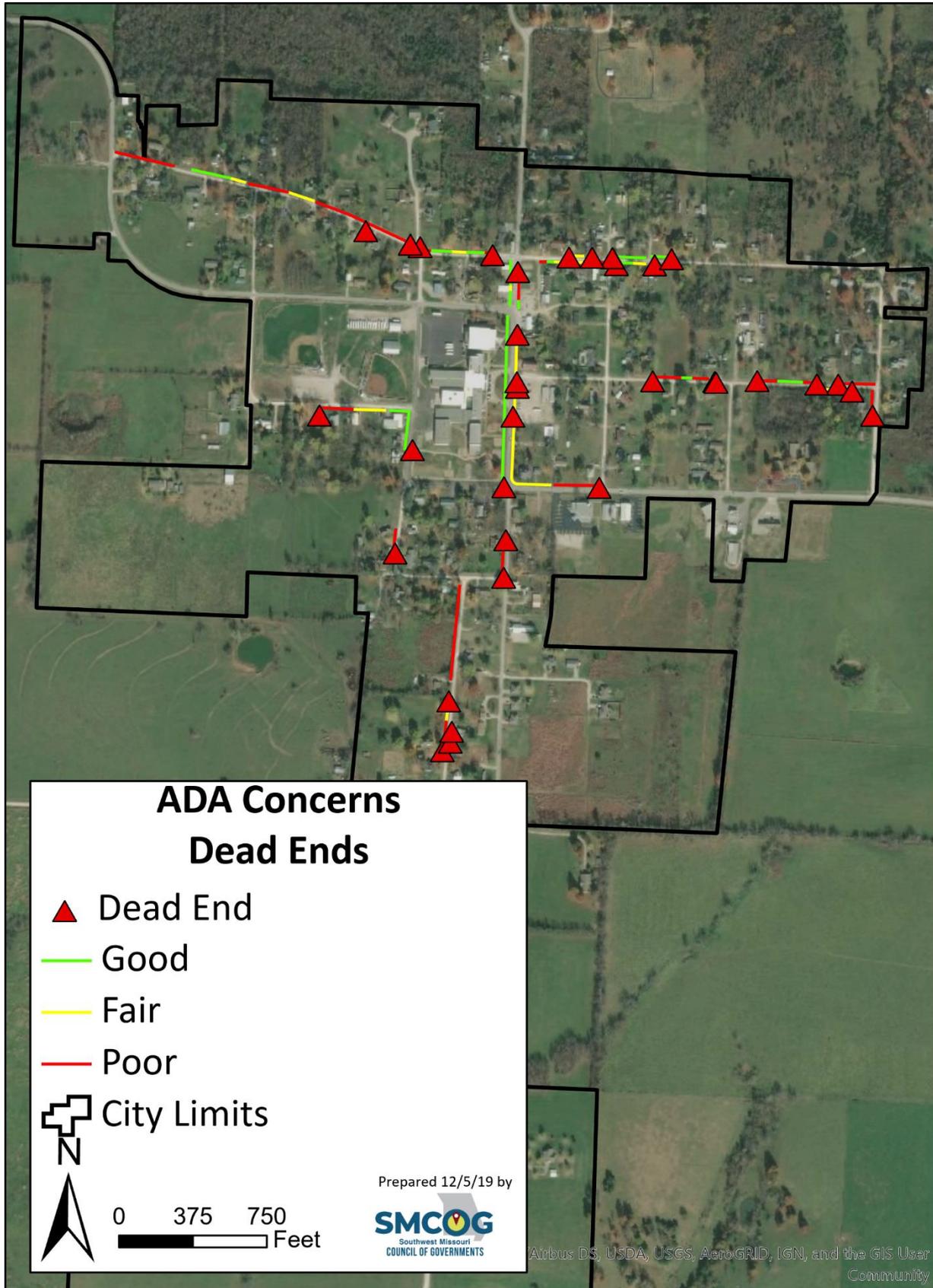


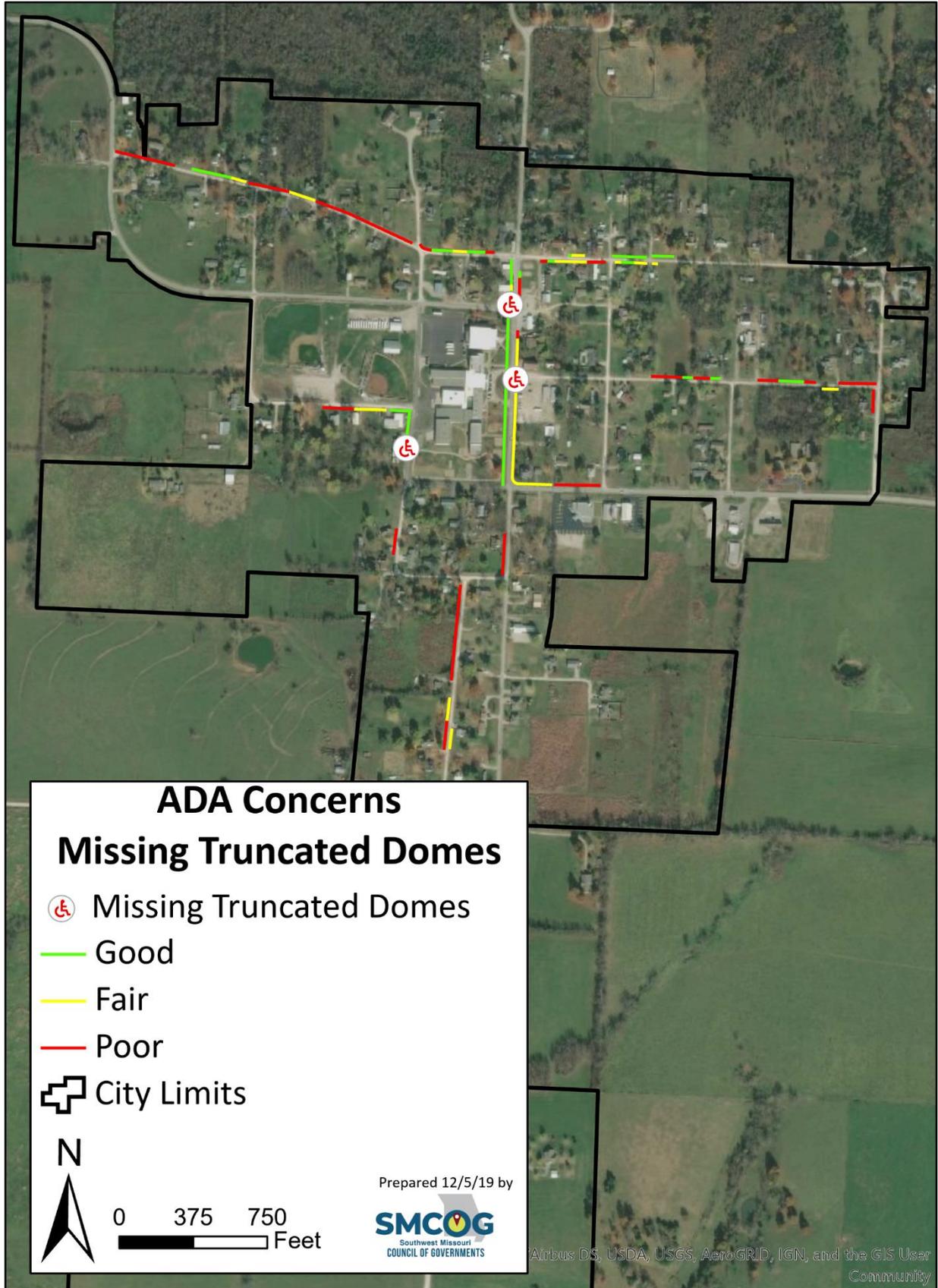
