Michigan Avenue Corridor Study

Locally Preferred Alternative Report

FINAL June 2016

RTA
OF SOUTHEAST MICHIGAN

AECOM

Table of Contents

List of Tables

List of Figures

1.0 Executive Summary

Following a comprehensive process that defined existing conditions, developed goals and objectives, and included multiple screening processes, the Michigan Avenue Corridor Study is recommending a Locally Preferred Alternative (LPA) for consideration and adoption by the Regional Transit Authority. Due to its size and various travel markets, the Study is recommending an interconnected set of rapid transit services for the 40-mile corridor. **Figure 1-1** provides a view of the transit services being proposed.

Figure 1-1: Michigan Avenue Corridor Locally Preferred Alternative

As shown in Figure 1-1, the LPA includes a Regional Rail service providing for long, cross-corridor trip making, supplemented by two bus rapid transit (BRT) lines that will service the more dense population and employment centers in Washtenaw and Wayne Counties, as well as provide a rapid connection to Detroit Metro Airport. In total, the combined projects involve an estimated capital investment of $316 million (2015 $), and offer a significant improvement to mobility, job accessibility and economic development in the corridor.

Each of the project elements included in the LPA plays an important role in expanding access to regional destinations and supporting future development within the communities along the corridor. The initial fact finding for the Purpose and Need for this study spotlighted the importance of not only improving transit services in the strong transit markets at either end of the study area, but also providing rapid connectivity between them. Regional Rail will provide an end-to-end service in the Corridor that is competitive with auto travel times and supportive of economic development planning. Notably, this includes service connecting the two most dynamic and regionally important downtowns in Southeast Michigan, with intermediate stations that provide access to other regional job centers including Detroit Metro Airport.

On the eastern end of the Corridor, the proposed Michigan Avenue BRT service would provide a much-needed rapid one-seat ride from Detroit and Dearborn to Metro Airport, and also support economic development planning, local job access and service to environmental justice populations. The route would provide service to multiple Detroit neighborhoods and East Dearborn before connecting to the Dingell Transit Center. From there the service would continue through West Dearborn, Dearborn Heights, Inkster, Wayne and Romulus. These communities are currently served by limited local bus service that does not meet regional mobility needs or development goals.

On the western end of the Corridor, the proposed Washtenaw Avenue BRT would upgrade transit service along the busiest corridor in the AAATA system. The 9-mile route would connect the Blake Transit Center in Downtown Ann Arbor to the Ypsilanti Transit Center in Downtown Ypsilanti, operating primarily along Washtenaw Avenue. Transit signal priority, faster boarding, and station spacing would offer speed improvements over the current local bus routes, and improvements to transit amenities would support local plans for corridor revitalization.

When combined, the project elements will provide a seamless set of connections that improves local and regional tripmaking for commuters, residents and visitors in the Michigan Avenue Corridor.

Table 1-1: Michigan Avenue Corridor LPA Details

Routes	**Regional Rail**: Ann Arbor Amtrak to Detroit New Center via existing railroad corridor
	Michigan Avenue BRT: DTW to Downtown Detroit via Merriman Road and Michigan Avenue
	Washtenaw Avenue BRT: Downtown Ann Arbor to Downtown Ypsilanti via Washtenaw Avenue
Number of Stations	41 Stations
Total Corridor Capital Costs (2015$)	$316 million
Total Corridor O&M Costs (Annual 2015$)	$34.8 – $43.1 million
Likely Environmental Impacts	Minimal, projects operated in existing transportation corridors
Park and Ride Locations	Up to 10
On-Street Parking Spaces Impacted*	185 – 1,609
Estimated Weekday Ridership (all projects)	11,800 – 12,400 Boardings per Day

***Further design as well as decisions on the importance of parking vs. bike lanes will determine ultimate impact along Michigan Ave.*

Figure 1-2: LPA Runningway Concept - Downtown Detroit to West Dearborn (Dedicated Lane, Center Running)

Figure 1-3: LPA Runningway Concept Cross Section – Downtown Detroit to West Dearborn

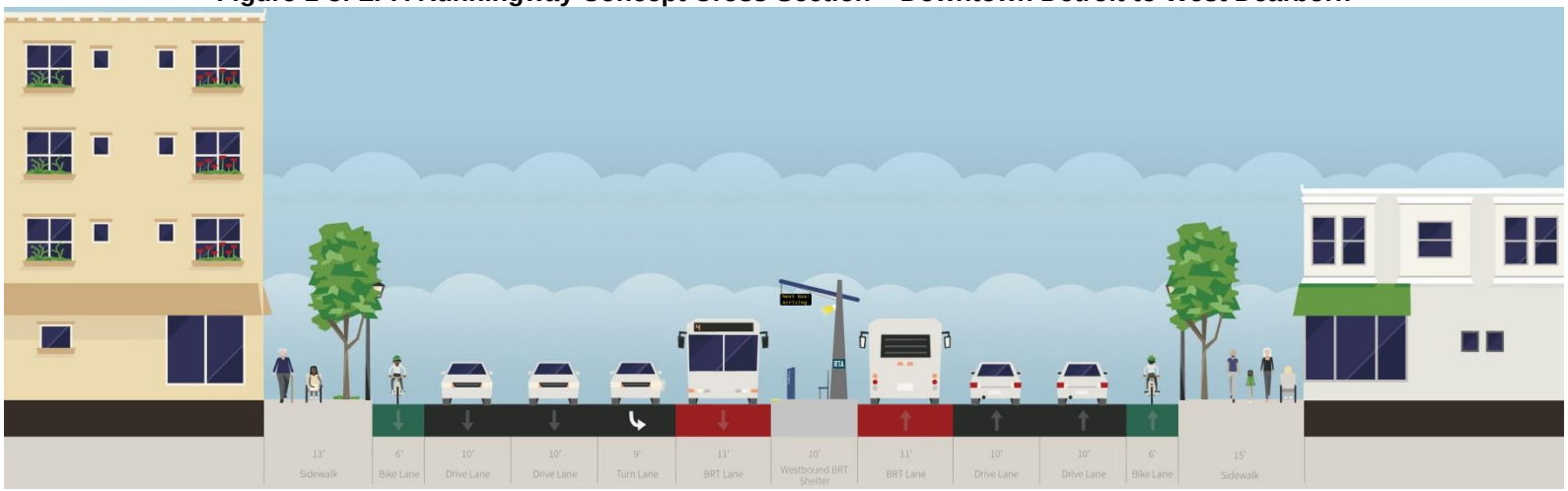


Figure 1-4: LPA Runningway Concept - West Dearborn to Metro Airport (Mixed Traffic, Curb Running)

Figure 1-5: LPA Runningway Concept Cross Section – West Dearborn to Metro Airport

Figure 1-6: LPA Runningway Concept - Washtenaw Avenue (Mixed Traffic, Curb Running)

Figure 1-7: LPA Runningway Concept Cross Section - Washtenaw Avenue

2.0 Project Overview

The Michigan Avenue Corridor Study has been led by the Regional Transit Authority of Southeast Michigan (RTA), a newly established agency overseeing transit planning and funding in the four counties of Washtenaw, Wayne, Oakland and Macomb. The study was funded through a combination of Federal Transit Administration (FTA) and Michigan Department of Transportation (MDOT) funds, and identified and evaluated a series of transit investment alternatives to improve transit service between Detroit, Ann Arbor, Detroit Metropolitan Wayne County (Metro) Airport, and the intermediate communities. The Corridor is roughly 40 miles in length, as measured from the Blake Transit Center in Ann Arbor to Campus Martius in downtown Detroit (four blocks east of the Rosa Parks Transit Center).

The initial study area (**Figure** 2-1**)** included all areas within one mile of Michigan Avenue, Washtenaw Avenue, Merriman Road, and other streets that were candidate locations for arterial transit between Detroit and Ann Arbor. The study area included most of the parallel state-owned railroad Corridor along which Amtrak Wolverine service operates (with existing stations located in Ann Arbor, Dearborn, and Detroit).

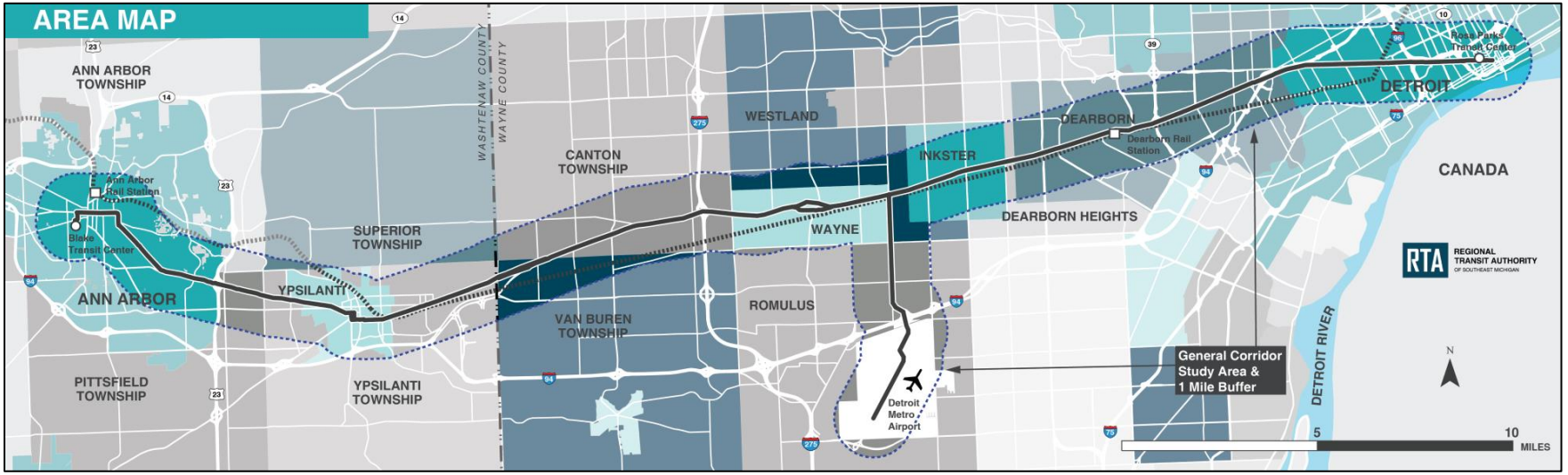
The Corridor communities included the following cities and townships within Wayne and Washtenaw Counties:

- Ann Arbor
- Dearborn
- Dearborn Heights
- Detroit
- Inkster
- Romulus
- Wayne
- Westland
- Ypsilanti
- Ann Arbor Township
- Canton Township
- Pittsfield Township
- Superior Township
- Van Buren Township
- Ypsilanti Township

The study expanded on previous planning work to identify a locally-preferred transit investment alternative that would facilitate safe, efficient and expanded levels of mobility within the study Corridor, and improve connectivity between Corridor communities and the region. Additional reasons for the study included improving connections with other local and regional transit routes (such as the Gratiot and Woodward Avenue Corridors), supporting future development within the Corridor, and increasing transit accessibility to Metro Airport.

Following a multi-phase, iterative alternative development and evaluation process that is supported by extensive public engagement activities, the RTA Planning and Service Coordination Committee will recommend the Locally Preferred Alternative (LPA) to the RTA Board of Directors (Board) for adoption. The LPA will be the transit investment alternative that best meets the purpose and need for the project and is competitive for funding through the FTA's New/Small Starts capital funding program. The RTA Board will submit the LPA to the Southeast Michigan Council of Governments (SEMCOG) for adoption into its 2040 Regional Transportation Plan for Southeast Michigan.

Figure 2-1: Michigan Avenue Corridor Study Area



2.1 Existing Conditions

The Michigan Avenue Corridor has been an important thoroughfare through Detroit and a route to the West for many years. Michigan Avenue between Detroit and Washtenaw County follows the approximate alignment of the Old Sauk Trail, a Native American pathway. Michigan Avenue was constructed in the early 1800s as part of Judge Augustus B. Woodward's 1806 street plan for Detroit.

2.1.1 Demographics

Michigan Avenue has seen a fair amount of change in recent years due to the population declines in the region. Despite this, there are nearly 300,000 people who live within the Michigan Avenue Corridor Study Area (1 mile area on either side of the corridor). This figure is expected to remain stable between now and 2040. Many of these residents are concentrated in Detroit, Dearborn, Ypsilanti, and Ann Arbor. This corridor is home to a large number of zero-car households and households that live below the poverty line, as well as a high student population and a rising senior population. All groups which are likely to benefit from increased transit options.

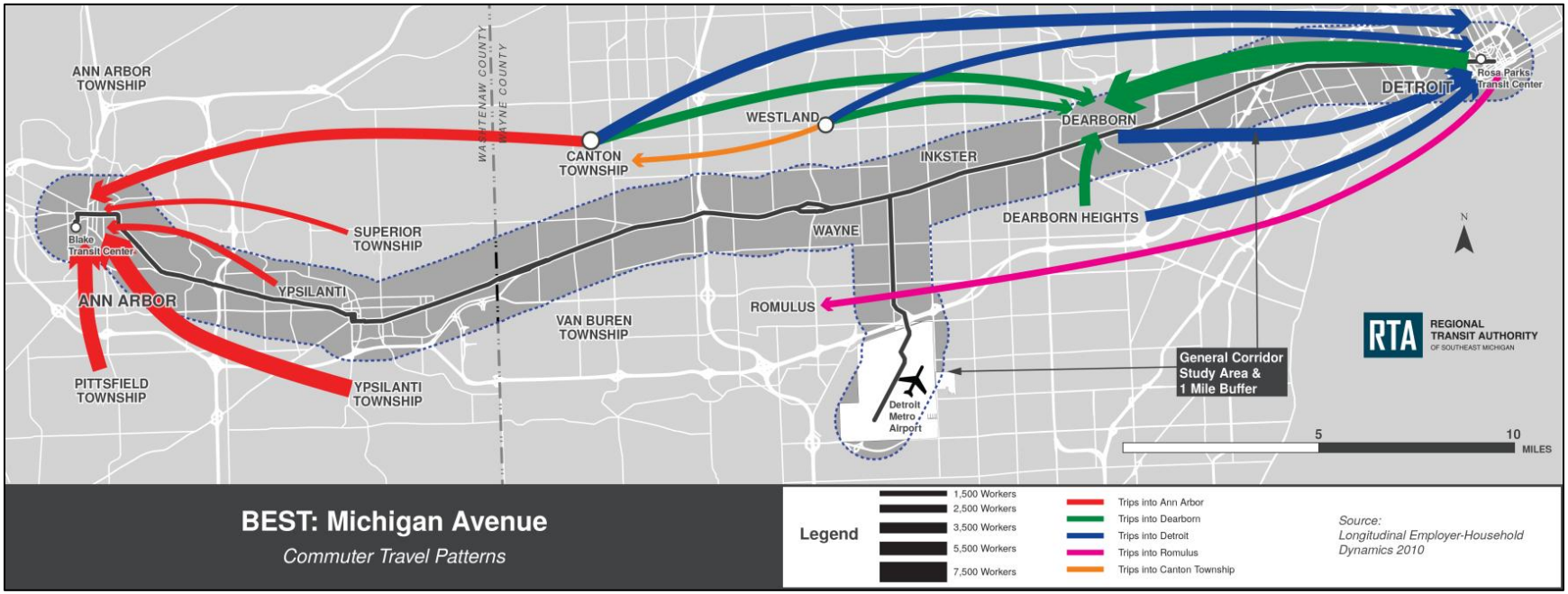
The Michigan Avenue Corridor Study Area is also home to nearly 290,000 jobs. This figure is expected to grow by over 25,000 jobs by 2040, a 9.2% increase. Employment density is highest in Downtown Detroit, Downtown Ann Arbor, and Dearborn near the Ford Campus, and these areas are expected to grow.

2.1.2 Transportation

Existing public transit in the Michigan Avenue Corridor is concentrated at the ends of the corridor. In Ann Arbor and Ypsilanti, service is provided by the Ann Arbor Area Transportation Authority (AAATA). In Detroit, service is provided by the Detroit Department of Transportation (DDOT). The Suburban Mobility Authority for Regional Transportation (SMART) provides service on Michigan Avenue between Dearborn and Wayne, as well as other routes connecting to the north and south. No transit currently exists between Wayne and Ypsilanti.

Daily commuter travel patterns tend to stay within the county they originate in. For example, about 15,000 commuters travel into Ann Arbor for work each day from the adjacent communities. A similar trend is evident in Wayne County. Dearborn attracts a large number of commuters coming from Detroit, Dearborn Heights, and Westland each day. Additionally, a significant number of workers are commuting from Dearborn, Dearborn Heights, and Canton to Detroit. **Figure** 2-2 shows the major commuting patterns in the Michigan Avenue Corridor.

