3 Needs Identification

3 Identification of Regional Transportation Needs

In order to determine transportation needs that the MTP would address, the study team conducted a deficiencies analysis of the transportation system within the Monroe Urbanized Area. Current land use and economic development plans in the region factored into the analysis, as did information gathered from the public visioning and engagement processes.

The needs assessment included both quantitative and qualitative evaluation of the transportation system for 2010 as well as for the forecast year 2040. The technical roadway analysis relied on a Travel Demand Model developed for the Monroe Urbanized Area, while quantitative and qualitative approaches were used to analyze the non-roadway elements of the transportation system. As a result, this chapter is divided into roadway and non-roadway needs assessments.

While the MTP update process used demographic forecasts throughout the needs analysis, the data was most relevant to the proper functionality of the travel demand model. Therefore, the demographic estimation and forecasting methodology is discussed in the roadway needs assessment section.

Roadway Needs Assessment

Current travel patterns, in combination with defensible assumptions regarding demographic and socioeconomic trends, are used to create estimates of future travel patterns. Travel demand models use demographic forecasts and estimate future demand on the transportation network both from vehicles as well as alternative modes of transportation. The modeling process identifies deficiencies on the roadway network that are currently occurring and those that are likely to occur in the future.

Travel Demand Model

Travel demand forecasting quantifies the existing and future interaction between supply and demand on the transportation system. The supply of transportation is represented by the characteristics of the roadway network, while the demand for transportation is created by the separation and intensity of urban activities. Land use forecasts provide estimates of where people will live and where businesses will locate in the future. These forecasts include the intensity of activity anticipated, such as the number of households or employees, and socioeconomic characteristics, such as income level and household size, which are prepared for small geographic areas called traffic analysis zones (TAZs). The service characteristics of the roadway and land use forecasts are direct inputs to the travel demand model.

The Monroe Travel Demand Model used in the Monroe Urbanized Area 2040 MTP is modeled in TransCAD version 6.0 and was developed by Neel-Schaffer, Inc. in conjunction with the Louisiana Department of Transportation and Development (LADOTD). The Monroe TDM is based upon a conventional four-step trip-based modeling approach. The traditional four major components of the travel demand model are:

- ***Trip Generation*** - The process of estimating trip productions and attractions at each TAZ.
- ***Trip Distribution*** - The process of linking trip productions to trip attractions for each TAZ pair.
- ***Modal Choice*** - The process of estimating the number of trips using a particular mode for each TAZ pair. Because of the low frequency of transit trips, pedestrian, and bicycle trips in the modeling area, this step was not performed.
- ***Trip Assignment*** - The process of assigning auto and truck trips onto specific highway facilities in the region.

More technical information about the modeling process can be found in Appendix B.

Socioeconomic Data Development

The following section describes the process for developing socioeconomic data for the Monroe Travel

Demand Model. More technical information about this process can be found in Appendix B.

Base Year (2010) Demographic Data

Prior to forecasting demographics (population and employment) to the year 2040, a base year for which existing demographic and land use data is available is first established. The purpose of selecting the base year is to provide a starting point from which to project population and employment growth. For the 2040 MTP, the year 2010 was selected as the base year.

The demographic data required as input into the trip generation programs can be subdivided into five major categories: population, occupied dwelling units (households), retail employment, non-retail employment, and school attendance. This data was compiled from several sources: population and housing from the 2010 Census, employment from a database of employers in the study area purchased from InfoUSA, and school attendance from the Department of Education and individual private schools.

Population

Population enters the trip generation equation in terms of calculating population per occupied dwelling unit by zone, which allows the distribution of units into household size categories. Population data for the base year, 2010, was obtained from the 2010 U.S. Census. In 2010, the total population of the study area was 153,720 persons with 148,186 persons in households, and 5,534 persons in group quarters (dorms, prisons, etc.). The base year study area population density by TAZ is shown in Figure 3-1.

Dwelling Units (DU)

The largest single type of developed land use in the study area is residential land. The number of dwelling units plays a major role in trip generation since many trips have an origin and/or destination in residential areas. Both total and occupied dwelling units were calculated from the 2010 Census, and were aggregated by TAZ.

In 2010, there were 64,481 total dwelling units in the study area; of that total, 58,691 (91%) were occupied. Occupied dwelling units were further classified by auto ownership and household size using the American Community Survey 5-year (2008-2012) Public Use Microdata Samples (PUMS) dataset and the 2010 Census data. The complete list of classifications that were developed to use in estimating the number of trips generated from each TAZ can be found in Appendix B.

Employment

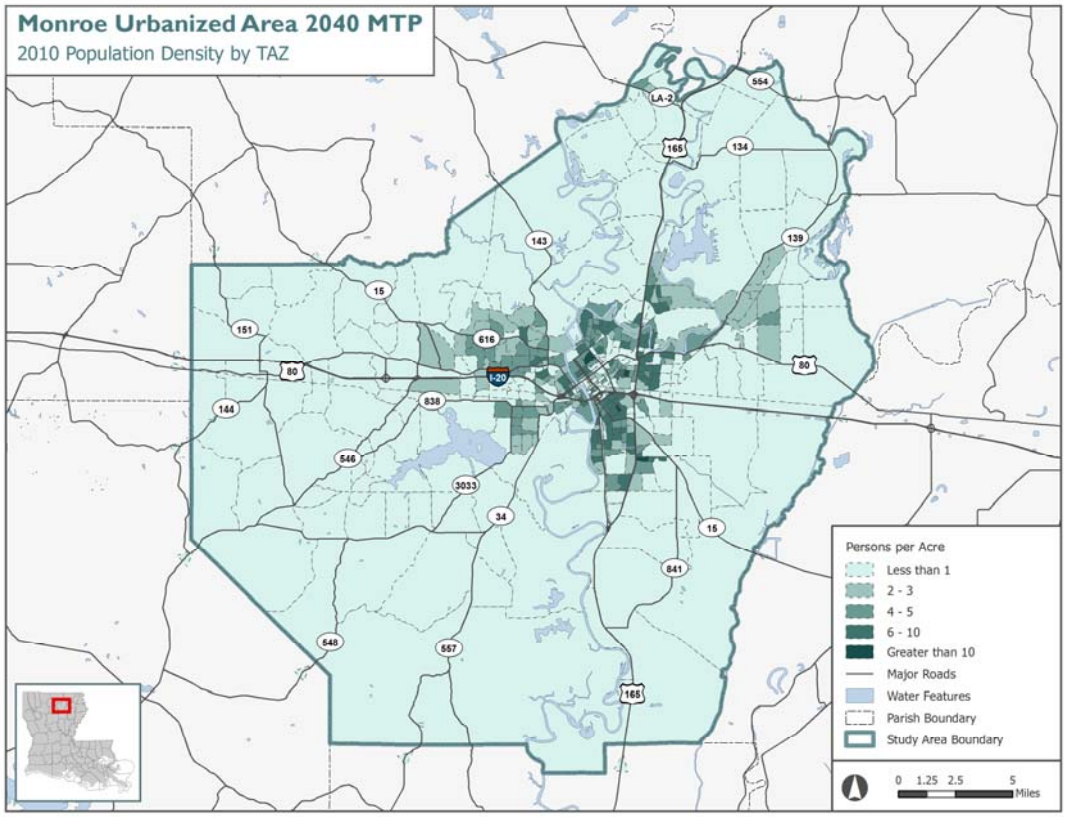
The location of employment centers has a major impact on travel in the area, particularly home-based work trips. A database of employers from InfoUSA was used to develop the various employment types in the study area based on the Standard Industrial Classification (SIC) codes assigned to the business. Total employment in the study area in 2010 was 76,770. For modeling purposes, employment types were organized into five categories. Table 3-1 shows the total employment figures for each classification, while Figure 3-2 maps the base year study area employment density by TAZ.

Table 3-1: Employment by Classification (2010)

Industry Classification	SIC	Total
Total Employment	n/a	76,770
Retail Employment	52-59	17,127
Agriculture, Mining and Construction Employment	1-19	4,106
Manufacturing, Transportation/Communications/Utilities and Wholesale Trade Employment	20-51	13,440
Government, Office and Services Employment	60-97	41,666
Other Employment	99	431

Source: InfoUSA; NSI, 2015

Figure 3-1: Study Area 2010 and 2040 Population Density



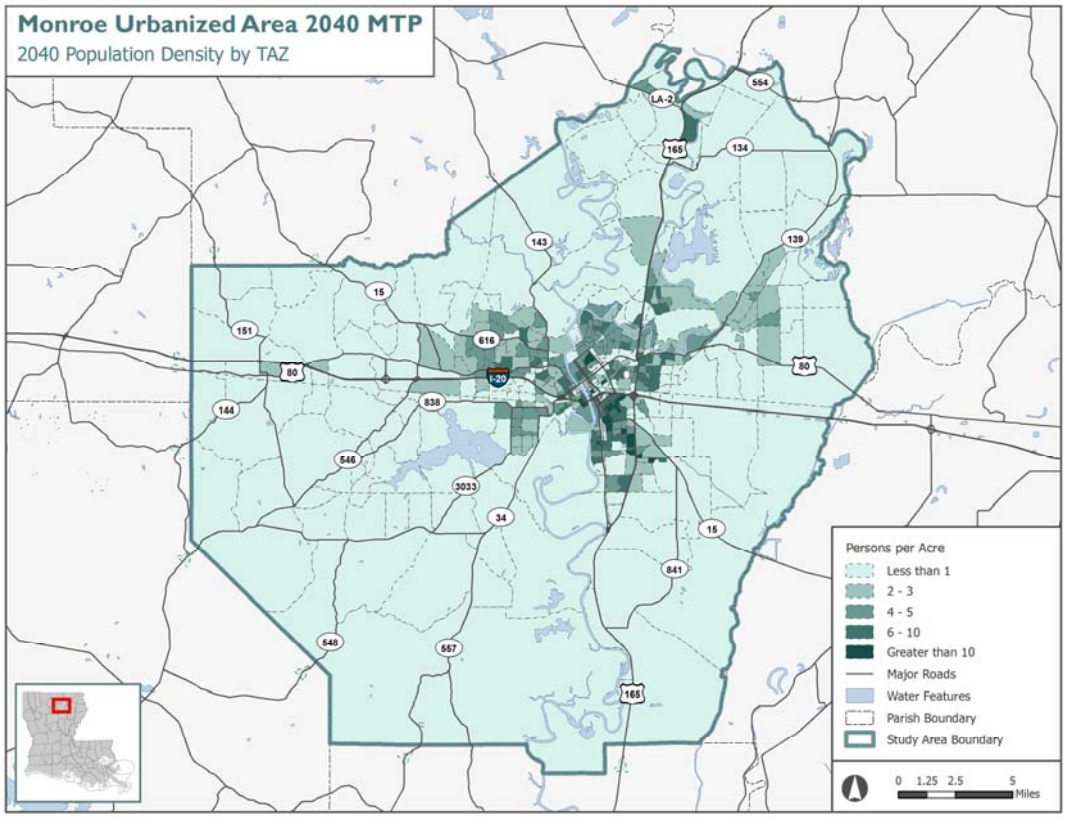
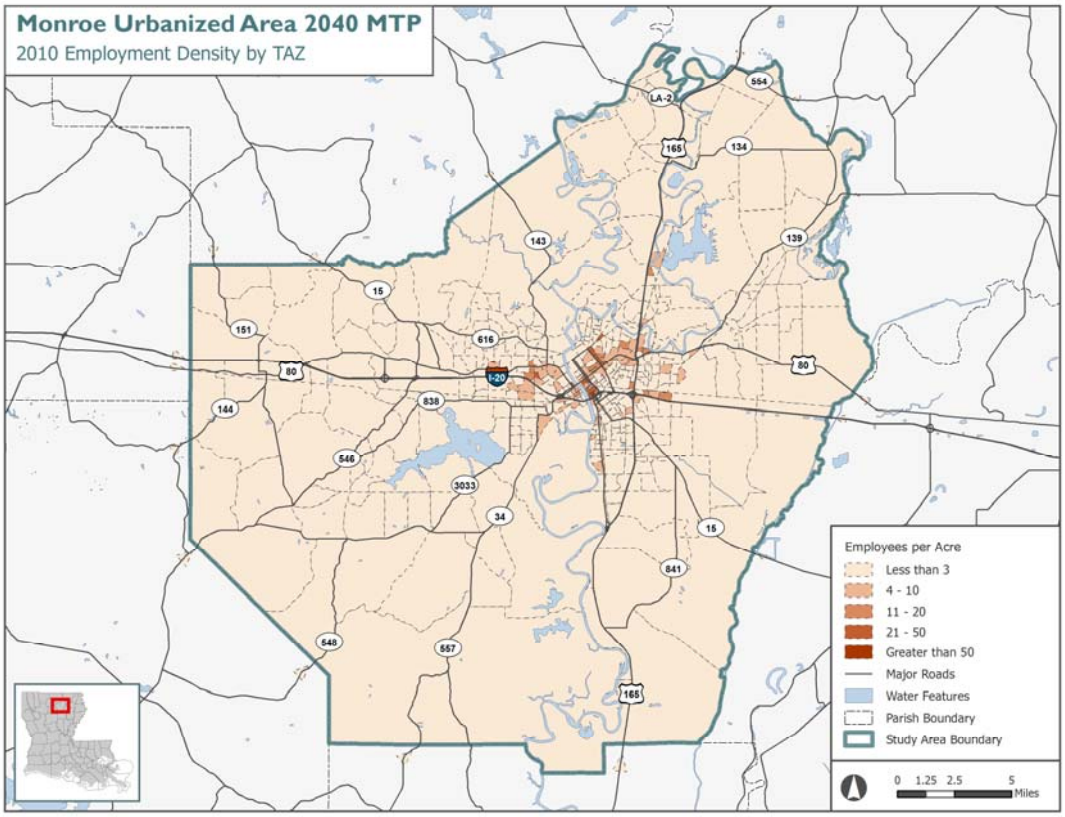
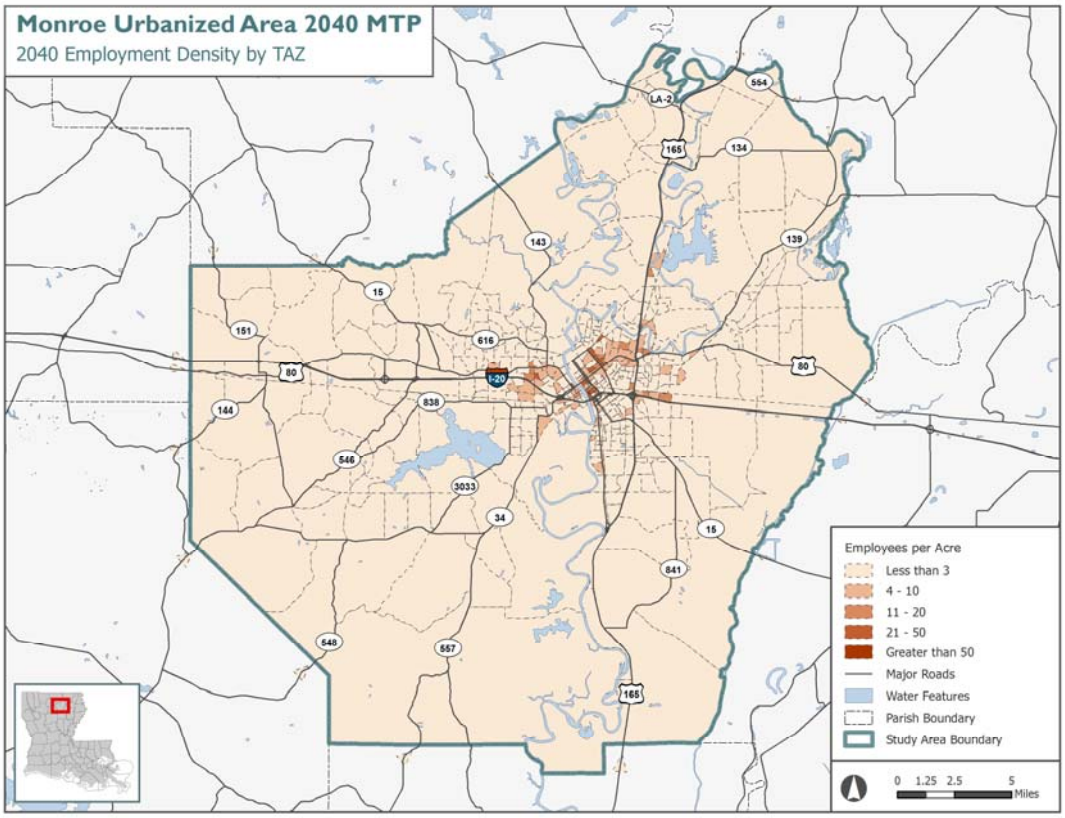


