City of Madison ALABAMA

December 2017

Baseline Conditions and Needs Assessment

2040 TRANSPORTATION MASTER PLAN

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1.0 INTRODUCTION AND BACKGROUND

1.1 PURPOSE AND BACKGROUND

The 2040 Transportation Master Plan (2040-TP) is to serve as a blueprint for the City of Madison to develop its transportation network in a programmed, cost-effective manner that furthers the overall vision of the City. The 2040-TP effort will strive to develop a transportation network that reinforces the City's Core Values:

- Grow Strategically and Smart
- Reinforce Strong Neighborhoods
- Provide Better Connections
- Ensure Functionality with Inspiring Design

To further these goals, one key focus area of the plan is promoting the principles of "Complete Streets." Simply stated, Complete Streets principles recognize the need for a transportation network that serves automobile traffic in a manner that also accommodates and promotes (by design) travel by other modes such as transit, bicycling, and walking in a safe and comfortable manner.

The major tasks of the 2040-TP are:

- Step 1: Establish Overall Goals for the 2040-TP Effort – The goals will help establish the study's overall direction and associated work program. More detail on the 2040-TP goals and objectives is provided in the section that follows.
- Step 2: Identify Baseline Conditions and Assess Needs – An assessment of existing conditions will support development of an overall transportation profile for the city and identification of mobility needs for auto travel, bicycling and walking throughout the city.
- Step 3: Develop and Evaluate Improvement Alternatives – Based on identified needs, a list of needed improvements will be developed and evaluated, guided by the goals and objectives and public input.
- Step 4: Develop an Overall Strategy and Implementation Plan – The implementation plan will include a prioritized list of cost-feasible projects as well as policy recommendations to foster bicycling and walking.

1.2 REPORT OVERVIEW

The purpose of the Baseline Conditions and Needs Assessment Report is to document Steps 1 and 2 above. As such, it contains the following:

- Goals, Objectives and Performance Measures – Detailed in the next section of this Report, the goals, objectives and performance measures provide the overall direction for the study and establish measureable results that should be tracked.
- Overview of Travel Demand Modeling Activities – A summary of the activities for updating the Huntsville MPO Regional Travel Demand Model for the 2040-TP analysis. Summarize inherent modeling issues and provide a response on how to deal with these issues.
- Inventory of Existing Conditions – A profile of the existing characteristics of the roadway, sidewalk, and bicycling network within the City.

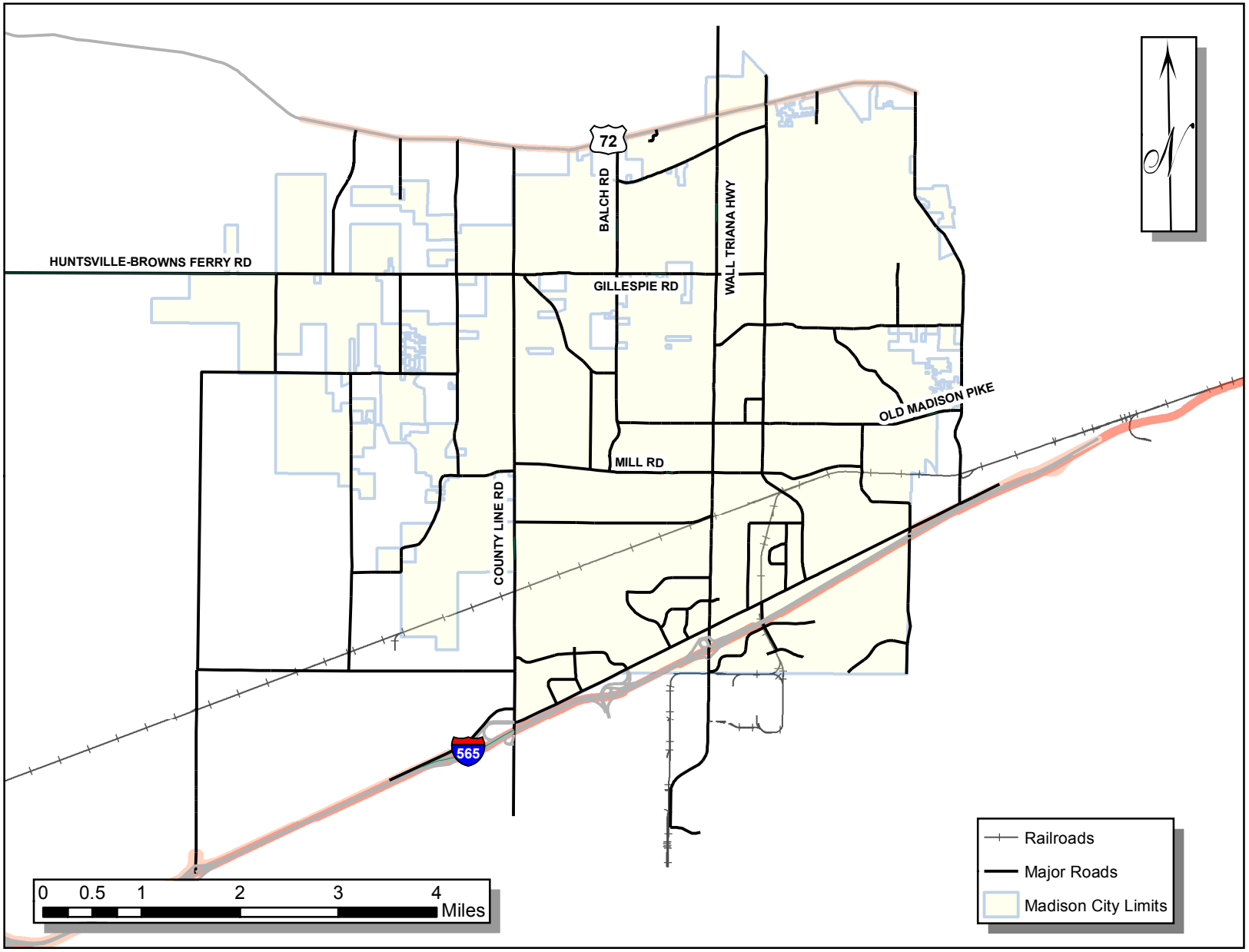
- Identification of Existing and Projected Needs – Overview of existing and projected congestion, connectivity gaps, safety deficiencies, and other needs with respect to vehicle, bicycle, and pedestrian travel.
- Profile of Evaluation Framework – A framework on how improvements will be categorized for evaluation and the criteria that will be used for prioritization.

1.3 STUDY AREA

The 2040-TP study area consists of the area within the City limits of Madison, which is shown in Figure 1-1. The City of Madison is surrounded on all sides by the City of Huntsville and is within the planning area of the Huntsville Area Metropolitan Planning Organization (MPO). It should be noted that, due to the irregular shape of the jurisdictional boundaries, some characteristics of areas that border the Madison City limits were taken into consideration. Figure 1-2 shows the City in relation to the Huntsville region.

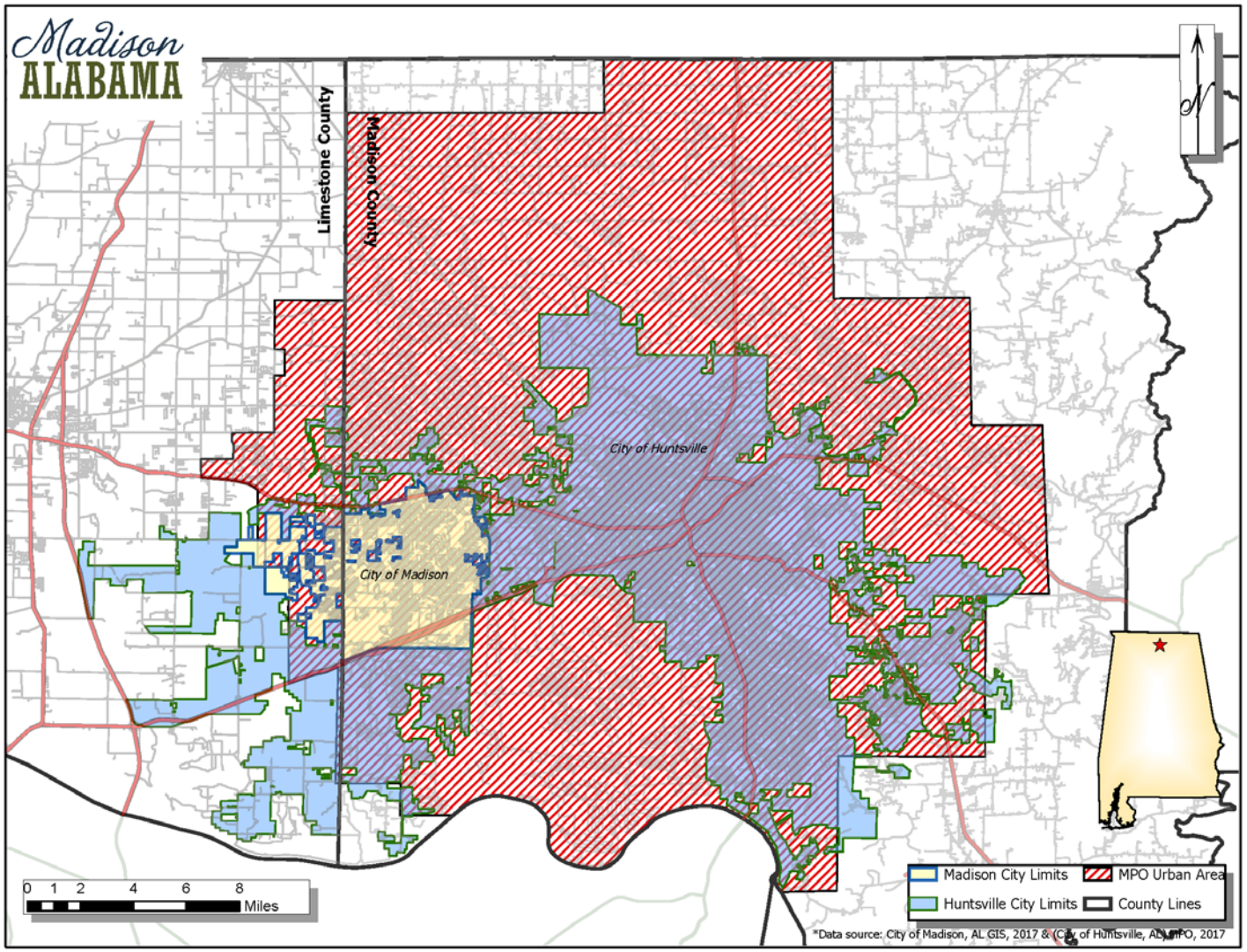
Additionally, it is understood that a percentage of traffic in Madison is commuter traffic. Through the process of analysis and evaluation, the goal is identify the percentage of “through” traffic due to commuter use. This traffic will not change the overall results, but an understanding may help in identifying routes that would enable improving the congestion during peak periods.

Figure 1-1: Study Area



*Data Source: City of Madison, AL, GIS, 2017

Figure 1-2: Huntsville MPO Region



Source: City of Madison and City of Huntsville, 2017

2.0 GOALS, OBJECTIVES, AND PERFORMANCE METRICS

Development of the goals and objectives for the 2040-TP considered several factors:

- Linkages to previous City initiatives
- Consistency with Federal, State and regional policy
- Specific focus on Complete Streets principles
- Applicability to potential performance measures

A review of relevant policy documents was conducted to craft an overall framework for the development of transportation goals for the City of Madison. A more detailed overview of the review of previous studies is provided in Section 3.0. Emphasis areas identified to guide development of the goals, objectives, and performance measures for 2040-TP included:

- Mobility
- Safety
- Multimodal Travel
- Land Use Connectivity/Context
- Connectivity
- Intergovernmental Coordination

These emphasis areas were confirmed by input from the Steering Committee during a meeting on May 18, 2017. Table 2-1 summarizes the goals, objectives, and performance metrics for 2040-TP and outlines identified performance metrics developed to correspond with the 2040-TP goals and objectives. This summary is based on available data and the level of effort needed for the monitoring process.

Table 2-1: Goals, Objectives and Performance Metrics

Goals	Objectives	Related Performance Metrics
Improve mobility throughout the City of Madison	Reduce congestion and increase travel reliability along the City's arterial and major collector roadways	• Volume-to-Capacity (V/C) ratios along the City's arterials and major collectors • Travel time along the City's arterials and major collectors
Increase safety throughout the City's transportation network	Promote safety along the City's transportation network	• Rate of auto crashes per vehicle miles traveled • Number of bicycle and pedestrian crashes
Promote travel by alternative modes	Promote the application of Complete Streets concepts during the improvement of existing roadways or construction of new roadways	• Miles of bike lanes and bike trails • Linear feet of sidewalks • Number of pedestrian crosswalks
Promote land use context through active transportation	Enhance pedestrian connections at activity centers	• Sidewalks and trail connections to commercial and recreational activity centers • Pedestrian signals at commercial and recreational nodes
Increase connectivity of the transportation network for all users (i.e., ADA* compliance)	Increase the interconnectivity between roadways and on-street and off-street bicycle and pedestrian facilities	• Level of connectivity of bicycle and pedestrian network (qualitative)) • Linear feet of ADA-compliant sidewalks • Number of ADA-compliant intersections • Number of ADA-compliant driveways
Maximize potential implementation opportunities through interagency coordination	Maintain active coordination with ALDOT, the Huntsville Area MPO, Madison County, Limestone County and the City of Huntsville on the status of planned and programmed projects	• Attendance by City representatives at MPO policy board meetings • Attendance at TCC meetings by City staff

* Americans with Disabilities Act (ADA)

3.0 TRAVEL DEMAND MODELING

Travel demand modeling is a process in which the existing and projected household, employment, and school enrollment numbers are used to forecast traffic for a given base year and projected conditions. This section describes the process undertaken to develop projected travel demand throughout the City of Madison through use of the Huntsville MPO travel demand model. To accurately forecast traffic within the City of Madison, three primary steps were undertaken:

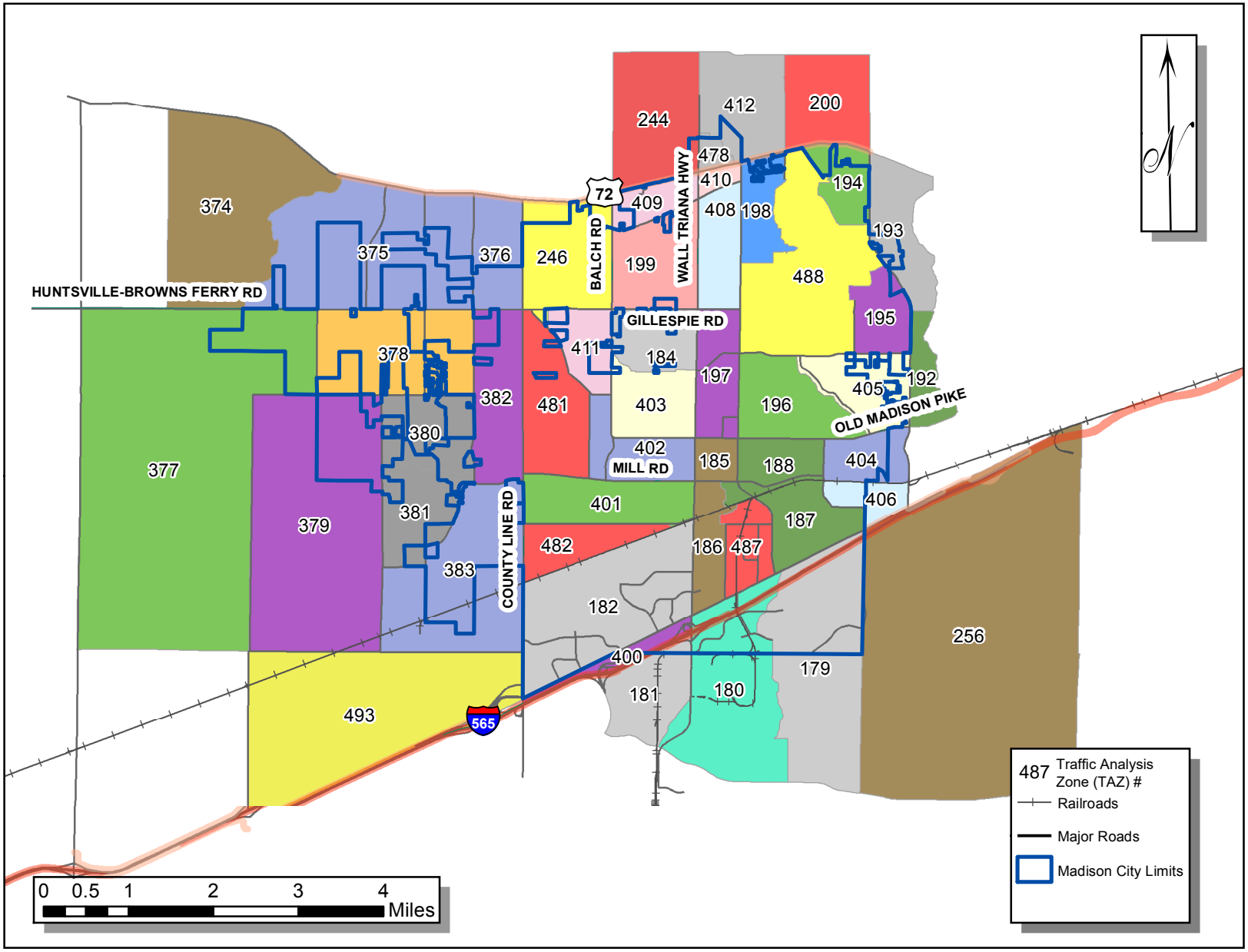
- Revision of the socioeconomic (SE) data – households, employment, and school enrollment – as well as other input within the City of Madison provided by City staff
- Revisions to the Huntsville MPO model to incorporate the updated SE data provided by the City of Madison for the years 2017, 2025, and 2040
- Travel forecasts developed for the years 2017, 2025 and 2040.

The travel demand process attempts to convert socioeconomic data into trips on the roadways. The three-step process first converts SE data to number of trips, then distributes the trips throughout the community, and finally assigns the trips to the roadways that make the most sense in actual travel. Initially, the socio-economic data is aggregated to traffic analysis zones (TAZs) – essentially neighborhoods surrounded by community streets. The use of TAZs versus individual households and businesses allows for an ease of data collection and reduction in operation time. Of the 502 TAZs within the Huntsville MPO model, 49 are fully or partially within the City of Madison. A map of the TAZ structure in relation to the City limits of Madison is provided in Figure 3-1.

To develop accurate household, employment, and school enrollment estimates throughout the city for travel demand modeling, City staff completed a comprehensive parcel-by-parcel inventory of all existing parcels for all zoning/land use types for properties within Madison and portions of Huntsville that were within these TAZ boundaries. This exercise was undertaken in order to update the base year population and employment totals in the Huntsville MPO regional model, which were developed based on 2009 data. The TAZ boundaries used are the same as those used by the Huntsville MPO in developing travel demand forecasts for the Huntsville region.

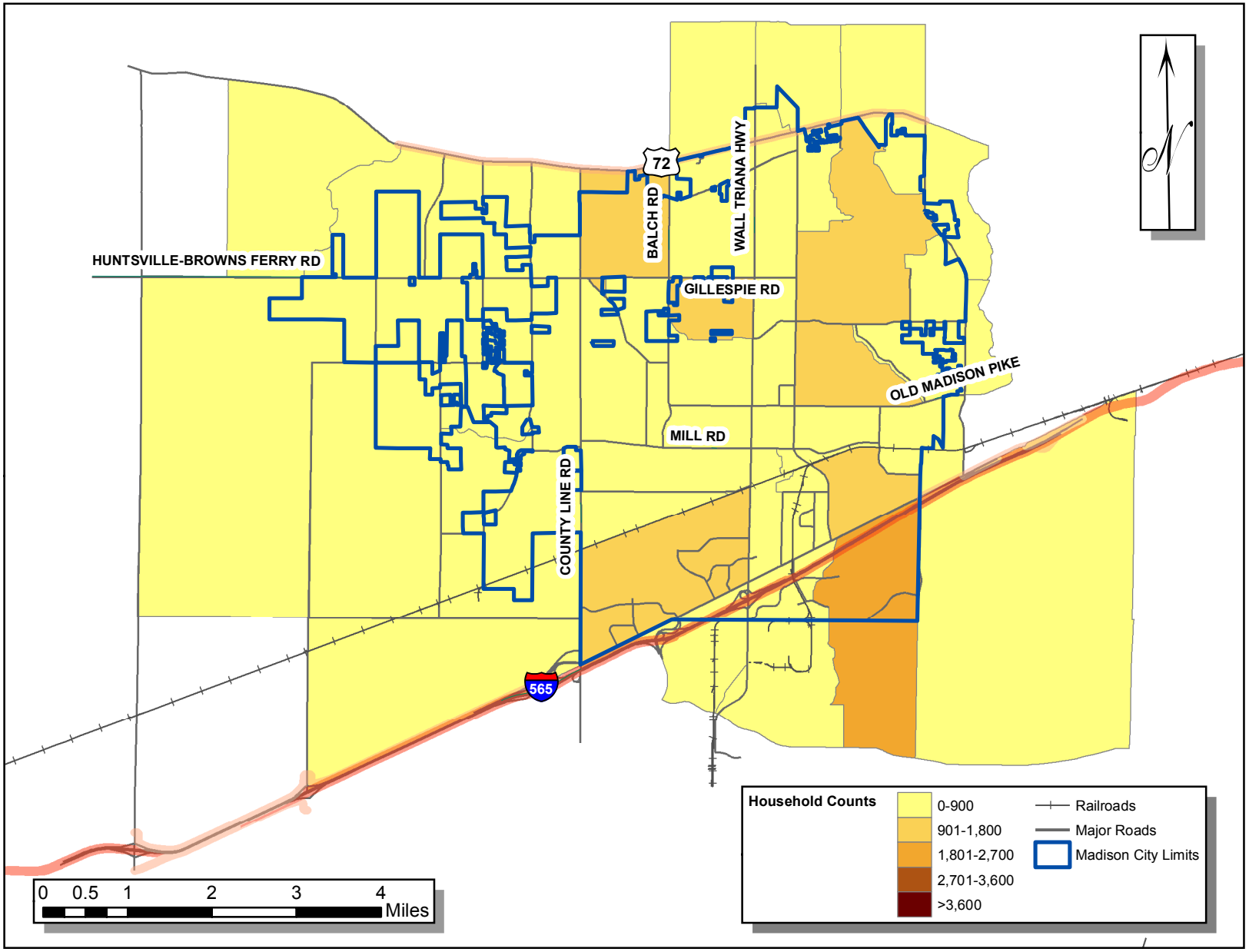
More detailed information on the travel demand modeling activities is provided in a supplemental report entitled *Travel Demand Modeling Technical Memorandum*.

