Downtown Kalamazoo Planning and Environmental Linkages

FINAL REPORT

July 2019

Submitted to:

MDOT
Michigan Department of Transportation

by:

CDM Smith

Stadium Drive, Kalamazoo Avenue and Michigan Avenue Corridor (I-94BL/M-43) in the City of Kalamazoo Planning and Environmental Linkages Report.

The Planning and Environmental Linkages (PEL) Report for the Stadium Drive, Kalamazoo Avenue and Michigan Avenue Corridor (I-94BL/M-43) in the City of Kalamazoo is complete in accordance with Federal Highway Administration's PEL process. This process was completed as a result of a collaborative effort between the City of Kalamazoo, the Michigan Department of Transportation, other agencies, organizations, stakeholders, and the public. As stakeholders of the system, it is beneficial that we come together, providing potential solutions to deliver a safer and more efficient transportation facility with the PEL area. As members of the Admin Team, we were integral in this process with input from the Local Advisory Group and the public.

As an acknowledgment of partnership for this process, we are in concurrence with the Final Stadium Drive, Kalamazoo Avenue and Michigan Avenue Corridor (I-94BL/M-43) in the City of Kalamazoo PEL Report.

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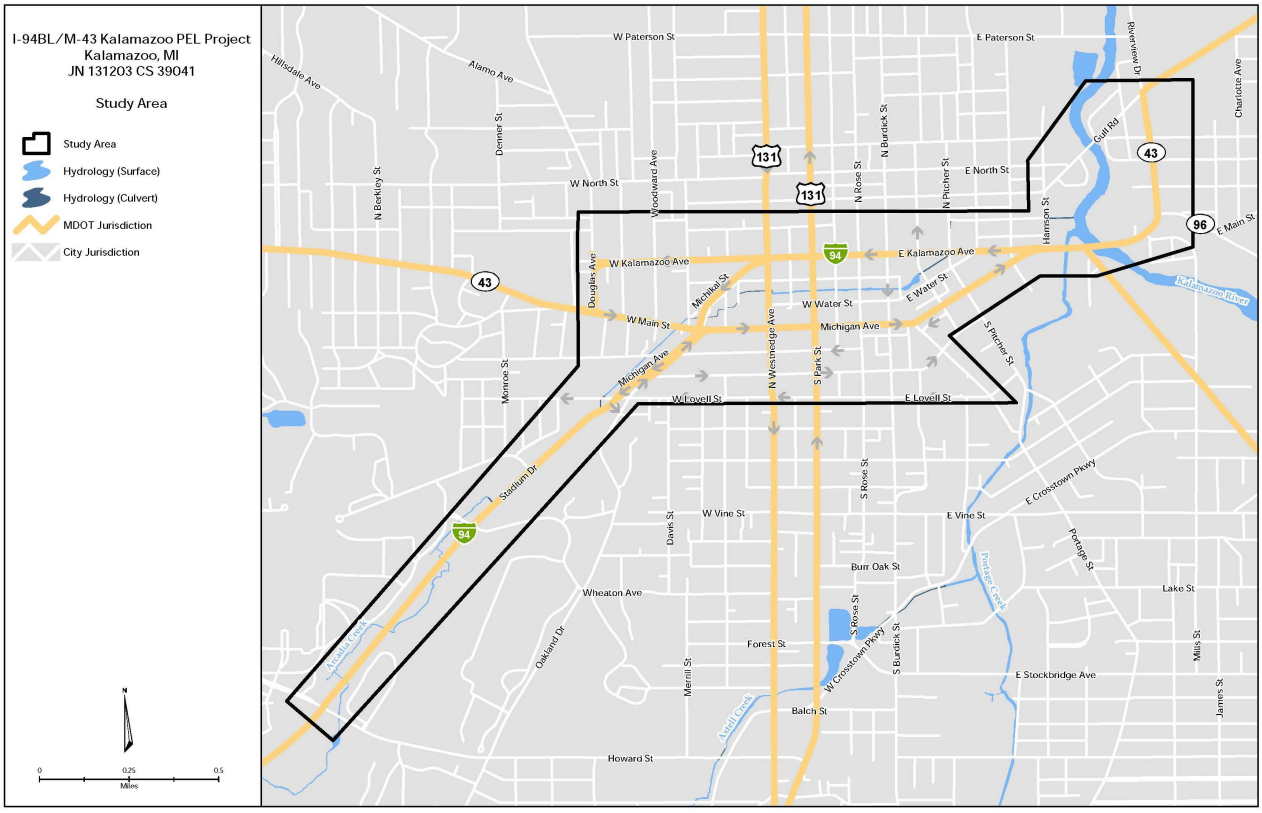
1 Executive Summary

The Stadium Drive, Kalamazoo Avenue and Michigan Avenue Corridor (I-94BL/M-43) Planning and Environmental Linkages (PEL) study in the City of Kalamazoo (City) was sponsored by the Michigan Department of Transportation (MDOT). The study began in 2016 and was substantially completed in January 2019, with the recommendation being a jurisdictional transfer of the MDOT highways, within the City's corporate limits, to the City with MDOT retaining ownership of highway rights-of-way. This option was explored when the City and MDOT decided the best avenue to achieve their downtown street vision was to have full jurisdictional control of the network within their corporate limits. Overall, MDOT and the City functionally have different priorities for the respective highways; MDOT's focus was safe and efficient operations for motorized and non-motorized traffic operations; whereas, the City's focus was revitalizing and sustainability of the downtown, reduced focus on efficient traffic operations with better accommodation and continuity/connectivity of non-motorized traffic. MDOT internally led the study from inception to May 2017 at which time the consultant team of CDM Smith, MKSK and Surveying Solutions was brought under contract. This team of consultants and MDOT formed the Study Team. The Federal Highway Administration (FHWA), the City and numerous other agencies and advocacy groups were involved throughout this study. The project study area is shown below in **Figure 1-1**. . Further jurisdictional transfer information can be found in **Section 8.1** of the Downtown Kalamazoo PEL Report.

Figure 1-1: Project Study Area



The study area is highly developed with commercial and retail businesses along with residential properties bordering the commercial zone as well as serving as a commuter corridor. The study area roadways link Western Michigan University (WMU), Kalamazoo College, multiple neighborhoods and the Central Business District together. This corridor has many challenges starting with a relatively high average daily traffic of almost 29,000, a large number of pedestrians and bicyclists, and multiple destinations. A brief overview of the key roadways is described in the **Table 1-1**.

Table 1-1: Key Roadways

Street	Segment	# of Lanes	Speed Limit (mph)	On-Street Parking (Y/N)	Road Type
Douglas Ave	Main to Kalamazoo	3	35	No	One-Way Pair
Kalamazoo Ave	Douglas to Michikal/Westnedge	2-3	30-35	No	One-Way Pair
Kalamazoo Ave	Pitcher to Michigan	3	30	No	One-Way Pair
W Main St	Douglas to Michikal	3-4	35	No	One-Way Pair
Michigan Ave	BUS 94 to Westnedge	5-6	30-35	Yes	One-Way Pair
Michigan Ave	Kalamazoo to King	5-6	30	No	Undivided
Michigan Ave	King to Riverview	4-6	40	No	Undivided
Michigan Ave	Pitcher to Kalamazoo	3-4	30	No and Yes	One-Way Pair
Michigan Ave	South to Main	2-3	35	No	Divided
Michikal St	Main to Kalamazoo	3	35	No	One-Way Pair
Riverview Dr	Michigan to Gull	4-5	40	No	Undivided
Stadium Dr	Oliver to Lovell	4-6	35	No	Undivided
Stadium Dr	Howard to Oliver	5-6	45	No	Undivided

Over the years a number of studies have been undertaken by the City, MDOT, and local groups to evaluate traffic operations, address traffic problems and evaluate improvements to the downtown streets with the goal to enhance access and the economic viability of the corridor.

Planning and Environmental Linkages (PEL)

The Study Team has followed FHWA's PEL process throughout the study. The PEL process is documented to ensure environmental issues are considered early in the transportation planning process and to help identify a future project(s). The PEL Questionnaire (**Appendix G**) provides a summary of the PEL process that guided this study.

Project Purpose and Need

The draft Purpose and Need was developed with input from the Admin Team, Local Advisory Group (LAG) and public prior to alternatives analysis and provided the criteria for alternative comparison. Refer to **Section 3** for full details on who comprised these groups. After presenting the draft Purpose and Need at the second public information meeting and incorporating comments, the below final Purpose and Need was developed. The full Purpose and Need can be found in **Section 5**.

Project Purpose

The purpose of the Downtown Kalamazoo PEL study is to improve **safety** and **operations** for all users of various transportation modes and pedestrians within the project area and to provide a quality integrated transportation network for economic prosperity for the downtown business community and quality of life through safe mobility options for all users.

Project Need

The study will address the following needs:

- Improve the safety of the corridors within the study area.
- Improve operations and connectivity for users of all modes by implementing context sensitive solutions
- Update/optimize operations at intersections to provide balanced operations for all modes.

Methodology

The methodology used for this study was based on past MDOT studies of similar type projects and follows an alternatives development and evaluation process typically associated with NEPA alternatives analysis. The scope of work for this study included documentation of the PEL process which was done as the study developed. The purpose for completing this documentation is to:

- Summarize the environmental analysis and potential impacts completed thus far for use when funding is secured and NEPA classification is pursued.
- Engage and solicit input from stakeholders and members of the public.
- Refine the study purpose and need statement.
- Develop a Preferred Alternative for use in securing funding and considering phasing.
- Document the method of solving existing traffic congestion and crash issues.

Key coordination points between decision makers included the collection of data, crash analysis, and traffic operation analysis. MDOT provided the preliminary environmental information and additional resource coordination occurred with FHWA and Michigan State Historic Preservation Office (SHPO). FHWA attended numerous project meetings and SHPO was included indirectly through incorporation of the concurrent historical property survey that was completed in the Fall of 2018. Michigan Department of Environmental Quality (MDEQ) and SHPO were included in the LAG but did not attend any meetings.

Project Meetings and Stakeholder/Public Engagement

The PEL process approach to transportation decision-making considers environmental, historical, cultural, and feasibility issues early in the transportation planning process. Public engagement gives the public the opportunity to be part of the process and help guide the project team to decisions that are acceptable to the community. Two public meetings were held. The first public

meeting covered the PEL process and approach, the project schedule, and an overview of the study area. The comments received generally supported two-way street functionality, enhanced pedestrian crossing and intersection safety, bike lanes, and traffic calming.

The second public meeting presented the Draft Purpose and Need document and attendees were provided time to ask questions and make comments. Public comments included improved connectivity to neighborhoods, WMU, and downtown, better recognition of historic features, enhance the quality of life, pedestrian crossing safety, traffic operations at key intersections, and traffic calming.

The PEL process encourages agencies to be involved early in the planning process to enable a cohesive flow of information, to resolve issues early-on and improve project delivery timeframes. Two agency organizations were formed for the Kalamazoo PEL study. The Admin Team members were transportation facility owners or had a direct stake in the existing facilities, with the expectation that they would sign-off of the PEL document indicating they are in agreement with the results. The LAG was composed of other stakeholder groups within the community. Additional stakeholder engagement details are in **Section 3**.

Draft Illustrative Alternative Development and Analysis

The Study Team developed the following draft illustrative alternatives based on the data collected and Purpose and Need Statement. The existing one-way pair of South and Lovell Streets are under City jurisdiction and identified for conversion to two-way which is reflected in each build alternative.

- **No-Build:** No change to the current roadways but traffic volumes increased to the build year of 2040.
- **Alternative 1A:** Two-way conversion with Michikal Street remaining one-way. This alternative converts Kalamazoo Avenue, Michigan Avenue, Douglas Avenue and Main Street to two-way streets within the study area. Park Street and Westnedge Avenue were initially converted to two-way streets but due to operational concerns were changed back to one-way streets. The City has expressed desire to also convert these streets to two-way but realizes it is not an immediate study goal.
- **Alternative 1B:** Two-way conversion without Michikal Street. This is the same alternative as 1A except Michikal Street is removed.
- **Alternative 2:** One-way road diet. This alternative looks at opportunities to reduce the number of through travel lanes along with intersection treatments to improve bicycle/pedestrian options, parking and other roadside amenities.
- **Alternative 3A:** Hybrid system with Michikal Street remaining one-way. This alternative is a blend of Alternatives 1A and 2, where Michigan Avenue and Main Street are the only conversions to two-way.
- **Alternative 3B:** Hybrid system without Michikal Street. This is the same alternative as 3A except Michikal Street is removed.

- **Alternative 4:** Two-way conversion with Michikal reversed. This alternative converts Michigan and Kalamazoo Avenues within the downtown area to two-way while Kalamazoo Avenue outside the downtown area along with Douglas Avenue and Main Street remain one-way. Michikal Street remains one-way but is reversed.

As jurisdictional transfer discussion increased, the traffic analysis in turn focused on the City preferred alternatives of 1A, 1B and 4 since they are the most likely to support the vision in the City's Master Plan. Also, the alternatives development process did not evolve past the draft illustrative alternative stage due to the transfer discussions. When the City commences their study, these alternatives will be reevaluated.

Potential Issues for Future Consideration

Future design activities should incorporate public engagement to ensure the project considers all community concerns while offering stakeholders an opportunity to shape the look of the corridor. Additional environmental investigation is anticipated during future project phases and may require mitigation as discussed in **Appendix D**.

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2 Introduction

This chapter of the report provides the background of the PEL study, including the study area and previous studies that have been conducted.

2.1 Background

The Stadium Drive, Kalamazoo Avenue and Michigan Avenue (I-94BL/M-43) corridor is located in the City of Kalamazoo (City). These two roadways link WMU, Kalamazoo College, multiple neighborhoods and the Central Business District together (**Figure 2-1**). This corridor has many challenges starting with an average daily traffic of almost 29,000, a large number of pedestrians and bicyclists, and multiple destinations.

The MDOT Kalamazoo Transportation Service Center (TSC) and Southwest Region have worked closely with the City and the public for many years to make improvements in and around the greater Kalamazoo area. However, in the last few years, MDOT has seen a tremendous increase in the amount of public concerns generated within this corridor. The majority of the concerns centered on the need for improved pedestrian/bicycle safety.

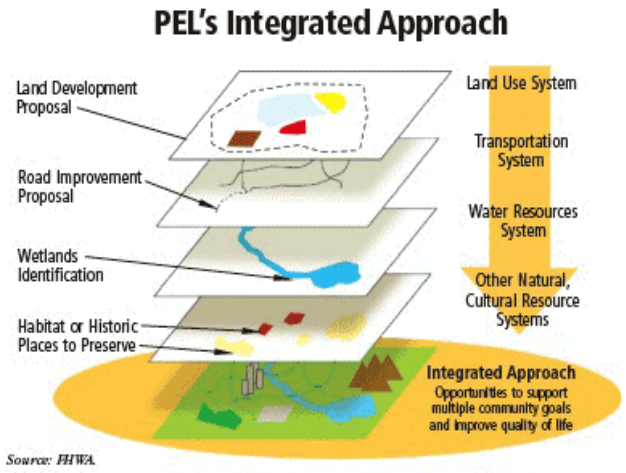
MDOT met with the Governor's Office of Urban Initiatives to discuss potential solutions to the concerns raised by the public. MDOT and the Governor's office developed a steering team that consisted of representatives from WMU, Kalamazoo College, local philanthropic organizations, the City, Kalamazoo Area Transportation Study (KATS), and Kalamazoo Downtown Partnership. The steering team agreed to oversee and participate in a coordinated condensed charrette to gain the necessary input and generate potential solutions to the concerns raised by those using the Stadium Drive and Michigan Avenue Corridor (the corridor).

The public outreach efforts were robust. Leading up to and throughout the charrette week (September 30 and October 3, 2014), an interactive map was available online. Attendees at charrette events were given the opportunity to complete questionnaires. Over 1,200 interactions were documented with the public. The local newspaper, the Kalamazoo Gazette, hosted real-time chat groups where City and MDOT officials answered questions.

To continue the momentum generated by the charette and work towards a comprehensive transportation solution, FHWA and MDOT proposed a PEL study, sponsored by MDOT. MDOT led this effort from early 2016 to May 2017 at which time the consultant team of CDM Smith, MKSK and Surveying Solutions was brought under contract. The robust public outreach effort and improvements options formed the starting foundation for the PEL study.

2.2 PEL Process

In 2015, the Fixing America's Surface Transportation Act ("FAST" Act) was signed into federal law. One aspect of the FAST Act was to accelerate the environmental review process for surface transportation projects. This also formalized the PEL process in order to accelerate the review. Typically, environmental review does not occur early enough in a planning process and can end up requiring a re-evaluation of the document process and revisiting of decisions that have been made. The PEL process ensures that environmental aspects are considered early enough in the planning process such that informed decisions are made from the start. A PEL process represents a collaborative and integrated approach to transportation decision-making that 1) considers environmental, community, and economic goals early in the transportation planning process, and 2) uses the information, analysis, and products developed during planning to inform the environmental review process. This process will typically develop a Purpose and Need statement early in the planning process, include environmental data collection and at least some analysis of the data.

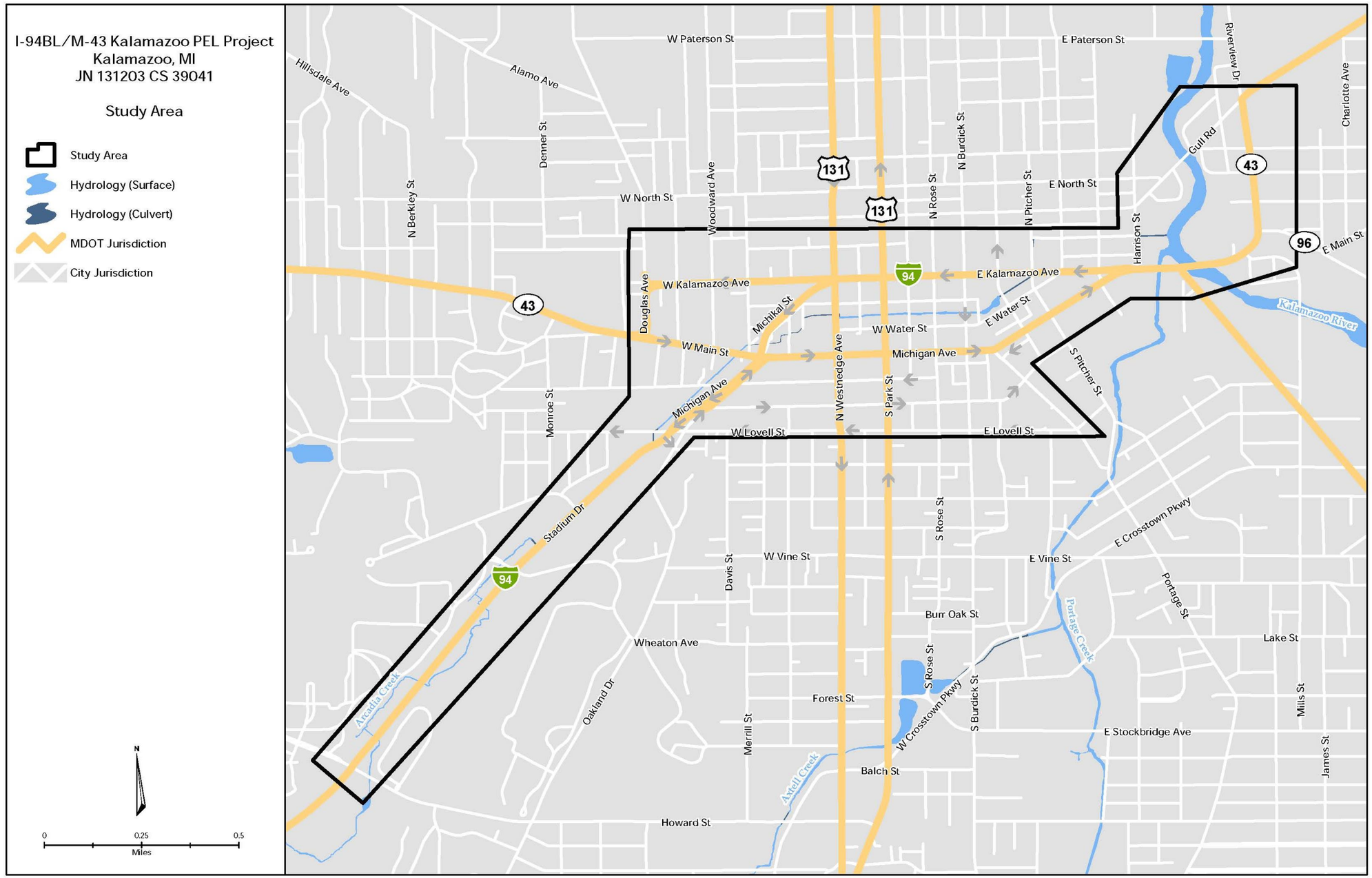


This report includes a summary of the process that was followed (**Figure 3-1**). The goal of the study is to select future transportation improvements to improve safety, operations, and pedestrian mobility and provide a quality integrated transportation network for various transportation modes. The Federal Highway Administration's (FHWA) PEL process is being followed to ensure planning and environmental factors are considered throughout the study to carry forward into a National Environmental Policy Act (NEPA) analysis. The PEL process also promotes a partnership with the key stakeholders within the study area leading to an improved and balanced planning and decision-making process. The PEL Questionnaire (**Appendix G**) provides a summary of the PEL process that guided this study.