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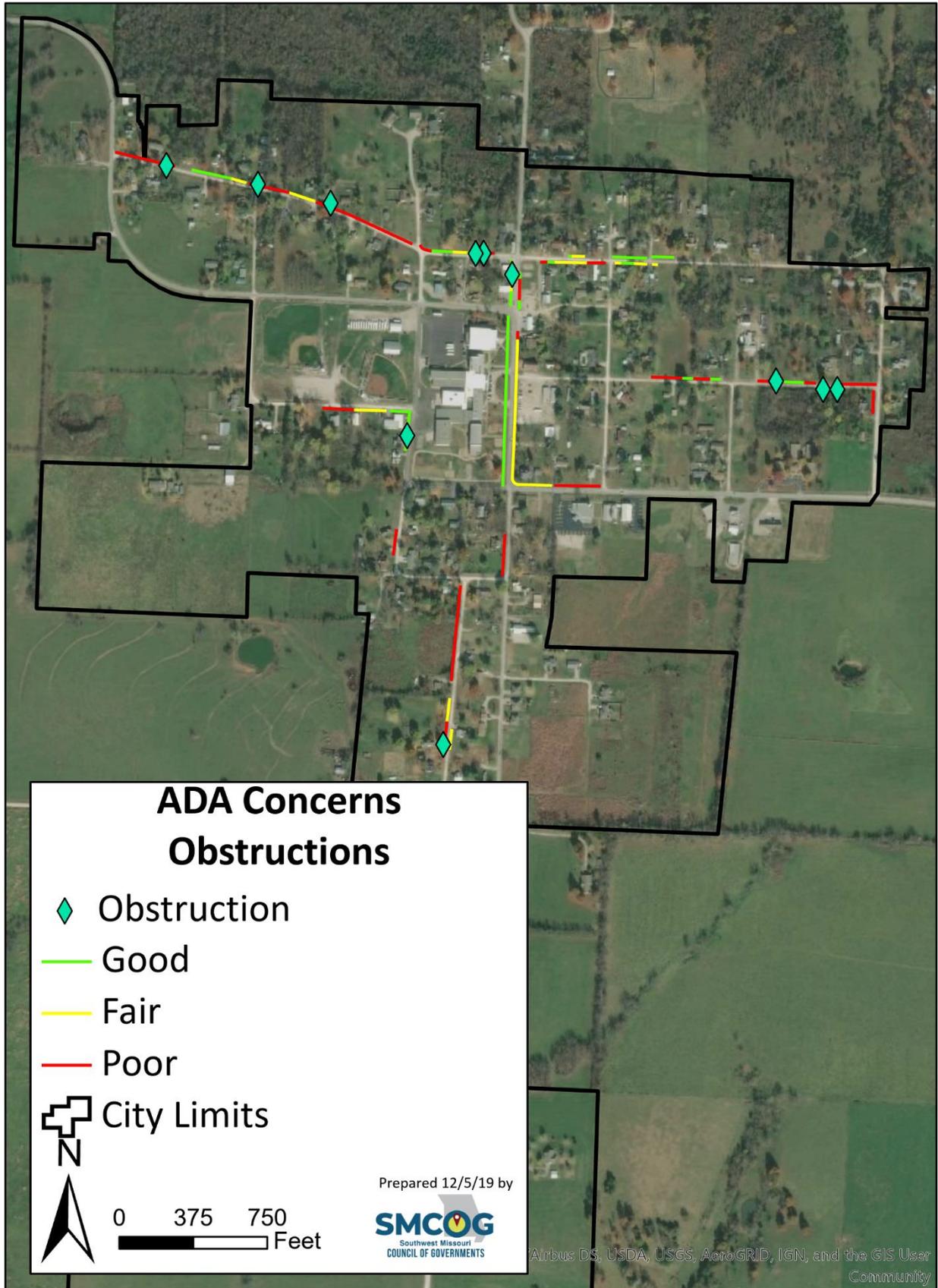