Figure 3-1: TAZ Structure within the City of Madison



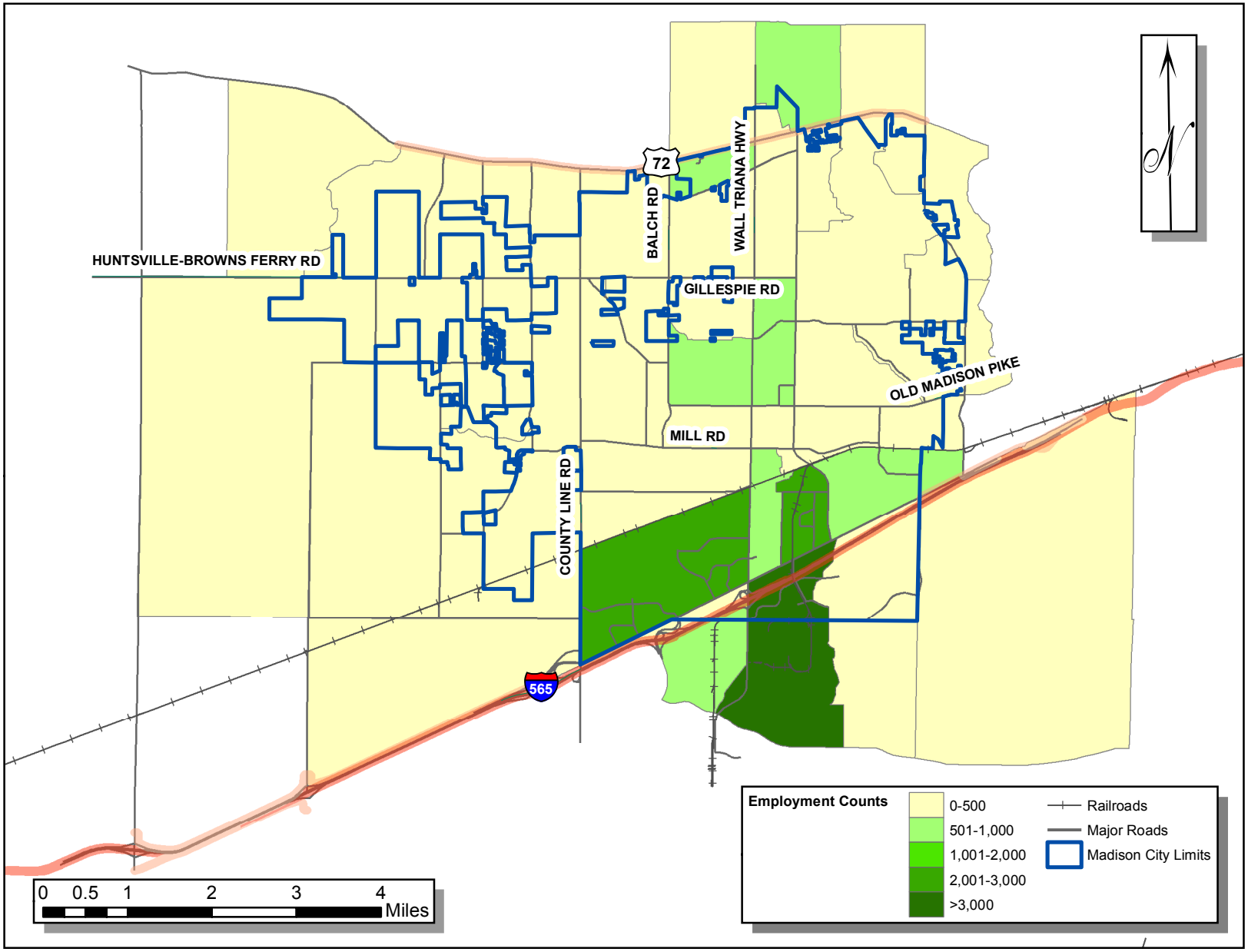
*Data Source: City of Huntsville (Huntsville MPO) GIS, 2017

Figure 3-2: Base Year (2010) Household Distribution by TAZ



City of Huntsville (Huntsville MPO) GIS, 2017

Figure 3-3: Base Year (2010) Employment Distribution by TAZ



City of Huntsville (Huntsville MPO) GIS, 2017

4.0 INVENTORY OF EXISTING CONDITIONS

This section presents the key characteristics that provide the foundation for identifying potential transportation needs throughout the City of Madison. As such, this section includes an overview of:

- Population and Employment Distribution and Growth
- Profile of the Existing Roadway System
- Safety Characteristics
- Bicycle and Pedestrian Travel
- Land Use and Zoning Policies
- Planned and Programmed Improvements

It should be noted that this section does not include a discussion related to transit since there is currently no municipal service offered within the City other than the Madison Assisted Ride System (MARS). The MARS program is available for residents eligible for paratransit services under ADA guidelines. However, as travel and congestion continue to increase along the Highway 72 corridor, the potential for transit is likely to increase.

4.1 POPULATION AND EMPLOYMENT DISTRIBUTION AND GROWTH

Understanding population and employment trends provides a baseline for understanding existing and projected travel in and around the city. As such, this section details the historical population trends as well as the existing and projected distribution of population and employment throughout the city.

4.1.1 Historical Population

According to the latest Census data provided by U.S. Census Bureau, American FactFinder,[1] the City of Madison has a population of approximately 48,000. As shown in Table 4-1 below, the City of Madison has experienced significant growth since 1980. Much of that growth is attributable to the growth of the overall Huntsville metropolitan area. Given its location in relation to the employment centers of Huntsville, most of this growth occurred in eastern portions of the City of Madison.

Table 4-1: Historical Population Growth for the City of Madison

Year	Population	Change	% Change
1980	4,057	**	**
1990	14,904	10,847	267.4%
2000	29,329	14,425	96.8%
2010	42,938	13,609	46.4%
2016	47,959	5,021	11.7%

Source: US Census Bureau, 2016[2]

[1] https://www.census.gov/quickfacts/fact/table/madisoncityalabama/PST045216
[2] Ibid.

4.1.2 Existing and Projected Household Distribution

A key variable in determining transportation needs and travel patterns is the distribution of population throughout the city. As described in detail in Section 3.0, City staff completed a comprehensive parcel-by-parcel inventory of all existing parcels for all zoning/land use types for properties within Madison and portions of Huntsville that were within these TAZs. After the 2017 household count was estimated, household projections were completed by City staff for the years 2025 and 2040 based on:

- Issued permits without development having occurred
- Approved projects
- Planned development applications in progress
- Opportunity or likelihood of development of vacant acreage

As a result of this analysis, the estimated and projected population trends in the TAZs in and around the City of Madison are as follows:

Table 4-2: Existing and Projected Households In TAZs In and Around Madison

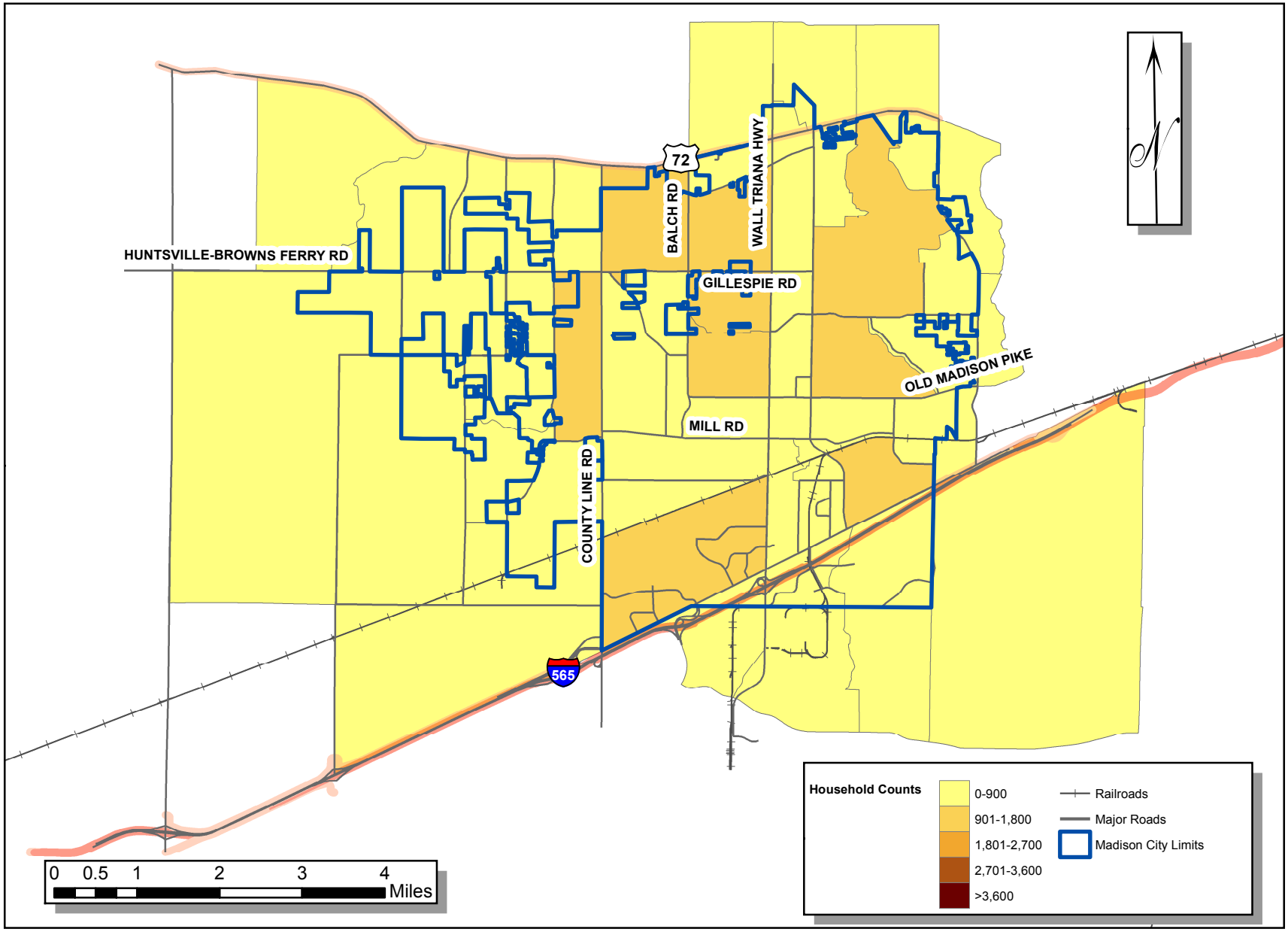
2017 Estimated Households (Baseline)	25,170
2025 Projected Households	31,310
2040 Projected Households	40,340
2017-2025 Projected Household Increase	6,040 (24%)
2025-2040 Projected Household Increase	9,030 (29%)
2017-2040 Projected Household Increase	15,070 (60%)

Source: City of Madison Planning and Development Staff
Notes: 1) Includes areas outside of the municipal boundaries;

As shown in Figure 4-1, the distribution of households estimated in 2017 is relatively consistent throughout the city. Given the number of single-family households in the area, the population density in and around the city is relatively low. As Table 4-2 reflects, a substantial amount of residential growth is projected for the area in and around Madison. Furthermore, it is projected to occur at a steady rate through 2040. The areas in and around Madison projected to experience the most residential growth between 2017 and 2025 include:

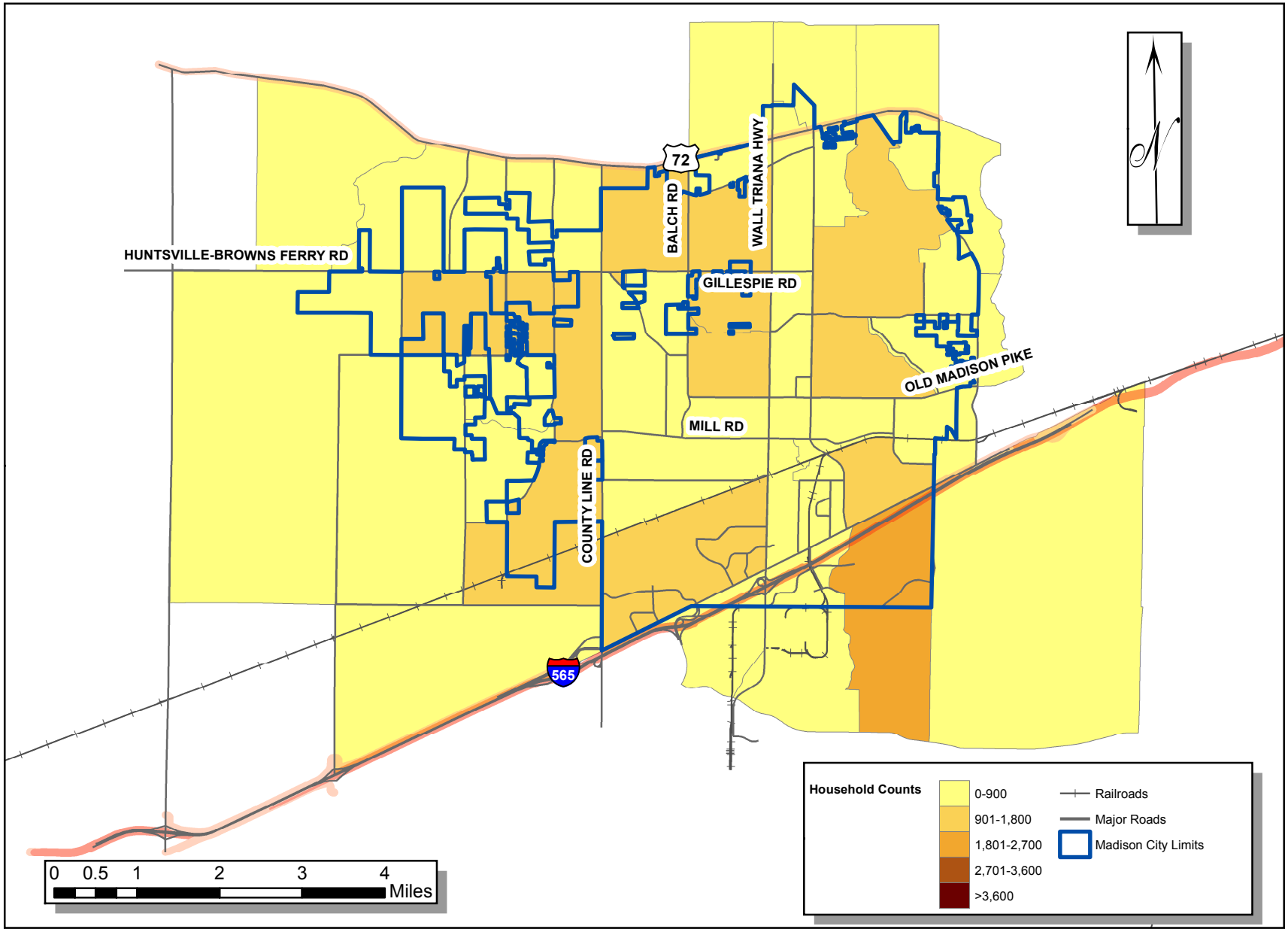
- West of County Line Road in Limestone County
- Along Zierdt Road south of I-565
- South of Highway 72 between Balch Road and County Line Road

Figure 4-1: 2017 Household Distribution by TAZ



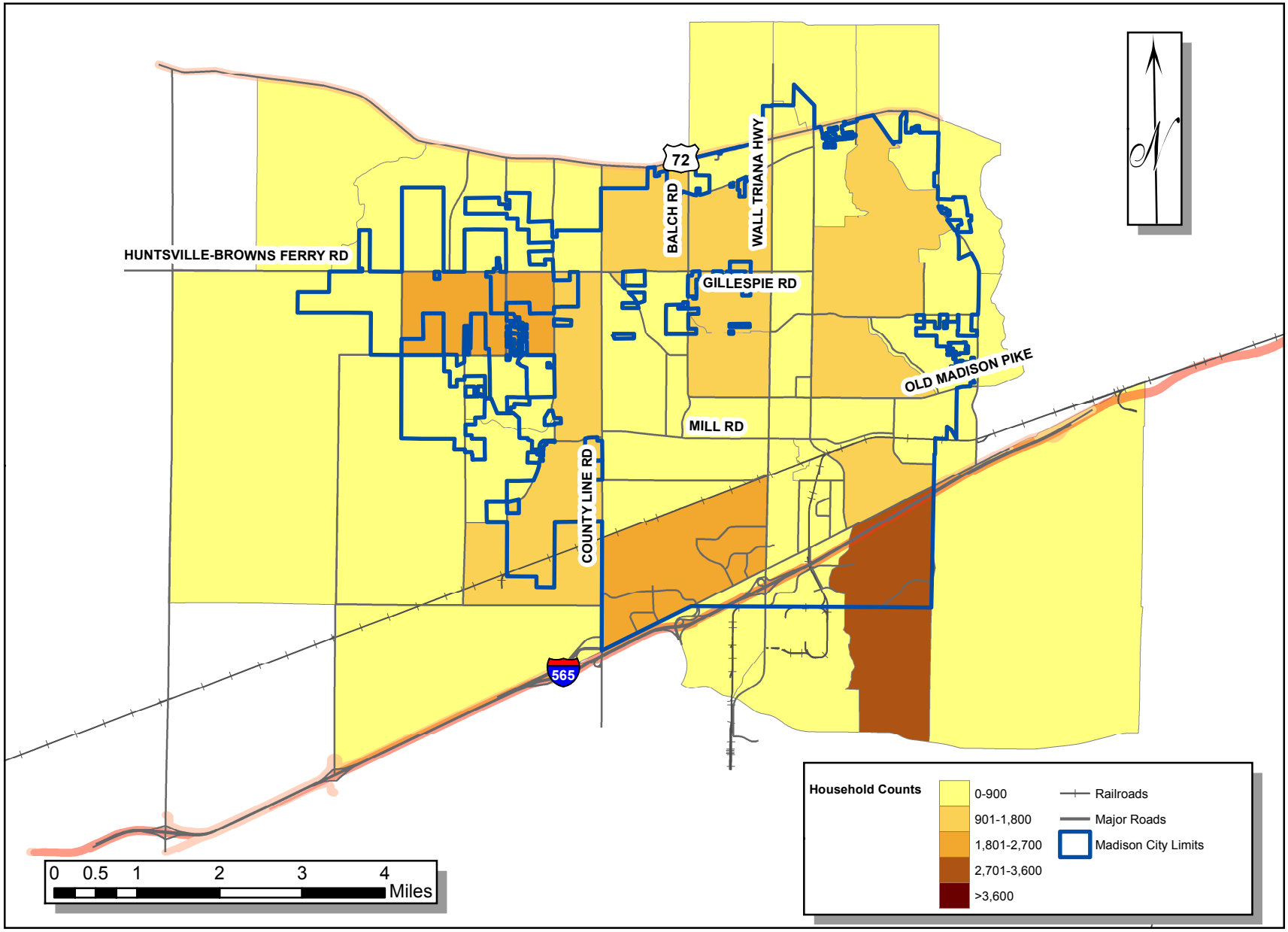
*Data Source: City of Madison, AL, GIS, 2017

Figure 4-2: 2025 Household Distribution by TAZ



*Data Source: City of Madison, AL, GIS, 2017

Figure 4-3: 2040 Household Distribution by TAZ



*Data Source: City of Madison, AL, GIS, 2017

It should be noted that many of the areas east of County Line Road are projected to experience little development increase due to existing build-out. Growth in these areas is limited to infill development and redevelopment activities. While most of the areas listed above are outside of the City limits, the development growth potential will have an impact on Madison's roadways. The distribution of households projected within the City of Madison for 2025 and 2040 are shown in Figures 4-2 and 4-3, respectively.

4.1.3 Existing and Projected Employment Distribution

Unlike population, historical counts for the number of jobs specifically for the City of Madison are not available. However, based on the estimates developed by the City of Madison staff, the estimated number of jobs within the TAZs in and around the City of Madison is approximately 37,500 jobs. As shown in Figure 4-4, most of the existing 2017 baseline employment is located along Madison Boulevard between Wall Triana Highway and County Line Road, along Wall Triana Highway south of I-565, and, to a lesser degree, along Highway 72. The estimated and projected employment trends in the TAZs in and around the City of Madison are shown below in Table 4-3. It should be noted that much of the employment increase is due to activity occurring outside of the city limit boundary for Madison. Several TAZ boundaries include active business development areas in the City of Huntsville near the Huntsville International Airport and the Redstone Gateway.

Table 4-3: Existing and Projected Employment Trends in TAZs In and Around Madison[1]

2017 Employment Estimate	34,640
2025 Employment Projection	45,860
2040 Employment Projection	67,130
2017-2025 Projected Employment Increase	11,220 (40%)
2025-2040 Projected Employment Increase	21,270 (46%)
2017-2040 Projected Employment Increase	32,490 (94%)

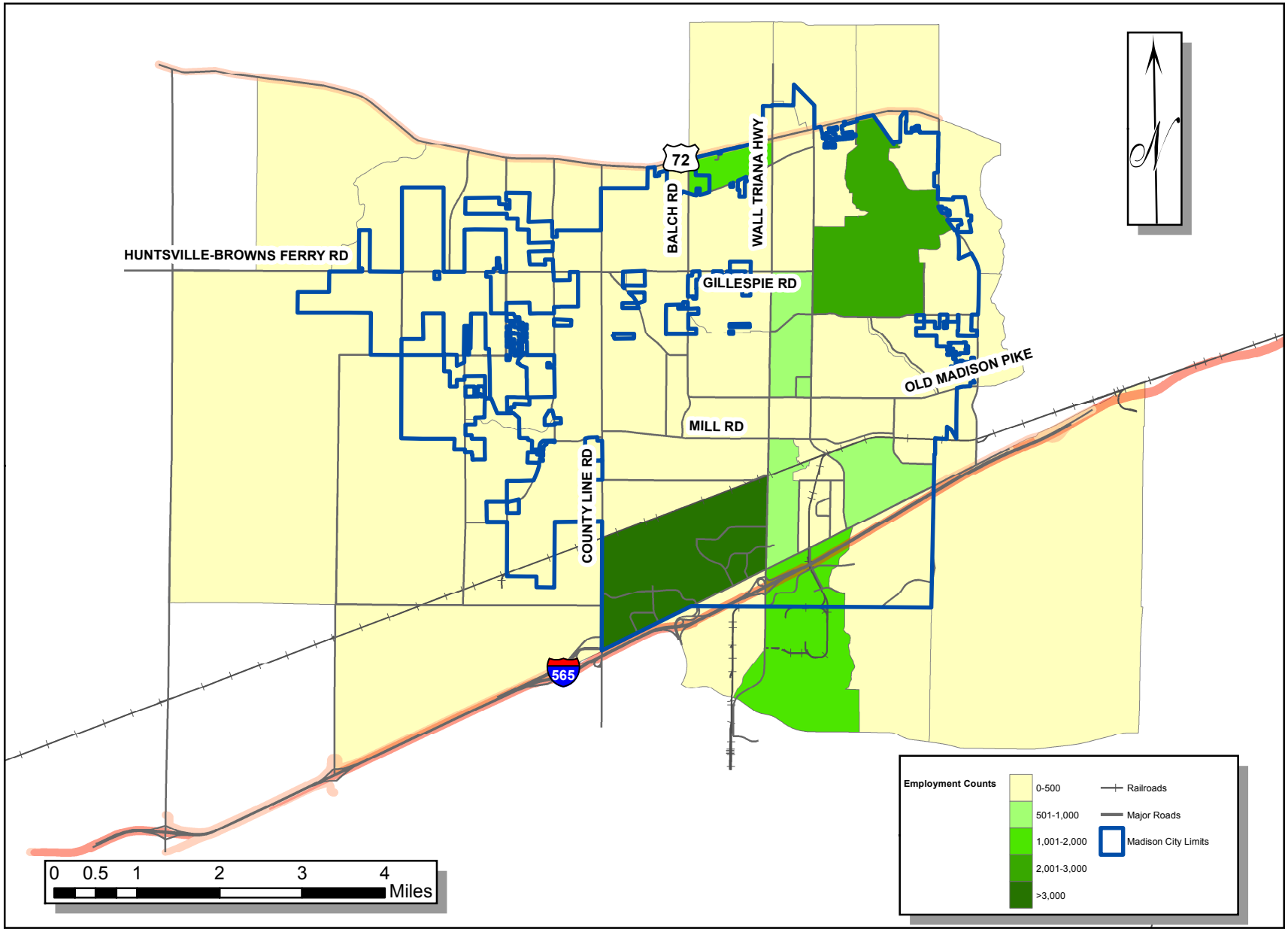
Source: City of Madison Planning and Development Staff
Notes: 1) Includes areas outside of the Madison municipal boundaries

The projected distribution of employment throughout the city for 2025 and 2040 is shown in Figures 4-5 and 4-6, respectively. The areas in and around Madison projected to experience the most growth in jobs between 2017 and 2025 include:

- South of I-565 between Wall Triana Highway and Zierdt Road
- East of the city on Redstone Arsenal at the Redstone Arsenal Gateway south of I-565

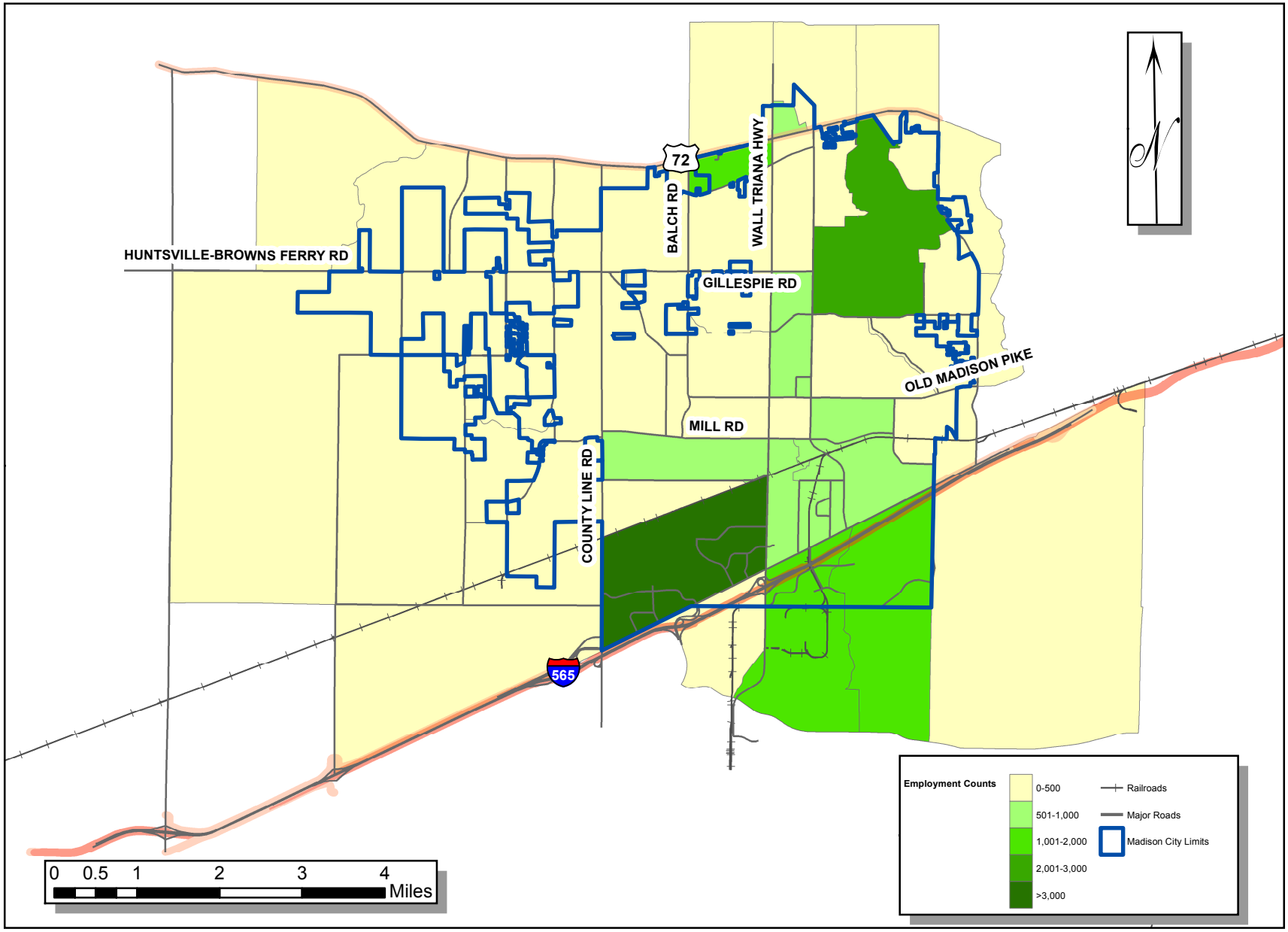
From 2025-2040, the areas projected to experience significant increases in employment are those listed above as well as areas between Highway 72 and Huntsville-Browns Ferry Road west of County Line Road. Most of the areas projected for employment are outside the Madison city limits.

