Gratiot Avenue Transit Study

Locally Preferred Alternative Report

5/31/2016

RTA
REGIONAL
TRANSIT AUTHORITY
OF SOUTHEAST MICHIGAN

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1 Executive Summary

Bus Rapid Transit – Dedicated Lane Median Running was selected as the locally preferred alternative (LPA) for Gratiot Avenue. Service Plan A: Detroit to M-59 via Gratiot Avenue and Service Plan B: Detroit to M-59 via Gratiot Avenue and Main Street (within Mt. Clemens) are both being advanced for further evaluation. Figure 1-1 shows the LPA route and stations. Figure 1-2 shows the LPA runningway.

The LPA represents a major transit investment along the Gratiot Avenue corridor that will address the need for rapid, premium service that links Wayne and Macomb Counties to the region. The LPA was carefully crafted through extensive technical analysis and continuous stakeholder engagement, and successfully addresses the purpose and need of the study. The LPA will improve mobility and access to transit along the corridor, especially for the region's transit dependent population, senior population, and millennial population. The LPA will serve short, medium, and long distance trips with reliable, "one-seat" service that addresses the strained existing local bus system, allowing those services to focus resources on local trips. A transit investment of this magnitude also has the ability to stimulate economic development and job growth within the corridor area, as similar systems constructed across the United States have typically yielded $4 in economic development for each $1 invested in BRT. Similarly, this project has the potential to greatly impact the quality of life and livability of the corridor, which would significantly improve the likelihood of retaining the increasing senior and millennial populations. Lastly, the LPA will build upon a solid foundation that already exists within this corridor, connecting residents and visitors to major destinations and employment centers within the region.

FIGURE 1-1: LPA ROUTE AND STATION LOCATIONS

FIGURE 1-2: LPA RUNNINGWAY CONCEPT (DEDICATED LANE MEDIAN RUNNING)

TABLE 1-1: GRATIOT AVENUE BRT LPA CHARACTERISTICS

Gratiot Avenue Bus Rapid Transit		
Total Length	23 Miles	
Number of Stations	19 Stations	
Operational Characteristics	**Peak Hour Headway**	**Off Peak Hour Headway**
	10 Minutes	15 - 60 Minutes
Travel Time	**Peak Hour BRT Travel Time**	**Peak Hour Auto Travel Time**
	52 minutes - 56 minutes	52 minutes - 57 minutes
Capital Cost	$252M	
Operating and Maintenance Cost	$17.5M / year	
Environmental Impacts	Low	
Park and Ride Locations	M-59 Metro Parkway Macomb Mall 8 Mile Road McClellan Avenue	
Parking Spaces Impacted	1,033	
Estimated Weekday BRT Ridership	13,500 boardings per day	
Estimated Corridor Ridership	17,930 boardings per day (+7,375 over baseline)	
FTA Cost Effectiveness (Small Starts)	$1.33 (Medium-High)	

2 Project Overview

The Gratiot Avenue Transit Study represents a crucial early step in the development of enhanced transit along Gratiot Avenue. This study is being led by the Regional Transit Authority of Southeast Michigan (RTA) and includes the development and evaluation of multiple rapid transit alternatives between Downtown Detroit and M-59 (Hall Road). The study area spans the 23-mile Gratiot Avenue corridor that serves portions of Wayne and Macomb counties. The Gratiot Avenue Transit Study was initiated in April 2015 and the Locally Preferred Alternative (LPA) reflected in this report was adopted in May 2016.

The corridor communities along Gratiot Avenue include five cities and townships in Wayne and Macomb Counties:

