RESOLUTION RO821-01

A RESOLUTION TO ADOPT

Harriman Bike/Ped Plan

August 3, 2021

WHEREAS, Harriman City Council and stakeholders have met to discuss and provide

input in the development of the plan/study.

WHEREAS, the Tennessee Department of Transportation funded the plan through a Community

Transportation Planning Grant.

WHEREAS, the Harriman City Planning Commission has adopted said plan and

recommended said plan to the Harriman City Council

WHEREAS, the City of Harriman will implement the components of Harriman Bike/Ped Plan to the extent possible as resources are available

NOW, THEREFORE, BE IT RESOLVED by the Harriman City Council that the

Harriman Bike/Ped Plan(attached) is adopted as part of the municipality's general

plan.

Mayor, Harriman City Council

ATTEST: Theresa Beard

Recorder







Bicycle/Pedestrian Master Plan

August 2021



Prepared by:

CDM Smith

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INTRODUCTION

The City of Harriman was awarded a Tennessee Department of Transportation (TDOT) Community Transportation Planning Grant (CTPG) in 2020 for a Pedestrian and Bicycle Master Plan. This study identifies the existing conditions and facilities within the study area, identifies the needs based on gaps in the network and potential connections, and provides improvements that will help to complete the bicycle and pedestrian network.

Project Background

TDOT's Office of Community Transportation (OCT) works to coordinate the state's transportation planning, local land use decisions, and community visions to guide the development of a safe and efficient statewide transportation system. As part of this effort, TDOT initiated the CTPG program.

The goals of the Rural CTPG are to:

- Assist rural communities with planning efforts that define the transportation cohesiveness between multimodal transportation systems and local land use objectives that achieve the statewide transportation goals
- Aid with the creation of planning documents that support improvements in traffic flow, safety, and overall efficiency of the transportation system
- Provide governments with planning resources to achieve community visions as related to transportation and land use needs that promote future economic growth

In January 2020, the City of Harriman submitted a Pedestrian and Bicycle Master Plan application to receive CTPG funding for the area centered around downtown Harriman but also including the commercial corridors of US 27/SR 61/Roane Street, US 70/SR 1, and SR 29 to Interstate 40 (I-40). A copy of the CTPG application can be found in Appendix A.

Project Purpose

The City of Harriman is looking to provide more non-motorized transportation options for residents to access essential needs, schools, parks, and other places of interest. The City has recently moved the City Administration building to the 400 block of US 27/Roane Street, which also houses the police department and a community center. A new splash pad was recently constructed at the Harriman Community Center located between Clinch Street and Emory Drive. The City has also recently acquired an EPA brownfield site, where they plan to develop a new park with river access. The City also desires to connect downtown to the southern portion of the City south of the I-40 interchange where there are additional residential neighborhoods, retail, and athletic fields. The Pedestrian and Bicycle Master Plan will allow the City to provide thoughtful and intentional infrastructure that addresses the community's multimodal transportation needs.

PUBLIC INVOLVEMENT

Opportunities for public involvement and stakeholder input were provided throughout the plan process. Stakeholders from the City were present at the initial kickoff meeting to provide input regarding what types of non-motorized facilities should be prioritized throughout the study area. After this kickoff meeting, a public survey was published online. A second stakeholder meeting was held to present the initial findings and recommendations and gather feedback regarding the plan before the final submission to the Board of Mayor and Aldermen. The meeting minutes and public survey results are provided in Appendix B.

Stakeholder Meetings

The City of Harriman pooled together various interested parties including the City Manager, the Harriman Mayor, the Harriman Housing Director, and the head of the Planning Commission to serve as stakeholders.

The first stakeholder meeting was held on March 17, 2021 in a virtual format. The purpose of this meeting was to introduce the stakeholder group and the project team and to define the scope and project limits of the study. The group reviewed the CTPG application submitted by the City, which is attached in Appendix A. US 27/Roane Street is the primary corridor through downtown, bisecting this area of town. It includes sidewalks on both sides of the roadway and there are opportunities for dining, entertainment, and employment. The CTPG application discussed the desire to provide more pedestrian and bicycle facilities throughout the neighborhoods adjacent to the downtown Harriman corridor. Within these neighborhoods are Harriman High School, Harriman Middle School, the Harriman Community Center, several public housing units, and four parks located throughout the neighborhoods. In addition to the downtown area, the application also includes a desire to complete the nonmotorized network along SR 29 to connect to the southern part of Harriman where there are additional neighborhoods, retail, and athletic facilities near I-40.

The stakeholder group discussed the project opportunities for enhancing the bicycle and pedestrian network within the study area mentioned in the CTPG application. The group pointed out that there are two current streetscape projects within downtown Harriman: the first along US 27/Roane Street, which is focused on upgrading sidewalks and lighting, and the second is along Margrave Drive and Carter Avenue, which is focused more on traffic calming aspects such as providing crosswalks and better street markings. Other opportunities include upgrading crosswalks to conform to ADA standards, addressing non-compliant facilities from the ADA Transition Plan, and connecting the City's parks and other recreational amenities. The meeting minutes are provided in Appendix B.

The second stakeholder meeting was held on June 16, 2021, also in a virtual format. The purpose of this meeting was to reconvene with the stakeholders and present the proposed improvements based on the data collection and public survey.

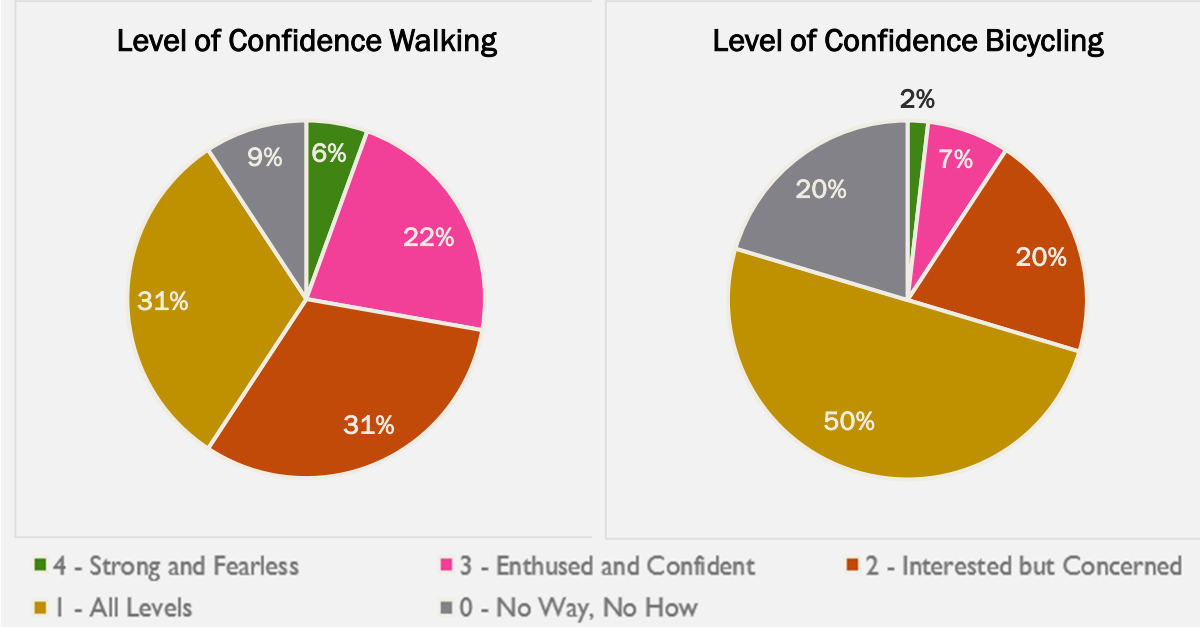
Public Survey

A public survey was distributed online by the City and was available between April 12, 2021 through April 30, 2021 via the SurveyMonkey platform.

The purpose of the public survey was to understand the public's desires regarding walking and biking around Harriman. A series of demographic questions were asked initially to ensure that a broad population was being captured. The majority of respondents were over age 30, with 30 percent being over 60 years of age. Females made up 55 percent of the respondents. Recreation/leisure was selected as the top reason for currently walking and bicycling. To get to parks was also selected as a reason many people currently walk and bike. To get to work/school and to get essential needs were less popular answers.

Figure 1 shows the summary of responses regarding the individual's level of confidence in walking and bicycling. As expected, people are generally more comfortable walking next to travel lanes than they are with riding a bike alongside traffic, evidenced by the number of Level 3 and 4 responses. Only 9 percent of respondents are confident bicycling in traffic or in a narrow bike lane. Twenty percent of respondents consider themselves comfortable in a buffered bike lane, but 50 percent would prefer a separate facility such as a greenway or other off-roadway facility. The recommendations of this plan should cater to the majority of users; therefore, the City of Harriman should consider separated infrastructure improvements that will make less experienced users feel the safest.

Figure 1 - Public Survey Questions 1&2: Level of Confidence Walking and Bicycling



When asked why they do not walk or bike more within the study area, the most popular responses were due to a lack of infrastructure and the quality of infrastructure. These answers track with the fact that most of the respondents are casual users who would feel more comfortable with facilities that keep them separated from vehicular traffic. When asked what types of infrastructure they would like to see implemented, greenways/trails were ranked first, followed by sidewalk upgrades. Again, the interest in greenways and trails indicates that most users feel more comfortable separated from roadway traffic. Upgrading sidewalks aligns with the fact that one of the major deterrents

for walking was the quality of the infrastructure. According to the survey, respondents are more interested in upgrading the existing sidewalks over filling in sidewalk gaps.

The online survey included two open-ended questions for respondents to give additional feedback. The first asked which intersections do they feel particularly uncomfortable crossing. The responses to this question are provided in **Table 1** below. A few intersections were mentioned multiple times: Pine Ridge Road at US 70, the entrance to Riverfront Park, and the intersection in front of Harriman High School.

Table 1 – Public Survey Question 9: Dangerous Intersections

Location	User Comment
Pine Ridge Road @ US 70	
Intersection in front of Harriman HS	
Main Street Intersections	Poor lighting
Pine Ridge Road @ US 27	
Roane Street	
Anywhere along US 27	
Pine Ridge Road @ US 70	High traffic volume
Riverfront Park Entrance	No sidewalk and stop sign/speed limits not obeyed
Emory Road	Used as a bypass to Roane Street
Riverfront Park Entrance	Stop signs not obeyed; need pedestrian crossing
In front of Harriman HS	
Riverfront Park Entrance	
Roane Street @ Carter Street	
Pine Ridge Road @ US 70	
Riverfront Park Entrance	Intersection is confusing
I-40 @ Pine Ridge Road/SR 29	
I-40 @ Pine Ridge Road	

The second open-ended question asked if there was anything not covered in the survey that they would like to see within this plan. A summary of these responses is provided in **Table 2**. Several responses reference a greenway along the Emory River. Other responses indicate the desire for Harriman to invest in infrastructure and other development that will boost the economy for residents and visitors alike. Investments in bicycle and pedestrian features will help to boost economic development as areas become widely accessible for all users and age groups.

Table 2 – Public Survey Question 13: Other Items to Consider

User Comment
A greenway trail that runs along the river
Convert railroad tracks to Rails to Trails
Greenway trails linking parks and other recreational venues and wayfinding signs
Easy accessibility for all ages
Bike lanes separated by a physical barrier
Rails to Trails
Reroute US 27 along the river or reroute all trucks along the river
Sidewalk on Fiske Road
Bike Facilities (see Glenwood Springs, CO)
YMCA, Improve Boys & Girls Club, paved sidewalks everywhere, do not close Roane Street for events, create a Town Square, promote/attract businesses that residents could use regularly
Utilize old paper mill for greenway
Invest in the beautification of downtown
Expand the study area to include all of Harriman
Greenway along river
Better access for residents of Harriman Gardens
Slow down traffic along Roane Street
Dog park, sensory obstacle course

EXISTING CONDITIONS

The City of Harriman, Tennessee is located along the Emory River and is one of several cities within Roane county. The City offers many recreational opportunities to its residents and visitors and has numerous economic opportunities and civic attractions for its citizens. Overall, this section of the report will focus on a review of the socioeconomic conditions of Harriman, how it has grown over the previous decades, how it has developed, and its land uses. It will also review any relevant planning studies and how they have influenced development in the City. Additionally, it will review the current roadway characteristics from a vehicular perspective and the existing bicycle and pedestrian infrastructure within the City.

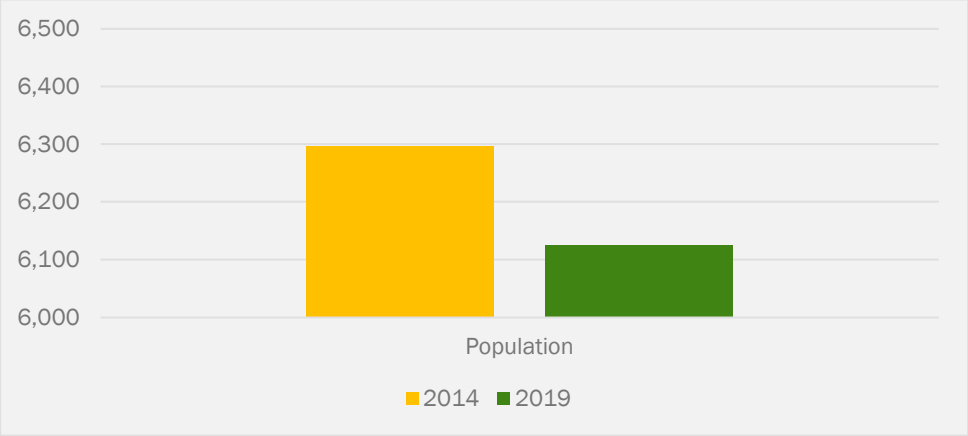
Socioeconomic Conditions

The population of a city greatly affects the needs it will have in the future. How the population of a city is distributed between sex and age, the health of a population, how many people are unemployed and how a population grows are all factors which influence the city and how it will change over coming years. Reviewing and analyzing these conditions is important for any type of city planning but is especially important for non-motorized planning. For example, if a population is growing older, then that city's needs may be different. There may be a need for more benches and sidewalks, especially in a downtown or other area with prevalent commercial space. This section will focus on reviewing the socioeconomic factors for the City of Harriman.

Existing Population and Growth Trends

One of the most important factors to understand about a city is how it has grown in the past. The United States Census Bureau collects a myriad of socioeconomic data which can be used for this review. Based on US Census data, the City of Harriman, Tennessee had a population of around 6,300 people in the year 2014. By the year 2019, the population of the city had declined slightly to 6,100. This data is shown in **Figure 2**.

Figure 2 - City of Harriman Population



Source: 2019 American Community Survey 5-Year Estimates

According to the data shown in **Table 3**, the City of Harriman has seen an annual 0.54 percent decline in population since 2014. Harriman shows slower growth than Roane County, the State of Tennessee, and the United States. This is not atypical, as many rural areas throughout the United States have slowed down in population or

growth has even declined. This decline in population is an important factor because typically cities have been growing or at least maintaining a stable population. The fact that population is declining will be reviewed further throughout this report.

Table 3 - City of Harriman Annual Population Growth

Year	Harriman, Tennessee	Roane County, Tennessee	Tennessee	United States
2014	6,296	53,162	6,499,615	316,515,021
2019	6,126	53,075	6,709,356	324,697,795
Annual Growth	-0.54%	-0.03%	0.65%	0.52%

Source: 2019 American Community Survey 5-Year Estimates

Age and Gender Distribution

It is important to understand how an area is distributed when it comes to population, as every age group needs something different when it comes to transportation. A younger population may need greater access to schools or parks, whereas an older population may need access to parks, the downtown area, or business districts. Population growth is one of the most important factors in how a city grows over time and greatly affects the overall age distribution of a city's population. A period with rapid population growth, followed by a dramatic decline in growth can lead to age groups that are significantly larger than the ones before or after them. This situation is currently happening in the United States with the generation of Baby Boomers and is having vast impacts on the country[1].

The Harriman population has declined overall, but there have also been changes in the distribution of the population when broken down by age and sex. Figure 3 and Figure 4 show the 2014 and 2019 age and gender populations. Nearly every single age cohort has declined between 2014 and 2019 for both males and females. The only age/sex cohort with a significant increase in 2019 is the 20-24 female cohort. Overall, the shifts have not been extreme, but they do reinforce the fact that the population is not growing in Harriman.

Figure 5 compares the distribution of ages in Harriman in the years 2014 and 2019. The only age groups to grow from 2014 to 2019 are those aged 25 to 44, with the 25 to 34 age growing the most overall.