2.3 Study Area

The study area, as shown in **Figure 2-1**, includes segments of MDOT trunklines: Stadium Drive (between Howard Street and Michigan Avenue), Michigan Avenue (between Stadium Drive and Kalamazoo Avenue), Kalamazoo Avenue (between Douglas and Harrison Street), Michikal Street (between Michigan Avenue and Kalamazoo Avenue), Riverview Drive (between Harrison Street and Gull Street), Douglas Avenue (between W. Main Street and Kalamazoo Avenue), West Main Street, Westnedge Avenue and Park Street. Local road segments include South and Lovell Streets.

Figure 2-1: The City Kalamazoo PEL Study Area



Source: MDOT

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2.4 Previous Studies

Over the years a number of studies have been undertaken by the City, MDOT, and local groups to evaluate traffic operations, address traffic problems and evaluate improvements to the downtown streets with the goal to enhance access and the economic viability of the corridor. Most recent studies have looked into transforming downtown Kalamazoo into a more pedestrian-friendly and less vehicle-dependent area along with making the parking system operate more effectively.

Recently completed studies include the Imagine Kalamazoo Master Plan and their Strategic Vision Plan with a goal to create policy direction for land development and transportation; and the KATS Pedestrian, Greenway, and Transit Plan to improve linkages between the existing transit network and the non-motorized infrastructure in the region.

More information on these and other previous studies can be found in **Appendix A**.

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3 Public Engagement and Agency Coordination

3.1 Public Engagement

The PEL process approach to transportation decision-making helps the planning team consider environmental, historical, cultural, and feasibility issues early in the transportation planning process. Public engagement gives the public the opportunity to be part of the process and help guide the project to decisions that are acceptable to the community. For the Kalamazoo PEL study, residents, business owners and other stakeholders were encouraged to share ideas, suggestions, and concerns during and following public meetings. Summaries for these public meetings can be found in **Appendix B**.

3.1.1 Public Meeting #1 – April 20, 2016

MDOT conducted an Open House format meeting on April 20, 2016 to discuss future improvements within the downtown Kalamazoo PEL study area. Residents, business owners and the media were invited to attend the meeting which discussed the PEL process and approach, the project schedule, and an overview of the study area.

Attendees were invited to provide comments using sticky notes on a map of the study area. Comment forms were also available for attendees to send in comments via mail or email. The comments generally supported two-way street functionality, enhanced pedestrian crossing and intersection safety, bike lanes, and traffic calming.

3.1.2 Public Meeting #2 – October 20, 2016

The public was invited the attend the second public meeting on October 20, 2016, conducted by MDOT, to help define the purpose and need for road improvements in the PEL study area. The Draft Purpose and Need document was presented and attendees were provided time to ask questions and make comments.

Comment forms were made available for attendees to provide comments via mail or email. Public comments included improved connectivity to neighborhoods, WMU, and downtown, better recognition of historic features, enhance the quality of life, pedestrian crossing safety, traffic operations at key intersections, and traffic calming. Public comments showed concerns that some non-motorized connections are missing or less than desirable (see **Figure 4-11).** The public meeting identified intersections that are particularly problematic for various modes. In addition, the traffic model analysis results showed two intersections that are operating under congested conditions and others that are approaching congested conditions. Traffic volumes are expected to grow which will only make the study area intersections and more congested.

3.2 Agency Coordination

The PEL process encourages agencies to be involved early in the planning process to enable a cohesive flow of information, to resolve issues early-on and improve project delivery timeframes. Two agency organizations were formed for the Kalamazoo PEL study. The Admin Team members, identified in **Table 3-1**, were transportation facility owners or had a direct stake in the

existing facilities, with the expectation that they would sign-off of the PEL document indicating they agree with the results. The LAG, **Table 3-2**, was composed of other stakeholder groups within the community. Representatives from Federal, State, City and local agencies were involved with this process. Notes for the below listed meetings and a list of Admin Team and LAG members can be found in **Appendix C**.

Table 3-1: Admin Team

Admin Team
MDOT
City of Kalamazoo
Kalamazoo Downtown Partnership
FHWA
KATS
WMU
Kalamazoo Metro Transit

Table 3-2: LAG

Local Advisory Group
Academia
Kalamazoo College
Kalamazoo Valley Community College (KVCC)
KVCC Arcadia Commons Campus
Businesses/Freight Companies
Kalamazoo Institute of Arts
Southwest Michigan First
ARVCO Container Corporation
Graphic Packaging International
City
City of Kalamazoo Historic District Commission (HDC)
City of Kalamazoo Historic Preservation Commission (HPC)
City of Kalamazoo Parks and Recreation
Complete Streets Coalition of Kalamazoo
Kalamazoo Metro Transit
City of Kalamazoo Planning Commission
Kalamazoo Regional Chamber of Commerce
Clubs/Groups/Advocacy
Bike Friendly Kalamazoo (BFK)
Kalamazoo Bicycle Club
Disability Network of Southwest Michigan
Discover! Kalamazoo
Congregations
First Baptist Church
First Congregational Church
St. Augustine Cathedral and School

Local Advisory Group
County
9th Judicial Circuit Court for Kalamazoo County
Kalamazoo County - Administration
Kalamazoo River Valley Trail - Parks Foundation of Kalamazoo County
Kalamazoo Community Foundation
Kalamazoo County Brownfield Authority
Central County Transportation Authority (CCTA)
Federal
Federal Courthouse
Healthcare Facilities
Bronson Healthcare
Neighborhood Associations
Douglas Neighborhood Association (DNA)
Eastside Neighborhood Association (KENA)
Edison Neighborhood Association
Northside Association for Community Development
Stuart Area Restoration Association
Vine Neighborhood Association
West Main Hill Neighborhood Association
West Main Hill Neighborhood Association/representative
Gateway Coalition (South Street Historic District group)
Oakland Drive - Winchell Neighborhood Association
State
Michigan Department of Environmental Quality
Michigan State Historic Preservation Office (SHPO)
State of Michigan Office of Urban and Metropolitan Initiatives

3.2.1 Admin Team Kickoff Meeting #1 – January 13, 2016

An Admin Team Kickoff Meeting was held by MDOT on January 13, 2016. Representatives from the City, FHWA, Downtown Kalamazoo Partnership, WMU, KATS and MDOT were in attendance. MDOT presented a PowerPoint overview of the PEL process, the study limits, data needs from agency partners, purpose and need, road safety audit, and alternative development.

3.2.2 LAG Meeting #1 – March 14, 2016

MDOT met with the LAG on March 14, 2016 at the MDOT Southwest Region office. A map of the study area was discussed and MDOT presented PowerPoint slides describing the PEL process. MDOT defined the roles of the different agency groups for the Kalamazoo PEL study:

- MDOT led coordination and guided the study through the PEL study. MDOT was responsible for keeping the Admin Team and LAG informed on the PEL study progress; facilitating discussion and information sharing; and the scheduling and conducting of public meetings.

- FHWA assures the study was conducted in a manner consistent with PEL process so that the work and conclusions can be carried forward into NEPA review.
- Admin Team: In general, this is a body of governmental organizations that have jurisdiction and policy control over specific public areas and infrastructure. This group has the authority to implement recommendations identified through the PEL process, can help collaborate to seek funding opportunities to move forward and to act on other policy, planning and approvals in a coordinated fashion.
- LAG: This is a group consisting of organizations that represent different cultural, environmental, economic and social interests within the study area. It is a representative form of public involvement.

The group discussed public outreach efforts including the MDOT hosted website to share information about the PEL study and gather public input, as well as the upcoming public involvement meeting.

3.2.3 City of Kalamazoo Update Meeting #1 – May 30, 2017

The MDOT/Consultant team was introduced to the City at the May 30, 2017 meeting. They met to discuss the project scope and schedule and upcoming roadway or development projects. Key points of discussion were the PEL process and alternative development, current and future roadway projects and developments in the study area, identification of stakeholders for the LAG, and initial public meeting planning.

3.2.4 City of Kalamazoo Update Meeting #2 – August 21, 2017

The MDOT/Consultant team met with the City, KATS and Kalamazoo Downtown Partnership to talk about their expectations for roadway and non-motorized improvements in the city. This included a discussion of existing conditions and new plans and policies already in progress by the City. Also discussed was the evaluation criteria to be applied to proposed alternatives and what would be considered a fatal flaw in the proposed action.

3.2.5 Admin Team Meeting #2 – September 15, 2017

The purpose of the meeting was to kick back off the project, MDOT to introduce the consultant team, summarize the data collected to date, discuss the evaluation criteria, discuss the draft Illustrative Alternatives and present the upcoming project schedule. In addition, a recap of the final Purpose and Need was presented as well as a slide summary of past studies that were reviewed as part of this project.

3.2.6 LAG Meeting #2 – October 9, 2018

The Admin team meet with the LAG on October 9, 2018 at the MDOT Southwest Region Office to update the group on the status of the study, the potential jurisdictional transfer and the City's plan moving forward. MDOT provided a presentation on the jurisdictional transfer, identifying the roads under review and the M-43 re-designation including the expected change in travel times. The City discussed the next steps in the process and the timeline for the transfer. Feedback

was solicited from the group on future meetings and ways to inform the public understanding of the jurisdictional transfer.

4 Existing and Future Conditions

This chapter discusses the existing social, environmental, and cultural resources within the Study Area as well as the future land use, traffic and safety conditions. An environmental review was conducted by MDOT in 2016 when the project was initially started. A summary of that review is provided in **Appendix D**. Additional field reconnaissance or assessment of environmental conditions and assets were not part of the project scope.

4.1 Existing Conditions

4.1.1 Social Resources

The social environment includes the characteristics of the people and land uses within the Study Area. This includes the demographic makeup, any economic or socially disadvantaged populations, and the land use defining the ways the Study Area property can be used.

4.1.1.1 Land Use - No anticipated concerns

The project Study Area consists of residential land, commercial, and industrial land uses (**Figure 4-1**). The land use within the study area transitions into small residential areas before reaching the downtown area. East of the Kalamazoo River, there is more commercial and residential land uses present. Educational facilities in the study area include WMU and Kalamazoo College which consume most of the southwest portion of the study area. The land uses in **Figure 4-1** are from the tax assessor's office and represent the land use tax category for the land shown.

There are currently no parcels included in the project that fall within Agriculture or Forestry zone districts, meaning that no additional work related to the Farmland Protection Policy Act or Farmland Development Rights Agreement would be required. There are no substantial land use impacts expected with any of the draft Illustrative Alternatives.

4.1.1.2 Emergency Services

The region's emergency services departments keep the people and businesses safe and secure. The locations of nearby emergency services are shown on **Figure 4-2**. Emergency response teams understand the need to minimize response time. Emergency services have commented on the increased response times via the one-way streets and how their personnel are often reprimanded for traveling the wrong way on a one-way street to decrease response time.

4.1.1.3 Recent Downtown Development

There has been a lot of development interest in downtown Kalamazoo. **Figure 4-3** shows the potential develop activity being considered which includes mixed use, apartments, hotels, and a county office building.

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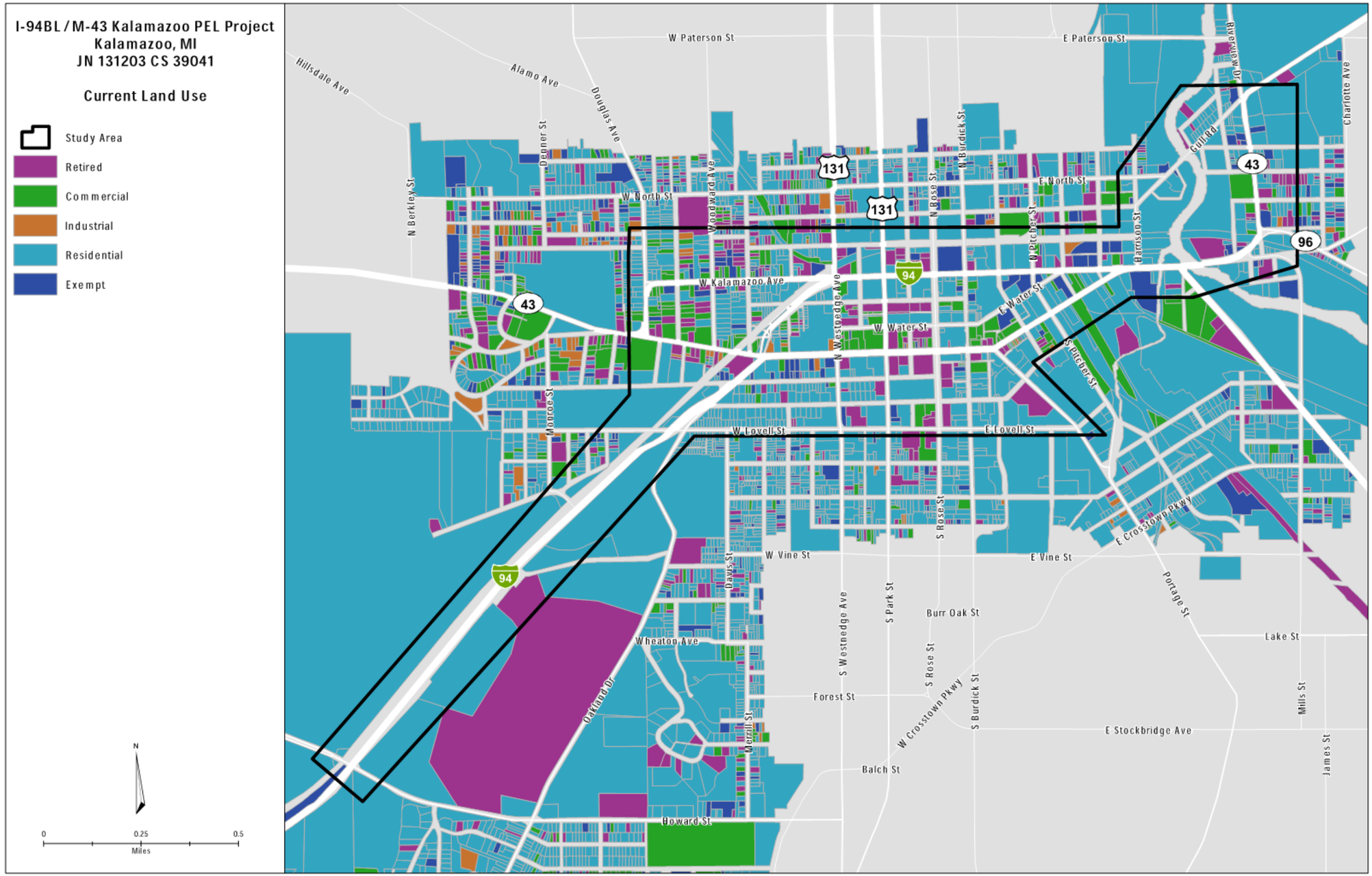
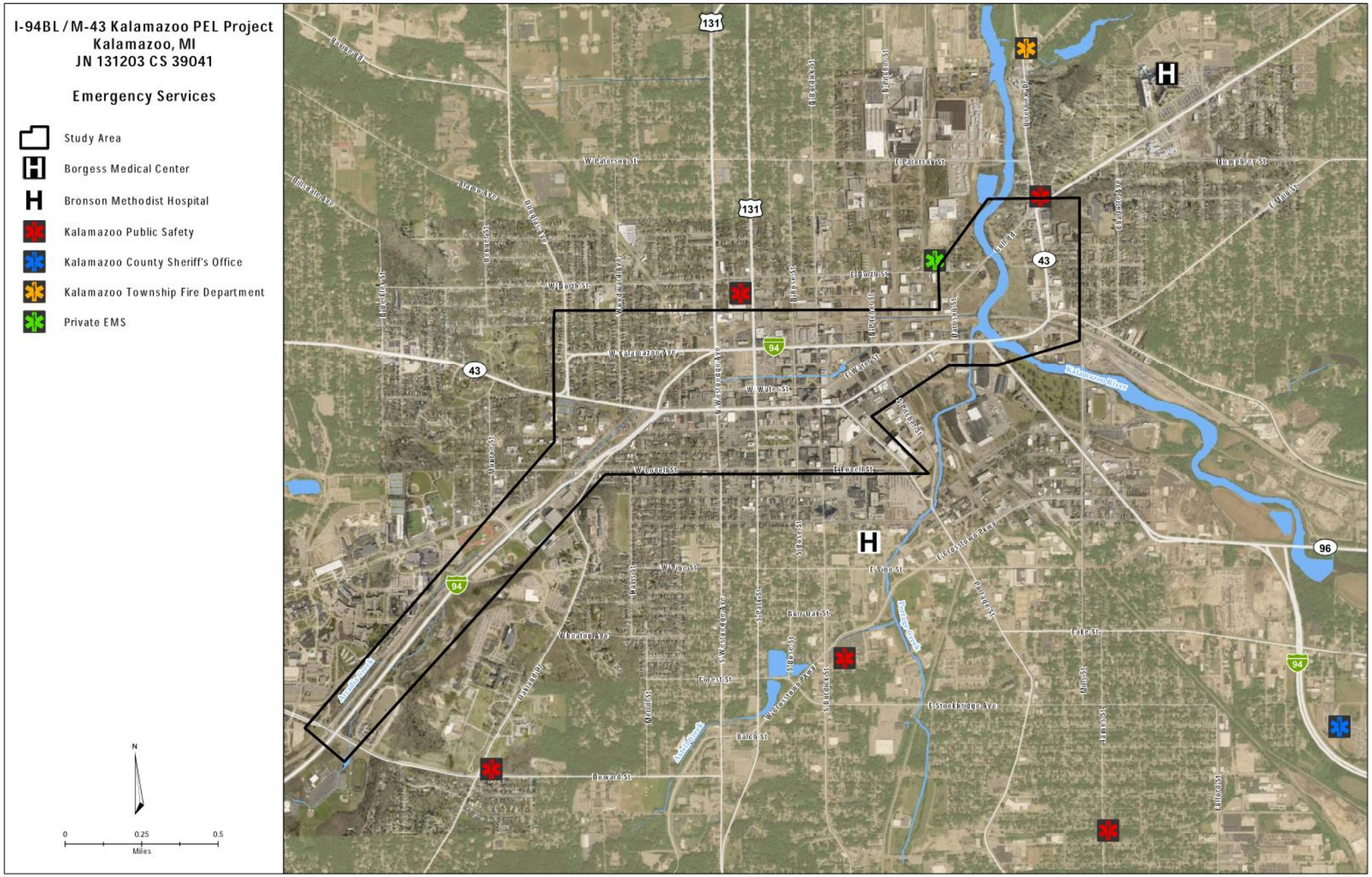
Figure 4-1: Current Land Use



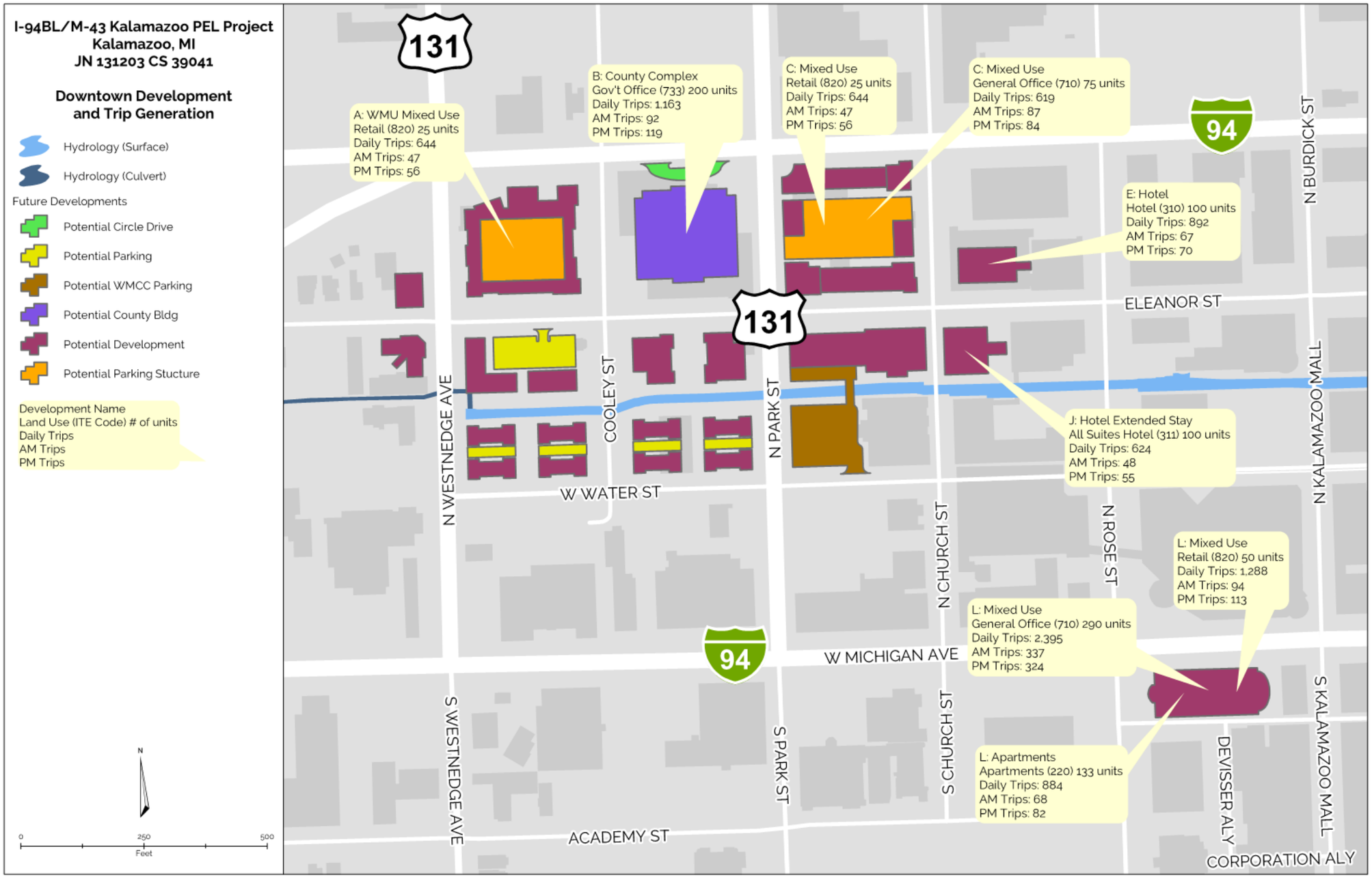
Source: CDM Smith with City of Kalamazoo data

Figure 4-2: Emergency Services



Source: CDM Smith with City of Kalamazoo data

Figure 4-3: Downtown Development



Source: CDM Smith with City of Kalamazoo and Kalamazoo County data

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4.1.1.4 Community Demographics

Data from the U.S. 2010 Census as well as the American Community Survey (ACS) 2011-2015 five-year estimates were used to identify the demographic characteristics of the Study Area, metropolitan area and State.