Figure 4-4: 2017 Employment Distribution by TAZ



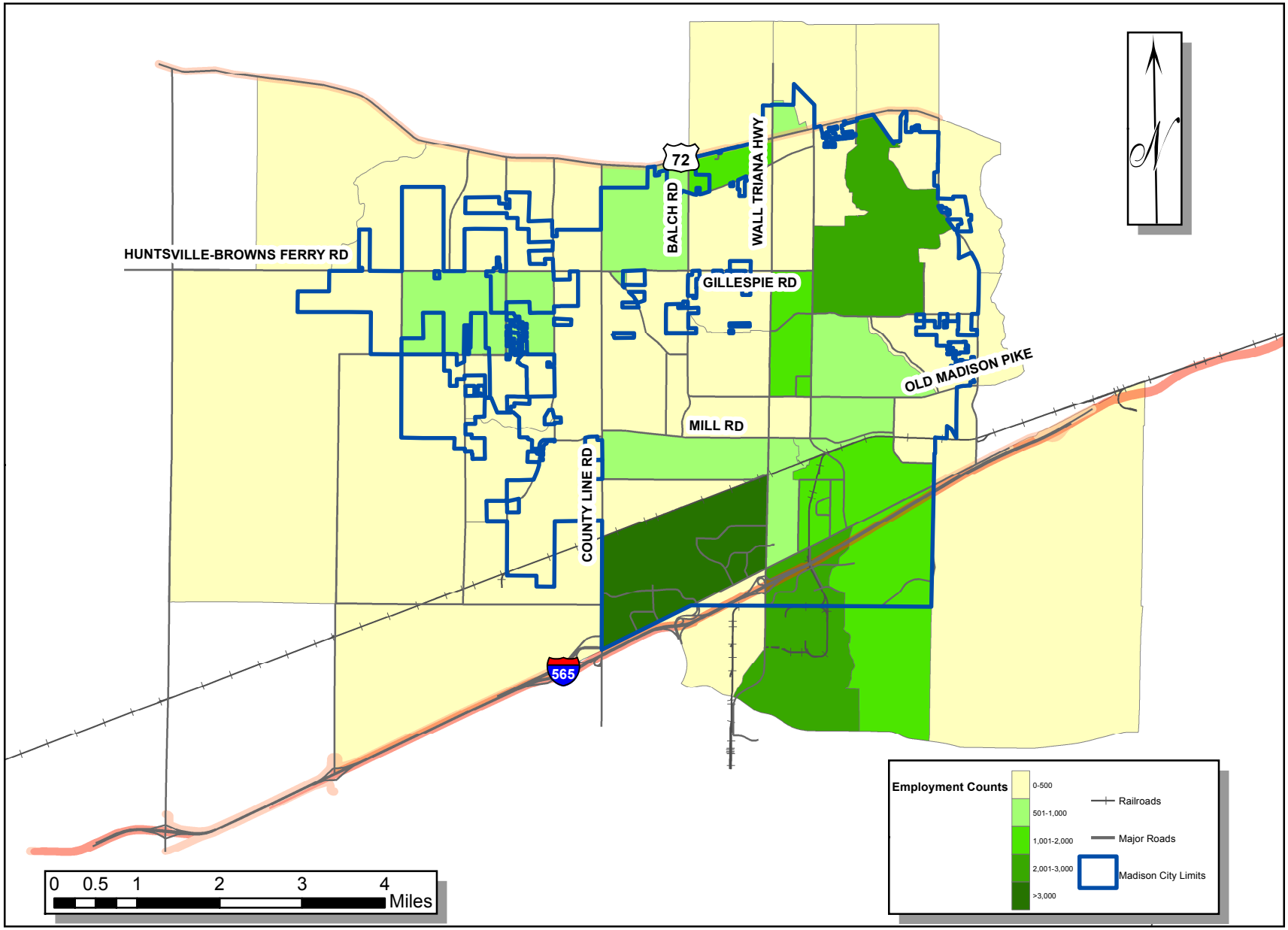
*Data Source: City of Madison, AL, GIS, 2017

Figure 4-5: 2025 Employment Distribution by TAZ



*Data Source: City of Madison, AL, GIS, 2017

Figure 4-6: 2040 Employment Distribution by TAZ



*Data Source: City of Madison, AL, GIS, 2017

4.2 ROADWAY PROFILE

This subsection provides the baseline conditions for the existing roadway network in and around the City of Madison. As such, it offers an overview of characteristics that help identify needs based on roadway configurations and geometrics in relation to traffic conditions.

4.2.1 Roadway Characteristics

The City of Madison roadway network is characterized by two major east-west travel corridors through the extreme northern and southern sections of the city – Highway 72 and I-565/Madison Boulevard – that are connected via minor arterials and collector streets that travel north-south. East-west travel within the city is served by local collectors.

Number of Lanes

Figure 4-7 identifies the number of lanes for key roadways in the city. The majority of surface roadways in the City of Madison have two lanes. Exceptions to this include Highway 72, County Line Road, Madison Boulevard, and the segment of Hughes Road from Madison Boulevard to Plaza Boulevard, which all have four lanes. I-565 has six lanes through the city.

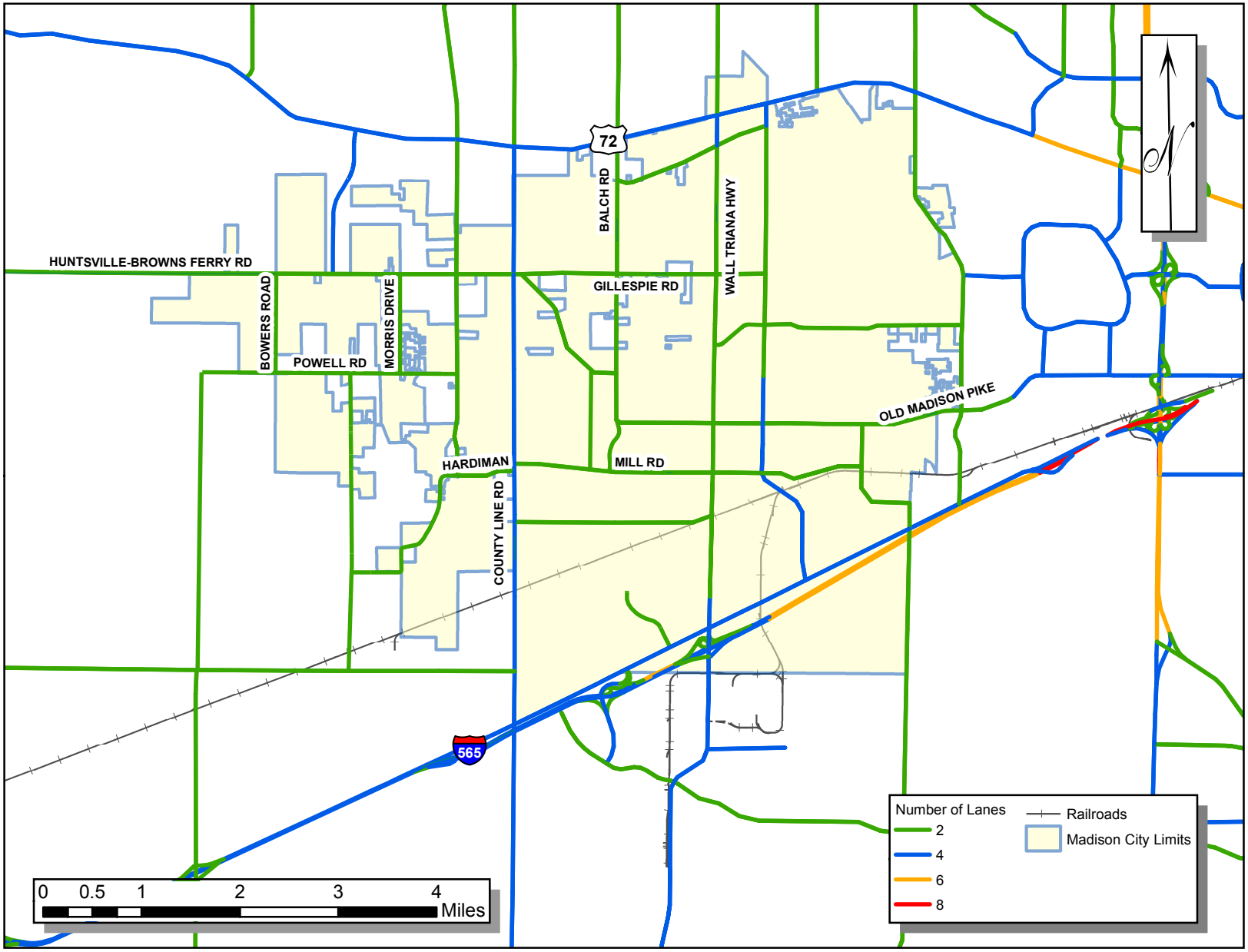
Functional Classification

Functional classification is the process by which roadway facilities are grouped into classes according to the character of traffic service they are intended to provide. Typically, functional classification is determined by local representatives who coordinate with ALDOT to obtain an official designation. Each category places a different emphasis on providing the two major functions of a roadway—movement of traffic and access to property:

- Interstates—Defined as significant highways that feature limited access and continuous, high-speed movements for a wide variety of traffic types. I-565 is the only interstate highway in the City of Madison (and in the Huntsville region).
- Arterials—Typically carry higher volumes at higher speeds and for longer trip lengths. Arterials are further classified as principal or minor depending on the amount of traffic they carry and their overall connectivity within a specific region. The only principal arterial within the city is Highway 72. Minor arterials include Madison Boulevard, Wall Triana Highway, Slaughter Road and County Line Road.
- Collectors—Allow access to activity centers from residential areas. Many of the primary roadways within the city are collectors. Major collectors include Hughes Road, Balch Road, Old Madison Pike and Burgreen Road. Minor collectors include Mill Road, Gillespie Road, Eastview Drive, and Highland Drive.
- Local Roads—Provide excellent access to adjacent properties, but move significantly less traffic through an area. The majority of roadway miles in the city are comprised of local roads. It should be noted that local roadways are not a focus area of this plan given it is a citywide effort.

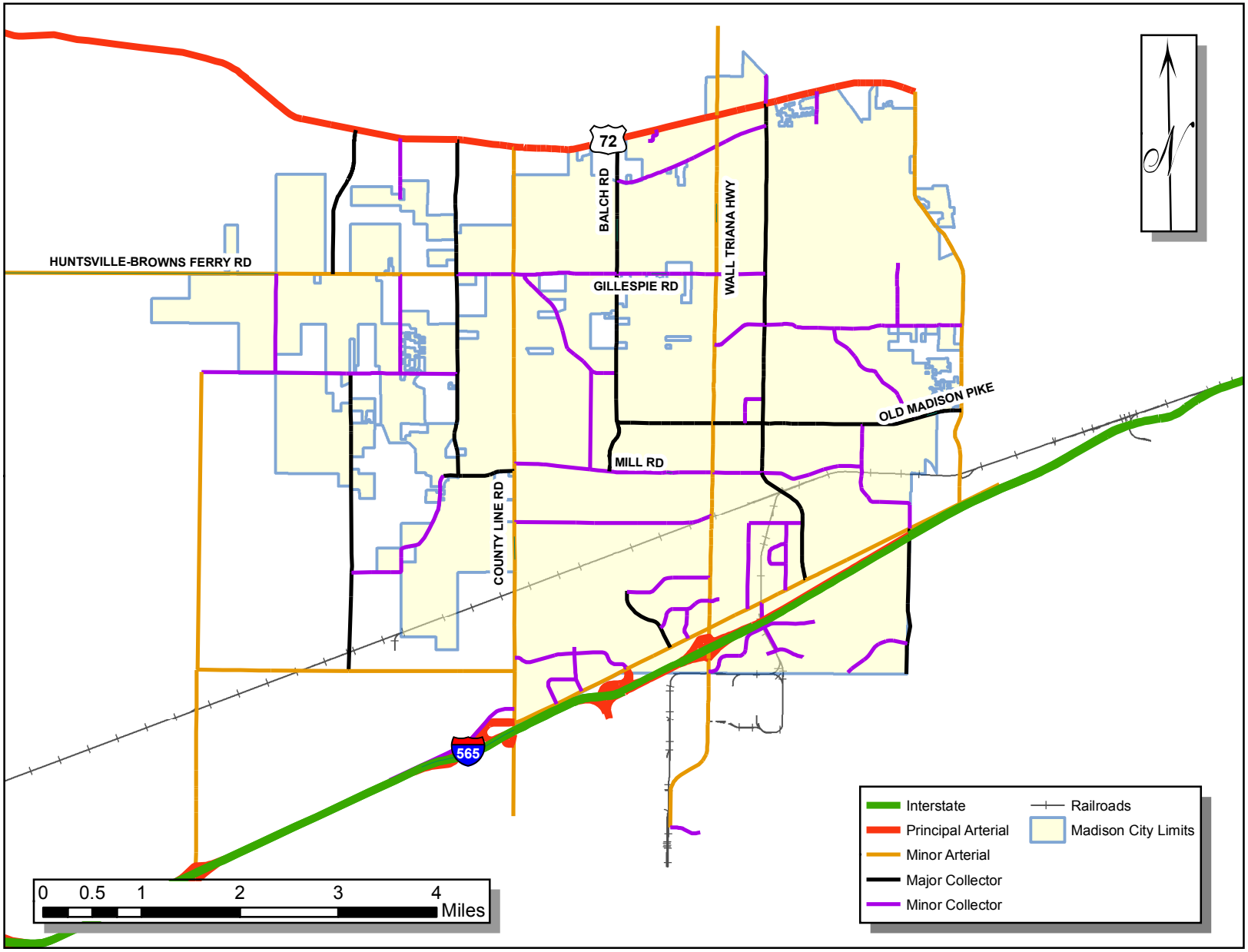
Figure 4-8 shows the functional classification of the roadways in and around the City of Madison.

Figure 4-7: Number of Roadway Lanes



*Data Source: (City of Huntsville, AL) MPO, 2017 & City of Madison, AL, GIS, 2017

Figure 4-8: Roadway Functional Classification



*Data Source: (City of Huntsville, AL) MPO, 2017 & City of Madison, AL, GIS, 2017

Traffic Signals

The identification of traffic signal locations is important in that it helps determine locations where potential operational improvements related to signal adjustments and/or enhancements can be applied. As shown on Figure 4-9, there are a total of 49 signals in and around the City of Madison. Most of these signals are located along the following roadways:

- Highway 72
- Wall Triana Highway
- Hughes Road
- County Line Road
- Slaughter Road
- Old Madison Pike
- Zierdt Road

The City of Madison maintains approximately 35 signals in and around Madison except those at the following locations (which are maintained by the City of Huntsville):

- Highway 72 at County Line Road
- Highway 72 at Wal-Mart entrance (Promenade Point Parkway)
- Highway 72 at Balch Road
- Highway 72 at Lawson Ridge Drive / Hughes
- Highway 72 at Nance Road
- Highway 72 at Jeff / Slaughter Road
- Slaughter Road at Farrow Road
- Slaughter Road at Old Madison Pike
- Slaughter Road at Madison Boulevard

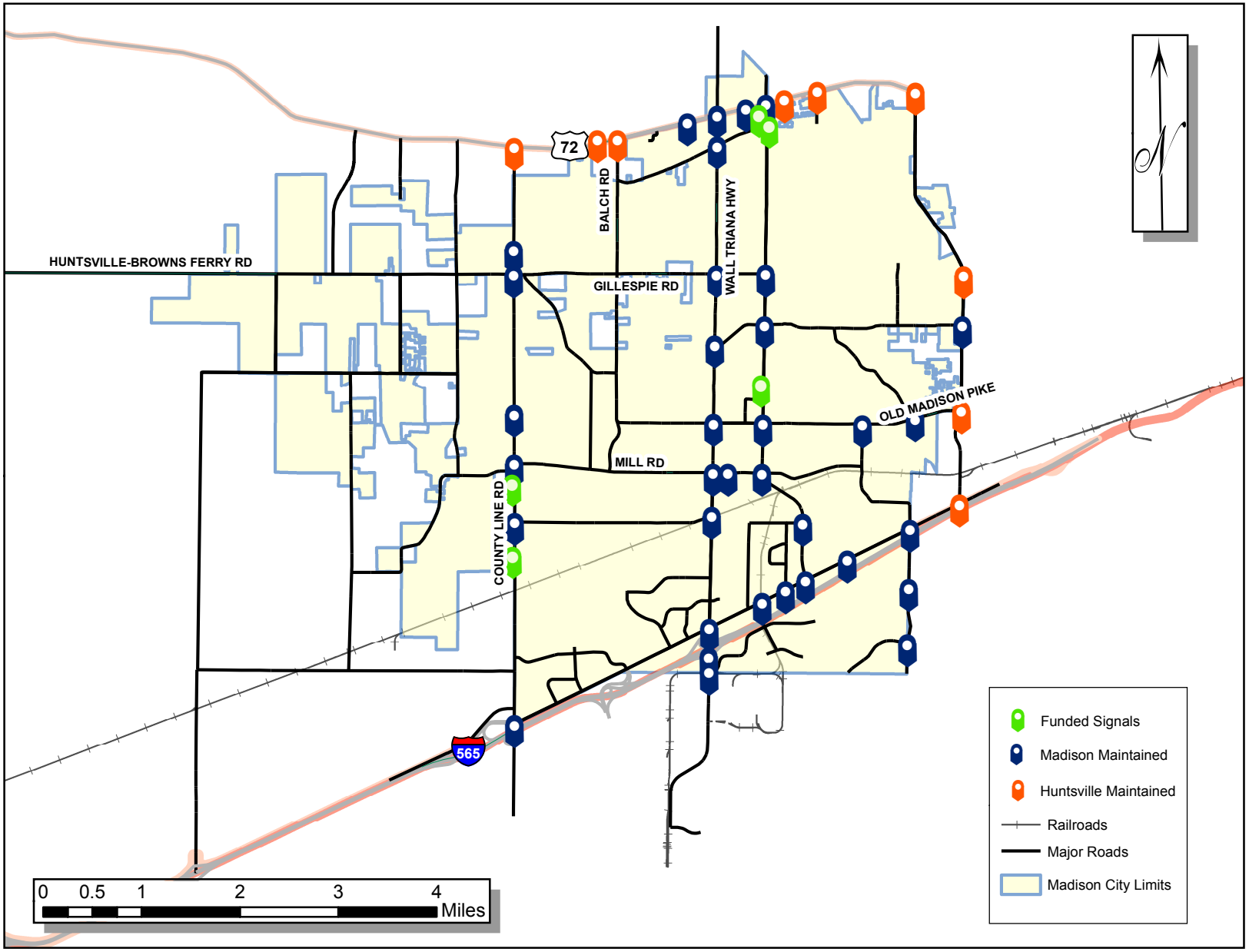
Other Roadway Characteristics

Roadway maintenance jurisdiction is an important factor when developing recommendations involving roadway widenings, operational improvements and/or bicycle and pedestrian accommodations. The City generally has more flexibility in implementing recommendations along roadways under their maintenance responsibility. Highway 72 is the only surface street not under the maintenance responsibility of the City.

Train traffic and significant at-grade railroad crossings are important considerations when identifying potential recommendations and safety hazards. The southern portion of the City of Madison is traversed by the Norfolk Southern Railway. Critical at-grade crossings occur at the following roadways:

- Sullivan Street (Wall Triana Highway)
- Shelton Road
- Slaughter Road

Figure 4-9: Signalized Intersections



*Data Source: (City of Huntsville, AL) MPO, 2017 & City of Madison, AL, GIS, 2017

4.2.2 Existing Traffic Conditions

Traffic conditions are determined using two components: volume and capacity. Volume is generally reported as Annual Average Daily Traffic (AADT) and provides insight regarding demand on the system. Using the regional travel demand model, volumes are combined with roadway capacities to determine how well the system is functioning, as well as to identify issues where the transportation network is over capacity. These two factors – the number of trips along the roadway network and the ability of the facilities to accommodate these trips – are also the two primary indicators of roadway deficiencies.