[1] The Baby Boom Cohort in the United States: 2012 to 2060, US Census Bureau

Figure 3 - City of Harriman Population Pyramid (2014)

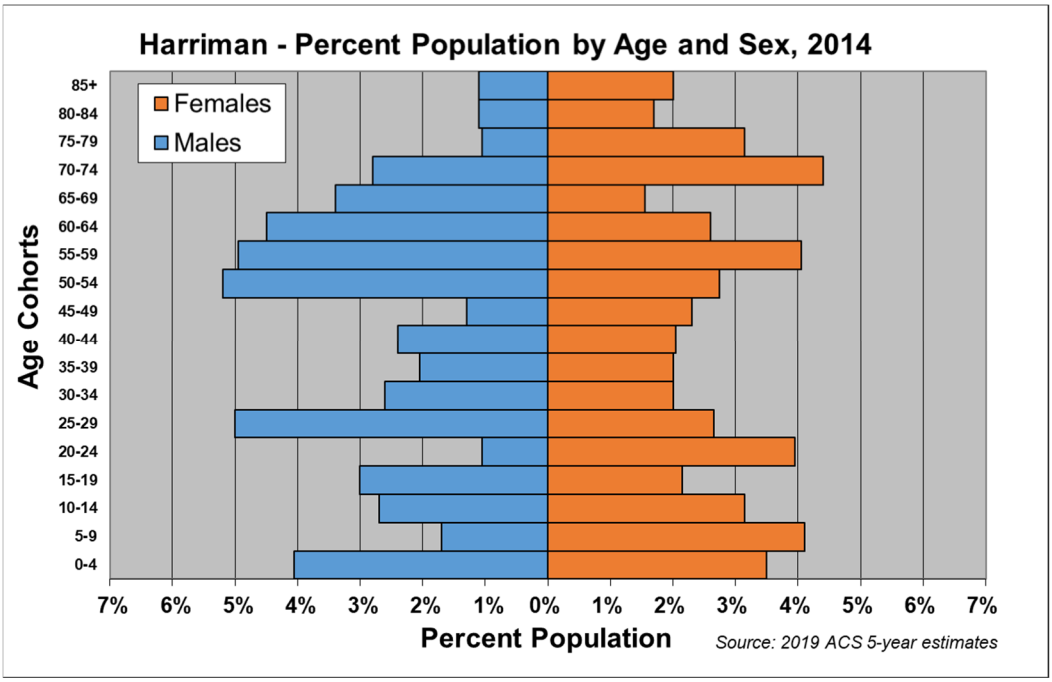


Figure 4 - City of Harriman Population Pyramid (2019)

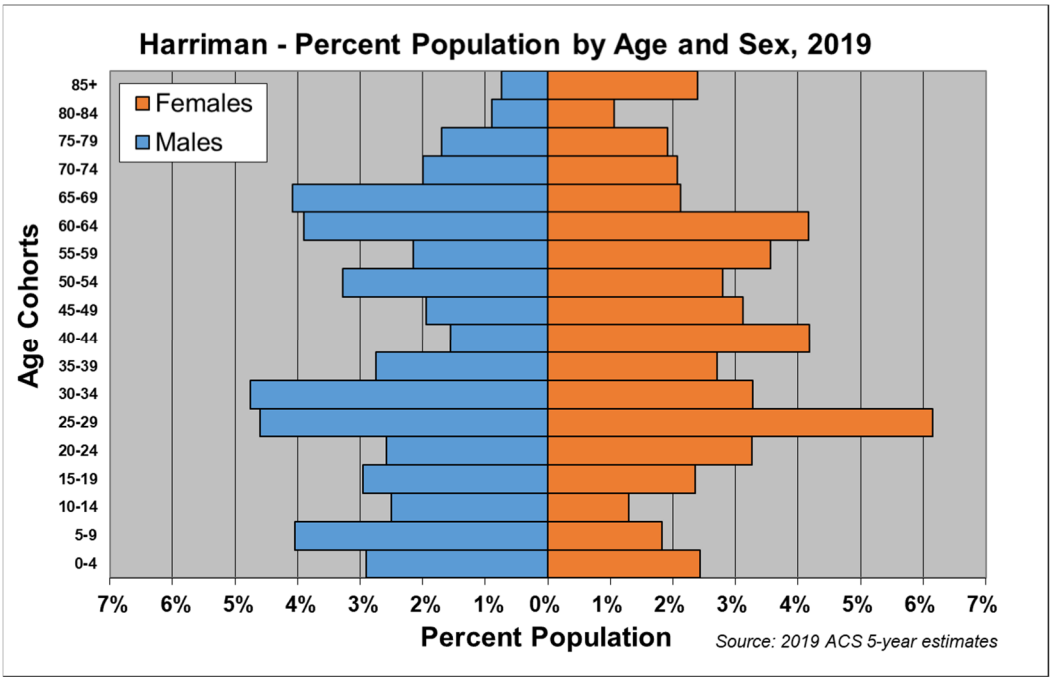
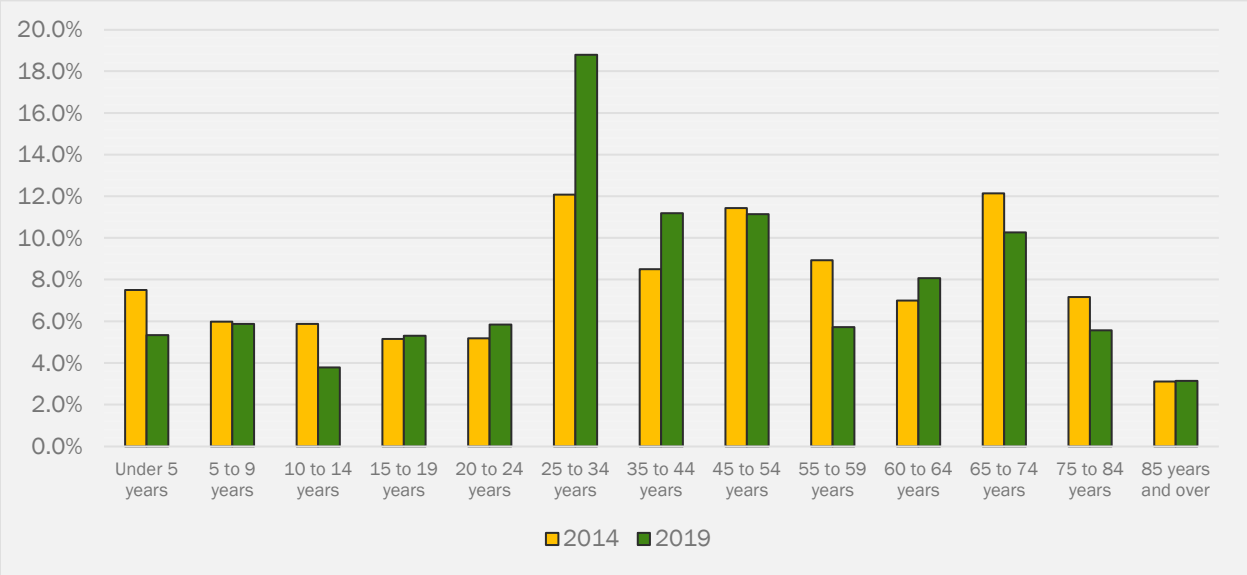


Figure 5 - City of Harriman Age Distribution (2014 & 2019)



Source: 2019 American Community Survey 5-Year Estimates

In 2014, the median age was 44.3 but was 39.5 in 2019. This shows that while the city is not growing in population at all, it is growing slightly younger. Non-motorized facility needs differ depending on the ages of the people in those areas, so if trends were to continue, more emphasis may be needed in areas nearby schools or parks.

Health Factors

Another important component to look at is the health of the citizens in the city or region. The availability of non-motorized infrastructure allows people the option to walk, ride their bicycle, or use another option to travel around for work or leisure. Without adequate infrastructure, obesity, diabetes, and hypertension could become more prevalent than in a city with well-connected networks. It is also important to know how many people in a city are disabled, as their needs should be met as well.

The Women, Infants, and Children (WIC), a component of the Special Supplemental Nutrition Program, provides nutritional assistance to children under the age of 5. They collect health data for these children, which is readily available at the county level but not the municipal level. Per the Tennessee Department of Health, children who are on WIC have lower rates of obesity within Roane County compared to the state overall, but slightly higher rates of children being overweight, shown in **Table 4**.

Table 4 - Children on WIC and Obesity Rates (2020)

Area	Overweight	Obesity
Tennessee	12.80%	18.40%
Roane County	15.30%	15.70%

Source: https://www.tn.gov/health/health-program-areas/fhw/wic/redirect-wic/data-stats.html

The prevalence of diabetes in a city is another important health factor to consider. Higher rates could indicate a lack of options for exercise and recreation, poor availability for healthy grocery stores, or some other factor. While this data is not captured at the municipal level, it can be reviewed at a county level. Table 5 shows the prevalence of diabetes in the population within Roane County as well as within the state of Tennessee in 2019. The number of people who have been diagnosed with diabetes is lower within Roane County than the state overall, though these numbers do not break down by the type of diabetes.

Table 5 – Diagnosed Diabetes Prevalence (2018)

Area	Diabetes
Tennessee	12.2%
Roane County	11.3%

Source: https://gis.cdc.gov/grasp/diabetes/DiabetesAtlas.html

It is also important to understand the number of individuals who are currently disabled in a community. People with disabilities have the right to move freely around their city, so it is important to plan for these populations. According to the US Census Bureau data, in 2019 23.6 percent of those that live within the city are disabled in some fashion.

Employment

According to US Census data, in the City of Harriman the current average commute time is 28.8 minutes, which is slightly longer than the national average of 26.9 minutes. There are 2,967 people over the age of 16 with some sort of earnings and their median earnings are $29,617. There are a total of 1,885 full-time workers within the City of Harriman, whose median salary is $38,652. The current poverty rate is 18.9 percent. Overall, there is a considerable population who work in some form or capacity.

It is important for cities to have good infrastructure that serves its citizens for recreational as well as commuting purposes. Giving people choices for their commutes could result in shorter travel times overall in the area while also increasing health benefits. Additionally, walking and bicycling are considerably less expensive than owning a vehicle.

Tourism

The City of Harriman hosts several festivals and events each year for its residents and visitors to enjoy. A few of those include the annual Hooray for Harriman Labor Day Festival, the Tennessee Medieval Faire, Hauntings of Historic Harriman, and the Historic Christmas Home Tour. Providing access to these festivals with non-motorized infrastructure would bring more people to them and perhaps reduce the need for parking facilities.

Existing Land Uses

The City of Harriman's current development was reviewed to determine where development had occurred throughout the area, what areas of the city may have low-

income housing, and which areas would be of interest to those who live in or visit the area. Understanding these development patterns may provide more insight into where non-motorized infrastructure is needed for the city.

Land Use Analysis

The parcel data for Roane County was analyzed and the summary of existing land uses for the City of Harriman is shown in **Table 6**. Land use classifications were made by combining individual land uses together into groups. The existing land use map for the study area is shown in **Figure 6**.

As expected within a city of its size, residential and commercial land uses are the most prevalent, comprising approximately 75 percent of the total land mass in Harriman.

Table 6 – City of Harriman Land Use Analysis

Land Use	Parcels	Acres	Percent
Agricultural	2	71.22	6.03%
Religious Institutions	9	7.81	0.66%
Commercial	191	189.05	16.00%
Industrial	9	64.61	5.47%
Parks and Recreation	7	71.05	6.01%
Public/Semi-Public	11	7.44	0.63%
Residential	938	692.89	58.63%
Schools	4	38.74	3.28%
Transportation	3	6.00	0.51%
Utilities	1	3.11	0.26%
TOTALS	**1188**	**1182**	**100%**

Source: Roane County Parcel Data

Low-Income/Poverty Areas

A review of the low-income areas, or those under the poverty line, was also conducted within the study area. Data on poverty status was collected from the US Census Bureau and mapped by census tract. The results are shown in **Figure 7**.

The map shows that the census tract associated with downtown Harriman southeast of US 27/Roane Street is comprised of 30-40 percent of people living under the poverty line. This indicates that this area would be a good candidate for non-motorized improvements. The other census blocks within the study area limits consist of less than 20 percent of people living under the poverty line.

Figure 6 - City of Harriman Existing Land Use Map

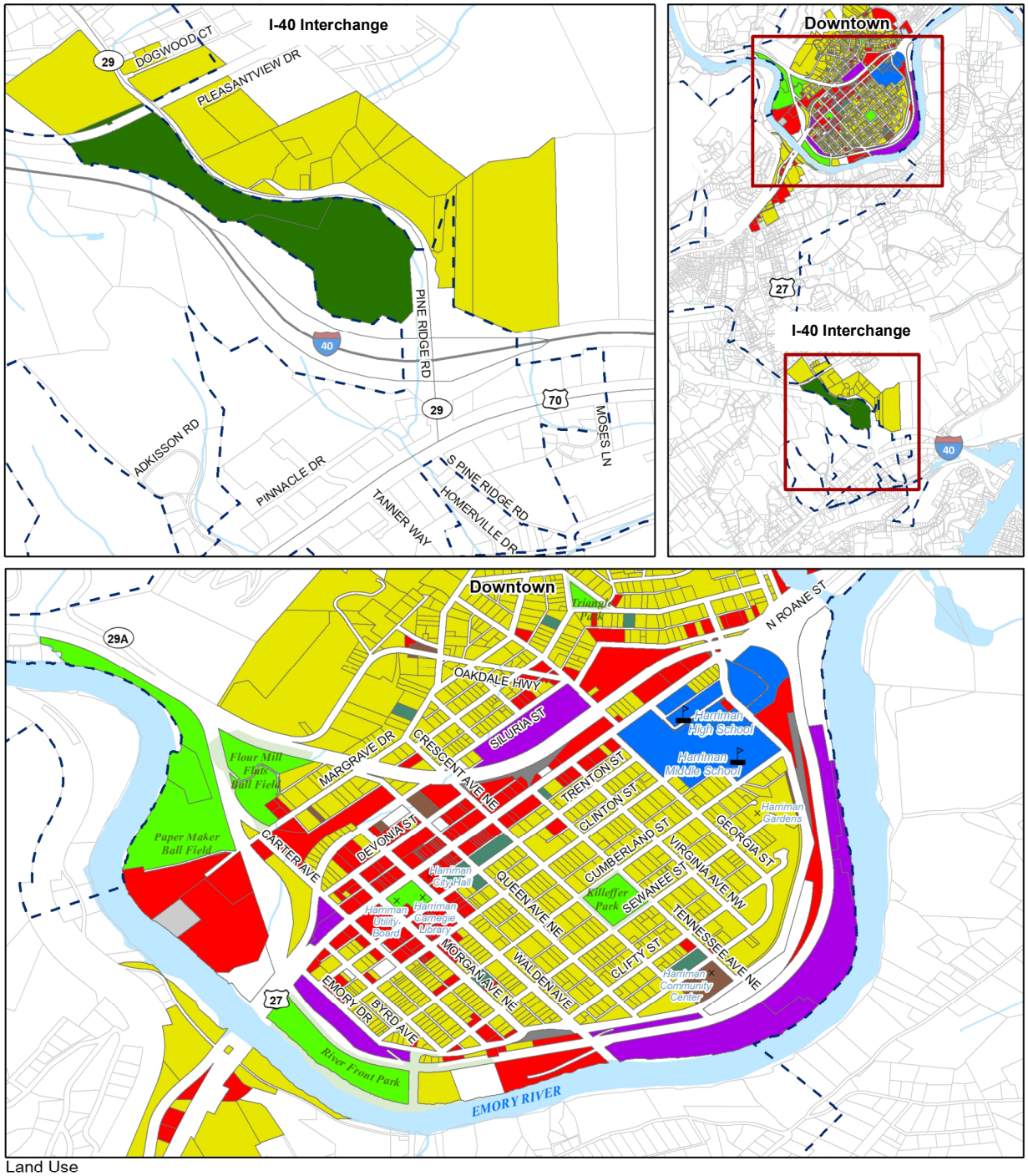
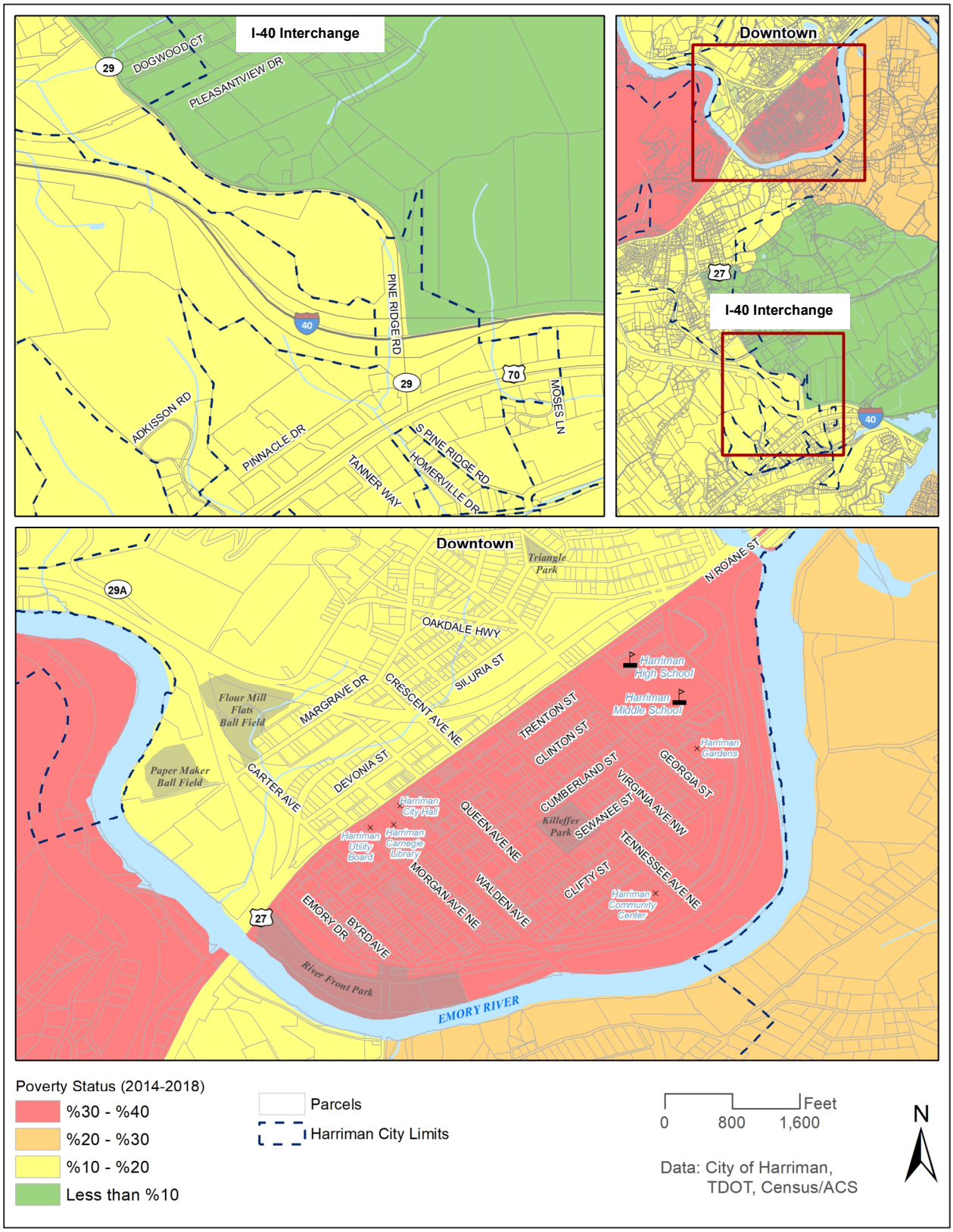


Figure 7 - City of Harriman Poverty Status by Census Tract



Places of Interest

There are many places throughout Harriman which are important to people who live and visit the city from an economic, civic, or cultural standpoint. While every city is different, each one typically has places that people tend to gather around or find important. Understanding where those points of interest are located is important when trying to provide multiple transportation options to and from these places. **Figure 8** and **Figure 9** show civic institutions, parks, schools, and other places of interest within the City of Harriman. Additionally, the Cornstalk Heights Historic neighborhood hosts several events and tours that bring tourists to the area. The majority of the places of interest are located within the downtown portion of the study area, but the Roane Medical Center and other commercial services are located nearby the I-40 interchange with US 29/Pine Ridge Road.