Figure 2-2: Michigan Avenue Commuting Patterns



2.1.3 Environmental

The main environmental feature present in the Michigan Avenue Corridor is the Detroit/Rouge River Watershed, which is present in 75% of the corridor study area. Additionally, nearly 140 acres of wetlands are present in the study area. The majority of the wetlands and waterbodies in the study area are associated with the Rouge River that flows between Canton and the mouth of the river in Dearborn. Results from the environmental analysis indicate that the proposed project is not likely to have any significant adverse environmental impacts.

2.1.4 Land Use

A high level land use analysis was completed in order to understand the types of land uses that were directly adjacent to the Michigan Avenue Corridor. Land uses at the ends of the corridor are very supportive of high-capacity transit investments. These areas include the Detroit CBD, Corktown, Livernois Avenue, Downtown Ypsilanti, Eastern Michigan University, University of Michigan, and Downtown Ann Arbor. Dearborn has relatively dense employment and residential land uses, but they are dispersed widely and are difficult to serve with transit. The central part of the corridor is the most dispersed and will be very difficult to serve efficiently with transit. Transit with park and ride access may be better suited in these areas.

2.2 Purpose and Need

2.2.1 Purpose

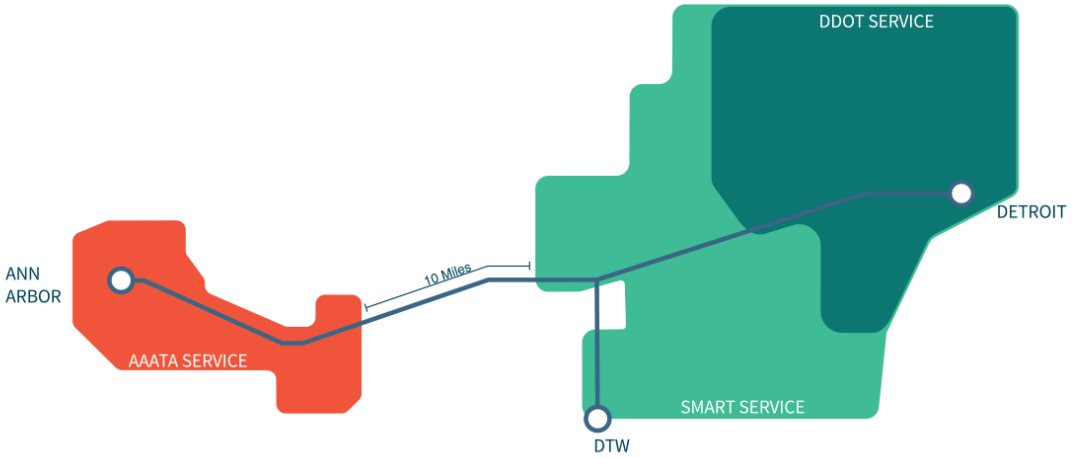
High-capacity transit investment in the Michigan Avenue Corridor will link activity centers to meet existing local and regional transit needs, as well as accommodate anticipated growth in travel demand. This regional service is intended to supplement local transit service and provide mobility options that match emerging demographic trends and preferences, leverage existing transportation infrastructure to improve connectivity, support the mobility of community members who rely on transit, and encourage sustainable development patterns. Transit investment will improve access to a range of corridor-based regional resources, including employment, goods and services, medical care, and educational opportunities. Access to and from the regional transit system will be supported through integration with local fixed route transit, park and ride facilities, and bike and pedestrian infrastructure.

2.2.2 Needs

Need #1: Current Michigan Avenue Corridor transit service does not efficiently, effectively, or competitively connect corridor residents, employees, and visitors with their destinations. High-capacity regional transit investments are needed to provide transit connections that do not currently exist and leverage existing transit service and infrastructure to support expanded corridor-wide mobility.

- **There are strong transit markets at the western and eastern ends of the study corridor but no transit connections between them.** The local fixed route transit networks along the corridor in Wayne and Washtenaw Counties are separated by a 10-mile gap without transit service, and there is no existing regional connection between these communities.
- **Employment destinations are concentrated in Detroit, Dearborn and Ann Arbor, with lower density employment areas spread throughout the corridor;** the existing transit network does not link these job centers nor facilitate efficient, auto-competitive service options to match existing corridor commutes. Improved regional transit connectivity between homes and jobs across the corridor would expand job access and opportunity, as well as promote increased job development in central cities that are well-connected by high-capacity regional transit systems.
- **Transit connections from the eastern half of the corridor to Metro Airport take up to four times longer than the same trip by car**. Transit travel times between Detroit and Metro Airport (100 to 135 minutes) are at least three times longer than the same trip by car (24 to 40 minutes); transit travel times between Central Dearborn and Metro Airport (85 minutes) are four times longer than the same trip by car (16 to 22 minutes).

CURRENT TRANSIT DOESN'T SERVE ALL RESIDENTS



Need #2: The Michigan Avenue Corridor includes many population groups that are likely to be dependent on transit. Strong growth in transit-dependent populations is occurring in communities that have little or no transit service. High-capacity transit investment is essential to support access to opportunities and improved quality of life for transit-dependent residents.

- **A significantly higher percentage of the study area population lives below the poverty line, compared to the State of Michigan and the US, and that percentage is increasing**. Nearly 30% of the study area population lives below the poverty line, compared to 16.8% in the State of Michigan and 15.4% in the US. The percent of study area residents living below the poverty line has grown by more than 77% between 2000 and 2013.
- **The senior population is growing the fastest in areas with limited or no transit service;** the largest senior population continues to be located in areas with comparatively high levels of transit service (Detroit), but is growing fastest in areas without transit (Canton Township).
- **The number of zero-car households within the corridor is increasing.** The highest rates of growth of zero-car households (Pittsfield Township, Superior Township, and Ypsilanti Township) are occurring outside of the communities with the greatest number of zero-car households (Detroit, Ann Arbor, and Westland).
- **The corridor college student population is large and growing.** The share of study area college student population is double the student share of the population found at the State and US levels.

Need #3: Study area population and employment densities are higher than regional densities, and growth is forecast to more evenly distribute throughout the corridor. High-capacity transit investment is necessary to accommodate this growth and to improve multimodal connections between growing communities throughout the corridor.

- **Total study area population is forecast to remain steady through 2040, but will redistribute among the corridor communities.** Detroit is forecast to remain the largest corridor community (by a factor of five) despite forecast population loses; the communities at the western end of the corridor have the greatest forecast increase in actual population.
- **Study area employment density is almost four times greater than the four-county RTA region.** The highest concentrations of employment density in 2010 were spread throughout the corridor: Ann Arbor, Dearborn, Detroit, and Ypsilanti. These communities will continue to have the highest concentrations of employment density through 2040.

Need #4: The communities in the study area have demonstrated a commitment to sustainable growth strategies in their adopted plans and policies. Detroit, Dearborn, Ann Arbor, Wayne, and Ypsilanti are among corridor communities whose plans identify targeted, transit-supportive development patterns as priorities for the community and Michigan Avenue Corridor. A high-capacity regional transit system investment that leverages existing transportation facilities while reducing reliance on single-occupant vehicles will be necessary to achieve these goals.

2.3 Project Goals and Objectives

The goals and objectives shown in **Table 2-1** were developed in response to public and stakeholder input gathered throughout the first phase of the planning process along with technical analysis that examined the current and future conditions of the Michigan Avenue Corridor.

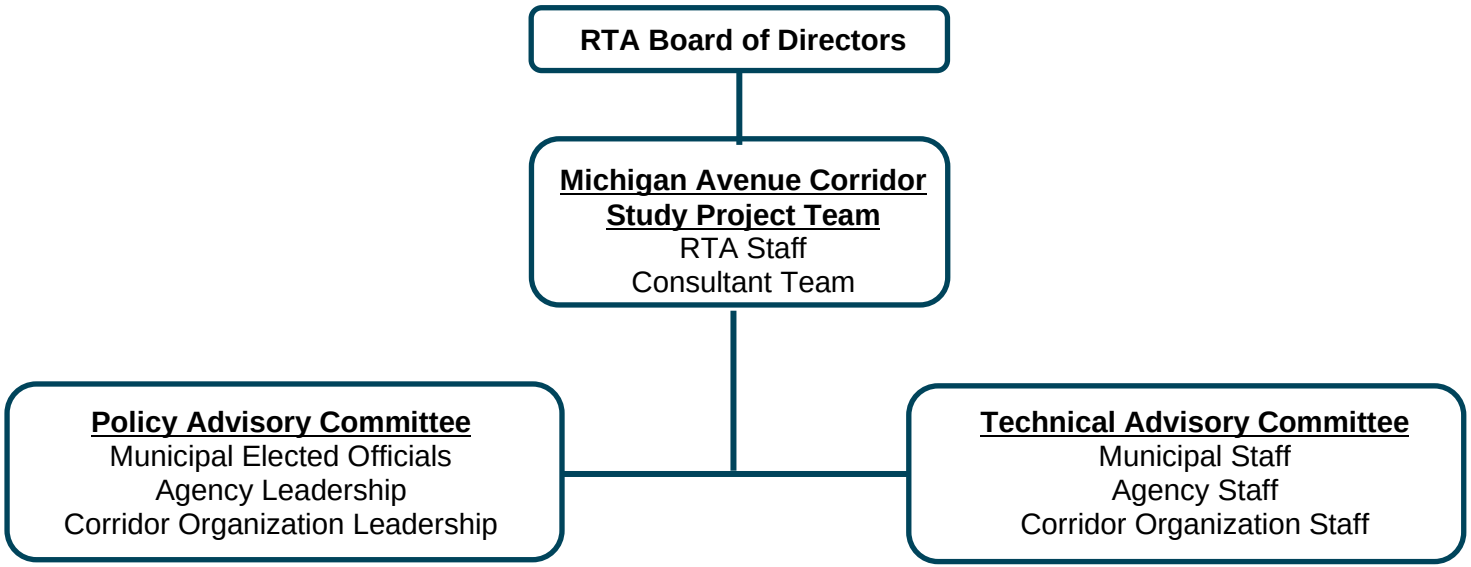
Table 2-1: Goals and Objectives for the Michigan Avenue Corridor Study

Goals	Objectives
Increase the efficiency, attractiveness and utilization of corridor and regional transit for all users	• Provide reliable, frequent service that improves the experience of existing customers • Provide capacity for future growth • Provide improved passenger amenities and infrastructure • Ensure safe and comfortable transit services and facilities for all users
Improve multi-modal connectivity between the activity centers including primary cities at the eastern and western ends of the study area with intermediate communities	• Provide frequent, high-capacity, one-seat transit connections between key study area activity generators • Improve pedestrian and non-motorized access to corridor transit stops/stations • Ensure sufficient park-and-ride access to the system
Enhance connectivity of the corridor to the regional transportation network	• Support regional planning efforts for a more balanced, multi-modal transportation network in the region • Coordinate with existing and planned transit services • Ensure connectivity to services connecting travelers to destinations within and beyond the study area • Consider existing infrastructure, including low-density and underutilized freight and passenger rail corridors, as an alternative to competing for capacity on crowded regional highways and local arterials • Provide for acceptable traffic operations and parking options in the study area • Enhance connections to non-motorized transportation
Support land use and development patterns that reflect the vision for growth contained in local and regional plans and policies	• Maximize the economic development and revitalization efforts of local communities • Improve access to employment concentrations to support regional economic development • Support institutional and key stakeholder planning efforts, particularly strategic growth planning for study area educational institutions and major employers • Support local and regional goals for transit-friendly development within the study area
Contribute to regional equity, sustainability and quality of life	• Promote a more efficient and sustainable local and regional transportation system that reduces energy usage, pollution and costs of living • Minimize impacts to the natural environment • Increase mobility and accessibility for transit-dependent populations • Maximize opportunities for place making and enhanced character in study area communities
Develop and select an implementable and community-supported project	• Define and select regional transit improvements with strong public, stakeholder and agency support • Define and select regional transit improvements that are cost-effective and financially feasible, both in the short- and long-term • Define and select transit improvements that are competitive for Federal Transit Administration funding

2.4 Project Decision Making

This project was initiated and led by the Regional Transit Authority and was supported by both the Technical Advisory Committee and the Policy Advisory Committee. Due to the accelerated schedule of this project, the committees often convened jointly to foster communication. The committees worked with the RTA, project team, and community stakeholders to guide the evaluation of alternatives and develop an LPA that is responsive to the local and regional needs for transit investment while being competitive for federal funding.

Figure 2-3: Project Decision Making Process



2.5 Summary of Stakeholder Involvement

The primary objective for the Michigan Avenue Corridor Study community engagement was to involve local and regional stakeholders in a meaningful conversation about developing Michigan Avenue as one of the three southeast Michigan rapid transit corridors. To that end, the project team focused on:

- Listening to stakeholder concerns and aspirations
- Reviewing and incorporating existing development, land use and other plans that may impact corridor transit planning
- Making the case for the regional transportation with information about transit modes, local benefits and long-term value
- Combining local technical and policy expertise with community input to arrive at a Purpose and Need statement that accurately reflects corridor goals and produces a Locally Preferred Alternative (LPA) that can be supported by the FTA and moved toward implementation.

To achieve success, the Michigan Avenue study outreach effort is deeply inclusive of community representatives and highly transparent with the project's process and findings. A wide variety of outreach tools designed to reach a full spectrum of communities was employed. A key measure of success was that participants throughout the corridor felt they provided valuable input during the process and were empowered to support changes in their community's future through transit investment.

Through inclusive stakeholder engagement tactics, the Study Team received hundreds of detailed public comments, engaged in many conversations and tallied dozens of polls that were used to change and mold the project to best serve the local population.

With public stakeholder involvement we were able to determine specifics, such as:

- Having the commuter rail commence in New Center as opposed to Corktown
- Using Merriman to access the airport as opposed to Middlebelt or Telegraph
- Considering a rail station at Clark and Michigan Avenues
- Having intermittent BRT service connect Wayne and Ypsilanti
- Locating a BRT station at Livernois and Michigan
- Ensuring the Renaissance Center is accessible for commuters
- Looking into shuttle service to and from the college campuses in Dearborn
- Conveniently connecting to the two other BRT corridors

Table 2-2: Stakeholder and Public Outreach Events

Location	Date
City of Wayne	April 1, 2015
City of Canton	April 2, 2015
City of Dearborn	April 7, 2015
City of Inkster	April 15, 2015
Ypsilanti Township	April 16, 2015
U of M Transportation	April 20, 2015
City of Ann Arbor	April 23, 2015
City of Ypsilanti	April 23, 2015
City of Westland	April 29, 2015
Joint Policy and Technical Committee	April 30, 2015
Campus Martius Kick-off	May 12, 2015
Washtenaw County	May 18, 2015
Wayne County Community College District	May 19, 2015
Dearborn	May 19, 2015
Macomb Community College	May 20, 2015
Royal Oak Elks Club	May 21, 2015
Vantage Port	May 4, 2015
Reimagine Washtenaw	May 10, 2015
Technical Committee Meeting	May 10, 2015
Wayne Main Street	June 18, 2015
Corktown Farmers Market	June 23, 2015
West Dearborn DDA	June 25, 2015
Corktown Business Association	June 29, 2015
Wayne Farmers Market	July 1, 2015
Technical Committee Meeting	July 8, 2015
Ypsilanti DDA	July 16, 2015
Dearborn Farmers Market	July 17, 2015
EMU popup	October 8, 2015
Ypsilanti Open House	October 8, 2015
Corktown Flier Distribution	October 9, 2015
Wayne Open House	October 12, 2015
U of M Dearborn Popup	October 13, 2015
Henry Ford College Popup	October 13, 2015
Dearborn Open House	October 13, 2015
Technical Committee Meeting	October 14, 2015
Detroit Open House, Corktown	October 14, 2015

Location	Date
Dearborn Inn popup	October 21, 2015
Westin Book Cadillac popup	October 21, 2015
The Henry Hotel popup	October 22, 2015
Inkster City Council	November 2, 2015
East Dearborn DDA	November 12, 2015
West Dearborn DDA	November 19, 2015
Detroit Future City	November 23, 2015
City of Detroit Planning	November 30, 2015
Corktown Business Association	November 30, 2015
Vantage Port	December 3, 2015
City of Dearborn Planning Commission	December 7, 2015
Technical Committee Meeting	December 9, 2016
Dearborn Living Street Project	December 14, 2015
BRT Detroit Alignment	December 15, 2015
Michigan Avenue Business Association	December 16, 2015
Reimagine Washtenaw	December 19, 2015
Technical Committee Meeting	January 13, 2016
Arab American Political Action Committee	January 20, 2016
Michigan Association of Railroad Pass.	January 28, 2016
Wayne County Airport Authority	January 29, 2016
MDOT Rail Coordination	February 9, 2016
Technical Committee Meeting	February 10, 2016
Henry Ford College	February 15, 2016
Dearborn Business Leaders	February 26, 2016
MDOT Metro Region Coordination	February 26, 2016
WCAA Staff Meeting	March 1, 2016
City of Wayne	March 4, 2016
Technical Committee Meeting	March 9, 2016
Detroit Open House	March 29, 2016
Mount Clemens Open House	March 30, 2016
Ann Arbor Open House	March 31, 2016
Pontiac Open House	April 2, 2016
Future Urban Leaders of Detroit (WSU)	April 4, 2016
Dearborn Federation of Neighborhood Associations	April 6, 2016