The Study Area has lost population and households between 2010 and 2015 which differs from the Kalamazoo-Portage metro area which experienced growth of 2.6 percent in population and 2.2 percent in the number of households. The State of Michigan held steady with less than one percent decline in population but lost nearly six percent in the number of households (**Table 4-1**). The data also shows that the study area has a lower population over 65 within seven percent than the metro area (14%) and State of Michigan (15%).

Table 4-1: 2010 and 2015 Population and Households

	2010 Population	2015 Population	Percent Change	2010 Households	2015 Households	Percent Change
Study Area	991	945	-4.6%	278	260	-6.5%
Kalamazoo-Portage Metro area	323,831	332,103	2.6%	127,035	129,792	2.2%
Michigan	9,952,687	9,900,571	-0.5%	3,806,621	3,585,532	-5.8%

Source: 2010 Census; 2015 American Community Survey five-year estimates

Table 4-2 breaks down the race and ethnicity data from the ACS 2011-2015 five-year estimates. The Study Area is more diverse with 33 percent minority population than the metro area which is at 21 percent minority population. Michigan is closer to the metro area with 24 percent minority population.

Table 4-2: Percent Minority Population

	Total	White	Black	Hispanic	American Indian	Asian	Pacific Islander	Two or More/ Other Race
Study Area	991	666 (67%)	228 (23%)	35 (3%)	7 (1%)	14 (1%)	1 (>0%)	40 (4%)
Kalamazoo-Portage Metro area	332,103	263,749 (79%)	29,846 (9%)	19,798 (6%)	1,040 (>1%)	6,379 (2%)	83 (>1%)	10,870 (3%)
Michigan	9,900,571	7,513,622 (76%)	1,366,632 (14%)	467,021 (5%)	47,055 (>1%)	267,671 (3%)	1,823 (>1%)	224,664 (2%)

Source: 2010 Census; 2015 American Community Survey five-year estimates

The household income within the Study Area is not representative of the metro area nor the State of Michigan as seen in **Table 4-3**. The Study Area may have more single person/single income households compared to the metro area and state which could account for some of the differences.

Table 4-3: Percent of Households by Household Income

	< $15,000	$15,000 to $25,000	$25,000 to $50,000	$50,000 to $75,000	$75,000 +
Study Area	97 (37%)	34 (13%)	62 (24%)	22 (8%)	44 (17%)
Kalamazoo-Portage Metro area	12%	11%	26%	19%	32%
Michigan	13%	11%	25%	19%	32%

Source: 2010 Census; 2015 American Community Survey five-year estimates

Based on the minority and household income data above, the evaluation for environmental justice populations should be completed in future NEPA documentation.

4.1.2 Natural Resources

The natural resources include the Study Area's plants and animals, water features, parks, and other natural resources.

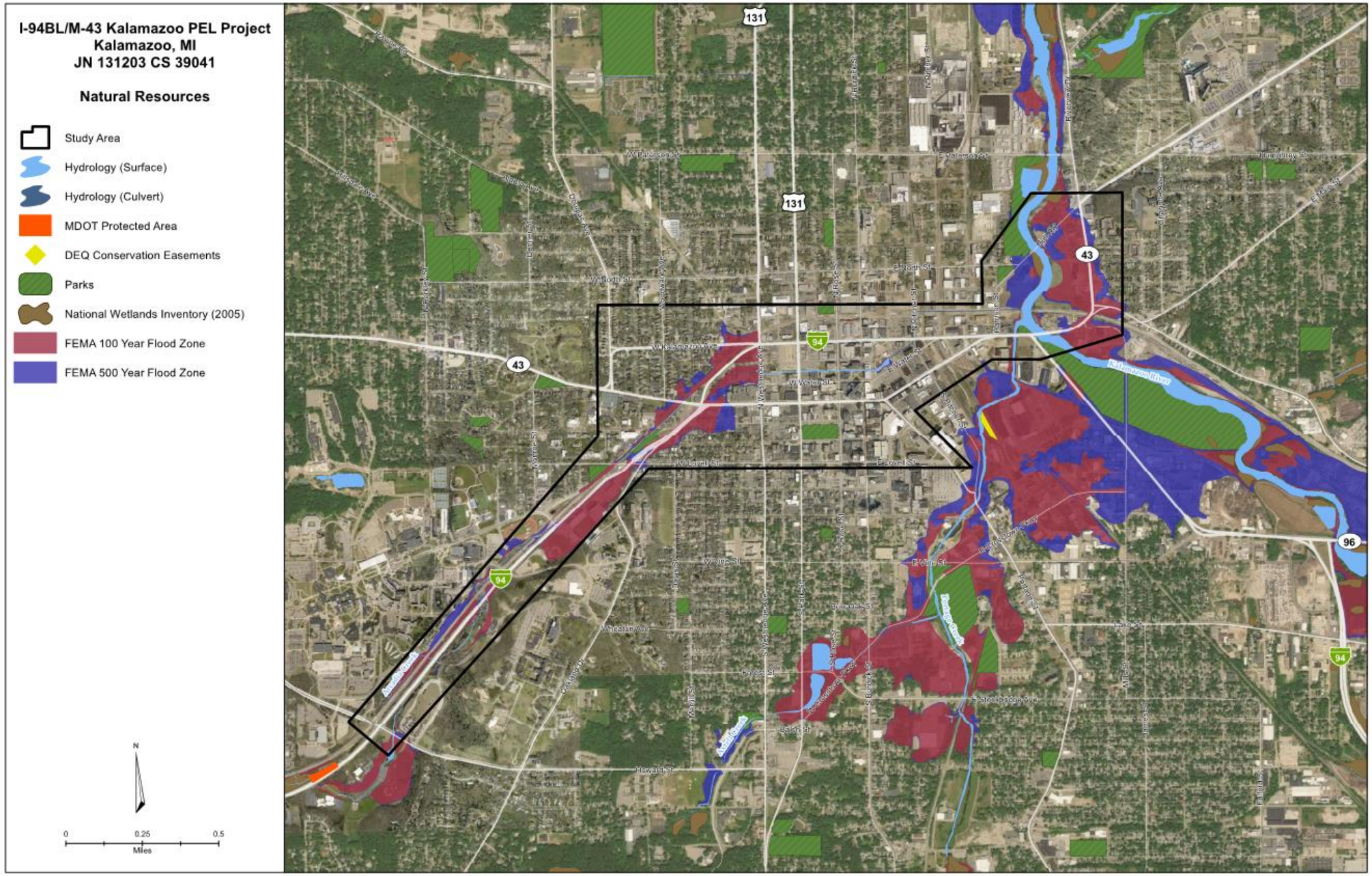
4.1.2.1 Parks – No anticipated concerns

There are eight parks within the Study Area. The parks are shown on the natural resources **Figure 4-4**. These places include:

- Lovell Street Park
- College Park
- Bronson Park
- Martin Luther King Jr. Park
- Rose Park Veterans Memorial
- Red Arrow Golf Course
- Harrison Park
- Verburg Park

There are no anticipated impacts with any of the draft Illustrative Alternatives to parks in the Study Area. Verburg Park is the only park in the Study Area listed that used Land and Water Conservation Funds as of September 2017. It is situated in the northeast portion of the Study Area along the west banks of the Kalamazoo River. As a result, future NEPA studies will have to consider potential Section 6(f) parkland mitigation if Verburg Park is impacted by the alternatives. All of the parks would be evaluated for Section 4(f) potential impacts.

Figure 4-4: Natural Resources



Source: CDM Smith with FEMA, State of Michigan, and City of Kalamazoo data

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4.1.2.2 Wetlands – No anticipated concerns

There are very few wetlands within the Study Area; there is one identified wetland location as shown in **Figure 4-4**. The wetland is listed in EPA's NEPAssist database as a 0.77-acre freshwater pond and located along the west bank of the Kalamazoo River south of Gull Road. There is also a potential for riverain wetlands along the Kalamazoo River.

There are no anticipated concerns with impacts to the wetlands with any of the draft Illustrative Alternatives. If work related to the project takes place in any wetlands, a MDEQ Part 303 permit will be required with additional potential for a U.S. Army Corps of Engineers (USACE) Section 404 or Section 10 permit.

4.1.2.3 Floodplains – potential concerns

As shown in the Natural Resource **Figure 4-4**, the 100- and 500-year floodplain extends along the Arcadia Creek west of Westnedge Avenue, both banks of the Kalamazoo River, and the along Portage Creek. With any of the draft Illustrative Alternatives, there are potential impacts that will require mitigation during construction. If proposed cuts and fills are identified in the floodplain, a MDEP Part 31 permit will be required with additional potential for USACE Section 404 or Section 10 permits

4.1.2.4 Water Quality – potential concerns

The water quality assessment report for the Kalamazoo River watershed reports the overall water quality status as impaired. The impaired status is a result of dioxins, mercury, and polychlorinated biphenyls (PCBs) for fish consumption and other indigenous aquatic life.

There are potential impacts with implementation of any of the draft Illustrative Alternatives. In future steps in project development, if proposed work impacts a stream, lake, or drain, then a MDEQ Part 301 permit will be required. Section 404 or Section 10 permits may also be needed from the USACE.

4.1.2.5 Wildlife, Plants & Threatened and Endangered Species – potential concerns

There are potential impacts to wildlife, plants and threatened and endangered species with implementation of any of the draft Illustrative Alternatives. Rosinweed, a threatened species at the state level, has been identified in the study area near Howard Street at Arcadia Creek which is enrolled in MDOT's Protected Area Program, as shown in **Figure 4-4**. If any future work takes place off existing pavement, field surveys will be required to analyze the potential impacts to the species and its habitat. If the species is impacted, a Michigan Endangered Species Permit will be required. Along with obtaining the permit, MDOT Environmental Services Section staff must be consulted and mitigation may be required. It is possible such mitigation could take place in the form of a continuing prairie restoration project with WMU.

There are five federally listed threatened or endangered species in Kalamazoo County. Three federally listed endangered species include eastern rattlesnake, Indiana bat, and the northern long-eared bat. The lone federally listed threatened species include Mitchell's Satyr Butterfly. In addition, any future NEPA studies will have to address The Bald and Golden Eagle Protection Act, as well as The Migratory Bird Treaty Act.

The state listed species within Kalamazoo County include 17 endangered and 61 threatened species. However, a much smaller list is expected as a result of the built urban environment within the Study Area. Noted in MDOT review is the Northern Long-Eared Bat near the Kalamazoo River. Due to this record, if any tree removal or clearance of trees with 3" diameter or greater at breast height, a review by the MDOT ecologist and a consultation with the U.S. Fish and Wildlife Service will be mandated. State and federal coordination will be required as the NEPA process moves forward to address at risk species.

If work below the ordinary high-water mark of the Kalamazoo River is planned, then a freshwater mussel survey and relocation may be required due to the upstream presence of state species of concern Elktoe and state threatened Purple Wartyback. This crossing should first be reviewed by the MDOT ecologist during the summer to determine if suitable habitat and a community occurs at the crossing.

If any substantial substructure or superstructure bridge work is proposed, then informal consultation will be required with the U.S. Fish and Wildlife Service (USFWS) due to the potential for roosting bats. This process typically requires 14 days but may be subject to longer timelines due to the proximity of the Northern Long-Eared Bat.

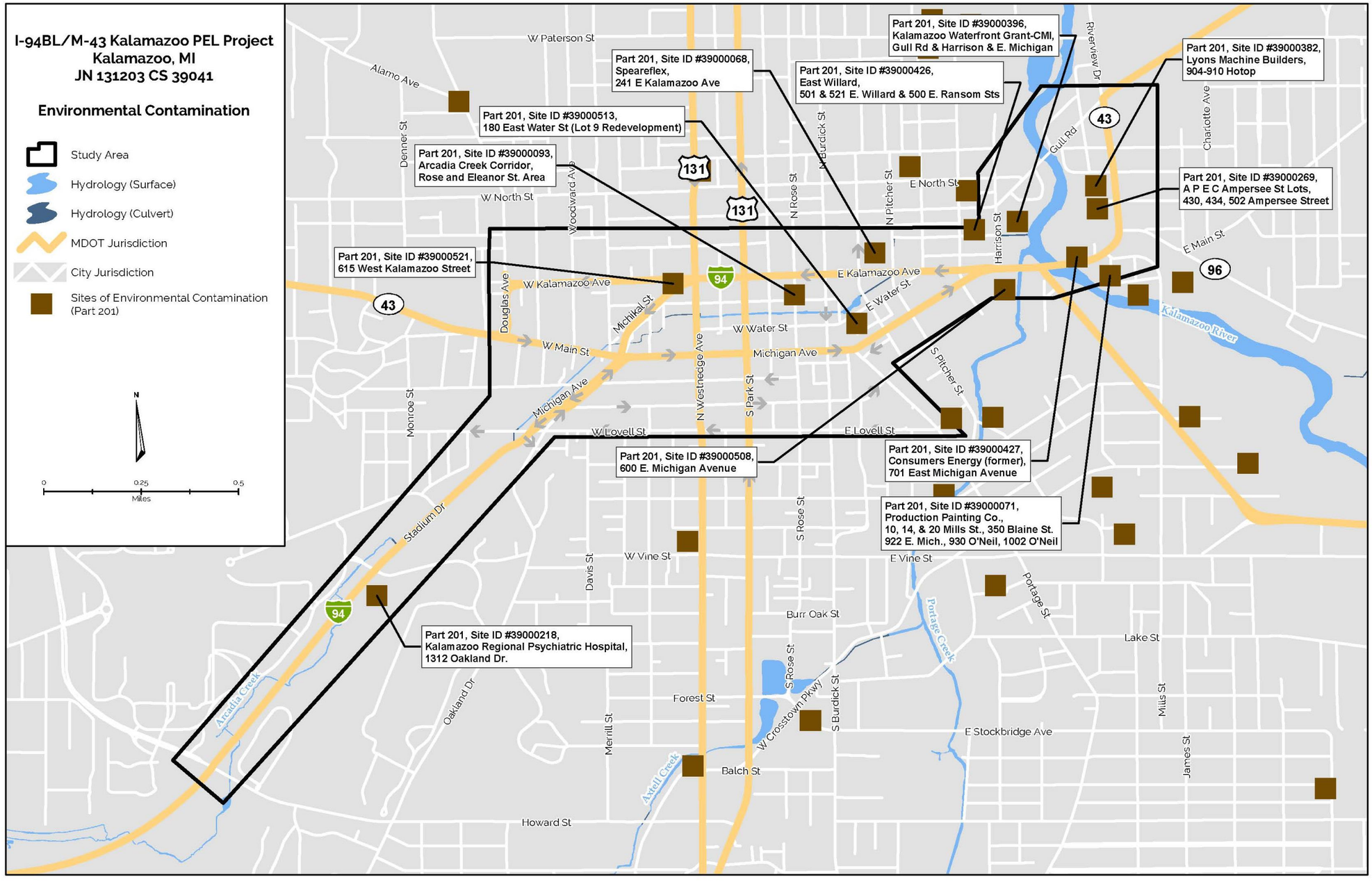
4.1.2.6 Hazardous Materials – potential concerns

There are potential concerns related to hazardous materials implementation of any of the draft Illustrative Alternatives. NEPAssist[1] identified 41 potential hazardous materials locations within the study area. During the NEPA process, special attention would be given to these potential locations, especially industrial and manufacturing sites that may use chemicals in their processes, auto service-related business where fuel and oil products are located, and drycleaners with the use of cleaning solution that may be harmful to the environment if right of way is needed from these types of businesses.

According to review by MDOT, there are a number of known Part 201 contaminated sites within or near the proposed project area, with those within the study area shown in **Figure 4-5**. It is recommended a Project Area Contamination Survey (i.e., PACS, Phase I Environmental Site Assessment) be conducted to confirm known and identify potential sites of contamination. A PACS is necessary to purchase fee ROW and may be necessary for grading permit/easement ROW. All contaminated media must be handled and disposed of appropriately in accordance with state and federal regulations. In addition, railroad grades are historically contaminated and the railroad bridge over Riverview Drive.

[1] NEPAssist is a web-based application that draws environmental data from EPA Geographic System databases.

Figure 4-5: Environmental Contamination



Source: CDM Smith with MDOT, MDEQ and City of Kalamazoo data

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4.1.2.7 Noise – potential concerns

Noise impacts are a potential concern with noise sensitive receptors in the study area and adjacent to the proposed alternatives. Potential noise impacts should be considered through the NEPA process. If the project includes the addition of a new through traffic lane, auxiliary lane, or significant horizontal roadway realignment, then a noise analysis will be required. There are noise sensitive land uses at W. South Street and Michigan Avenue (park and residences) and residences north of Main Street and Michigan Avenue within the area of potential effect. There are also neighborhoods around Michikal, Douglas, Kalamazoo and W. Main Street in the west side of the area of interest. There are also residences along Gull Street and Riverview Drive in the northeast section of the area of interest.

4.1.2.8 Air Quality – No anticipated concerns

The Study Area and the Kalamazoo region is no longer classified as a non-attainment/ maintenance area for ozone according to EPA's NEPAssist database from January 2019. As a result, detailed air quality modeling will not be required for this project in the NEPA documentation. There are no anticipated concerns with implementation of any of the draft Illustrative Alternatives.

4.1.3 Cultural Resources – potential concerns

Cultural resources are related to the historical resources of the Study Area. This includes historic properties, historic districts, and prehistoric sites. In the city of Kalamazoo historic properties are likely to be a concern for future projects. MDOT completed a survey of historic districts and properties in the Fall of 2018 which are shown in **Figure 4-6**.

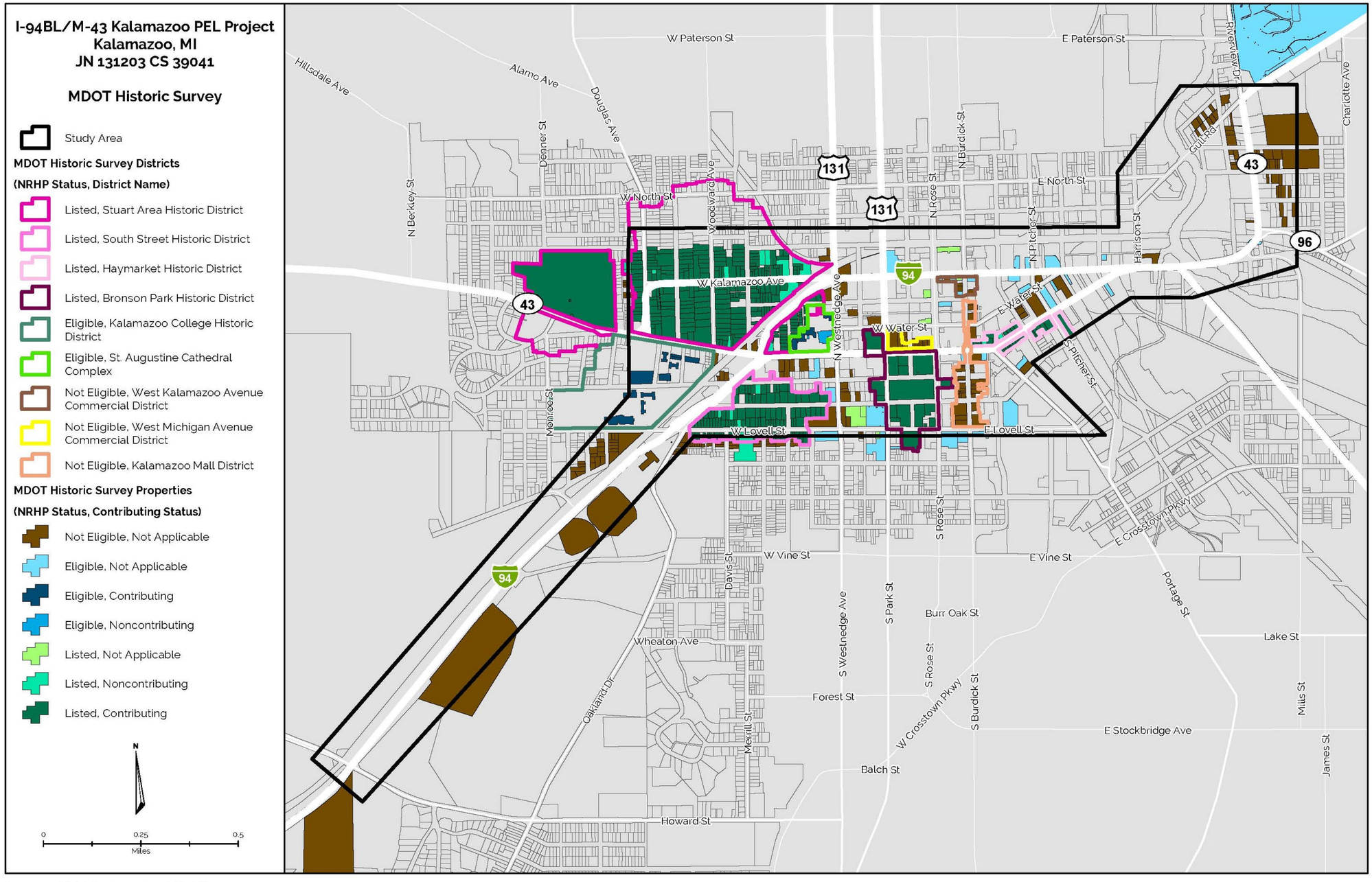
Within the PEL Study Area, 743 built historic resources were identified. This included four National Register of Historic Places (NHRP) listed districts, the Stuart Area Historic District, South Street Historic District, Haymarket Historic District and Bronson Park Historic District; and two eligible historic districts, Kalamazoo College Historic District and St. Augustine Cathedral Complex. The historic districts encompassed 418 individual contributing and noncontributing properties; the boundaries and status of each were re-evaluated for the survey. No changes to the existing NRHP-listed historic boundaries were recommended. The survey included additional research and evaluation of 41 individual historic resources and five potential historic districts. Of these, 31 historic properties and two historic districts were recommended eligible for inclusion in the NRHP.