Existing Traffic Volumes

Three sources were used to identify existing daily traffic volumes in and around the City of Madison:

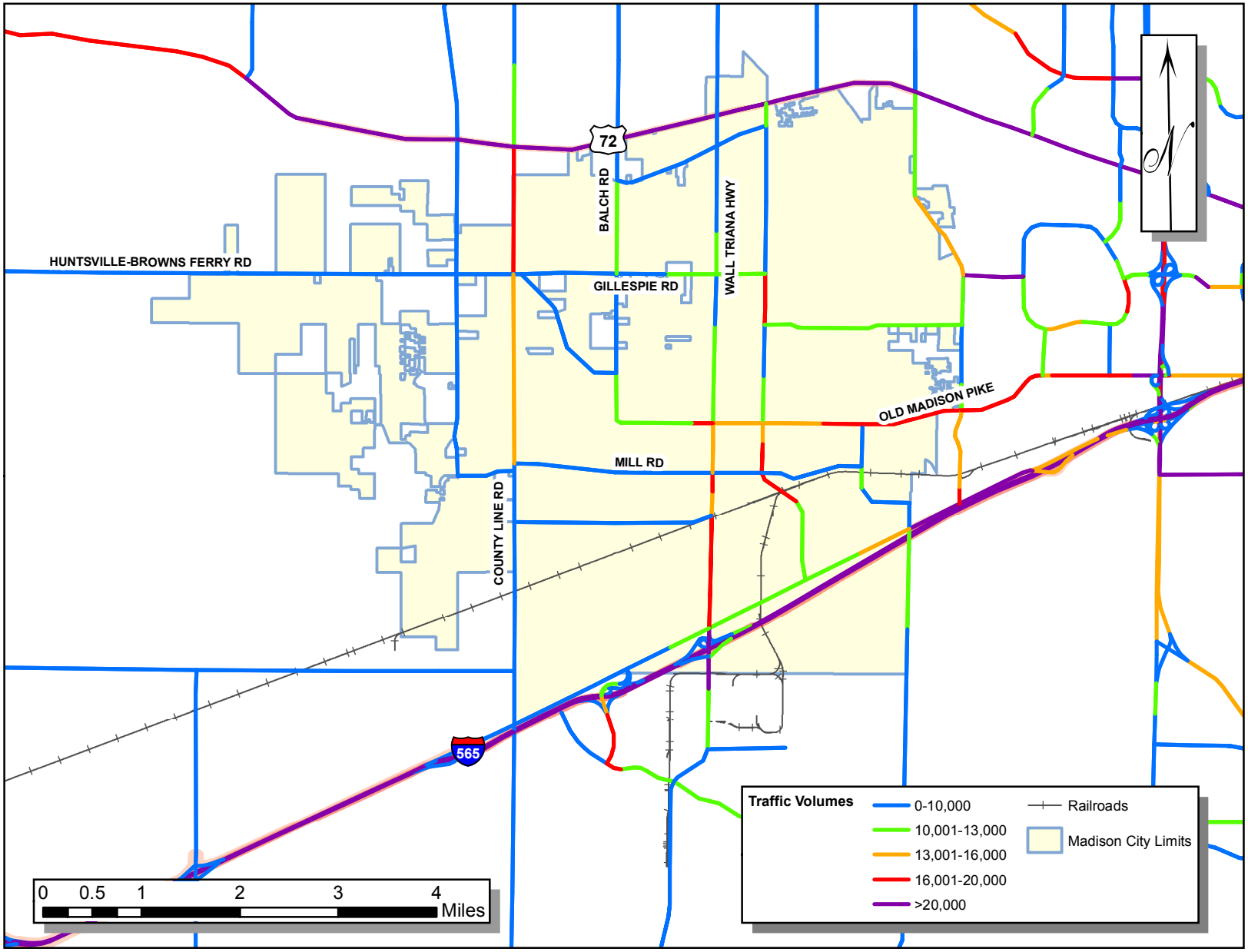
1) Huntsville MPO base year travel demand model volumes, derived from traffic counts taken prior to 2010
2) Traffic counts taken by the City of Madison in 2016-2017
3) Revised traffic volumes for 2017 generated by application of the Huntsville MPO travel demand model to the revised SE data (detailed previously in Section 3)

Figure 4-10 shows the 2010 Huntsville MPO base year model volumes generated by the Huntsville MPO and used for their most recent Long Range Transportation Plan (LRTP) update in 2016. Observations from the base year model volumes include:

- Only I-565 and Highway 72 carried more than 20,000 trips per day.
- Roadway volumes on the eastern side of the city generally had much higher traffic volumes than on the western side.
- Daily trips along the minor arterial and collector roadways in the eastern portions of the city were fairly evenly distributed, with many segments carrying 10,000-20,000 trips per day.
- None of the roadways west of County Line Road carried more than 5,000 trips per day.

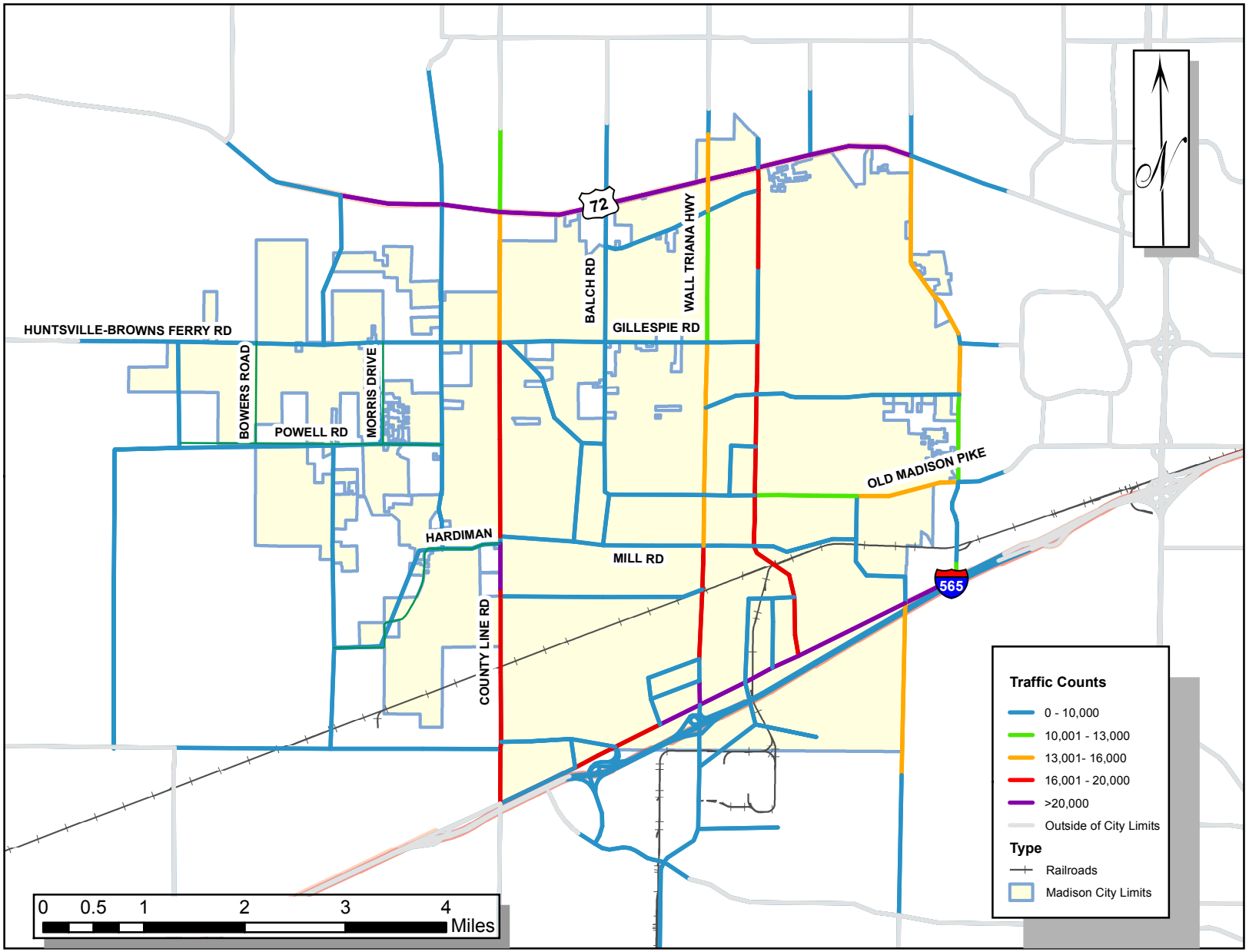
In 2017, the City of Madison collected updated traffic counts at specific roadways throughout the city to establish a base year for this study. These counts, shown in Figure 4-11, were fairly consistent with the model volumes developed from the 2010 MPO counts, but slightly higher due to growth that has since occurred. Most of the higher roadway volumes, ranging from 17,000 to 23,500 trips per day, were found along the north-south roadways of Wall Triana Highway, County Line Road, and Hughes Road. Of the east-west roadways where counts were taken, Old Madison Pike had the highest volumes ranging from 10,000 to 16,000 trips per day.

Figure 4-10: 2010 Base Year Model Volumes (Huntsville MPO)



*Data Source: (City of Huntsville, AL) MPO, 2017

Figure 4-11: City of Madison Traffic Count Results (2017)



*Data Source: City of Madison, JRWA, 2017

As detailed previously in Section 3.0, a specific travel demand model run was developed to reflect 2017 conditions. The estimated volumes resulting from this model run are presented in Figure 4-12. Highlights of the 2017 model run results include:

- Overall traffic volumes along many roadways are higher than what was estimated in the 2010 base year. This is especially true for the north-south roadways through the City – Wall Triana Highway, Hughes Road and Slaughter Road.
- Other notable segments with higher estimated volumes include:
  - County Line Road (due to its widening from 2 to 4 lanes)
  - Old Madison Pike
  - Eastview Drive
  - Mill Road

While the results above were generated from a validated travel demand model, it is important to note that there are significant differences between the model volumes and the traffic counts along certain roadway segments throughout the City. Examples of which are provided below.

Table 4-4: Significant Differences – Traffic Counts vs. Model Volumes

Roadway Segment	Traffic Volume Ranges from Counts	Traffic Volume Ranges from Model
Madison Boulevard from Westchester Drive to Hughes Road	22,000 – 27,700	11,800 – 19,600
County Line Road from Mill Road to Madison Boulevard	17,000 – 23,600	34,800 – 34,900
Old Madison Pike from Hughes Road to Slaughter Road	10,700 – 15,400	20,000 – 20,300
Eastview Drive from Hughes Road to Slaughter Road	6,350-6,400	14,650 – 16,500
Huntsville-Browns Ferry Road from Balch Road to Hughes Road	3,000 – 6,000	9,900 – 18,700

Note: Other differences between the model volumes and traffic counts are found along smaller segments throughout the City.

Discrepancies between traffic counts and model volumes can be explained by the following factors:

- The travel demand model is meant to estimate and project trips at a regional level rather than the more localized level needed for 2040-TP.
- While the travel demand model is a tool that attempts to replicate how people travel, it does not have the ability to capture the specific behavior of every driver. The limitation also relates to the number of roadways available and the over reliance on travel times.

Given these issues, it was determined that the traffic counts taken in 2017 will serve as the Madison base year traffic volumes for the purposes of determining levels of congestion.

Existing Levels of Congestion

A commonly used measure for assessing congestion along roadway segments, the volume to capacity (V/C) ratio compares the traffic volumes of a roadway segment to its carrying capacity. These V/C ratios are typically used to determine a level of service (LOS) for a given roadway, which is indicated by assigning a “grade” of A (best)

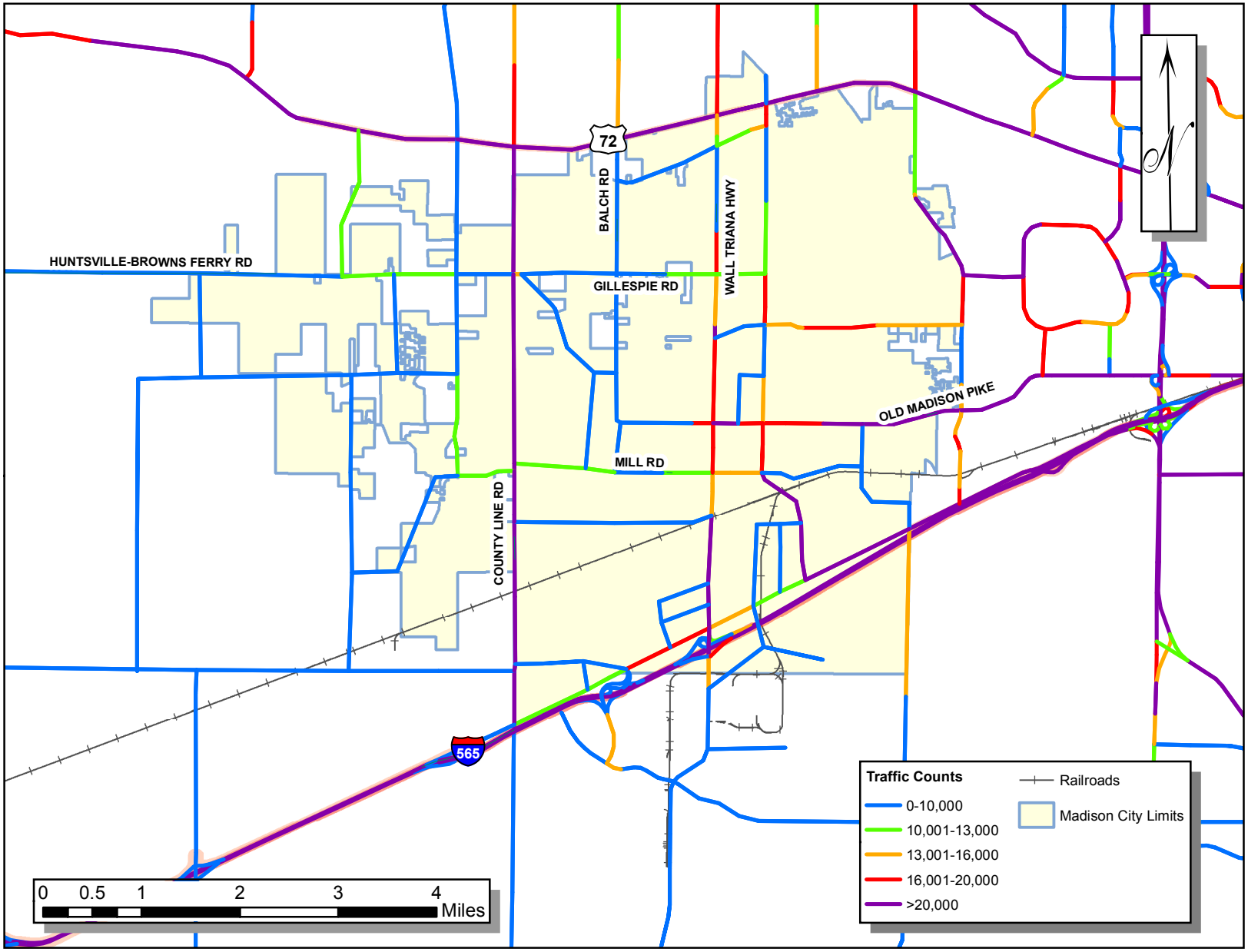
through F (worst). The factors that determine LOS are somewhat subjective; however, in an urbanized area, segments are typically considered congested when they experience V/C ratios of 1.00 or greater, or an LOS of E or F. For this analysis, LOS was defined as presented in Table 4-5.

Table 4-5: Level of Service Description

Level of Service	V/C Ratio	Traffic Conditions
LOS A-C	<.85	Ranging from free flow to stable flow. Ability to maneuver through lanes is noticeably restricted and lane changes require more driver awareness. Most experienced drivers are comfortable, roads remain safely below but efficiently close to capacity, and posted speed is maintained. Minor incidents may still have no effect but localized service will have noticeable effects and traffic delays will form behind the incident.
LOS D	.8501 – 1.000	Approaching unstable flow. Speeds slightly decrease as traffic volumes slightly increase. Freedom to maneuver within the traffic stream is much more limited and driver comfort levels decrease. Minor incidents are expected to create delays. It is a common goal for urban streets during peak hours.
LOS E	1.001 – 1.15	Unstable flow, operating at capacity. Flow becomes irregular and speed varies rapidly because there are virtually no usable gaps to maneuver in the traffic stream and speeds rarely reach the posted limit. Any disruption to traffic flow, such as merging ramp traffic or lane changes, will create a shock wave affecting traffic upstream. Any incident will create serious delays.
LOS F	>1.15	Forced or breakdown flow. Every vehicle moves in lockstep with the vehicle in front of it, with frequent slowing required. Travel time cannot be predicted, with generally more demand than capacity. A road in a constant traffic jam is at this LOS, because LOS is an average or typical service rather than a constant state. For example, a highway might be at LOS D for the AM peak hour, but have traffic consistent with LOS C some days, LOS E or F others, and come to a halt once every few weeks.

Source: American Association of State Highway Transportation Officials (AASHTO)

Figure 4-12: 2017 Roadway Model Volumes



*Data Source: City of Huntsville (Huntsville MPO), JRWA, 2017

Existing levels of congestion were developed by applying the traffic count data taken by the City to the capacities within the 2017 Base Year Model run. The V/C ratios generated from this exercise are provided in Figure 4-14. Major highlights of the base year congestion are as follows:

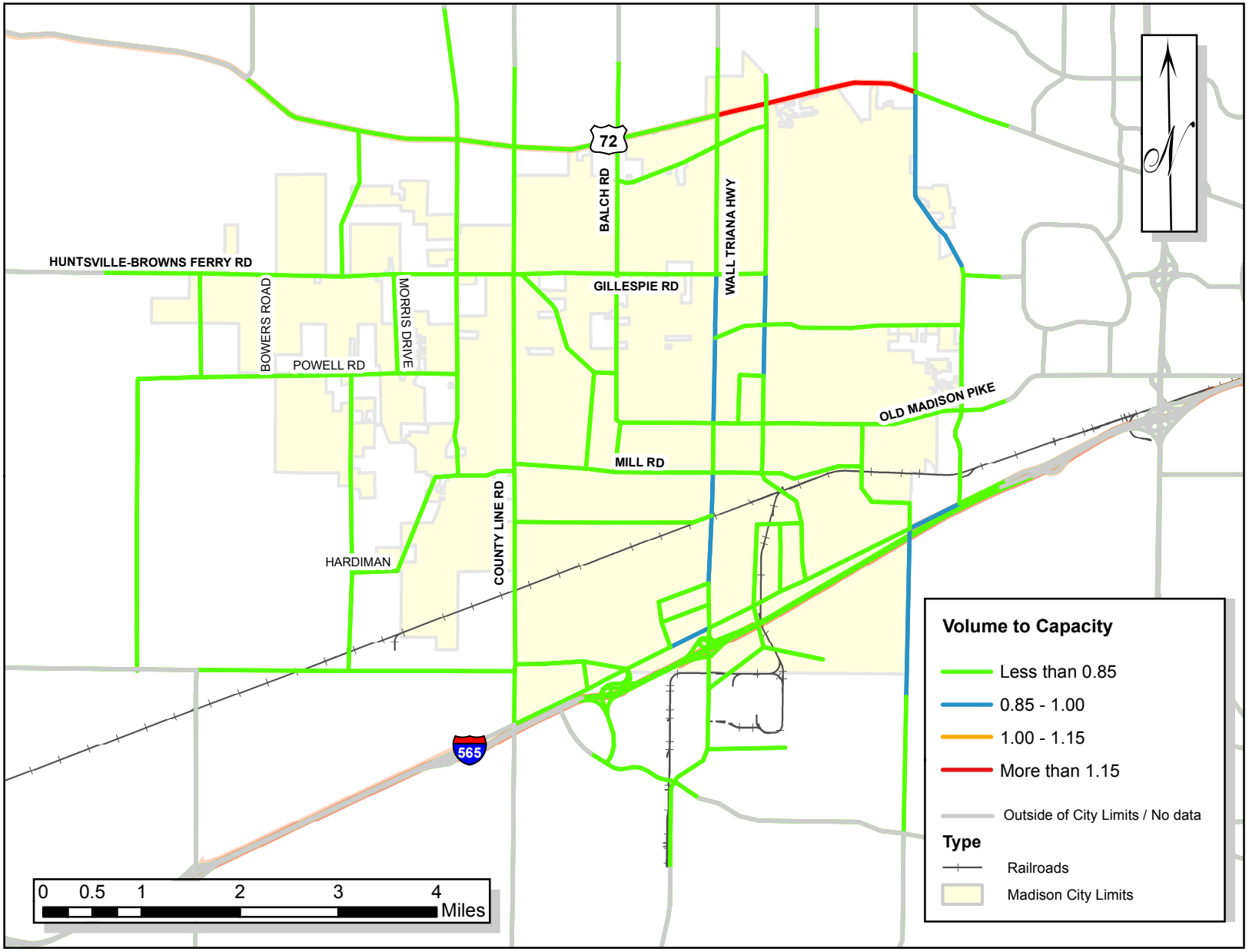
- Many of the roadways in the city are operating at high to moderate levels of congestion.
- Higher levels of congestion were shown on the following segments:
    - Highway 72 throughout the city
    - Wall-Triana Highway throughout the City
    - Hughes Road throughout the City
    - Old Madison Pike from Hughes Road to Slaughter Road
    - Mill Road from County Line Road to Hughes Road
    - County Line Road from Madison Boulevard to Huntsville-Browns Ferry Road

In order to determine future levels of congestion, the following steps will take place:

- Future year model runs for 2025 and 2040 will be developed based on the projected socioeconomic data provided by the City.
- The growth factors between the 2017 and future year model volumes will be applied to the traffic counts taken by the City to determine projected volumes for 2025 and 2040.
- The volumes will be assigned to the roadway networks in 2025 and 2040 to determine congestion levels for those years.

The results of this analysis will help determine how congestion levels are projected to change given anticipated growth and programmed improvements. This, in turn, will assist in the prioritization of potential improvements identified through the 2040-TP process.

Figure 4-13: 2017 Congestion Levels Based on Traffic Counts



*Data Source: JRWA, 2017

4.3 SAFETY

Development of 2040-TP included a review of safety data obtained from the University of Alabama's Critical Analysis Reporting Environment (CARE) database. Table 4-6 provides the number of crashes within the City of Madison by severity for the years 2010-2014. It should be noted that the "unknown" category is where the reporting officer didn't make a comment on the severity of the crash and/or the form was incorrectly completed. A higher crash severity can indicate more unsafe conditions and/or higher travel speeds along a particular roadway network. For this analysis, crash data for those that occurred in the municipal limits of the City of Madison was compared to Madison County as a whole. In summary:

- Approximately 80 percent of the city's crashes did not result in injury. This is slightly higher than the county's 76 percent.
- The county had approximately twice the percentage of fatality crashes as the city.
- There were approximately 5,400 crashes in the City of Madison during the five-year period, averaging 1,080 crashes per year.

Table 4-6: Crashes by Severity, 2010-2014

	City of Madison							Madison County	
	2010	**2011**	**2012**	**2013**	**2014**	**TOTAL**	**PERCENTAGE**	**2010-2014 TOTAL**	**PERCENTAGE**
Fatal Injury	1	2	5	1	0	**9**	0.17%	**182**	0.36%
Incapacitating Injury	27	25	27	23	18	**120**	2.22%	**1,710**	3.37%
Non-Incapacitating Injury	98	69	61	67	84	**379**	7.01%	**4,410**	8.69%
Possible Injury	84	93	96	111	146	**530**	9.80%	**4,547**	8.96%
Property Damage Only	791	778	902	886	907	**4,264**	78.88%	**38,526**	75.94%
Unknown	31	37	21	8	7	**104**	1.92%	**1,354**	2.67%
Grand Total	**1,032**	**1,004**	**1,112**	**1,096**	**1,162**	**5,406**		**50,729**	

Source: University of Alabama, CARE Data, 2010-2014

Per ALDOT policy, CARE data related to specific crash locations cannot be published. However, a review of the data for 2011-2016 indicates that many crashes occur along corridors that experience higher traffic volumes, including Highway 72, Wall Triana Highway, Hughes Road, and Madison Boulevard.

Table 4-7 shows the number of bicycle and pedestrian crashes throughout the city from 2010 to 2014. Of particular note:

- Pedestrian or bicyclist involved crashes were few, totaling 20 for pedestrians and 15 for bicyclists.
- Little difference in the ratio of pedestrian and bicycle involved crashes is seen between the City of Madison and Madison County.

Table 4-7: Pedestrian and Bicyclist Involved Crashes, 2010-2014

	City of Madison							Madison County	
	2010	2011	2012	2013	2014	TOTAL	PERCENTAGE	2010-2014 TOTAL	PERCENTAGE
1 Pedestrian Involved	6	4	3	5	1	**19**	0.35%	**313**	0.62%
2 Pedestrians Involved	0	0	0	1	0	**1**	0.02%	**12**	0.02%
No Pedestrians Involved	1,026	1,000	1,109	1,090	1,161	**5,386**	99.63%	**50,403**	99.36%
1 Bicyclist Involved	0	2	1	3	9	**15**	0.28%	**138**	0.27%
No Bicyclist Involved	1,032	1,002	1,111	1,093	1,153	**5,391**	99.72%	**50,590**	99.73%
Grand Total	**1,032**	**1,004**	**1,112**	**1,096**	**1,162**	**5,406**		**50,729**	

Source: University of Alabama, CARE Data, 2010-2014

From 2011-2016, bicycle crash locations were fairly widespread. However, pedestrian crashes occurred primarily along the roadways with higher traffic volumes and automobile crashes – Highway 72, Wall Triana Highway, Hughes Road, and Madison Boulevard. It should be noted that statistics are not taken for crashes between bicyclists and pedestrians because no auto is involved.