Table 2-3: Michigan Avenue Technical Committee Members

Name	Community/Organization
Michael Benham	AAATA
Julia Roberts	AAATA
June Nickleberry	AFSCME
Greg Hohenberger	Canton Township
Kristen Thomas	Canton Township
Eli Cooper	City of Ann Arbor
Wendy Rampson	City of Ann Arbor
Barry Murray	City of Dearborn
Ron Amen	City of Dearborn Heights
Khalil Mogassabi	City of Detroit
Ron Brundidge	City of Detroit
Richard Marsh Jr	City of Inkster
M. Jeannie Fields	City of Inkster
Paul Lippens	City of Inkster
Tim Keyes	City of Romulus
Lori Fodale	City of Wayne
Matt Miller	City of Wayne
Bruce Thompson	City of Westland
Beth Ernat	City of Ypsilanti
Bonnie Wessler	City of Ypsilanti
Casey McNeill	DDOT
Dara O'Byrne	Detroit Future City
Chris Dorle	Detroit Future City
Cornelius Henry	DTC
Sommer Woods	M-1 Rail

Name	Community/Organization
Kari Martin	MDOT
Chris Gulock	MDOT
Jim Schultz	MDOT
Rita Screws	MDOT
Gorette Yung	MDOT
Matthew Bourke	Pittsfield Township
Prashanth Gururaja	RTA CAC
Robert C Polk	RTA CAC
Alex Bourgeau	SEMCOG
Deanna Donahoo	SEMCOG
Robert Cramer	SMART
Melissa Hightower	SMART
Lisa Solomon	University of Michigan
Steve Dolen	University of Michigan
Darrell Fecho	Van Buren Township
Nathan Voght	Washtenaw County
Brett Lenart	Washtenaw County
Ryan Buck	WATS
Tim Attalla	Wayne County
Bryce Kelley	Wayne County
Rhanda Saghir	Wayne County
John Paul Minear	Wayne County Airport Authority
Joe Lawson	Ypsilanti Township
Joe Meyers	Ypsilanti DDA

Table 2-4: Michigan Avenue Policy Committee Members

Name	Community/Organization
Matt Carpenter	AAATA
Bob Guenzel	AAATA
Susan Pollay	Ann Arbor DDA
Fred Westbrook	ATU
Phil LaJoy	Canton Township
Chris Taylor	City of Ann Arbor
Steve Powers	City of Ann Arbor
John O'Reilly	City of Dearborn
Dan Paletko	City of Dearborn Heights
Jed Howbert	City of Detroit P&DD
Hilliard Hampton	City of Inkster
LeRoy Burcroff	City of Romulus
Lisa Nocerini	City of Wayne
William Wild	City of Westland
Amanda Edmonds	City of Ypsilanti
Ralph Lange	City of Ypsilanti
Triette Reeves	DDOT
Barbara Hansen	DTC
Ken Dobson	Eastern Michigan University

Name	Community/Organization
Stanley Jensen	Henry Ford Community College
Cynthia Glass	Henry Ford Community College
Paul Childs	M-1 Rail
Luke Forrest	Michigan Municipal League
Tony Kratofil	MDOT
Matt Chynoweth	MDOT
Mandy Grewal	Pittsfield Township
Carminie Palombo	SEMCOG
John Hertel	SMART
Paul Krutko	SPARK
Kathleen Wendler	SW Detroit Business Association
Sue Gott	University of Michigan
Linda Combs	Van Buren Township
Verna McDaniel	Washtenaw County
Andy Kandrevas	Wayne County
Wayne Sieloff	Wayne County Airport Authority
Brenda Stumbo	Ypsilanti Township
Karen Lovejoy-Roe	Ypsilanti Township
George Anton Moroz	The Henry Ford

Table 2-5: Michigan Avenue Corridor Study Technical and Policy Committee Meeting

Meeting	Date
Joint Technical and Policy Committee Meeting	April 30, 2015
Technical Committee Meeting	June 10, 2015
Technical Committee Meeting	July 8, 2015
Joint Technical and Policy Committee Meeting	August 12, 2015
Technical Committee Meeting	September 9, 2015
Technical Committee Meeting	October 14, 2015
Joint Committee Meeting	November 18, 2015
Technical Committee Meeting	December 9, 2015
Technical Committee Meeting	January 13, 2016
Joint Technical and Policy Committee Meeting	February 10, 2016
Technical Committee Meeting	March 9, 2016
Joint Committee Meeting	April 13, 2016
Joint Committee Meeting	May 11, 2016

Table 2-6: RTA Social Media Outreach

Social Media Platform	Activity		
Facebook	**Likes**	**Impressions**	
	3,224	896,000	
Twitter	**Followers**	**Retweets**	**Mentions**
	667	1,100	2,700
YouTube	**Views**		
	512		

3.0 Evaluation Process and Results

3.1 Alternative Development and Evaluation Process Overview

Following the documentation of the existing conditions and Purpose and Need statement, the Michigan Avenue Corridor Study moved into the evaluation phase. This phase began with the development transit alternatives, as well as the specific physical and service elements of each alternative.

After the defining the transit alternatives, a three-step evaluation method was used to develop and identify the Locally Preferred Alternative:

- The first step ("Tier 1: Pass/Fail Analysis") assessed each mode and alignment relative to overall implementation viability.
- The second step ("Tier 2: Detailed Evaluation") assessed the mode/alignment pairings that passed the Tier 1 Analysis.
- The alternative(s) that fare(s) best against the detailed criteria in this second step were identified as Preferred Alternative(s) and further refined in the third step ("Tier 3: Refine the LPA"). The Locally Preferred Alternative was identified at the conclusion of the third step.

The evaluation criteria associated with each step represent a combination of quantitative and qualitative performance measures. The Tier 1 phase applied fewer and broader measures, including information from previous corridor/area studies. The Tier 2 phase applied more and finer performance measures to identify the Preferred Alternative(s), and the third step evaluated the Preferred Alternative(s) against federal criteria to determine the Locally Preferred Alternative. This three-step process resulted in the identification of an LPA that not only meets locally-identified project purpose and needs, but is competitive for federal funding.

Table 3-1: Evaluation Criteria Summary

Project Goals	Tier 1: Pass/Fail Analysis (Qualitative)	Tier 2: Detailed Evaluation (Qualitative and Quantitative)	Tier 3: Refine the LPA (Quantitative and Qualitative)
Increase the efficiency, attractiveness and utilization of corridor and regional transit for all users	Ridership capacity	Ridership Number of passengers per service-hour Estimated vehicle hours travelled (VHT) Ability to provide appropriate transit capacity	*FTA competitiveness (based on Cost-Effectiveness criteria)
Improve multi-modal connectivity between the activity centers at the eastern and western ends of the study area with intermediate communities	Multi-modal connectivity	Connections between activity centers Community mobility improvements	
Enhance connectivity of the corridor to the regional transportation network	Regional connectivity	Potential right-of-way impacts Bicycle and pedestrian safety Parking and traffic impacts	
Support land use and development patterns that reflect the vision for growth contained in local and regional plans and policies	Economic development Compatibility with local and regional plans	Compatibility with local and regional plans Land use and economic development opportunities	
Contribute to regional equity, sustainability and quality of life	Environmental impacts	Consistent with existing or planned community character Environmental impacts/benefits	
Develop and select an implementable and community-supported project	Capital cost Community support	Capital and operating and maintenance costs Cost effectiveness Community support	*FTA competitiveness (based on Cost-Effectiveness criteria)

**Consistent with FTA New Starts/Small Starts criteria*

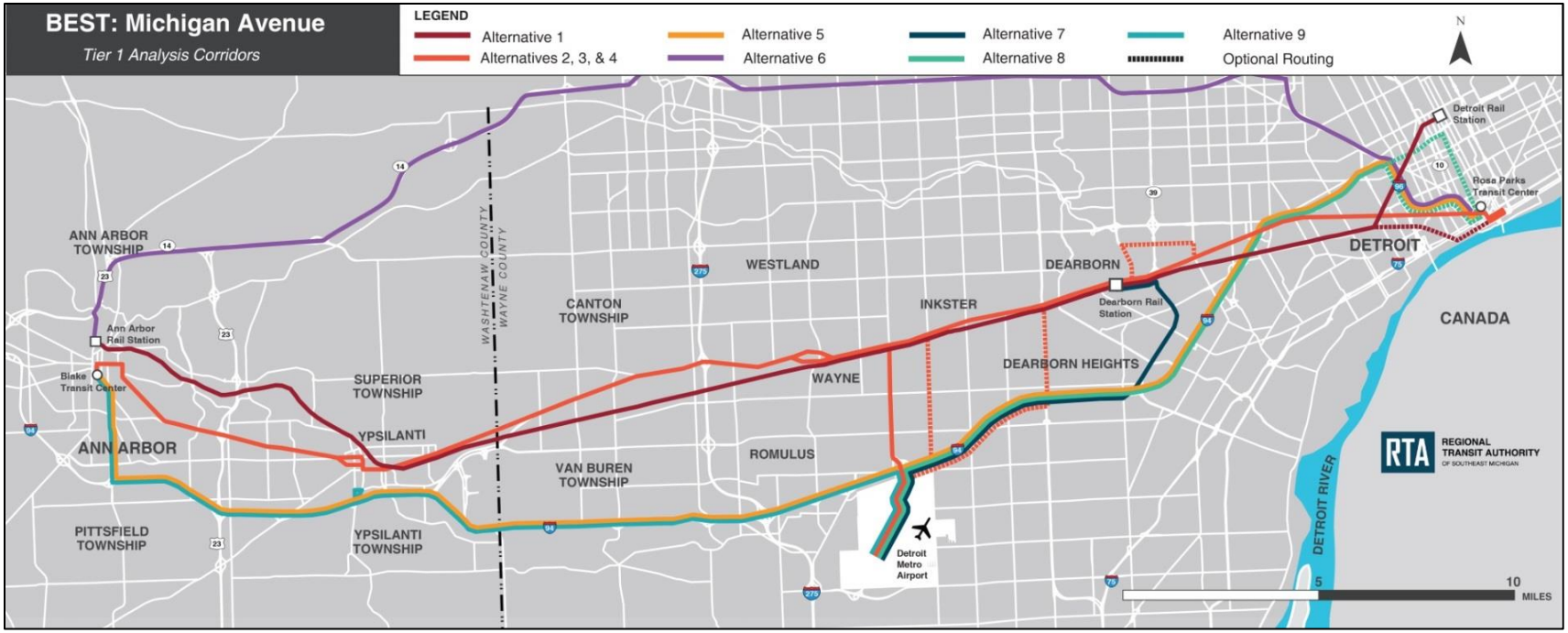
3.2 Tier 1 Definition and Evaluation of Alternatives

The Tier 1 Evaluation of Alternatives was structured to efficiently identify the alternatives that do not fully meet the project purpose or goals and objectives. The analysis follows a three step process of defining the universe of alternatives, pairing modes and alignments to create alternatives, and evaluation of the alternatives. This initial screening is intended to be high level to evaluate the large number of alternatives. The alternatives were rated "pass" or "not pass" for each of the criteria. Alternatives that received two or more "not pass" rankings are assigned an overall assessment of "defer", and will not be carried forward into the Tier 2 evaluation.

3.2.1 Tier 1 Alternatives

The Michigan Avenue Corridor transit alternatives were developed in June 2015 and reviewed by the project Technical Advisory Committee. Alignments were drawn on maps and then paired with the modes listed below to create the universe of alternatives (see **Figure** 3-1**)**: Commuter Rail (Alternative 1); Bus Rapid Transit (Alternative 2); Streetcar (Alternative 3); Light Rail (Alternative 4) and Express Bus (Alternatives 5-8).

Figure 3-1: Tier 1 Analysis Alternatives



3.2.2 Tier 1 Results

The alternatives were evaluated on ridership capacity, multimodal connectivity, connectivity to the transportation network, economic development potential, and compatibility with local and regional plans, environmental impacts, and capital costs. The four options for Alternative 3 received a "not pass" for ridership capacity and capital costs. The Alternative 4 options all received a "not pass" rating for the environmental impacts and capital costs criteria. Alternatives 5, 6, and 7 each received "not pass" ratings for the ridership capacity, multimodal connectivity, transportation network connectivity, and economic development potential. Alternatives 7 and 8 were rated "not pass" for ridership capacity, multimodal connectivity, and economic development potential. These alternatives were ultimately given "defer" assessments and not carried on to the next phase of study (see **Table 3-2**).

Table 3-2: Tier 1 Analysis Alternatives

Mode	Overall Assessment	Reason for Deferral
Commuter rail	Pass	--
BRT	Pass	--
Premium BRT	Pass	--
Streetcar	Defer	• High capital costs to serve the entire corridor • Insufficient capacity to meet demand across the corridor
LRT	Defer	• High capital costs to serve the entire corridor • Right-of-way constraints
Express bus	Defer	• Not supportive of economic development potential • Not supportive of transportation network connectivity • Does not serve the diversity of transit trips types within the corridor

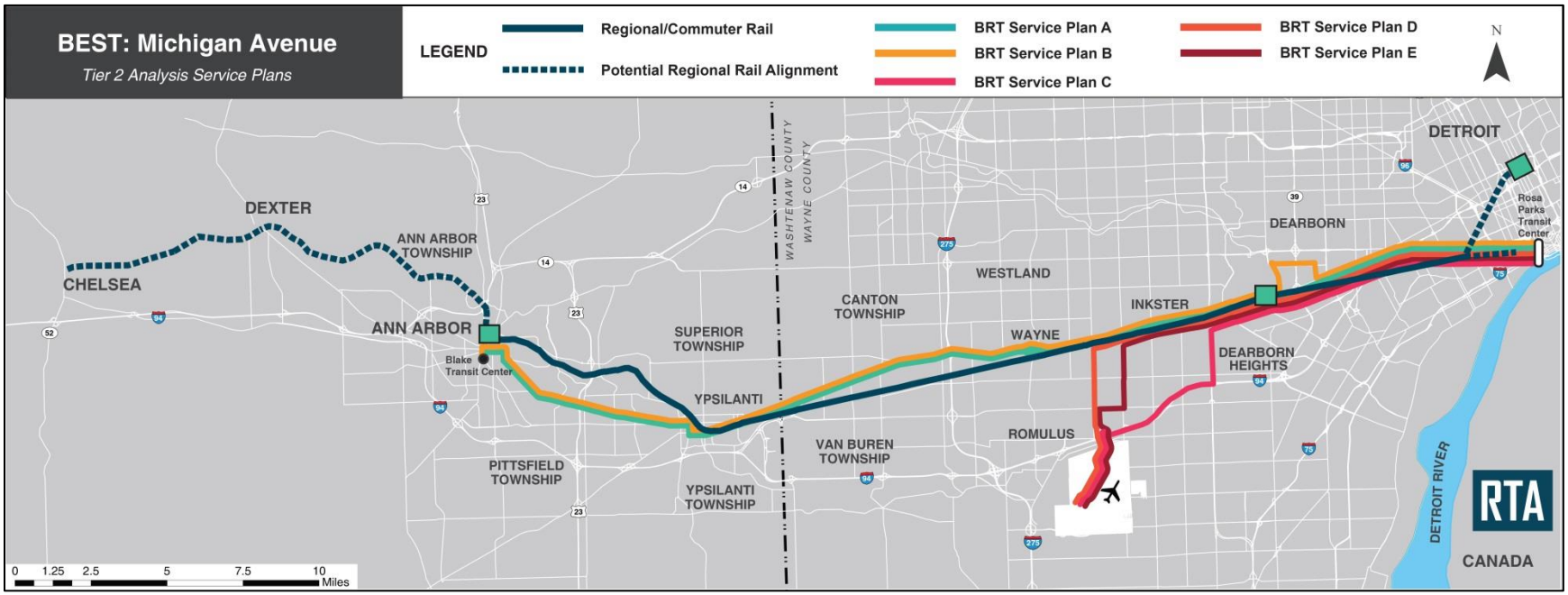
Advancing from Tier 1, the following alternatives were assessed an overall "pass" rating and will be carried on to the next phase of study where more detailed study will facilitate ridership forecasting, service plan development, and cost estimating:

1. Commuter rail on existing MDOT rail right-of-way between Ann Arbor and Detroit, with service in Detroit to either New Center or Corktown
2. Bus Rapid Transit (BRT and Premium BRT options) along Washtenaw and Michigan Avenues between Ann Arbor's Blake Transit Center, Detroit Metro Airport (along Merriman Road) and Detroit's Rosa Parks Transit Center, with routing options:
    a. Deviate from Michigan Avenue along Greenfield Road, Hubbard Drive and Evergreen Road in the vicinity of the Fairlane Town Center
    b. Deviate from Michigan Avenue along Telegraph Road and I-94 to Detroit Metro Airport
    c. Deviate from Michigan Avenue along Middlebelt Road to Detroit Metro Airport

3.3 Tier 2 Definition and Evaluation of Alternatives

The Tier 2 Detailed Evaluation of Alternatives will help to refine the alternatives that were advanced from the Tier 1 analysis by analyzing more detailed, alternative-specific aspects of the routes and modes. The Tier 2 analysis compares Service Plans for Bus Rapid Transit (BRT) and Commuter Rail for the Michigan Avenue Corridor. Five of these Service Plans are Bus Rapid Transit (BRT)-based, while the other five are rail-based. Two of the BRT Service Plans (A and B) run the entire length of the corridor, from Ann Arbor to Detroit, while the other three run between Detroit Metro Airport (DTW) and Downtown Detroit. The rail Service Plans all use the existing Amtrak railroad corridor, but have varying termini and service options. The Commuter Rail option runs from the Ann Arbor Amtrak station to Detroit's New Center Amtrak station and has 5 round trips per day. The Regional Rail alternatives operate between 8 and 15 round trips per day and end at different locations in Detroit. Regional Rail A ends at the New Center Amtrak station, while Regional Rail B ends in Corktown at Vernor Highway. The routing of the ten Service Plans is shown in **Figure** 3-2 below.