As a result of the built urban environment, the likelihood of any undisturbed prehistoric sites is highly unlikely. However, archaeological sites from the founding of Kalamazoo may be present in the Study Area within the historical districts. If a historical district or property is impacted, consultation with the SHPO is required for Section 106 impacts. NEPA will need to provide a Section 106 concurrence for impacts to historical districts or properties.

4.1.4 Indirect/Cumulative Impacts – No anticipated concerns

It is not anticipated that any of the draft illustrative alternatives would have long-term impacts. It is not anticipated that they would change land use patterns in the area or have impact on future development patterns. Although, past activity in the area, recent development trends, and local projects (non-MDOT projects) within the study area could create a cumulative impact, the impact would likely to be a positive one; cumulative effects resulting from known and anticipated actions in the area would be expected to be minimal. Meetings early on with stakeholder groups should take place to try to determine ways to minimize construction and/or detour impacts.

Figure 4-6: Historic Resources



Source: CDM Smith with MDOT data

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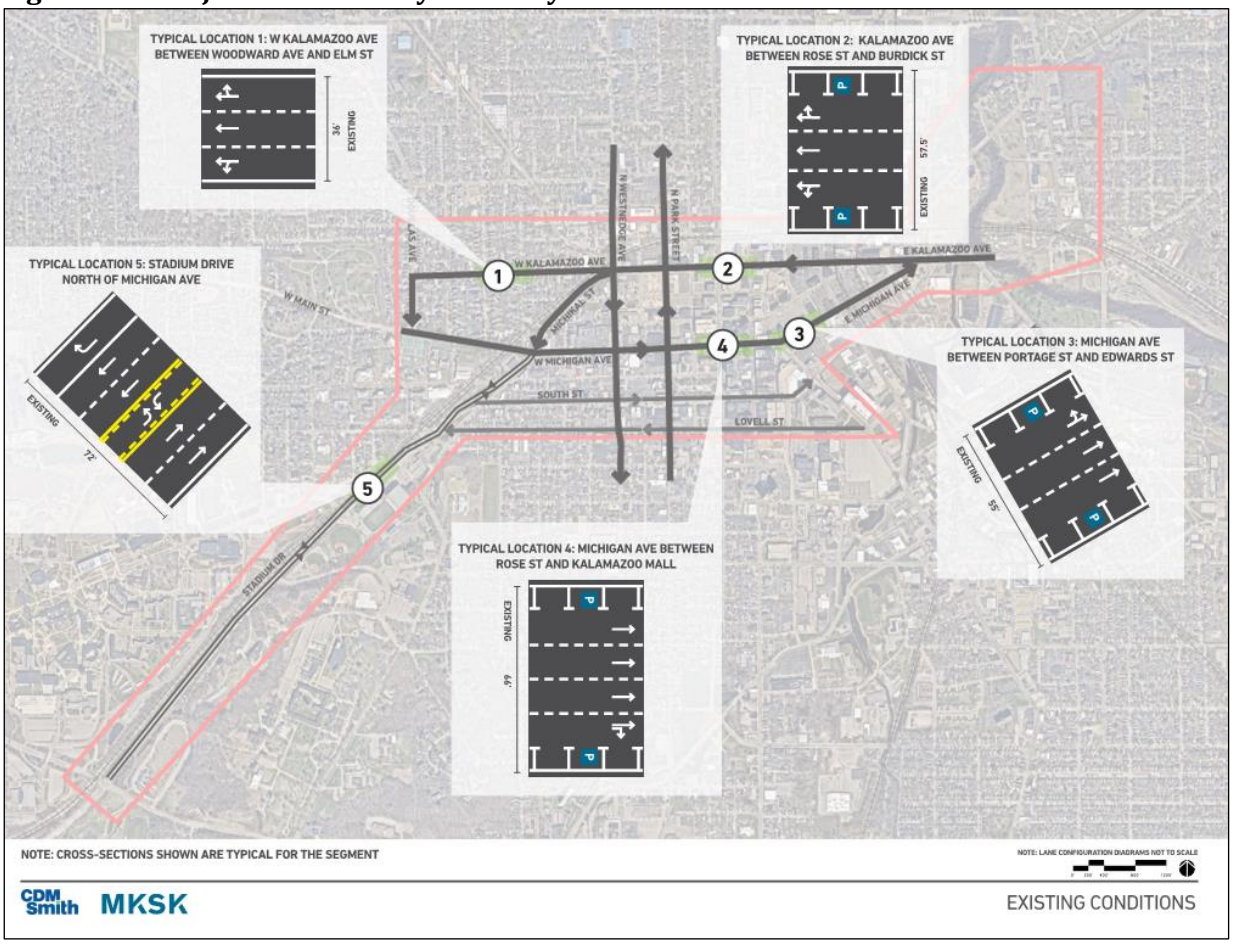
4.1.5 Transportation

The purpose of this report is to detail the traffic analysis for the Kalamazoo PEL study within the City. As part of this project, traffic conditions within downtown Kalamazoo were analyzed along the following key roadways whose traffic flow and main roadway laneage is shown in **Figure 4-7**.

- Kalamazoo Avenue
- Michigan Avenue
- Stadium Drive
- Westnedge Avenue
- Park Street
- South Street
- Lovell Street
- Michikal Street

While the study area lies within the entirety of the City, there were multiple stakeholders involved in the traffic analysis, including the Michigan Department of Transportation (MDOT), the City, and KATS.

Figure 4-7: Project Location Key Roadways



4.1.5.1 Right-of-Way

The amount of land required for a roadway has many determining factors. The number of lanes, parking, and non-motorized facilities are a few examples of these factors. Once develop occurs adjacent to the roadway it becomes a bigger challenge to increase the width of the road for additional travel lanes or non-motorized facilities. **Figure 4-8** shows the existing right-of-way for a number of key roadways in the Study Area, which vary between 66' to 99'.

4.1.5.2 Roadway Classification

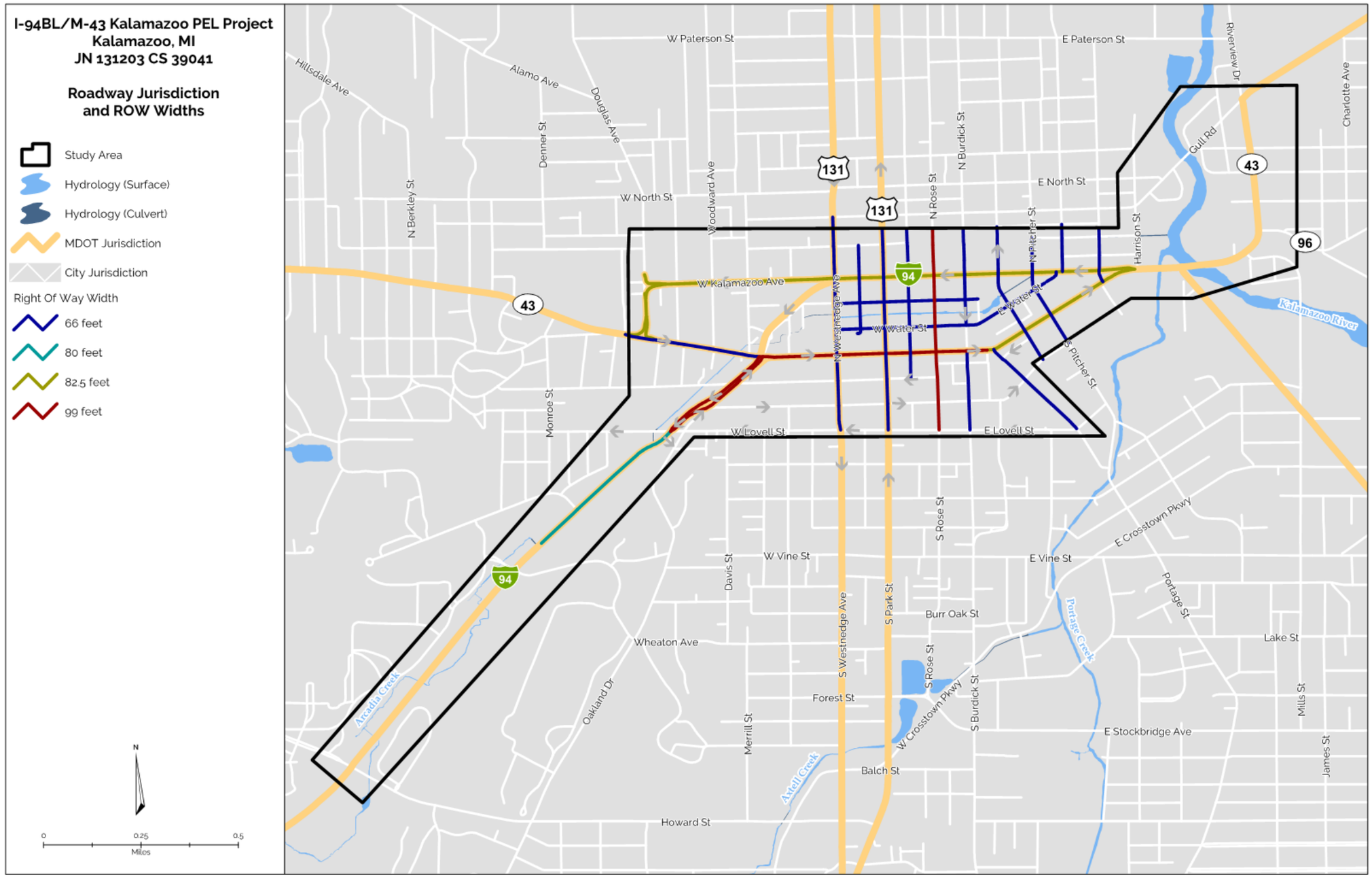
Kalamazoo has a number of highways on the National Highway System (NHS) that are responsible for moving vehicles as the primary function over providing access to the surrounding property. As the scale slides to minor arterials, collector, and local roads, the primary function of the roads shifts to providing access to the adjacent properties. As a result, there is an increasing number of driveway access on local and collector roads than on arterial roadways. **Figure 4-9** displays the functional classification of the Study Area roadways.

4.1.5.3 Vehicular Traffic

Existing year volumes (2017) are created using the 2010 travel demand model output, 2017 special counts, MDOT historical counts and annual growth factors to year 2017. The special

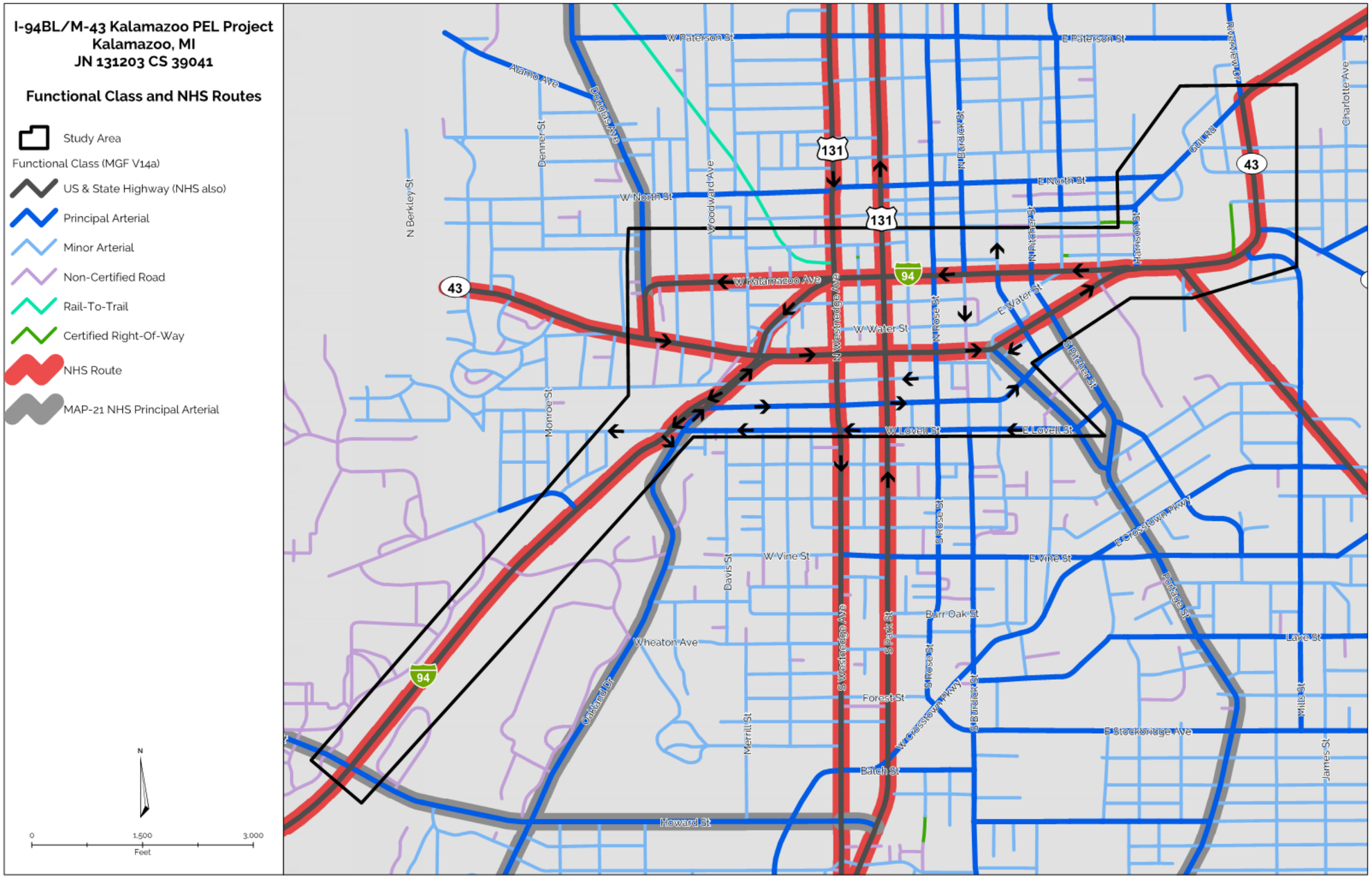
counts at 33 intersections are compared with 2017 MDOT counts and 2010 model output. If the special counts are reasonably close to MDOT count, then the counts are not adjusted and used directly. However, if the special counts are significantly different from the MDOT counts, then the special counts are adjusted using engineering judgement based on travel demand model output and adjacent intersection traffic volume. **Figure 4-10** shows the 2017 average daily traffic volume ranges developed for the existing conditions. Further information on the data collection and traffic counts can be found in **Appendix E**.

Figure 4-8: Roadway Jurisdiction and Right-of-Way



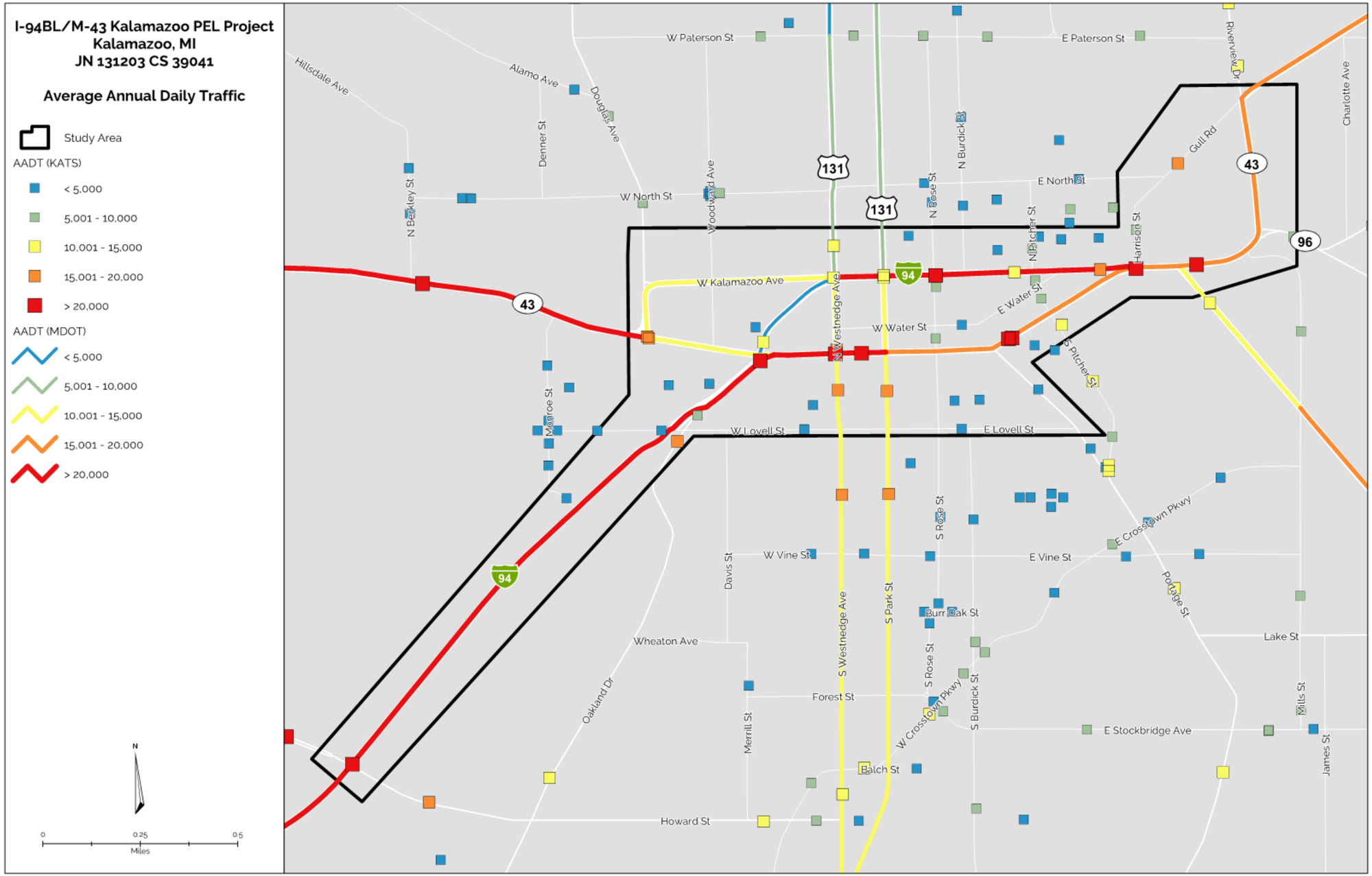
Source: CDM Smith with MDOT and City of Kalamazoo data

Figure 4-9: Functional Class and NHS Routes



Source: CDM Smith with MDOT and City of Kalamazoo data

Figure 4-10: Existing 2017 Daily Traffic Volumes



Source: CDM Smith with MDOT and KATS model data

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Level of service (LOS) is a qualitative statement of the acceptability of traffic conditions based on delay. The LOS index ranges from LOS A, indicating excellent traffic conditions with little to no delay, to LOS F, indicating very congested conditions with excessive delay. it was determined from the Steering Committee that LOS D was desirable for future year intersection operations, while LOS E was acceptable for the overall intersection operations. Of the 50 intersections, three intersections present concerns about existing conditions (2017) as shown in **Table 4-4**. This table features intersections that are LOS D or worse since LOS D can be considered the threshold of congested and LOS E or worse is congested. The intersections at LOS D are nearing congested levels and include the southbound left turn at Michigan Avenue and Harrison Street during the AM peak period, the intersection of Howard Street and Crosstown Parkway during the AM and midday peak period, and the Westnedge Avenue and Paterson Street intersection during all three periods. The two congested intersections at LOS E or LOS F are the southbound left turn at Michigan Avenue and Harrison Street during the PM peak period and the Howard Street and Crosstown Parkway intersection during the PM peak period. All other intersections operate at LOS C or better.