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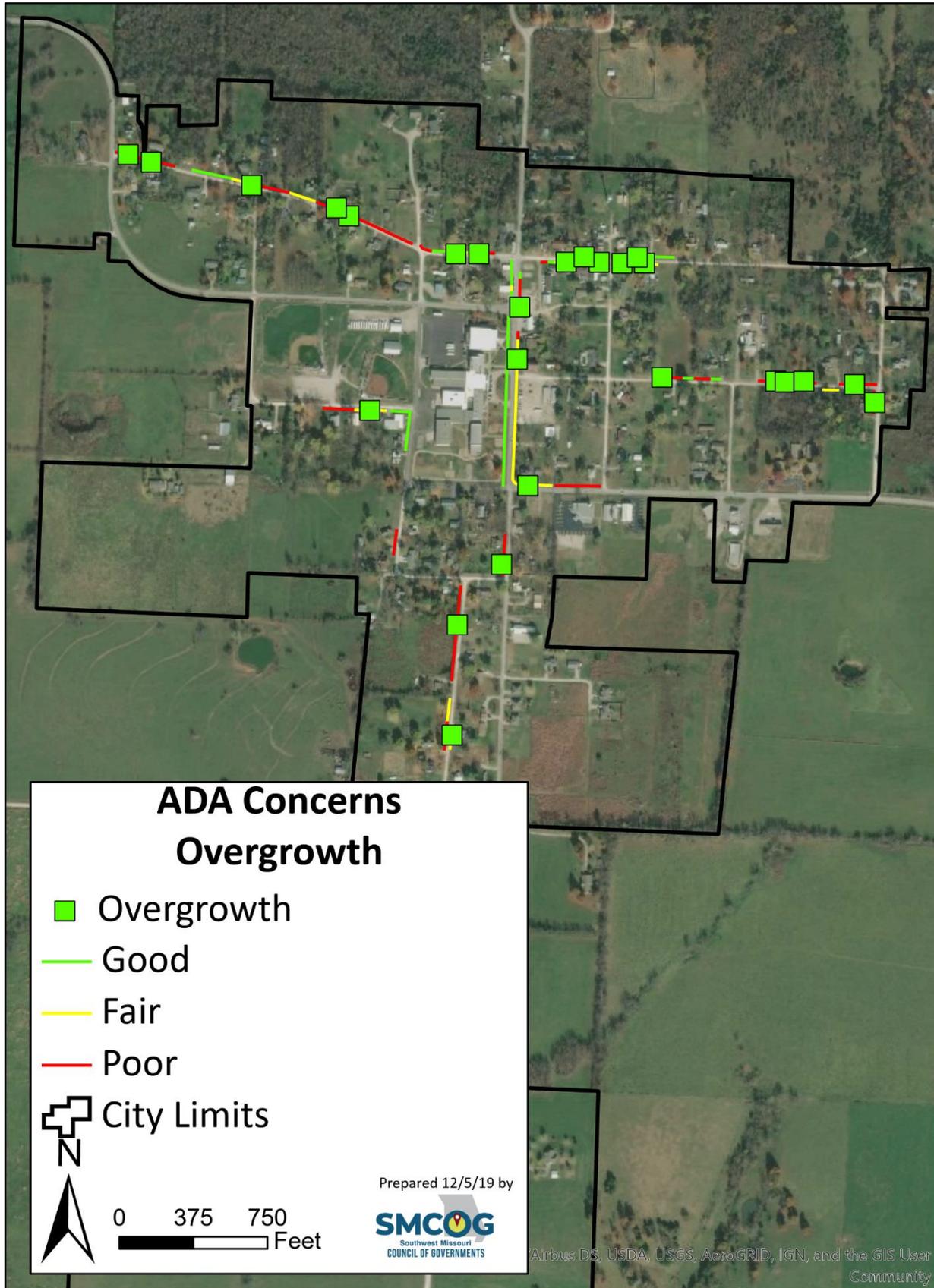
# APPENDIX A – ADA CONCERN LOCATIONS BY TYPE