Figure 3-2: Tier 2 Analysis Service Plans



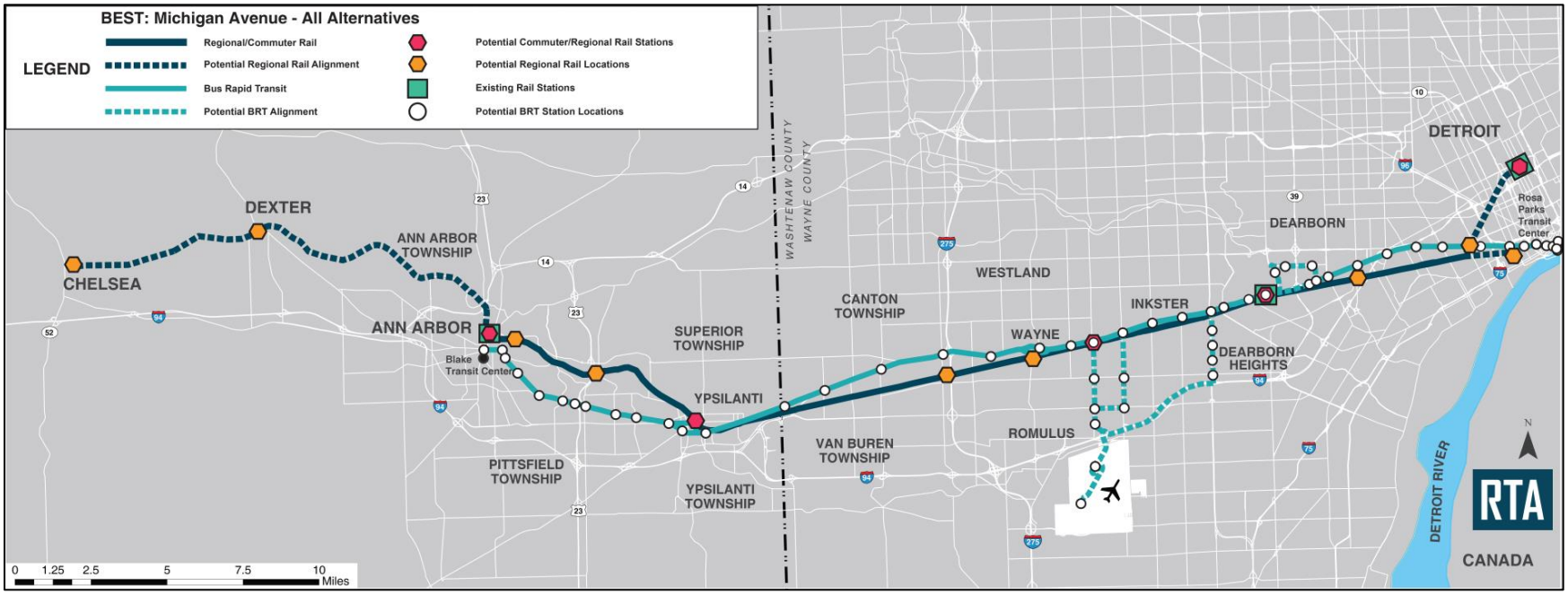
3.3.1 Detailed Definition of Alternatives

The detailed alternatives that were identified include the following:

- No Build
- Commuter Rail
- Regional Rail
- Bus Rapid Transit – Mixed Traffic
- Bus Rapid Transit – Dedicated Curb Lane
- Bus Rapid Transit – Dedicated Center Lane

Figure 3-3 shows the alignment options that were studied during the initial screening phase and recommended for detailed development. For purposes of the detailed definition and evaluation phase, it is assumed that each BRT alternative will maintain consistent runningway operations for the length of the corridor. For instance, the BRT - Dedicated Curb Lane alternative will operate in a dedicated side lane along the entire route between Ann Arbor, Detroit Metro Airport, and Detroit.

Figure 3-3: Tier 2 Transit Alternatives



No Build Alternative

The No Build Alternative would be comprised of all the transit improvements within the Michigan Avenue Corridor that exist or have dedicated funding for future improvements by 2040. The No Build Alternative is assumed to continue operations of existing service for all corridor routes. The service would be comprised of the following transit routes and services:

- Amtrak Wolverine Service
- DDOT Route 37
- SMART Route 200
- SMART Route 280
- AAATA Route 4
- AAATA Route 710
- AAATA Route 787/AirRide
- AAATA Route J (new route in 2016)

No changes to stop locations, spacing, station facilities, transit vehicles, fare collection, or branding are assumed in this alternative.

Commuter Rail

The Commuter Rail service would run on existing freight rail between Ann Arbor and Detroit, terminating at the Detroit's New Center Amtrak Station. The definition of the Commuter Rail alternative is consistent with the Ann Arbor – Detroit Regional Rail Project. The service would operate 5 round trips per day in addition to evening and night express bus service between Detroit and Ann Arbor. The Commuter Rail alternative would take advantage of the three existing rail stations in Ann Arbor, Dearborn, and Detroit, and add two more in Depot Town in Ypsilanti and in Western Wayne County. These stations would be spaced about 10 miles apart. Stations will include a variety of amenities including ticket vending machines, seating, and bike parking facilities, parking, route information, platform lighting, and taxi stands, among others.

The Commuter Rail would run along the existing rail and require modest track and signal improvements. The service would utilize 23 refurbished rail cars owned by the Great Lakes Central Railroad powered by a diesel-electric push-pull locomotive and be branded to identify it with the RTA. Fare collection would be entirely off-board through ticket vending machines located at the stations.

Regional Rail

The Regional Rail alternative expands upon the Commuter Rail alternative through increased service frequency, additional stations, and two potential terminal locations in Detroit. The service would have either 8 or 15 round trips per day and additional bus service would be added to facilitate last mile connections and additional late night full corridor trips. The Regional Rail alternative would also use the three existing rail stations in the corridor, but would add an additional 9 – 10 depending on the terminal station in Detroit (either at New Center or in Corktown at Vernor Highway). These stations would be spaced roughly 4 miles apart. Stations will include a variety of amenities including ticket vending machines, seating, and bike parking facilities, parking, route information, platform lighting, and taxi stands, among others.

The Regional Rail alternatives will run along the same track, utilize the same vehicles, and require similar track and signal improvements as the Commuter Rail alternative.

Bus Rapid Transit – Mixed Traffic

The BRT - Mixed Traffic alternative includes substantial changes to the service plan, vehicles and technology used within the corridor. However, like current corridor transit service and the No Build alternative, this alternative will operate in mixed traffic throughout the corridor. The service will operate at 10 minute frequency during the weekday peak, 15 minutes during the midday, 20 minutes on the weekends, and 60 minutes late night. The following five service plans were developed as potential alternatives:

- Service Plan A: Ann Arbor to Detroit via Washtenaw and Michigan Avenues
- Service Plan B: Ann Arbor to Detroit via Washtenaw and Michigan Avenues, plus Hubbard Road loop to serve Fairlane area
- Service Plan C: Downtown Detroit to Metro Airport via Michigan Avenue, Telegraph Road, and I-94
- Service Plan D: Downtown Detroit to Metro Airport via Michigan Avenue and Merriman Road
- Service Plan E: Downtown Detroit to Metro Airport via Michigan Avenue, Middlebelt Road, and Ecorse Road

Each of these service plans would have additional bus routes added to provide end-to-end, last mile, and express airport transit service.

The Grand Rapids Silver Line BRT operates in Mixed Traffic

Stations will be spaced roughly one mile apart to provide a travel time more consistent with an automobile and will be placed in areas with activity centers and other trip generators. Station spacing through the downtown areas of Detroit, Dearborn, and Ann Arbor may be closer together due to higher demand. Stations will have upgraded facilities compared to traditional bus stop amenities. These

may include recognizable shelters, large stop platforms, ticket vending machines, seating, safety upgrades, route and schedule information, real-time bus location information, level boarding, and bike parking facilities among others.

The BRT - Mixed Traffic alternative would use existing roadways and would generally operate as buses do today, loading and unloading passengers on the right-hand side of the transit vehicle and roadway. The BRT - Mixed Traffic alternative may use a combination of 60-foot hybrid articulated buses with right-door loading and 40-foot standard buses; vehicle deployment decisions will be based on operating data and service planning. The existing articulated buses would continue operations according to current service planning and fleet deployment practices, and could be used to supplement the articulated buses purchased to operate the BRT service.

Bus Rapid Transit – Dedicated Curb Lane

The BRT - Dedicated Curb Lane alternatives utilize the same potential service plans as the Mixed Traffic option and would include the same service characteristics, vehicular, station, and technology improvements of the BRT - Mixed Traffic alternative. However, this alternative would operate in a curbside lane that is exclusively dedicated to transit service. The runningway for the BRT - Dedicated Curb Lane alternative will be an exclusive dedicated lane along the curb of the roadway where right-of-way is available and cost constraints allow. The lane will not be grade-separated, but will be visually distinctive (through the use of lane markings and posted signage) from general traffic lanes. When operating as an exclusive lane, general vehicular traffic will be able to access the lane for right turns at intersections and access to driveways and parking lots along the length of the alignments.

The Geary Boulevard BRT in San Francisco Operates in a Dedicated Curb Lane

Bus Rapid Transit – Dedicated Center Lane

Similarly to the BRT - Dedicated Curb Lane alternative, the BRT - Dedicated Center Lane alternative will operate in a lane that is exclusively dedicated to transit service and shares the same Service Plans as the other options. The Dedicated Center Lane alternative will also have the same service, vehicular, station, and technology improvements of the other BRT alternatives. The runningway for the BRT - Dedicated Center Lane alternative will be an exclusive dedicated lane that operates along the center of the roadway for the length of the alignment. The lane will be visually distinctive (through the use of lane markings and posted signage) from general traffic lanes. When operating as an exclusive lane, left turns will be limited to signalized intersections to mitigate any potential conflicts between the transit vehicles and left-turning general traffic.

Cleveland's Euclid Avenue BRT Operates in a Dedicated Center Lane

3.3.2 Tier 2 Results

Tables 3-3 and **3-4** summarize the Tier 2 evaluation results. Key results and findings were documented in a series of Technical Memoranda, and include:

- **Station Areas:** Sixty-two potential station locations were identified and evaluated as part of the Station Area Evaluation memo. The stations that performed the highest were those located in areas with existing transit, high population density, and high employment density. These stations are mostly located in the downtown areas of Ann Arbor, Ypsilanti, Dearborn, and Detroit. The corridor was also divided into segments for this analysis, and stations in Segment A (Ann Arbor-Ypsilanti) has the

highest average population density in the corridor, while Segment E (Dearborn-Detroit) has the highest average employment density.

- **Transportation:** The travel time for the eight different service plans varies widely depending on the mode and the runningway for the BRT options. The rail alternatives are expected to take 45 minutes for commuter rail (Detroit to Ann Arbor) and between 66 and 72 minutes for regional rail (Detroit to Chelsea). The various BRT runningway options result in different travel times for the service. The dedicated lane BRT alternatives provide about a 25% decrease in travel time over standard bus, while the mixed-traffic BRT travels about 10% faster than the standard bus. The center-running BRT would have fewer impacts to bicyclists and pedestrians than the curb running options (mixed traffic and dedicated curb) and on-street parking in most cases would have to be removed to accommodate dedicated bus lanes.
- **Environmental:** The environmental analysis found there would be little impact to the natural, cultural, and historic resources located along the corridor. Impacts to environmental justice populations would likely be positive, as the projects considered would improve transit service and access for a number of low-income, minority and zero-car households.
- **Capital Costs:** The estimated capital cost of the rail alternatives (in 2015 $) range from $175 million to $563 million, while the BRT capital costs range between $123 and $307 million. Since Service Plans A and B travel the entire length of the corridor they require the highest capital investment ($230 to $307 million). Service Plans C, D, and E travel between Downtown Detroit and DTW and are about half the length of the corridor and have a lower capital cost estimate ($123 to $179 million).
- **Operations and Maintenance Costs:** These costs correlate directly to the Service Plans. The total annual costs for rail range between $6.8 and $37.8 million per year, depending on the service level and the total BRT O&M costs range between $15.9 and $30.4 million per year. The O&M costs for the dedicated lane BRT options cost about $1 million less per year because of the travel time savings.
- **Ridership:** Potential ridership on the system was evaluated to understand the differences between the Service Plans. Metrics from the existing transit service along the corridor from AAATA, DDOT, and SMART were used to determine the daily ridership along the corridor. Ridership for the Michigan Avenue rail alternatives was estimated to be between 1,360 and 1,550 daily trips. The bus rapid transit alternatives serving the Detroit to DTW corridor ranged between 5,600 and 6,800 daily boardings, while the full service corridor connecting Detroit to Ann Arbor showed daily boardings of 12,600. The Washtenaw Avenue recommended alternative is an augmented version of Alternative A and will have updated ridership figures in the Locally Preferred Alternative Report.

Based on the Tier 2 evaluation, the alternatives recommended to advance to Tier 3 analysis are presented in **Figure 3-4**. This reflects the recommendation to advance a Regional Rail project primarily relying on existing or proposed stations to connect the length of the corridor, as well as BRT alternatives serving the more dense local travel markets at either end.

Figure 3-4: Recommended Alternatives based on Tier 2 Analysis

As shown, the following alternatives were recommended to advance to the Tier 3 analysis:

- **Commuter/Regional Rail:** A recommendation of the analysis is to continue to advance implementation of the rail alternative in the corridor as the most expedient method for serving current and future long-distance trips between Wayne and Washtenaw Counties. The analysis found that BRT-based services would do a poor job of connecting these travel markets with an acceptable travel time competitive with automobiles. The rail project would also conform best with transportation and economic development planning that has been conducted at the local level by communities actively participating in the study. The recommended alternative would be a hybrid of the Service Plans analyzed for Commuter and Regional Rail, serving five stations between Ann Arbor and Detroit with 8 round trips per day. This level of service would allow for a reasonable schedule for serving commuting and other trips in the corridor without triggering costly rail capacity upgrades that would likely be needed if the service expanded beyond that schedule. The stations would make use of existing and future Amtrak stations in Detroit, Dearborn and Ann Arbor as well as new stations in Ypsilanti (Depot Town) and Western Wayne County.
- **Bus Rapid Transit:** To improve regional connectivity and supplement the rail service, bus rapid transit upgrades are also recommended at the east and west ends of the corridor. The middle portion of the corridor (Segments B and C) was found to have low levels of density, transit demand and development potential, and thus not consistent with an investment in BRT infrastructure or service at this time. The recommended characteristics of the BRT at each end are:

- DTW to Detroit via Merriman and Michigan Avenue (Service Plan D): A strong recommendation of the analysis is high-quality, frequent BRT service connecting DTW to Detroit that offers a viable alternative to drive-and-park access.
    - From DTW to the Dingell Transit Center (Dearborn), the service is recommended to operate in mixed-traffic due to right-of-way and traffic restrictions through West Dearborn. Service along Michigan Avenue through Inkster and Wayne connecting to Merriman Road is suggested due to the greater ridership potential and equitable access of this service alignment.
    - From the Dingell Transit Center to Detroit, the service is recommended to operate in center-running dedicated lanes, as this option is found to work within the existing right-of-way, offer the best performance for the transit service, conform with non-motorized planning, and support economic development and placemaking opportunities. The routing through downtown Detroit has yet to be determined and will need to be coordinated with the RTA's ongoing analysis of projects for the Woodward and Gratiot corridors.
- Ann Arbor to Ypsilanti on Washtenaw Ave: Between downtown Ann Arbor and downtown Ypsilanti, an upgraded mixed-traffic operating BRT service is recommended due to the potential significant traffic impacts from converting a travel lane to dedicated transit lane in this corridor. Consistent with local planning, the quality and usability of end-to-end transit in this corridor can still be improved through the use of larger BRT transit vehicles, greater station spacing, station enhancements that include level-boarding and off-board fare collection, and transit signal priority to increase capacity and decrease travel times.