Table 4-4: 2017 Existing Conditions Level of Service for Congested Intersections

Intersection	Traffic Control	Peak Period	2017 Existing Traffic		
			V/C	DELAY	LOS
Michigan Ave at Harrison St	STOP EBL/SBL	AM	0.28 / 0.34	12.4 / 28.4	B / D
		MD	0.23 / 0.29	10.6 / 23.6	B / C
		PM	0.47 / 0.64	16.0 / 75.4	C / F
Howard St at Crosstown Pkwy	SIGNAL	AM	0.92	45.3	D
		MD	0.73	42.0	D
		PM	1.01	67.2	E
Westnedge Ave (US-131 BR) at Paterson St	SIGNAL	AM	0.70	45.5	D
		MD	0.70	45.4	D
		PM	0.70	45.4	D

Note: Average vehicle delay estimated in seconds. STOP control analyses presented by minor approach.
Source: Synchro model results

Table 4-5 shows the existing travel time for the key streets in the study. These travel times were developed from the Synchro models and will be used to evaluate the change in travel time and speed when compared to 2040 No-Build conditions in Table 5-8. The EB Michigan corridor has similar AM and PM travel characteristics. This contrasts with the Kalamazoo corridor that experiences slower travel speeds and nearly twice the delay in the PM period as in the AM period. The Michikal corridor was in between the other two corridors with a 50 percent increase in total delay between the AM and the PM periods.

Table 4-5: Existing (2017) Travel Times

Corridor	Limits	Travel Time	Scenario		
			Existing AM Peak	Existing MD Peak	Existing PM Peak
EB Michigan (US-131/I-94BL/M-43)	From Michikal to Harrison	Total Delay (S/veh)	41.2	30.7	41.4
		Total Travel Time (s)	161.2	153.5	163.4
		Total Distance (mi)	1.0	1.0	1.0
		Arterial Speed (mph)	23.9	24.5	23.0
WB Kalamazoo (I-94 BL/M-43)	From Harrison to Westnedge	Total Delay (S/veh)	23.7	34.2	44.5
		Total Travel Time (s)	111.7	123.9	149.6
		Total Distance (mi)	0.7	0.7	0.7
		Arterial Speed (mph)	24.9	23.3	21.5
SW Michikal	From Westnedge to Michigan	Total Delay (S/veh)	4.8	5.0	6.2
		Total Travel Time (s)	25.2	25.8	26.7
		Total Distance (mi)	0.2	0.2	0.2
		Arterial Speed (mph)	29.0	28.0	29.0

Source: Synchro model results

4.1.5.4 Non-Motorized System

Providing for the mobility needs of all residents, the non-motorized system within Kalamazoo covers those walking, bicycling, and persons with mobility assistive devices such as wheelchairs or scooters. **Figure 4-11** shows the existing non-motorized system along with proposed and potential on- and off-road segments to expand the system.

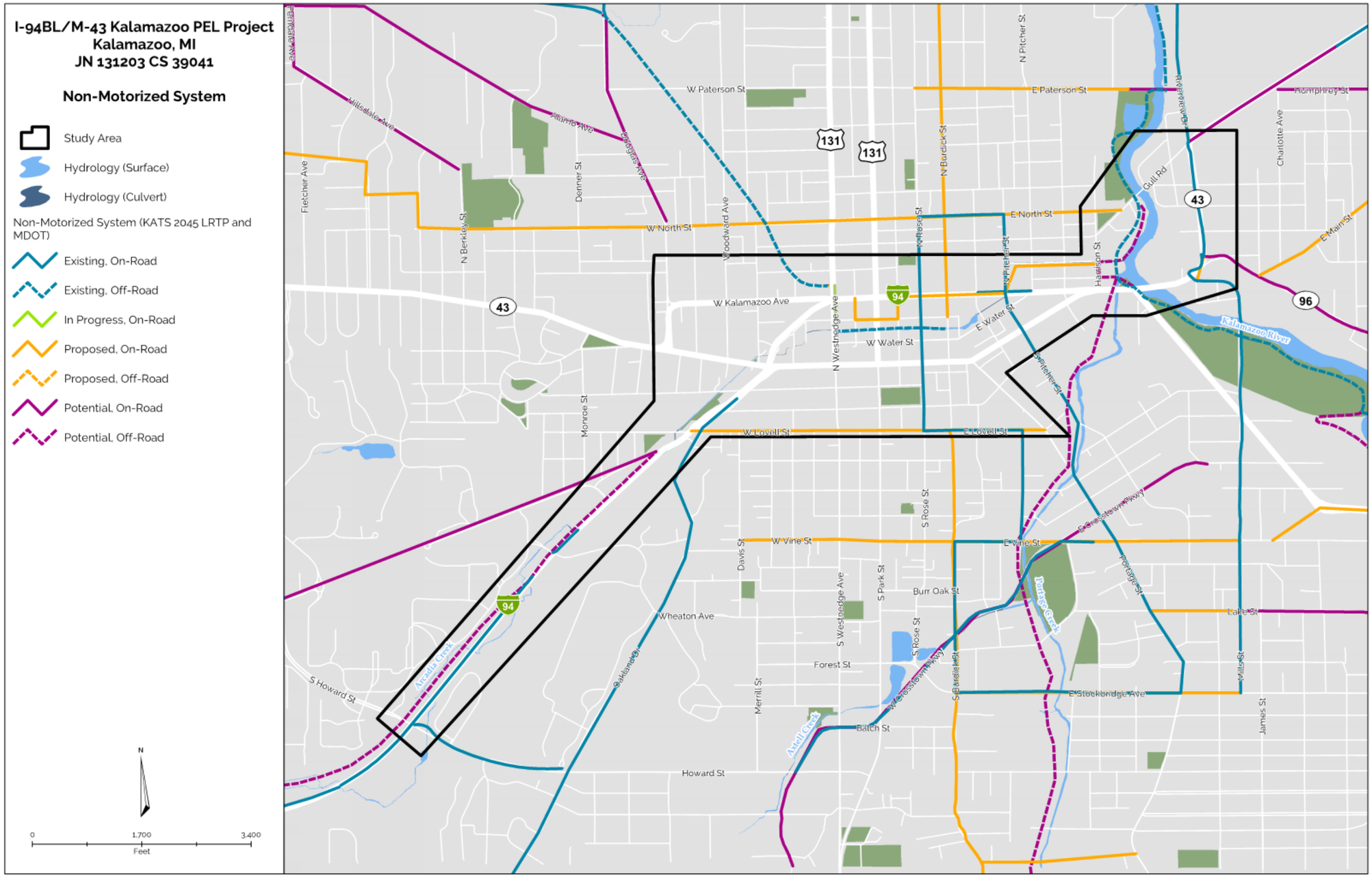
4.1.5.5 Transit

There are 19 bus routes within the City. **Figure 4-12**, from the KATS travel demand model, shows the routes in the study area and the estimated ridership. The maximum daily ridership in the study area is approximately 1,200 passengers per day based on the base year 2010 KATS travel demand model.

4.1.5.6 Downtown Parking

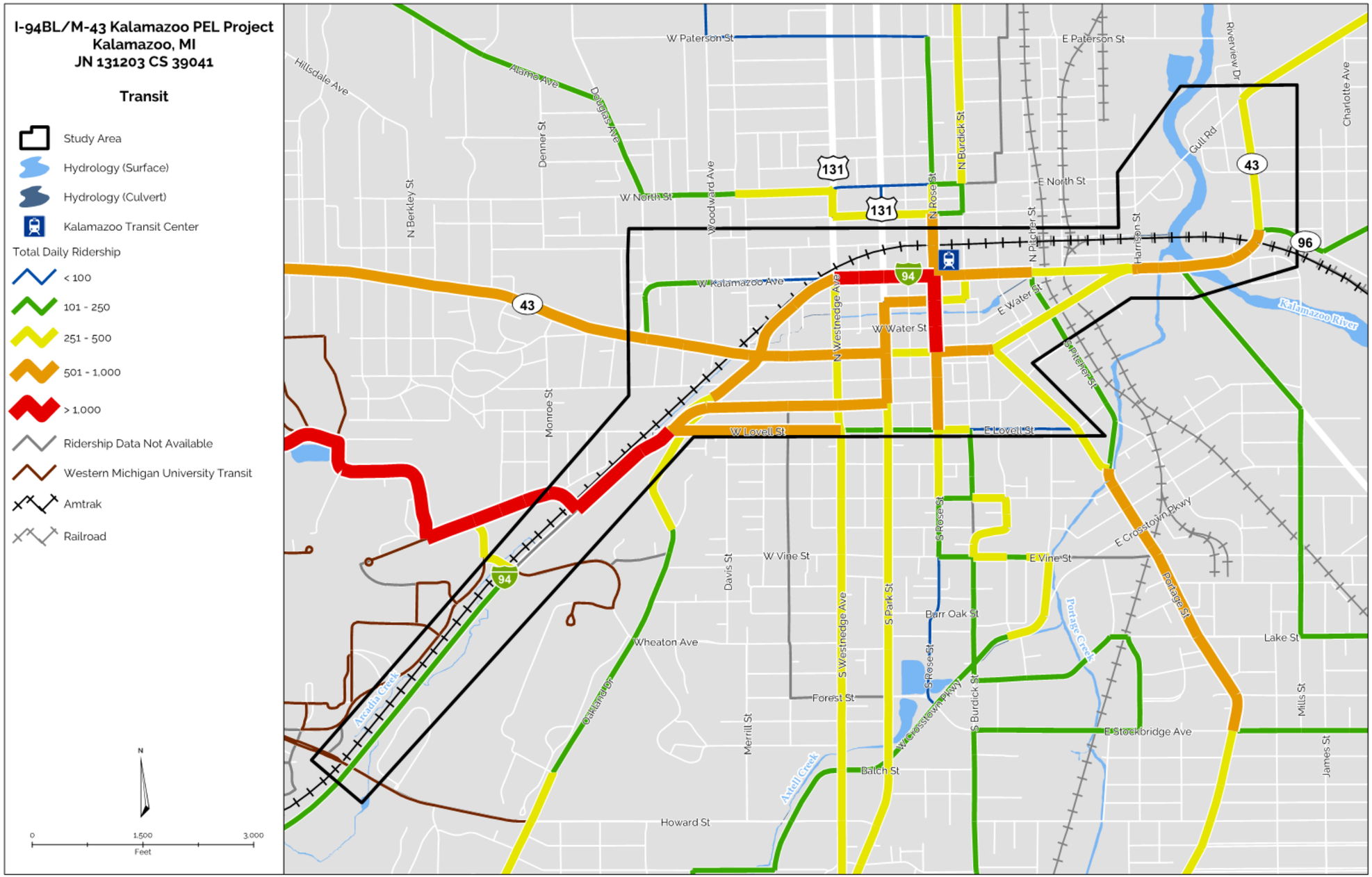
Providing safe and convenient downtown parking is important in attract patrons downtown to support the local businesses. Kalamazoo offers free and metered on-street parking as well as parking lots and parking ramps throughout downtown as shown in **Figure 4-13**. The City is currently conducting a parking study which has not progressed sufficiently to include results within this document.

Figure 4-11: Non-Motorized System



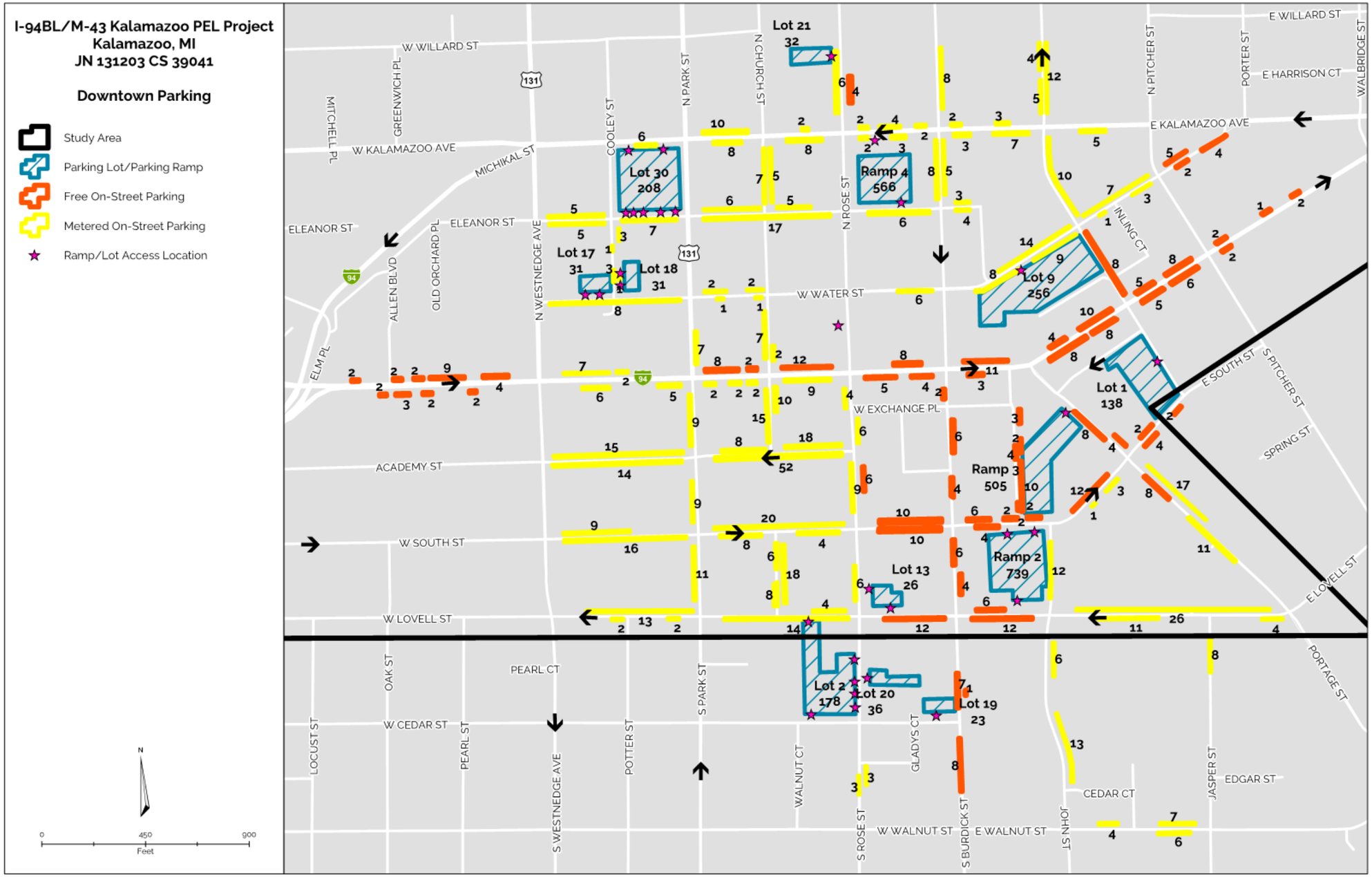
Source: CDM Smith with MDOT, City of Kalamazoo, and KATS model data

Figure 4-12: Estimated Transit Ridership



Source: CDM Smith with KATS data

Figure 4-13: Downtown Parking



Source: CDM Smith with City of Kalamazoo data

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4.1.5.7 Safety

Crash data was obtained from the MDOT for crashes along the key study area roadways and intersections as shown in **Figure 4-14** for the five-year period from January 2012 to December 2016. The data was separated into the 13 roadway segments within the study area with distances ranging from 250 to 3,250 feet long, as well as the 22 intersections extending 200' in each direction. Segments between proximal intersections of concern were not analyzed separately since the 200' reach of each either overlapped or left little unanalyzed length. Vehicle crashes along the corridor were analyzed using varying filters, including crash type, weather, and roadway conditions. These analyses were conducted to determine the frequent types of collisions and to further understand potential reasons and trends that explain how and why collisions are occurring along the corridor. More detailed crash data can be found in **Appendix E**.

A total of 1,768 crashes occurred over the five-year study period in the Kalamazoo study area (**Figure 4-14**). Crashes from year to year have been steadily increasing with a small drop from 2012 to 2013. A total of 348 crashes occurred in 2012 increasing to 381 crashes in 2016.

The majority of the crashes (85%) resulted only in property damage and injuries existed in 15 percent of the crashes. However, one fatality was reported during the 2012-2016 period along this study area. The highest crash types include 660 (37%) rear-end collisions, 381 (22%) sideswipe crashes, and 278 (16%) angle crashes. Two out of three crashes occurred at intersections within the study area.

There are 43 pedestrian or bicyclist involved crashes within the study area. No pedestrian or bicyclist has been killed within the corridor for the study years of 2012 to 2016.

Prior to this study a Road Safety Audit (RSA) was conducted during the week of October 17 – 21, 2016. RSA's are a formal safety performance examination of an existing or future road or intersection by an independent, multi-disciplinary team. RSAs help promote road safety by identifying safety issues during the planning, design, and implementation stages, promoting awareness of safe design practices, integrating multimodal safety concerns, and considering human factors. The safety concerns, proposed mitigations, cost and time of return for each crash potential can be found in the report located in **Appendix F**.

Aside from analysis of crash data to plan for improvements and the mitigation strategies identified in the RSA, safety during construction is also a significant consideration if the project moves forward. Depending on the work required, detours can be planned that result in temporary inconveniences yet have no significant long-term impact on the community.

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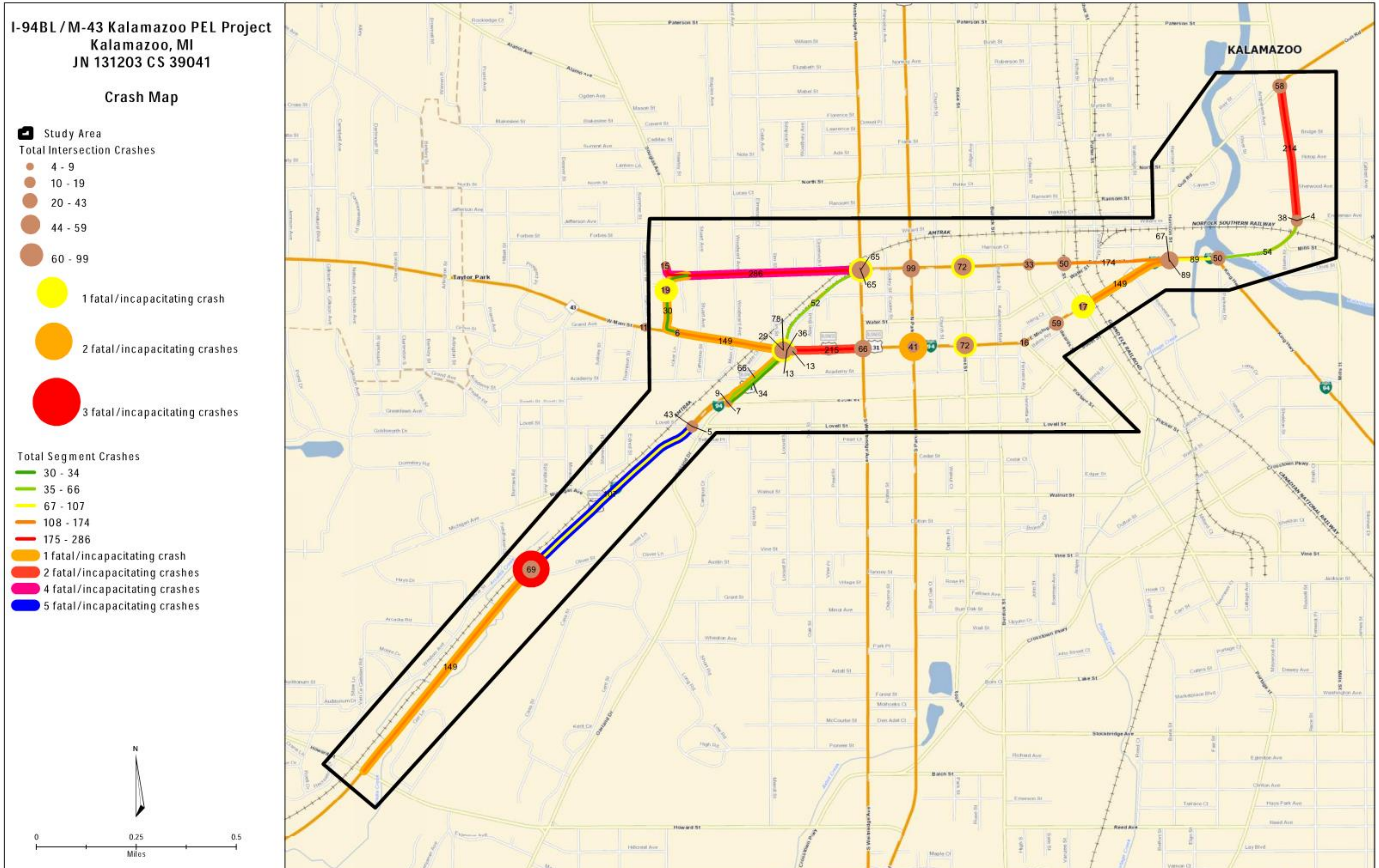
Figure 4-14: 2012 to 2016 Crash Locations



Source: CDM Smith with MDOT data

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4.2 Future Conditions

4.2.1 Land Use

The central business district (CBD) and the surrounding mixed use and commercial uses consume a large portion of the east and central part of the Study Area. There are a few residential neighborhoods to the west of the CBD before giving way to the educational land uses provided by Kalamazoo College and WMU. **Figure 4-15** shows the future land use plan in the Study Area to accommodate the anticipated slow growth in the study area and in Kalamazoo.

Figure 4-16 highlights the future projects and developments planned in the near future. As one would expect, there is a lot of future and potential planned activities in and around the CBD. **Figure 4-3** highlighted potential downtown development with over 425 retail spaces, 200 hotel rooms, 133 apartment units, and a County government office building.