Figure 3-2: Study Area 2010 and 2040 Employment Density





School Attendance

School attendance figures include public and private elementary, middle, and high schools; colleges; universities; vocational and business schools. Total school attendance in the study area in 2010 was 44,644 students. This number includes the 8,645 students that attend the University of Louisiana at Monroe. For modeling purposes, the school attendance is measured by the number of students attending a school in a traffic zone and not by the number of students residing in a traffic zone.

Horizon Year (2040) Demographic Forecast

The study team prepared population and employment forecasts for the entire Parish for the future years of 2020, 2030, and 2040. For this purpose, preliminary population forecast numbers were developed using a cohort-component approach. Then, preliminary employment forecasts were developed with the assumption that employment will grow slightly faster than population, based on historical trends in metropolitan areas. These preliminary forecasts were confirmed through discussions with the public, key stakeholders, and the MPO Director. A more thorough overview of the 2040 demographic forecast can be found in Appendix B.

Forecast Development Description

The allocation of future population growth to the TAZs relied upon information provided by the public, key stakeholders, MPO staff, and local planning officials, along with additional information from existing studies, plans, documents, and news articles. Planners responsible for residential development at the municipal and parish level were interviewed during the preparation of the forecasts. Specifically, they were asked to identify the locations of residential developments that were either planned, under development, or recently completed and then to approximate the number of new dwelling units associated with each development. These developments could be either single-family or multifamily developments.

In order to forecast future populations of each TAZ, this local knowledge of residential development was considered alongside GIS data such as historical population change, environmental constraints such as flood zones and wetland areas, existing land use patterns, future land use regulations, and regional accessibility.

Information necessary to allocate new employment growth was gathered according to a similar process. Local planners were asked about anticipated major employers, retail developments, or other new employment centers planning to locate within their jurisdictions. The most prominent projects identified were the IBM Application Development and Innovation Center and expansion of the CenturyLink campus. Planners were also asked if the area is anticipated to lose any major employers, but none were identified. Other questions concentrated on sensitive environmental features and properties protected from development, along with new or planned parks, recreational facilities, schools, and other public buildings. To supplement the interviews, information was gathered from a review of recent local news articles concerning economic development.

As with the population forecasts, the development of employment forecasts also incorporated GIS data such as historical population change, flood zones and wetland areas, existing land use patterns, future land use regulations, regional accessibility, and proximity to major roadways and other transportation infrastructure.

Final Demographic Forecasts

Table 3-2 presents the forecast demographic data for the study area. Figure 3-1 and Figure 3-2 show the changes in population and employment by TAZ between the years 2010 and 2040.

Table 3-2: Ouachita Parish Final Population and Employment Totals

Year	Population	Dwelling Units	Total Employment	Retail Employment	School Attendance
2010	148,186	64,481	76,770	17,127	46,644
2020	157,242	68,585	83,152	18,086	46,138
2030	164,426	71,619	87,091	19,002	48,483
2040	170,972	74,433	90,439	19,735	51,269

Roadway Deficiencies Analysis

A deficiencies analysis is the process of identifying future transportation infrastructure needs based on observing how well a roadway is performing or anticipated to perform based on available data. Roadway level of service (LOS) is one indicator of roadway performance, ranking the quality of the flow rate along a given section of road using a letter-grade scale, with LOS A being the best flow rate and LOS F representing completely congested flow synonymous with system failure. LOS can be expressed through volume to capacity (V/C) ratios; for example, if Link A has a volume of 4,000 vehicles and a capacity of 8,000 vehicles, dividing the volume by the capacity yields a V/C ratio of 0.50. This ratio indicates that there is remaining capacity on Link A.

The analysis performed for this MTP update utilized V/C ratios computed by the Monroe Travel Demand Model for the roads in Ouachita Parish for which there were volume and capacity data available. The analysis results are illustrated in Figure 3-3, and indicate congestion along key regional roadways may increase over time if no improvements are made to the system.

Crash Analysis

In order to develop a holistic analysis of roadway performance in terms of both congestion and safety, data provided by the Louisiana Highway Safety Commission (LHSC)'s statewide crash database supplemented roadway performance information described in the deficiencies analysis. Understanding where crashes have occurred and what conditions may have contributed to them can help officials develop strategies, protocols, and modifications to infrastructure to mitigate future incidents.

This analysis examined crashes from the years 2011 through 2013 in Ouachita Parish. The analysis focused on the number of crashes at individual locations, crash severity, crash types, roadway conditions, and the involvement of speed or influence of substances.

The analysis determined specific locations within Ouachita Parish that had higher than average crash rates (crashes per million vehicle miles travelled) to help prioritize safety improvements throughout the transportation network. To determine high crash rate roadway segments in the region, the analysis uses segment length calculated from the network layer and base year traffic volumes (expressed as Average Daily Traffic or ADT) obtained from the Monroe Travel Demand Model. Table 3-3 and Figure 3-4 show the top ten roadway segments with the highest crash rates in Ouachita Parish. Similarly, Table 3-4 and Figure 3-5 show the top ten intersections with the highest crash rates in the parish.

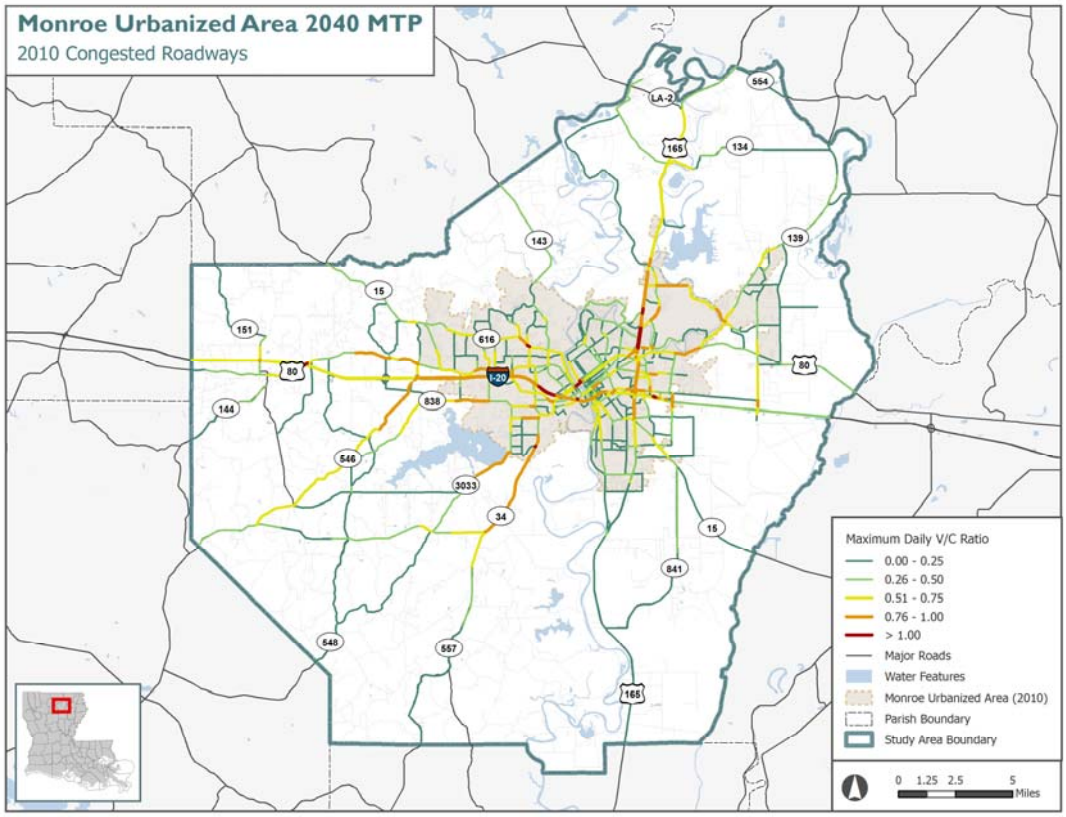
Within the study area, a total of 15,678 crashes occurred between 2011 and 2013. The majority of these crashes took place between the hours of 7 AM and 7 PM, with the most crashes occurring from 3 PM to 6 PM. Neither adverse weather conditions nor speeding were significant factors in most crashes. The four most common collision types, making up nearly 77 percent of the crashes in the study area, were:

- Rear end collisions;
- Right angle collisions;
- Non-collision with motor vehicle (NCWMV); and
- Side swipe same direction.

From 2011 to 2013 there were 48 fatal crashes and 5,065 injury crashes. About four (4) percent of the crashes that occurred in the study area involved alcohol, while almost 15 percent of total fatal crashes are alcohol related.

Based on this analysis, many crashes could be attributable to high traffic volumes during peak periods. Recommendations for reducing the most common types of crashes and improving overall roadway safety are outlined in Chapter 4.