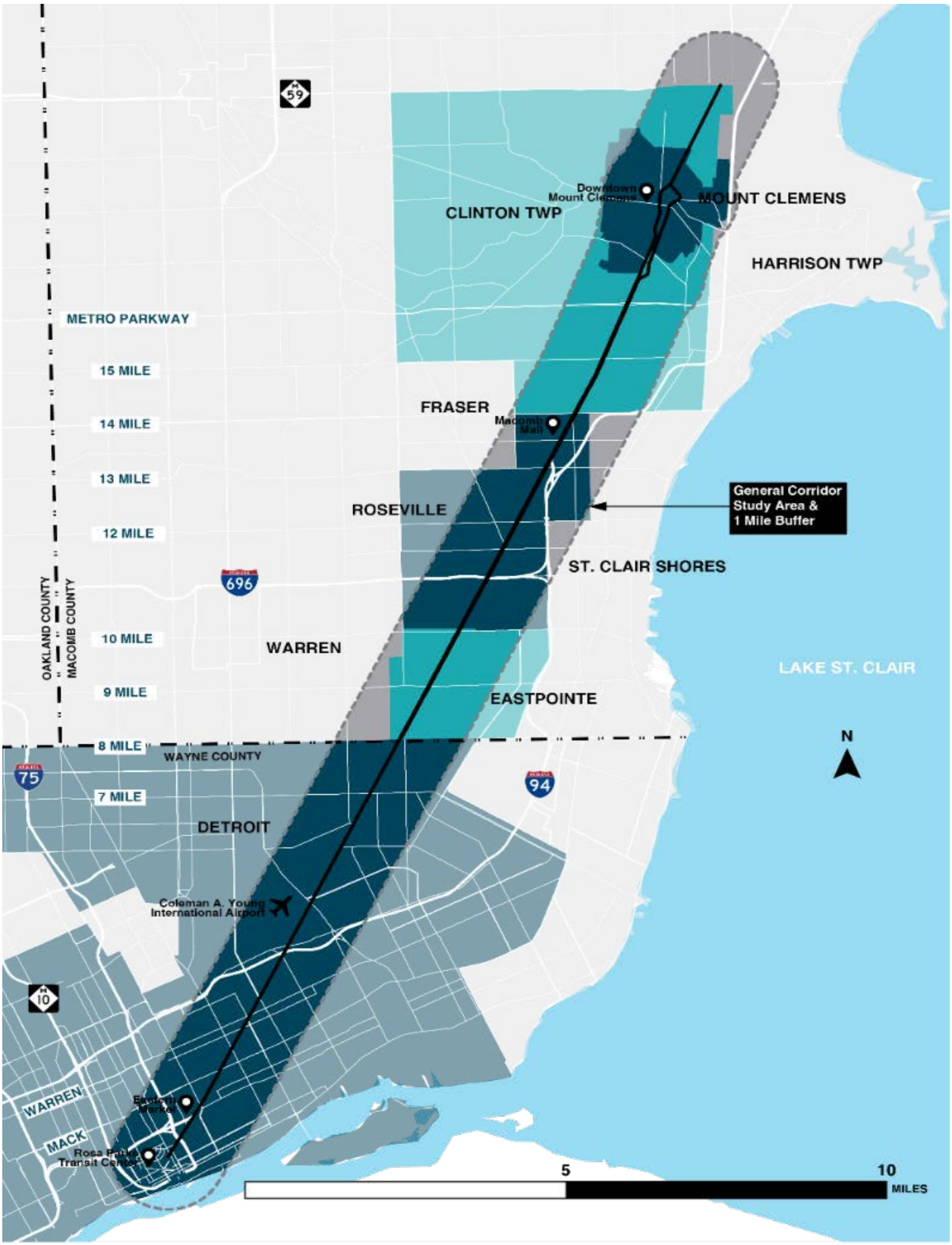
- Clinton Township
- Detroit
- Eastpointe
- Mount Clemens
- Roseville

The study area lies within a two-mile wide buffer centered on Gratiot Avenue. The study features a multi-phase, iterative process for alternative development and evaluation supported by input from study's Advisory Committee. Committee membership is comprised of all of the municipalities, counties, transit agencies and other key institutional stakeholders. The process is also supported by extensive public engagement activities. The process included the development of several reports and technical memoranda that summarize the analysis and describe the process for selection of the LPA. The aforementioned documents can be found on the RTA's website at www.rtamichigan.org and are listed below:

- Purpose and Need Statement
- Existing Conditions Memos
    - Tech Memo #1 – Planning Studies
    - Tech Memo #2 – Transportation
    - Tech Memo #3 – Corridor Demographics
    - Tech Memo #4 – Land Use Analysis
- Tier 1 Evaluation Summary Report
- Tier 2 Detailed Definition of Alternatives Report
- Tier 2 Evaluation Summary Report
- Tier 2 Technical Memos
    - Tech Memo #1 – Transportation
    - Tech Memo #2 – Operations and Maintenance Costs
    - Tech Memo #3 – Capital Costs
    - Tech Memo #4 – Ridership
    - Tech Memo #5 – Environmental Impacts
    - Tech Memo #6 – Station Area

Upon completion of this study, the RTA Planning and Service Coordination Committee will recommend the 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 (as defined in this report) and is found to be competitive for Federal Transit Authority (FTA) New/Small Starts capital funding. It will describe the preferred mode, alignment, general station locations, and associated modifications to the existing system to support the LPA. The RTA Board will then submit the LPA to the Southeast Michigan Council of Governments (SEMCOG), the region's Metropolitan Planning Organization, for adoption into its 2040 Regional Transportation Plan for Southeast Michigan. The 2040 Plan is scheduled for completion in the spring of 2016.

FIGURE 2-1: STUDY AREA



2.1 Existing Conditions

Gratiot Avenue (M-3) is one of the oldest and most significant transportation corridors in southeast Michigan and continues to serve as a main artery that extends northeastward from Downtown Detroit to Macomb and St. Clair counties. Prior to the development of the interstate highway system, Gratiot Avenue was the main route connecting communities along Lake St. Clair cities and townships of Detroit, Eastpointe, Roseville, Clinton Township, Mount Clemens, New Haven, Richmond, Marysville, and Port Huron. Much of the development of these communities is due to the existence of Gratiot Avenue. Given its importance to southeast Michigan, travel along the corridor has increased throughout the years, and it remains one of the primary routes connecting Downtown Detroit to Port Huron and Canada.