Table 3-3: Tier 2 Evaluation Results by Service Plan

Criteria	BRT (Service Plans)															Rail		
	A: Detroit – Ann Arbor			B: Detroit – Ann Arbor w/ Dearborn Loop			C: Detroit – DTW via Telegraph			D: Detroit – DTW via Merriman			E: Detroit DTW via Middlebelt			Commuter	Regional	
		Dedicated			Dedicated			Dedicated			Dedicated			Dedicated				
Transportation	Mixed	Curb	Center	Mixed	Curb	Center	Mixed	Curb	Center	Mixed	Curb	Center	Mixed	Curb	Center		A	B
Length of Alternative *(miles)*	40.2			41.8			20.8			21.5			21.1			38	54.6	51.6
Number of Stations	47			50			27			30			29			5	13	13
Average Speed *(mph)*	18.7	22.2		18.6	22		20.8	23.8		19.4	22.4		19.4	22.7		50.7	45.2	46.2
Travel Time *(minutes)*	129	109.5		135.5	114		68	60		75.5	65.5		75.5	64.5		45.0	72.5	67.0
Environmental																		
Sensitive Lands *(acres)*	50,199			50,199			13,324			15,010			14,167			50,199	50,199	50,199
Cultural & Historic Resources *(count)*	1,112			1,112			582			651			617			1,112	1,112	1,112
Ops & Maintenance																		
Annual Cost *(millions)*	$47.50	$46.80		$48.40	$47.40		$38.80	$38.50		$39.40	$39.20		$39.10	$38.20		$23.60	$37.0 - $48.9	$36.40 - $44.0
Capital Costs																		
Total Cost *(millions)*	$230.10	$252.40	$293.20	$241.20	$265.00	$308.00	$128.10	$141.80	$162.00	$140.90	$153.30	$177.50	$138.10	$149.30	$172.70	$175.00	$368.50 - $562.90	$332.40 - $498.60
Cost per Mile *(millions)*	$5.70	$6.30	$7.30	$5.80	$6.30	$7.40	$5.90	$6.60	$7.50	$6.30	$6.90	$8.00	$6.30	$6.80	$7.90	$4.60	$6.80 - $10.30	$6.40 - $9.70
Station Area Evaluation																		
Population *(sum tot. pop. w/in .5 mi of stations)**	169,717			174,654			90,397			88,182			84,746			2,884	33,765	
Employment *(sum tot. pop. w/in .5 mi of stations)**	459,921			482,228			371,756			373,239			372,216			5,056	55,988	

**Some double counting occurs due to station area overlap*

Table 3-4: Tier 2 Evaluation Results by Corridor Segment

	BRT (Segments)																											
	A: Ann Arbor - Ypsilanti			B: Ypsilanti – I-275			C: I-275 – Merriman Rd			D: Merriman Rd – Dingell TC			E: Dingell TC – Downtown Detroit			E4: Dingell TC – Downtown Detroit + Hubbard Loop			F1: Merriman Rd			F2: Middlebelt Rd			F3: I-94 + Telegraph Rd		
		Dedicated			Dedicated			Dedicated			Dedicated			Dedicated			Dedicated			Dedicated			Dedicated			Dedicated	
Transportation	Mixed	Curb	Center	Mixed	Curb	Center	Mixed	Curb	Center	Mixed	Curb	Center	Mixed	Curb	Center	Mixed	Curb	Center	Mixed	Curb	Center	Mixed	Curb	Center	Mixed	Curb	Center
Travel Time *(minutes)*	35.5	28.5		23	19.5		12	11		21	18		39		33	44.5	38.5		16	14.5		18.5	17		20.5	19.5	
Level of Service *Rating*	C	F	F	B	E	E	B	B	B	B	B	B	C	E	E	A	D	D	B	E	E	A	D	D	C	E	E
Parking *(% spots removed)**	15%	100%	100%	0%			5%	86%	15%	0%			4%	100%	9.5% - 100%*	4%	100%	9.5% - 100%*	0%								
Impact to Bike *Facilities (avg)***	pos		sig pos	no chg		pos	sig pos	pos	sig pos	sig pos	pos	sig pos	pos			pos			sig pos	pos	sig pos	sig pos	pos	sig pos	sig pos	pos	sig pos
Impact to Ped *Facilities (avg)***	no chg	sig pos		sig pos			no chg	sig pos		no chg	pos		no chg		pos	no chg		pos	pos								
Environmental																												
Sensitive Lands *(acres)*	15,629			12,546			7,014			2,529			1,580						10,901								
Cultural & Historic Resources *(count)*	324			77			60			103			505						43								
Station Area Evaluation																												
Population *(avg of tot. pop. w/in .5 mi of stations)****	5,723			1,572			2,269			2,986			3,005						575			416			2,763		
Employment *(avg of tot. pop. w/in .5 mi of stations)****	8,419			934			1,656			2,240			16,502						816			859			990		
Minority Population*	34.7%			39.4%			34.9%			40.6%			60.7%						30.3%								
Living in Poverty**	24.0%			16.3%			18.8%			22.2%			39.2%						18.9%								
Limited English Proficiency**	5.5%			3.3%			2.5%			3.9%			12.1%						2.5%								
Development Potential																												
Average of Segment Station Scores *(8 possible points)*	5.3			3.5			2.7			3.1			6						2.3								

** In these areas, depending on final design, there is potential for localities to choose between bike facilities or on-street parking spaces*
*** no change (no chg), some positive impact (pos), significant positive impact (sig pos)*
**** Some double counting occurs due to station area overlap*
***** % of total population within one mile of segment*

3.4 Tier 3 LPA Refinement

Following the detailed quantitative and qualitative analysis of Tier 2, the final step was to refine the alternatives based upon public and stakeholder feedback as well as competitiveness for federal funding through FTA New Starts / Small Starts.

3.4.1 Recommended Alternative Refinements

For each of the recommended alternatives, a set of refinements took place to determine the detailed plan for these options:

- Regional Rail
    - Further evaluation and outreach regarding mid-corridor station options indicated a station at Wayne Road near downtown Wayne would offer the greatest potential for ridership and economic development. This option is recommended in the Locally Preferred Alternative.
    - Capital cost estimates were refined based on a more detailed analysis of assumed station, track, layover and maintenance facility options along the corridor between Ann Arbor and Detroit. This resulted in a revised cost estimate for consideration as the LPA.
- Michigan BRT
    - Low-performing stations from the Tier 2 ridership analysis were removed from the corridor between Metro Airport and Detroit, with resulting reductions in assumed travel times and capital costs.
    - Potential locations of park-and-ride lots were considered with a total of three lots assumed for this recommended project. Further analysis of park-and-ride locations would be conducted during future phases of the project.
    - Updated ridership modeling was completed on the preferred option to determine FTA competitiveness.
- Washtenaw BRT
    - Low-performing stations from the Tier 2 ridership analysis were removed from the corridor between Ypsilanti and Ann Arbor, with resulting reductions in assumed travel times and capital costs.
    - Potential locations of park-and-ride lots were considered with a total of three lots assumed for this recommended project. Further analysis of park-and-ride locations would be conducted during future phases of the project.
    - Updated ridership modeling was completed on the preferred option to determine FTA competitiveness.

3.4.2 FTA Small Starts Competitiveness

Because each of the recommended projects for the RTA falls below the threshold of $300 million in capital investment, the appropriate corresponding FTA program for consideration would be Small Starts. This program has been successfully used to fund Bus Rapid Transit projects in the State of Michigan, with projects built in Grand Rapids and in design for Lansing.

A key criterion for determining FTA competitiveness is the Cost Effectiveness of the project, which for Small Starts is factored as the annualized cost per rider for the federal share of capital funding. Because 50% is currently a typical federal share for similar projects advancing through this program, **Table 3-5** below uses that as a benchmark for rating competitiveness. A more complete financial plan for these projects would need to be developed at a later date based on regional transit funding levels and priorities.

Table 3-5: Small Starts Competitiveness

Critical Indicators	Regional Rail	Michigan BRT	Washtenaw BRT
Total Capital Cost (2015$)	$128 Million	$132 Million	$56 Million
Assumed FTA Capital Cost (50%)	$64 Million	$66 Million	$28 Million
Annual O&M Cost	$10.7 – 19.0 Million	$17.1 Million	$7.0 Million
Average Weekday Ridership	1,150 – 1,750	6,895	3,694
Cost Effectiveness (annualized cost per rider)	$6.81 - $4.48	$1.54	$1.21
Potential FTA Small Starts Funding	**Low to Medium-Low**	**Medium-High**	**Medium-High**

Eventually, to qualify for FTA funding each project would be evaluated based on a host of other FTA “project justification” criteria as shown in **Figure 3-5** below. The projects would be rated as part of entry into the Project Development process for Small Starts.

Figure 3-5: Small Starts Project Justification Criteria and Subfactors

Mobility Improvements 16.66%	Total linked trips on the proposed project, with a weight of two given to trips made by transit dependent persons.
Environmental Benefits 16.66%	Dollar value of the anticipated direct and indirect benefits to human health, safety, energy, and the air quality environment scaled by the annualized federal share of the project (computed based on the change in vehicle miles traveled resulting from implementation of the proposed project).
Congestion Relief 16.66%	New transit trips resulting from implementation of the project.
Cost-Effectiveness 16.66%	Annualized capital federal share of the project per trip on the project.
Economic Development 16.66%	• Transit supportive plans and policies • Demonstrated performance of plans and policies • Policies and tools in place to preserve or increase the amount of affordable housing
Land Use 16.66%	• Existing corridor and station area development and character • Existing station area pedestrian facilities, including access for persons with disabilities • Existing corridor and station area parking supply • Proportion of existing “legally binding affordability restricted” housing in the counties through which the project travels

Source: https://www.transit.dot.gov/funding/grant-programs/capital-investments/final-capital-investment-grant-program-interim-policy

4.0 Locally Preferred Alternative

The Michigan Avenue Corridor is more than 40 miles long and encompasses a wide range of population density, development styles, community types, and travel patterns. This poses some unique challenges to providing transit in the corridor. The major transit markets are located at the ends of the corridor, while far fewer people live, work and use transit in the middle of the corridor. Since the travel time for a full corridor BRT is over 2 hours, it would not be an attractive option for those trying to travel from Ann Arbor to Detroit. The travel time on commuter rail, however, would be 45-55 minutes.

Each of the project elements included in the LPA plays an important role in expanding access to regional destinations and supporting future development within the communities along the corridor. The initial fact finding for the Purpose and Need for this study spotlighted the importance of not only improving transit services in the strong transit markets at either end of the study area, but also providing rapid connectivity between them. Regional Rail will provide an end-to-end service in the Corridor that is competitive with auto travel times and supportive of economic development planning. Notably, this includes service connecting the two most dynamic and regionally important downtowns in Southeast Michigan, with intermediate stations that provide access to other regional job centers including Detroit Metro Airport.

On the eastern end of the Corridor, the proposed Michigan Avenue BRT service would provide a much-needed rapid one-seat ride from Detroit and Dearborn to Metro Airport, and also support economic development planning, local job access and service to environmental justice populations. The route would provide service to multiple Detroit neighborhoods and East Dearborn before connecting to the Dingell Transit Center. From there the service would continue through West Dearborn, Dearborn Heights, Inkster, Wayne and Romulus. These communities are currently served by limited local bus service that does not meet regional mobility needs or development goals.

On the western end of the Corridor, the proposed Washtenaw Avenue BRT would upgrade transit service along the busiest corridor in the AAATA system. The 9-mile route would connect the Blake Transit Center in Downtown Ann Arbor to the Ypsilanti Transit Center in Downtown Ypsilanti, operating primarily along Washtenaw Avenue. Transit signal priority, faster boarding, and station spacing would offer speed improvements over the current local bus routes, and improvements to transit amenities would support local plans for corridor revitalization.

When combined, the project elements will provide a seamless set of connections that improves local and regional tripmaking for commuters, residents and visitors in the Michigan Avenue Corridor.

For these reasons, the recommended transit alternatives for the Michigan Avenue Corridor are the following:

- Regional Rail: Ann Arbor Amtrak to Detroit New Center Amtrak via the existing railroad line
- Michigan Avenue BRT: Metro Airport to Downtown Detroit via Michigan Avenue and Merriman Road
- Washtenaw Avenue BRT: Downtown Ann Arbor to Downtown Ypsilanti via Washtenaw Avenue

Figure 4-1: Michigan Avenue Corridor Locally Preferred Alternative

The Michigan Avenue LPA, which includes the Regional Rail and two BRT lines, is expected to have capital costs of about $316 million. Total operations and maintenance costs for the LPA are estimated to run between $35 and $43 million per year. All three of the projects included in the LPA are anticipated to have low environmental impacts, as they operate within existing transportation corridors. Up to 10 park and ride locations are planned for the corridor, three along the Michigan Avenue BRT and two each for the Regional Rail and the Washtenaw BRT. Finally, it is expected that more than 11,000 riders will use the services in the corridor each day. Detailed information about each specific project in the LPA can be found in the next three sections.

Table 4-1: Michigan Avenue Corridor LPA Details

Routes	**Regional Rail**: Ann Arbor Amtrak to Detroit New Center via existing railroad corridor
	Michigan Avenue BRT: DTW to Downtown Detroit via Merriman Road and Michigan Avenue
	Washtenaw Avenue BRT: Downtown Ann Arbor to Downtown Ypsilanti via Washtenaw Avenue
Number of Stations	41 Stations
Total Corridor Capital Costs (2015$)	$316 million
Total Corridor O&M Costs (Annual 2015$)	$34.8 – $43.1 million
Likely Environmental Impacts	Minimal, projects operated in existing transportation corridors
Park and Ride Locations	Up to 10
On-Street Parking Spaces Impacted*	185 – 1,609
Estimated Weekday Ridership (all projects)	11,800 – 12,400 Boardings per Day

***Further design as well as decisions on the importance of parking vs. bike lanes will determine ultimate impact along Michigan Ave.*

4.1 Ann Arbor to Detroit Regional Rail

The proposed Regional Rail service would run on the existing tracks currently used by Amtrak intercity passenger trains. Regional Rail would operate between Ann Arbor and Detroit, with an eastern terminus at Detroit's New Center Amtrak Station. The proposed service is a hybrid of alternatives considered in the Tier 2 evaluation; it provides the same number of stations as the Tier 2 Commuter Rail alternative (5 stations), while offering additional service to these stations (8 daily round trips).

The proposed Regional Rail stations include three existing Amtrak stations, one proposed Amtrak station, and one station exclusive to Regional Rail. Stop spacing would vary from five to ten miles along the length of the corridor. The proposed stations are:

- Ann Arbor—Existing Amtrak station on Depot Street in the near term, and the proposed Ann Arbor Intermodal Passenger Rail Station once provided (location to be determined)
- Ypsilanti—Proposed Amtrak station in the Depot Town neighborhood
- Wayne—A proposed new station near Wayne Road, on the south side of Downtown Wayne. Shuttle service to Metro Airport would be offered at this station
- Dearborn—the John D. Dingell Transit Center and Dearborn Amtrak Station, which opened for service in December 2014
- Detroit—Existing Amtrak station in the city's New Center business district. MDOT is seeking partnerships to create a new multi-modal passenger rail station at the site, which Regional Rail would serve once provided

RTA may consider additional amenities, stations, trips and service extensions after the line is operational and should additional funding be available. One station currently under consideration would provide a direct transfer between Regional Rail, Bus Rapid Transit, and local bus services where the line crosses Michigan Avenue near Clark Avenue. **Figure** 4**-**2 shows the Regional Rail alignment and proposed station locations.

Figure 4-2: Michigan Avenue Regional Rail LPA

Regional Rail capital costs are expected to be $128 million, while the incremental annual operating and maintenance costs are estimated to be between $12.1 and $20.4 million. It is estimated that between Ann Arbor and Detroit, during the peak hour, the Regional Rail will take approximately 45 minutes. For comparison, during the peak period, auto travel time between the Ann Arbor and Detroit can take anywhere between 45 and 60 minutes. Park and ride lots are planned along the route. Between 1,150 and 1,750 riders per day are expected to use the Regional Rail service.