Figure 3-3: 2010 and 2040 Daily Maximum V/C Ratios



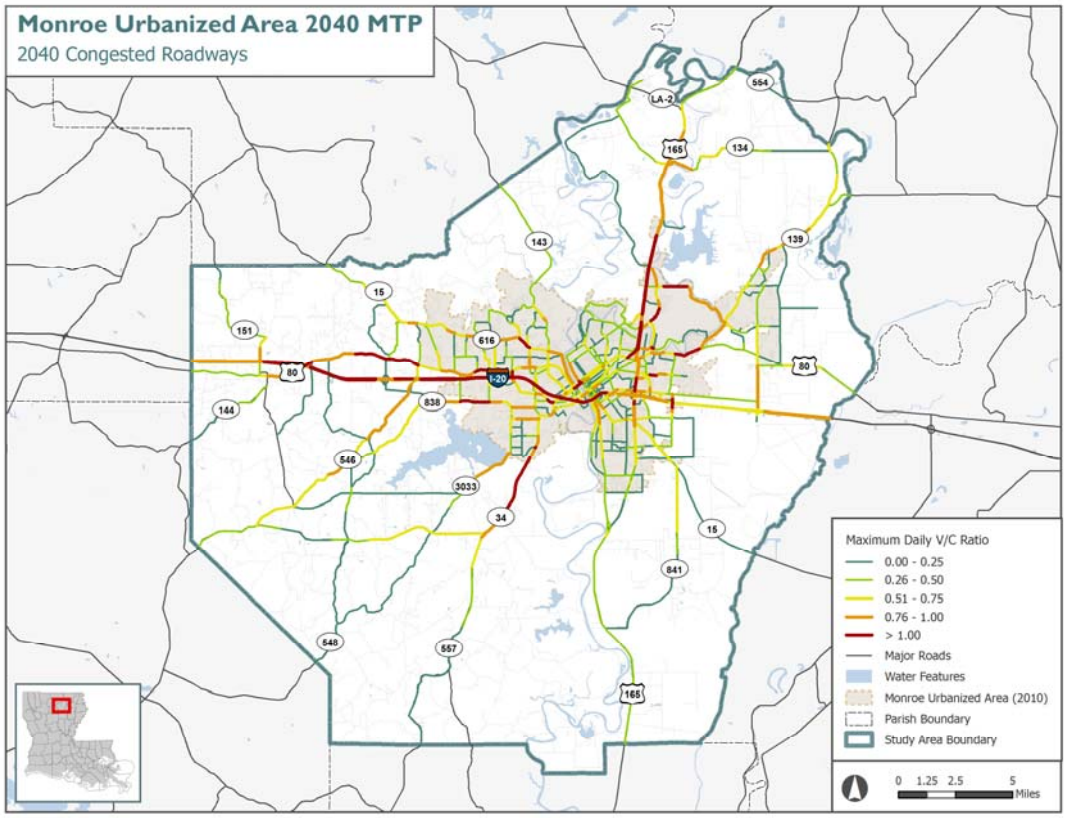


Table 3-3: Top Ten High Crash Roadway Segments (2011-2013)

Segment	From	To	Total Crashes	Annual Crash Frequency	ADT	Length (mi)	Crash Rate*
I-20 WB	LA 617 Off Ramp	LA 617 On Ramp	245	82	30,872	0.41	17.75
I-20 EB	LA 617 Off Ramp	LA 617 On Ramp	72	24	29,200	0.73	3.08
US 80 (Cypress St)	LA 3249/Well Rd	Vernon Ln	70	23	16,145	0.11	35.48
I-20 EB	LA 546	LA 3249/Well Rd	59	20	28,298	2.82	0.69
US 80 (Desiard St)	US 165 SB Ramps	US 165 NB Ramps	59	20	24,794	0.06	36.83
US 80 (Louisville Ave)	Washington St	Plaza Blvd	45	15	22,514	0.26	9.61
US 80 (Louisville Ave)	Newcombe St	0.16 Miles East of Newcombe St	41	14	21,977	0.16	10.91
US 165 SB	Renwick St	Louberta St	38	13	17,210	0.25	8.28
I-20 WB	LA 34 Off Ramp	LA 34 On Ramp	37	12	33,203	0.71	1.39
I-20 WB	LA 3249/Well Rd	LA 546	35	12	28,909	2.76	0.41
*Crash Rate is expressed in crashes per million vehicle miles travelled							

Source: LHSC; NSI, 2015

Figure 3-4: Top Ten Crash Roadway Segments (2011-2013)

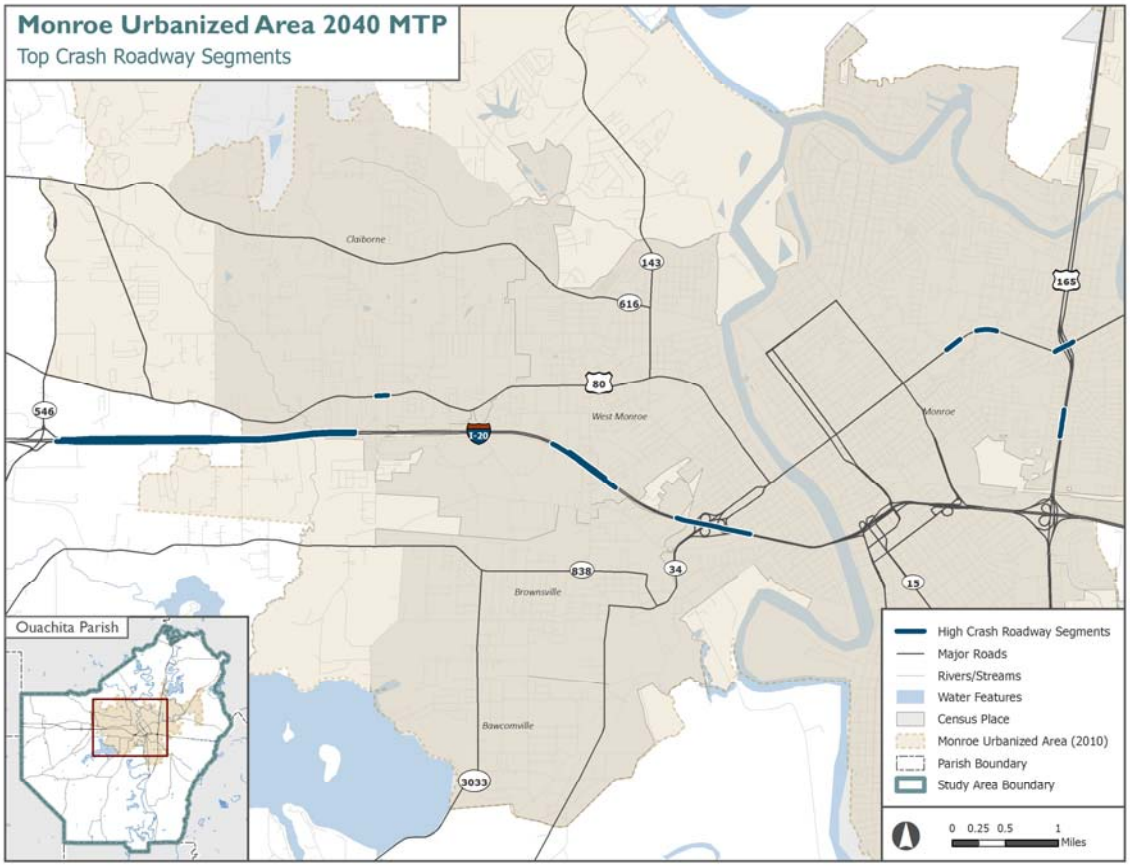
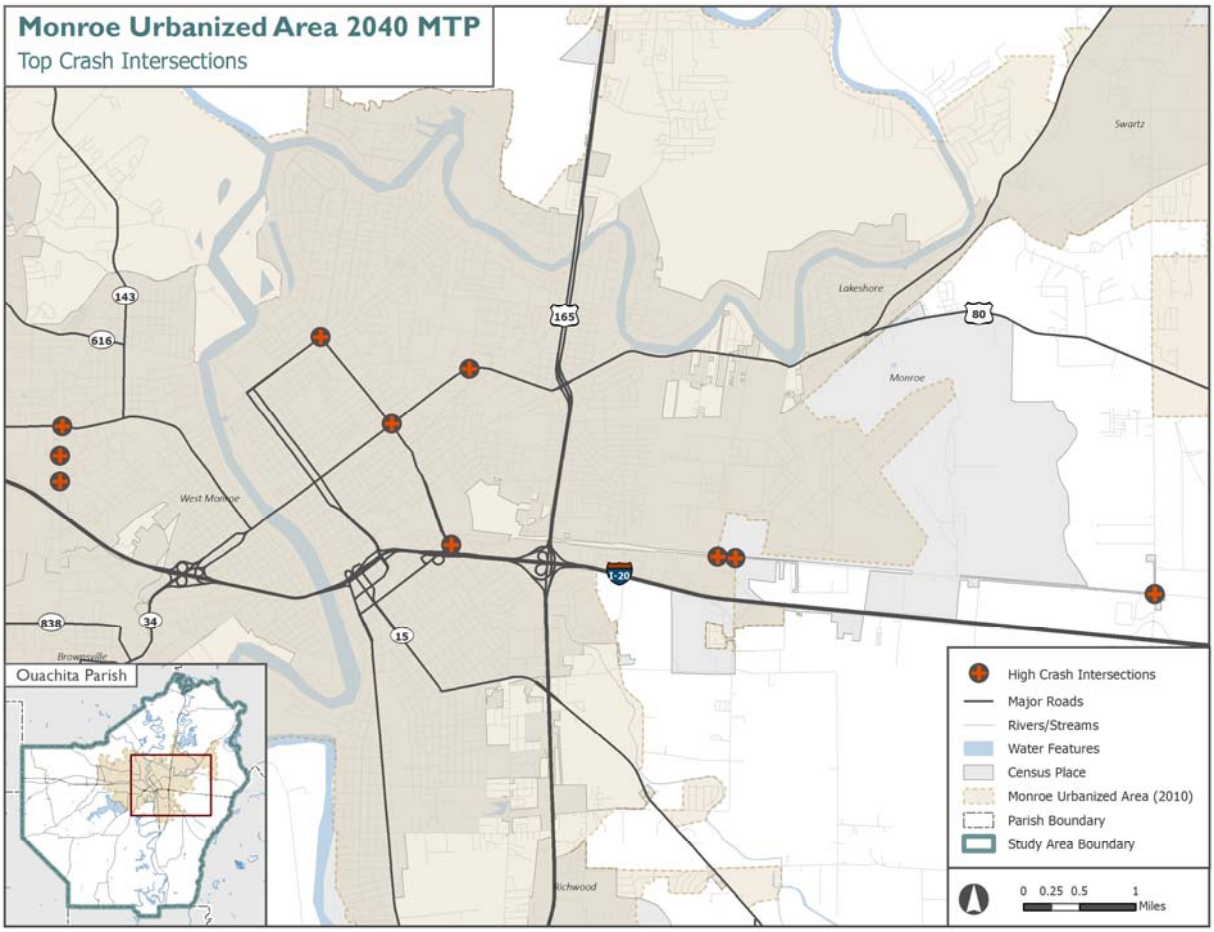


Table 3-4: Top Ten High Crash Intersections (2011-2013)

Location	Total Crashes	Annual Crash Frequency	ADT	Crash Rate*
LA 594 (Texas Ave) @ I-20 WB Ramps/18th St	103	34	20,665	4.55
LA 594 (Millhaven Rd) @ Garrett Rd	41	14	8,845	4.34
LA 617 (Thomas Rd) @ Glenwood Dr	118	39	27,565	3.88
LA 594 (Millhaven Rd) @ Meadowlark Dr	42	14	10,668	3.60
LA 617 (Thomas Rd) @ McMillan Rd	64	21	20,860	2.76
US 80 (Louisville Ave) @ LA 840-6 (N 18th St)	115	38	39,011	2.67
LA 840-6 (N 18th St) @ Forsythe Ave	40	13	13,686	2.60
US 80 (Cypress St) @ LA 617 (Thomas Rd)/Splane Dr	73	24	27,741	2.37
US 80 (Louisville Ave) @ Washington St/Lamy Ln	69	23	28,298	2.23
LA 594 (Millhaven Rd) @ Kansas Ln	40	13	16,435	2.17
*Crash Rate is expressed in crashes per million vehicle miles travelled				

Source: LHSC; NSI, 2015

Figure 3-5: Top Ten Crash Intersections



Summary of Roadway Needs Assessment

The results of the roadway needs assessment indicate that some important roadway sections are expected to experience operational deficiencies in the future. The analyses indicate that anticipated traffic from growth and development will be more than the currently committed improvements can accommodate in some areas. There is typically a long lead-time required to select, prioritize, design, and build transportation improvements to address shortcomings. Many factors must be considered when selecting projects to mitigate these deficiencies, and the results of the roadway needs assessment process is only one tool to consider. Chapter 4 will describe how these results were used to prioritize projects for consideration in the MTP.

Non-Roadway Needs Assessment

While the travel demand model and crash data provide quantitative tools to identify deficiencies and needs within the roadway portion of the transportation network, they are less effective at describing deficiencies for other elements of the transportation network. This section discusses the analysis methods used to identify deficiencies and needs for the transit system, bicycle and pedestrian network, freight users, and interregional passenger transportation system.

Transit Deficiencies Analysis

Public transportation in the Monroe Urbanized Area is owned and operated by the Monroe Transit System. Founded in 1906, Monroe Transit is the nation's oldest publically-owned transportation system.