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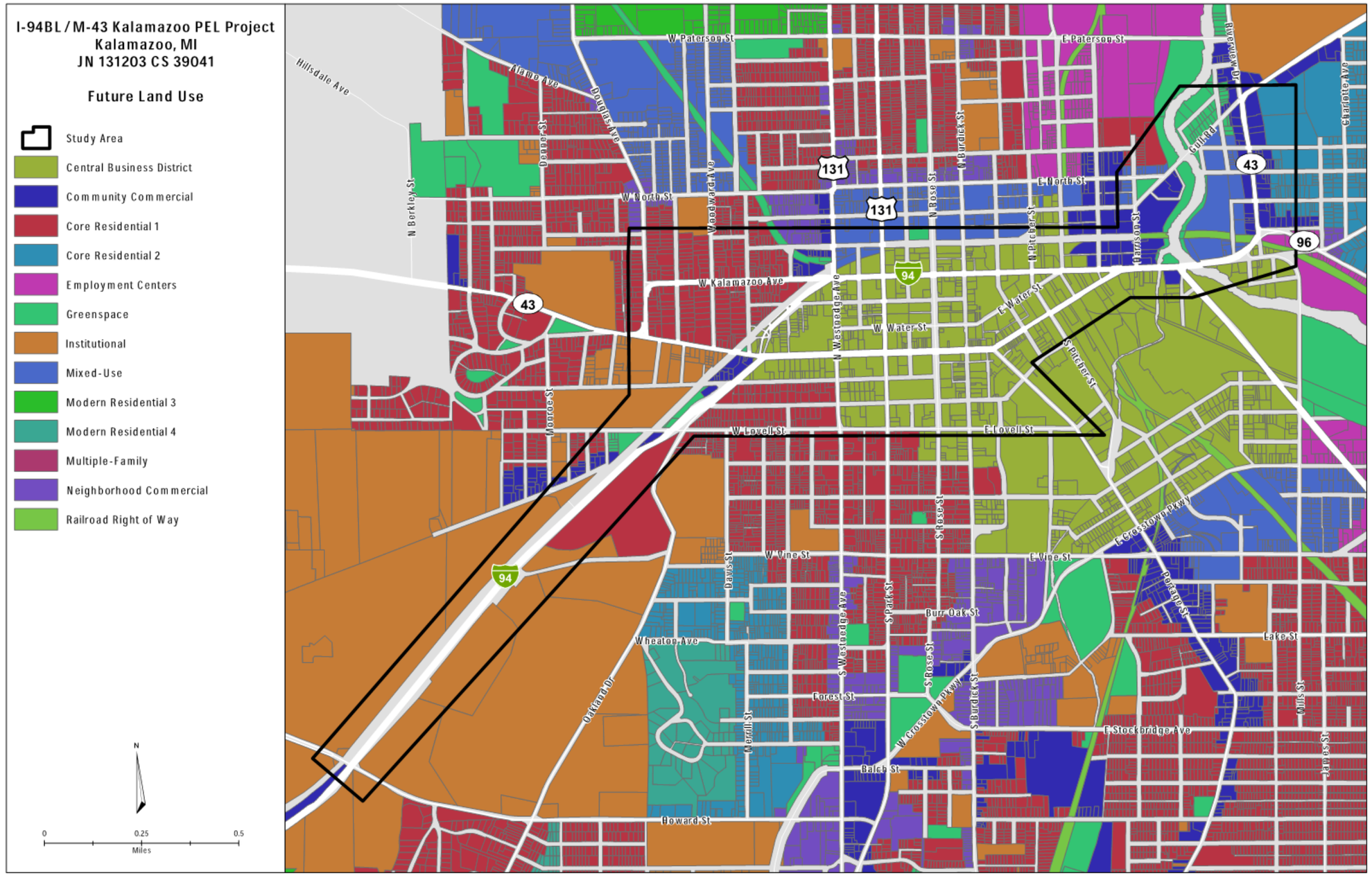
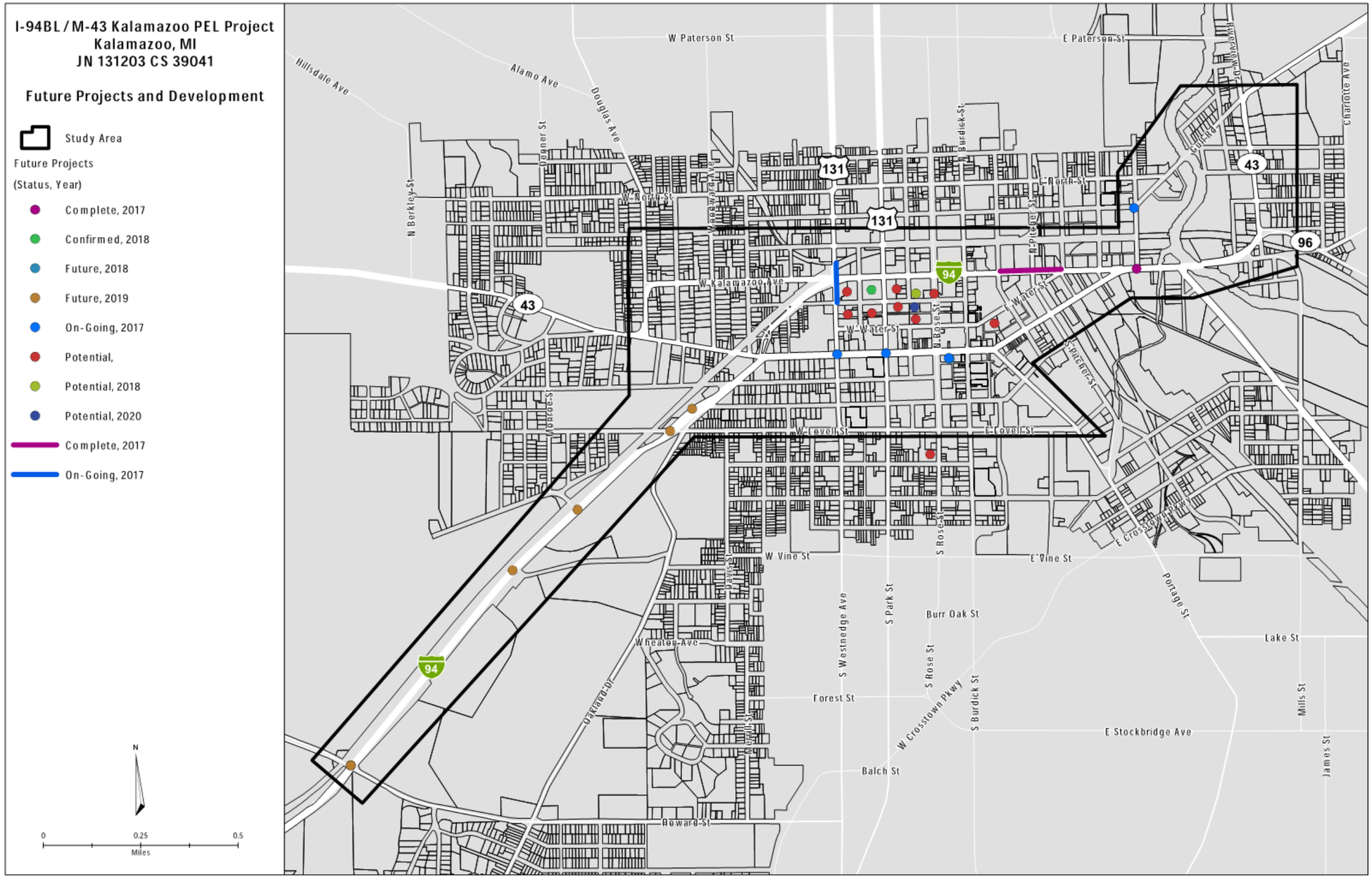
Figure 4-15: Future Land Use



Source: CDM Smith with City of Kalamazoo data

Figure 4-16: Future Projects and Developments



Source: CDM Smith with MDOT and City of Kalamazoo data.

4.2.2 Transportation

The KATS travel demand forecasting model was utilized as the basis to determine future year (2040) traffic along the corridor. Future year traffic volumes, delay, level of service and travel time are presented for year 2040 for corridors in the study area. The key model years were the 2010 base year and the 2045 future year. The 2045 model results were adjusted to the year 2040 in order to analyze future year conditions. (**Appendix E**)

The model was calibrated by adding additional centroid connectors to improve access to land use and loading of trips onto the highway network. Additional model preparation work involved creating 2017 socioeconomic data from 2010 and 2045 values by interpolation.

The future year volumes were developed using the KATS model growth rates and a comparison of historical traffic counts. The growth rates developed were applied to existing 2017 traffic volumes to produce future 2040 traffic volumes.

Growth rates were developed using the travel demand model. Table 4-6 shows growth rates for the study area in terms of modeled vehicle miles and hours traveled.

The Study Team agreed that 0.3% per year growth rate (approximately 7% growth between 2017 and 2040) was reasonable and is consistent with the low population growth in Kalamazoo in the past 20-30 years.

Table 4-6: Area Growth Rates

	Yr2010		Yr2045		2010-2045 Growth Rate %	
Function Class	Modeled VMT	Modeled VHT	Modeled VMT	Modeled VHT	VMT	VHT
Principal Arterial	254,819	10,140	268,576	11,216	0.2%	0.3%
Minor Arterial	40,386	1,803	45,250	2,072	0.3%	0.4%
Collector	7,573	405	8,475	482	0.3%	0.5%
Minor Collector	673	62	711	69	0.2%	0.3%
Total	303,451	12,411	323,011	13,839	0.2%	0.3%

Source: KATS Model

4.2.2.1 Future Level of Service

The future year traffic volumes for 2040 No Build were evaluated in Synchro for operational analysis. **Table 4-7** displays the level of service for the 2040 No Build conditions for the intersections with congestion levels at LOS D or worse. These include 3 signalized intersections and one stop control intersection. A comparison of **Table 4-7** to **Table 4-4: 2017 Existing Conditions Level of Service** shows a slight worsening of conditions for the 2040 year.

Table 4-7: 2040 No Build Level of Service at Congested Intersections

Intersection	Traffic Control	Peak Period	2040 NO BUILD TRAFFIC		
			V/C	DELAY	LOS
Michigan Ave at Harrison St	STOP EBL/SBL	AM	0.32 / 0.42	13.3 / 34.1	B / D
		MD	0.25 / 0.35	11.1 / 26.9	B / D
		PM	0.54 / 0.87	18.4 / 133.2	C / F
Howard St at Crosstown Pkwy	SIGNAL	AM	0.83	49.2	D
		MD	0.82	49.2	D
		PM	1.13	83.5	F
Park St (US-131BR) at Kalamazoo Ave (I-94BL/M-43)	SIGNAL	AM	0.56	6.0	A
		MD	0.67	7.7	A
		PM	1.06	36.3	D
Burdick St at Kalamazoo Ave (I-94BL/M-43)	SIGNAL	AM	1.14	47.9	D
		MD	0.88	17.2	B
		PM	1.31	99.5	F

Note: Average vehicle delay estimated in seconds. STOP control analyses presented by minor approach

Source: Synchro model results

4.2.2.2 Travel Times

Table 4-8 shows the 2040 No Build travel times for the key streets in the study (Michigan, Kalamazoo, and Michikal corridors) based on the Synchro models. A comparison of **Table 4-8** to **Table 4-5: Existing 2017 Travel Times** shows the Michigan corridor had slight increases in total delay during the AM and Mid-day period while experiencing a slight decrease in the PM delay. The Kalamazoo corridor saw marginal increase in total delay in the AM period, mid-day nearly doubled, and the PM period more than tripled. Michikal corridor remained steady with small improvements to the total delay in the mid-day and pm periods.

Table 4-8: 2040 No Build Travel Times

Corridor	Limits	Travel Time	Scenario		
			No Build AM Peak	No Build MD Peak	No Build PM Peak
EB Michigan (US-131BR/I-94BL/M-43)	From Michikal to Harrison	Total Delay (s/veh)	45.7	37.1	39.2
		Total Travel Time (s)	165.5	158.3	160.8
		Total Distance (mi)	1.0	1.0	1.0
		Arterial speed (mph)	22.8	23.3	23.1
WB Kalamazoo (I-94BL/M-43)	From Harrison to Westnedge	Total Delay (s/veh)	25.4	68.2	153.7
		Total Travel Time (s)	114.2	158.5	245.1
		Total Distance (mi)	0.7	0.7	0.7
		Arterial speed (mph)	24.3	19.1	15.8
SW Michikal	From Westnedge to Michigan	Total Delay (s/veh)	4.7	4.0	4.4
		Total Travel Time (s)	24.7	24.2	24.8
		Total Distance (mi)	0.2	0.2	0.2
		Arterial speed (mph)	29.0	30.0	29.0

Source: Synchro model results

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5 Purpose and Need

5.1 Draft Purpose and Need

The Draft Purpose and Need was presented at the second Public Meeting held on October 20, 2016. Meeting attendees were given time for verbal comments as well as provided comment forms to leave written comments after the meeting or to submit them via mail and email. The key public concern was safety, especially centered on intersections, and the need for improved pedestrian/bicycle safety. The Purpose and Need was finalized after review and consideration of all comments received.

5.2 Final Purpose and Need

The purpose of the Downtown Kalamazoo PEL is to improve **safety** and **operations** for all users of various transportation modes and pedestrians within the project area and to provide a quality integrated transportation network for economic prosperity for the downtown business community and quality of life through safe mobility options for all users.

This PEL process includes the study area shown in **Figure 2-1** and aims to address the following needs.

- Improve the safety of the corridors within the study area.
- Improve operations and connectivity for users of all modes by implementing context sensitive solutions. Update/optimize operations at intersections to provide balanced operations for all modes.
- Create a plan to focus future MDOT and local agency projects within the study area corridors that improve operations and safety for all users (drivers, cyclists, pedestrians, transit users and commercial traffic).
- Identify and recognize historic features and natural resources in order to avoid and minimize impacts.
- Maintain economic viability through active downtown businesses in the study area.
- Coordinate with publicly adopted community plans within the context of downtown Kalamazoo, neighborhoods and campus areas.
- Optimize the existing transportation infrastructure to coordinate with adopted community and neighborhood plans.

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6 Evaluation Criteria

The draft evaluation criteria was developed and presented at the September 15, 2017 Admin Team meeting. As the PEL study recommendation of a jurisdictional transfer of streets to the City came into focus, no additional discussion occurred regarding the draft evaluation criteria. These will be reevaluated by the City for their future study. A sample of a criteria evaluation matrix is shown in **Table 6-1.** **Table 6-2** presents the draft evaluation criteria originally developed for the Kalamazoo PEL Study. A brief discussion of that criteria is provided in this section.

Table 6-1: Sample Comparison of Evaluation Criteria

Comparison of Alternatives – Evaluation Matrix							
Goal	**Evaluation Criteria**	**Evaluation Criteria Description**	**Desired Outcome**	**How will it be evaluated?**	**No Build**	**Alt 1**	**Alt 2**
Roadway System Ease of Use	Impact to planned travel time	Does the project increase planned travel time?	Minimize the increase in planned travel time	The higher the increase in planned travel time the lower the score.	2	1	3

Scoring

Low	**1**	Poor
Medium	**2**	Acceptable
High	**3**	Good

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Table 6-2: Draft Evaluation Criteria for the Kalamazoo PEL Study

Goal	Evaluation Criteria	Evaluation Criteria Description	Quantitative or Qualitative?	Goal?	How will it be evaluated?
Roadway System Ease of Use	Impact to navigation and connectivity	Does the project make the transportation system easy to navigate?	Quantitative	Improve access	The higher the reduction in vehicle miles travelled, the higher the score.
	Impact to planned travel time	Does the project increase planned travel time on Michigan and Kalamazoo?	Quantitative	Minimize the increase in planned travel time	The higher the increase in planned travel time the lower the score.
	Maintain M-43, BL I-94, and BL US-131 routes	Are the M-43, BL I-94, and BL US-131 routes maintained?	Quantitative	Maintain connectivity	Reducing number of turns from/to a BR/BL will score higher. The higher the additional turns, the lower the score.
Community Vitality	Avoid adverse impact to neighborhoods	Does the project adversely divert additional traffic and increase speeds through neighborhoods?	Quantitative	Minimize adverse effect to neighborhood traffic & speed	Review the results of the travel demand model, an increase in traffic will result in a lower score, a decrease will result in a higher score.
	Impact to placemaking opportunities	Does the project provide quality area for public space on Michigan Avenue btw Park and Kalamazoo (landscaping, outdoor seating, etc.)?	Quantitative	Improve placemaking.	Width of ROW available on Michigan Avenue for placemaking (ROW less pavement & sidewalk)
	Support future land use and planning	Is the project consistent with existing community plans and goals?	Qualitative	Supports Land Use and Plans	More consistency with plans and goals will result in a higher score.
	Impact to truck deliveries	Does the project impact access for truck deliveries?	Quantitative	No reduction in truck delivery access	Review the results of the travel demand model, the higher the increase in VMT will result in a lower score. Also look at parking & delivery impact.
	Impact to on-street parking	Does the project impact on-street parking?	Quantitative	Minimal impacts to parking	The higher number of parking impacts, the lower the score.
Environmental Responsibility	Minimize Historic Properties/Districts affected	Does the project impact Historic Properties/Districts and if so, to what level?	Quantitative	No Impacts	Higher # of impacts will receive a lower score.
	Minimize parkland impacts	Does the project impact parkland and if so, to what level?	Quantitative	No Impacts	Higher # of impacts will receive a lower score.
	Impact to Environmental Justice communities	Does the project disproportionately affect minority or low-income communities?	Qualitative	No Impacts	Higher impacts will receive a lower score.
	Minimize hydrologic impacts (wetland, floodplain, creek)	Does the project impact waterways, decrease water quality or increase stormwater runoff?	Quantitative	No impacts to waterways	Area of wetland & floodplain fill
	Impact to water quality and/or stormwater volume	Does the project impact water quality or decrease stormwater volume?	Quantitative	Improves water quality, decreases stormwater runoff	Change in impervious surface, addition of green infrastructure
	Minimize ROW Impacts/Relocations	Does the project fit within existing ROW and if not, what is the extent of impacts?	Quantitative	No ROW acquisition	Higher impacts will receive a lower score.
Safety	Impact to non-motorized safety	Does the project impact safety for non-motorized users?	Qualitative	Improve Safety	Higher number of non-motorized facilities & fewer gaps opportunities will create a higher score.
	Impact to motorized safety	Does the project impact safety for motorized users?	Qualitative	Improve Safety	The higher the increase in conflict points will receive a lower score.
	Impact to emergency response time	Does the project impact emergency response time?	Quantitative	Reduce Time	The higher the reductions in time will receive a higher score.

Goal	Evaluation Criteria	Evaluation Criteria Description	Quantitative or Qualitative?	Goal?	How will it be evaluated?
	Cost vs. safety impact (Note - to be evaluated with Practical Alternatives)	What is the return (expected benefits) on investment (project cost)?	Quantitative	Higher ROI	Higher ROI (per HSM) will receive higher score.
Equitable Access \ Complete Streets	Impact to transit mobility	Does the project provide opportunities for additional transit service?	Qualitative	No reduction in access/mobility	The more opportunities to improve access or service, the higher the score.
	Impact to bicyclist mobility	Does the project impact connectivity for the bicycle network?	Quantitative	Add routes/paths/bike lanes	Evaluate the improved connectivity of bicycle network.
	Impact to pedestrian mobility	Does the project impact connectivity for the pedestrian network?	Quantitative	Add sidewalk & crossings	Number of crossings & sidewalk where currently gapped added.

7 Draft Illustrative Alternatives

When developing alternatives as part of a PEL study, it is important to consider solutions or alternatives from prior studies (**Appendix A**) such as the 2014 charette and 2016 RSA. In addition, there needs to be an evaluation of the potential alternatives from a "blank slate" point of view to be certain other potential solutions are uncovered that may have been overlooked or not evaluated. Thus, the range of alternatives covers a wide scope and includes what has already been considered and new alternatives for consideration, taking into account the study data obtained and ensuing analysis.

7.1 Alternative Development

Table 7-1 summarizes both the alternative concepts that were carried forward as draft illustrative alternatives along with those dismissed from further evaluation and development. Meeting the Purpose and Need statement of balancing safe and quality mobility options for all users with operations was the determining factor.

Table 7-1: Alternative Development Summary

Alternative	Label	Reason for Consideration	Determination and Reasons
Two-way conversion with Michikal as-is	1A	• Improve motorist access • Improve non-motorized safety • Likely sufficient operations	**Carried Forward:** While operations at Kalamazoo/ Westnedge/ Michikal intersection would be difficult, alternative sufficiently Meets Purpose and Need.
Two-way conversion without Michikal	1B	• Improve motorist access • Improve non-motorized safety • Likely sufficient operations • Michikal ROW could be redeveloped	**Carried Forward:** While WB Kalamazoo traffic patterns would change, alternative sufficiently Meets Purpose and Need.
One-way road diet	2	• Maintain existing traffic patterns • Right-size roadways • Improve non-motorized safety	**Carried Forward:** While it would not improve motorist access, alternative provides space for additional parking and complete street features.
Two-way conversion hybrid	3	• Improve motorist access to downtown • Improve non-motorized safety downtown • Kalamazoo retains high level of operations (outside core downtown)	**Carried Forward:** Blends Alternatives 1 & 2 to balance operations with accessibility.
Two-way conversion with Michikal reversed	4	• Improve motorist access • Improve non-motorized safety • Likely sufficient operations	**Carried Forward:** Addresses Alternative 1A Kalamazoo/ Westnedge/ Michikal operation concern while still maintaining current traffic patterns.