4.4 Bicycle and Pedestrian Travel

The City of Madison is fortunate to already have an extensive pedestrian and trails network to serve as the backbone of its ongoing pedestrian and bicycle network expansion. Because Madison's significant residential growth has occurred primarily within the past several decades, and sidewalks were required in new residential development during this period, a large portion of its neighborhood streets have sidewalk on at least one side. In the more recently developed western side, sidewalks are commonly found on both sides of the street. Like most localities in recent years, the City of Madison has included sidewalk requirements within its Zoning Ordinance. Article V, Section 5-18A (Ord. 97-50) requires 5-foot concrete sidewalk along the adjacent public City street frontage for any project subject to the provisions.

The City is aggressively planning for future expansion of pedestrian and bicycle facilities along its higher volume roadways. Much of Hughes Road between Highway 72 and Madison Boulevard includes a 6-foot wide multiuse path along the western side, although gaps do exist. Recent improvements along County Line Road included installation of multiuse path (a total of approximately 7.5 miles) along both sides of the roadway from the City's northern limit almost to Madison Boulevard. The width of these paths is 10 feet. A multiuse path is in place alongside Eastview Drive from Wall Triana to Hughes Road. In addition, the City's Greenway and Trails Master Plan outlines specific non-vehicular improvements by project location and type, and prioritizes them into one of three groups for future implementation. In addition, a paved walking trail is provided in Dublin Memorial Park.

The City's existing and planned bicycle and pedestrian facilities are shown in Figures 4-14 and 4-15. In addition to the abundance of existing and planned facilities alongside roadways, the City of Madison manages and maintains two multiuse greenway trails:

- Bradford Creek Greenway – From its southern terminus at Palmer Park on Palmer Road, travels 2.3 miles along Bradford Creek to its northern terminus at Heritage Elementary School on County Line Road south of Gillespie Road.

- Mill Creek Greenway – Beginning on Mill Road about a half-mile east of Bradford Creek Greenway and just past Mill Creek Elementary School, travels approximately a half mile northward along Mill Creek and passing the Mill Creek Dog Park en route to its northern terminus at Browns Ferry Road.

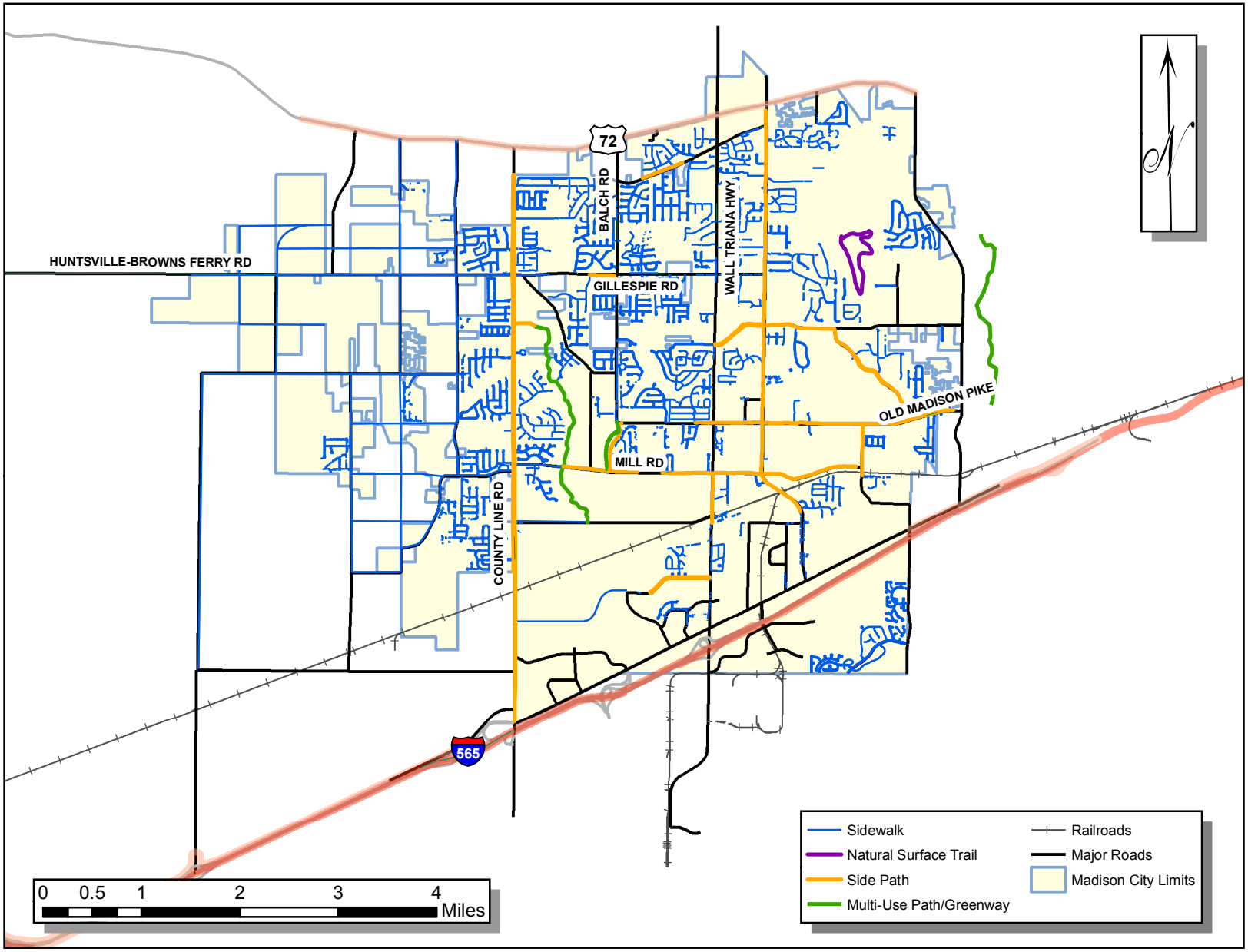
In the eastern portion of the city, the Rainbow Mountain Preserve trails are managed and maintained by the Land Trust of North Alabama. Consisting of five hiking trails totaling approximately three miles, access is provided on the western side via the Rainbow Mountain Trailhead at Stoneridge Park off Stoneway Trail or on the eastern side via Oakhurst Drive.

Located in the City of Huntsville, on Madison's eastern border with Huntsville and currently composed of two disconnected segments, Indian Creek Greenway is managed and maintained by the City of Huntsville. The main (southern) section begins at Madison Pike east of Slaughter Road, between Madison Academy and St. John Paul II Catholic High School. It travels northward paralleling the alignment of Indian Creek for approximately 2.85 miles, passing Columbia High School just south of Farrow Road and ending about 0.75 mile south of University Drive (Highway 72). North of Farrow Road, a spur connects to Creekwood Park's walking trails and dog park. The greenway's northern segment, also known as Providence Greenway, travels one-mile northward from University Drive to end behind Providence Elementary School.

The City of Huntsville also has several additional planned and programmed facilities in the Madison vicinity:

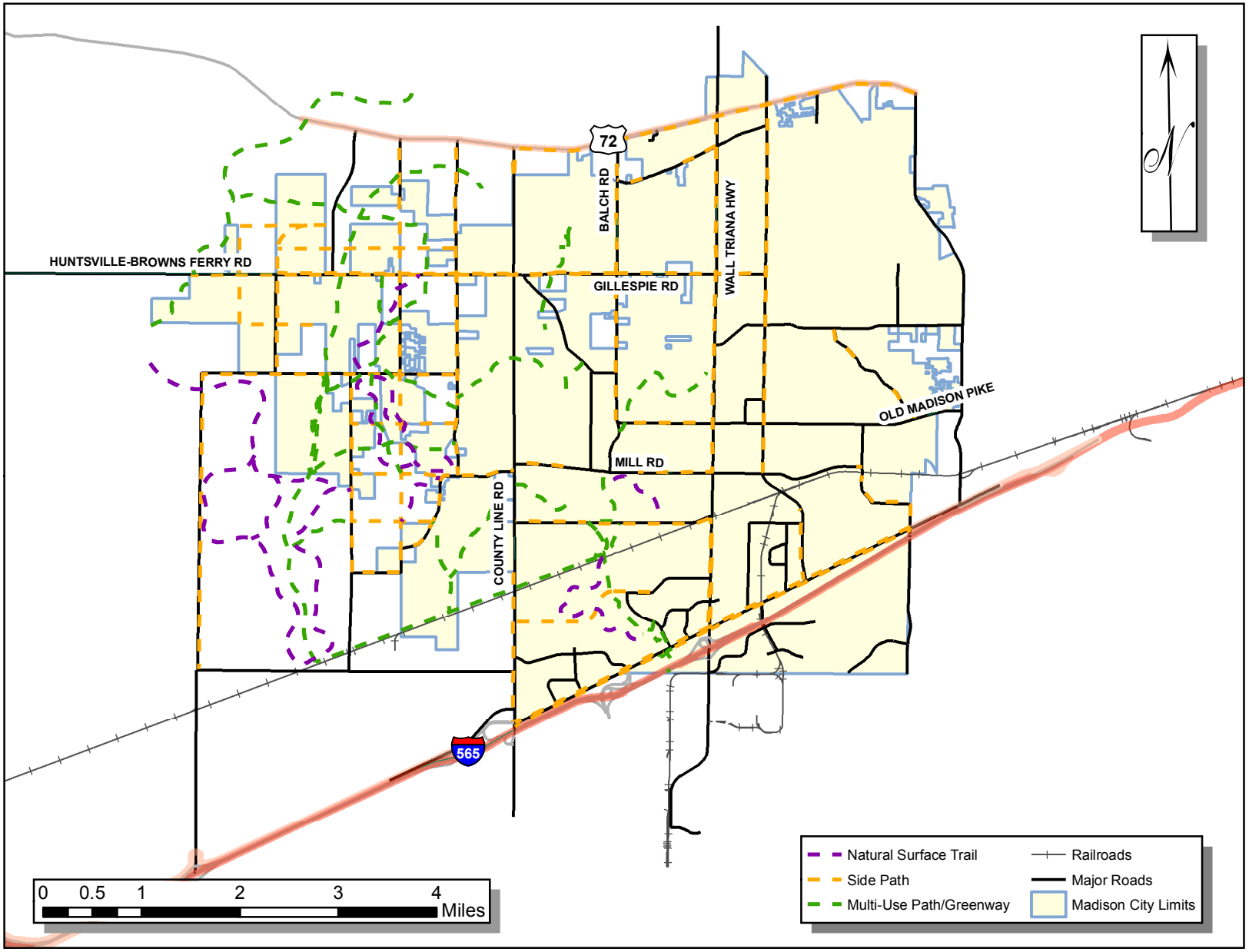
- Zierdt Road – Bicycle lanes southbound to Martin Road were recently completed, with northbound lanes to be included in a future phase
- Betts Spring Branch – Greenway located south of Madison between I-565, Redstone Arsenal, Martin Road and Huntsville International Airport, within The Reserve development
- Barren Fork Creek/Miller Branch – Greenway south of Martin Road with future connection to Betts Spring Branch Greenway
- Limestone Creek – Greenway traveling north-south parallel to Limestone Creek to the west of Madison approximately between I-565 and Highway 72
- Knox Creek – Greenway north of Highway 72 connecting east-west between Wall Triana Highway and the future Limestone Creek Greenway

Figure 4-14: Existing Bicycle and Pedestrian Facilities



*Data Source: City of Madison, AL, GIS, 2017

Figure 4-15: Planned Bicycle and Pedestrian Facilities



*Data Source: City of Madison, AL, GIS, 2017

4.5 LAND USE AND DEVELOPMENT

Understanding land use and development trends and policies is critical when considering transportation solutions because land use and transportation are inherently connected. An assessment of current and projected land use and development can assist in identifying specific needs along certain transportation corridors.

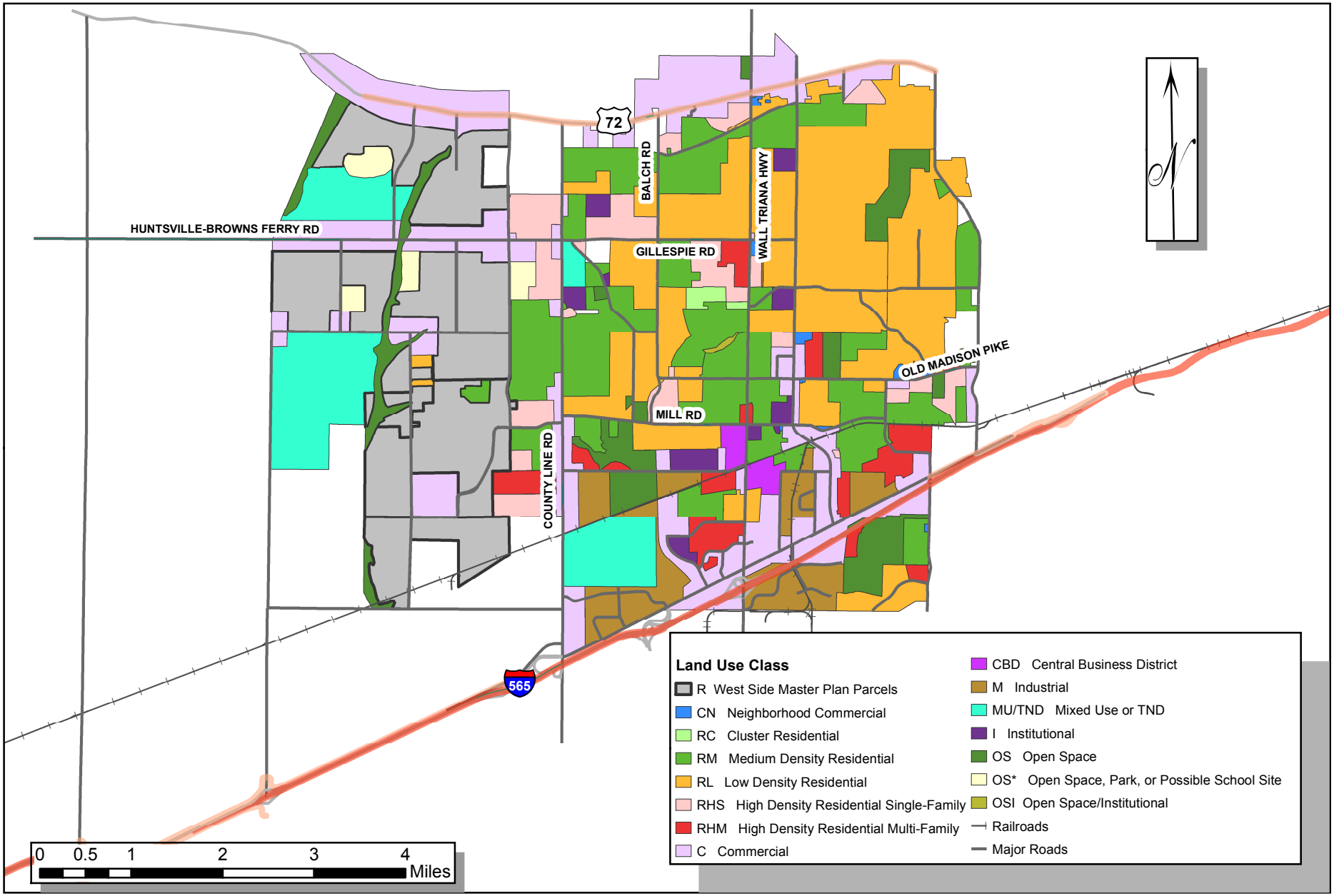
The basis of this analysis is the City's future land use map, shown in Figure 4-16. As can be seen, residential development is found in all areas of the study area. Nearly all residential development consists of single-family homes of varying densities, with limited multifamily development. The city's west side is included in the West Side Master Planning area. This Plan defines density ranges, but the zoning is currently primarily agriculture and much of the area is still unincorporated. Residential development is of particular importance in a transportation study because of the large number of peak hour commute trips and school trips it tends to generate. Given the development potential of the West Side Master Plan area, measurements and tracking of traffic counts and impacts must be monitored as development occurs. While not reflected in Figure 4-16, a need for more multi-use development to reduce congestion along Highway 72 has been identified through discussions with City officials.

Highway 72 and Madison Boulevard are the primary commercial corridors in the city. Hughes Road and County Line Road also have nodal commercial uses at intersections. This category consists primarily of strip shopping centers, restaurants and convenience retail, which generate large numbers of trips for short-term purposes. Because of the amount of ingress and egress associated with these uses, access management is usually a priority at these locations to promote safe and efficient travel. It should also be noted that there are several undeveloped commercial corridors in the western part of the city, especially along Huntsville-Browns Ferry Road. In these instances, access management techniques should be integrated during initial development activities to mitigate future operational issues.

The locations of industrial land uses are important because they tend to have a much higher share of transport truck traffic and at roadway access points. These points result in operational issues due to the larger vehicles' wider turning radii and slower deceleration/acceleration requirements. In the City of Madison, these uses are primarily located in the southern portion of the city between the Norfolk Southern Railroad and the Madison Boulevard / I-565 corridor.

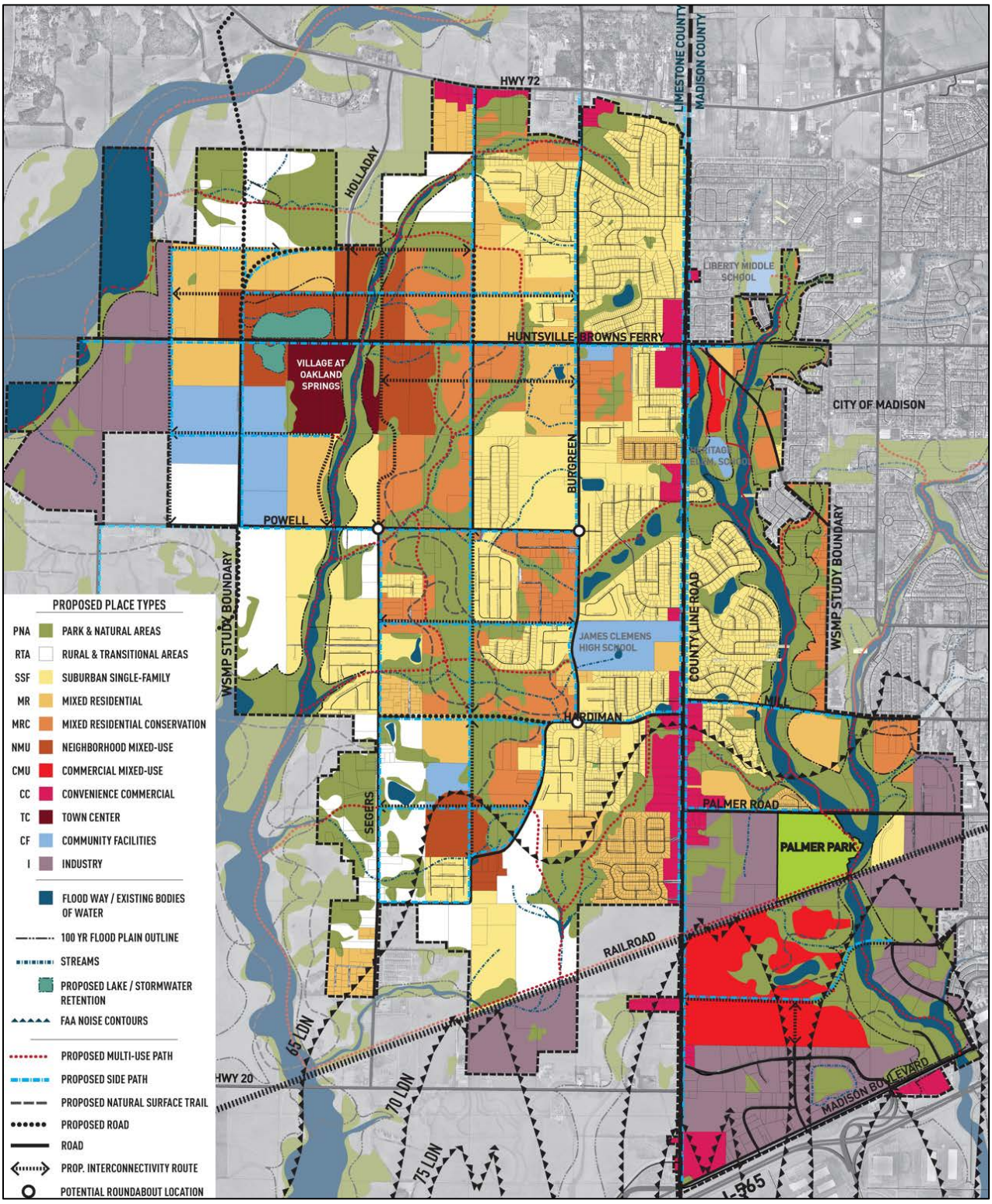
Another key land use planning effort is the West Side Master Plan, which is shown in Figure 4-17. As shown, the plan calls for a detailed mix of land uses throughout the west side of the City. The land use plan was developed to conform to noise contour lines associated with the Huntsville International Airport. As such, the Plan calls for a great deal of mixed commercial and industrial uses south of Palmer Road and most residential development north of the contour lines. More detail on the West Side Master Plan is provided in Appendix A.

Figure 4-16: City of Madison Future Land Use Map



*Data Source: City of Madison, AL, GIS, 2017

Figure 4-17: West Side Master Plan Vision Map



Source: City of Madison, West Side Master Plan, 2015

4.6 Planned Roadway Improvements

Planned improvements identified in previous studies and/or policy documents provide a good baseline as potential alternatives for solving transportation issues throughout the city. This is especially true for relatively recent studies as they should be geared to solving issues and needs that are still prevalent. The sources inventoried for planned and programmed improvements include the following:

- Huntsville MPO Improvements – Contains a list of programmed (funded), fiscally-constrained long-term projects and visionary projects for the Huntsville region included in the current LRTP, as well as information provided by subsequent project updates through July 2017.
- Madison Growth Plan – Contains a number of smaller-scale focused area improvements to further the Key Development Areas (KDAs) specific recommendations identified in the Plan.
- West Side Master Plan – Identifies needed roadway improvements within the western portion of the City.
- 2025 Transportation Master Plan – Identifies prioritized projects based on 2001 conditions, many of which are still needed.

A more in-depth review of previous studies is provided in Appendix A of this report.

4.6.1 Huntsville MPO Improvements

The Huntsville MPO LRTP was adopted in 2016 and identified prioritized improvements in and around the City of Madison. The initial list of improvements within the LRTP has been amended by the MPO to reflect changes in the work plans from ALDOT. Improvements have been grouped in two categories:

- Fiscally-constrained – Projects anticipated to have funding and be completed by 2040 (Table 4-8)
- Visionary – Improvements identified as needed but where no funding prior to 2040 is anticipated (Table 4-9)

The financially-constrained and visionary improvements are shown in Figure 5-22 and labeled as shown in Tables 4-8 and 4-9.

In reviewing the fiscally-constrained projects in the MPO work plan through 2040, the most important improvements for the City of Madison would be:

- ALDOT project - Highway 72 widening from County Line Road to Providence Main Boulevard from 4 to 6 lanes – As noted in Table 5-7, the construction date for this improvement is under evaluation due to costs associated with the current widening design. The construction data will continue to be monitored throughout the 2040-TP effort. This project would enable Highway 72 to carry more traffic, potentially easing the burden on east-west roadways throughout the city.
- I-565 Interchange near Zierdt Road construction – This project is being completed by a private developer and, to date, all of the funding for the project has not yet been secured. This project would provide more mobility options along Madison Boulevard and nearby roadways as a roadway element of the Town Madison development.
- Slaughter Road widening from Highway 72 to Madison Boulevard – This project is being sponsored by the City of Huntsville, but will provide congestion relief on Madison's eastern side.