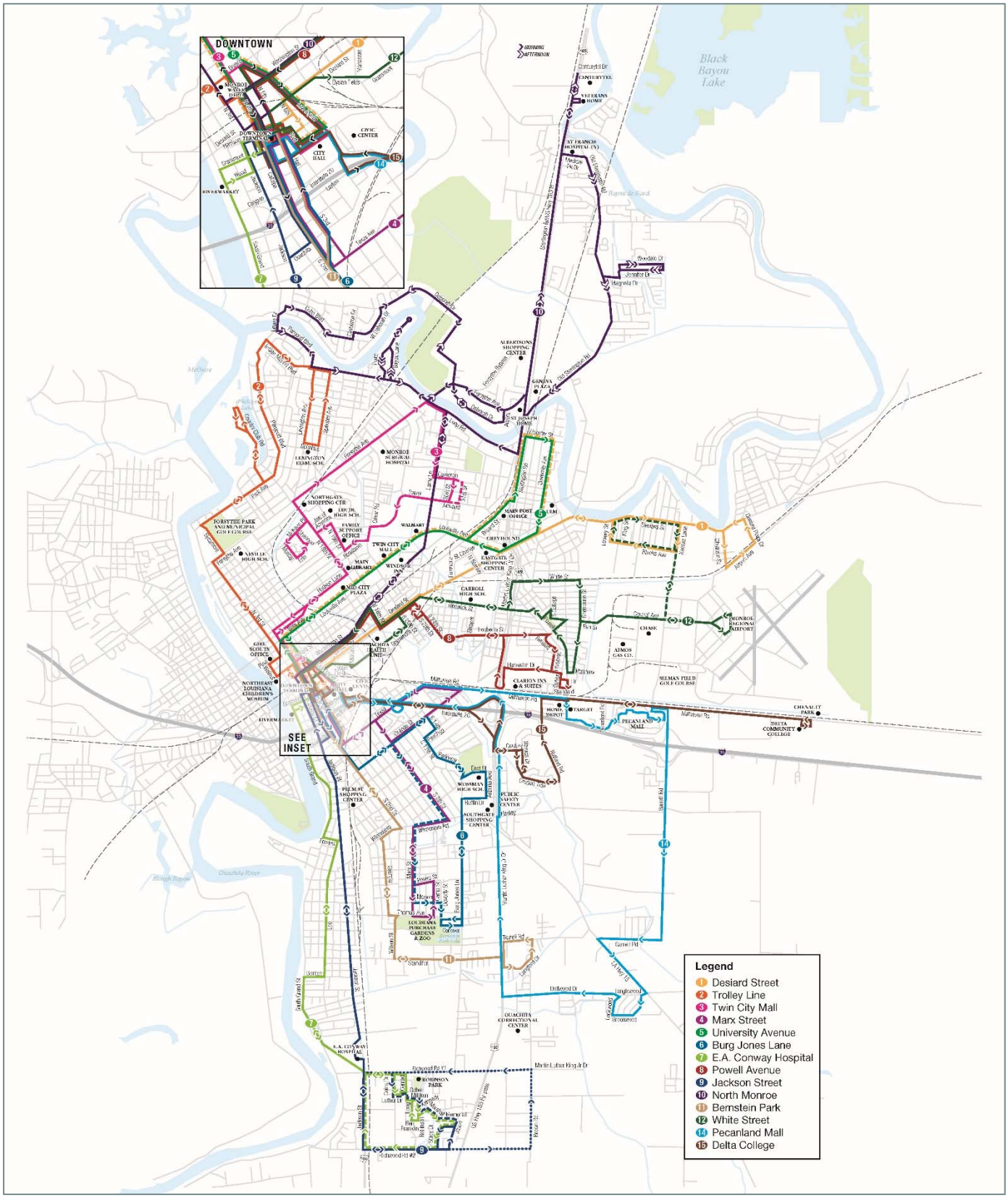
Monroe Transit operates 14 fixed routes, a flyer route to Louisiana Technical College-Delta Ouachita Campus (VoTech), four night rider routes, and paratransit services within the Monroe Urbanized Area.

An analysis of the existing transit system and community public transportation needs is included in the sections below to assist in prioritizing future investments in public transportation. The analysis includes an inventory of existing services, an analysis of the populations currently served by the existing transit system, and the identification of target transit rider subareas within the region and likely destinations for transit riders. Stakeholder meetings with Monroe Transit System, information gathered at the public visioning workshop, and a Geographic Information Systems (GIS)-based approach informed the transit analysis.

Existing Service

During the week, Monroe Transit operates 14 fixed routes and a VoTech flyer route within the Monroe Urbanized Area, as shown in Figure 3-6. Generally, the fixed routes operate between the hours of 6 AM and 6:45 PM, with some slight variations on specific routes. Headways are typically 45 minutes, meaning there is approximately 45 minutes between each bus at a given stop. The VoTech flyer route operates Monday through Friday when classes are in session at the Louisiana Technical College-Delta Ouachita Campus. The bus departs from the downtown terminal at 7:30 AM and arrives at the college campus at 7:50 AM. In the afternoon, the bus departs from the college campus at 3:15 PM and arrives at the downtown terminal at 3:40 PM.

Figure 3-6-: Monroe Transit Fixed Route Weekday Service



Source: Monroe Transit

In addition to the 14 fixed routes operating between Monday and Friday, Monroe Transit operates four night rider fixed routes, Monday through Saturday, from approximately 6 P.M. to 10:30 P.M. The system also provides limited service on Saturdays on 11 of the 14 weekday fixed routes from approximately 6 AM to 6:45 PM, as well as on all 4 of the night rider routes. The Saturday routes generally have a 45 minute headway. There is no service offered on Sunday.

Paratransit service, or specialized door-to-door transportation provided to people with disabilities who are not able to ride the fixed-route buses, is operated within three quarters of a mile of all fixed routes. Prior to scheduling a trip, individuals must be approved by Monroe Transit, which requires the submittal of an application by the participant and a physician. The paratransit service is operated during the same hours as the fixed route service. No service is offered west of the Ouachita River.

Table 3-5 shows the standard fares offered by Monroe Transit. Notably, Monroe Transit provides free transfers, meaning individuals that need to use multiple routes to reach their destination are only required to pay a single fare.

Table 3-5: Monroe Transit Fares

Standard Fares	Cost
Adult Fare	$1.00
Elderly/ Disabled	$0.50
Student (Up to 12th grade, with I.D.)	$0.90
Children (Height below Fare Box)	FREE
Transfers	FREE
City of Monroe Employees	FREE
Paratransit	$2.00 per trip

Source: Monroe Transit

Transit Ridership

Data from the National Transit Database (NTD) show that the number of annual unlinked passenger trips on the Monroe Transit System has generally been increasing over time, as seen in Table 3-6. While there was a drop in unlinked passenger trips between 2009 and 2010, the number of unlinked passenger trips has increased by just over 100,000 trips between 2010 and 2013, the latest year for which data is available, for an annual average growth rate of 2.2 percent. Unlinked passenger trips are defined as the number of passengers who board public transportation vehicles. Passengers are counted each time they board vehicles no matter how many vehicles they use to travel from their origin to their destination.

Table 3-6: Annual Unlinked Passenger Trips

	2009	2010	2011	2012	2013
Bus	1,193,421	1,160,954	1,179,652	1,237,729	1,265,378
Paratransit	10,171	9,797	9,177	9,265	8,964
Total	***1,203,592***	***1,170,751***	***1,188,829***	***1,246,994***	***1,274,342***

Source: NTD, 2015

System Coverage

An analysis of the existing public transportation system was performed using a GIS-based approach to identify potential ridership in the study area. The analysis included all three route services, consisting of the regular weekday service, Saturday service, and night service. The methodology involved the creation of a quarter-mile buffer around each transit route and an analysis of the total population and total employment located within the buffer zone. A quarter-mile distance is generally accepted as the

distance individuals are willing to walk to reach a transit stop.

Population

U.S. Census blocks, which represent the smallest geographic area for which Census data is available, were overlaid with the quarter-mile buffer, and the percentage of area overlap was calculated for each Census block. The percentage of Census block area falling within the quarter-mile buffer was then applied to the population totals for each Census block to develop an estimate of potential ridership. For example, if the entire Census block fell within the quarter-mile buffer, it was assumed that 100 percent of the population of that Census block represents potential riders. However, if only 50 percent of the Census block fell within the quarter-mile buffer, it was assumed that only 50 percent of the population represents potential riders.

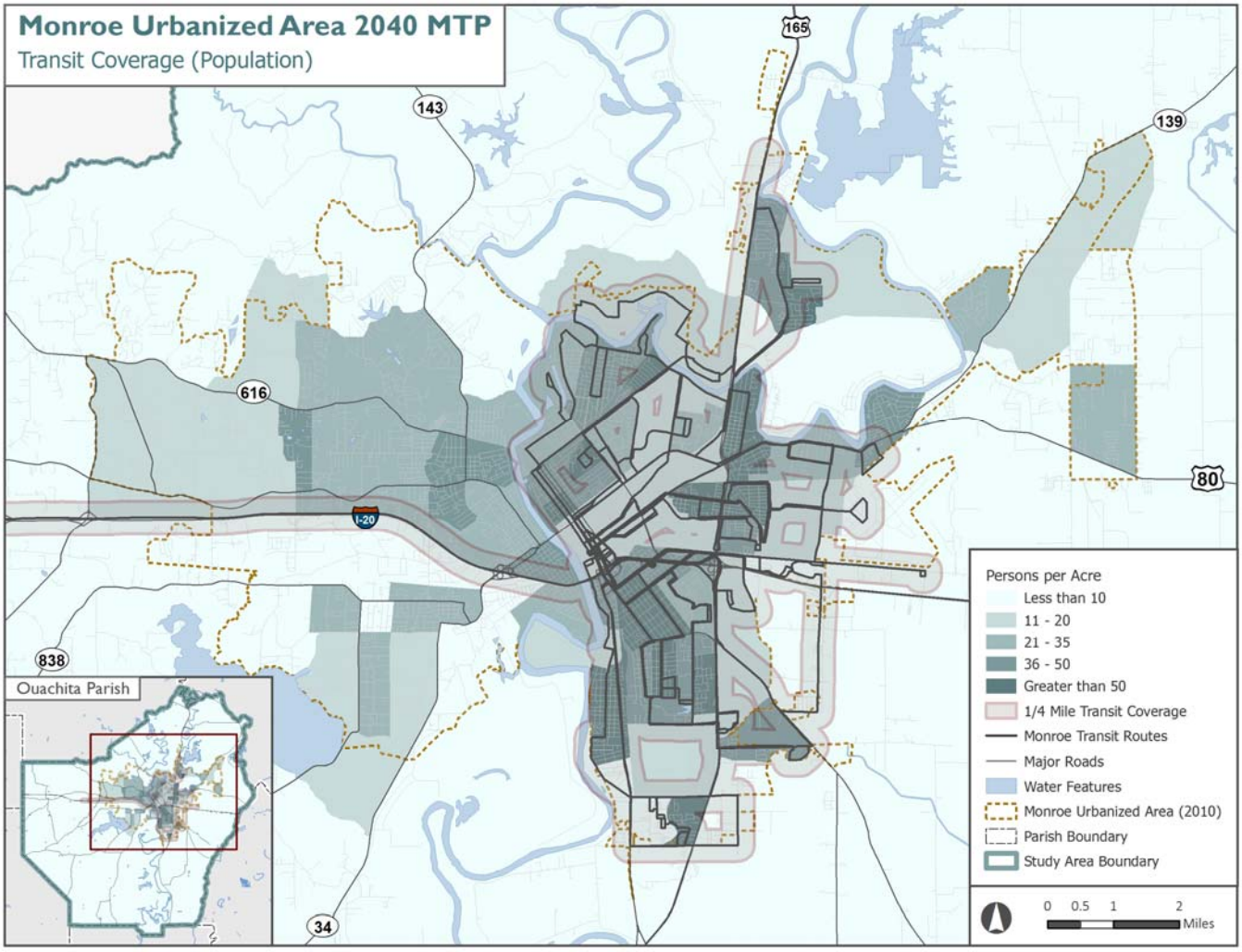
Figure 3-7 shows the quarter-mile buffer, or potential ridership area, for all routes operated by Monroe Transit, excluding paratransit services. For the regular weekday fixed-route service, approximately 41 percent of the study area population – or approximately 65,000 individuals – represent a potential rider. For Saturday service, the percent of the total population of the Parish that represents potential riders drops to 33 percent, or approximately 50,000 individuals. That number is further reduced for the night rider routes, which provide service to approximately 35,000 potential riders, or 22 percent of Ouachita Parish. As shown in Figure 3-7, the majority of potential riders are located in the Monroe Urbanized Area. Individuals residing in the rural regions of Ouachita Parish, as well as those living in West Monroe, do not presently have convenient access to any transit services. Table 3-7 summarizes the population totals served by the existing fixed route services.

It should be noted that this analysis does not account for actual development patterns within each Census block, and instead assumes an equal distribution of population across the area. In reality, residential population will likely be concentrated in certain areas of each Census block, with other land uses and open space occupying the remainder of the area.