Figure 8 - City of Harriman Places of Interest (Downtown Harriman)

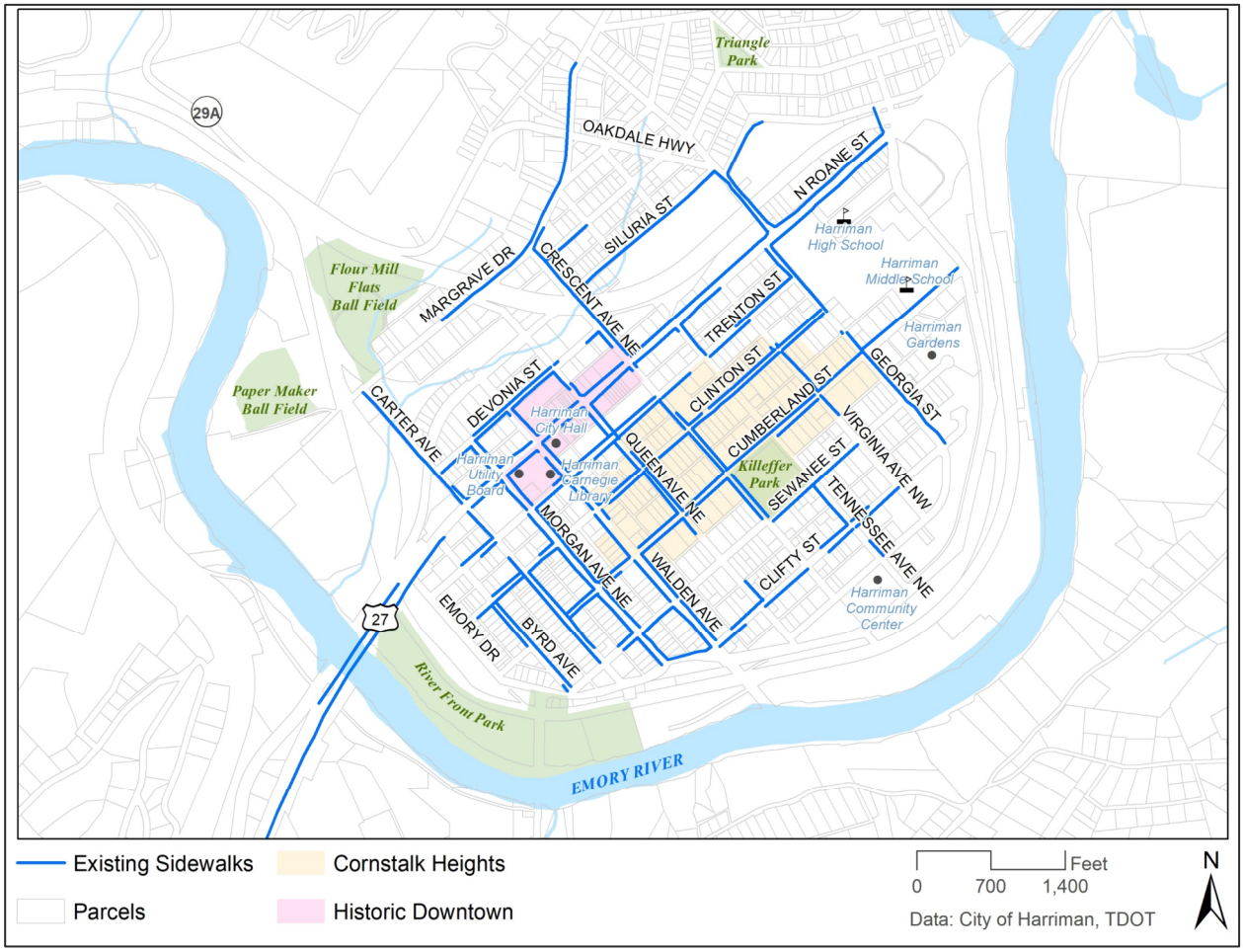
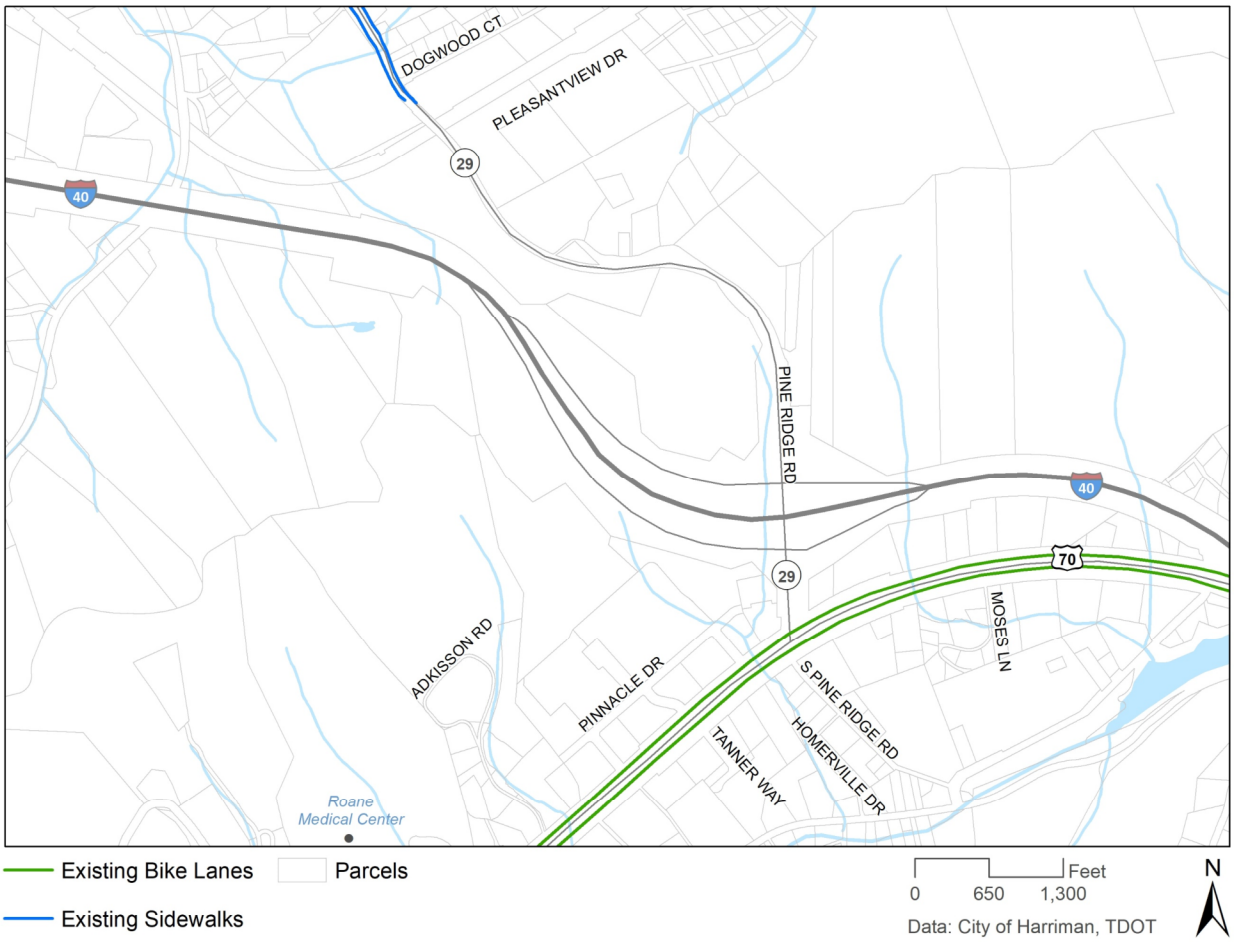


Figure 9 - City of Harriman Places of Interest (I-40 Interchange)



Recent Plans and Studies

There have been several planning studies conducted over the past years which may impact how non-motorized infrastructure should be planned and prioritized throughout the study area and the surrounding region. A brief review of these studies was conducted to better understand the key points and how they may apply to this Master Plan.

ADA Self-Evaluation and Transition Plan (2019)

ADA Transition Plans are a federally mandated requirement by Title II (State and Local Government) of the Americans with Disabilities Act. The purpose of this document is to ensure that people with disabilities are not being discriminated against when public facilities are built or designed by creating a planning framework to identify any potential barriers. The City passed its ADA Self-Evaluation and Transition Plan in 2019. The self-evaluation is a review of how the City's policies, services, activities, public facilities, or pedestrian facilities might affect those with disabilities. The transition plan reviews the results of the self-evaluation, identifies where there might need to be improvements, and determines a priority for addressing any issues.

The self-evaluation component of the plan was broken into three parts: City Policies, Services, Activities, and Programs; Public Facilities; and Pedestrian Facilities within the Right-of-Way. While each are important, the most relevant component to this review was the Pedestrian Facilities within the Right-of-Way, which evaluated a total of 14.8 miles of sidewalk within Harriman. The amount of sidewalk found to be compliant and the planning-level estimates for instituting any improvements can be found in **Table 7**.

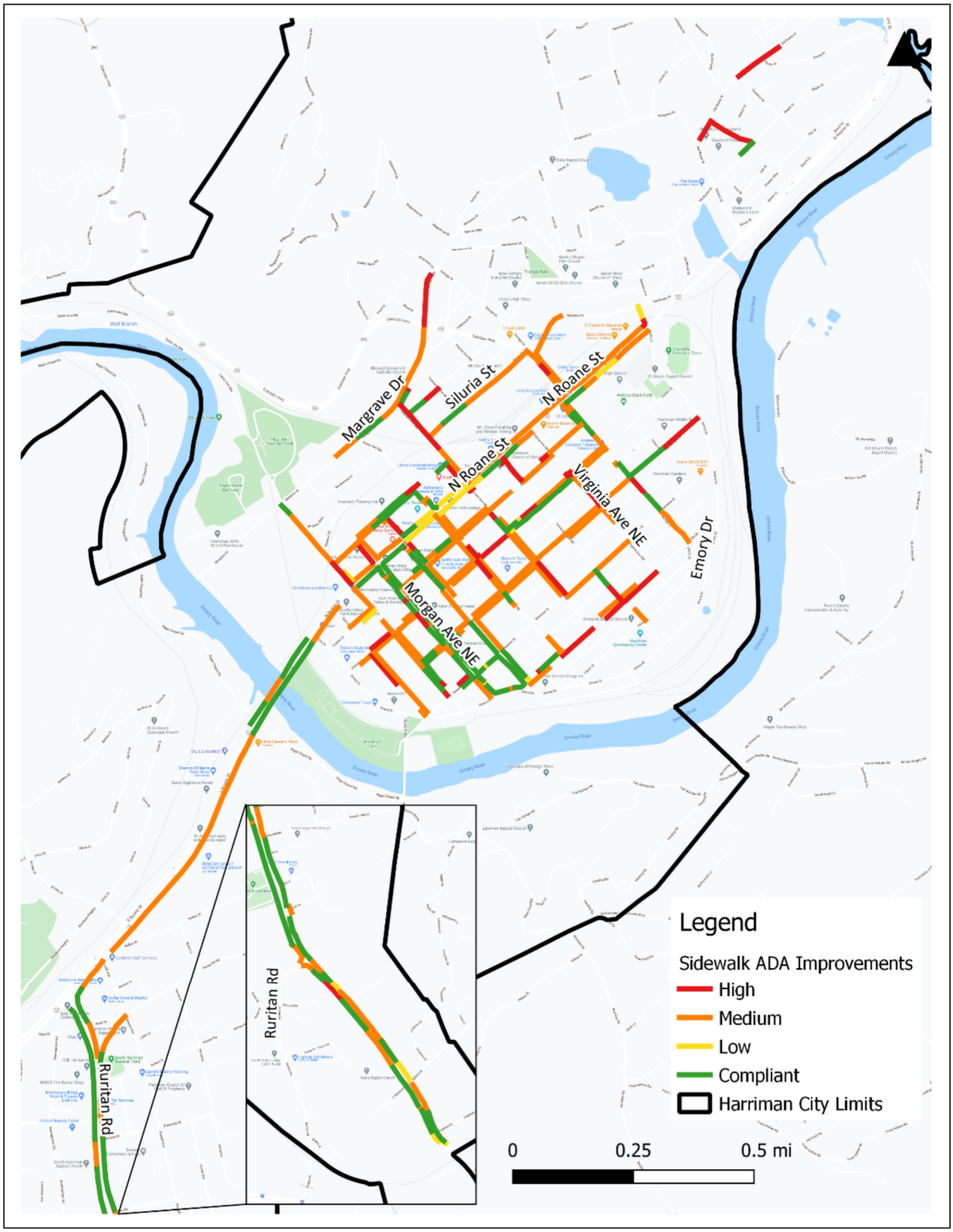
Table 7 – City of Harriman Sidewalks by Compliance

Priority	Length (mi)	Cost Estimate
Compliant	4.4	$0
Low	0.6	$128,900
Medium	7.8	$1,593,600
High	2.0	$407,800
TOTAL	**14.8**	**$2,130,300**

Source: Harriman ADA Self-Evaluation and Transition Plan (2019)

A map of the sidewalk analysis showing the sidewalks in compliance and those that are not (ranked by low to high priority) is shown in **Figure 10**. As can be seen from this map and the table above, over half of the sidewalks inventoried need to be brought up to a higher standard. Many of the medium and high priority locations are within the Cornstalk Heights neighborhood and along N Roane Street.

Figure 10 - Sidewalk ADA Improvements Needed by Severity



Source: Harriman ADA Self-Evaluation and Transition Plan (2019)

Roane County 10-Year Parks and Recreation Master Plan (January 2020)

Most areas in the United State have master planning documents which assist them in guiding their regions' development and growth. At times, regions will also plan for certain types of infrastructure, such as non-motorized facilities. Roane County, Tennessee completed their 10-year master plan for parks and recreational facilities in January 2020. This document reviews the existing conditions of the county and primarily focuses on how best to plan for parks and recreational areas. There are two main cities that are mostly featured in this master plan – Rockwood and Kingston. Harriman is discussed in the plan with respect to these areas.

There are various facilities/trails/parks that are mentioned throughout the master plan and how they are important to Roane County. A public meeting was held in Harriman in June 2019 where a survey was taken of residents within Harriman asking what types of recreational facilities they would like to see more of in their community. The results of that survey are listed below:

- Develop more campgrounds and ATV trails (3),
- New park playgrounds,
- Resurface tennis courts,
- Nature trails,
- Indoor pool/recreational center (8),
- Regional ATV trail (2),
- Running/walking trails,
- Build shoreline trail at Roane County Park, and
- Refurbish Scarborough Trail

Additionally, it was noted that one of the major negative views regarding parks and recreational facilities was the lack of access to them from the more rural areas. Overall, there is a desire for better connectivity to the current facilities in Harriman so that everyone can enjoy them equally. It is also apparent that citizens would like to see a greater diversity of recreational options.

Roane County Trails Master Plan (June 2020)

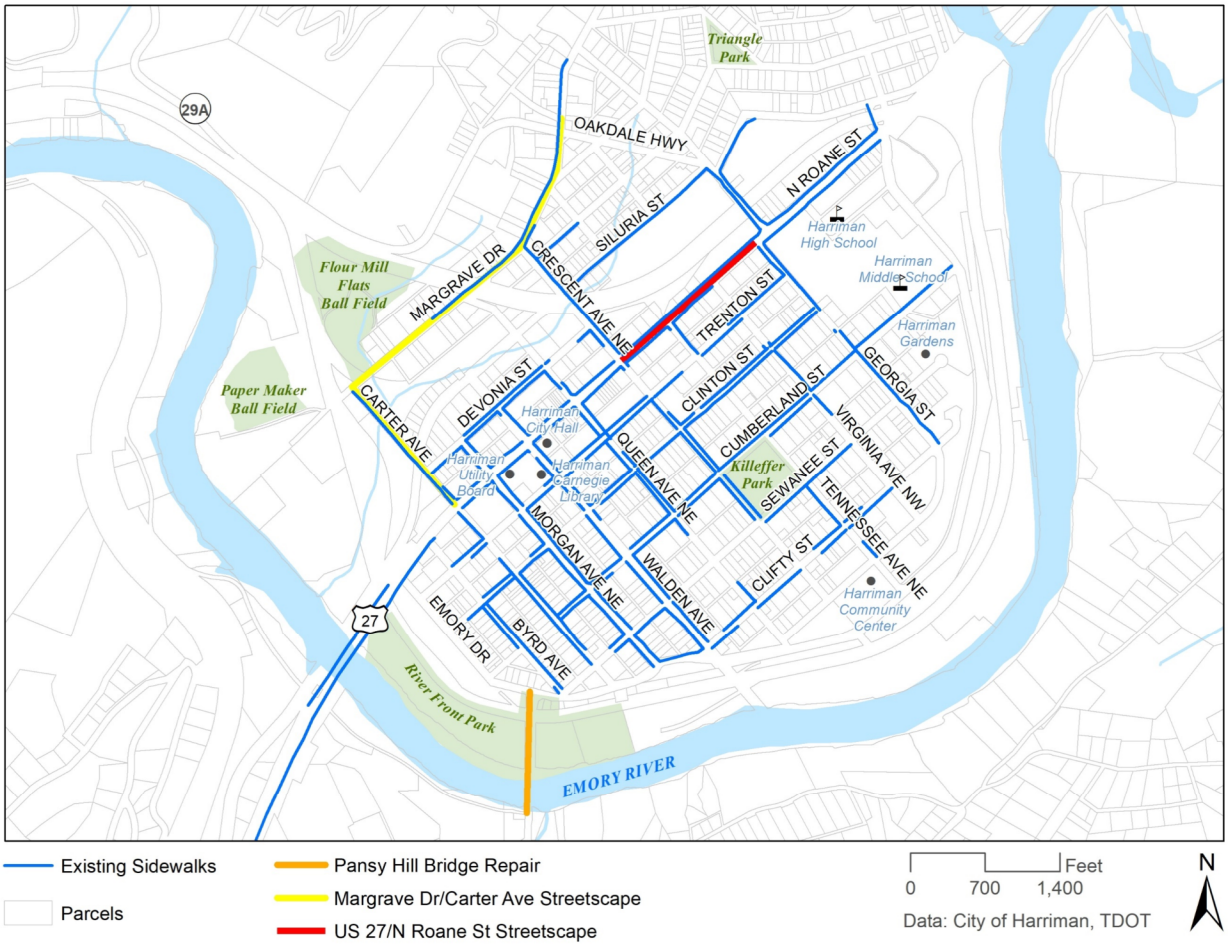
The Roane County Trails Master Plan was developed in June 2020, which focused on the various trails within the region and what areas might be best for developing them further into a comprehensive network. The trails reviewed in the master plan were greenways, walking/hiking trails, bicycle lanes, and a hybrid trail/bicycle lane. In addition to this plan, access to healthy foods was also reviewed at a regional level.

While the master plan focused on all of Roane County, it does mention several facilities within the City of Harriman. Several parks and a greenway in Harriman are mentioned as connection points to other facilities that would be part of the comprehensive network. A bike lane is proposed along US 27/N Roane Street and greenways are proposed that would connect to Riverfront Park in Harriman to the TVA Lakeshore Park and to For Southwest Point Park in Kingston.

Current Design Projects

There are currently three roadway design projects going on around the City of Harriman. The City has been interested in bringing substandard infrastructure into compliance and upgrading older facilities to increase safety for residents. **Figure 11** shows the three design projects, which are also discussed in detail below.

Figure 11 – Current and Pending Design Projects in Harriman



US 27/N Roane Street Streetscape

This project was implemented through TDOT's Transportation Alternatives Program (TAP). The limits for the project extend along US 27/N Roane Street from Crescent Avenue to Georgia Avenue. The upgrade to this facility includes new sidewalks on each side to replace the deteriorating pavement that is currently there. Upgrades to the street lighting are also included to increase the visibility in downtown Harriman.

Margrave Drive/Carter Avenue NW Streetscape

This project is currently in design and will move into construction in the coming years. The project incorporates Margrave Drive and Carter Avenue NW. These streets are located near the downtown corridor and provide a connection to Flour Mill Park, which attracts many locals for events. The current roadways are two-lane facilities

with limited right-of-way, as seen in **Figure 12**. The project will include milling and resurfacing of the roadway, updating the striping, ADA upgrades, and lighting upgrades. The following traffic calming measures will be implemented:

- Crosswalks for safer pedestrian crossings
- Narrowing the road for shorter crossing distances
- Introducing a center median
- Applying pavement markings

Figure 12 – Margrave Drive



TDOT Bridge Rehabilitation

As part of the Improving Manufacturing, Public Roads, and Opportunities for a Vibrant Economy (IMPROVE Act), the Pansy Hill Road bridge over the Emory River was chosen for rehabilitation. The Pansy Hill Road bridge is one of the two bridges used to enter the City of Harriman from the south. Currently, the bridge is a two-lane facility, with total travel lane width of 35 feet. Sidewalk is provided on one side of the bridge, as seen in **Figure 13**. The rehabilitation will occur in the next three years and include reconstructing the bridge deck, concrete pavement, and foundation.