Table 4-2: Regional Rail: Ann Arbor to Detroit

Total Length	40 Miles	
Number of Stations	5 Stations	
Operations Characteristics	**8 round trips per weekday** 3 AM peak, 3 PM peak, 2 off-peak	
Travel Time (End to End)*	**Peak Hour Rail Travel Time** 45 minutes	**Peak Hour Auto Travel Time** 45 - 60 minutes
Capital Costs (2015$)	$128 million	
O&M Costs (Annual 2015$)	$10.7 – $19.0 million	
Likely Environmental Impacts	Minimal, service operates on existing rail line serving primarily existing stations	
Park and Ride Locations	5 (Park and ride options to be explored at each station)	
Estimated Weekday Ridership (market analysis)	1,150 – 1,750	

A conceptual rendering of Regional Rail service at the John Dingell Transit Center in Dearborn

4.1.1 Operating Characteristics

The Regional Rail service plan would include eight daily roundtrips: three round trips during both the AM and PM peak periods, one midday train, and one late train after evening events. The service would be designed to support work, school and event trips to both ends of the rail corridor. RTA will coordinate with MDOT and Amtrak with the intent to provide access to all Amtrak trains in the corridor for Regional Rail customers. Amtrak currently operates 3 daily round trips between Pontiac, Detroit and Chicago serving the Amtrak stations in the corridor. In the coming years, MDOT and Amtrak intend to double the intercity trips in the corridor to offer 6 round trips. Once these additional intercity trips are added and Regional Rail is implemented, 14 daily round trips will stop at Amtrak stations in the corridor. MDOT is currently leading an environmental analysis to increase intercity service to 10 round trips (between Detroit and Chicago) by 2035. RTA will seek access to all corridor intercity trains for its customers. **Table 4-3** summarizes all proposed rail round trips in the corridor by year 2025.

Table 4-3: Proposed Regional and Intercity Round Trips between Ann Arbor and Detroit

Proposed Regional Rail Round Trips	Existing Intercity (Amtrak) Round Trips	Proposed Total Intercity (Amtrak) Round Trips by 2025	Anticipated Combined Corridor Round Trips by 2025
8	3	6	14

4.1.2 Travel Time Estimates

The Regional Rail travel time is expected to take 45 minutes from Ann Arbor to Detroit. **Table** 4-4 shows the travel time estimates between stations and for the entire route. As a comparison, the travel time in a car between New Center and Ann Arbor is about 45 minutes, without traffic. During the peak hour, auto travel time along this route can vary between 50 minutes and 65 minutes. The regional rail will offer more consistent travel time and reliability because it is separated from traffic.

Table 4-4: Regional Rail Travel Time between Stations

Regional Rail Run Times		Travel Time (mins)	
Start Station	**End Station**	**EB min**	**WB min**
Detroit/New Center	Dingell TC	14.7	16.3
Dingell TC	Inkster	8.8	8.4
Wayne	Ypsilanti	12.0	11.7
Ypsilanti	Ann Arbor	9.6	8.6
Detroit/New Center	**Ann Arbor**	45.0	45.0

Capital Cost Estimate

The Michigan Avenue Regional Rail LPA is expected to cost roughly $128 Million. The major cost elements include Guideway (track improvements where line is owned by freight railroads) and Support Facilities (maintenance and layover yards). The track improvements are located between Dearborn and the Detroit New Center vicinity, and resolve conflict between freight, inter-city passenger rail and regional rail operations. A combined maintenance and layover facility will be located within the City of Detroit at a to-be-determined site. An additional layover facility will be located in Ann Arbor. The only station not categorized as an existing condition is the western Wayne County station, identified here as Wayne Station. Locomotives are categorized as capital investments while passenger coaches are assumed to be leased and counted as an operating and maintenance expense. A financing plan developed during the next phases of the project will identify cost-sharing for all elements. **Table** 4-5 shows the breakdown of capital costs by SCC code.

Table 4-5: Regional Rail Capital Cost Summary (2015$)

SCC	Costs
10 Guideway	32,285,000
20 Stations/Stops	6,982,560
30 Support Facilities	28,321,800
40 Sitework and Special Conditions	11,357,390
50 Systems	5,525,000
60 Right-of-Way	379,400
70 Vehicles	7,276,500
80 Professional Services	21,728,596
90 Unallocated Contingency	14,485,731
100 Finance Charges	0
Total Project Cost Estimate:	**128,341,977**
Total Miles:	**39.72**
Cost per Mile:	**3.2 Million**

4.1.3 Operating Costs Estimate

The Regional Rail Operations and Maintenance (O&M) costs are estimated at between $14.4 and $22.7 million per year. This estimate is based on a "high" cost and a "low" cost system with similar characteristics to this corridor. The O&M cost includes the new regional rail service, as well as the existing bus service that runs in the corridor. The AAATA, SMART, and DDOT routes currently cost about $1.2 million per year. By combining the services, the total incremental O&M cost (increase in costs from existing service) would be between $13.2 and $21.5 million per year. **Table** 4-6 displays a breakdown of the Regional Rail O&M costs.

Table 4-6: Regional Rail LPA Operations and Maintenance Costs (2015$)

Service	Annual O&M Costs: No Build Alternative ($Millions)	Annual O&M Costs: Regional Rail LPA ($Millions)
Rail (High)	$0.0	$19.0
Rail (Low)	$0.0	$10.7
BRT	$0.0	$0.0
DDOT	$0.0	$0.0
SMART	$0.0	$0.7
AAATA	$1.2	$3.0
Total (High)	$1.2	$22.7
Total (Low)	$1.2	$14.4
Incr. Difference (High)		**$21.5**
Incr. Difference (Low)		**$13.2**

In addition to the cost of providing the regional rail service, additional supplemental service will be provided in the corridor. The existing AirRide service will be increased and is expected to cost about $1M. Additional shuttle service is planned to be added in Ypsilanti and Ann Arbor to help with connections to the rail stations. This is estimated to cost about $0.8M. Finally, late-night supplemental bus service will be implemented to provide those who need service after the final train has run. This service is expected to cost about $0.7M.

4.1.4 Ridership

The market potential of the Regional Rail alternative was studied using two methods. First, a GIS-based approach used the proximity of zones to each proposed station to develop separate geographic markets. This approach was supplemented by a model network driven approach to determine travel sheds for rail stations by introducing a restriction of up to ten minutes of drive access to the stations.

The highest transit share of 10 percent was assumed for a one-seat transit ride in a walk access and walk egress transit market. Transit shares were reduced as the access and egress distances increased. A lower transit share was assumed for longer egress distances, since an automobile is not available to provide convenient egress from the rail station to the final destination.

The total number of trips in the one-mile buffer walk access market is relatively low at **7,800**. This is likely to result in modest ridership estimates for the walk access rail market. The size of the rail market grows considerably when flows in the three-mile buffer are included in the market.

Based on these results the ridership potential for rail is estimated in the range of **1,360** to **1,550** trips.

It should be repeated that the asserted market shares are subjective. These estimates rely on professional judgement and on measures of transit market shares derived from the Census Transportation Planning Package data, the SEMCOG model for the corridor, and the onboard survey. If we consider an average margin of error of 15 percent, the ridership potential for commuter rail would be within the range of **1,150 to 1,750 trips**.

It should be also noted that these estimates are independent of the level of service for the proposed rail service, travel times and costs for other competing modes, and socioeconomic characteristics of the corridor's residents. We view these estimates as providing only an order of magnitude estimate that serves as a reasonableness check for more elaborate approaches.

4.1.5 Linkages to RTA Transit Master Plan

In addition to the Regional Rail service, the RTA's Regional Transit Master Plan (RTMP) is recommending additional service to complement and support the Regional Rail. Table 4-7 shows the additional transit services that will connect to and supplement the rail service.

Table 4-7: RTMP Complementary and Supplemental Transit Service

Complementary Transit Service
Increased Frequency on Ann Arbor to DTW (AirRide) bus service
New Shuttles to Rail Stations in Ann Arbor and Ypsilanti
Late-Night Supplemental Bus Service between Ann Arbor and Detroit
Supporting Transit Service
Ypsilanti Connector Local Bus
Plymouth/Livonia Commuter Express
Canton Commuter Express

4.1.6 Regional Rail LPA Stations

Five initial stations are recommended for the Regional Rail alternative. **Table 4-7** displays the details of each of the recommended stations.

Table 4-8: Regional Rail Station Characteristics

Stations	General Overview	Nearby Destinations	Land Use	Economic Development Potential	Transit Connections	Potential Park and Ride	Population Density	Employment Density
Michigan Avenue Regional Rail								
Ann Arbor Amtrak	The Regional Rail alternative would use the existing Ann Arbor Amtrak Station for startup operations. This station is located on Depot Street near Broadway Street, roughly one-half mile north of downtown Ann Arbor. Station multi-modal transit facilities, parking, and passenger drop-off zones are highly constrained at the existing Ann Arbor Station as configured. No modifications to the existing facility would be made other than signage and ticketing provisions. The City of Ann Arbor in conjunction with MDOT and the Federal Railroad Administration is conducting a study for an expanded Intermodal Passenger Rail Station in the city. Once the site is determined, the RTA intends to serve Ann Arbor at that station regardless of its location.	Kerrytown District, Ann Arbor Farmer's Market, Broadway Park, North Main Street, UM Medical Center	Parkland/ Urban Neighborhood	Medium	17	Yes	6,643	13,369
Depot Town	Historically a passenger rail stop until 1984, the Depot Town station would be located a few blocks northeast of Downtown Ypsilanti. No station currently exists, but the City of Ypsilanti has committed funds for design and toward construction of an Amtrak station platform at Depot Town, north of the intersection of E. Cross and N. River streets.	Depot Town business district, Eastern Michigan University, Downtown Ypsilanti, Riverside Park	Urban Neighborhood/ Small Urban Downtown	High	1	Yes	4,586	3,027
S. Wayne Road	The proposed Wayne station would be constructed on the southern end of downtown Wayne at Wayne Road. Platforms would be located along both of the two mainline tracks in the area. On-site transit facilities would facilitate convenient connections to nearby employment sites (including the Ford Michigan Assembly Plant) and Metro Airport. This location also offers a potential meet-up point for local transit services in Wayne and Washtenaw counties. An extension of transit service from Ypsilanti to this station site would eliminate the exiting 10-mile gap in Michigan Avenue transit service.	Downtown Wayne, Ford Michigan Assembly, Wayne Public Library, Wayne Commons Shopping Center	Small Downtown/ Industrial/ Single Family Neighborhood	High	1	Yes	3,269	1,448
John Dingell Transit Center	Regional Rail would serve Dearborn at the existing John D. Dingell Transit Center / Dearborn Amtrak Station. The Michigan Avenue BRT would be able to interface with the Regional Rail service here. This station would also interface easily with the Michigan Avenue BRT service, which also has a stop at the Dingell Transit Center.	Downtown West Dearborn, Fairlane Town Center, UM Dearborn, Henry Ford College, Rouge River Park, Ford Campus, Henry Ford Museum	Parkland/ Small Urban Downtown/ Industrial	High	3	Yes	1,082	4,150
Detroit Amtrak / New Center	The Regional Rail alternative would serve a station at the location of the existing Detroit Amtrak Station in the city's New Center business district. This is near office towers and other employment centers, higher educational facilities, and a mixed-use residential area. The station will soon connect Detroit's Greater Downtown areas via the M-1 Rail in addition to existing DDOT and SMART bus service. Proposed future transportation services at the station include RTA Woodward BRT, intercity motor coach service, and potential airport express services. MDOT is currently negotiating with Canadian National Railroad to determine if Regional Rail trains will be able to serve the existing Amtrak station prior to station and local trackway enhancements. MDOT is also preparing to issue a request for proposals for redevelopment of properties surrounding the station to include new station provisions.	New Center Business district, Fisher Building, Cadillac Place, Midtown & Downtown Detroit	Urban Office Center/ Mixed Use Residential	Medium	5	Yes	2,781	10,195

4.2 Michigan Avenue Bus Rapid Transit

Bus Rapid Transit along Michigan Avenue between Detroit Metro Airport and Downtown Detroit is also recommended as one of the locally preferred routes in the Corridor. The route takes riders from Detroit's Central Business District through the Corktown and Michigan-Martin Southwest Detroit neighborhoods before reaching East and West Dearborn, and Inkster. Service south to Metro Airport from Inkster also provides service to Romulus. The preferred route is 21.5 miles long. **Figure** 4-3 shows the LPA's route between Detroit and Metro Airport and the recommended station locations.

Figure 4-3: Michigan Avenue BRT

The capital costs for the Michigan Avenue BRT are expected to be about $132 million while the annual operating and maintenance costs are estimated to be about $17.1 million. The BRT will run every 10 – 20 minutes during the peak period, depending on the day,

and will arrive every 20 – 60 minutes off-peak, depending on the time of day. It is estimated that between Metro Airport and Downtown Detroit, during the peak hour, the BRT will take approximately 69 minutes. For comparison, during the peak period, auto travel time between the airport and Detroit along Michigan Avenue can take anywhere between 40 and 70 minutes. Three park and ride lots are planned along the route. Nearly 6,900 riders per day are expected to use the Michigan Avenue BRT.

Figure 4-4: LPA Runningway Concept – Downtown Detroit to West Dearborn (Dedicated Center Running)

Figure 4-5: LPA Runningway Concept - West Dearborn to Metro Airport (Mixed Traffic Running)

Table 4-9: Michigan Avenue BRT: Metro Airport to Downtown Detroit

Total Length	22.5 Miles	
Number of Stations	26 Stations	
Operations Characteristics	**Peak Hour Headway** 10 – 20 minutes	**Off-Peak Headway** 20 – 60 minutes
Travel Time (End to End)*****	**Peak Hour BRT Travel Time** 69 minutes	**Peak Hour Auto Travel Time*** 40 minutes – 70 minutes
Capital Costs (2015$)	$132 million	
O&M Costs (Annual 2015$)	$17.1 million	
Likely Environmental Impacts	Minimal, operates within existing rights-of-way	
Park and Ride Locations	**Total Park and Rides**	**Potential Locations**
	3	**Inkster / Dearborn Heights** *(Merriman Rd, Middlebelt Rd, Inkster Rd or Beech Daly Rd)* **Dearborn** *(Outer Dr, Dingell Transit Center or Greenfield Rd)* **Detroit** *(Wyoming Ave, Livernois Ave)*
On-Street Parking Spaces Impacted	150 – 1,574**	
Est. Weekday BRT Ridership (model forecast)	6,900 boardings per day	
Est. Corridor Ridership (model forecast)	10,200 boardings per day	
FTA Cost Effectiveness (Small Starts)	$1.54 (Medium-High)	

**Based on Google Maps travel time at 5:15 pm*

***Further design as well as decisions on the importance of parking vs. bike lanes will determine ultimate impact along Michigan Ave.*

A conceptual rendering of the Michigan Avenue BRT Rail service at the 14th Street Station in Corktown

A conceptual rendering of the Michigan Avenue BRT service at the Schaefer Road Station in Dearborn

4.2.1 Operating Characteristics

The Michigan Avenue BRT would have a weekday AM and PM peak period headway of 10 minutes and a 15 minute headway during the midday and evening hours. The early morning weekday BRT would come twice per hour and the late night bus would arrive once per hour. Headways increase on the weekends as fewer people are expected to use the service. Saturday service will still have about the same 20 hour service span while the early morning and late night service are eliminated on Sundays (16 hour service span). On the weekend, midday and PM peak hour headways would be 20 minutes, while AM peak and evening service would run every 30 minutes.

Additional service, outside of the Michigan Avenue BRT, would also be added to act as feeder service to the communities along the Michigan Avenue Corridor. Other bus routes would also facilitate long distance connections between Detroit and Metro Airport, Ann Arbor and Ypsilanti to Metro Airport, Detroit to Ann Arbor, and Canton to Ypsilanti.

4.2.2 Travel Time Estimates

Travel time for the Michigan Avenue LPA is about 1 hour and 9 minutes from end-to-end, depending on the direction of travel. This represents a savings of about 16 minutes during the peak hour and a 20% faster travel time than the existing bus. The travel time is faster due to reduction of stops along the route compared to the existing service, the addition of transit signal priority technology, and dedicated lanes for the eastern half of the route through Dearborn and Detroit. The estimated travel time for the BRT is closer to the normal auto travel time during the peak hour, which can vary between 40 and 70 minutes along Michigan Avenue.

Table 4-10 below shows the travel time, distance, and average speed of the existing bus and the Michigan Avenue BRT.

Table 4-10: Michigan Avenue BRT Travel Time Estimates

Mode	Direction	Total Travel Time			One-way distance (mi)	Avg. MPH
		Hours	Minutes	Seconds		
Existing Bus	EB	1	26	42	25.1	17.2
	WB	1	24	30	23.6	
Michigan Avenue BRT	EB	1	10	48	25.1	21.3
	WB	1	7	36	23.6	

4.2.3 Capital Cost Estimate

The Michigan Avenue BRT LPA is expected to cost roughly $132 Million. Major cost elements include Stations/Stops, Sitework and Special Conditions, Vehicles and Professional Services (design, engineering, and construction). A large investment in Systems will allow for transit signal priority, off-board fare collection and the needed communications hardware. Unallocated contingency was purposefully kept conservative at this point in the study. **Table** 4-11 shows the breakdown of capital costs by SCC code.