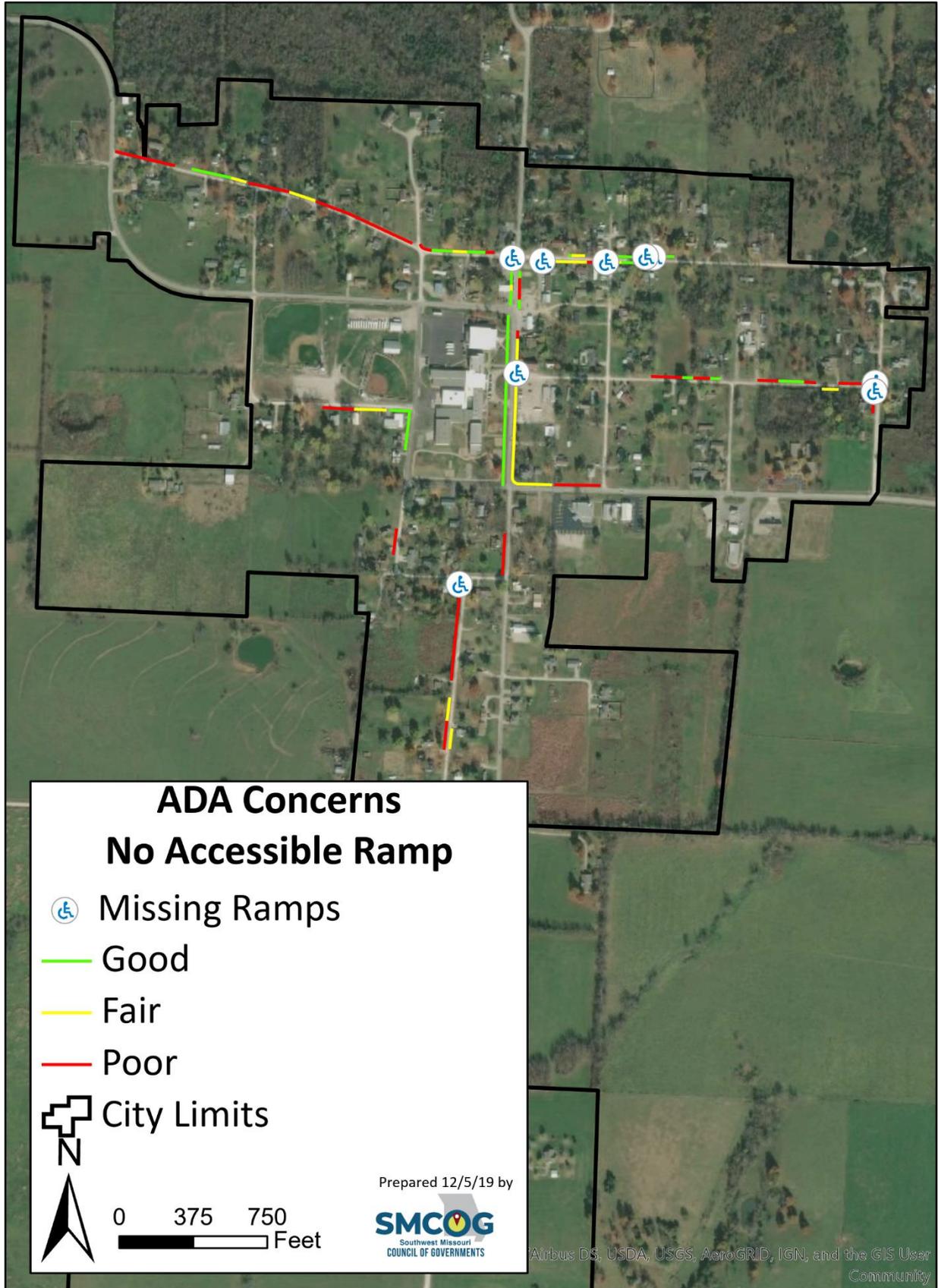


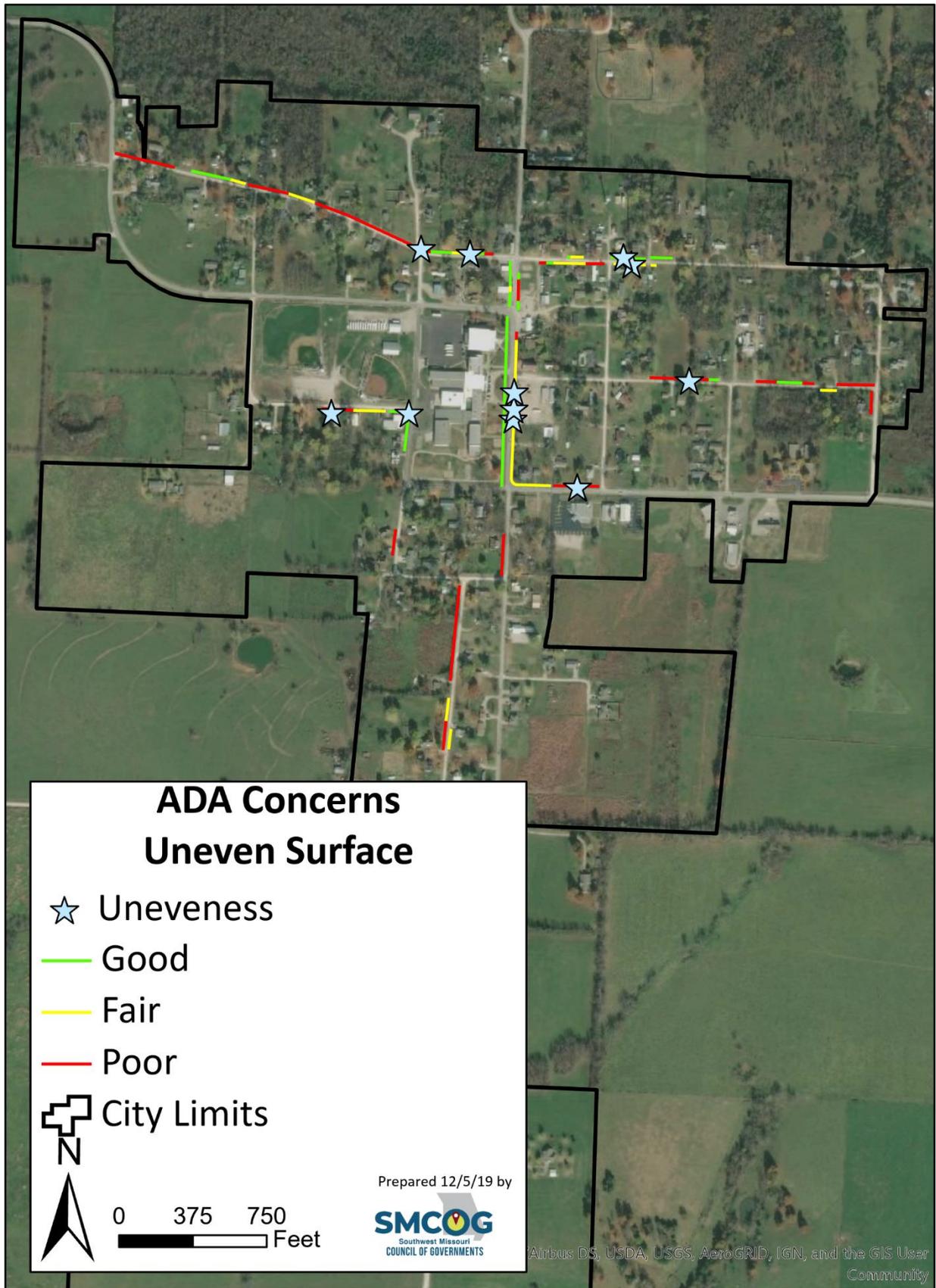












## APPENDIX B – COST BREAKDOWN FOR SIDEWALK IMPROVEMENT AND REPAIR

### PROJECT A: \$216,610.18

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	Curb Ramps	-	3	\$160	\$640
2	5' Sidewalk	FT	1595 LF	\$50	\$79,769
3	Concrete Approaches	SY	96 SY	\$115	\$11,040
4	Remove Exist. Sidewalk	FT	1392.20 FT	\$20	\$27,854
5	15" HDPP (pipe)	FT	30 LF	\$45	\$1,350
6	6" Curb Edge	FT	200 FT	\$31	\$6,200
7	Embankment	CY	444 CY	\$30	\$13,333
8	Misc. Work	-	-	-	\$9,200
9	Contingency Fee	-	-	10%	\$14,939
10	Professional Fees	-	-	-	\$52,285