Figure 13 – Pansy Hill Road Bridge Over Emory River



Existing Roadway Characteristics

There are two major roadways that connect the City of Harriman to other areas within the region:

- SR 29/Ruritan Road/Pine Ridge Road
- US 27/N Roane Street

This section provides a review of the existing roadway characteristics that impact how comfortable and safe non-motorized users feel. The amount of traffic on a roadway is a significant factor to consider when determining what types of facilities to include alongside the roadway. By looking at historical crash data, trends can be analyzed to determine what types of improvements could be made to make the roadway safer.

Existing Traffic Volumes

The TDOT traffic count stations within the City of Harriman were evaluated to understand the traffic trends within the study area. There are 23 count stations located within the study area and are shown in **Figure 14**. The traffic is reported in terms of daily volumes and are summarized in **Table 8**. The historical traffic data between 2014 and 2018 was analyzed to determine the annual growth rate of traffic. The majority of the count stations indicate there was an increase in traffic from 2014 to 2018, with an average annual growth rate of 5.76 percent. Interestingly, the count station along US 27 south of the Emory River shows about a

1 percent annual growth rate and the count station along US 27 north of downtown shows a 4 percent annual growth rate; however, the count station along US 27 in downtown Harriman shows a -0.3 percent annual growth rate. The count stations along Margrave Drive and Carter Avenue show very high annual growth rates, indicating that these roads may be used as a bypass to US 27.

Figure 14 – Existing (2018) Annual Average Daily Traffic Volumes

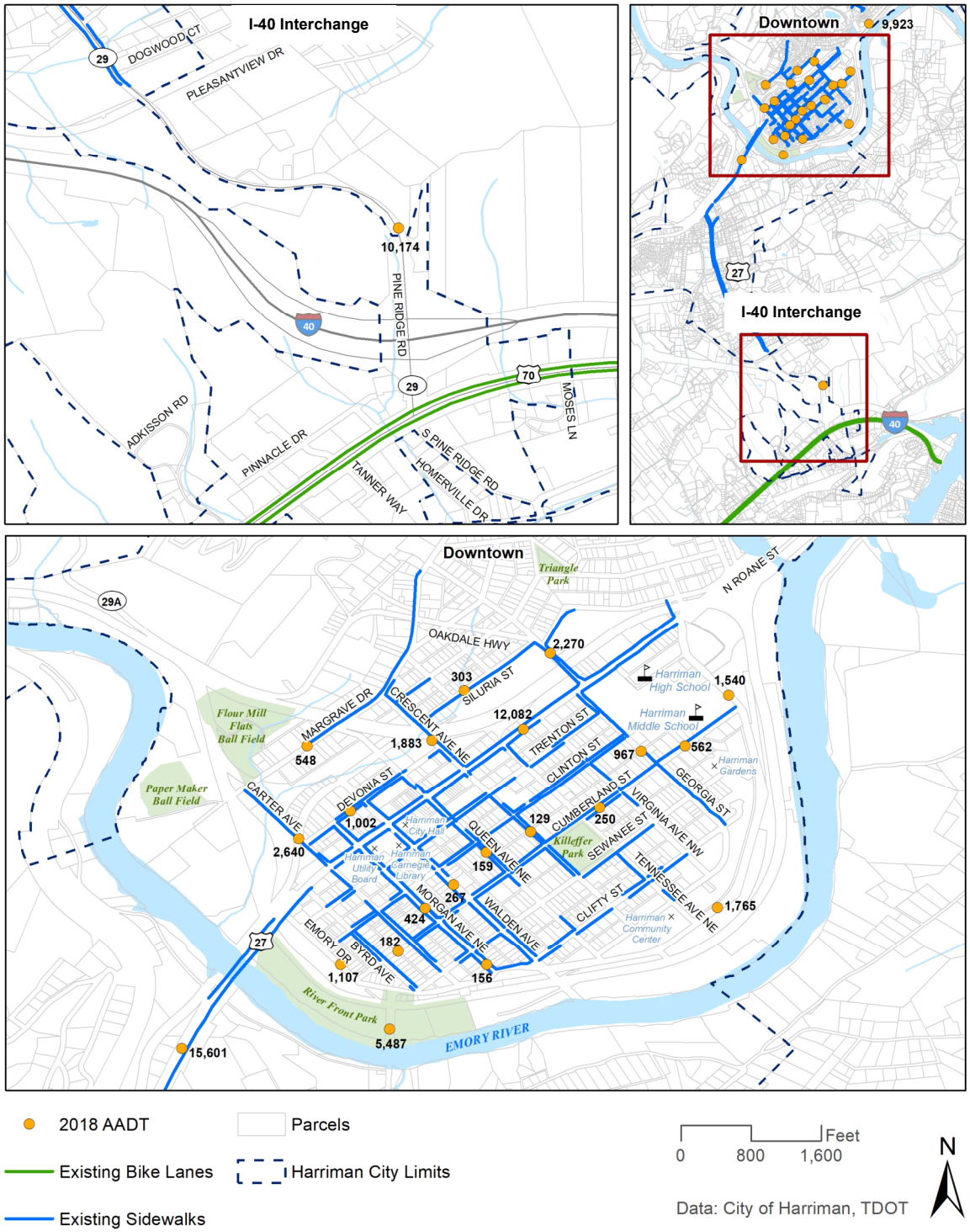


Table 8 – Annual Average Daily Traffic Volume Five-Year Summary (2014-2018)

Roadway	2014	2015	2016	2017	2018	Annual Growth Rate
Pine Ridge Road	8,990	9,116	9,854	10,353	10,174	3.14%
US 27/SR 61	15,015	15,156	16,209	16,235	15,601	0.96%
Pansy Hill Road	3,513	3,543	4,154	4,188	5,487	11.79%
Emory Drive	1,147	1,100	1,111	1,215	1,107	-0.88%
Cumberland Street	166	158	159	144	182	2.33%
Morgan Avenue	259	277	279	240	156	-11.90%
Morgan Avenue	525	648	654	518	424	-5.20%
Walden Avenue	262	199	201	227	267	0.47%
Queen Avenue	104	131	126	95	159	11.20%
Crescent Avenue	127	99	102	96	129	0.39%
Cumberland Street	217	204	217	224	250	3.60%
Emory Drive	1,458	1,501	1,516	1,535	1,765	4.89%
Georgia Street	730	780	784	900	967	7.28%
Cumberland Street	375	449	442	446	562	10.64%
Emory Drive	1,635	1,651	1,794	1,784	1,540	-1.49%
Carter Avenue	539	555	560	889	2,640	48.77%
Margrave Drive	200	254	256	260	548	28.66%
Devonia Street	773	1,187	1,198	1,346	1,002	6.70%
Crescent Avenue	1,084	1,340	1,353	1,229	1,883	14.80%
Siluria Street	344	497	456	440	303	-3.12%
Oakdale Highway	2,760	2,830	3,025	2,985	2,270	-4.77%
US 27/N Roane St	12,234	12,284	12,352	13,823	12,082	-0.31%
US 27/N Roane St	8,350	9,255	9,726	9,230	9,923	4.41%

Source: TDOT Traffic History

Vehicular and Non-Motorized Crash Data

Crash data were collected for the study area within the City of Harriman using TDOT's Enhanced Tennessee Roadway Information Management System (E-TRIMS). The most recent and complete five-year data set (2016-2020) were analyzed. The details from the crash reports were reviewed to accurately understand the crash results.

A total of 374 crashes were reported during the five-year analysis period from 2016 to 2020. Figure 15 shows the locations of the crashes within the study area. The highest number of crashes occurred on SR 29 near I-40 and on US 27 through downtown Harriman. Table 9 shows a breakdown of the types of crashes that occurred in the study area. The most common crashes within the City were rear end (approximately 45 percent) and angle collisions (approximately 17 percent).

Figure 16 shows the crashes that occurred at intersections. The intersections with the highest density of crashes are the I-40 ramp termini at SR 29, US 27 at Walden Avenue, and US 27 at Georgia Avenue. These intersections would be good candidates for improvements that would benefit vehicular and non-motorized users.

Figure 15 – City of Harriman Vehicular Crashes by Crash Type (2016-2020)

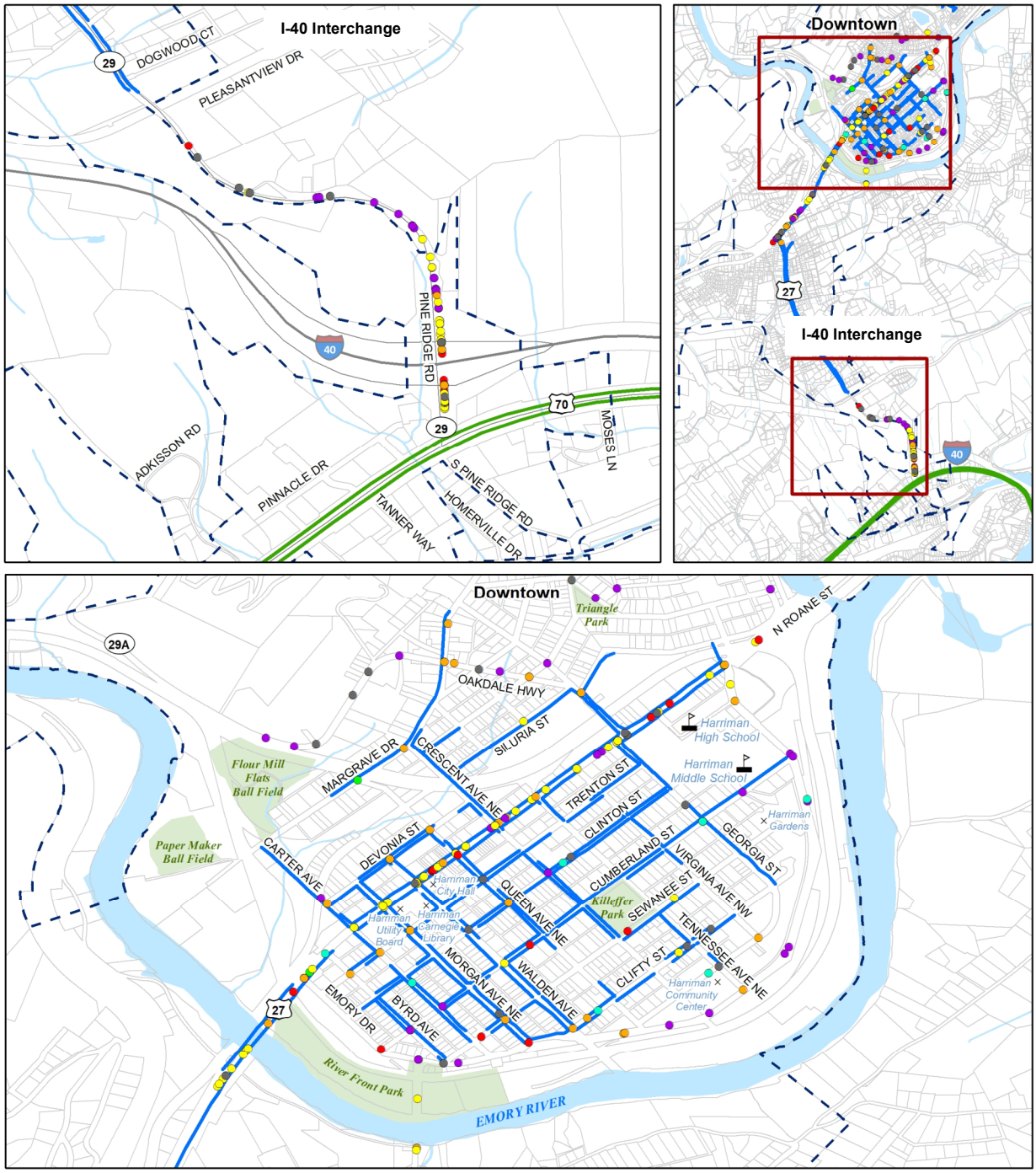


Figure 16 – City of Harriman Vehicular Crashes – Intersection Crashes (2016-2020)

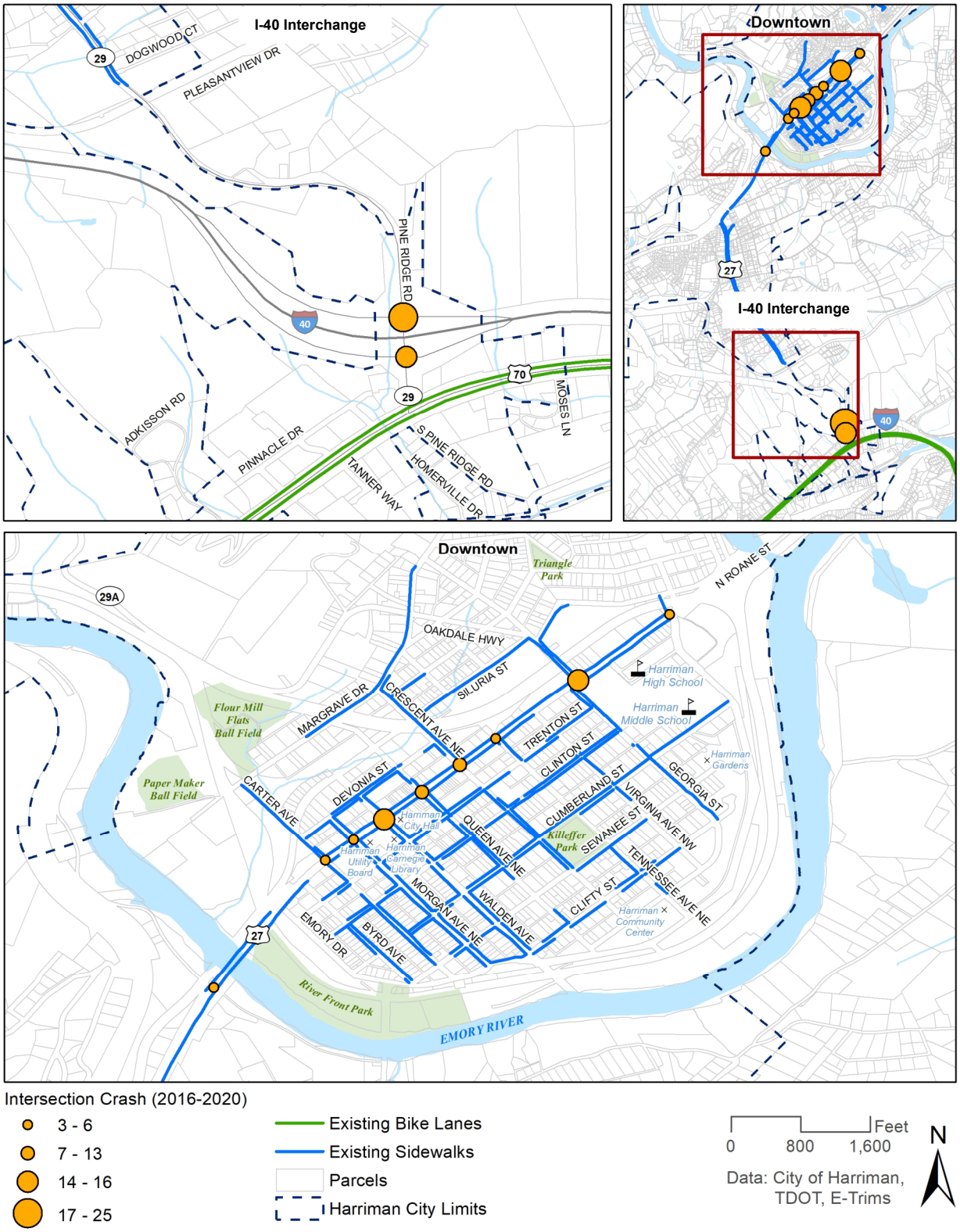


Table 9 – City of Harriman Crashes by Type (2016-2020)

Type of Crash	Number of Crashes	Percentage of Crashes
Angle	64	17%
Head On	6	2%
Single Vehicle	61	16%
Rear End	167	45%
Sideswipe, Opposite Direction	12	3%
Sideswipe, Same Direction	28	7%
Other	36	10%
TOTAL	**374**	**100%**

Source: TDOT E-TRIMS

Of the 374 crashes that occurred in the five-year analysis period, 290 crashes (78 percent) resulted in property damage only. No fatalities occurred during this time period, but there were two serious injury crashes and 82 minor injury crashes. **Table 10** summarizes the crash data by severity and **Figure 17** shows the locations of the crashes, categorized by severity.

Table 10 – City of Harriman Crashes by Severity (2016-2020)

Injury Severity	Number of Crashes	Percentage of Crashes
Fatal Injury	0	0%
Serious Injury	2	1%
Minor Injury	82	22%
Property Damage	290	77%

Source: TDOT E-TRIMS

Two bicycle and/or pedestrian crashes occurred along US 27 during the five-year analysis period. One crash occurred near the intersection of Emory Drive in the early morning hours when poor lighting caused low visibility. The other crash occurred in the downtown corridor at the intersection of Walden Avenue.

Additional years of crash data were analyzed for more bicycle and pedestrian occurrences. Five other crashes occurred dating back to 2002. Three of those five crashes happened at the intersection of US 27 and Georgia Avenue. The bicycle and pedestrian crash locations are shown in **Figure 18**. The crashes that occurred during the five-year crash data analysis period are highlighted.