Table 4-11: Michigan Avenue BRT Capital Cost Summary (2015$)

SCC	Costs
10 Guideway	1,927,000
20 Stations/Stops	26,450,000
30 Support Facilities	6,500,000
40 Sitework and Special Conditions	17,178,000
50 Systems	9,473,000
60 Right-of-Way	5,460,000
70 Vehicles	27,195,000
80 Professional Services	18,458,000
90 Unallocated Contingency	15,426,000
100 Finance Charges	3,856,000
Total Project Cost Estimate:	**$131,924,000**
Total Miles:	**22.5**
Cost per Mile:	**$5,863,289**

4.2.4 Operations and Maintenance Costs

The Michigan Avenue BRT Operations and Maintenance (O&M) costs are estimated to be roughly $26.3 million per year. This includes the new BRT service, as well as the existing DDOT and SMART service running on Michigan Avenue. DDOT service currently costs about $2.4 million per year and SMART service costs about $5.5 million per year. By combining the services, the total incremental O&M cost (increase in costs from existing service) would be $18.4 million per year. **Table 4-12** shows the detailed total O&M costs for the LPA, with local service.

Table 4-12: Michigan Avenue BRT Operations and Maintenance Costs (2015$)

Service	Annual O&M Costs: No Build Alternative ($Millions)	Annual O&M Costs: Michigan Avenue BRT ($Millions)
Rail	$0.0	$0.0
BRT	$0.0	$17.1
DDOT	$2.4	$2.8
SMART	$5.5	$6.5
AAATA	$0.0	$0.0
Total	$7.9	$26.3
Incr. Difference		**$18.4**

In addition to the cost of providing the Michigan Avenue BRT service, additional supplemental service will be provided in the corridor. The existing DDOT service on Michigan Avenue (Route 37) will be increased and is expected to cost about $0.4M. SMART service on Michigan Avenue (Route 200) will also be increased which is expected to cost about $0.2M. Additional shuttle service is planned to connect those using the BRT to the Fairlane Mall/UM Dearborn area. This shuttle service is estimated to cost about $0.8M.

4.2.5 Ridership

Metrics from the existing transit service along the corridor from AAATA, DDOT, and SMART were used to determine the daily ridership along the corridor. The ridership estimate for the Michigan Avenue BRT alternative was determined using the E6C+ model using a 10 minute maximum drive access time and 18 minute maximum walk access and walk egress time assumptions. The model resulted in a ridership estimate of 6,783 boardings on the planned Michigan Avenue BRT service and access to the BRT from driving made up about 25 percent of the total ridership (1,712 boardings). This leads to an increase in corridor ridership (Detroit to Metro Airport) of more than 5,200 compared to the baseline. High numbers of boardings in the accessed via driving category are projected for Merriman Road (562), Ford HQ (625) and Griswold/Lafayette (241), making them potential candidates for park and ride locations.

4.2.6 Linkages to RTA Transit Master Plan

In addition to the Michigan Avenue BRT service, the RTA's RTMP is recommending additional transit service to complement and support the BRT system.

Table 4-13 shows the additional transit services that will connect to and supplement the rail service.

Table 4-13: RTMP Complementary and Supplemental Transit Service

Complementary Transit Service
Increased Service on DDOT Route 37 (Michigan Ave)
Increased Service on SMART Route 220 (Michigan Ave)
New Fairlane Area Shuttle
Supporting Transit Service
Greenfield Cross-County Connector
Grand River Cross-County Connector
Fort-Eureka Cross-County Connector
Detroit Airport Express
Ypsilanti Connector Local Bus

4.2.7 Proposed Michigan Avenue Stations

24 stations are recommended for the Michigan Avenue BRT alternative. **Table 4-14** displays the details of each of the recommended stations.

Table 4-14: Michigan Avenue BRT Station Characteristics

Station	General Overview	Nearby Destinations	Land Use	Economic Development Potential	Transit Connections	Potential Park & Ride Location	Street Character	Population Density	Employment Density
Michigan Avenue									
DTW McNamara Terminal	McNamara, opened in 2002, is the larger of Detroit's terminals. AirRide and alternating trips on SMART route 125 Fort Street service are provided at the terminal's Ground Transportation Center. Courtesy shuttles connect the two terminals at ten minute intervals. The Westin hotel is located in the terminal, along with dozens of retail stores that bolster the airport's employment base.	Metro Airport	Airport terminal	Low	2	-	Pedestrian bridge provides access to Ground Transportation Center	0	988
DTW North Terminal	The DTW North Terminal serves all airlines except for Delta and its affiliated partners, which operate out of the McNamara Terminal. The North Terminal, opened after major renovations in 2008, is host to all non-Delta and Delta affiliate airlines. SMART Route 280 serves this terminal, as well as AirRide and alternating trips of SMART Route 125 Fort Street.	Metro Airport	Airport terminal	Low	3	-	Pedestrian bridge provides access to Ground Transportation Center	0	1,299
Merriman Road / Smith Road	Headed south on Merriman, Smith Road is the nearest commercial node before reaching the airport property. Merriman transitions from a two-way road to a divided highway, which becomes grade-separated when progressing farther south toward the airport campus.	Airport long-term parking and hotels	Airport long-term parking and hotels	Medium	1	Yes	Three travel lanes in each direction, one turn lane with wide landscaped median; no street parking	298	967
Merriman Road	Merriman Road is a popular route to access Detroit Metro Airport, located just a few miles to the south. Though the southeast side of the intersection is undeveloped, the southwest side is home to a cluster of neighborhoods with detached homes. On the northeast side of the stop is a shopping plaza with a Kroger grocery store.	Taft-Galloway Elementary School, Kroger grocery store	Suburban commercial / residential	Low	1	Yes	Four travel lanes in each direction, one right turn lane in each direction and Michigan Left pockets inside large landscaped medians; no street parking	3,133	1,448
Middlebelt Road	Middlebelt Road presents additional opportunity for new development. Like Inkster Road, the Middlebelt is locally important as a north-south access road to various suburban Detroit cities. SMART Route 280 Middlebelt South connects to Detroit Metro Airport's North Terminal to the south, and north to Garden City Hospital.	U-Haul Truck Sales of Detroit, various industrial employers	Suburban commercial / residential	Low	2	Yes	Four travel lanes in each direction, one right turn lane in each direction and Michigan Left pockets inside large landscaped medians; no street parking	3,815	406
Inkster Road	Michigan Avenue here contains commercial sites, several apartment buildings and light industry. Thompson Tower is a mid-rise apartment complex just west of the intersection that could serve as a promising basis for transit oriented development at this node. The area has good potential for re-orienting business to the street and filling out the commercial frontage through infill development. Within the half mile buffer from the Avenue are residential blocks of detached homes, and the Lower Rouge Parkway greenbelt. The MDOT railroad/Amtrak corridor is configured parallel to the Avenue and a few blocks to the south.	Thompson Tower apartments	Suburban commercial / residential	Low	1	Yes	Four travel lanes in each direction, one right turn lane in each direction and Michigan Left pockets inside large landscaped medians; no street parking	3,501	592
Beech Daly Road	Continuing its character as a wide divided highway of approximately 200 feet in width, the Beech Daly stop in Dearborn Heights is very auto-oriented. The intersection has numerous set back developments.	Dearborn Heights 20th District Court, Daly School Kindergarten, Westwood Cyber High School	Suburban commercial / residential	Low	1	Yes	Four travel lanes in each direction, one right turn lane in each direction and Michigan Left pockets inside large landscaped medians; no street parking	4,181	1,810

Station	General Overview	Nearby Destinations	Land Use	Economic Development Potential	Transit Connections	Potential Park & Ride Location	Street Character	Population Density	Employment Density
Telegraph Road	US Highway 24, known as Telegraph Road in Michigan, is a major north-south state trunkline highway that connects multiple counties and reaches as far south as Ohio. Telegraph at Michigan Avenue is located in the City of Dearborn, but is immediately adjacent to the cities of Dearborn Heights, Inkster and Taylor. Michigan Avenue runs over the trunkline along an overpass, with access via ramps, including parallel sidewalks for non-motorized users. SMART route 275 Telegraph intersects Michigan and provides north-south transit service.	Access to adjacent cities of Dearborn Heights, Inkster and Taylor	Suburban commercial	Low	2	-	Four travel lanes in each direction and Michigan Left pockets inside large landscaped medians; no street parking	4,328	3,781
Outer Drive	Just before Outer Drive, Michigan Avenue becomes a divided highway. From this point, the right-of-way is over 200 feet wide, with eight through lanes in addition to turning lanes. Shopping centers are set back from the street with large parking lots along the Avenue. This streetscape can potentially transform over time to be more pedestrian- and transit-oriented.	Kroger Grocery store, Westborn Mall, other strip style retail	Suburban commercial	Low	2	Yes	Four travel lanes in each direction, one right turn lane in each direction and Michigan Left pockets inside small landscaped medians; no street parking	4,137	5,585
Mason Street	Another walkable district along Michigan Avenue in Dearborn is roughly between Oakwood Boulevard and Military Street. As in East Dearborn, Michigan Avenue narrows to only 85 feet wide. No on-street parking is provided, but off street parking is abundant. Arterial transit along this nearly 2-mile walkable corridor may need to operate in shared lanes.	Significant commercial node at Mason Street, located approximately one-half-mile from the new Dingell Transit Center and less than a mile from The Henry Ford.	Small downtown urban / urban residential neighborhood	High	1	-	Two travel lanes in each direction, one turn lane and no street parking	3,522	6,348
John Dingell Transit Center	The new John D. Dingell Transit Center is an Amtrak and Intermodal Station about 1.5 miles from the University of Michigan-Dearborn and Fairlane Town Center, on the east edge of West Dearborn. The station presents a possible new transfer location between SMART and DDOT services. It is also well situated to connect with airport motor coach services from Southfield and other Oakland County communities in the Southfield Freeway corridor.	Immediately adjacent to Greenfield Village property and The Henry Ford; Downtown West Dearborn	Suburban institutional bordering small downtown commercial; could use improved connections to Downtown West Dearborn, currently separated via auto-oriented businesses	High	3	Yes	Three travel lanes in each direction and Michigan Left pockets inside large landscaped medians; no street parking	1,154	4,150
Dearborn Civic Center (Michigan / Mercury)	Along the 2.5-mile segment between Greenfield Road and Oakwood Boulevard, Michigan Avenue takes on characteristics of a limited-access highway. The segment contains many important destinations. A Southfield Freeway interchange consumes acres of land in the area. The segment's northern edge offers many destinations with transit-oriented development potential.	Ford Motor Company World Headquarters, Henry Ford Centennial Library, Ford Community and Performing Arts Center, Dearborn civic complex and 9th District Court; Fairlane Town Center mall, the University of Michigan-Dearborn, Henry Ford College, and several hotels and office buildings	Suburban residential / Civic	Medium	3	-	Five travel lanes in each direction, right turn lanes in each direction, Michigan Left pockets inside large landscaped medians; no street parking	1,647	8,842
Greenfield Road			Suburban residential / commercial	Low	3	Yes	Three subgrade travel lanes in each direction, two at-grade travel lanes in each direction, no turn lanes; street parking on north side	6,223	4,597

Station	General Overview	Nearby Destinations	Land Use	Economic Development Potential	Transit Connections	Potential Park & Ride Location	Street Character	Population Density	Employment Density
Schaefer Road	Centered on the intersection with Schaefer Road, East Dearborn is the city's historical pedestrian-oriented business district. This portion of Michigan Avenue is a short distance from commercial and cultural activity centers on Ford Road and Warren Avenue to the north, the Ford River Rouge Complex and other riverfront industrial businesses, and the towns of Melvindale and River Rouge to the south. Michigan Avenue narrows through East Downtown Dearborn to 100 feet. The current configuration provides five lanes with sidewalk pockets for curbside parking and right turn lanes. The existing streetscape provides few amenities for transit customers. The stop offers a connection to DDOT route 41 Schaefer.	Former Dearborn City Hall (recently retrofitted into artist residences), Arab American National Museum, shopping centers on the blocks north of Michigan Avenue, medical facilities, and on-street retail. Adjacent to Ford River Rouge Complex.	Urban residential / commercial / institutional	High	3	-	Two travel lanes in each direction, center turn lane, pocket turn lanes and street parking on both sides of street	8,998	7,121
Wyoming Avenue	Auto-dominant uses at this location. On the border of Detroit and Dearborn. The stop offers a connection to DDOT Route 54 Wyoming. Nearing the city limits, Michigan Avenue is separated from I-94 by only a single block on the north side.	MDOT park and ride facility	Suburban industrial / commercial	Low	3	Existing park and ride lot in the northwest corner of Michigan and Wyoming with 62 spaces	Two travel lanes in each direction, center turn lane and pocket turn lanes	3,172	2,248
Central Avenue	Similar in commercial composition to Livernois, this stop at the intersection of Central and Michigan Avenues is home to a mix of newer auto-oriented and older street-oriented buildings. Central Avenue is a locally important north-south street connecting various Southwest Detroit neighborhoods and destinations.	Priest Elementary and Middle School	Urban residential / commercial	Low	3	-	Two travel lanes in each direction, center turn lane and parking on both sides of street	7,740	1,594
Livernois Avenue	Livernois Avenue is home to a collection of strip commercial and some older street-oriented businesses. This intersection provides many opportunities for infill and redevelopment. The stop facilitates a connection to the DDOT Livernois bus route, which serves numerous residential neighborhoods along with the University of Detroit Mercy to the north, and the Vernor Highway commercial stretch and Fort Wayne and River Rouge to the south.	Neighborhood grocery store Prince Valley Market	Urban residential / commercial	Low	3	Yes	Two travel lanes in each direction, center turn lane and parking and bike lanes on both sides of street	7,067	1,203
Clark Avenue	The Clark Avenue stop provides a connection south to the West Vernor Highway commercial strip and well-programmed Clark Park.	Clark Street Technology Park, home to a Fedex shipping center and Vitec, an automotive equipment manufacturer	Urban industrial / low-density residential	Medium	3	-	Two travel lanes in each direction, right turn lanes in each direction and medians; bike lanes present on both sides of street	3,711	1,219
Vernor Highway / 14th Street	A number of new restaurants and small businesses have populated the storefronts in west Corktown, making this an in-demand location. The station fronts one of Detroit's most prominent landmarks, the Michigan Central Station, which is set back from the Avenue at Roosevelt Park. The station building sits at the gateway between Corktown and other Southwest Detroit neighborhoods along Vernor Highway.	Corktown commercial and residential neighborhoods, Roosevelt Park	Urban residential / commercial	High	3	-	Two travel lanes in each direction, center turn lane, parking and bike lanes on both sides of street	2,570	4,042
Trumbull Avenue	Crossing the M-10/John C. Lodge Freeway, Michigan Avenue transitions to the residential and commercial core of Detroit's Corktown neighborhood. Corktown is a historic, mixed-use neighborhood framed by freeways, railroad tracks, and the Detroit River. Michigan Avenue is the main thoroughfare in the neighborhoods. The neighborhood has a resurgent business association with an interest in reviving café culture and providing bicycle access for residents and visitors.	Corktown commercial and residential neighborhoods	Urban residential / commercial	High	5	-	Three travel lanes in each direction, center turn lane, parking on both sides of street	2,048	12,801

Station	General Overview	Nearby Destinations	Land Use	Economic Development Potential	Transit Connections	Potential Park & Ride Location	Street Character	Population Density	Employment Density
3rd Street	The street character is not very hospitable to pedestrians and presents an opportunity to re-orient mix of uses to the street.	MGM Grand Casino, DTE's downtown campus and the Detroit Police Department / Public Safety Headquarters	Institutional/ urban residential	High	7	-	Three travel lanes in each direction and a center turn lane	4,097	31,472
Rosa Parks Transit Center (Cass Ave)	The Rosa Parks Transit Center, the city's downtown transit hub, is four blocks west of Campus Martius along Michigan Avenue. The Transit Center is near two major hotels and a concentration of office units. It is also surrounded by high-rise residential buildings and historic office buildings undergoing rapid redevelopment. Two People Mover stations frame the Transit Center, allowing convenient connections to much of the downtown area.	Major hotels, Detroit People Mover Stops, McNamara Federal Building and downtown residential	Downtown urban	High	28	-	Change from three to two travel lanes in each direction and a center turn lane; one right turn lane at NE corner of intersection	4,038	49,035
Campus Martius	Iconic urban park with year-round programming and space for relaxed recreation.	Recreation, major employers, downtown residential and connection to M-1 Rail	Downtown urban	High	17	-	Two travel lanes in each direction and a center turn lane, parking on either side of the street	4,028	56,258
Larned Street and Congress Street / Woodward Avenue	The Downtown Detroit stations provide access to the large concentration of employment, cultural and sporting events in the region's geographic center. Woodward Avenue's M-1 Rail modern streetcar project is currently under construction through Campus Martius and would interface with the BRT stops. A continuation of Michigan Avenue transit services through downtown Detroit is important to offer uninterrupted connections through the business district.	Coleman A. Young Municipal Center, Hart Plaza, downtown employment, M-1 Rail	Downtown urban	High	25	-	Four lanes in one direction, no parking	2,880 - 3,335	52,572 - 55,727
Randolph Street / Cadillac Square	Location provides a connection to central downtown from the east side of the Central Business District.	Greektown entertainment district and employers	Downtown urban	High	8	-	Change from three to two travel lanes in each direction; parking on both sides of street south of Congress, parking on the west side of street north of Cadillac Square	3,620	57,032
Randolph Street / Gratiot Avenue	Entrance to downtown from Gratiot and connection to future Gratiot BRT; near pocket neighborhoods in NE Central Business District.	Greektown and Paradise Valley / Harmonie Park entertainment districts, Detroit Opera House, YMCA, 36th District Court, downtown employers	Downtown urban	High	6	-	Two travel lanes in each direction, multiple left and right turn lanes with some street parking	4,696	61,617

4.3 Washtenaw Avenue Bus Rapid Transit

The locally preferred alternative (LPA) also includes service along Washtenaw Avenue in Ann Arbor and Ypsilanti. The preferred route is roughly 9 miles long and would start at the Blake Transit Center in Downtown Ann Arbor and end at the Ypsilanti Transit Center is Downtown Ypsilanti. The route would run along 4th Avenue from William Street to Huron Street then on Huron Street until Washtenaw Avenue. The Route would turn onto Washtenaw Avenue and continue for about 7 miles to Downtown Ypsilanti until turning onto N Adams Street and continuing one block to the Ypsilanti Transit Center. **Figure** 4-6 shows the alignment of the LPA.