Table 3-7: Population Served by Existing Fixed Route Services

	Population Within Quarter-Mile Buffer	Percent Population Within Quarter-Mile Buffer
Weekday Transit Routes	63,338	41.2%
Saturday Transit Routes	50,727	33.0%
Night Transit Routes	34,798	22.6%

Figure 3-7: Monroe Transit Service Coverage



Employment

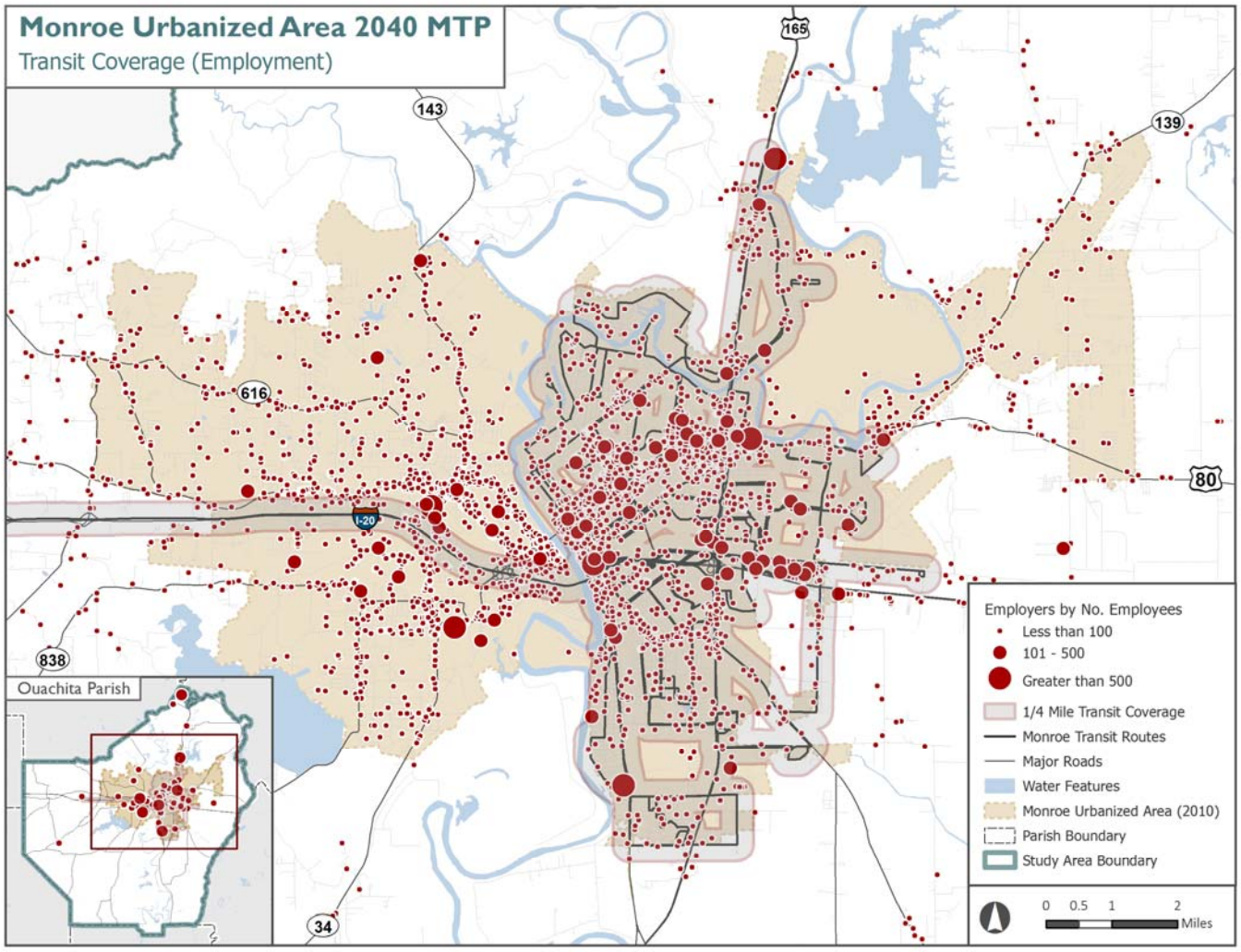
Point-level employment data from InfoUSA was used to determine the system coverage for employment in the region. The analysis included an examination of existing jobs within a quarter-mile of an existing transit route, using the number of employees reported for each establishment. Figure 3-8 shows the quarter-mile buffer for all routes operated by Monroe Transit, excluding paratransit services, and the location of employment centers in the study area.

For the regular, fixed-route service, operating Monday through Friday during the day, approximately 65 percent of the existing jobs in the study area, or approximately 50,000 jobs, are within a quarter-mile distance of an existing weekday service transit route. For Saturday service, the percent of total existing employment within walking distance of a transit route drops to just over 57 percent, or approximately 44,000 jobs. That number is further reduced for the night rider routes, which provide service to approximately 35,000 existing jobs, or 46 percent of the jobs in Ouachita Parish. As shown in Figure 3-8, the majority of existing jobs are located in the Monroe Urbanized Area. Individuals working in the rural regions of Ouachita Parish, as well as those working in West Monroe, do not presently have convenient access to any transit services. Table 3-8 summarizes the employment totals served by the existing fixed route transit service.

Table 3-8: Employment Served by Existing Fixed Route Services

	Employees Within Quarter-Mile Buffer	Percent Employees Within Quarter-Mile Buffer
Weekday Transit Routes	50,221	65.4%
Saturday Transit Routes	43,832	57.1%
Night Transit Routes	34,928	45.5%

Figure 3-8: Monroe Transit Service Employer Coverage



Target Transit Rider Subareas

In Monroe, as in most areas with small urban transit systems, transit-dependent populations - people that have limited transportation options - constitute the highest ridership. Therefore, the system was analyzed in relation to origins and destinations of individuals with limited transportation choices. Data from the American Community Survey (ACS), an ongoing Census Bureau Survey that collects population data that goes beyond what is reported by the Decennial Census, was analyzed at the Block Group level, a geographic area comprising several Census Blocks.

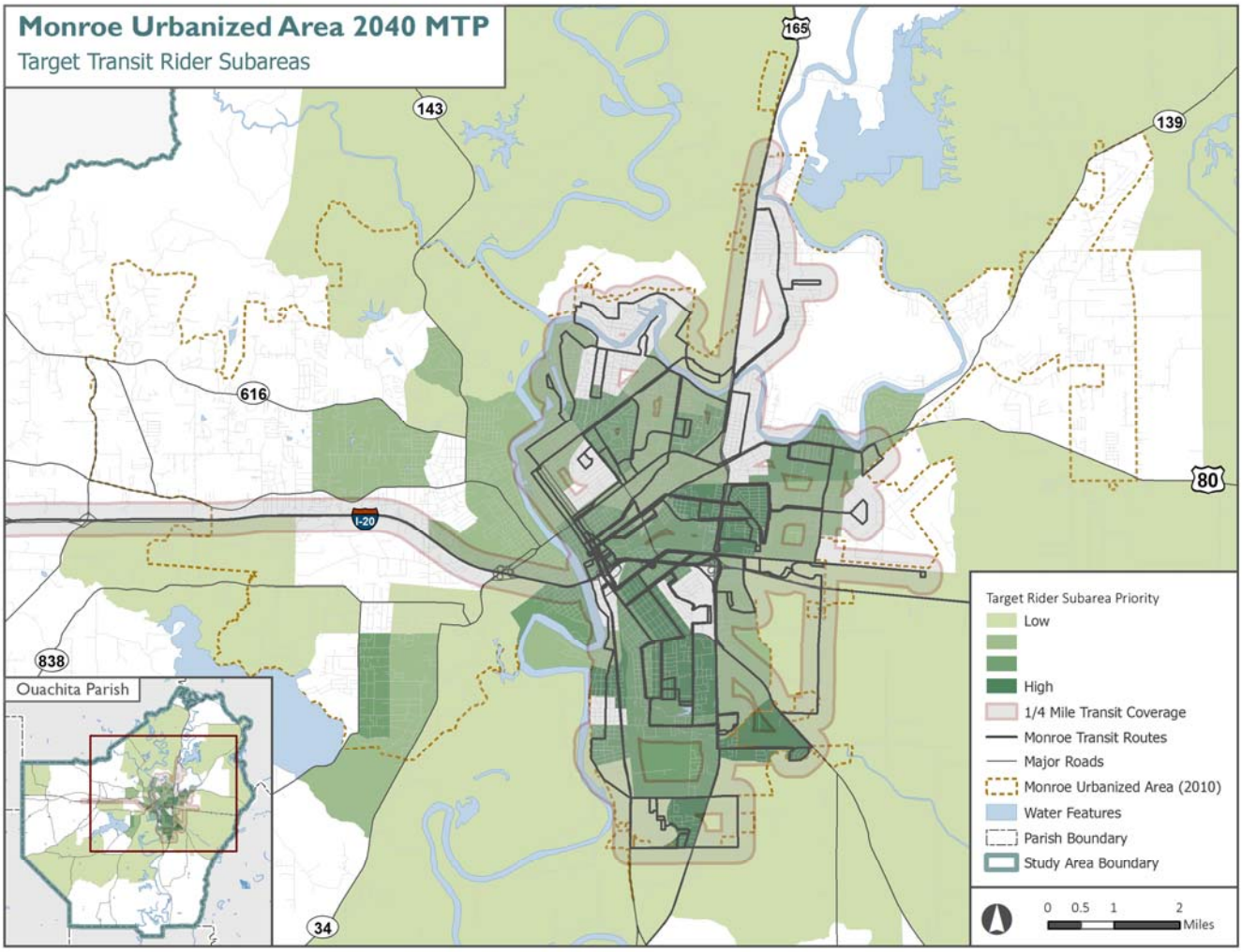
ACS five-year estimates from 2009 to 2013 were used for the following characteristics, generally associated with transit dependency:

- Vehicle availability;
- Income;
- Disability; and
- Age.

It is generally assumed that individuals without regular access to a private automobile, those living below the poverty level, individuals with a disability, and those under the driving age, or those who have exceeded the age at which it is safe to drive, are more likely to rely on public transportation for their mobility needs.

Target transit rider subareas were identified by calculating the percent of either the total population or the number of households in each Census Block Group considered transit-dependent within each category. Census Block Groups with more than 30 percent of the total population identified as being transit-dependent were considered to be target transit rider subareas. Transit rider subareas were then prioritized by assigning each block group a separate score based on the actual percentage of residents which fell into each of the four transit-dependent categories. These scores were then totaled for each block group, and finally weighted based on the population density of the block group to identify areas in the region with the highest concentrations of transit-dependent populations. Figure 3-9 shows the result of the subarea identification process.

Figure 3-9: Target Transit Rider Subareas



Most of the target transit rider subareas are located in central Monroe and are generally well served by existing transit. However, there are some areas in West Monroe that have medium to high concentrations of transit-dependent populations and no transit service. Several block groups in rural parts of the parish exhibited high percentages of transit-dependent populations, but do not appear as high-priority in this analysis due to the low population densities of these areas.

Access to Key Destinations

In addition to analyzing potential ridership and access to public transportation for transit-dependent populations, the analysis includes an evaluation of access to key destinations within the region. A total of 301 key destinations were identified in Ouachita Parish, including schools, civic institutions, religious institutions, regional attractions, parks, major employers, shopping, social services, community centers, and medical facilities. As shown in Figure 3-10, most of the key destinations are clustered within the Monroe Urbanized Area.

The analysis of access to key destinations evaluated the number of destinations within a quarter mile buffer of the weekday fixed route service, the Saturday service, and the night service. For regular, weekday service, approximately 64 percent of the key destinations are within a quarter mile of a transit route. This percentage drops to 58 percent for Saturday service, and only 45 percent for the night rider routes. Table 3-9 shows the percentage breakdown of key destinations that are within the transit coverage area.