Figure 17 – City of Harriman Vehicular Crashes by Severity (2016-2020)

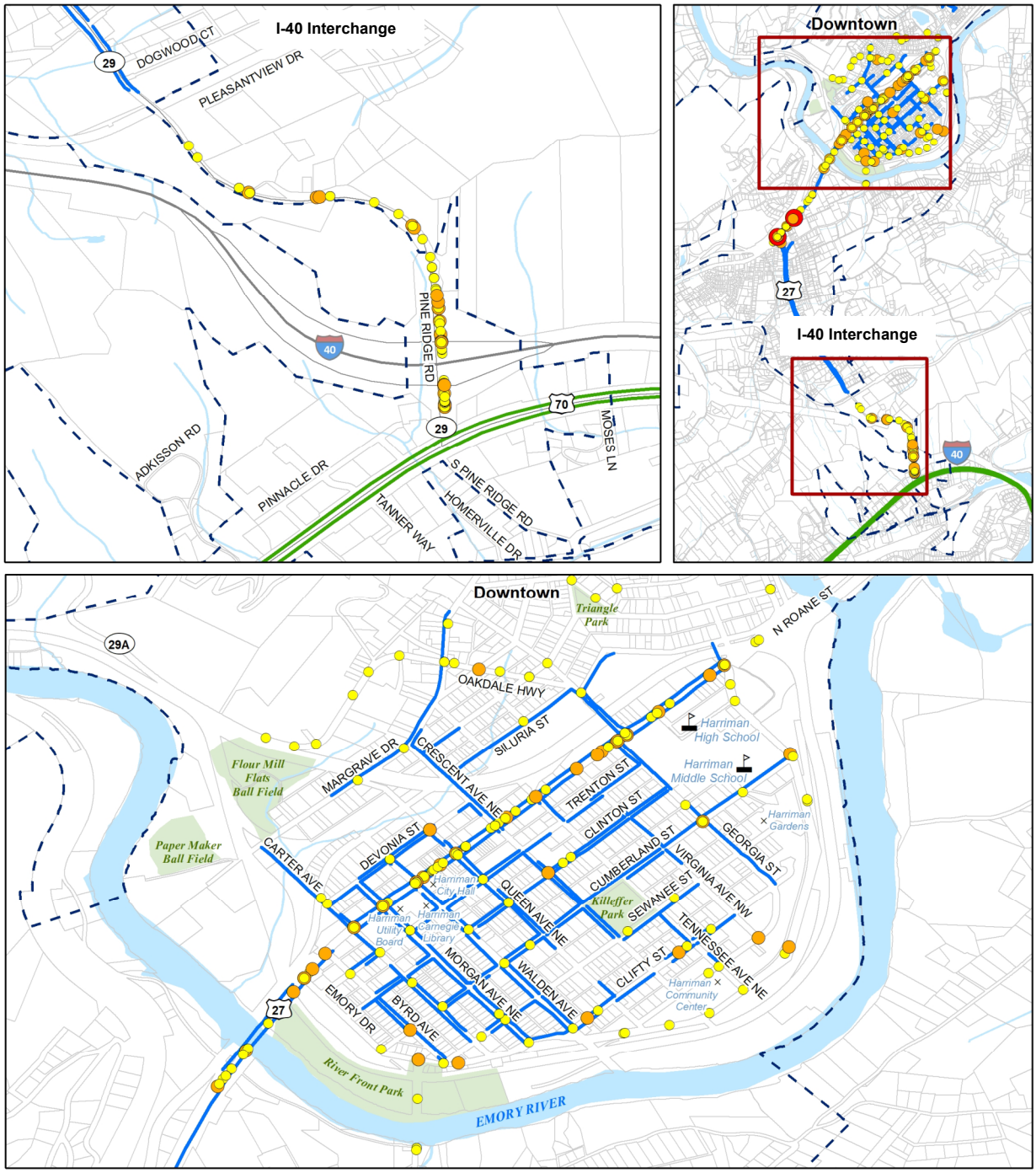
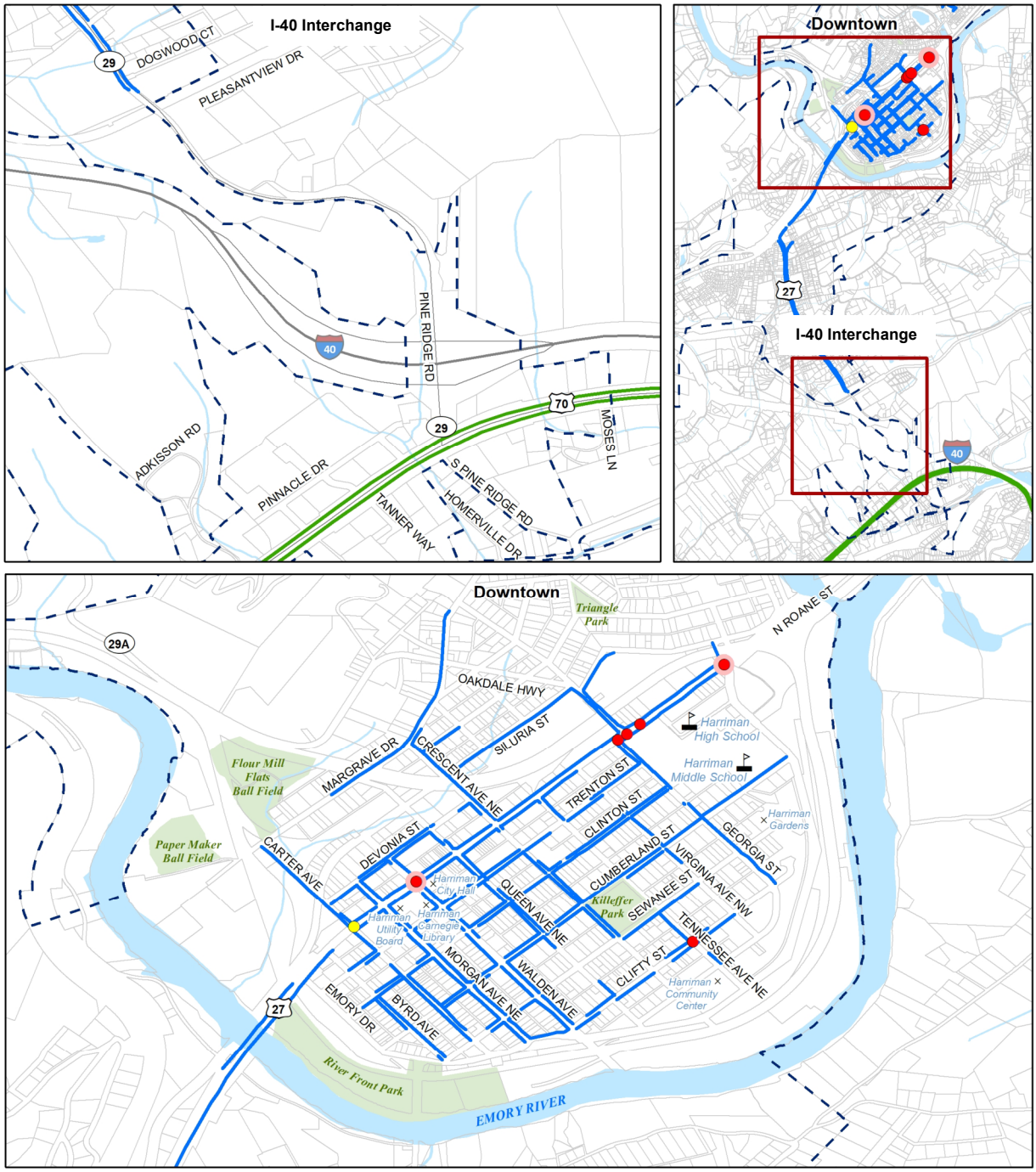


Figure 18 – City of Harriman Non-Motorized Crashes (2002-2021)



Existing Bike/Ped Facilities

The City of Harriman has numerous roadways, some of which have bicycle and pedestrian infrastructure, but there are several key areas throughout the city where this is missing. Without a connected network of sidewalks and/or bicycle lanes, these modes of transportation are much more difficult to utilize fully. The main roadways within the project study area were reviewed to determine which had existing bicycle or sidewalk infrastructure, as well as what areas within the city had greenways. Additionally, the existing parks and recreational facilities in the city were reviewed to determine where there may be potential gaps in the non-motorized network in relation to these facilities.

Existing Bicycle Infrastructure

Typically, bicycle infrastructure consists of bicycle lanes, shared use pathways, or other types of trails. While these may serve different purposes, they are all nonetheless important. The two main roadways which were reviewed, US 27 and SR 29, offer different bicycle infrastructure. SR 29 has on-street bicycle lanes along the entire length of the roadway. US 27 does not have any marked bicycle infrastructure, but it has paved shoulders that could be used by a bicyclist. The shoulders are not continued through the bridge over Emory River, making it a pinch point for cyclists.

Existing Sidewalk Infrastructure

A similar review was done of the study area roadways based on the sidewalk infrastructure that is available. SR 29 has sidewalks along both sides of the roadway and provide good coverage. US 27 does not have adequate sidewalk coverage along the northern part of the roadway and contains gaps along the southern portion.

Existing Greenways

While not within the study area, there is a greenway that connects the TVA Lakeshore Park to Swan Pond Circle Road, which eventually connects to Swan Pond Road and then the City of Harriman via the Pansy Hill Road bridge over the Emory River. There are no other greenways within the area, but the Roane County Trails Master Plan (June 2020) recommends a network of greenways to connect the region together.

Strava Data

When planning for non-motorized infrastructure, it is important to review where these users are currently traveling, which roadways users tend to avoid, and which paths users prefer.

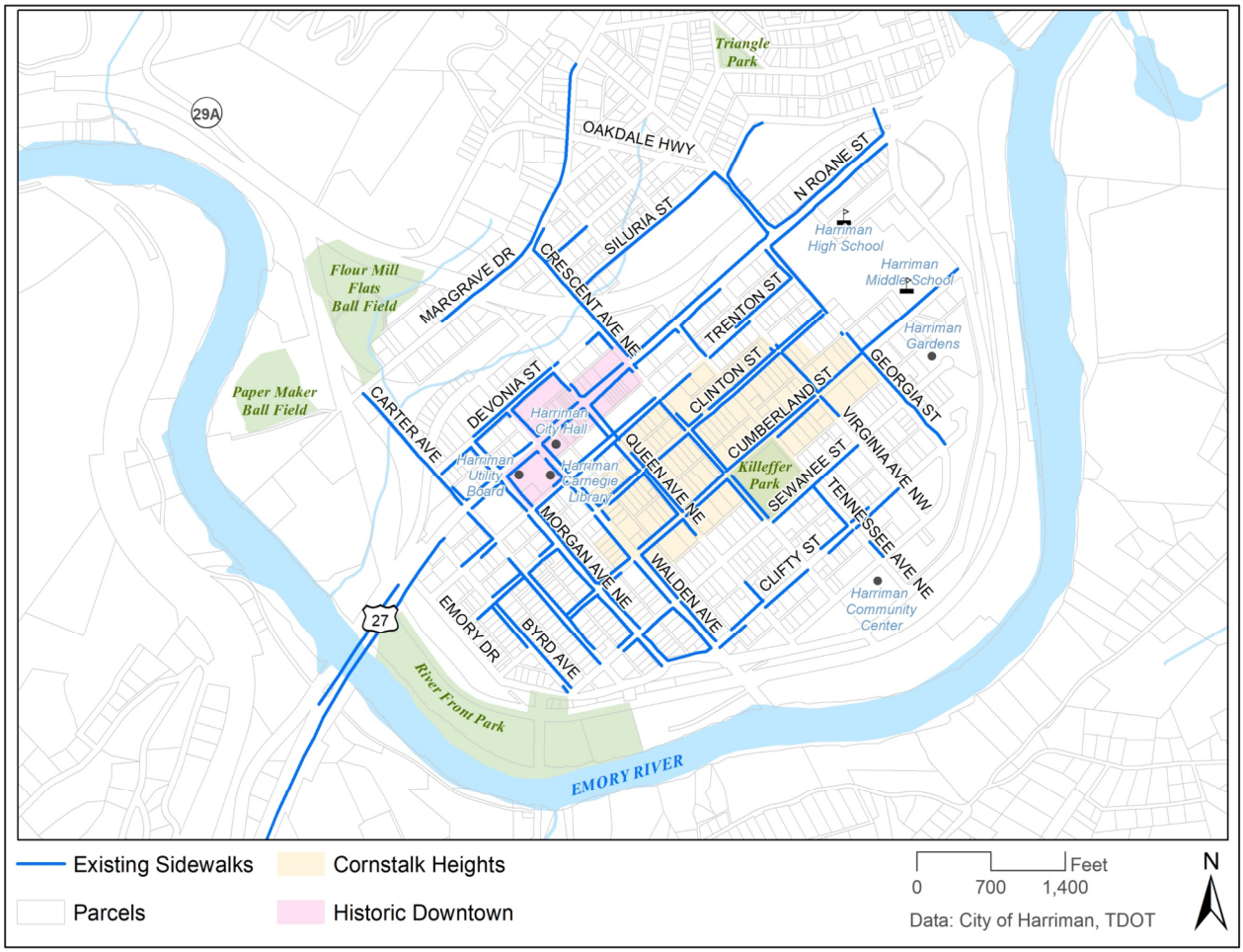
Crowd-sourcing data is one way that planners look for important information from people in local areas, and one key data source is Strava. This company can utilize the GPS tracking from smartphones and collect information on where cyclists travel when users log their rides through the app. TDOT has a partnership with Strava and the available data was reviewed as part of this plan. It should be noted that the sample size for this data is rather small, so these inferences should be validated with further study.

After reviewing the Strava data from the past year, several key points were gleaned to help understand which routes are preferred by cyclists. The first is that Roane Street, Pansy Hill Road, Oakdale Highway, and Emory Drive were the roadways that had the highest bicycle usage. Also, many of the trips taken were by visitors, or those that don't live within the region, and during the summer and fall months. This means that a focus on connecting facilities at a regional level could be an important factor when developing new infrastructure.

Existing Parks and Recreation Facilities

There are several parks throughout the City of Harriman, as well as several civic/recreational facilities that the public can use and enjoy. It is important for a city to have parks, not only for those who visit the area or are passing through, but also for people who live in the area. Having sufficient park space is important from a public health perspective. **Figure 19** shows the various parks that are available within Harriman, which range in size and amenities.

Figure 19 - City of Harriman Parks (Downtown Harriman)



TVA Lakeshore Park is one of the largest and most recently built parks near Harriman, containing boat ramps, newly seeded water features with fish, restrooms,

picnic areas, 2 miles of walking trails, and a pedestrian bridge crossing the water. While it is not within the study area, it is important as it may draw visitors and residents and may need more non-motorized infrastructure in the coming years.

Flour Mill Flats Ball Field and Paper Maker Ball Field provide baseball and softball fields that are available to the City of Harriman between Carter Avenue and along Margrave Drive. There are public restrooms, bleachers, and several fields available.

Figure 20 – Flour Mill Flats Ball Field



Riverfront Park is a large park along the Emory River located between the bridges along Pansy Hill Road and US 27. There is a large field, boat slip, restrooms, playground, and a trail that runs along the edge of the park. It is accessible via a small road connecting to Emory Drive.

Figure 21 – Riverfront Park



Figure 22 – Riverfront Park





Killifer Park is a medium-sized park in the heart of the residential section of downtown Harriman. It has several amenities such as benches, a gazebo, and basketball courts. Several blocks south of Killifer Park is the Harriman Community Center, which has several recreational facilities available to residents. There is a large field next to the Community Center, a new splash pad, and a larger, indoor basketball court.

Figure 23 –Killifer Park







Figure 24 –Harriman Community Center





Triangle Park is located north of US 27. While it does have some green space, a small gazebo, playground equipment, and a basketball court, it is rather small compared to the other parks mentioned around Harriman.

Figure 25 –Triangle Park







NEEDS IDENTIFICATION

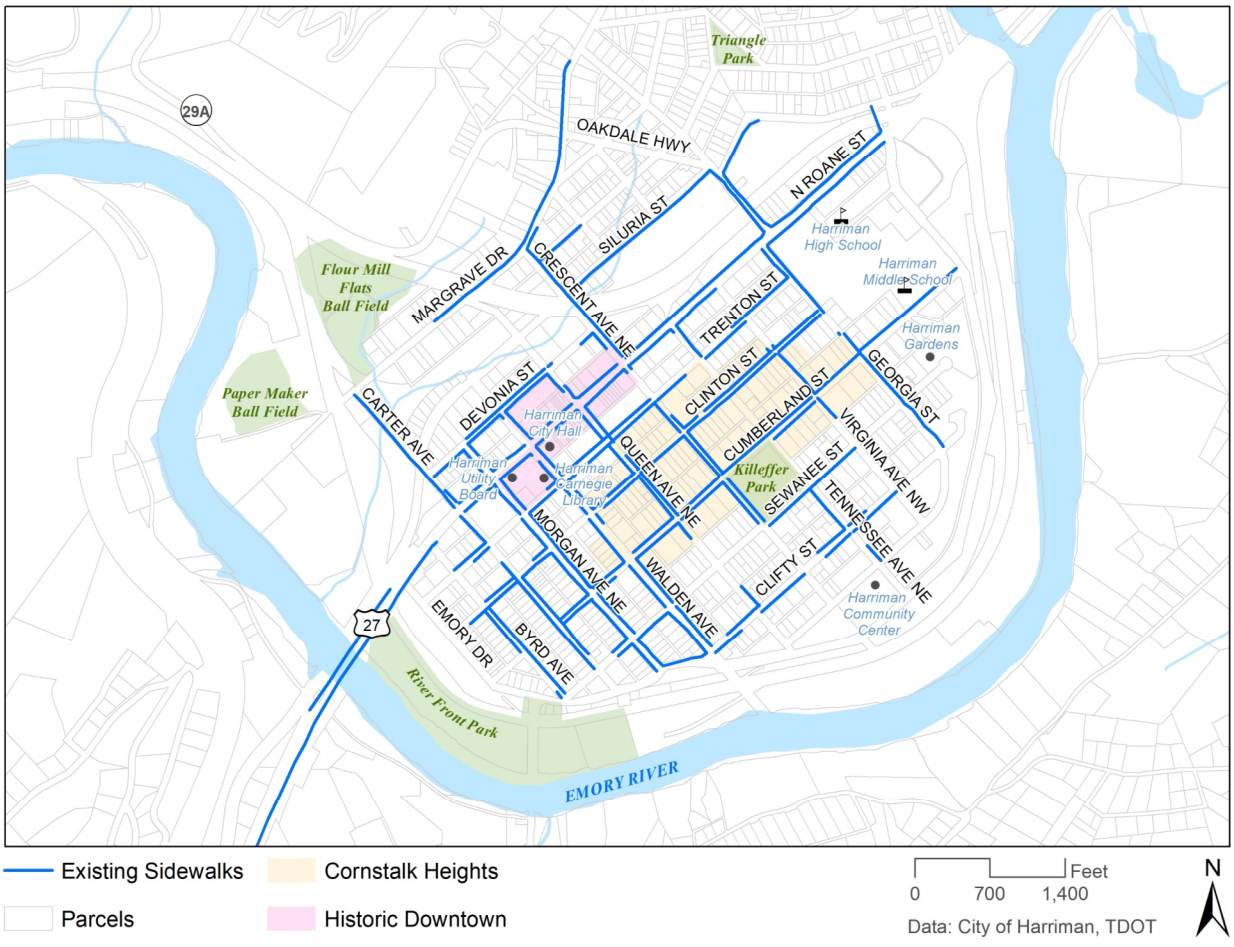
The Existing Conditions analysis paints a picture of the current environment within the study area. From here, needs that will help to complete the non-motorized infrastructure network can be identified. The following sections detail the opportunities that Harriman should consider when deciding how to improve their non-motorized facilities.

Gaps in the Existing Network

The first place to start for a needs' assessment is to determine where there are existing gaps in the network. **Figure 26** and **Figure 27** show the existing sidewalk and bicycle infrastructure for the two areas of interest.

There are existing bike lanes and sidewalks along SR 29 from US 27/Roane Street to Ruritan Road that were recently installed, which is why this section is not of focus for the Master Plan. Bike lanes are also present along US 70, south of I-40. The City of Harriman should consider extending the bike lanes and sidewalks from their terminus on SR 29 to US 70.