Table 4-8: Huntsville MPO Planned Improvements – Fiscally-Constrained (2017-2040)

2040-TP Map Number	Project Type	Project Description	Construction Year* (LRTP)	Updated Construction Year**
1	Capacity	Widen US 72 from 4 to 6 lanes from County Road Line to Providence Main Boulevard	2016	TBD
2	Maintenance and Operations	Construct Interchange on I-565 near Zierdt Road	2015	TBD
3	Capacity	Widen Balch Road from 2 to 4 lanes from Browns-Ferry Road to Gooch Lane***	2030	2018
4	Capacity	Widen Slaughter Road from 2 to 4 lanes from Old Madison Pike to US Alternate 72	2023	2027
5	Capacity	Widen Slaughter Road from 2 to 4 lanes from US 72 to Old Madison Pike	2036	NA
6	Capacity	Widen Zierdt Road from 2 to 4 lanes from US Alternate 72 to Martin Road	2015	Under Construction
7	Capacity	Widen Old Highway 20 from 2 to 4 lanes from County Line Road to Segers Road	2016	NA
8	Capacity	Widen Old Highway 20 from 2 to 4 lanes from Segers Road to Greenbrier Road	2022	NA
9	New Roadway	Greenbrier Parkway as a 4-lane roadway from I-565 to Old Highway 20	2016	NA
10	New Roadway	Greenbrier Parkway as a 4-lane roadway from Old Highway 20 to 5000' North of Old Highway 20	2016	NA
11	New Roadway	Greenbrier Parkway as a 4-lane roadway from 5000' North of Old Highway 20 to Huntsville-Brownsville Ferry Road	2020	NA
12	Maintenance and Operations	Roundabout Installation at Balch Road and Gillespie Road	NA	2018
NA	Maintenance and Operations	Resurfacing Highway 72 from Balch Road to Hughes Road	NA	2019

*- Reflects year in 2040 Huntsville Long Range Transportation Plan (LRTP). NA = Not in LRTP

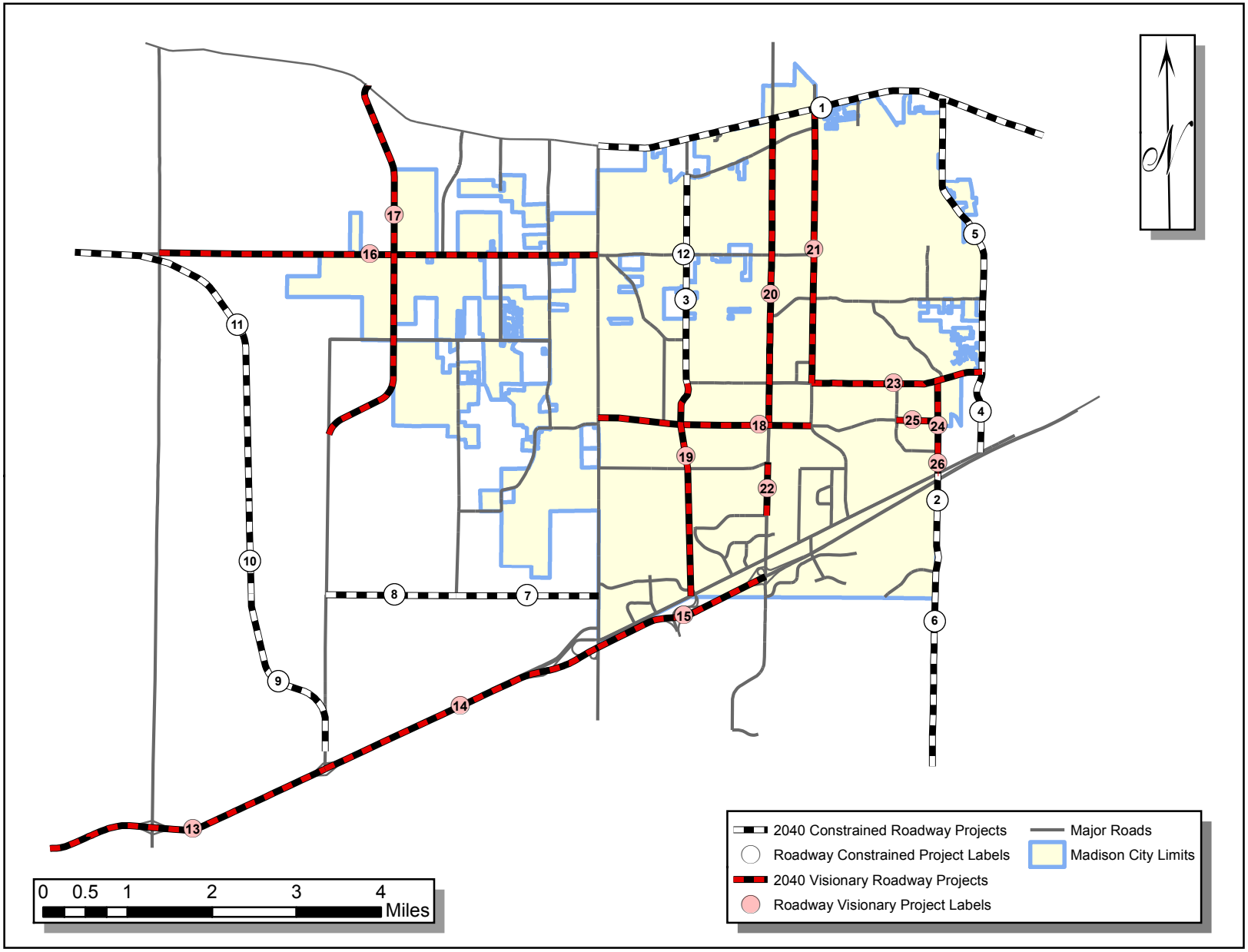
**- Reflects year in ALDOT Transportation Project Status Report to Huntsville MPO, July 2017. NA = No mention of project.

***-Project has been changed to a 2-foot widening and resurfacing preojewct per ALDOT Transportation Project Status Report.

Table 4-9: Huntsville MPO Planned Improvements – Visionary (Post 2040)

2040-TP Map Number	Project Type	Project Description	Construction Year* (LRTP)
13	Capacity	Widen I-565 from 4 to 6 lanes from East of I-65 to Greenbrier Road	Visionary (Beyond 2040)
14	Capacity	Widen I-565 from 4 to 6 lanes from Greenbrier Road to Madison County Line	Visionary (Beyond 2040)
15	Capacity	Widen I-565 from 4 to 6 lanes from Madison County Line to Wall Triana Highway	Visionary (Beyond 2040)
16	Capacity	Widen Browns Ferry Road from 2 to 4 lanes from Mooresville Road to County Road Line	Visionary (Beyond 2040)
17	New Roadway	Powell Road Extension as a 4-lane Road from Powell Road to Holladay Drive	Visionary (Beyond 2040)
18	Capacity	Widen Mill Road from 2 to 4 lanes from County Line Road to Hughes Road	Visionary (Beyond 2040)
19	New Roadway	Extending Balch Road as a 4-lane roadway from Browns Ferry Road to Madison Boulevard	Visionary (Beyond 2040)
20	Capacity	Widen Wall Triana Highway from 2 to 4 lanes from Highway 72 to Mill Road	Visionary (Beyond 2040)
21	Capacity	Widen Hughes Road from 3 to 4 lanes from Old Madison Pike to Highway 72	Visionary (Beyond 2040)
22	Capacity	Widen Sullivan Street from 3 to 4 lanes from Royal Street to Front Street	Visionary (Beyond 2040)
23	Capacity	Widen Old Madison Pike from 3 to 4 lanes from Hughes Road to Slaughter Road	Visionary (Beyond 2040)
24	New Roadway	Extending Zierdt Road as a 2-lane roadway from 1 mile north of Madison Boulevard to Old Madison Pike	Visionary (Beyond 2040)
25	New Roadway	Extending Portal Lane as a 2-lane Road from Shelton Road to Zierdt Road Extension	Visionary (Beyond 2040)
25	Capacity	Widen Shelton Road from 2 to 4 lanes from Madison Boulevard to 1/4 mile north of Madison Boulevard	Visionary (Beyond 2040)

Figure 4-18: Huntsville MPO Planned and Programmed Improvements



*Data Source: (City of Huntsville, AL) MPO, 2017

Significant visionary projects that would impact traffic within the City of Madison include:

- Old Madison Pike widening from 3 to 4 lanes from Hughes Road to Slaughter Road – Would provide additional capacity to a corridor that carries a significant amount of commuter traffic during peak hours.
- Browns Ferry Road widening from 2 to 4 lanes from Mooresville Road to County Road Line – Would provide additional capacity to the high growth area on the West Side of the city.
- Mill Road widening from 2 to 4 lanes from County Line Road to Hughes Road – Would increase east-west connectivity through the city. Balch Road extension as a 4-lane roadway from Browns Ferry Road to Madison Boulevard – Would provide greater connectivity in the growing west side.
- Wall Triana Highway widening from 2 to 4 lanes from Highway 72 to Mill Road – Would provide additional capacity on a roadway segment projected for congestion.
- Hughes Road widening from 3 to 4 lanes from Old Madison Pike to Highway 72 – Would help accommodate north-south traffic from Madison Boulevard to Highway 72, particularly during the peak hour.

4.6.2 Madison Growth Plan Improvements

Improvements specifically called out in the 2012 City of Madison Growth Plan were classified as:

- Intermediate (within the next 12 months)
- Short-Term (within the next 3 years)
- Mid-Term (3 to 7 years)
- Long-Term (7 to 12 years)

Identified transportation improvements and their rationale include:

- Highway 72 Roadway Enhancements (Mid-Term) – Although a State route and such efforts will be more expensive than other strategies, certain key segments of Highway 72 may warrant physical enhancements like widening or lane reconfiguration.
- I-565 Interchange Planning and Implementation (Short- and Mid-Term) – Initiate discussions with ALDOT and initiate preliminary studies for installation of an interchange as recommended in the Growth Plan.
- Madison Boulevard Streetscape Improvements (Mid-Term) – Support redevelopment along Madison Boulevard with aesthetic improvements; add trees, lights and plantings; mandate more consistent signage; upgrade the pedestrian/bicycle environment; improve bicycle/pedestrian connections between Downtown, Madison Boulevard, and Hughes Road.
- Old Madison Pike Roadway Enhancements (Mid-Term) – Maintain and improve automobile capacity with targeted enhancements like bridge widening and adding turn/deceleration lanes; include access management policies to maintain and improve flow.
- Sullivan Street /Wall Triana Highway Roadway Enhancements (Long-Term) – Investigate methods to improve traffic operations along the corridor, particularly in the segment immediately adjacent to the Historic Downtown.
- Mill Road realignment at County Line Road (Long-Term) – To improve operations and flow at this off-set intersection, consider realignment strategies for making a true four-way intersection.

These projects will be considered during development of the overall implementation strategies for 2040-TP in the next phase of the study.

4.6.3 West Side Master Plan Improvements

The West Side Master Plan recommended nine specific roadway projects to improve connectivity throughout the area:

- Improve Huntsville-Browns Ferry Road from a two-lane road to a four-lane parkway with center turn pockets and median.
- Create a new minor collector from Hardiman Road to Segers Road to serve as an additional east-west connection.
- Improve Burgreen Road from Hardiman Road to Highway 72 from a two-lane road to a two-lane road with center turn pockets and median and roundabouts at the intersections with Hardiman Road and Powell Road.
- Create a new local road that connects Morris Drive to Henderson Lane.
- Improve Segers Road from Powell Road south to the intersection of the new east-west connector road between Hardiman and Segers, with a roundabout at the intersection with Powell Road.
- Improve Hardiman Road from a two-lane road to a two-lane road with center turn pockets and median from Burgreen Road to Segers Road.
- Improve the east-west portion of Powell Road from Burgreen Road from a two-lane road to a two-lane road with center turn pockets and median.
- Create a new road that connects the north-south portion of Powell Road north to Holladay Boulevard via Bowers.
- Create a new road that connects to Highway 72 west of Holladay Boulevard

As with the proposed improvements resulting from the Growth Plan, the improvements listed above will be considered during development of recommendations for the 2040-TP.

4.6.4 2025 Transportation Master Plan Improvements

Some of the projects recommended in the 2025 Transportation Master Plan have been completed or carried forward into the more recent plans. Additional projects that may warrant consideration for the future include:

- High Priority
    - Extend Balch Road from Mill Road to Madison Boulevard
- Medium Priority
    - Extend Royal Drive from Westchester Road to Balch Road Extension (not possible until Balch Road extension to Madison Boulevard is complete)
    - Extend Portal Lane from Shelton Road to Zierdt Road (not possible until Balch Road extension to Madison Boulevard is complete)
    - Modify the I-65 Interchange at Airport

5.0 MULTIMODAL TRANSPORTATION NEEDS

This section provides an overview of the preliminary needs that have been identified based on the contents of this report. The three primary means of identifying these needs were the travel demand model results, review of previous studies and other data collection.

5.1 AUTO TRAVEL NEEDS

Needs identified for key corridors within the City of Madison are listed below. This universe of needs provides the basis behind the next phase of 2040-TP, which will include a more in-depth look at each corridor to assess alternative mobility solutions.

- Highway 72 – Capacity improvements on Highway 72 have been identified in the LRTP and several previous studies. The roadway will likely experience significant congestion, even after the planned widening in 2019 is complete. In addition, access management policies and better signal timings are needed along the corridor.
- Wall Triana Highway/Sullivan Street –Wall Triana Highway/Sullivan Street carries a significant amount of the City's north-south surface street traffic. The widening of Wall Triana Highway to a 4-lane facility from Mill Street to Highway 72 is a visionary project in the 2040 LRTP; however, the segment expected to be the most congested is that south of Old Madison Pike to Madison Boulevard near Downtown. Other identified needs include access management policies and operational improvements to upgrade the accessibility to the Historic Downtown.
- Old Madison Pike/Browns Ferry Road – Traffic counts indicate that, after Highway 72 and Madison Boulevard, this local roadway accommodates most of the city's east-west surface street traffic. This corridor is one of the few that crosses the city from Huntsville to County Line Road. It currently operates under congested conditions, which will likely continue to worsen through 2040. A visionary project in the LRTP calls for the widening of this roadway to four lanes from Hughes Road to Slaughter Road; however, the segment west of Hughes to Balch Road is also projected to be congested. Other identified needs include operational improvements at Slaughter Road and Hughes Road.
- Hughes Road – Hughes Road experiences significant increases in congestion during peak periods and also carries a great deal of school traffic. More detailed assessment of potential improvements along this corridor is needed. The Hughes Road corridor has been recommended for access management strategies, and the presence of schools and multi-use trail along the roadway indicate a more in-depth analysis of the interface between cyclists, pedestrians and motorists is needed.
- County Line Road – As the western portion of the city continues to grow, traffic is anticipated to increase steadily along the roadway. Also, much like Hughes Road, the presence of a multi-use trail will require an assessment of the interface between cyclists, pedestrians and motorists. Unlike the more developed areas of Madison to the east, the potential to implement access management strategies along this corridor is much greater. Realignment of the Hardiman Road/Mill Road intersection at County Line Road is also an identified need.

- Slaughter Road – Much like Hughes Road, this roadway experiences significant increases in congestion during peak periods. More detailed assessment of potential improvements along this corridor is needed. Operational improvements at Old Madison Pike have also been identified as a need along the roadway.
- Madison Boulevard – Due to its proximity to I-565, very few needs have been identified for Madison Boulevard with regard to mobility, other than access management techniques and streetscape improvements.
- Balch Road – One shortfall of the Huntsville travel demand model is the assumption of Balch Road as a 4-lane roadway from Browns Ferry Road to Highway 72. Therefore, a more detailed assessment is required to identify needs along this roadway. The need for access management along the corridor and the extension of this roadway to Madison Boulevard were also identified in previous studies.
- Huntsville-Browns Ferry Road – Located in the rapidly growing western portion of the city, this corridor is projected to operate under congested conditions by 2040. Given the undeveloped nature of land along the roadway, access management and development controls will play a critical role in preserving mobility along the roadway.
- Zierdt Road – With the ongoing capacity improvements to this roadway, no needs are identified for this corridor beyond promoting responsible access management to preserve corridor mobility.
- Other Roadways –Mill Road, Gillespie Road, Eastview Drive, and Gooch Lane are all projected to experience significant increases in congestion during peak periods. More detailed assessment is needed to investigate potential improvements along these corridors.

It should also be noted that several other recommendations specific to the roadway network in the western portion of the city were included in the West Side Master Plan. These include new connector roads and capacity improvements throughout the area, as noted within Subsection 4.6.3. These will also be evaluated in the next phase of the 2040-TP effort.

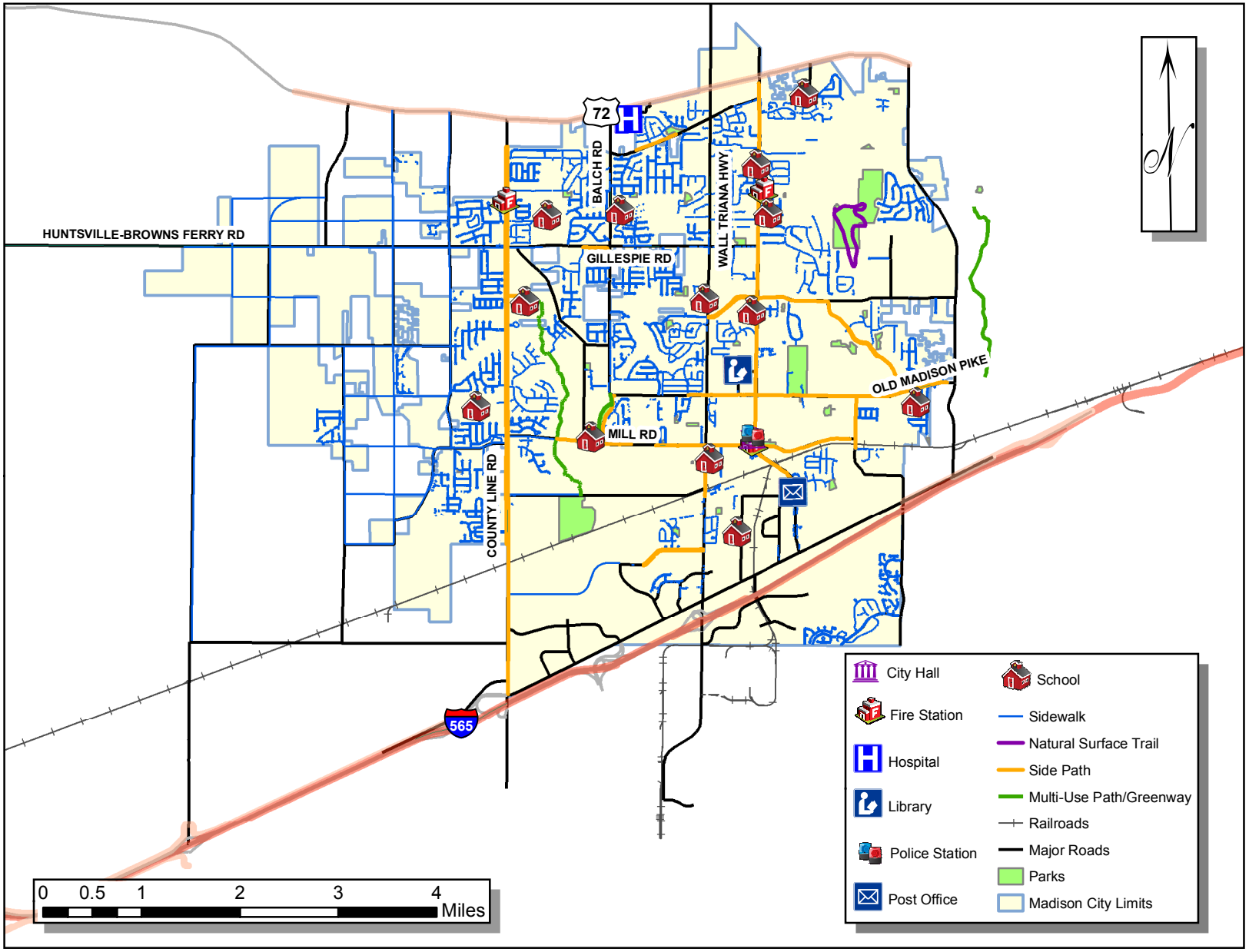
5.2 Bicycle and Pedestrian Needs

Information was gathered from the City of Madison GIS to develop an overall profile of bicycle and pedestrian connectivity, which is presented in Figure 6-1. With respect to bicycle facilities, there is very little connectivity to the city's primary facilities: Bradford Creek Greenway, Mill Creek Greenway, County Line Road side paths and Hughes Road side path. Furthermore, there is very little connectivity to several schools and parks within the city, which is identified in the Growth Plan. A review of the location of existing facilities, parks and schools indicates a need for bicycle accommodations along the following corridors to promote bicycle connectivity:

- Mill Road
- Old Madison Pike
- Gillespie Road
- Eastview Drive
- Balch Road
- Palmer Road
- Highland Drive

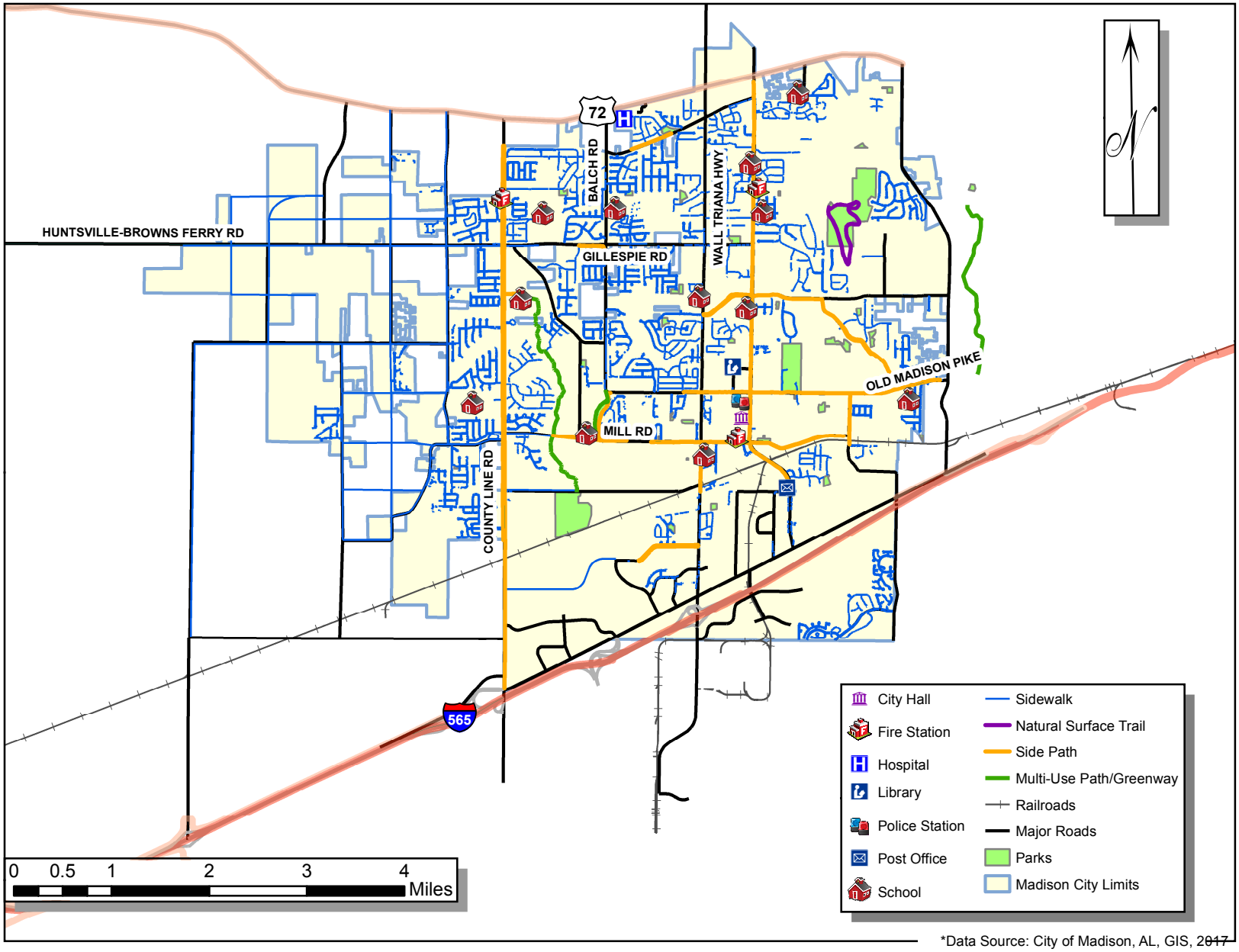
These needs are consistent with those identified in the Parks and Recreation Master Plan 2025.