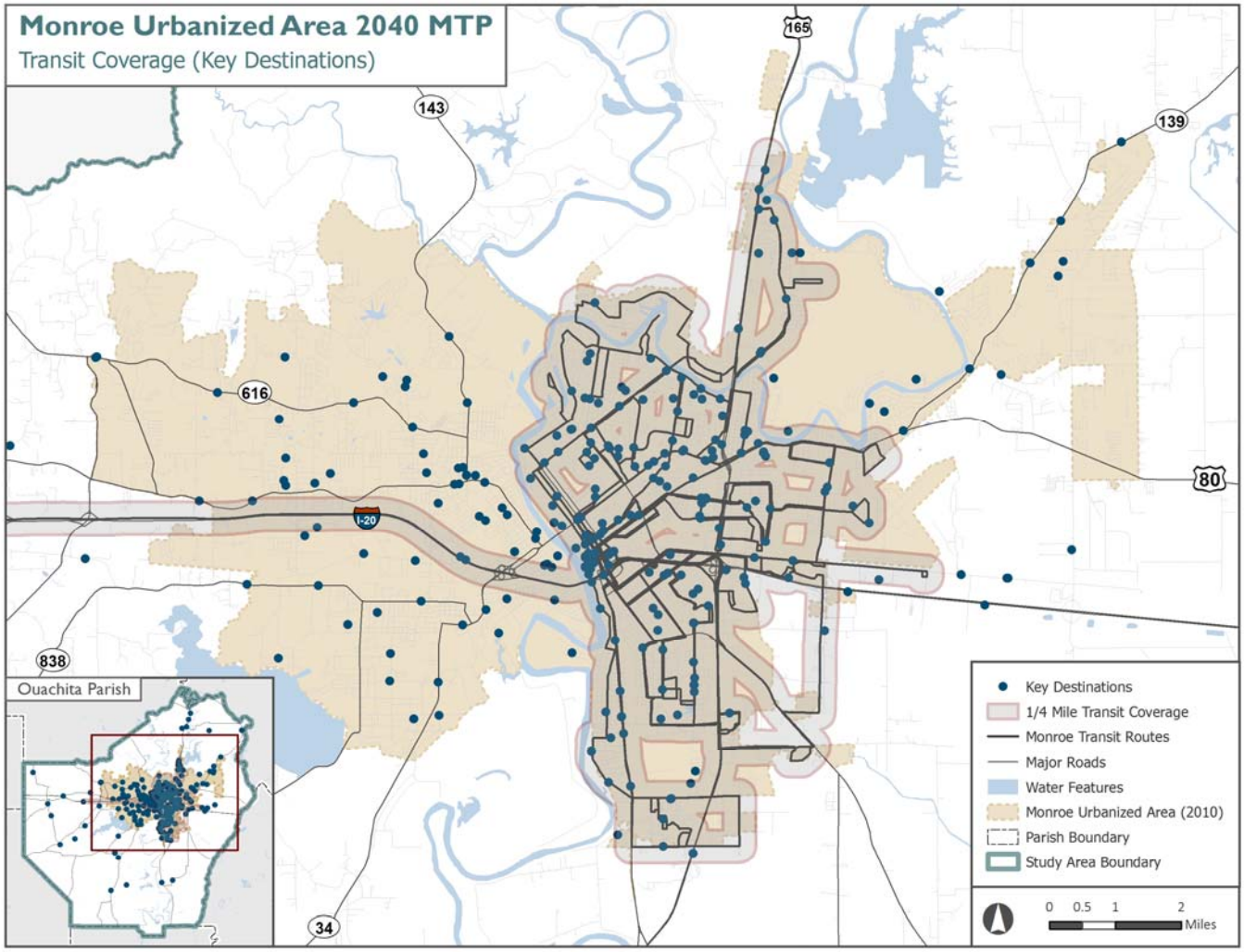
Table 3-9: Key Destinations Inside the Transit Coverage Area

Key Destination	Percent
Religious Institutions	60%
Schools	61%
Attractions	90%
Major Employers	96%
Multi-Family	98%
Civic Institutions	98%
Parks	99%
Shopping	99%
Medical Facilities	99%

Overall, 197 key destinations are not within a quarter mile of a transit route. The overwhelming majority of these destinations are religious institutions and schools, which together make up 79 percent of the key destinations outside the transit coverage area, followed by attractions. Key destinations outside the transit coverage area include, but are not limited to:

- West Monroe Convention Center;
- Northeast Louisiana Delta African American Museum;
- Kiroli Park;
- Cheniere Lake Park;
- Revolution Park Racing and Entertainment Complex;
- Twin City Motorsports Park;
- Graphic Packaging International;
- Bancroft Bag;
- Entergy Louisiana;
- Glenwood Regional Medical Center; and
- Super 1 Shopping Center.

Figure 3-10: Key Destinations and Transit Coverage



Challenges and Opportunities

Overall, nearly half of the total population of Ouachita Parish resides within a quarter mile of a fixed transit route, and is thus considered a potential rider for Monroe Transit. The percentage drops significantly when considering transit services offered on Saturday or after 6 P.M. The transit coverage area is concentrated in the Monroe Urbanized Area, specifically in the City of Monroe. Transit services are not available to individuals who live outside the urbanized area in the more rural regions of the Parish. However, the most significant regional deficiency is that the fixed-route service does not capture destinations or service people in West Monroe, which has a population of nearly 15,000 residents.

Transit dependent populations tend to be concentrated in the Monroe Urbanized Area, particularly within the City of Monroe, and therefore, fall within the transit coverage area. However, there are a number of block groups in more rural areas of the Parish, as well as in urbanized areas of West Monroe, that do not have access to public transportation.

Key destinations within Ouachita Parish are generally well-served by the regular, weekday fixed routes, with 64 percent of identified key destinations falling within a quarter mile of a fixed route. However, this percentage decreases for both Saturday service (58 percent) and the night rider routes (45 percent). Examples of key destinations that are unreachable by transit include the West Monroe Convention Center, Glenwood Regional Medical Center, and the Super 1 Shopping Center.

Bicycle and Pedestrian Facilities

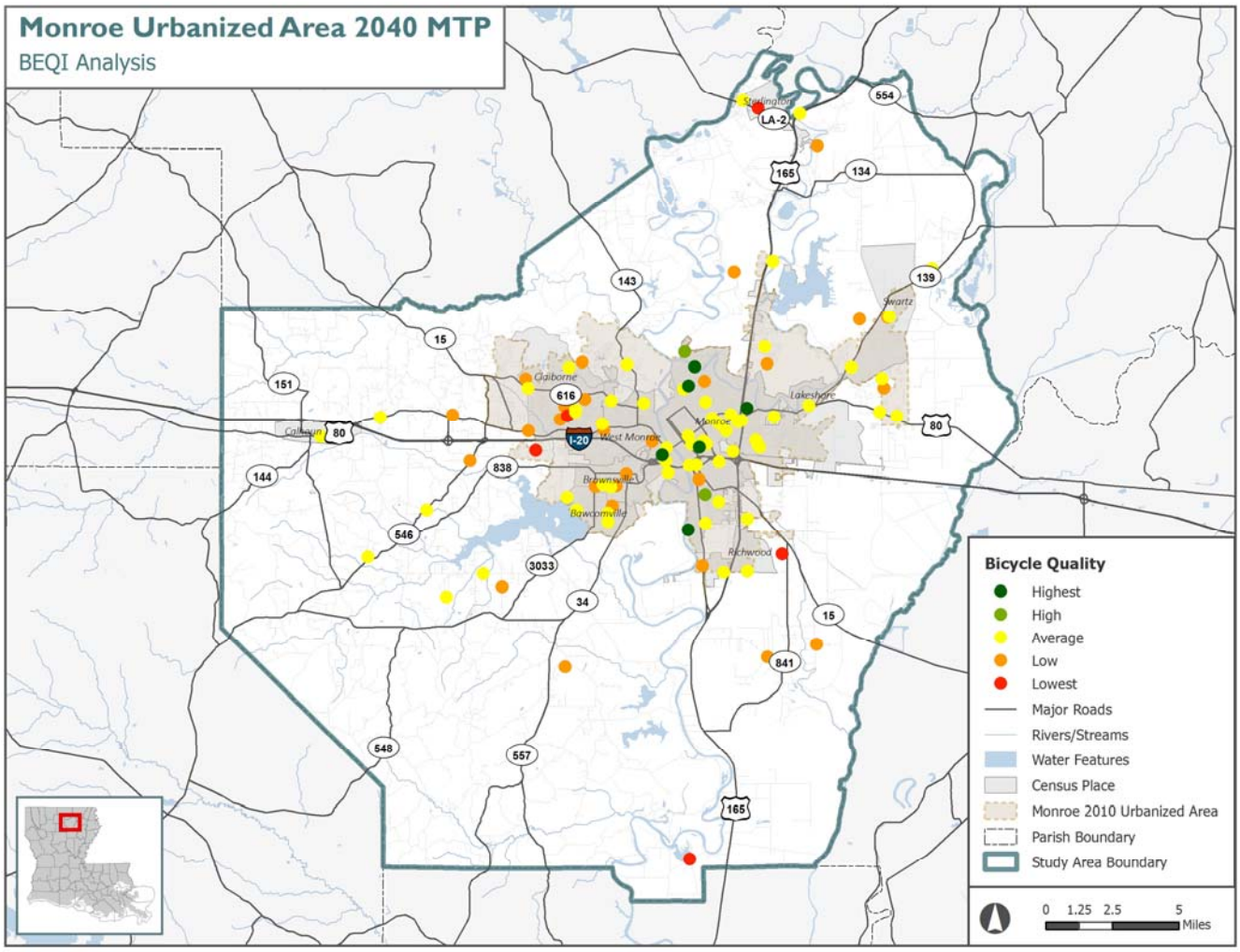
A truly multimodal transportation system provides safe and efficient travel options for all modes of transportation, including active transportation options such as bicycling and walking. In order ensure that these modes are a viable alternative for Monroe Urbanized Area residents, it is important to first have a clear understanding of current bicycling and pedestrian conditions in the area and to identify areas with opportunities for improvement. To this end, this plan includes an assessment of the area's current bicycling and pedestrian conditions obtained through two means: soliciting feedback from stakeholders in the active transportation community and the public through visioning workshops, as outlined in Chapter 2; and evaluating bicycling and pedestrian conditions at 100 randomly chosen locations throughout the region representing diverse area types (urban, suburban, rural, etc.) and a wide range of street types (major arterials, neighborhood streets, etc.). The results of the bicycle and pedestrian analysis are described below.

Bicycle Assessment

A systematic evaluation of bicycling conditions in the area was undertaken to better understand the physical condition of the bicycling environment in the Monroe Urbanized Area. The assessment utilized evaluation criteria adopted from the Bicycle Environmental Quality Index (BEQI)[1], a planning tool developed by the San Francisco Department of Public Health that allows planners to assign a bicycling suitability score to locations on the street network based on environmental variables that either enhance or detract from favorable bicycling conditions. The BEQI utilizes a combination of qualitative and quantitative indicators related to street and intersection design, safety, traffic, and adjacent land use to assign an overall BEQI score to the chosen locations. These locations are then categorized by the quality of bicycling conditions as either highest, high, average, low or poor quality. The rating system was applied to 100 randomly chosen locations throughout the Monroe Urbanized Area in order to acquire a high-level characterization of bicycling conditions in the area. Figure 3-11 shows the results of the bicycling assessment, including the geographic distribution of BEQI scores for the chosen locations.

[1] *More information on the BEQI methodology can be found at following link: http://www.sfhealthequity.org/component/jdownloads/finish/19-beqi/91-bicycle-environmental-quality-index-report/0?Itemid=62*

Figure 3-11: Bicycle Quality Assessment Results



Results from the bicycling assessment indicate that overall the Monroe transportation network offers average to below average bicycling conditions, with 59 of the 100 locations returning an "Average" quality rating and 32 locations rated as either "Low" or "Poor". An "Average" rating, according to the BEQI methodology, indicates that there are, "bicycle conditions present but room for improvement". A "Low" quality rating, on the other hand, signifies that there are "minimal bicycling conditions" present at a given location, while a "Poor" quality rating indicates that "bicycling conditions (are) absent".

Conditions that detract from the Monroe bicycling environment that were frequently observed include a lack of bike lanes or other dedicated facilities, narrow two-lane roadways with little room to safely pass, and a lack of lighting throughout the area. Conversely, conditions that were observed that promote the bicycling environment include low speed limits in many parts of the network, a lack of significant elevation changes, smooth pavement and abundant tree cover. Locations that received a "High Quality" or "Highest Quality" rating were generally located in the more urbanized locations of the area, though poor conditions were also observed in many urbanized areas.