Figure 26 –City of Harriman Existing Non-Motorized Infrastructure (Downtown)

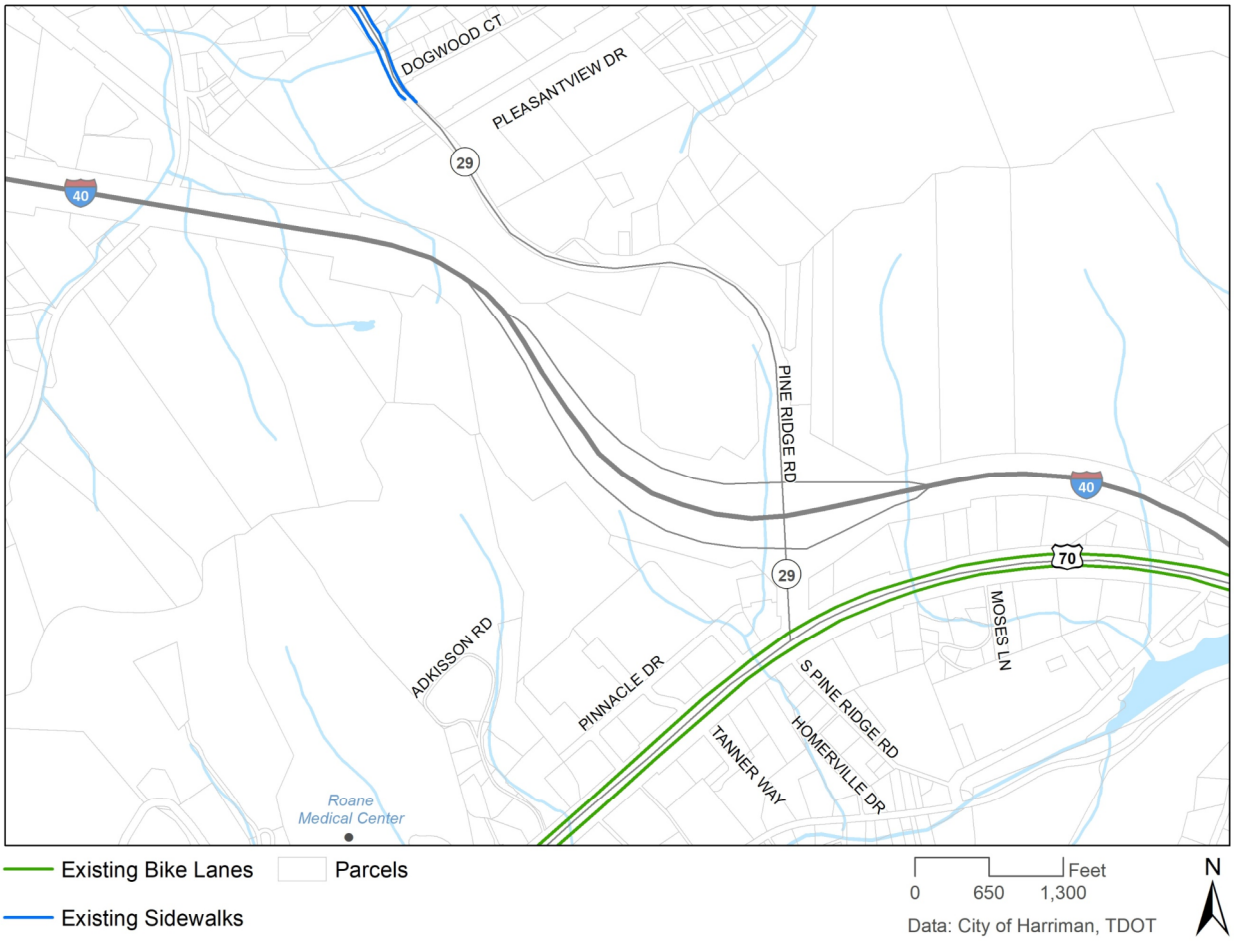


The neighborhoods adjacent to downtown have spotty sidewalk coverage and most of the sidewalks are not ADA-compliant, according to the City's ADA Transition Plan.

According to the public survey, residents are more interested in upgrading the existing sidewalks than filling in sidewalk gaps. The City of Harriman should devise a prioritization plan to upgrade the sidewalks most in need of repair while also filling critical gaps, such as along Emory Road.

There are currently no greenways within the City. According to the public survey responses, residents have a keen interest in greenways, especially along the river and traveling between the parks.

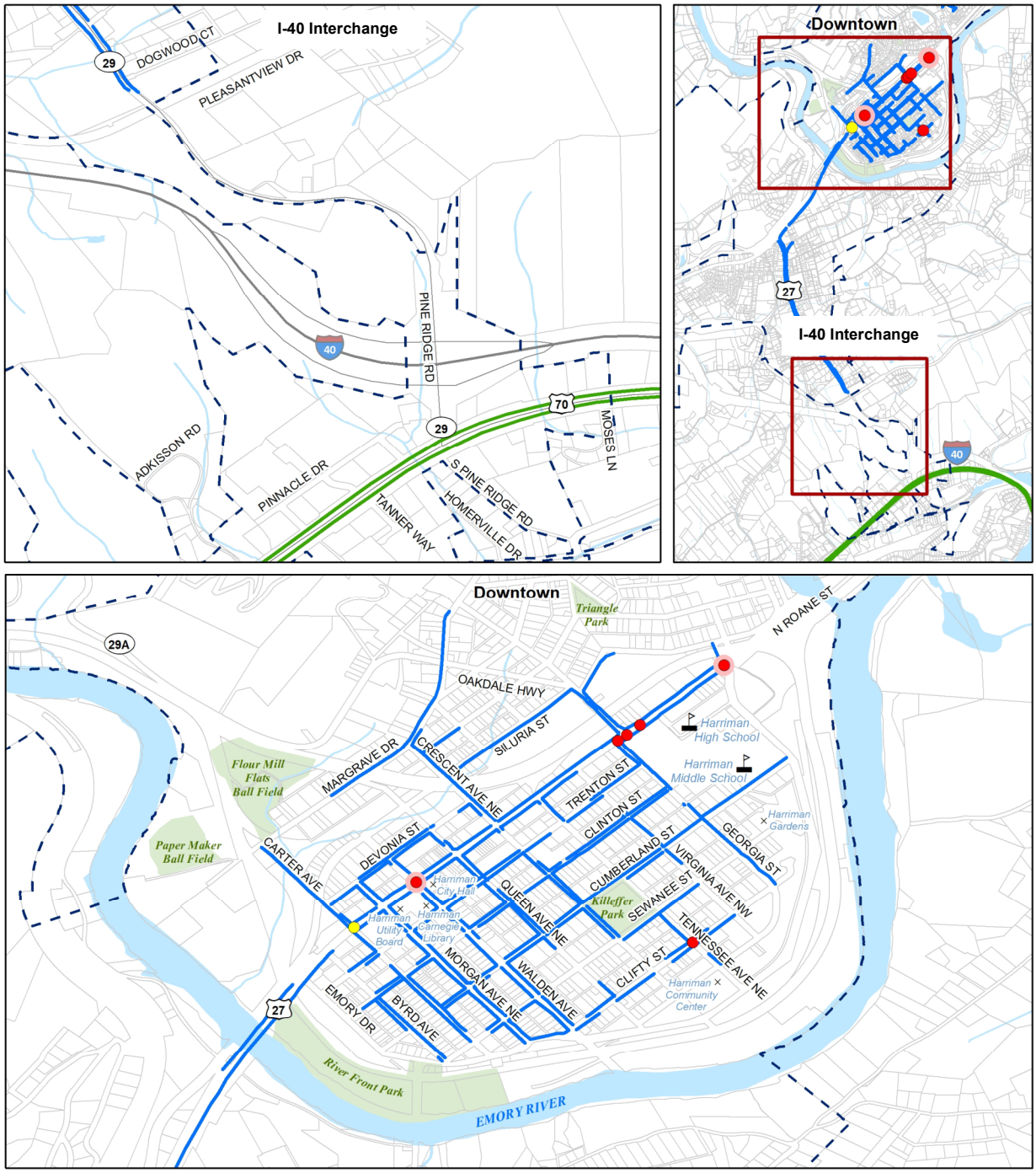
Figure 27 –City of Harriman Existing Non-Motorized Infrastructure (I-40 Interchange)



Crash Hot Spots

As discussed in the crash analysis, seven crashes occurred between 2002 and 2020 that involved bicycles or pedestrians. Two pedestrian-involved crashes occurred along US 27 during the five-year analysis period. One crash occurred near the intersection of Emory Drive and the other crash occurred at the intersection of Walden Avenue. Additional years of crash data were analyzed for more bicycle and pedestrian occurrences. Five other crashes occurred dating back to 2002. Three of those five crashes happened at the intersection of US 27 and Georgia Avenue. The intersections where these crashes occurred, shown in **Figure 28**, should be looked at further to provide safer accommodations for non-motorized users.

Figure 28 –City of Harriman Non-Motorized Crashes (2002-2020)



Proximity to Low Income Areas

From the socioeconomic analysis, it was found that the census tract associated with downtown Harriman southeast of US 27/Roane Street is comprised of 30-40 percent of people living under the poverty line. The other census blocks within the study area limits consist of less than 20 percent of people living under the poverty line. **Figure 29** and **Figure 30** show the existing sidewalk network overlaid on the poverty status maps. Improvements that help connect these areas of employment, grocery stores, recreational facilities, schools, and other places of interest around the city should be prioritized as these are likely users who rely on non-motorized modes and public transit as their main means of transportation.

Figure 29 –City of Harriman Poverty Status by Census Tract (Downtown)

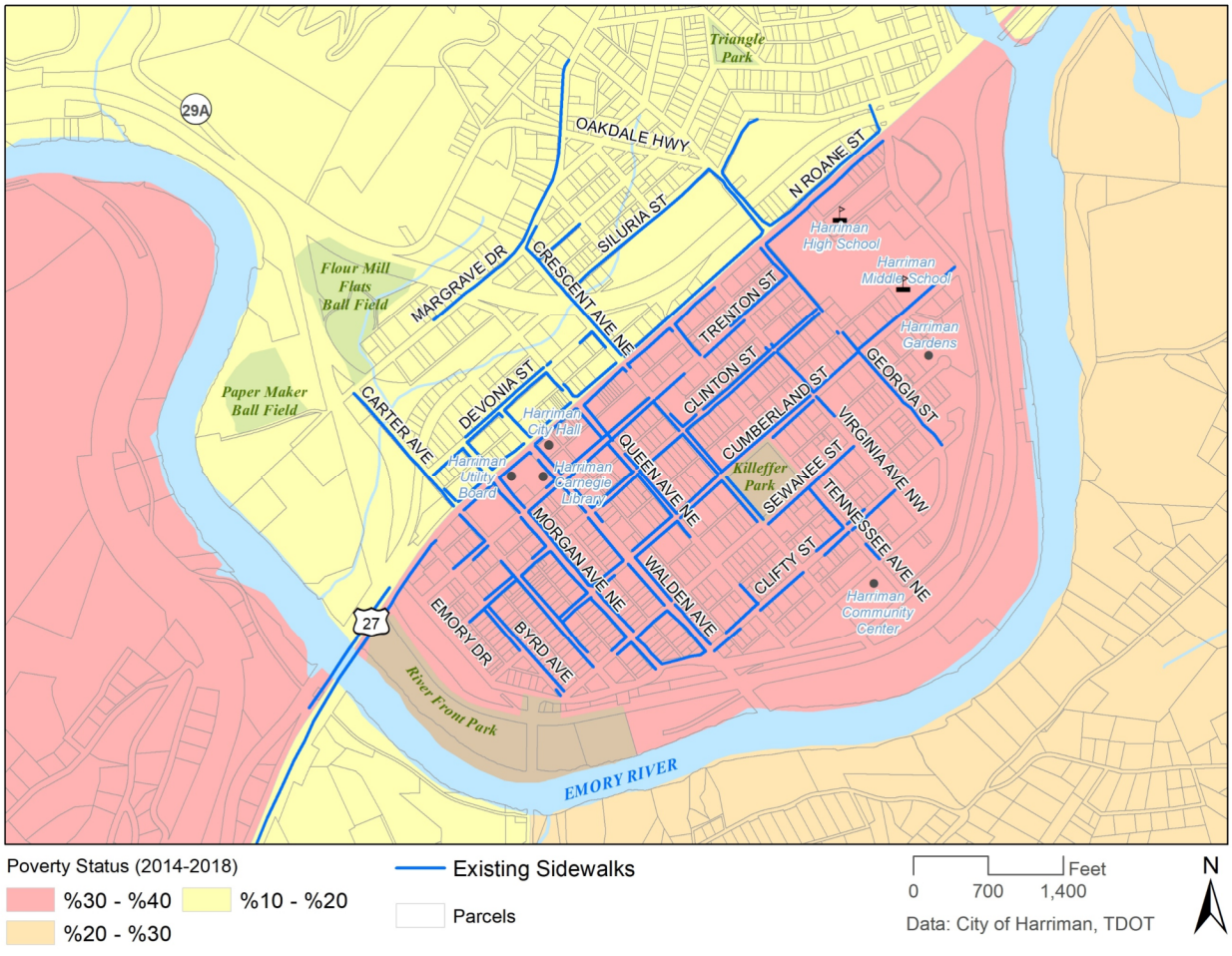
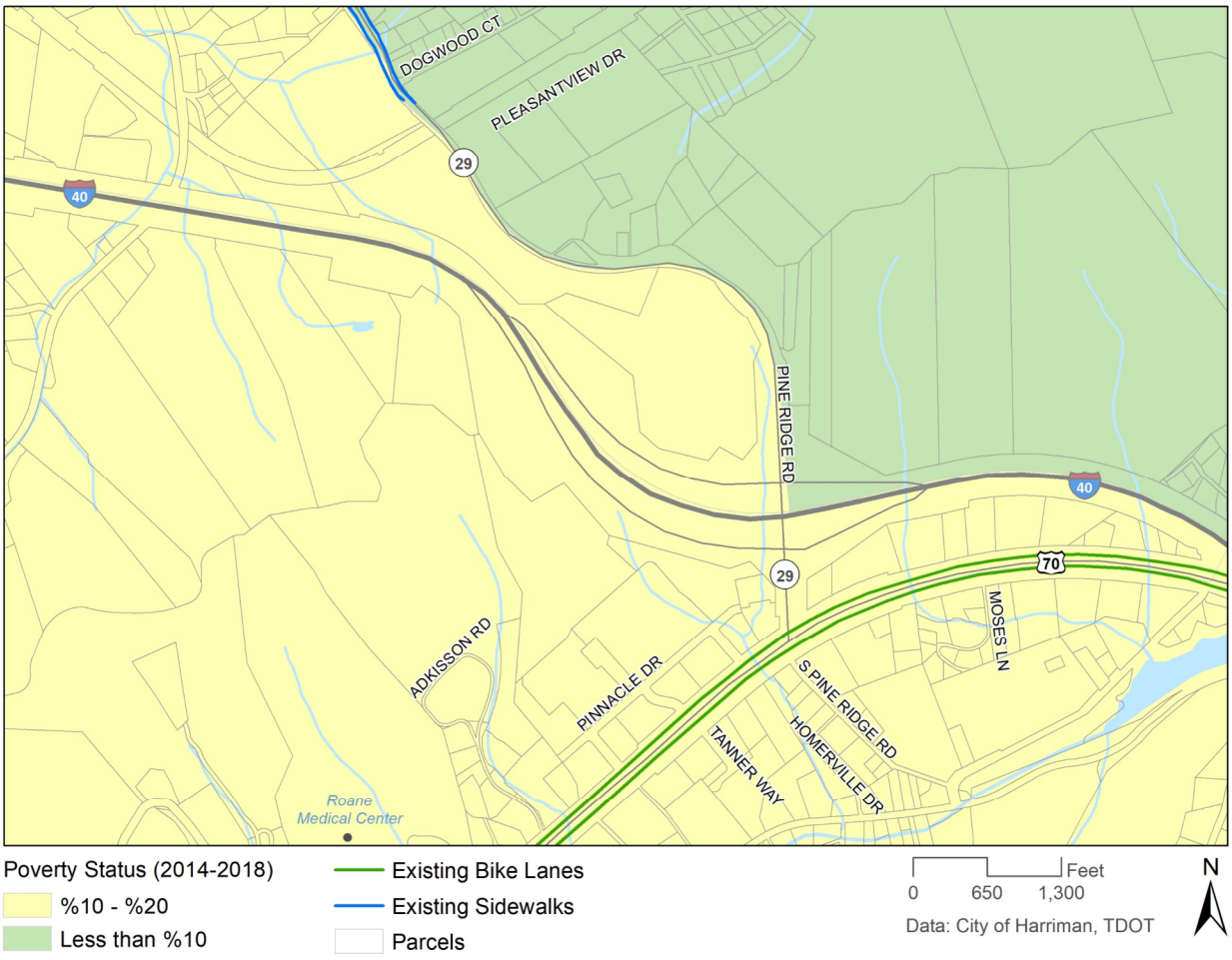


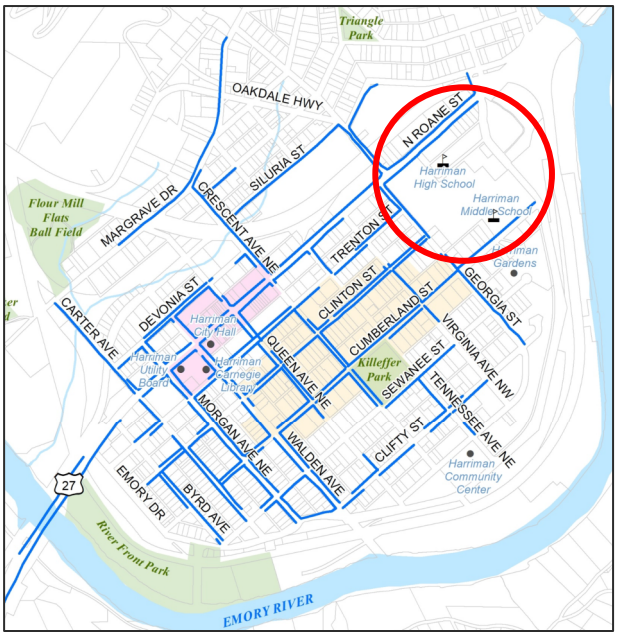
Figure 30 –City of Harriman Poverty Status by Census Tract (I-40 Interchange)



Proximity to Schools

There are two schools, Harriman High School and Harriman Middle School within the study area. The City of Harriman should prioritize network improvements that will provide better non-motorized access to these schools. There are no pedestrian facilities located along Emory Road and the existing sidewalks along US 27, Georgia Avenue, and Cumberland Street were identified as needing improvements to comply with ADA standards in the ADA Transition Plan.