### PROJECT B: \$152,812.26

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	Curb Ramps	-	6	\$160	\$960
2	5' Sidewalk	FT	990 LF	\$50	\$51,570
3	Concrete Approaches	SY	128 SY	\$115	\$14,720
4	Remove Exist. Sidewalk	FT	450 FT	\$20	\$11,472
5	15" HDPP (pipe)	FT	40 LF	\$45	\$2,700
6	6" Curb Edge	FT	200 FT	\$31	\$9,300
7	Embankment	CY	250 CY	\$30	\$6,667
8	Misc. Work	-	-	-	\$8,000
9	Contingency Fee	-	-	10%	\$10,539
10	Professional Fees	-	-	-	\$36,886

**PROJECT C: \$191,906.26**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	Curb Ramps	-	7	\$160	\$1,120
2	5' Sidewalk	FT	1489.18 LF	\$50	\$74,490
3	Concrete Approaches	SY	131.11 SY	\$115	\$15,078
4	Remove Exist. Sidewalk	FT	1168.09 FT	\$20	\$23,362
5	15" HDPP (pipe)	FT	60 LF	\$45	\$2,700
6	6" Curb Edge	FT	100 FT	\$31	\$3,100
7	Embankment	CY	417 CY	\$30	\$12,500
8	Misc. Work	-	-	-	-
9	Contingency Fee	-	-	10%	\$13,235
10	Professional Fees	-	-	-	\$46,322

**PROJECT D: \$50,666.78**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	Curb Ramps	-	5	\$160	\$800
2	5' Sidewalk	FT	431.79 LF	\$50	\$21,590
3	Concrete Approaches	SY	56.89 SY	\$115	\$6,542
4	Remove Exist. Sidewalk	FT	431.79 FT	\$20	-
5	15" HDPP (pipe)	FT	20	\$45	\$1,100
6	6" Curb Edge	FT	100 FT	\$31	\$3,100
7	Embankment	CY	119 CY	\$30	\$3,583
8	Misc. Work	-	-	-	-
9	Contingency Fee	-	-	10%	\$3,672
10	Professional Fees	-	-	-	\$10,280

**PROJECT E: \$216,692.45**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	Curb Ramps	-	5	\$160	\$800
2	5' Sidewalk	FT	1489.8 LF	\$50	\$86,287
3	Concrete Approaches	SY	149.33 SY	\$115	\$17,173
4	Remove Exist. Sidewalk	FT	1014.97 FT	\$20	\$20,299
5	15" HDPP (pipe)	FT	40	\$45	\$1,800
6	6" Curb Edge	FT	300 FT	\$31	\$9,300
7	Embankment	CY	486 CY	\$30	\$14,583
8	Misc. Work	-	-	-	-
9	Contingency Fee	-	-	10%	\$14,944
10	Professional Fees	-	-	-	\$52,305

**PROJECT F: \$231,262.29**

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
1	Curb Ramps	-	5	\$160	\$1,120
2	5' Sidewalk	FT	1,498.8 LF	\$50	\$85,724
3	Concrete Approaches	SY	202.67 SY	\$115	\$23,307
4	Remove Exist. Sidewalk	FT	738.72 FT	\$20	\$14,774
5	15" HDPP (pipe)	FT	40	\$45	\$1,800
6	6" Curb Edge	FT	600 FT	\$31	\$18,600
7	Embankment	CY	472 CY	\$30	\$14,167
8	Misc. Work	-	-	-	-
9	Contingency Fee	-	-	10%	\$15,949
10	Professional Fees	-	-	-	\$55,822