Alternative	Label	Reason for Consideration	Determination and Reasons
Two-way conversion with Michikal two-way	N/A	• Full east-west motorist access • Improve non-motorized safety • Likely sufficient operations	**Eliminated:** Low performance compared with Alternatives 1A, 1B & 4. Complicates intersection of Kalamazoo/ Westnedge/ Michikal intersection.
Two-way conversion with Michikal as-is and Kalamazoo part one-way	N/A	• Improve motorist access • Improve non-motorized safety • Likely sufficient operations	**Eliminated:** Low performance compared with Alternatives 1A, 1B & 4. Two-way access was desired along full length of Kalamazoo along with Douglas.
Two-way conversion with Michikal as-is and lowering speed & street class on Michigan	N/A	• Improve motorist access • Improve non-motorized safety • Likely sufficient operations • Improve Michigan's downtown feel	**Eliminated:** Low performance compared with Alternatives 1A, 1B & 4.

The following sections summarize the work done for the draft illustrative alternatives carried forward. These were presented to the Study, Admin and LAG teams but not presented for public comment and are therefore to be considered draft. It was during this stage of the project that the jurisdictional transfer discussions furthered and advancing the MDOT led alternative development was deemed unnecessary. Only analysis underway at this time and determined to be value added for a future City study was completed. Items omitted include a Highway Safety Manual crash analysis of the alternatives and traffic analysis for Alternatives 2 and 3. Details on the traffic and safety analysis completed can be found in **Appendix E**. Alternatives were not scored using the evaluation criteria.

7.2 Alternative 1, Two-Way Conversion

This alternative converts Kalamazoo Avenue, Michigan Avenue, Douglas Avenue and Main Street to two-way streets within the study area. Park Street and Westnedge Avenue were initially also converted to two-way streets but due to operational concerns were changed back to one-way streets. The City has expressed desire to also convert these streets to two-way but realizes it is not an immediate study goal.

Both Alternative 1A and 1B will improve the balance between traffic operations and non-motorized mobility through the reduction of Michigan Avenue right-of-way needs from 46 feet to 36 feet. The right-of-way reduction will result in the opportunity to maximize intersection operations, context sensitive solutions, and non-motorized mobility while increasing safety along Michigan Avenue.

7.2.1 Alternative 1A, With Michikal Street

This version maintains the current one-way operations of Michikal Street at a southwest direction as shown in **Figure 7-1**. **Table 7-2** contains the alternative congested intersections. At

the end of this section **Table 7-5** compares the travel time of the draft illustrative alternatives fully analyzed.

Table 7-2: 2040 Alternative 1A Level of Service at Congested Intersections

Intersection	Traffic Control	Peak Period	2040 ALT 1A Traffic		
			V/C	DELAY	LOS
Michigan at Lovell	STOP NW	AM	0.44	15.9	C
		MD	0.54	17.5	C
		PM	0.83	36.3	E
Howard at Crosstown Pkwy	SIGNAL	AM	0.90	47.1	D
		MD	0.76	26.9	C
		PM	1.12	48.3	D
Burdick at Kalamazoo	SIGNAL	AM	0.86	36.1	D
		MD	0.84	34.0	C
		PM	0.96	44.3	D

Note: Average vehicle delay estimated in seconds. STOP control analyses presented by minor approach

7.2.2 Alternative 1B, Without Michikal

This version removes Michikal Street to check the corresponding operation impacts at the Westnedge/Kalamazoo and Main/Stadium/Michigan intersections as shown in **Figure 7-2**. **Table 7-3** contains the alternative congested intersections. At the end of this section **Table 7-5** compares the travel time of the draft illustrative alternatives fully analyzed.

Table 7-3: 2040 Alternative 1B Level of Service at Congested Intersections

Intersection	Traffic Control	Peak Period	2040 ALT 1B Traffic		
			V/C	DELAY	LOS
Howard at Crosstown Pkwy	SIGNAL	AM	0.89	43.4	D
		MD	0.76	26.8	C
		PM	1.11	48.0	D
Park at Michigan	SIGNAL	AM	1.11	88.6	F
		MD	0.78	19.3	B
		PM	0.95	32.9	C
Rose at Michigan	SIGNAL	AM	1.46	230.6	F
		MD	1.21	117.4	F
		PM	1.33	168.4	F
Burdick at Michigan	SIGNAL	AM	1.30	87.9	F
		MD	1.08	42.4	D
		PM	1.19	65.1	E
Edwards at Michigan	SIGNAL	AM	1.32	122.1	F
		MD	1.11	44.7	D
		PM	1.07	33.4	C
Pitcher at Michigan	SIGNAL	AM	0.65	33.5	C
		MD	1.36	175.7	F
		PM	1.46	224.7	F
Burdick at Kalamazoo	SIGNAL	AM	0.85	34.2	C
		MD	0.80	29.3	C
		PM	0.96	41.2	D
Portage at Michigan	SIGNAL	AM	1.13	68.8	E
		MD	0.92	19.4	B
		PM	1.22	61.2	E
Michigan at Kalamazoo	SIGNAL	AM	0.40	17.6	B
		MD	0.80	23.7	C
		PM	0.96	49.5	D

Note: Average vehicle delay estimated in seconds. STOP control analyses presented by minor approach

7.3 Alternative 2, One-Way Road Diet

This alternative looks at opportunities to reduce the number of through travel lanes along with intersection treatments to improve bicycle/pedestrian options, parking and other roadside amenities while maintaining one-way traffic as shown in **Figure 7-3**. A detailed traffic analysis was not completed for this alternative due to City disinterest.

Alternative 2 would maximize the implementation of context sensitive solutions and improve non-motorized safety to the greatest extent. However, this alternative would be less likely to improve traffic operations in general and at intersections.

7.4 Alternative 3, Two-Way Conversion Hybrid

This alternative is a blend of Alternatives 1 and 2, where Michigan Avenue and Main Street are the only conversions to two-way. A detailed traffic analysis was not completed for this alternative due to City disinterest. Alternative 3A maintains the current one-way operations of Michikal Street at a southwest direction as shown in **Figure 7-4** and Alternative 3B removes Michikal Street as shown in **Figure 7-5**.

Alternative 3 would be somewhere in between the Alternatives 1A/1B and Alternative 2 in meeting the implementation of context sensitive solutions, improve non-motorized safety and traffic operations for all modes.

7.5 Alternative 4, Two-Way with Michikal Reversed

This alternative converts Michigan and Kalamazoo Avenues within the downtown area to two-way while Kalamazoo Avenue outside the downtown area along with Douglas Avenue and Main Street remain one-way. Michikal Street remains one-way but is reversed to check the corresponding operation impacts at the Westnedge/Kalamazoo intersection as shown in **Figure 7-6**. **Table 7-4** contains the alternative congested intersections. At the end of this section **Table 7-5** compares the travel time of the draft illustrative alternatives fully analyzed.

Alternative 4 will improve the balance between traffic operations and non-motorized mobility through the reduction of Michigan Avenue right-of-way needs from 46 feet to 36 feet. The right-of-way reduction will result in the opportunity to maximize intersection operations, context sensitive solutions, and non-motorized mobility while increasing safety along Michigan Avenue.

Table 7-4: 2040 Alternative 4 Level of Service at Congested Intersections

Intersection	Traffic Control	Peak Period	2040 ALT 4 Traffic		
			V/C	DELAY	LOS
Howard at Crosstown Pkwy	SIGNAL	AM	0.87	54.2	D
		MD	0.76	41.4	D
		PM	1.03	70.0	E
Michikal at Westnedge	SIGNAL	AM	0.77	27.5	C
		MD	0.80	25.7	C
		PM	1.02	42.6	D
Park at Michigan	SIGNAL	AM	1.19	64.8	E
		MD	0.80	15.8	B
		PM	1.30	91.9	F

Note: Average vehicle delay estimated in seconds. STOP control analyses presented by minor approach

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Table 7-5: 2040 Alternatives 1A, 1B and 4 Travel Times

Corridor	Limits	Travel Time	Scenario								
			Alt 1A AM Peak	Alt 1A MD Peak	Alt 1A PM Peak	Alt 1B AM Peak	Alt 1AB MD Peak	Alt 1B PM Peak	Alt 4 AM Peak	Alt 4 MD Peak	Alt 4 PM Peak
EB Michigan	From Michikal to Harrison	Total Delay (s/veh)	77.3	77.7	136.8	111.1	141.5	227.8	100.2	65.6	102.4
		Total Travel Time (s)	192.5	191.8	250.1	226.6	574.4	654.8	192.5	152.4	193.9
		Total Distance (mi)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		Arterial speed (mph)	20.4	20.5	18.3	16.3	15.9	13.3	18.3	21.2	17.1
WB Michigan	From Harrison to Michikal (Alts 1A, 1B & 4)	Total Delay (s/veh)	102.3	93.9	162.3	142.6	83.4	129.6	110.8	75.6	122.9
		Total Travel Time (s)	205.7	202.8	277.8	372.4	186.2	242.5	261.7	176.7	534.7
		Total Distance (mi)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		Arterial speed (mph)	19.4	19.4	14.6	16.2	18.0	14.2	15.6	18.0	16.1
EB Kalamazoo	From Westnedge to Michigan	Total Delay (s/veh)	50.4	47.7	50.4	56.1	48.7	53.0	29.4	25.7	53.4
		Total Travel Time (s)	128.6	127.2	128.6	138.3	130.2	134.6	96.7	95.3	127.7
		Total Distance (mi)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
		Arterial speed (mph)	20.0	21.0	20.0	19.0	20.0	19.0	27.0	28.0	21.0
WB Kalamazoo	From Michigan to Westnedge	Total Delay (s/veh)	60.7	57.1	60.7	77.7	63.6	128.5	39.4	47.5	87.8
		Total Travel Time (s)	135.3	132.3	135.3	163.2	142.4	219.5	110.9	119.5	164.0
		Total Distance (mi)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
		Arterial speed (mph)	19.0	20.0	19.0	16.0	18.0	13.0	24.0	22.0	16.0
NE Michikal	From Michigan to Elm Pl (Alts 1A,1B) From Michigan to Kalamazoo (Alt 4)	Total Delay (s/veh)	2.1	3.3	2.1	-	-	-	2.1	2.4	2.5
		Total Travel Time (s)	10.6	12.8	10.6	-	-	-	30.6	31.2	31.3
		Total Distance (mi)	0.1	0.1	0.1	-	-	-	0.2	0.2	0.2
		Arterial speed (mph)	22.0	18.0	22.0	-	-	-	24.0	23.0	23.0
SW Michikal	From Westnedge to Michigan	Total Delay (s/veh)	18.1	5.2	18.1	-	-	-	-	-	-
		Total Travel Time (s)	36.6	22.4	36.0	-	-	-	-	-	-
		Total Distance (mi)	0.2	0.2	0.2	-	-	-	-	-	-
		Arterial speed (mph)	20.0	32.0	20.0	-	-	-	-	-	-