Figure 31 –City of Harriman Schools



IMPROVEMENTS

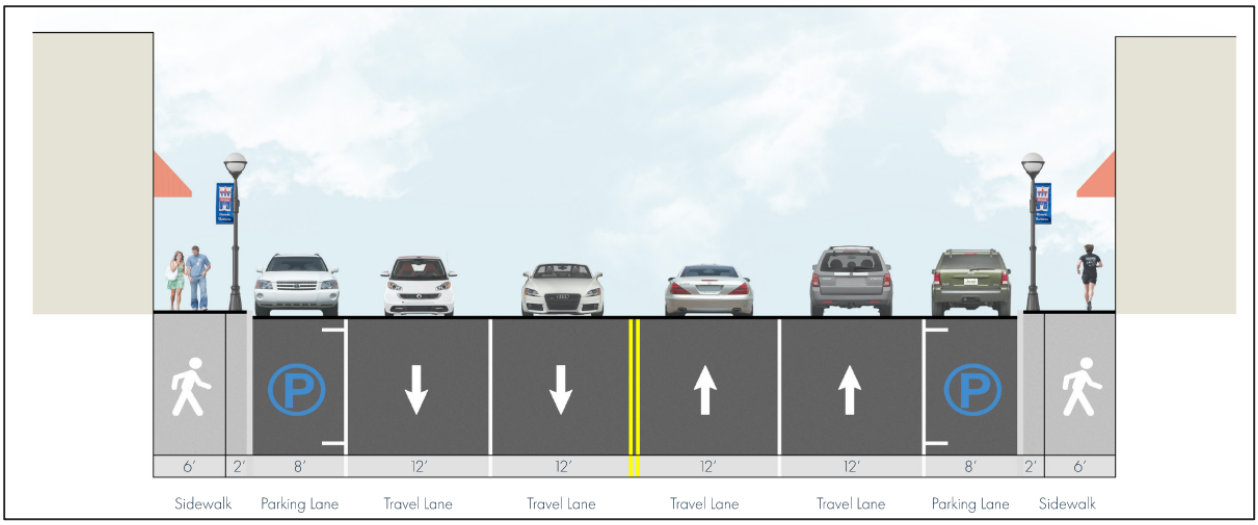
This section details the improvements that the City of Harriman should focus on to create a more comprehensive active transportation network within the study area.

US 27/N Roane Street Improvements

US 27/Roane Street is the main roadway that passes through downtown Harriman. The existing cross section, which is depicted in **Figure 32**, consists of two 12-foot lanes in each direction, on-street parking on both sides, and 8-foot sidewalks on both sides.

During discussions with the City about areas this plan should focus on, the US 27 corridor was mentioned for several reasons. US 27 bisects downtown and is the only major route connecting to Wartburg and Oak Ridge to the north and I-40 and Rockwood to the south. The posted speed limit through downtown is 25 miles per hour (mph); however, drivers often exceed the speed limit significantly. The stakeholder group expressed explicit interest in providing measures that would reduce the speed of vehicles to provide a safer environment for bicyclists and pedestrians.

Figure 32 – US 27/Roane Street Existing Cross-Section



Cross-Section between Morgan Street and Crescent Street

The following cross-sections provide varying options for the City to explore for US 27 between Morgan Street and Crescent Street. **Figure 33** depicts an option where the on-street parking on the north side of US 27 is removed and the sidewalk width is increased from 8 to 12 feet. There are several surface parking lots provided off US 27 that could be utilized in lieu of the on-street parking. Before any on-street parking is removed, the City should coordinate with property owners and perform a traffic and parking study for downtown.

The travel lane widths are reduced from 12 to 11 feet and a 6-foot raised median is provided. The wider sidewalks provide more room for pedestrians in the busier sections of downtown, such as in front of the Princess Theater. The median and narrower travel lanes naturally reduce vehicular speed as drivers compensate to

maintain comfort and safety. This also reduces the total crossing distance for pedestrians.

Figure 33 – Proposed US 27/Roane Street Existing Cross-Section (Center Median)

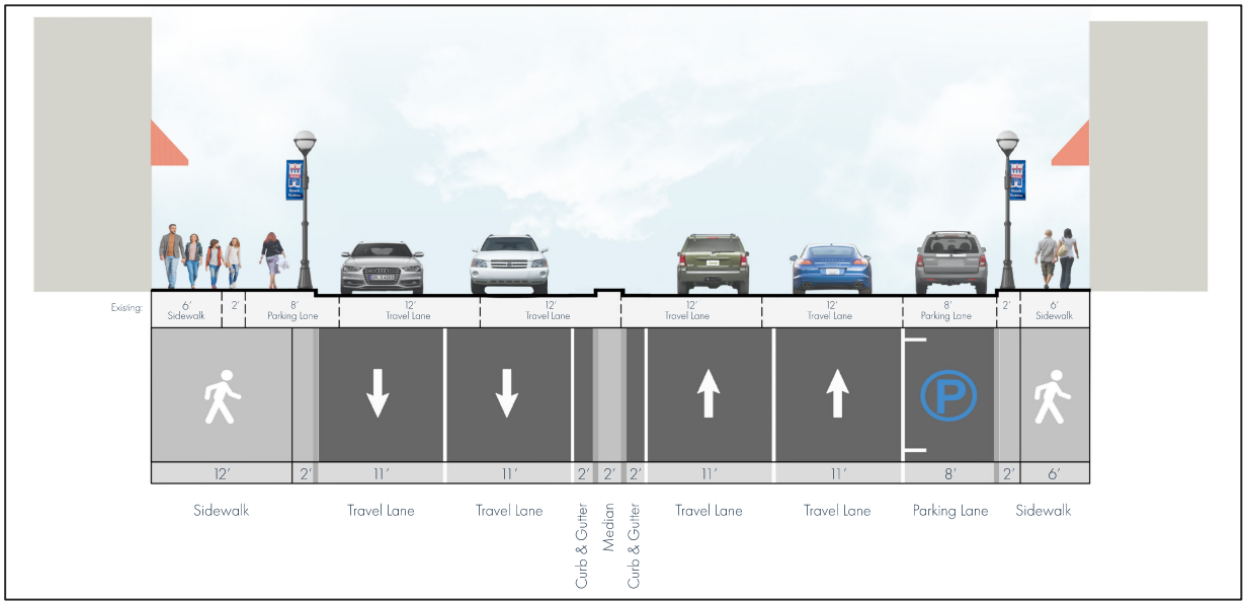


Figure 34 and **Figure 35** provide examples of reducing the number of lanes from four to three and providing bicycle accommodations along the roadway in the form of a cycle track on one side of the road or bike lanes on either side of the street. These cross-sections are provided as examples of the various options the City has regarding transforming this integral space. Another possibility is to retain on-street parking on the north side but provide bulb-outs at key locations. The City should first determine their prioritization of users and then decide on the appropriate cross-section to reap the most benefit.

Figure 34 – Proposed US 27/Roane Street Existing Cross-Section (Cycle Track)

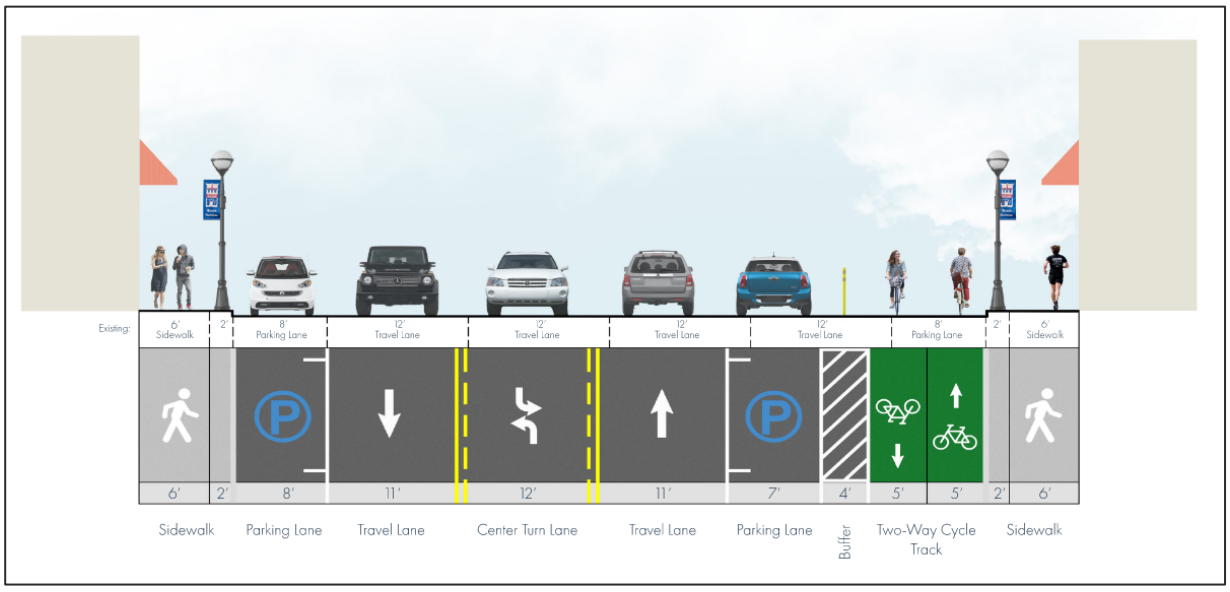
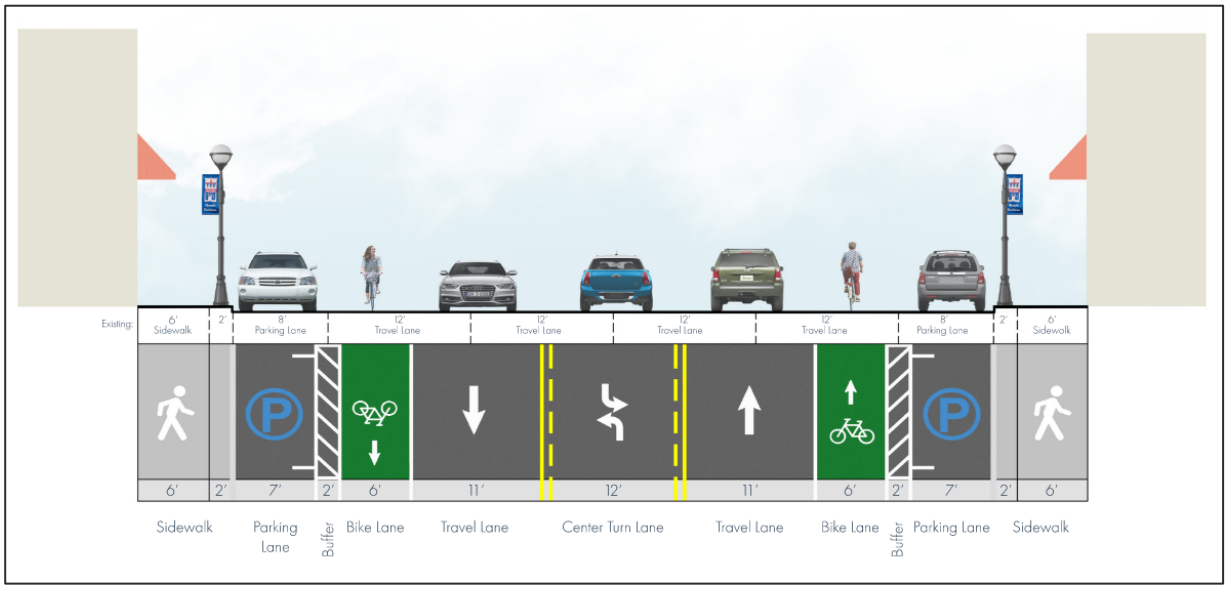


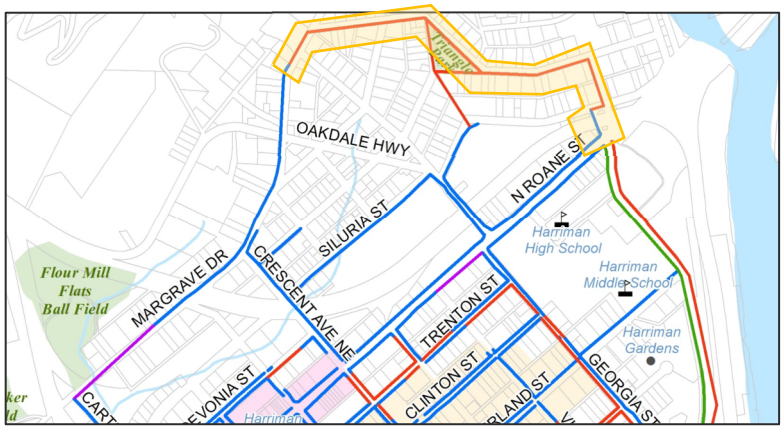
Figure 35 – Proposed US 27/Roane Street Existing Cross-Section (Bike Lanes)



Traffic Calming

Several traffic calming measures can be implemented along US 27 without changing the cross-section. Traffic calming measures include bulb-outs at intersections, painted crosswalks, and leading pedestrian intervals. Bulb-outs reduce the overall crossing width for pedestrians, thus reducing the amount of time they are exposed to vehicular traffic within the travel lanes. Painted crosswalks provide a visual distinction for drivers between the roadway and where they can anticipate pedestrians. Leading pedestrian intervals are a special signal phasing that calls the pedestrian phase before the vehicle phase, giving pedestrians a few seconds to establish their presence within the crosswalk before vehicles begin moving.

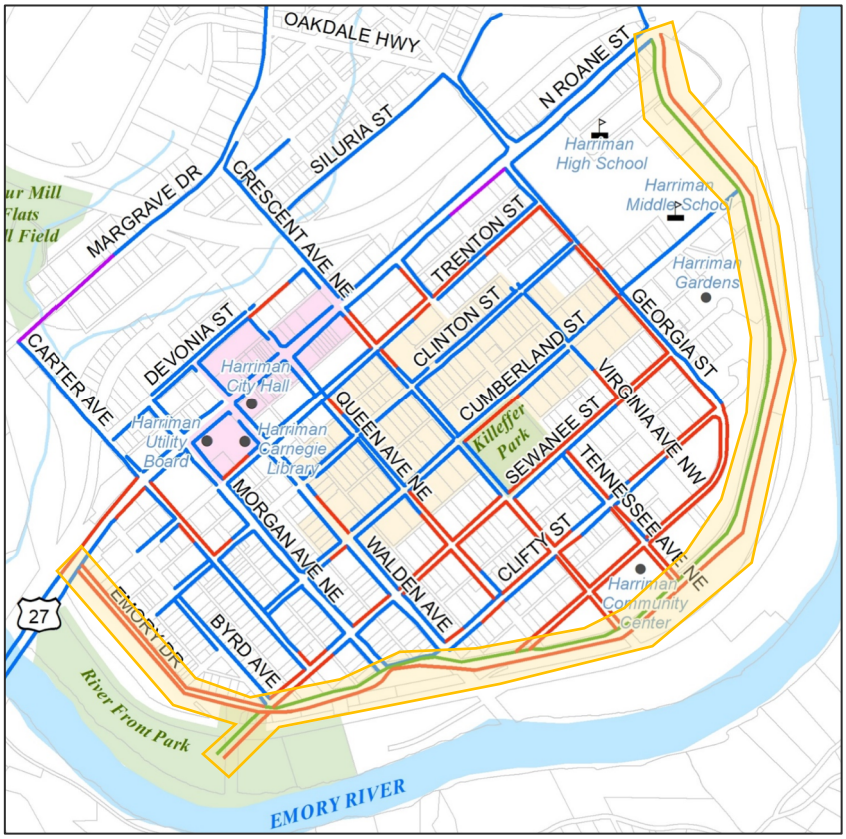
Figure 36 – North Loop (Sidewalk)



North Downtown Loop

There is an existing streetscape project along Margrave Drive between Carter Avenue and Hickory Street. The City should consider complementing this existing project with adding sidewalk connections between Margrave Drive and US 27 along Henderson Street, Unaka Street, Sevier Drive, Whittier Avenue, and Mayberry Street, as depicted in the highlighted portion of **Figure 36**. Additionally, the City should continue the sidewalk along Margrave Drive west of Carter Avenue to the entrance of Paper Maker Ball Field.

Figure 37 – South Loop (Sidewalk and Greenway)



South Downtown Loop

The south downtown loop is highlighted in **Figure 37**. Emory Drive currently does not have any non-motorized facilities. The stakeholder group emphasized Emory Drive as a major improvement area because Harriman High School, Harriman Middle School, Harriman Gardens, the Harriman Community Center, and Riverfront Park are all located along this roadway.

According to the public survey responses, residents are interested in having a greenway, ideally along the Emory River. Acquiring land next to the river could be a long process but implementing a greenway along Emory Drive could be a near-term solution. Providing the greenway on the western side of Emory Drive would allow access to the schools, Harriman Gardens, and the Community Center. An enhanced pedestrian crossing should be provided at the intersection with Sewanee Street to provide safe access to Riverfront Park.

Sidewalks should be provided on the opposite side of Emory Drive from the greenway. Additionally, sidewalks should be provided on both sides of Emory Drive between US 27 and Sewanee Street to complete the southern loop.

Ultimately, the City should consider extending Riverfront Park along the river to the north. The City has recently acquired the old mill site and is interested in purchasing more of the land adjacent to the river. Additional riverfront access would be ideal for providing a blueway along the Emory River and attract more adventure tourism to the area.

Pansy Hill Bridge

The bridge over the Emory River along Pansy Hill Road is scheduled for rehabilitation by TDOT in the next couple of years. The City should prioritize pedestrian and bicycle improvements along the bridge before final design has been completed. The existing bridge has a right-of-way width of 40 feet with sidewalk currently only provided on one side. A few cross-section options for the rehabilitated bridge are:

- Six-foot sidewalks on both sides with 11-foot lanes. Bicyclists would continue to share the road as they do today.

- Twelve-foot shared-use path on one side of bridge (includes 2-foot buffer on either side of path), 6-foot sidewalk on the other side of bridge, and 11-foot lanes.
- Widen the bridge or cantilever a separate path off of one side.

Intersection Improvements

Several intersections were identified in the public survey as being perceived as dangerous. The following provide options for creating safer accommodations for pedestrians and bicyclists at some of those key intersections.

Riverfront Park Entrance

The entrance to Riverfront Park is located at a five-legged intersection. Emory Drive westbound, the park entrance, and Byrd Avenue are all stop-controlled while Sewanee Street southbound and Emory Drive eastbound are free-flow. Pavement markings are faded and there are no crosswalks. The City should consider restriping the roads and painting crosswalks on the stop-controlled legs of Emory Drive and the park entrance. The City should also consider adding stop signs to all legs of the intersection or providing "Cross Traffic Does Not Stop" signs under the existing stop signs.

US 27/N Roane Street @ Georgia Avenue

According to the crash analysis, three pedestrian-involved crashes have occurred at the intersection of US 27 and Georgia Avenue. Georgia Avenue is offset by approximately 75 feet across US 27. US 27 is approximately 65 feet wide, which makes crossing at this intersection treacherous for pedestrians. On the US 27 southbound approach, a raised median could be installed that would provide pedestrian refuge. Painted crosswalks should be provided across both Georgia Avenue approaches and the northernmost leg along US 27 (where the raised median would be installed). Due to the width of US 27 and no opportunities for pedestrian refuge on the southern leg of the intersection, pedestrians should be discouraged from crossing US 27 here. Additionally, the City should consider reducing the curb radii of the southbound Georgia Avenue approach to reduce the crossing distances. All curb cuts should be upgraded to be ADA-compliant. The City should also consider moving the utility poles from within the sidewalks.