Figure 5-1: Existing Bicycle and Pedestrian Connectivity



*Data Source: City of Madison, AL, GIS, 2017

Figure 5-1: Existing Bicycle and Pedestrian Connectivity



*Data Source: City of Madison, AL, GIS, 2017

In reviewing the overall sidewalk needs in relation to trails, side paths, schools and parks and overall connectivity, pedestrian facilities are needed along the following corridors:

- Gillespie Road
- Balch Road
- Wall Triana Highway
- Mill Road
- Huntsville-Browns Ferry Road
- Browns Ferry Road
- Hardiman Road

In addition, another consideration to promote connectivity will be to increase the number of ADA compliant sidewalks throughout the city. The City adopted an ADA Transition Plan in 2016 that identifies pedestrian facilities within the public right-of-way.

The City has a current inventory of 220 miles of concrete or asphalt sidewalks generally 4-5 feet wide. There are also approximately 1,772 concrete curb ramps at a width of 4-feet (excluding flared sides). Of the 42 signalized intersections Madison maintains, 20 have pedestrian accessibility.

During the next phase of the 2040-TP, the study team will review the characteristics of the City's major corridors and identify their potential for accommodating both bicycle and pedestrian modes. This will include facilities such as dedicated bike lanes, share the road markings, shared use side paths, and sidewalks that are consistent with Complete Streets principles.

Another issue raised by City staff is that lack of parking facilities for bicycles. Other than along trail facilities, there are no bicycle racks or parking bars at shopping centers and commercial uses throughout the City. Therefore, as bicycle and trail connections are implemented, the City should look to zoning codes and other standards to provide more parking to increase the attractiveness of bicycling as a mode of travel.

5.3 Transit and Ridesharing Needs

As previously noted, there is currently no generally accessible public transit service within the City of Madison. However, given the existing and projected travel conditions projected along Highway 72, the demand for transit service to serve the retail uses along the corridor will likely increase. The demand for transit may also increase due to the projected employment in the adjacent of areas of Huntsville to the east of the City. An increase in public transit will require bus turnouts to avoid traffic congestion. Today, Madison does not provide these turnouts in the right-of-way of existing streets. Furthermore, many employers in the City may be willing participants in a ridesharing and/or carpooling program.

6.0 EVALUATION FRAMEWORK

This section provides an overview of the framework that will be used to evaluate potential projects for prioritization into the overall implementation plan for 2040-TP. The framework consists of two primary components that are described in the subsections that follow: 1) Improvement Categories and 2) Evaluation Criteria.

6.1 IMPROVEMENT CATEGORIES

As a multimodal plan, the Transportation Master Plan (2040-TP) will evaluate projects for implementation in five improvement factor categories. These categories identify the key factors that are required for roadways to remain functional, sustainable and suitable for the various modes of transportation within the right-of-way and connectivity to other networks.

- **Capacity**: The objective of this category is to identify operational improvements required to improve capacity. Improvements may include construction of additional 'through' lanes to increase the capacity and LOS of the corridor. Evaluation of connectivity between major land use centers and linkages to residential neighborhoods is required to identify volume increases due to development and growth that is correlated to a commensurate increase in congestion and delay.
- **Operations**: The objective of this category is to identify specific operational improvements at intersections (e.g., adding turn lanes; implementing modified signal phasing; or constructing a roundabout) that will enhance traffic flow in the corridor. While road segments between intersections (nodes) may function at acceptable Levels of Service (LOS), congestion, delay and crashes at nodes can negatively impact operations that affect the corridor.
- **Alternate Modes of Travel**: The goal of this category is to provide a balanced transportation network that satisfies the travel demands in response to community preferences and needs. Development patterns should provide alternative modes of transportation and not force auto travel alone. With right-of-way constraints within the City, the old paradigm of "paving your way out of congestion" is no longer applicable since it doesn't accommodate all the modes of travel that should be made available. Consequently, in certain areas, travel can be enhanced by providing infrastructure for bicyclists and pedestrians. Therefore, the objective of this category is to identify corridors with complimentary land uses, where facilities will promote trips by alternate modes and improve overall travel and LOS. Improvements in this category will include: on-street bicycle facilities (bike lanes, Share-the-Road markings, etc.), off-street bicycle improvements, multi-use trails and sidewalks.
- **Access Management**: The objective of this category is to identify corridors with a significant number of intersections and driveway access points in order to implement access management techniques. These access management techniques typically contribute to an increase in roadway capacity and improved LOS when correctly executed. Corridor intersections, whether a street or a driveway, serve as vehicular conflict points and result in traffic flow interruptions.
- **Complete Streets Application**: One of the primary goals of the 2040-TP effort is to promote the implementation of complete streets. Therefore, the objective of this category is to identify corridors

that are best suited for complete streets application. This determination is based upon multiple factors that include: the suitability for alternative modes within the right-of-way, availability of right-of-way and operational characteristics.

6.2 EVALUATION CRITERIA

Additionally, there is a range of relative factors that will be used in evaluating project category improvements. This includes both quantitative and qualitative factors. The evaluation criteria and initial considerations for different levels of importance include:

- **Congestion (Quantitative):** Projects are evaluated based on existing and projected volume-to-capacity (v/c) ratios and their ability to serve congested corridors. The analysis includes outputs from travel demand model runs for current and future years through the year 2040. The greater the v/c ratio, the higher the need for relieving congestion.
- **Intersection Operations (Quantitative/Qualitative):** Projects are evaluated on their ability to improve operations at intersections based on existing traffic counts and projected growth developed from the travel demand model. This measure also takes into account field survey observations.
- **Average Annual Daily Traffic (Quantitative):** Projects are evaluated on their ability to benefit high volume corridors. This is based on existing traffic counts and projected volumes derived from the travel demand model.
- **Bicycle Suitability (Qualitative):** Projects are evaluated based on their ability to serve land uses and community activities that support travel by bicycle. Examples include: residential areas, trails, parks, community gathering spaces, commercial activity, employment centers, and schools.
- **Pedestrian Suitability (Qualitative):** Projects are evaluated based on their ability to serve land uses and community activities that support travel by walking. Examples include: residential areas, trails, parks, community gathering spaces, commercial activity, employment centers, and schools.
- **Right-of-way Constraints (Quantitative):** Projects are evaluated based on available right-of-way. This is based on current right-of-way information provided by the Cities of Madison and Huntsville and Madison and Limestone Counties. The less right-of-way available, the higher the difficulty for project implementation.
- **Land Uses (Qualitative):** Projects are evaluated on their ability to serve higher density uses and/or projected high growth areas.
- **Costs (Qualitative):** Projects are evaluated based on the complexity of constructing the improvements, which directly influences overall project cost. Analysis is based on an order of magnitude cost of project types. Other factors, such as right-of-way and surrounding land uses, are also considered.
- **Safety (Quantitative):** Projects are evaluated based on their ability to improve safety along a corridor. Evaluation is based on recorded crash rates obtained from the Critical Analysis Reporting Environment (CARE) data for a given roadway. However, specific locations of crashes cannot be provided due to privacy issues of those involved.
- **Connectivity (Qualitative):** Projects are evaluated on their ability to improve connectivity of the transportation network by filling gaps in the network.

A matrix of the factors considered for each improvement is provided in Table 6-1. It should be noted that the evaluation of the factors may also change the overall definition of a project. The results of the project evaluation will be presented to the Steering Committee for their consideration and included in recommendations for prioritization of improvement projects.

Table 6-1: Project Evaluation Factors

		Improvement Categories				
		Capacity	Operations	Alternative Modes	Access Management	Complete Streets
Evaluation Factors	Congestion	X	X		X	
	Intersection Operations		X		X	
	Traffic Volumes	X	X	X		X
	Bicycle Suitability		X	X		X
	Pedestrian Suitability		X	X		X
	Right-of-way	X	X	X		X
	Land Uses	X	X	X	X	X
	Costs	X	X			
	Safety		X	X	X	X
	Connectivity	X		X		

7.0 MAJOR FINDINGS AND NEXT STEPS

7.1 MAJOR FINDINGS

- The distribution of population is relatively consistent throughout the city. The relatively low population density in and around the city is attributable to the number of single-family households in the area. A substantial amount of residential growth in and around Madison is projected to occur at a steady rate through 2040.
- Commercial employment is concentrated primarily in the areas along Madison Boulevard and Highway 72.
- Many of the transportation needs – most notably Hughes Road, Wall Triana Highway and County Line Road – have already been identified in previous studies, particularly the Madison Growth Plan and West Side Master Plan.
- The relatively low amounts of congestion projected by the travel demand model based on volume-to-capacity indicates that congestion throughout the City is related to operational issues at key intersections and/or elevated peak hour travel.
- Other than Highway 72, the most heavily traveled roadways are north-south connecting corridors.
- Old Madison Pike is the primary alternate to Highway 72 and Madison Boulevard for east-west travel. The Old Madison Pike/Browns Ferry Road corridor is also the only other that connects Huntsville to County Line Road.
- While access management has been recommended throughout the city, roadways such as County Line Road and Huntsville-Browns Ferry Road in the western portion have greater potential for initiatives given the undeveloped nature of the surrounding land. Access management will also be important as redevelopment occurs throughout the City, particularly along Highway 72 and Madison Boulevard.
- The two most important fiscally-constrained projects are the widening of Highway 72 from County Line Road to Providence Main Boulevard from four to six lanes and the construction of the I-565 Interchange near Zierdt Road.
- Several corridors need bicycle and/or pedestrian facilities, as noted in Subsection 5.2.
- While there is no public transit service currently in the City, the demand for transit and ridesharing will likely increase in the future given projected traffic conditions and nearby employment.

7.2 NEXT STEPS

- Development of 2025 and 2040 model runs based on the future year household and employment projections developed by the City to determine projected roadway conditions.
- Gather input from the 2040-TP Steering Committee to identify more detailed peak period deficiencies and solicit comment on the Goals, Objectives and Performance Measures.
- Conduct field surveys along key corridors to further identify roadway characteristics, peak period deficiencies, and areas of pedestrian demand without sidewalks.
- Collect right-of-way information in order to develop potential alternatives to promote Complete Streets throughout the city.

- Develop a list of roadway projects that reflect community objectives and also service existing and projected travel demands.
- Develop an implementation plan based on input from the 2040-TP Steering Committee and the public.

APPENDIX A: REVIEW OF PREVIOUS STUDIES AND PLANS

This section provides a review of relevant plans and studies that contain recommendations warranting consideration in development of 2040-TP. The following documents are summarized in this section:

- Madison Growth Plan
- West Side Master Plan
- Parks and Recreation Master Plan
- City of Madison Americans with Disability Act (ADA) Transition Plan
- City of Madison Comprehensive Plans
- Huntsville MPO Long Range Transportation Plan
- Huntsville MPO Bicycle and Pedestrian Plan

Of the documents listed above, the Madison Growth Plan and West Side Master Plan provide the most relevant insight on local transportation issues and needs for inclusion in 2040-TP. This is due to their recent completion dates, focus on multimodal transportation, and level of public and stakeholder input into both efforts.

MADISON GROWTH PLAN

Completed in 2012, the Madison Growth Plan identifies the areas in Madison with the highest potential for growth and redevelopment and lays out a vision for each of those areas. The Madison Growth Plan presented citywide policy recommendations as well as recommendations tailored to the specific strengths, character and needs of each "Key Development Area" or KDA. The plan consisted of four primary steps:

- Phase I: Inventory and Assessment
- Phase II: Framework Development
- Phase III: Growth Plan Development
- Phase IV: Action Plan and Implementation

The Madison Growth Plan contains the most relevant recommendations for City policy due to its recent completion, depth of its recommendations, and citywide applicability.

The contents and findings of the Madison Growth Plan related specifically to transportation and mobility needs are highlighted in the following paragraphs. The key findings are provided from a citywide perspective and for each of the six KDAs, which consist of:

- "Midtown" Madison (including the Historic Downtown core)
- Highway 72 (the corridor from Slaughter Road to County Line Road)
- Old Madison Pike (focused on the segment from Miller Plaza to the City line)
- South of I-565 (including portions of Madison Boulevard)
- County Line Road (from Highway 72 to I-565)
- Western Growth Area (most of Madison within Limestone County)

Citywide Issues, Needs and Recommendations

The identified issues, needs and recommendations with citywide applicability are summarized in the following points:

- Traffic congestion is an emerging problem in some developed areas. The Highway 72 corridor was mentioned as a noted hot spot in local traffic issues.
- Four overall strategies were developed for the city:
    - Maintain the integrity of the existing transportation system by managing access to public streets and encouraging good transportation design in new development projects.
    - Develop an appropriate street system in new growth areas.
    - Be sensitive to roadside context when planning new or modified transportation projects.
    - Consider the needs of all transportation users in planning and designing new or improved transportation facilities. Encourage alternative modes of travel through design and policy decisions.
- Connectivity and infrastructure in general are concerns as the city ages. While Madison has a growing greenway network, sidewalks throughout the city are disconnected and inconsistent.
- Many comments cited a need for additional parks and greenways.
- Encouraging the design and construction of new bicycle and pedestrian facilities is an excellent way to support and encourage citizens to make alternative transportation choices, which is the premise for Complete Streets. The Growth Plan also presents examples of roadway designs for Major Arterials, Minor Arterials and Collectors.
- A safer and more complete pedestrian network is needed to serve an aging population.
- One of the biggest transportation challenges of recent years has been the scarcity of funding to pay for needed projects. By all reasonable projections, the funding challenge will become more pronounced in future years as dollars appropriated for transportation at the federal and state levels continue to shrink.
- Within the City of Madison, access management techniques should be considered for all major and minor arterials (Highway 72, County Line Road, Balch Road, Wall Triana Highway, Hughes Road, Slaughter Road, Eastview Road and Madison Boulevard).
- As new developments are proposed in Madison, the City should consider requiring a traffic impact study for projects that will produce a net increase in vehicular trips of 100 or more in a peak hour.
- Citywide goals for transportation included:
    - Enhance walkability throughout the City by ensuring that new and improved roads include integrated sidewalks, trails and multi-use paths where appropriate.
    - Use access management strategies to maintain (and in some cases improve) the performance of the existing street network.
    - Ensure that growing areas have a connected hierarchical street network planned or in place to accommodate that growth, with stronger focus on connections to key intersections, nodes and development.
- Recommended citywide initiatives included:

- Bicycle/Pedestrian Plan – A two-fold approach should look at establishing and improving connections to existing neighborhoods, and creating a framework within which future development is served by the network.
- Complete Streets Standards – Create guidelines to ensure that, where desirable and appropriate, sidewalks, trails and bicycle facilities are designated for and designed into new roads and existing roads scheduled for improvement.
- Access Management Plan – Focusing primarily on arterials, outline a framework to reduce or moderate curb cuts and driveways, and to encourage interparcel access and shared frontage access.
- Future Street Network Plan – Applicable primarily in Limestone County and the area of the city south of I-565, the Major Street Plan effort should be expanded to identify and plan for future roadways and connections.

"Midtown" Madison KDA Issues, Needs and Recommendations

The "Midtown" Madison KDA connectivity goals for transportation included:

- Develop an alternative mode network of sidewalks, trails and greenway paths that connect among the various points of interest within and around the KDA.
- Include connections to residential areas to improve overall mobility.
- Upgrade accessibility to the Historic Downtown, such as through improvements on Sullivan/Wall Triana. Any projects undertaken should include accommodations for alternative modes in addition to traffic improvements.

Recommended initiatives for the "Midtown" Madison KDA included:

- Madison Boulevard Streetscape Improvements – In concert with redevelopment efforts and the wayfinding program, develop an aesthetic upgrade project roster for improving the ROW of the corridor.
- Sullivan/Wall Triana Roadway Enhancements – In concert with wayfinding efforts, improve operations along Sullivan, particularly between Madison Boulevard and the Historic Downtown.
- Greenway Trail Network Feasibility Study – Based on the initial Greenway Network, look at more detailed engineering for developing a sidewalk and trail system within the KDA, and with connections to the wider network beyond.
- Parking Study – To support a downtown "destination" commercial node, develop a parking management plan to address the parking needs of retailers and residents. On-street parking is necessary to support area merchants and must be accommodated in a way that is not intrusive to adjacent neighborhoods. The plan should also address parking management for special events.

Highway 72 KDA Issues, Needs and Recommendations

The Highway 72 KDA connectivity goals for transportation included:

- As additional east-west street network connections are difficult or impossible to create, look for opportunities to expand the city-wide greenway network to alleviate some of the volume on Highway 72.

- The traffic environment of Highway 72 (speed and volume of traffic) is not compatible with pedestrian and bicycle needs. As the corridor redevelops, improve conditions for alternative modes. The first initiative should focus on getting bicycle/pedestrian access to and across Highway 72 from intersecting north-south corridors. Access along the corridor is a lower priority and should be done in concert with a larger highway improvement project.
- Traffic signal timing and access management are critically important to maximizing the existing capacity of Highway 72. Make necessary improvements to these areas through a cooperative effort between the City of Madison, the Alabama Department of Transportation (ALDOT), and the City of Huntsville.

Recommended initiatives for the Highway 72 KDA included:

- Signal System Timing – Request a project through the Huntsville MPO and ALDOT to optimize traffic signal timing on Highway 72. Timing should be optimized every three to five years.
- Roadway Enhancements – Segments will require additional study, but transportation upgrades will be necessary to improve traffic flow along the corridor. Solutions may vary segment by segment, but will likely include improvements to signalization, lane operation and road widening.

Old Madison Pike Issues, Needs and Recommendations

The Old Madison Pike KDA connectivity goals for transportation included:

- Of primary importance, make improvements to link Old Madison Pike to the east (some are in process). To maximize efficacy, consider alternative modes, as allowed by right-of-way.
- Making this KDA a hub for the future greenway network, provide connections east to the Huntsville trailhead; west to the YMCA, skate park, Dublin Park and Downtown; and north and south to residential neighborhoods.
- As development occurs between Old Madison Pike and the rail corridor, create an internal street network to maximize connectivity and minimize impact on existing streets.

Recommended initiatives for the Old Madison Pike KDA included:

- Gateway Implementation – An entry gateway at the Slaughter Road intersection would welcome drivers coming from Research Park and potential pedestrians and cyclists coming from the trailhead.
- Roadway Enhancements – Continue traffic operation improvements and streetscape upgrades. Focus first on intersection improvements at Old Madison Pike and Slaughter Road. New street connections to Zierdt Road and Portal Lane will be important for system connectivity as the area develops. Construct each new street connection with bicycle and pedestrian accommodations.
- Greenway Network Planning – As a potential network hub, identify likely routes and typologies for sidewalks, bike routes, paths and trails.

South of I-565 (and portions of Madison Boulevard) Issues, Needs and Recommendations

Transportation connectivity goals for the KDA south of I-565 included:

- Create a new interchange at I-565, providing direct access into the KDA. This will support the area's retail and office, provide better connections for new development, and improve traffic flow within the rest of Madison by reducing the strain on the existing adjacent interchanges.

- Improve existing connections under I-565 to mitigate current choke points, especially for commuters. Wholesale reconfiguration might be prohibitively costly, so the approach may consist instead of signalization and timing upgrades.
- If the quarry can be reinvented as a park, expand its reach by forging greenway connections throughout the KDA, and to Zierdt Road in particular.
- Preserve capacity on Madison Boulevard from future deterioration through access management. In particular, the section of Madison Boulevard between Sullivan Street and Intergraph Way could benefit from an access management retrofit.

Recommended initiatives included:

- Interchange Planning – The timeline for conducting and obtaining approval for an Interchange Justification Study can easily take three to five years. Due to the importance of an interchange to high-density development, it will be important to get this process started as soon as possible.
- Greenway Network Planning – This initiative will be based on connections with a new quarry park and linking into bike paths associated with the Zierdt Road extension.
- Access Management – Working with ALDOT, prepare an access management plan for Madison Boulevard.

County Line Road Issues, Needs and Recommendations

County Line Road KDA connectivity goals for transportation included:

- County Line serves not only as an important traffic connection, but also as an entry into Madison from the north and south. Develop formal gateways at (or near) both the Highway 72 and I-565 intersections.
- As the corridor develops, implement sidewalks and bicycle facilities for the length of the route and on both sides of the thoroughfare. This will provide alternatives to driving and help reduce traffic. Additionally, pedestrian and bicycle facilities should be connected east and west, linking the neighborhoods to key destinations on the corridor.
- The Madison Major Street Plan recommends widening County Line Road to a six-lane facility as a low priority project. The City is cautioned that a six-lane facility would not be compatible with a strong bicycle and pedestrian environment. A four-lane median divided facility with access management would accommodate the projected 20-year traffic forecast, be more economically feasible, and in line with adjacent land uses.

Recommended County Line Road initiatives included:

- Gateways – In concert with intersection improvements (as need) and consistent with a broader “branding” effort, implement gateway treatments at the intersections with Highway 72 and the new I-565 interchange.
- Mill Road Realignment – For functional traffic flow and to improve the safety of the pedestrian crossing environment, develop a plan to replace the current offset alignment with a true four-way stop at Mill Road.
- Greenway Network Planning – Identify routes and trailhead locations for additional greenway infrastructure.

Western Growth Area

The Western Growth Area KDA connectivity goals for transportation included:

- For traffic flow and accessibility, add and improve connections to County Line Road and Highway 72. While the street network is the main thrust of efforts, to the greatest extent possible new and reconfigured roads should include sidewalks, bike lanes and/or multiuse paths. If bicycle/pedestrian accommodations are incorporated into all new or reconfigured streets, then off-system trails may be duplicative.
- The existing street network has large gaps in service both east-west and north-south. Lay out a network in advance to more easily shape the desired vision for future development within that network.
- As new roads are planned in this area, consider roundabouts (where appropriate) as a safer and operationally sound intersection treatment.
- Develop new residential neighborhoods with a high level of street connectivity, avoiding cul-de-sacs and dead-end streets.

Recommended initiatives for the Western Growth Area included:

- Roadway Network Planning – Before development overtakes the KDA, the City should plan and begin construction on a well-connected street grid for their Limestone County jurisdiction.
- Greenway Network Planning – This can occur in parallel with the roadway network effort, but should look at both on-street and off-street options for creating a comprehensive alternative-mode network.

Recommended Improvements

A specific list of prioritized improvements was develop based on the transportation recommendations detailed in each of the KDAs. Some of these improvements, e.g. County Line Road widening, have since been completed. These priorities will be re-examined based on the needs documented in this report during development of the implementation strategy, at the conclusion of the 2040-TP effort.

West Side Master Plan

The West Side Master Plan, completed in 2016, developed an overall vision to guide growth and future development in the city's west side, which contains more than 25 percent of Madison's total land area. The plan was completed in response to the high number of rezonings in the area: in the first half of 2016, the West Side contained 2,734 lots in approved or constructed subdivisions (totaling 2,196 acres of land), with another 145 lots in pending rezoning requests. That amounted to about 20 percent of the total area of the West Side, including unbuildable areas such as floodways and water bodies. The West Side Master Plan utilized public input and existing conditions assessments to develop an overall vision for the area.

Existing Mobility Conditions

Mobility was one of the elements assessed in the existing conditions analysis. The highlights from the mobility assessment include:

- With respect to multimodal transportation, the types of facilities that were considered for transportation purposes were streets, sidewalks, multi-use paths and bikeways. Greenways and trails were considered more as recreational facilities.

- The Plan identified the new I-565 interchange at County Line Road as a means to make County Line Road an even more prominent gateway into the city and the most prominent gateway in the West Side.
- Most existing streets in the West Side have remained largely unimproved. Originally designed and constructed to handle rural, agricultural traffic, these streets are now seriously challenged by significantly increased traffic related to large residential subdivisions.
- Nearly every major street in the planning area will need improvement to handle the expected traffic that continued construction will generate. Achieving this will be extremely challenging given the limited resources available for street improvements.
- With the exception of the shared use paths currently under construction along County Line Road, few facilities for non-motorized travel exist in the West Side that are not isolated within subdivisions. Subdivisions frequently include sidewalks, but there is no network providing continuous mobility that they can connect to, either existing or planned. There are also no direct pedestrian connections between adjacent residential areas and commercial centers, schools or other institutions.
- The only forms of public transit that currently exist in Madison are the Madison Assisted Ride System (MARS) operated by the Parks and Recreation Department and school buses that transport children to Madison City Schools. While it is doubtful that a funded public transit system will exist to serve the citizens of Madison over the term of this plan, it is possible that the City could be part of a larger regional effort to begin planning and building for some form of regional transit. Dispersed, low density, and erratic land use patterns make efficient transit impossible to plan and operate. In order to position itself to take advantage of future regional efforts, Madison should plan now by creating higher density, mixed-use centers in the West Side that can serve as transit stops whenever such a system is put into place.