Figure 7-1: Draft Illustrative Alternative 1A

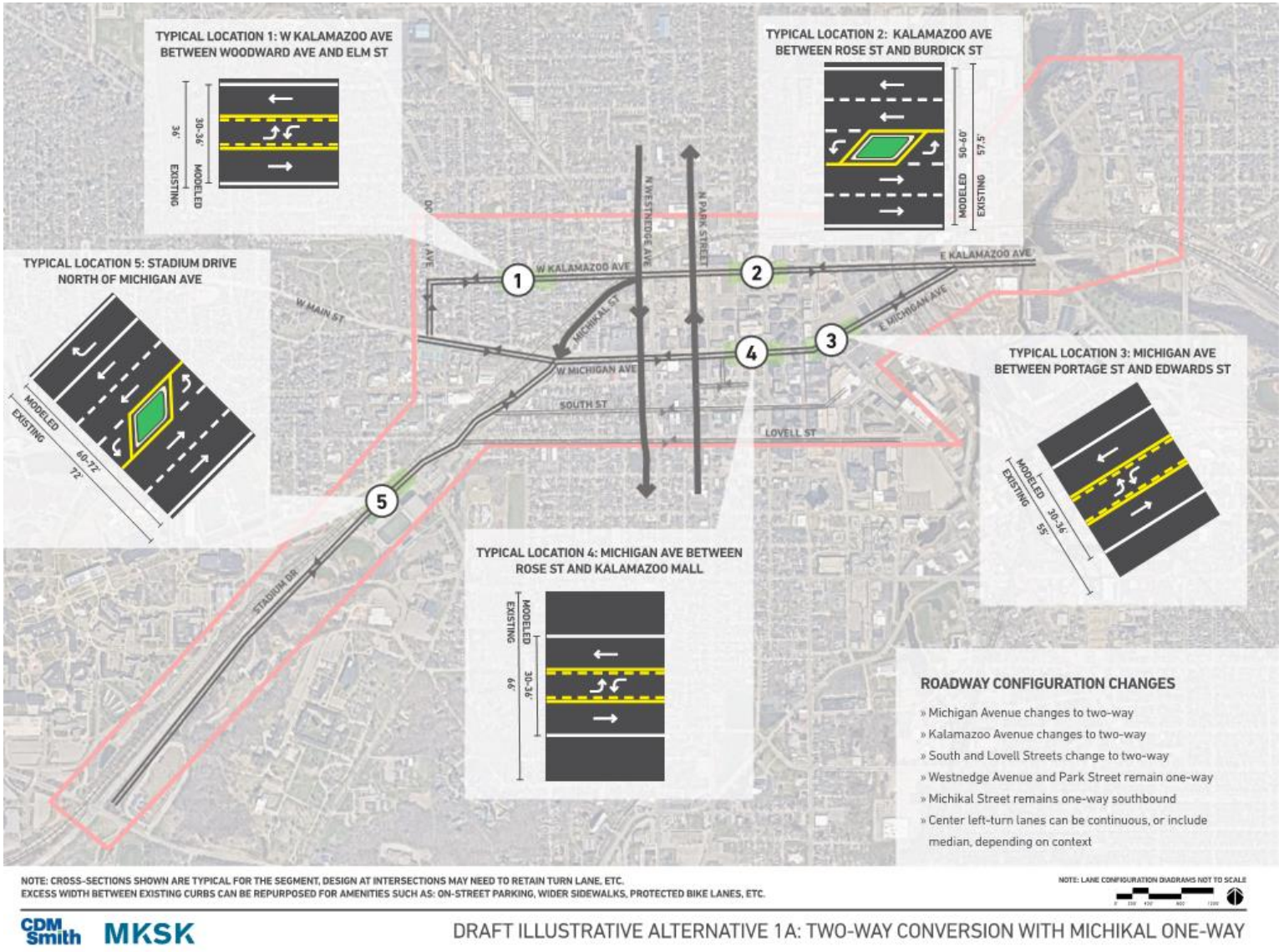


Figure 7-2: Draft Illustrative Alternative 1B

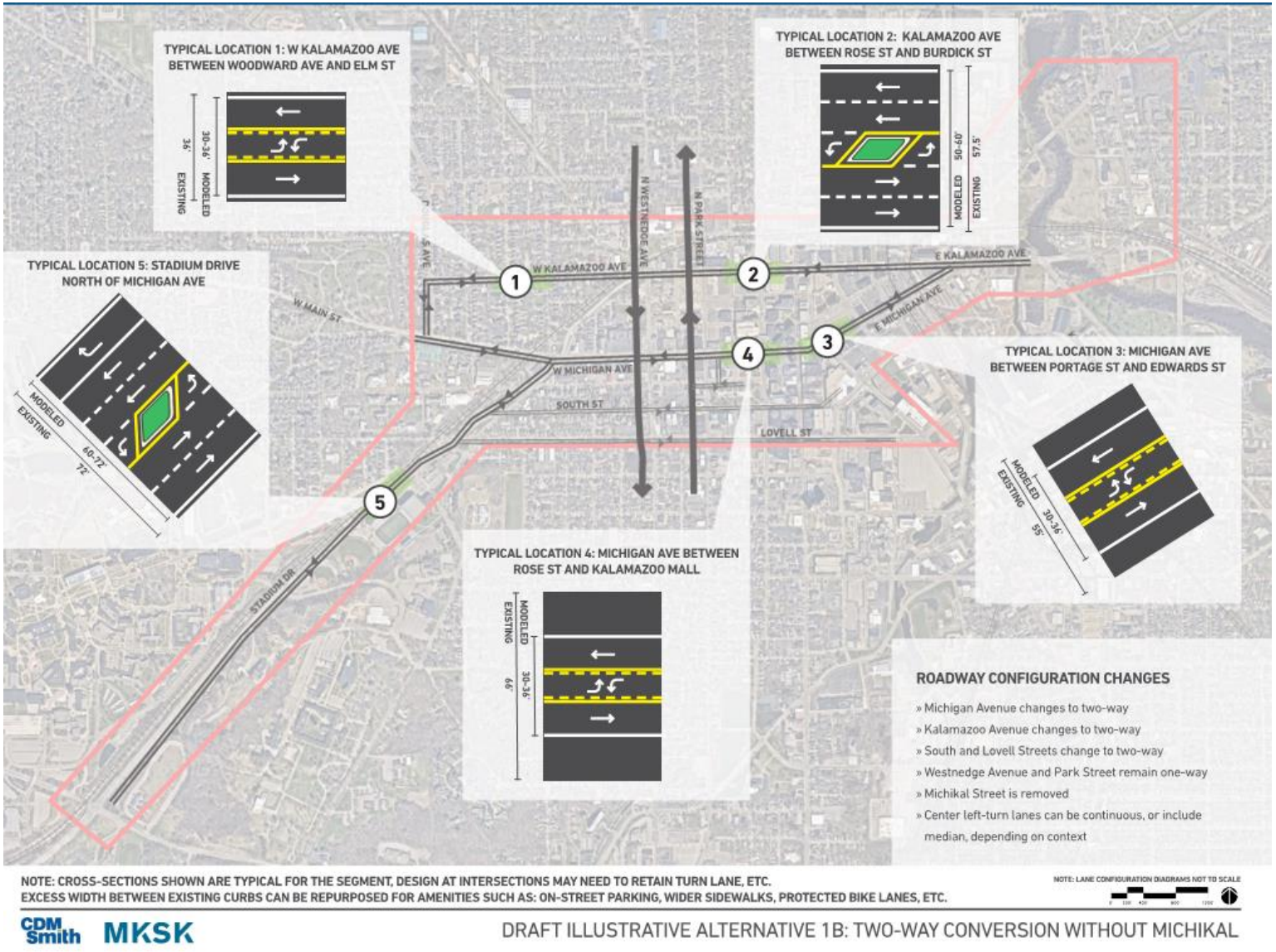


Figure 7-3: Draft Illustrative Alternative 2

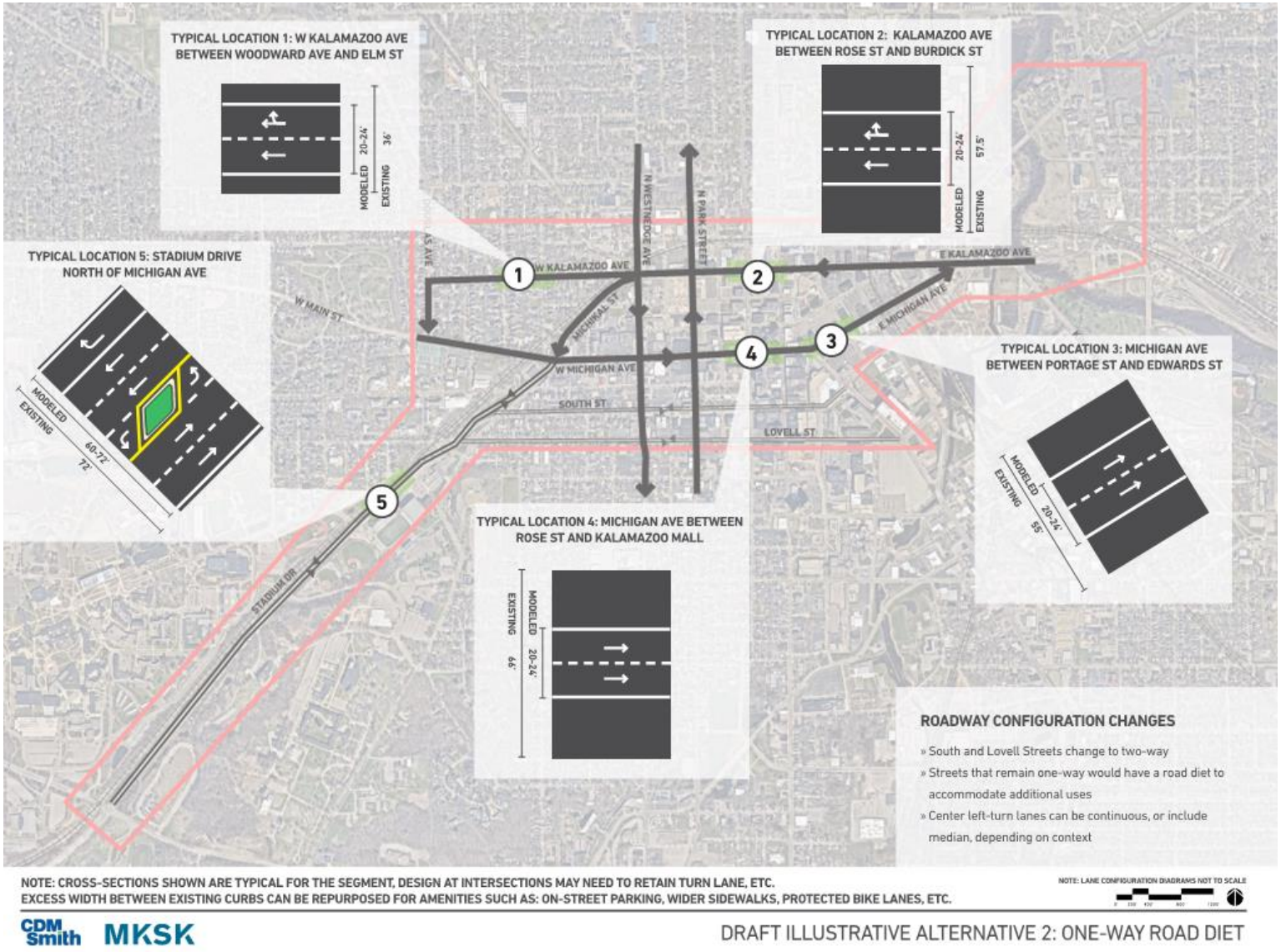


Figure 7-4: Draft Illustrative Alternative 3A

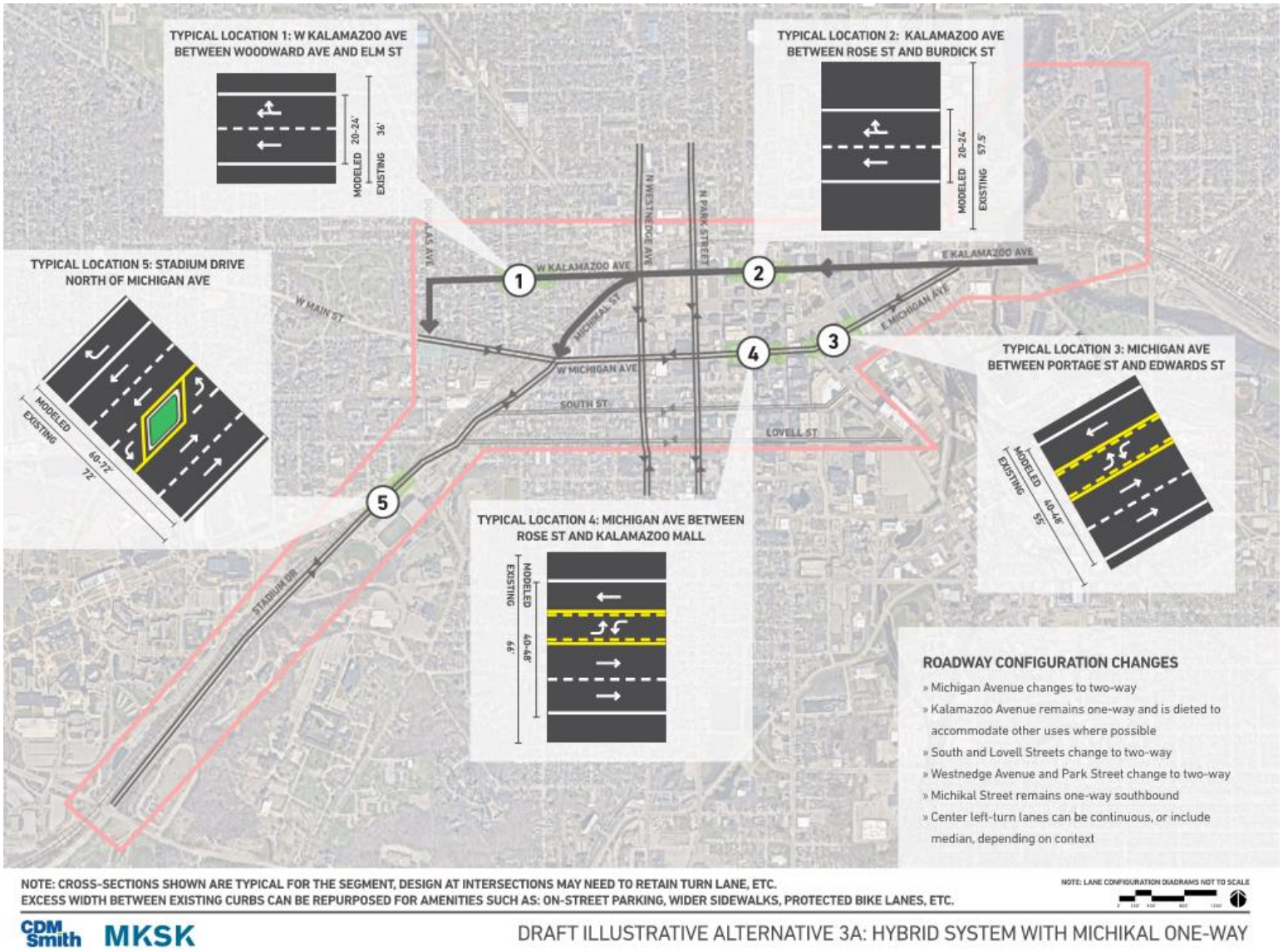


Figure 7-5: Draft Illustrative Alternative 3B

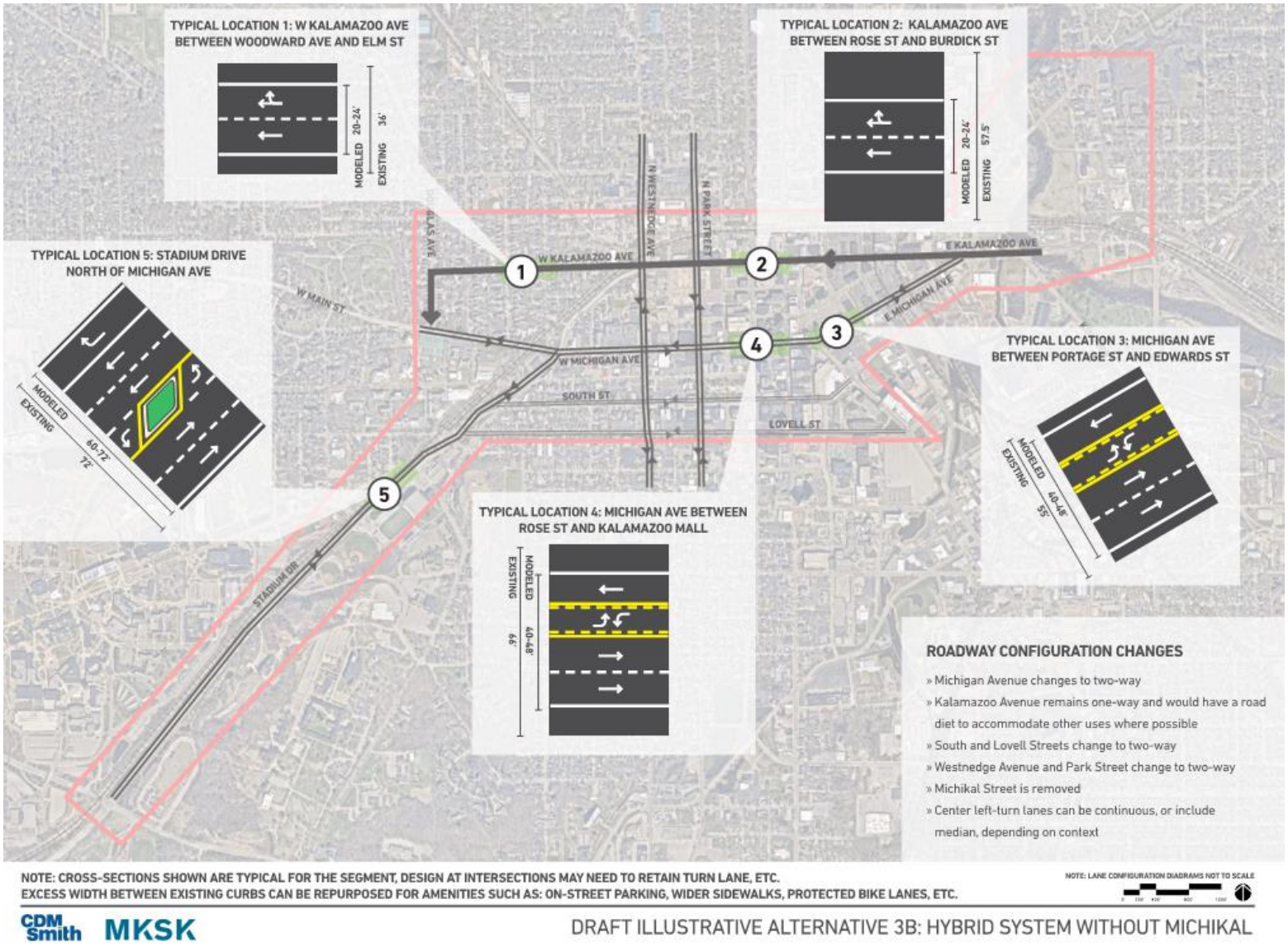
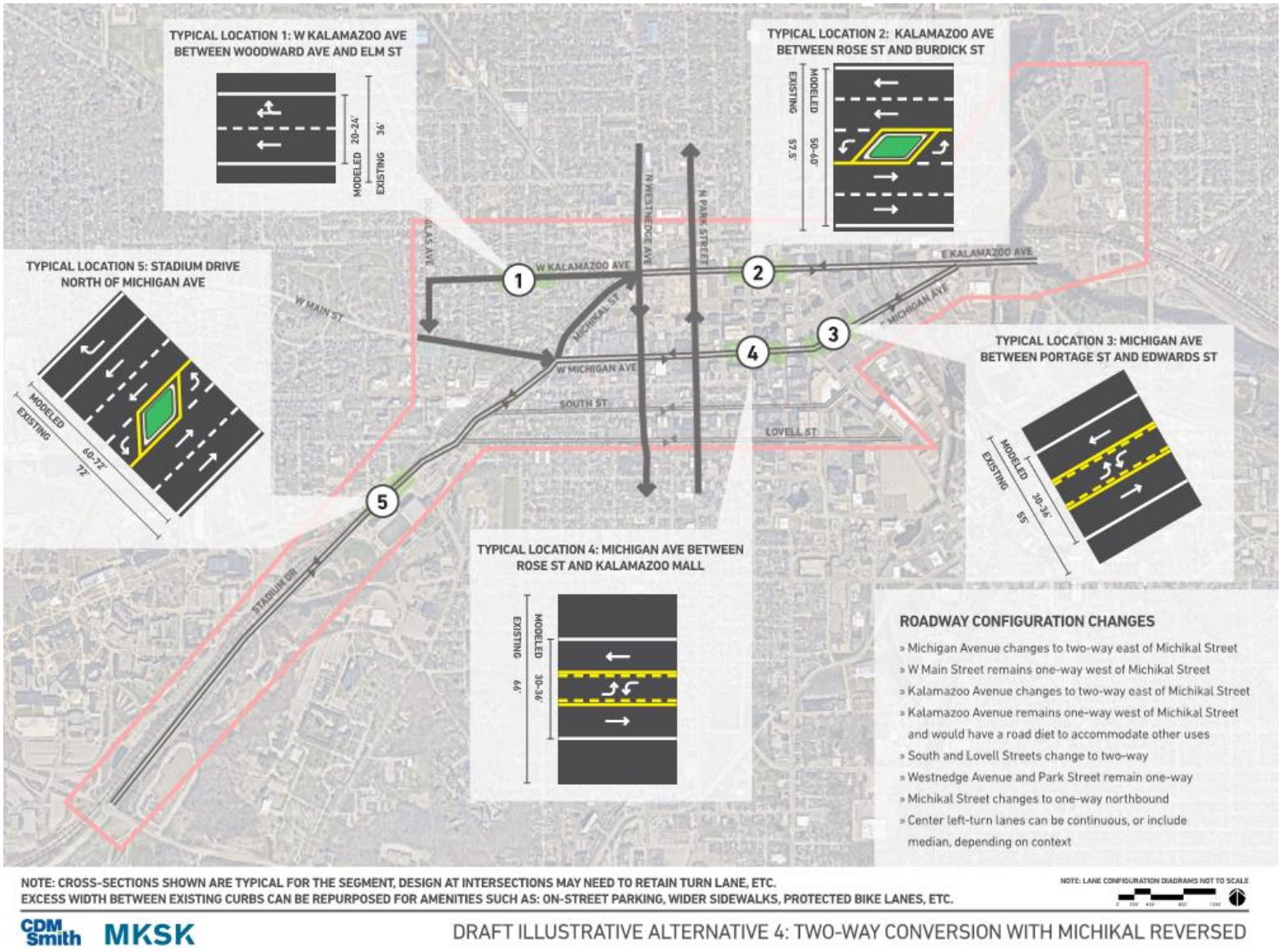


Figure 7-6: Draft Illustrative Alternative 4



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8 Conclusions

8.1 Jurisdictional Transfer

As discussed throughout this document, a jurisdictional transfer of streets shown in **Figure 8-1** from MDOT to the City is the final recommendation of this study. This option was explored when the City decided the best avenue to achieve their downtown street vision was to have full control of the network. The City's focus was to revitalize the downtown core to encourage economic growth and equitable access for all users with a reduced focus on traffic operations. Such considerations include roadway two-way conversions, traffic calming measures, increased bicycle only designations and curbside amenities. MDOT's functional responsibility and corresponding funding is focused on safe and efficient operations for both motorized and non-motorized users. Current Southwest Region funding strategies dictate MDOT spend 80% on freeways in order to meet FHWA pavement condition goals, which limits MDOT's ability to enhance non-freeway corridors outside of pavement conditions. Due to the transfer, a full alternative development and analysis process was not completed. Instead the effort focused on finalizing the analysis that would be of use to the City moving forward. Both MDOT and the City were engaged in this partnership and demonstrated the commitment and communication to see the transfer through. A large effort in this coordination was establishing the current state of turnback streets and the associated costs to repair them. The Transportation Commission and State Administrative Board approved the Memorandum of Understanding (MOU) on December 17 and 18, 2018, respectively. The Kalamazoo City Commission approved the MOU with an 8-1 vote at their January 7, 2019 meeting. The MOU was approved by MDOT on January 14, 2019. Sixty percent of the agreed upon $11,689,997 payment occurred shortly after MOU award date and the remaining 40% between years four and six once 60% of the identified projects are completed. All projects must be completed within ten years or the City will have to repay MDOT the funds associated with the incomplete projects.

The below items were not included in the transfer due to associated risk and costs. These remain under MDOT jurisdiction for both maintenance and repair responsibilities.

- Michigan Avenue bridge and appurtenances over Portage Creek
- Michigan Avenue bridge and appurtenances over Kalamazoo River
- Railroad bridge and appurtenances over Michigan Avenue
- Pumps and appurtenances on Michigan Avenue

Additional considerations regarding the transfer included the reroute of M-43 as shown in **Figure 8-2**. MDOT's statewide travel demand model was utilized to check the travel time impact between the existing and proposed routes. The result was a nominal difference that should not cause significant impact to travelers along full length.

Figure 8-1: Jurisdictional Transfer Map

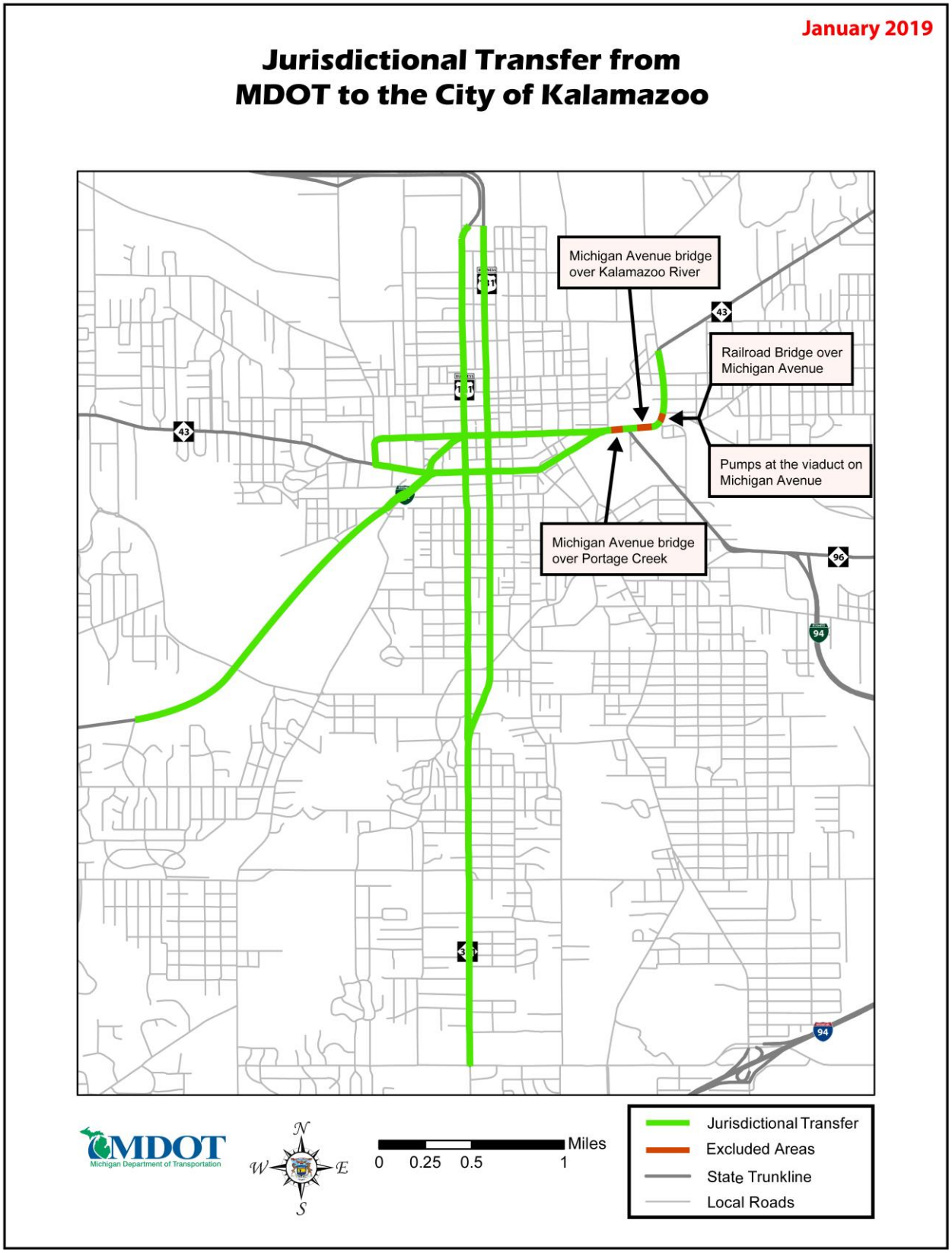
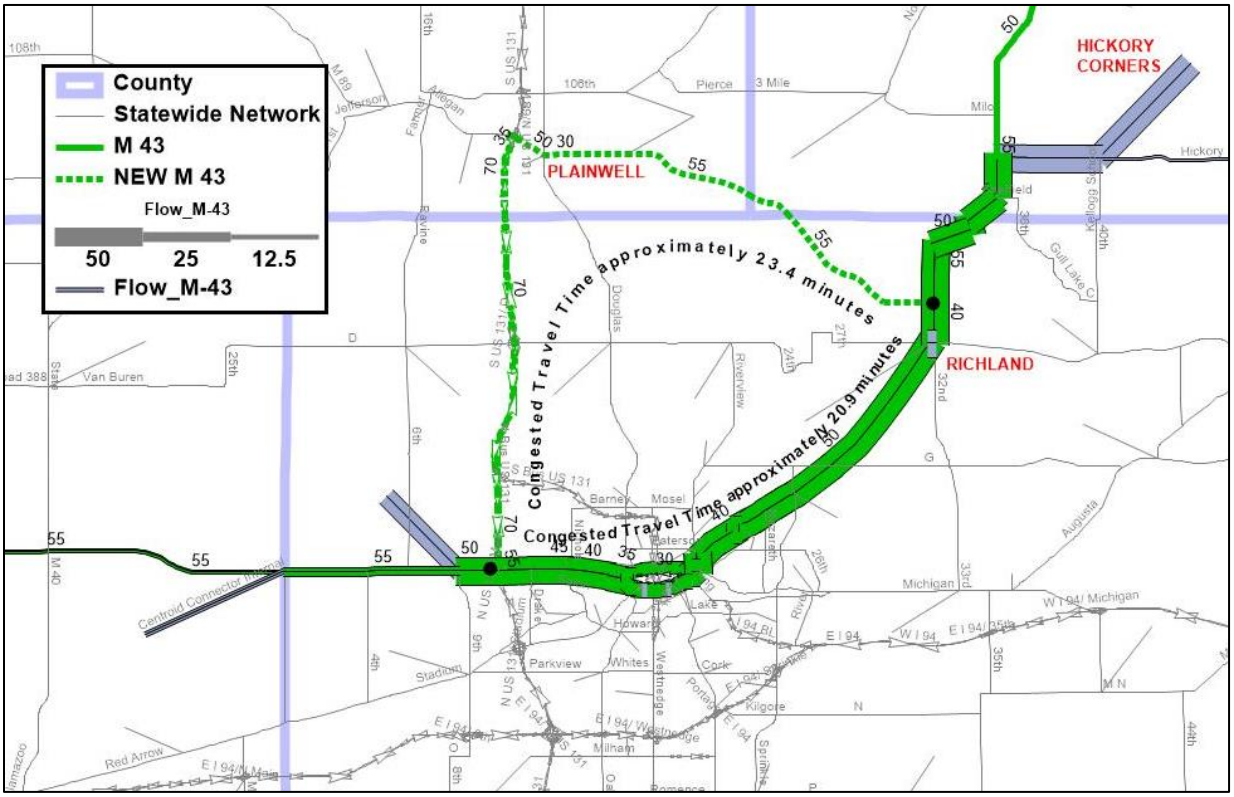


Figure 8-2: M-43 Re-Designation Map



8.2 Potential Issues for Future Consideration

Future design activities should incorporate public engagement to ensure the project considers all community concerns while offering stakeholders an opportunity to shape the look of the corridor. Additional environmental investigation is anticipated during future project phases and may require mitigation as discussed in **Appendix D**.