Figure 4-6: Washtenaw Avenue BRT

4.3.1 Washtenaw Avenue BRT: Preferred Alternative Characteristics

The capital costs for the Washtenaw Avenue BRT are expected to be about $56 million while the incremental annual operating and maintenance costs are estimated to be about $4.5 million. The BRT will run every 10 – 20 minutes during the peak period, depending on the day, and will arrive every 20 – 60 minutes, depending on the time of day. It is estimated that between Ann Arbor and Ypsilanti during the peak hour, the BRT will take approximately 35 minutes. For comparison, during the peak period, auto travel time between Ann Arbor and Ypsilanti can take anywhere between 25 and 40 minutes. Two park and ride lots are planned along the route and about 35 on-street parking spaces will need to be removed to accommodate BRT stations. Nearly 3,700 riders per day are expected to use the Washtenaw Avenue BRT.

Figure 4-7: LPA Runningway Concept - Washtenaw Avenue (Mixed Traffic Running)

Table 4-15: Washtenaw Avenue BRT: Downtown Ann Arbor to Downtown Ypsilanti

Total Length	9.1 Miles	
Number of Stations	10 Stations	
Operating Characteristics	**Peak Hour Headway** 10 – 20 minutes	**Off-Peak Headway** 20 – 60 minutes
Travel Time (End to End)*****	**Peak Hour BRT Travel Time** 35 minutes	**Peak Hour Auto Travel Time** 25 – 40 minutes*
Capital Costs (2015$)	$56 million	
O&M Costs (Annual, 2015$)	$7.0 million	
Likely Environmental Impacts	Minimal operates in existing rights of way	
Park and Ride Locations	**Total Park and Rides**	**Potential Locations**
	2	**Ann Arbor** *(Pittsfield Blvd)* **Pittsfield Twp / Ypsilanti Twp** *(Carpenter Rd, Golfside Rd)* **Ypsilanti** *(EMU: Washtenaw Ave/Cross St, Ypsilanti Transit Center)*
Parking Spaces Impacted	35 Spaces	
Est. Weekday BRT Ridership (model forecast)	3,694 boardings per day	
Est. Corridor Ridership (model forecast)	6,900 boardings per day	
FTA Cost Effectiveness (Small Starts)	$1.21 (Medium-High)	

**Based on Google Maps travel time at 5:15 pm*

A conceptual rendering of the Washtenaw Avenue BRT service at the Downtown Ann Arbor Station (Huron St / Fifth Ave)

4.3.2 Operating Characteristics

The Washtenaw Avenue BRT would have a weekday AM and PM peak period headway of 10 minutes and midday and evening headways of 15 minutes. The early morning weekday BRT would come twice per hour and the late night bus would arrive once per hour. Headways increase on the weekends as fewer people are expected to use the service. Saturdays will still have a 20 hour service span, while early morning and late night service on Sunday is eliminated (16 hour service span). Midday and PM peak hour headways would be 20 minutes, while AM peak and evening service would run every 30 minutes. Early morning and late night service would run hourly.

Additional service, outside of the Washtenaw Avenue BRT, would be added to act as feeder service to the neighborhoods and activity centers along Washtenaw Avenue. Other bus routes would also facilitate long distance connections between Detroit and Metro Airport, Ann Arbor and Ypsilanti to Metro Airport, Detroit to Ann Arbor, and Canton to Ypsilanti.

4.3.3 Travel Time

Travel time for the Washtenaw Avenue LPA is about 33 minutes from end-to-end, depending on the direction of travel. This represents a decrease of over seven minutes during the peak hour and a 17.5% faster travel time than the existing bus. The travel time is faster due to reduction of stops along the route compared to the existing service, the addition of transit signal priority technology, and queue jumps at specific bottleneck points along the route. The estimated travel time for the BRT is closer to the normal auto travel time during the peak hour, which can vary between 25 and 40 minutes. **Table 4-16** below shows the travel time, distance, and average speed of the existing bus and the Washtenaw Avenue BRT.

Table 4-16: Washtenaw Avenue BRT Travel Time

Mode	Direction	Total Travel Time			One-way distance (mi)	Avg. MPH
		Hours	Minutes	Seconds		
Existing Bus	EB	0	39	24	9.14	13.7
	WB	0	41	30	9.14	
Washtenaw Avenue BRT	EB	0	32	48	9.14	16.5
	WB	0	33	36	9.14	

4.3.4 Capital Costs

Cost estimates for the Washtenaw Avenue BRT are roughly $56 million or about $6.1 million per mile. Costs for Stations/Stops, Vehicles, and Professional Services (design and construction) make up over half of the total LPA cost. Since the BRT will not have any dedicated right-of-way, the costs for guideway are relatively small. Unallocated contingency is another large expenditure, but was purposefully kept conservative at this point in the study. Overall the Washtenaw Avenue BRT will cost about $6 million per mile. **Table 4-17** breaks down the capital cost estimates by SCC code.

Table 4-17: Washtenaw Avenue BRT Capital Cost Summary (2015$)

SCC	Costs
10 Guideway	229,000
20 Stations/Stops	11,143,000
30 Support Facilities	2,600,000
40 Sitework and Special Conditions	4,864,000
50 Systems	6,639,000
60 Right-of-Way	3,658,000
70 Vehicles	10,878,000
80 Professional Services	7,643,000
90 Unallocated Contingency	6,514,000
100 Finance Charges	1,628,000
Total Project Cost Estimate:	**55,796,000**
Total Miles:	**9.14**
Cost per Mile:	**6.1 Million**

4.3.5 Operations and Maintenance Costs

The Washtenaw BRT Operations and Maintenance (O&M) costs are estimated to be roughly $10.9 million per year. This includes the new BRT service, as well as the existing AAATA Route 4 which runs on the same route. AAATA Route 4 currently costs about $3.9 million per year. By combining the services, the total incremental O&M cost (increase in costs from existing service) would be around $6.0 million per year. **Table 4-18** displays a breakdown of the Washtenaw Avenue BRT O&M costs.

Table 4-18: Washtenaw Avenue BRT Operations and Maintenance Costs (2015$)

Service	Annual O&M Costs: No Build Alternative ($Millions)	Annual O&M Costs: Washtenaw Avenue BRT ($Millions)
Rail	$0.0	$0.0
BRT	$0.0	$7.0
DDOT	$0.0	$0.0
SMART	$0.0	$0.0
AAATA	$4.9	$3.9
Total	$4.9	$10.9
Incr. Difference		**$6.0**

In addition to the cost of providing BRT service along Washtenaw Avenue, changes to the existing service will take place to help support the BRT. AAATA's Route 43 will be extended from Ypsilanti to Wayne to provide a bus connection between Washtenaw and Wayne counties. The frequency of the route will stay the same, but as it will be running longer, it will cost an estimated $1.3M. Due to the increased service on Washtenaw Avenue, it recommended that AAATA reduce service on Route 4, which runs the same route. Some service will be kept to provide local service that supplements the BRT's express service. This is expected to save $2.3M in operating costs.

4.3.6 Ridership

Metrics from the existing transit service along the corridor from AAATA, DDOT, and SMART were used to determine the daily ridership along the corridor. The total ridership on the BRT service is estimated to be around 2,900 boardings per day. The remaining service on AAATA Route 4, which also runs along Washtenaw Avenue, would see about 2,700 boardings each day. This leads to an overall corridor ridership increase between Ypsilanti and Ann Arbor of more than 2,500 compared to the baseline. Park and Ride usage was almost exclusively utilized at the Ypsilanti Transit Center and the Pittsfield Boulevard stations.

4.3.7 Linkages to RTA Master Transit Plan

In addition to the Washtenaw Avenue BRT service, the RTA's RTMP is recommending additional transit service to complement and support the BRT system. shows the additional transit services that will connect to and supplement the rail service.

Table 4-19: RTMP Complementary and Supplemental Transit Service

Complementary Transit Service
Extension of AAATA Route 43 to Wayne
Reduction of AAATA service on Route 4 (additional service provided by BRT)
Supporting Transit Service
Plymouth/Livonia Commuter Express
Canton Commuter Express
Ann Arbor Airport Express
Ypsilanti Connector Local Bus
Ypsilanti Rail Feeder Local Shuttle
Ann Arbor Rail Feeder Local Shuttle

4.3.8 Washtenaw Avenue Station Locations

Nine stations are recommended for the Washtenaw Avenue BRT alternative. **Table** 4-20 displays the details of each of the recommended stations.

Table 4-20: Washtenaw Avenue BRT Station Characteristics

Station	General Overview	Nearby Destinations	Land Use	Economic Development Potential	Transit Connections	Potential Park & Ride Location	Street Character	Population Density	Employment Density
Washtenaw Avenue BRT									
Blake Transit Center	Main transit center for the Ann Arbor Area Transportation Authority and is located between 4th and 5th Aves at E William St in Downtown Ann Arbor.	Downtown Ann Arbor, Ann Arbor Library, Liberty Street business district	Downtown urban	High	17	-	One travel lane in each direction with street parking on either side	13,237	33,322
Downtown Ann Arbor	Located near the corner of 4th Ave and Huron St in Ann Arbor. The station is located near the heart of Downtown Ann Arbor and provides easy access to the many residential, office, and commercial uses in downtown.	Downtown Ann Arbor, Kerrytown, Farmers Market, State Street Business District	Downtown urban	High	10	-	Two travel lanes in each direction, one turn lane and no street parking	10,828	31,406
Huron / Glen	Located at the point when Huron St turns into Washtenaw Ave, and vice versa. This station is surrounded on three sides by the University of Michigan and a neighborhood in the northwest corner home to many students.	UM Central Campus, UM Hill Neighborhood, UM Medical School, State Street Business District	Urban residential / institutional	High	4	-	Two travel lanes in each direction, one turn lane and no street parking	11,848	21,019
UM Central Campus	Located near the corner of Washtenaw Ave and Geddes Ave to easily connect with the University of Michigan and the Central Campus Transit Center. The station is surrounded predominantly by the University and a neighborhood used for student housing.	UM Central Campus, UM Hill Neighborhood, S. University Business district	Institutional / urban residential	High	6	-	Two travel lanes in each direction, one turn lane and landscaped median; no street parking	15,166	28,733
Stadium Blvd	Located near where Washtenaw Ave and Stadium Blvd split. The station area is more suburban in development pattern than the previous stations and is surrounded by a mix of strip-style retail, offices, single family home neighborhoods, and a few apartments.	Trader Joe's Market, strip retail center, Arbor Village Apartments, Manchester Park, Murray Rec Center	Low density residential / suburban retail	Medium	1	-	Two travel lanes in each direction, one turn lane and large medians; no street parking	3,068	2,227
Pittsfield Blvd	Located in between S. Huron Pkwy and US-23. The station is located adjacent to strip style retail and office developments. A sizeable single family neighborhood is located to south of Washtenaw Ave and would benefit from the station.	Arborland Shopping Center, Victory Inn, Pittsfield Village Condos	Low density residential / suburban retail	Medium	3	Yes	Two travel lanes in each direction, one turn lane and no street parking; south side of stop is missing sidewalks in some places	2,794	3,550
Carpenter Road	This station would function in a similar capacity as the Pittsfield Blvd station, by serving riders from the east side of US-23. A park-and-ride station could be utilized here to accommodate commuters from US-23 traveling to Ann Arbor or Ypsilanti. A neighborhood of single family homes and few apartment complexes are also located within walking distance of the station.	Washtenaw County Sheriff's office, jail, and district court, 3 hotels, Glencoe Hills Apartments	Suburban residential / civic	Low	3	Yes	Two travel lanes in each direction, one right turn lane in each direction and one center turn lane; no street parking	4,133	3,245

Station	General Overview	Nearby Destinations	Land Use	Economic Development Potential	Transit Connections	Potential Park & Ride Location	Street Character	Population Density	Employment Density
Golfside Road	The uses along Washtenaw Ave at Golfside Rd are dominated by traditional suburban style development, however, the area is home to a number of single family neighborhoods and apartment complexes which leads to a relatively high population density.	Multiple apartment complexes, retail, bank	Suburban residential / commercial	Medium	2	Yes	Two travel lanes in each direction, one turn lane and no street parking; location is missing sidewalks in some places on both sides of street	5,678	1,568
Eastern Michigan	Located near where Washtenaw Ave and Cross St merge together and would serve Eastern Michigan University (EMU). A small commercial strip with restaurants and local retail is located adjacent to east side of the station area and would be served by this station as well.	EMU Campus, Ypsilanti Water Tower, Cross St commercial corridor	Urban neighborhood residential / institutional / small urban retail	High	3	Yes	Two travel lanes in each direction, one turn lane with medians; no street parking	7,463	1,873
Ypsilanti Transit Center	This is the second transit center that AAATA owns and operates after the Blake Transit Center. The station is located in Downtown Ypsilanti at the corner of N Adams Street and Pearl Street. Located downtown with a street frontage building lining the south side of the street. A municipal parking lot to the north of the station is available for commuters who wish to use it as a park and ride.	EMU Business School, Downtown Ypsilanti, Riverside Park	Small downtown urban / urban residential	High	9	Yes	One travel lane in each direction; street parking on west side of street	6,901	3,754

5.0 Next Steps

5.1 Approval and Adoption of LPA

The RTA Board of Directors will consider the recommended LPA during May of 2016, allowing the RTA and Michigan Avenue Corridor Study project team to advance the project into the environmental review phase in coordination with the Federal Transit Administration (FTA).

5.2 The National Environmental Policy Act

It is planned that RTA and Michigan Avenue Corridor Study project team will complete the environmental review phase during the summer and fall of 2016, ensuring the project complies with the National Environmental Policy Act (NEPA). The first step in this process is to complete a Class of Action (COA) Determination in coordination with the FTA. Based upon preliminary environmental analysis completed as part of the planning phase, it is anticipated that the COA for the BRT projects will be a Categorical Exclusion (CE). This determination is expected during the summer of 2016, allowing the RTA and project team to compete the CE process by early fall of 2016, prior to the November ballot initiative. The Regional Rail project would likely receive an Environmental Assessment Class of Action, which would require a more detailed and lengthy process.

5.3 Request Entry into FTA Small Starts

The Michigan Avenue Corridor project will be partially funded through the New Starts program that is administered by the FTA, which requires that the project agency (RTA) request entry into the program. It is anticipated that this process will be coordinated with the other projects in the RTA's proposed rapid transit system: Woodward BRT and Gratiot BRT. Following the completion of the NEPA process and the successful November ballot initiative, the RTA will conduct final engineering and vehicle procurement during the New Starts Project Development phase. The final design will be developed from the Preliminary Engineering completed during the NEPA process. The Project Development phase prepares the final plans, specifications and bid package for construction.

5.4 Project Funding

Funding for the Michigan Avenue Corridor project will be from a four-county property tax assessment (millage), the State of Michigan, and from the Federal New Starts program. Capital costs for the project will likely come from a variety of sources, including the State, the FTA, and the RTA millage. The operating costs will be paid primarily from funds collected from the millage as well as some funding from the State Department of Transportation. Detailed funding obligations have not yet been determined, but will be a part of the RTA's Regional Master Plan.