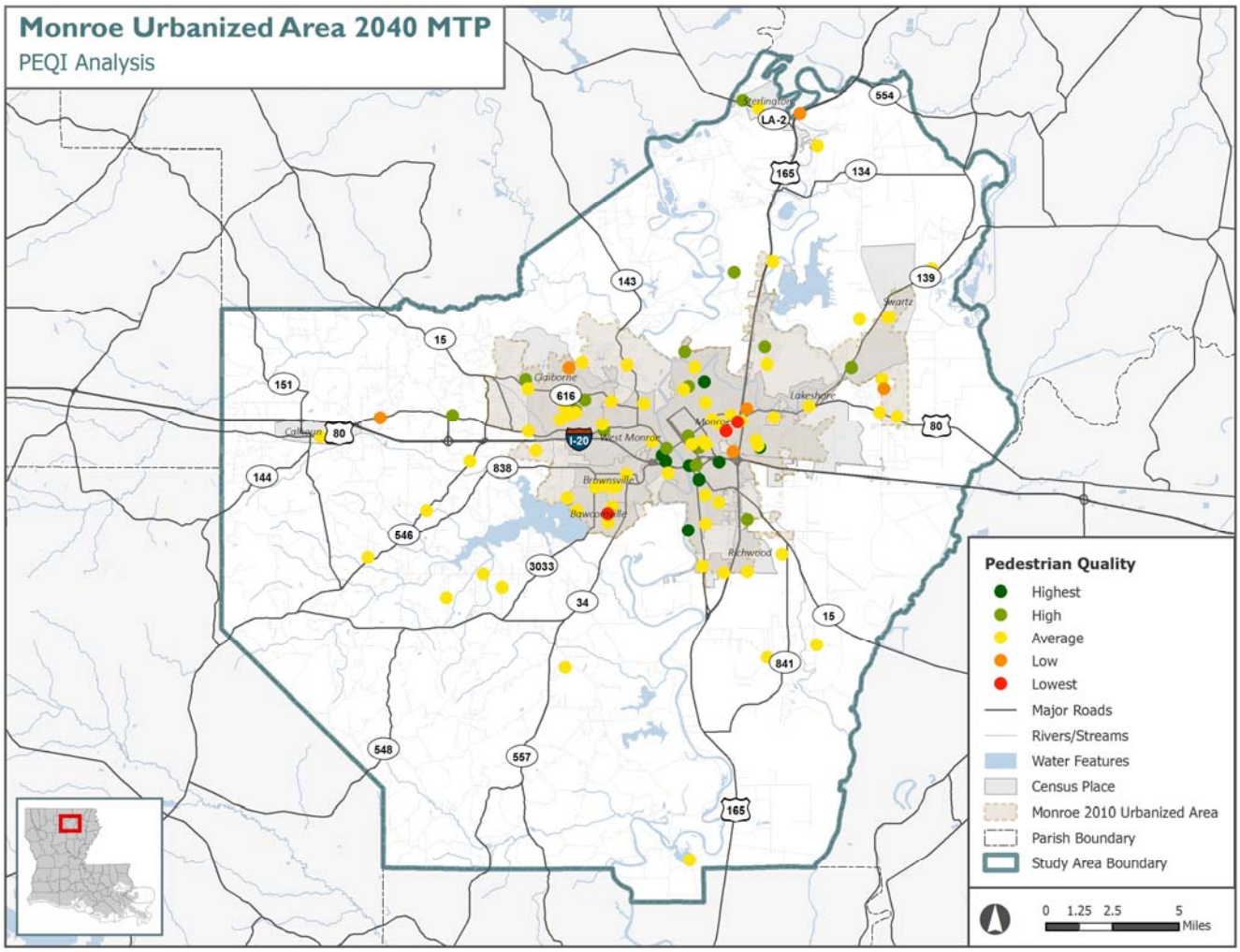
While this assessment includes a relatively small sample size of roads in the area, the results suggest that there are a number of deficiencies in the Monroe transportation system that result in below average bicycling conditions. A lack of dedicated bicycling facilities, especially on narrow roads without shoulders, for example, creates a real and perceived safety hazard and likely discourages many potential bicyclists from riding on area roads.

Pedestrian Assessment

Pedestrian conditions were assessed using evaluation criteria adopted from the Pedestrian Environmental Quality Index (PEQI)[2], which was also developed by the San Francisco Department of Public Health. Similar to the BEQI, the PEQI utilizes a combination of qualitative and quantitative indicators to assign an overall score representing the quality of the pedestrian environment for individual locations. Factors that are included in the rating system include the quality/completeness of sidewalks, presence or absence of traffic calming features or crosswalks, and presence of other pedestrian amenities such as public seating and lighting, among others.

The PEQI rating system was applied to 100 randomly chosen locations throughout the Monroe Urbanized Area in order to acquire a high-level characterization of pedestrian conditions. Figure 3-12 shows the results of the pedestrian assessment, including the geographic distribution of PEQI scores for the chosen locations.

Figure 3-12: Pedestrian Quality Assessment Results



[2] *More information on the PEQI methodology can be found at following link:*
http://www.sfhealthequity.org/component/jdownloads/finish/20-peqi/104-pedestrian-environmental-quality-index-peqi-an-assessment-of-the-physical-condition-of-streets-and-intersections/0?Itemid=62

Results from the pedestrian assessment suggest that in general, the Monroe transportation system provides average conditions for pedestrians. In fact, 67 of the 100 observed locations returned a rating of "Average", defined by the PEQI methodology as, "pedestrian conditions present but room for improvement". Conditions that detract from the pedestrian environment that were frequently observed include missing or incomplete sidewalks, a lack of crosswalks and signage to alert drivers of crossing pedestrians, and a lack of pedestrian-scale lighting. Conditions that were observed that enhance the quality of the pedestrian environment include low speed limits, prevalence of four way stop signs throughout neighborhoods, and abundant tree coverage. Pedestrian conditions characterized as “High” quality or “Highest” quality tended to appear more frequently in the residential environments of the urbanized areas, which were more likely to include safety features such as sidewalks and curbs.

The results of this analysis suggest that there are a number of opportunities to improve pedestrian conditions in the Monroe transportation system, particularly through the addition or repair of sidewalks and crosswalks.

Transportation System Maintenance and Operations (TSM&O)

In addition to reviewing relevant planning documents that address Transportation System Maintenance and Operation (TSM&O), stakeholders with knowledge of TSM&O activities in the Monroe Urbanized Area were consulted to identify operational and maintenance needs in the region.

Stakeholder	Title	Organization
Kirk Gallien	Deputy Assistant Secretary of Operations	LADOTD
Melvin Hicks	Engineer	LADOTD
Marc Keenan	General Manager	Monroe Transit
Douglas Mitchell	Director of Transportation	North Delta Regional Planning District

State

LADOTD operates a Traffic Monitoring Unit which coordinates the collection and monitoring of traffic data. The unit contracts with consultants and collaborates with localities to determine average daily traffic on the roadway system. LADOTD also models traffic simulation in Ouachita parish and operates traffic signal control systems along US Hwy 165.

LADOTD has a limited Intelligent Transportation Systems (ITS) operation in Ouachita Parish which consists of a project to relay emergency information to travelers on Interstate 20. Cameras along the interstate also send important roadway condition information to the Office of Emergency Preparedness. ITS technologies and applications with a primary focus on congestion management would likely provide the greatest benefit to the Monroe Urbanized Area.

State stakeholders mentioned the lack of funding as a barrier to implementing additional TSM&O improvements in the region. LADOTD works closely with FHWA to identify operations and maintenance funding sources for ITS infrastructure.

Transit

Recently, Monroe Transit has made improvements to its service in the City of Monroe that contribute to TSM&O in the region. Monroe Transit installed automatic vehicle locators (AVLs) that allow transit riders to see exact locations of buses along routes. This allows riders to plan their trips and wait times more precisely. The newly installed devices also enable the agency to gather operating data so services can be optimized. Transit stakeholders mentioned that more reliable equipment would reduce maintenance costs and cause fewer service interruptions. Improving operations and

maintenance of the transit system to better serve existing and future customer needs will allow the transit system to help alleviate congestion on over-capacity roadways without the need to explore costly major construction projects.

Intermodal Freight Analysis

A healthy transportation system not only moves people using roads, public transit, and non-motorized transportation, but it also moves goods efficiently throughout the region. Intermodal transportation facilities are key to economic success and quality of life in the Monroe Urbanized Area. This section discusses the current state of intermodal freight transportation in the OCOG region.

Existing Conditions and Facilities

Truck Facilities

The Monroe Urbanized Area roadway system consists of major roadways and highways used for passenger and commercial travel. These facilities include: Interstate 20, U.S. Highway 80, U.S. Highway 165, and State Highways LA-2, LA-15, and LA-34 in addition to arterials, collector streets, and bridges. Due to the extensive roadway and highway system, the region is home to many freight carriers and trucking facilities.

Rail Facilities

Two Class I (designated as the largest carriers) and one short line railroad operate in the Monroe Urbanized Area. Kansas City Southern (KCS) and Union Pacific (UP) are Class I railroads, while the Arkansas, Louisiana and Mississippi Railroad (ALM) is a short line railroad operating between Monroe and Crossett, Arkansas. The KCS line runs east-west through Monroe between Shreveport, Louisiana and Vicksburg, Mississippi. The UP line runs north-south through Monroe between Lake Charles, Louisiana and Pine Bluff, Arkansas.

Air Facilities

Monroe Regional Airport is a public use airport located in the eastern portion of the city. The airport occupies approximately 2,600 acres, and features three runways. The facility is available for both commercial passenger and cargo services. According to the Federal Aviation Administration, Monroe Regional Airport had over 120,000 enplanements in 2014. The airport reports the facility to be the third busiest cargo hub in Northeast Louisiana, with a capacity of almost 1.5 million tons of freight. The airport is currently exploring the feasibility of an additional 40,000 ton cargo facility to better serve air freight in the region.

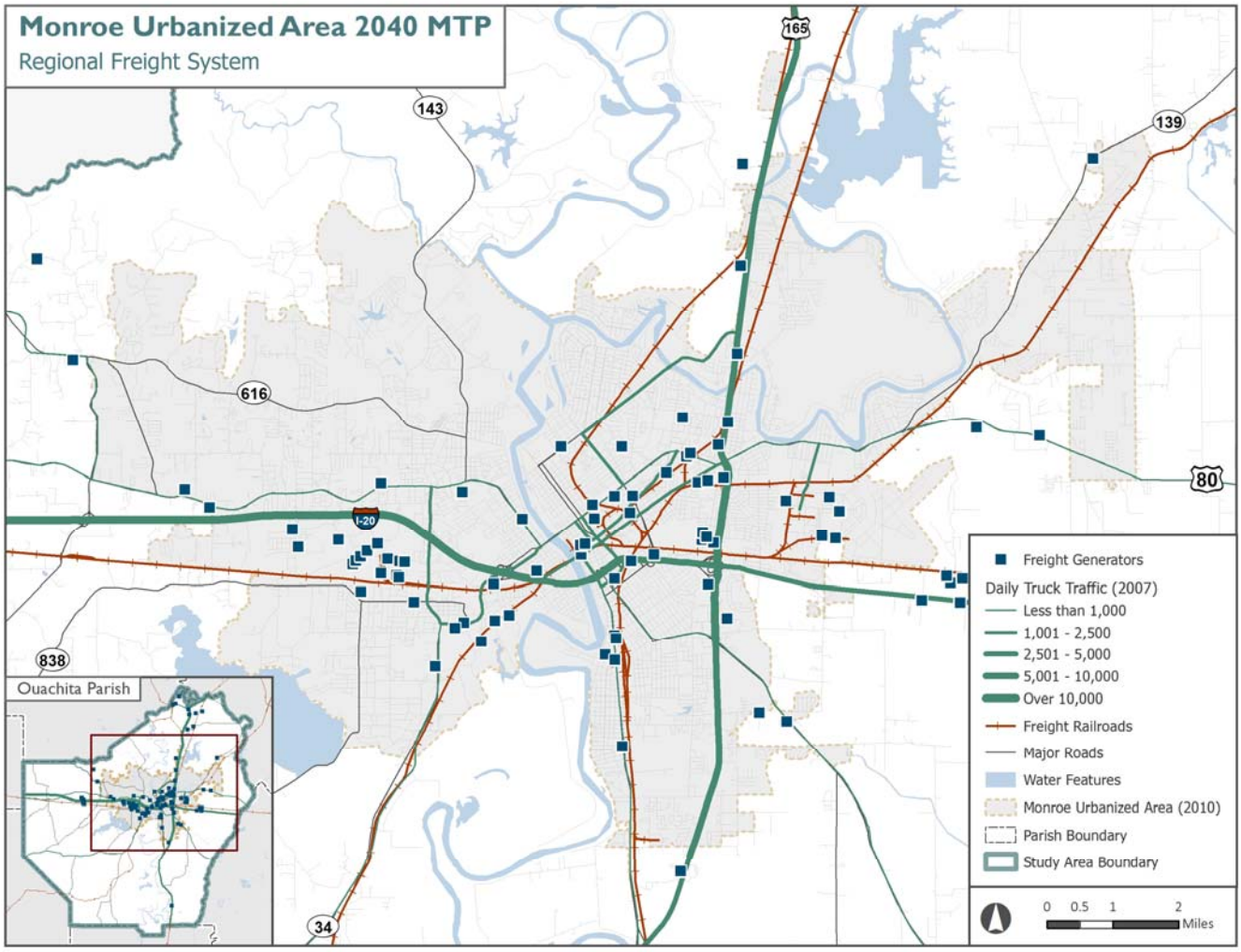
Intermodal Facilities

Intermodal freight involves moving goods between an origin and final destination using multiple modes. Transferring a shipment from a truck to a railcar or between a railcar and water barge are examples of intermodal freight. Intermodal freight can decrease the travel time for goods and lower shipping costs. Intermodal facilities in the region include the Monroe Regional Airport and Ouachita Terminals (Greater Ouachita Port).

Freight Generators

In order to understand the unique demands placed on the transportation system by freight, it is important to identify major freight generators in the region. These consist of major distribution centers, mining operations, and manufacturing companies with at least 100 employees, all of which are likely to generate large volumes of freight traffic. The locations of shipping entities – including FedEx, UPS, and the United States Post Office – were also explored, as these locations are likely to generate a significant amount of truck traffic. Finally, given the ability of freight to be shipped by both air and bus, Monroe Regional Airport and the Monroe Transit Downtown Terminal were included in the analysis to form a multi-modal understanding of freight demand. In total, 107 freight generators were located throughout Ouachita Parish, which are shown in Figure 3-13.