The Plan Vision

The West Side Master Plan's vision builds off the overall vision goal: "To create a vibrant, connected community for all ages that grows in a way that is fiscally healthy, forward thinking and environmentally sound." The overall vision was applied to the "Vision Elements" – place types, key amenities, street network, street types and street trees – which were combined to develop an overall vision map for the study area. Of these elements, street network and street types are most applicable to the 2040-TP effort. Highlights from these elements are summarized in the next paragraphs.

Street Network Vision Element

Guiding principles for the future street network are intended to ensure a balanced, attractive and efficient mobility network:

- Streets should respect the context of adjacent built environments and natural areas.
- Streets should support all modes of travel, where contextually appropriate, to foster the ability for people to choose how they move through and within the West Side.
- Streets should strike a balance between appropriate vehicular operational efficiency and safety for all users, regardless of their choice of travel mode.
- The City should work with ALDOT on facilities under ALDOT jurisdiction to achieve Complete Streets within the State system.

- Street design should support the types of development and redevelopment appropriate for the place type in which they occur.

Street Types Vision Element

Three different street types were identified for the West Side study area: Parkway, Avenue, and Local. Design standards developed for each street type addressed the following elements:

- Number of Lanes
- Pedestrian Facilities
- Bicycle Facilities
- Drainage
- Streetscape
- Furnishings
- Lighting

The design standards also offered a recommended cross section and alternative cross sections for each of the three street types. In addition, specific dimensions were recommended for the design components:

- Right-of-Way Width
- Median/Turn Lane Width
- Travel Lane Width
- Tree Lawn Width
- Side Path/Sidewalk Width
- Side Path/Shared-Use Path Width
- Parking (on or off-street)
- On-Street Bike Facility Type and Width

The design standards for the three roadway types will be considered during the development of the overall project needs and implementation strategy at the conclusion of the 2040-TP planning effort.

Proposed Improvements

The West Side Master Plan recommended nine specific roadway projects to improve connectivity throughout the area, which are discussed in further detail in Section 5 of this report. As with the proposed improvements resulting from the Growth Plan, these improvements will be considered during development of the 2040-TP recommendations.

Parks and Recreation Master Plan 2025

The Parks and Recreation Master Plan, completed in 2014, serves as the primary guiding document for improving, expanding and managing the City of Madison's parks system through 2025. The Plan establishes an open space and greenway system that links key cultural, recreational and civic destinations throughout the city and fosters development of a parks system that builds on the city's character and quality of life. The Plan also sets priorities on how and where funding will be allocated to best meet the community's needs and desires.

The Parks and Recreation Master Plan vision encompassed five primary aspirations that underlie the goals, recommendations and strategies for system expansion and enrichment. The City envisions a parks and recreation system that will be:

- A center of community life
- Abundant in active and passive recreation opportunities, natural areas and designed spaces
- For all ages—children, young adults, adults and seniors
- A system of walkways, greenways, trails and parks that weaves the community together
- Composed of premiere facilities that support economic development through visitation

The Plan laid out four goals, each supported by a number of specific measures:

- Our parks system is balanced and inclusive
- Our parks are well-maintained
- Parks and greenways connect us all
- Our recreational facilities are high quality

As part of the plan development process, a detailed inventory and analysis of all City parks and recreation lands/facilities was conducted. The Plan included 11 key recommendations:

- Create a Downtown Recreation Campus
- Acquire Property/Build a Community Park
- Civic Park
- Midtown Green Street Network
- Palmer Park Renovation
- Quarry Park
- Greenways, Complete Streets and Nature Trails
- Dublin Park Renovation
- Existing Parks and Facilities
- Senior Center
- Outdoor Event Space

Although the City anticipates its current park land is sufficient in total to fulfill demand through 2025, the park land is not distributed ideally within the city. The City has set a target of maintaining a ratio of about two acres per 1,000 residents in neighborhood park space. To support the desired future growth of the system, the Plan included siting criteria to be used in the process of evaluating property for parks acquisition. The Plan also included rules of thumb for balancing active, passive and conservation uses within park sites.

The Parks and Recreation Master Plan included an implementation action plan, which categorized projects as Tier 1 (within 5 years) or Tier 2 (within 10 years) priorities. Each of the two tiers addressed capital improvements as well as planning and operations. The Plan also discussed parks funding (capital and operations) as well as a number of public and private funding sources beyond municipal funds.

City of Madison Americans with Disability Act (ADA) Transition Plan

In 2016, the City of Madison completed its Americans with Disabilities Act (ADA) Transition Plan. The purpose of the ADA Plan was to develop a strategy to better accommodate the need for accessible paths in the public right-of-way that ensure equal means of access to all people, including the disabled. As a public entity of over 50 employees, the ADA requires the City of Madison to develop a transition plan. According to federal regulations the plan shall, at a minimum:

- Identify physical obstacles in the public entity's facilities that limit the accessibility of its programs or activities to individuals with disabilities.
- Describe in detail the methods that will be used to make the facilities accessible.
- Specify the schedule for taking the steps necessary to achieve compliance with this section and, if the time period of the transition plan is longer than one year, identify steps that will be taken during each year of the transition period.
- Indicate the official responsible for implementation of the plan.

Of the Plan's contents, the following pertain most to the development of the 2040-TP:

- Four types of facilities were evaluated within the Plan: sidewalks, curb ramps, signalized intersections and street parking.
- Sidewalks were inventoried through GIS mapping and the observation of aerial maps of the City. From the inventory done in December 2014, it was determined that the city contained approximately 220 miles of sidewalks. These sidewalks are generally of concrete or asphalt construction and are generally 4-5 feet wide. Inventory updates will be completed every 1-2 years.
- Curb ramps were also inventoried through GIS mapping. The city contained approximately 1,775 curb ramps as of December 2014. The curb ramps are of concrete construction with a width of 4 feet.
- The City of Madison has 42 signalized intersections. Of these, 20 have pedestrian accessibility.
- Based on the general evaluations, the City can reasonably deduce that most of its sidewalks, ramps, and driveways are noncompliant. About 150 miles of sidewalks are non-compliant, and about 1,700 ramps are non-compliant. In addition, the City has found multiple issues related to age that have caused pedestrian facilities to become non-compliant. Some issues include gaps caused by a 0.5 inch expansion by design, offsets, and landscape encroachments.
- Improvement strategies include the following:
    - City streets that are improved or upgraded will ensure ADA compliance throughout the course of the project.
    - During upgrades or replacements to equipment in traffic signal panels, the City will upgrade the intersection and ensure compliance.
    - In order to satisfy ADA law, the City will also remove certain sidewalks, ramps, etc., in addition to improvements and new facilities, to ensure compliance.

City of Madison Comprehensive Plan

The City of Madison Comprehensive Plan was originally adopted in 1995. An Executive Summary was added as part of the 2001 update, and all adopted policy revisions through August 2006 are noted in the current document. Over the years, the document has been expanded to include the 2025 Transportation Master Plan

and 2003 Madison Greenway and Trails Master Plan. In addition, the plan has been amended by the subsequent approvals of the Madison Growth Plan, the Madison Parks & Recreation Plan, and the West Side Master Plan.

In addition to listing land use categories and permitted uses, the original plan includes an inventory of vacant lands and the acreages needed by land use category to support projected population growth through 2010. Transportation is covered in the original document through a brief discussion of existing traffic circulation conditions and listing of projects identified as current needs that were completed.

2025 Transportation Master Plan

The 2025 Transportation Master Plan that is incorporated in the Comprehensive Plan document was completed in 2001. A roadway classification system was developed that included interstates, arterials, collector roads, and local streets, for a total city roadway network of 156 miles. The report noted that three major roadways provide east-west regional access – I-565, Highway 72, and Madison Boulevard – but that there are no north-south regional access routes within the city. North-south regional access is provided by I-65 to the west and US 231 and US 431 to the east. At that time, five planned roadway improvements were included in the City's existing Capital Improvement Program. Of those, all but one has been fully completed. The extension of Balch Road from Browns Ferry Road to Madison Boulevard was only completed as far south as Mill Road.

Not surprisingly, the greatest daily traffic volumes in 2000 were experienced on I-565, which carried 53,400 vehicles per day. The largest volumes on non-interstate roadways were experienced on Highway 72, Madison Boulevard and Wall Triana Highway, ranging from a high of 36,700 to a low of 28,700 trips per day. The other major roadways were Hughes Road, Madison Pike and County Line Road, with volumes ranging from 16,300 to 10,300 trips per day. Level of service (LOS) deficiencies were identified as segments with daily traffic volumes approaching or exceeding the roadway capacity, with LOS E volumes at 75-100 percent of capacity and LOS F exceeding 100 percent of capacity. Existing roadway deficiencies were identified on:

- Highway 72 from west of Hughes Road east beyond the study boundary (east of Slaughter Road)
- Wall Triana Highway from Gillespie Road south to Front Street
- Madison Boulevard from Wall Triana Highway/Sullivan Street east beyond the study boundary
- Wall Triana Highway/Sullivan Street between Madison Boulevard and I-565
- I-565 from Wall Triana Highway/Sullivan Street east beyond the study boundary

The study area was divided into 37 traffic analysis zones (TAZs), which allows for a better determination of roadway demand by considering the interrelationship between transportation and land use, under both current conditions and future projections. Travel demand modeling was used to project future travel demand along the roadway network based on future land use projections. Rather than using a particular horizon year for the future forecast, the plan was developed assuming the City of Madison was "built out." The analysis results projected that practically every major roadway within the study area would operate under deficient conditions – most at LOS F – without additional improvements.

A Major Street Plan was developed to alleviate existing congestion and mitigate anticipated future capacity deficiencies. In addition to constructing new roadways and widening existing roadways, the report also recommended the City pursue access management strategies as a means to protect existing and future roadway capacity. The Major Street Plan prioritized recommended projects as high (years 0-5), medium (years 5-8), and

low (years 8-10) based on implementation period. A total of 14 projects were included in the Major Street Plan. They are identified by priority below (along with their current status in parentheses):

- High Priority
  - Extend Balch Road from Browns Ferry Road to Madison Boulevard (partially complete; extended to Mill Road)
  - Extend Gillespie Road from Balch Road to County Line Road (complete)
  - Extend Eastview Drive from Hughes Road to Wall Triana Highway (complete)
  - Widen County Line Road from the railroad to Madison Boulevard (complete)
- Medium Priority
  - Extend Royal Drive from Westchester Road to Balch Road Extension (not possible until Balch Road extension to Madison Boulevard complete)
  - Widen Mill Road from County Line Road to Hughes Road (not complete; identified as a Visionary project by the MPO)
  - Widen Wall Triana Highway from Royal Drive to Front Street (proposed as a 4-lane; road is currently a 3-lane facility)
  - Modify the I-565 Interchange at Airport (no current plans to improve that location)
- Low Priority
  - Widen Balch Road from Highway 72 to Balch Road Extension (roadway is widened from Highway 72 to Wann Drive; the remainder has been changed to a shoulder widening with resurfacing)
  - Extend Zierdt Road from Shelton Road to Old Madison Pike (not complete; identified as a Visionary project by the MPO)
  - Widen Wall Triana Highway from Mill Road to Highway 72 (not complete; identified as a Visionary project by the MPO)
  - Extend Portal Lane from Shelton Road to Zierdt Road (not possible until Balch Road extension to Madison Boulevard complete)
  - Widen Hughes Road from Madison Pike to Highway 72 (not complete; identified as a Visionary project by the MPO)

It should be noted that the Highway 72 widening throughout the entire study area was not assigned a priority because it was assumed to be constructed by ALDOT to six lanes. This project is currently in the Huntsville MPO's fiscally-constrained improvements list.

The results of study activities documented in the plan indicated that many of the projected future deficiencies would be mitigated by the recommended improvements. Roadways remaining deficient included:

- LOS E
  - County Line Road from Gillespie Road to Madison Boulevard/I-565
  - Royal Drive-Westchester Road from Balch Road to Madison Boulevard
  - Wall Triana Highway from Gillespie Road to Front Street
  - Hughes Road from Eastview Drive to Madison Boulevard
- LOS F
  - Madison Boulevard throughout the study area
  - I-565 throughout the study area

- Wall Triana Highway/Sullivan Street from Front Street to I-565
- Highway 72 throughout the study area

Goals, Objectives and Policies

The Goals, Objectives and Policies section of the Comprehensive Plan addresses land use and traffic circulation. Changes resulting from the "EAR Update" and "2001 Update" are specifically noted for each policy.

I. Land Use

Goal: The City of Madison will: Strive to provide for balanced growth in all of its land use decisions, basing those decisions on the health, safety, welfare, and economic well-being of the citizens of Madison; permit development only in such locations and at such times as it deems to be in the public interest; ensure that all future development is compatible with the land which supports it as well as the character of the community; and permit only those developments of land that are environmentally suitable for the City.

The objectives outlined for accomplishing the land use goals included:

1. Infrastructure Management (8 policies)
2. Compatibility with Characteristics of Land (7 policies)
3. Density and Intensity Controls (4 policies)
4. Redevelopment Areas (7 policies, including one reserved)
5. Incompatible Uses (9 policies)
6. Preservation of Natural Areas (10 policies)
7. Preservation of Downtown's Historic Character (6 policies, including one reserved)
8. Aquifer Recharge Related Land Use Regulations (5 policies)
9. Planning for Future Land Uses and Annexations (7 policies)
10. Aesthetic Control Ordinances (3 policies, including two reserved)
11. Airport Compatibility Planning (12 policies)
12. Revision of Subdivision and Zoning Regulations (2 policies)
13. Growth Management and Annexation (19 policies)
14. Regulations on Temporary Uses (4 policies)
15. Flexible Zoning Techniques (3 policies)
16. Future Public Facilities Element (new)
17. Greenways, Trails, and Habitat Preservation (new)

II. Traffic Circulation

Goal: It is the goal of the City of Madison to provide a safe, convenient and economical traffic circulation system, with sufficient capacity to move people, goods and services throughout the City.

The objectives outlined for accomplishing the land use goals included:

1. Access Control Standards (3 policies)
2. Protect Right-of-Way for Future Expansion (4 policies)
3. Consistency with County and State Transportation Planning (6 policies)
4. Integrated Transportation System that Encourages Nonvehicular Modes (7 policies)
5. Regionally Integrated Transportation System (6 policies, including one reserved)

Within the traffic circulation section, several important items were included in specific detail:

- Policy 1.3 requires a permit for new access to the following roads: US 20, Highway 72, Hughes Road, Wall Triana Highway/Sullivan Street, Eastview Drive, Highland Drive, Miller Boulevard, Palmer/Front Street, Shelton Road, Stoneway Trail, Madison Pike/Browns Ferry Road, Gillespie Road, Gooch Road, Royal Drive, Kyser Boulevard, Lanier Road, Celtic Drive, all streets in the Historic District, Slaughter Road, Mill Road, and other streets as provided by Planning Commission resolution.
- Policy 2.1 identifies existing and new roads and/or roadway segments to be included on a right-of-way protection map consistent with ultimate development of laneage:
    - Existing Roads: Hughes Road, Sullivan Street, Wall Triana Highway, Eastview Drive, Highland Drive, Miller Boulevard, Palmer Road, Shelton Road, Mill Road, Madison Pike, Browns Ferry Road, Gillespie Road, Balch Road, County Line Road, Highway 72, US 20, and Zierdt Road.
    - New Roads: Gillespie Extension, Eastview Extension, Balch Extension, Shelton/Madison Pike (note that Portal Extension and Browns Ferry Extension were later struck from the initial list).
- Policy 3.6 calls on the City to work with the State to add two additional lanes to Highway 72 within the City limits by 2015.
- Several policies related to non-motorized transportation under Objective 4 were determined to be no longer needed and/or were deleted in subsequent plan updates. However, several important policies still stand:
    - Policy 4.1 compels the City to develop an integrated bikeway/trails system that links as many public spaces in Madison as possible, with emphasis on parks and schools.
    - Policy 4.2 requires sidewalks in all new subdivisions, with trails linking subdivisions to schools and/or parks required when such facilities are nearby.
- Policy 5.5 requires a site impact traffic evaluation for proposed rezonings and land use map changes where there is an increase in intensity or density, and the developer may be required to mitigate the impact of the project on the City's roadway network.
- Policy 5.6 adopts LOS D as the acceptable level of service on Sullivan Street/Wall Triana Highway, Hughes Road, and Mill Street from Wall Triana Highway to Hughes Road. The acceptable LOS for all other roads is C/D.

Madison Greenway and Trails Master Plan

Adopted in 2003, the Madison Greenway and Trails Master Plan had a two-fold mission: to preserve the city's more scenic and historic areas, and to provide adequate non-vehicular circulation to destinations in the city. At the time of the plan's development, only one multi-use corridor existed, stretching from the intersection of Hughes Road and Gooch Road and traveling south to Madison Boulevard. Small stretches of sidewalk also existed around the city. Natural walking paths were located on Rainbow Mountain near Stoneridge Park, as well as on land owned by The Land Trust of North Alabama near Mill Creek Crossing subdivision.

The plan designated four types of mode on its Future Greenway and Trails Map:

- Multi Use Corridor (MU) – paved surface, relatively flat and smooth, and wide enough to accommodate all types of users at the same time

- Bikeways Corridor (BK) – striped portion of existing or newly widened roadway
- Sidewalks Corridor (S) – paved concrete pathways, often used in combination with Bikeway Corridors
- Natural Corridor (N) – dirt pathway in a natural area or old mail route; suitable for use by hikers and off road non-motorized vehicles (e.g., mountain bikes)

Future phases of the Greenway and Trail System were grouped by one of three priority ranks – high, medium or low – based on factors including relationship to other capital projects, other available funding sources, compatibility with surrounding land uses, importance in protecting the eco-system, linkage to other corridors, nearby residential areas and other destinations, and the potential usage it may generate. The Comprehensive Plan provided details on each greenway and trail future phase, including project name, map number, corridor type, project description, relationship to other Capital Improvement Program (CIP) projects, and priority and justification. Organized below by priority, the projects included:

- High
    - Balch Road, Phase 1 (S/BK)
    - Bradford Creek, Phase 1 (MU)
    - Celtic Drive (S/BK)
    - Eastview, Phase 1 (MU)
    - Gillespie Road, Phase 1 (MU)
    - Highland Drive (S/BK)
    - Mill Creek (N)
    - Old Madison Pike (S)
    - Rainbow Mountain (N/S/BK)
- Medium
    - Balch Road, Phase 2 (MU)
    - Bradford Creek, Phase 2 (MU)
    - Browns Ferry Road (S)
    - County Line Road, Phase 1 (MU)
    - County Line Road, Phase 2 (S/BK)
    - Eastview, Phase 2 (MU)
    - Edgewater (S/BK)
    - Gillespie Road, Phase 2 (MU)
    - Historic District (S/BK)
    - Hughes Road (MU)
    - Mill Road (MU/BK/S)
    - Roma Drive (S)
    - Royal Drive (S/BK)
    - Wall Triana, Phase 1 (S/BK)
- Low
    - Bradford Creek, Phase 3 (MU)
    - Gooch Lane (S)
    - Kyser Boulevard (S/BK)

- Portal Lane (S)
- Shelton Road (S)
- Wall Triana, Phase 2 (MU)
- Zierdt Road (MU)

At the time the Parks and Recreation Master Plan 2025 was developed in 2013-2014, the City had initiated several projects recommended in the Greenway and Trails Master Plan, including: trails along Bradford and Mill creeks; sharrows on Highland Drive; multiuse path from Wall Triana to Hughes Road along Eastview Drive; and sidewalk installation on major roads in concert with new development. High priority projects still to be constructed included: Rainbow Mountain sidewalk connections; Balch Road (proposed extension from Mill Road to Madison Boulevard) sidewalks and bike lanes; Gillespie Road multiuse path (Balch Road to County Line Road); and Celtic Drive sidewalks and bike lanes.

HUNTSVILLE MPO YEAR 2040 LONG RANGE TRANSPORTATION PLAN

Adopted in March 2015 and amended as recently as December 2016, the Huntsville MPO Long Range Transportation Plan (LRTP) serves as a decision guide for major transportation improvements in the Huntsville area over a 25-year planning horizon, with an emphasis on the next 3-5 years. As a multimodal plan, the LRTP addresses all modes of travel – roadway, bicycle, pedestrian, transit, and freight. The LRTP study area includes the Census determined urbanized area, as well as nearby lands expected to become more densely developed in coming years. As such, it includes the City of Madison in its entirety, along with adjacent lands on all sides (much of which is within the Huntsville city limits). Projections for 2040 show major growth in both households and employment. Household growth is expected in the historically high-growth areas in northern and western Madison County, which includes the City of Madison. Furthermore, much of the employment activity is located immediately east of Madison, at Cummings Research Park, Redstone Arsenal, and major industrial and technology parks (including those at the nearby Huntsville International Airport).

The 2040 LRTP includes a number of roadway improvement projects – both financially constrained and visionary – to address capacity and operational needs. Due to the significant recent and projected growth within the western portion of the study area, it is not surprising that improvements are identified along the majority of key north-south and east-west corridors within the City of Madison. The LRTP includes a detailed illustration (Map 4.1) that identifies the corridor improvement projects by type (intersection and bridge projects, road projects, and interchange projects) and implementation (financially constrained or visionary), and which can be cross-referenced by Map Number to a more detailed project description (Tables 4.2-4.5).

Development of the MPO's Bicycle and Pedestrian Plan (contained within the LRTP) relied on information included in the 2035 LRTP, as well as more recent efforts by the area's jurisdictions. The City of Madison's 2025 Parks and Recreation Master Plan was an important resource for existing and planned facilities within the Madison city limits. Because interconnectivity with nearby facilities is essential for expanding the entire network throughout the MPO area, the City of Huntsville's Bicycle and Pedestrian Plan and its Greenways Plan were also key resources. As the LRTP states, encouraging the use of alternative means of transportation requires "linked" facilities and "coordinated" programs and services. The LRTP takes into consideration requirements for bicycle and pedestrian travel established by both the FHWA and MPO. The LRTP includes descriptions and locations of committed and future bicycle and pedestrian projects in Tables 7.1-7.2 and Map 7.1. The map identifies various

types of existing and planned facilities, including greenways, trails, pedestrian corridors, green streets, bike routes, bike lanes, road diets, and paved shoulders. A number of different facilities are located within the City of Madison, most of which continue into/connect to facilities in the surrounding area to form an expansive, interconnected network.

The Huntsville Urbanized Area is federally designated as a Transportation Management Area (TMA), requiring the MPO to develop and maintain a comprehensive Congestion Management Process (CMP). As part of the CMP, the MPO conducts a detailed analysis to identify current and future congestion problems on the network. The CMP report is contained within the LRTP. Several roadway segments within or adjacent to the City of Madison are identified as experiencing congested travel speeds less than or equal to 25 miles per hour. Comparison of travel time to work by subarea place of residence indicates an average travel time to work of approximately 19 minutes for Madison residents, which is actually less than many other subareas within the Huntsville MPO. As part of the CMP, network corridors were ranked with regard to their degree of congestion (under current conditions and/or by 2040). Two of the MPO's top ten congested corridors are within and immediately adjacent to the City of Madison. Highway 72 West from Hughes Road to Providence Main Street ranked #2, while I-565 from I-65 to Wall Triana Highway ranked #4. Specific congestion mitigation strategy recommendations were developed for these corridors. Planned roadway widenings and related operational improvements along these corridors are expected to enhance future mobility. A status update on segments recommended for action in the previous (2010) report was also presented, which addressed several segments within or adjacent to the City of Madison. Specifically, these included Highway 72 West from Hughes Road to Enterprise Way, Zierdt Road from Madison Boulevard to Edgewater Drive, and I-565 from County Line Road to Wall Triana Highway.