US 27/N Roane Street @ Emory Drive

A pedestrian-involved crash occurred at the intersection of US 27 and Emory Drive within the most recent five-year crash history period. The existing intersection is signalized; however, there are no crosswalks provided. There are dedicated left-turn lanes on both US 27 approaches. The City should provide crosswalks on all legs of the intersection and reduce the curb radii to shorten the crossing distances across Emory Drive. The City should study the feasibility of restricting the northbound left-turn lane and installing a raised median to provide pedestrian refuge across US 27. Vehicles wanting to make the northbound left turn can do so upstream at the Georgia Avenue intersection.

Pine Ridge Road @ US 70/SR 1

The intersection of Pine Ridge Road at US 70 was listed several times as one of the more dangerous intersections. While bike lanes are provided along US 70, there are no sidewalks present. There are no sidewalks or bike lanes currently along Pine Ridge Road. Part of the recommendations include extending the bike lanes and

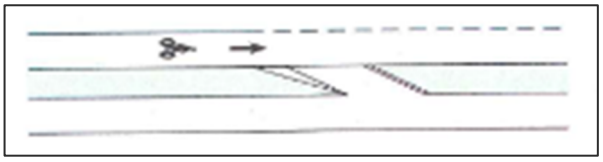
sidewalks along SR 29 (Pine Ridge Road) down to US 70. When this occurs, this intersection should be modified with crosswalks and pedestrian signals to allow for safe crossing opportunities.

I-40 Interchange Ramps

As previously mentioned, a component of this master plan includes a recommendation to extend the existing sidewalks and bike lanes along SR 29 down to US 70, south of I-40. Particular care needs to be taken at the ramp intersections with SR 29 due to the abrupt change in environment for vehicles coming off of the interstate. The Institute of Transportation Engineers (ITE) provide the state of the industry guidance on how to design these intersections in the "Recommended Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges" guidebook. The guidelines provided in this manual are summarized below for the types of ramps located at the I-40 interchange with SR 29.

On-Ramps

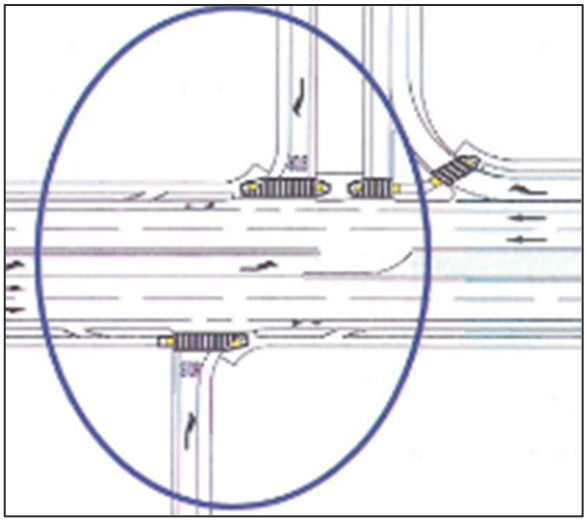
Figure 38 – Bike Lane "Exit Ramp"



The conflict point at on-ramps is between bicyclists proceeding through and motorists accessing the on-ramp to the interstate. The bike lane lines should be dotted at the ramp and in advance of the ramp to bring awareness to the driver that they are approaching a conflict point. An optional bike lane "exit ramp" is recommended prior to the on-ramp that allows the bicyclist to use the sidewalk. The bike lane "exit ramp" is portrayed in On-Ramps Figure 38. It is also recommended that a landscaped buffer is provided between the sidewalk and the travel lanes. It is a good idea to widen the sidewalk where it is anticipated that bicyclists and pedestrians will share the facility. A crosswalk should be placed perpendicular to the on-ramp to provide the shortest crossing distance, but not too far from the arterial that the pedestrian would not want to go out of their way to access. Pedestrian Hybrid Beacons (PHB) or Rectangular Rapid-Flashing Beacons (RRFB) could also be installed.

Off-Ramps

Figure 39 – Off-Ramp Stop Condition



Interstate off-ramps should always be at a right angle with the arterial to provide the safest crossing for pedestrians and bicyclists. The T-intersection illustrated in Off-Ramps

Figure 39 is the safest configuration for pedestrians and bicyclists as it provides the shortest crossing distance. This configuration also enhances their visibility because drivers must look to their left from a stopped condition to enter the roadway. Note that the bike lane "exit ramp" is also utilized as an option for

bicyclists to enter the sidewalk and use the crosswalk at the off-ramp. The I-40 at SR 29 interchange has the sweeping channelized right turn ramps as shown in the top portion of **Off-Ramps** **Figure 39**, hence the best practice case demonstrated in that illustration is applicable. Moreover, the ramp junctions with SR 29 are at right or near-right angles.

Proposed Non-Motorized Transportation Network

The following sections detail the critical connections that will promote a cohesive active transportation network throughout the study area.

Sidewalk Gap Closures

There are several gaps within the existing sidewalk network that should be filled. The red lines in **Figure 40** and **Figure 41** represent the proposed new sidewalks.

New Bicycle Facilities

According to the feedback from the public survey, most respondents tend to prefer separated facilities over on-street facilities such as bike lanes. Therefore, no additional bike lanes are proposed for the downtown portion of the study area. It is recommended that the existing bike lanes should be extended from Ruritan Road to US 70 to complete the connection. **Figure 41** depicts the recommended implementation of bike lanes along SR 29 from Ruritan Road to US 70.

New Greenway Connection

There is a desire from the stakeholder group and the respondents of the public survey to implement greenways to connect to the City's assets. While a greenway along the Emory River would be ideal, providing a multi-use facility along Emory Drive would be easier to implement in the near-term. This facility would provide a connection between several key places of interest around downtown Harriman.

Figure 40 – Proposed Non-Motorized Transportation Network (Downtown)

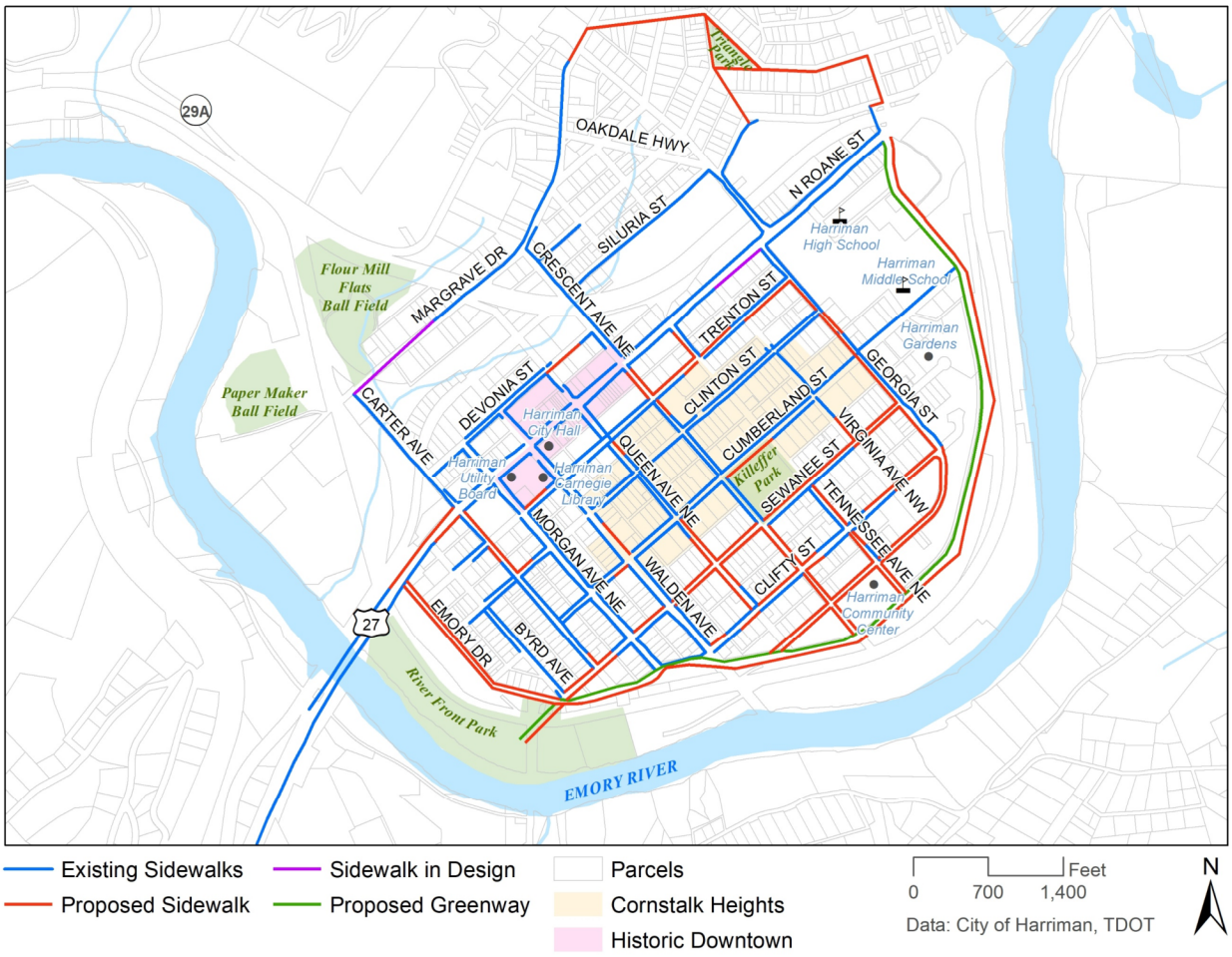
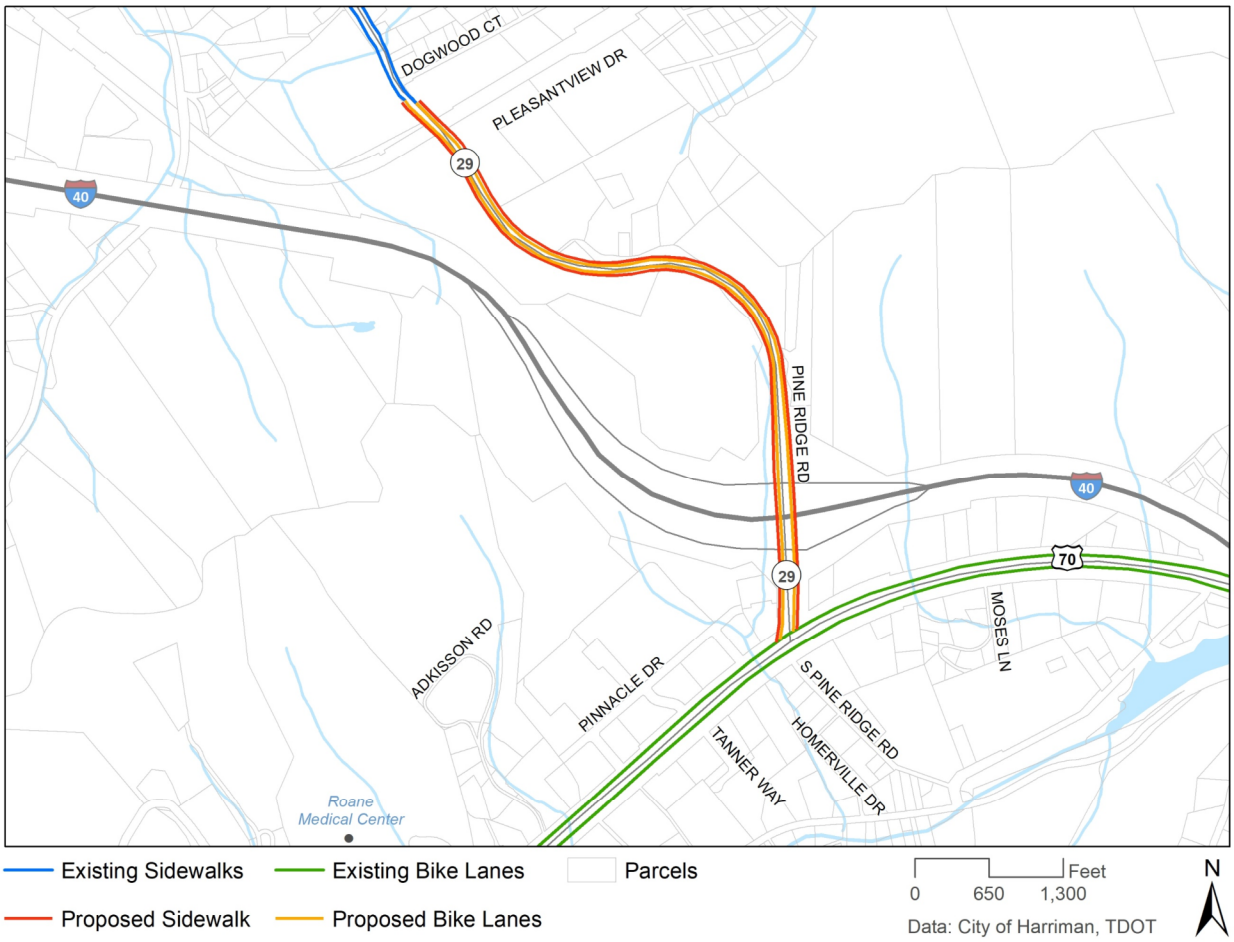


Figure 41 – Proposed Non-Motorized Transportation Network (I-40 Interchange)



IMPLEMENTATION PLAN

This study provides the framework to transform the study area into a space where residents and visitors can safely get to key destinations without the need for a vehicle. The improvements laid out in this report promote an improved quality of life for residents, tourists, and the local work force. The scenarios developed in this report are intended to serve as a long-range master plan for the City of Harriman; however, in an effort to help the City strategize and plan for this ultimate vision, the following provides an implementation plan that categorizes the projects into short-, mid-, and long-term timeframes. Within the short-, mid-, and long-term timeframes, the projects are listed in no particular order and implementation will depend on available funding from the City, TDOT, and federal agencies.

Short-Term Projects

- Pansy Hill Road Bridge
- Extend sidewalk on Margrave Drive to Paper Maker Ball Field
- Intersection Improvements
    - Riverfront Park Entrance
    - US 27 @ Georgia Avenue
    - US 27 @ Emory Drive
- Sidewalk upgrades near schools and Community Center
- Fill sidewalk gaps near schools and Community Center
- Traffic Calming on US 27/Roane Street
    - Crosswalks
    - Bulb-outs
    - Leading Pedestrian Intervals

Mid- to Long-Term Projects

- Greenway along Emory Drive
- North Downtown Loop Sidewalk
- South Downtown Loop Sidewalk and Greenway
- Bike lanes and sidewalks along SR 29
- Intersection Improvements
    - Pine Ridge Road @ US 70
    - I-40 Interchange Ramps
- Extension of Riverfront Park
- US 27/Roane Street Cross-Section Improvements

Identification of Funding Sources

Finding sufficient funding to construct transportation projects is often difficult, especially for small communities like Harriman. **Table 11** summarizes the various federal, state, and local funding sources that are available for implementing transportation and non-motorized improvements. These programs focus on multimodal improvements such as sidewalks, bike lanes, shared-use paths, and other similar infrastructure.

Table 11 – Funding Strategies

Grant/Program	Agency	Examples of Eligible Activities	Funding
Multimodal Access Grant	TDOT Multimodal Division	Multimodal Access Grant funding is available to improve transportation access for pedestrians, bicyclists, and transit users along State Routes using the following improvement types: sidewalks; pedestrian crossing improvements; bicycle facilities; multi-use paths; transit stop amenities; complete streets, road diet or traffic calming measures; improvements that address ADA non-compliance; pedestrian-scale lighting; and other improvements which primarily improve access for multimodal users.	95% state 5% local match State portion may not exceed $950,000
Transportation Alternatives Program (TAP)	TDOT Local Programs	All facilities must be hard-surfaced, ADA compliant, and provide adequate connectivity and separation from vehicular traffic. Sidewalk facilities must be a minimum of 5 feet wide and shared-use facilities must be a minimum of 10 feet wide. TAP funds can be used for sidewalks, walkways or curb ramps, bike lane striping, wide paved shoulders, bike parking and bus racks, traffic calming for the safety of bike/ped traffic, off-road trails, bike and pedestrian bridges/underpasses, and ADA compliance.	20% local match for construction Preliminary engineering, design, and ROW expenses are responsibility of local government
Recreational Trails Program	TDEC	Provides grant funding for land acquisition for trails, trail maintenance, trail construction, trail rehabilitation, and for trail head support facilities. All grant projects MUST be on publicly owned land.	20% local match
Local Parks and Recreation Fund	TDEC	Provides for the purchase of land for parks, natural areas, greenways, and the purchase of land for recreational facilities. Funds may also be used for trail development and capital projects in parks, natural areas, and greenways.	50% local match
Community Development Block Grant	TN Dept of Economic and Community Development	Provide essential, pressing community development needs in underserved areas. Can go towards community livability projects.	100% federal
Highway Safety Improvement Program	FHWA	The FAST Act continues the overarching requirement that HSIP funds be used for safety projects that are consistent with the State's Strategic Highway Safety Plan and that correct or improve a hazardous road location or feature or address a highway safety problem. The FAST Act specifically identifies the following activities on the inclusion list: installation of vehicle-to-infrastructure communication equipment; pedestrian hybrid beacons; and roadway improvements that provide separation between pedestrians and motor vehicles, including medians and pedestrian crossing islands.	90% federal 10% local match

Grant/Program	Agency	Examples of Eligible Activities	Funding
Surface Transportation Block Grant (STBG)	FHWA	In general, STBG projects may not be on local roads or rural minor collectors. There are a number of exceptions to this requirement, such as the ability to use up to 15 percent of a state's rural suballocation on minor collectors. Other exceptions include bridge and tunnel projects; safety projects; fringe and corridor parking facilities/programs; recreational trails, pedestrian and bicycle projects, and safe routes to school projects; boulevard/roadway projects largely in the ROW of divided highways; inspection/evaluation of bridges, tunnels, and other highway assets; port terminal modifications; and projects within the pre-FAST Act title 23 definition of "transportation alternatives."	80% federal 20% local match
Built Environment Grants	TN Dept of Health	These grants aim to increase access to safe and publicly accessible places that provide opportunities for physical activity for a diverse group of users, including those who live, visit, work, play, worship, and learn in the community.	Up to $85,000
Project Diabetes	TN Dept of Health	Grants are awarded to community partners with a focus on reducing overweight and obesity as risk factors for the development of type 2 diabetes. Grant activities are geared toward interventions that are applied before there is any evidence of disease.	Category A – funded up to 3 years; max of $150,000/year Category B – funded up to 2 years; max of $15,000/year
Community Grant Program	People for Bikes	Focuses most grant funds on bicycle infrastructure projects, such as: bike paths, lanes, trails, and bridges; mountain bike facilities; bike parks and pump tracks; BMX facilities; and end-of-trip facilities such as bike racks, bike parking, bike repair stations, and bike storage. Some advocacy projects are also funded, such as: programs that transform city streets, such as Ciclovias or Open Streets Days; and campaigns to increase investment in bicycle infrastructure.	Up to $10,000





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