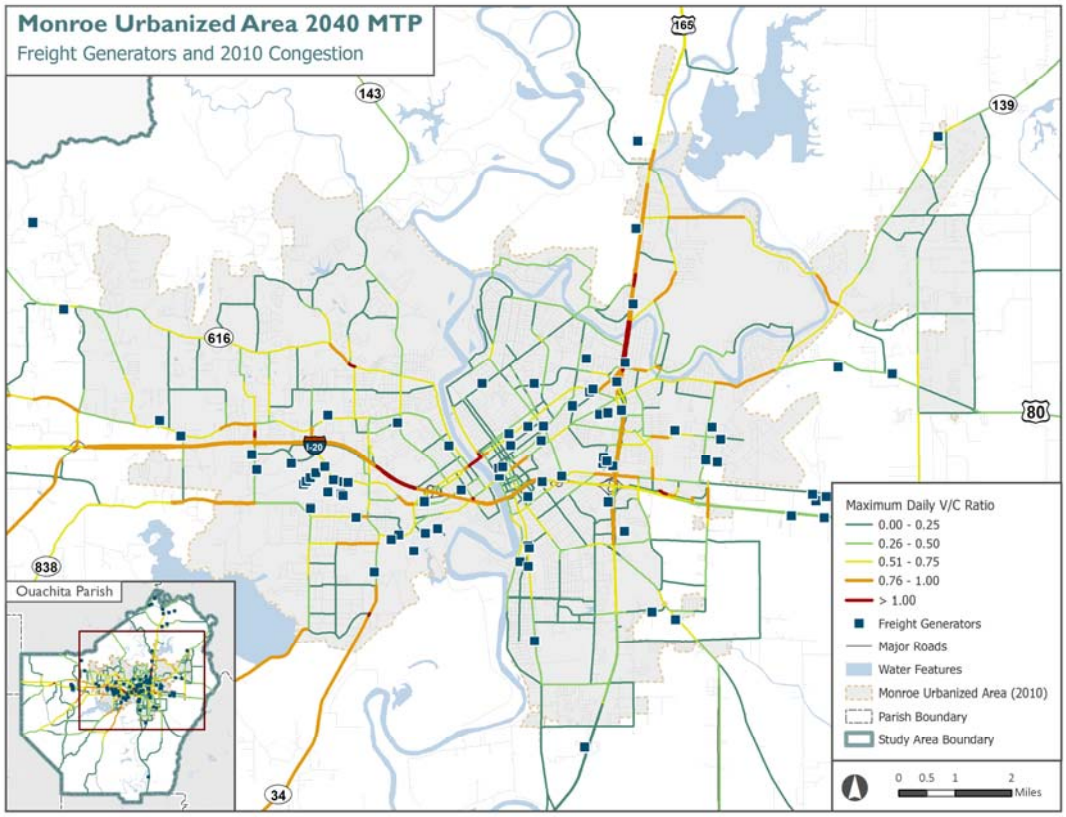
Figure 3-13: Monroe Urbanized Area Freight Generators

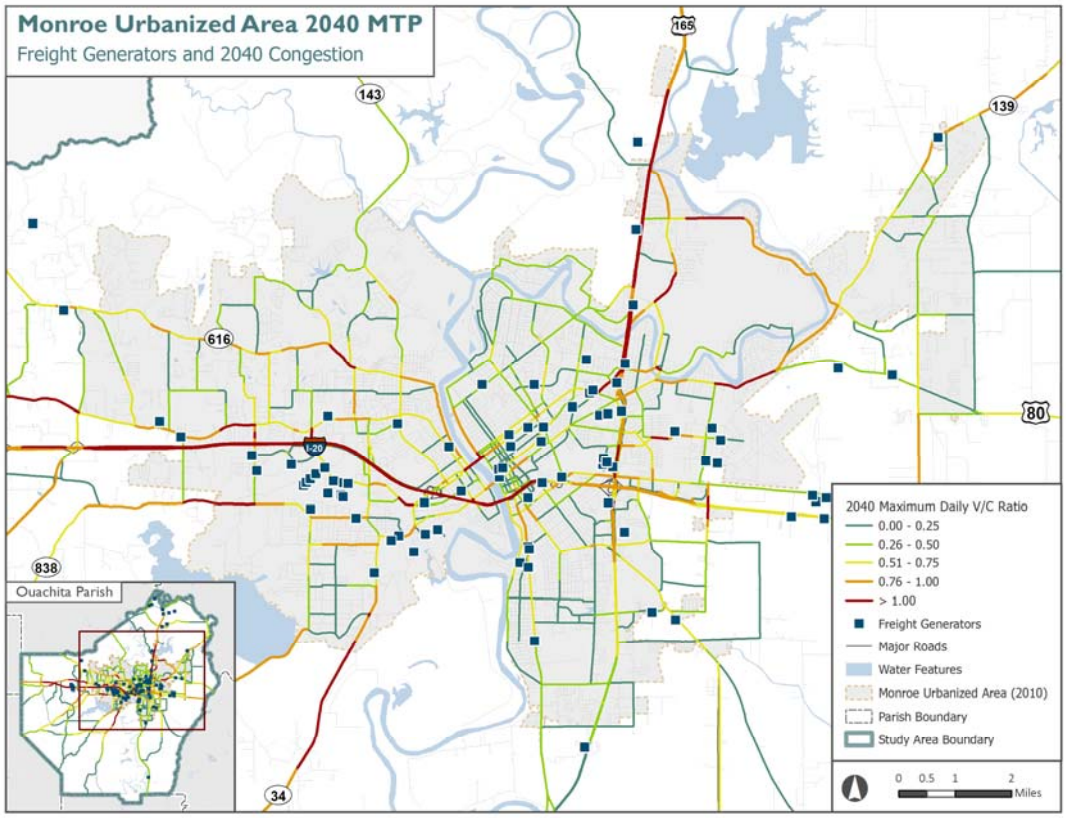


While congestion on the roadway network can be detrimental to all users, it is particularly harmful to freight traffic as increased travel times may lead to higher costs of goods or decreased likelihood that companies choose to locate facilities in the region. The freight analysis explored the relationship between the locations of major freight generators and congested roadways in the region. This was done by overlaying the locations of freight generators with the map of V/C ratios explored in the roadway deficiencies analysis. Figure 3-14 shows the proximity of freight generators to congested roads in both 2010 and 2040.

Although at present the majority of freight generators are located along uncongested portions of the roadway network, future congestion in key areas throughout the network may pose a challenge to existing freight facilities. These include freight generators in West Monroe which rely on access to I-20, locations along US 165 North, and freight generators that require a substantial number of trips across the Ouachita River, as most of the major river crossings are projected to be approaching or exceeding “congested” conditions by 2040.

Figure 3-14: 2010 Freight Generators, 2010 and 2040 V/C Ratios





Crash Locations

Highways and railroads account for nearly all fatalities and injuries involving freight transportation. Most of these fatalities involve individuals outside of the freight transportation industry, such as trespassers at railroad facilities and occupants of other vehicles killed in crashes involving large trucks. According to FHWA, approximately 12% of all highway related fatalities in 2012 involved large trucks; however, freight-related fatalities have largely remained stable or declined despite an increase in freight activity in recent decades.[3]

Table 3-10 shows the top 20 crash intersections in Ouachita Parish for crashes involving trucks of any kind between 2008 and 2013.

Table 3-10: Top Intersections for Crashes Involving Trucks (2008-2013)

Location	Crashes
LA 617 at Interstate 20	20
U.S. 165 at Interstate 20	13
LA 594 at Interstate 20	12
Interstate 20 at 5th Street	11
U.S. 165 at Interstate 20	11
LA 3249 at Interstate 20	10
LA 34 at LA 617	10
Interstate 20 at Garrett	9
U.S. 80 at LA 617	9
LA 34 at Interstate 20	9
U.S. 165 at Century	8
LA 34 at Natchitoches	8
U.S. 165 at LA 15	7
LA 617 at Downing Pines	7
LA 617 at Glenwood	7
LA 594 at Highway 594	6
U.S. 165 at Renwick	6
U.S. 165 at Loop	6
U.S. 165 at Ruffin	6
U.S. 80 at LA 34	6
U.S. 80 at LA 143	5
U.S. 165 at Riverbarge	5
U.S. 165 at Finks Hideaway	5
Total	*196*

Source: LHSC, 2015

Crashes occurred most frequently on Interstate and State highways, where vehicles traveling at higher speeds are likely to interact with slower moving vehicles. Intersection crashes can also be the result of numerous other factors including roadway and lighting conditions, inadequate signal timing, and impaired sight distances. Most freight-related crashes occurred between 8 A.M. and 6 P.M., and there was a significant decrease in early morning and late evening crashes when fewer passenger vehicles are on the road to interact with freight vehicles. The data also revealed that crashes involving trucks were more likely to result in severe injuries or fatalities due to size differences between passenger vehicles and freight vehicles.

Future Needs

Growth is anticipated to continue in the Monroe Urbanized Area and with that growth comes increased freight movement. During public outreach for the 2040 MTP, citizens and local stakeholders noted several concerns affecting freight transportation consistent with the information presented in this section. In addition to concerns over the abundance of at-grade rail crossings in the region, stakeholders noted that the Ouachita Terminal Lock & Dam facility is currently only open 20 hours a day and expressed a desire to see the facility operational 24/7. Other stakeholders acknowledged that the Ouachita Terminals facility is currently connected with the KCS railroad, but needs road improvements to handle additional truck traffic and improve intermodal connections.

Interregional Passenger Transportation

Interregional passenger transportation in the Monroe Urbanized Area is limited given the relatively small size of the urban area and its proximity to larger regional hubs in Shreveport.

Existing Conditions and Facilities

Passenger Rail

Passenger rail service is not available in the Monroe Urbanized Area, although Amtrak is available within driving distance of the region. Travelers can drive to Shreveport to catch a shuttle to the Texas Eagle Amtrak line in Longview, Texas, or to Jackson, Mississippi to catch the City of New Orleans line. The Northwest Louisiana Council of Governments

[3] *FHWA, 2013*

(NLCOG) recently explored the feasibility of passenger rail service between Shreveport, LA and Vicksburg, MS – including a station in Downtown Monroe. The study does not make any specific recommendations, but ensures that stakeholders can make an informed decision about possible implementation of regional passenger rail.

Intercity Bus

Greyhound Lines, Inc. directly connects the Monroe Urbanized Area to Shreveport and Jackson, Mississippi, as well as Atlanta and Dallas. Service is provided to regional destinations like New Orleans, Memphis, and Houston through transfer.

Air Travel

As the original birthplace of Delta Airlines, Monroe has a strong history of passenger aviation. The City of Monroe-owned Monroe Regional Airport is the region's commercial airport and is serviced by Delta, American, and United Airlines. The airport provides direct flights to Atlanta, Dallas-Fort Worth, and Houston. The airport completed a brand new passenger terminal in 2011 that features six (6) gates, a new baggage claim and ticketing area, and cocktail lounge and restaurant. The terminal project also included a new car rental facility housing several companies, including: Budget, National Car Rental, and Hertz. Short-term and long-term parking is also available at the airport.

Source: David Willoughby (via Archinect)

Based on enplanements, Monroe Regional Airport was ranked 212th in the Federal Aviation Administration (FAA) list of 2014 Commercial Service Airports. Historic enplanements are shown in Table 3-11. With the exception of CY 2012, enplanements have steadily increased over time at the airport.

Table 3-11: Monroe Regional Airport Enplanements

Year	Total Enplanements	Rank	Percent Change
CY 2014	120,589	212	4.17%
CY 2013	115,757	216	14.57%
CY 2012	101,034	222	-5.83%
CY 2011	107,290	217	6.84%
CY 2010	100,419	185	17.71%
CY 2009	85,314	228	-

Source: FAA, 2015

Future Needs

As the Monroe Urbanized Area grows, developing and maintaining efficient access to commuter bus and rail services will ensure that residents can connect with other metropolitan areas across the U.S. Continued growth of employment centers, such as the CenturyLink expansion, could increase demand for interregional passenger transportation – particularly at the Monroe Regional Airport.

Summary of Non-Roadway Needs Assessment

As a growing metropolitan area with a diverse range of transportation system users, the Monroe Urbanized Area exhibits a variety of needs beyond its roadway network. Fixed route transit service is provided but is limited, only serving the population within the City of Monroe. Bicycle and pedestrian accommodations are average to poor throughout Ouachita Parish, although non-motorized forms of transportation are better accommodated in the urban cores of Monroe and West Monroe. With access to several railroads, a major cross-country Interstate Highway (I-20), an inland river port, and capacity for air cargo, the Monroe Urbanized Area features a robust intermodal freight network that will likely continue to place additional demand on the transportation system as the region grows. Finally, as a relatively small metropolitan area located within close proximity to larger cities, non-driving opportunities for interregional passenger transportation are somewhat limited. All of these non-roadway needs were considered when making recommendations for projects to be included in the final 2040 MTP.