Streetcars were introduced on Gratiot Avenue in 1863, which served as a very popular route. Service remained until 1956 when the transit system converted to bus only operations in parallel with the construction of Interstate I-94 at that time. Gratiot Avenue is currently served by buses by the Detroit Department of Transportation (DDOT) and Suburban Mobility Authority for Regional Transportation (SMART) and remains one of the highest ridership transit corridors in southeast Michigan.

2.1.1 DEMOGRAPHICS

Gratiot Avenue has witnessed population decline consistent with regional trends of recent years. Despite this, there are still over 300,000 people who live within the Gratiot Avenue Transit Study area (1 mile area on either side of the corridor). This figure is expected to decline slightly between now and 2040. The majority of these residents are concentrated within Detroit, Clinton Township, and Roseville. There is also a high concentration of zero-car households, households that live below the poverty line, youth and school-aged populations, and senior populations along the corridor. All of these groups would likely benefit from increased transit options.

There are also approximately 190,000 jobs within the Gratiot Avenue corridor. This number is expected to increase by nearly 15,000 over the next 30 years, representing a 6.8% increase. The vast majority of jobs are concentrated in Detroit, particularly in the greater downtown area. However, job growth is expected to grow by nearly 15% in both Clinton Township and Mt. Clemens over the next 30 years.

2.1.2 TRANSPORTATION

Gratiot Avenue remains one of the highest ridership transit corridors in southeast Michigan. Transit is currently provided by DDOT Route 34, which provides service between downtown Detroit and 8 Mile Road, and SMART Route 560, which provides local service between downtown Detroit and 23 Mile Road. Additionally, SMART Route 565 mimics Route 560, but operates as an express commuter service with three inbound trips during the AM peak hour and 3 outbound trips during the PM peak hour. The function of these routes, both individually and as a system, can be inefficient and lack the ability as a mode to compete with automobiles.

Commuting patterns along the Gratiot Avenue corridor are primarily southbound during the AM peak hour and northbound during the PM peak hour. Average transit travel times along Gratiot Avenue are slightly higher than vehicular travel times during these peak hours. However, the majority of commuters utilize the parallel route of I-94, which can range from 25 minutes to 85 minutes during the peak hours due to frequent traffic incidents and general congestion along the corridor.

2.1.3 ENVIRONMENTAL

There are very few significant environmental features along the Gratiot Avenue corridor. The Clinton River represents the largest environmental feature within the study area which, along with 16,954 acres of sensitive land and 146 cultural sites, will be analyzed carefully during the environmental review phase.

Results from the preliminary environmental analysis conducted as part of this phase indicate that the proposed project is not likely to cause any significant adverse environmental impacts.

2.1.4 LAND USE

A high level land use analysis was completed in order to understand the development patterns that exist within the study area and whether a transit investment along Gratiot Avenue would align with these patterns. Overall, land uses at the southern (downtown Detroit) and northern (downtown Mt. Clemens) termini of the study area are very supportive of high-capacity transit investments. These areas include a mix of dense commercial and mixed density residential uses. While segments between these termini are typically comprised of low-density commercial/industrial and single-family residential uses, several corridor communities have more aggressive land use plans for these areas, particularly at major intersections where transit stations would likely be located. Furthermore, several major intersections in these lower density areas could be suitable locations for park-and-ride facilities that would connect residents with the transit investment.

2.2 Project Purpose and Need

PURPOSE

The purpose of this study is to identify the most feasible alternative(s) for high-capacity rapid transit along the Gratiot Avenue corridor from Downtown Detroit to Mount Clemens and M-59. The objectives are to provide additional mobility options for both dependent and choice transit users, improve transit capacity and reliability, support ongoing economic development efforts within the region, encourage additional investment along the corridor, and connect with other rapid transit corridors that have been identified by RTA.

NEED #1 – IMPROVE AND INCREASE MOBILITY OPTIONS ALONG THE CORRIDOR

Transit along the Gratiot Avenue corridor serves several population segments that are currently dependent on transit for their daily mobility needs. The current fixed routes along the corridor are operating at or near capacity and operated by two different transit providers: DDOT and SMART. Gaps in service coverage, both in terms of area of coverage and in frequencies of these fixed routes, create a less viable travel option among other transit sensitive population groups that could benefit from a frequent, reliable one-seat ride. These groups include, but are not limited to, those without access to vehicles, residents living in poverty, senior citizens, and students.

Along with supporting established transit ridership, additional unmet transit needs along the corridor that, , create the need for new high-capacity rapid transit service along Gratiot Avenue for the corridor's residents, employees, and visitors:

- The proportion of zero-car households within the study area is currently 14%, well above the regional average.
- Residents living in poverty account for over 25% of the study area's population, nearly double the RTA region. The poverty rate continues to rise based on trends of the last decade.
- By 2040, the senior population is expected to grow by over 50%. Elderly populations are generally more reliant on transit or other alternative forms of personal transportation for their daily mobility needs.
- By 2040, most of the communities within the study area are also expected to lose population, with the largest decrease in the City of Detroit. The remaining population in the corridor will be

disproportionately more dependent on public transit as a result of the compounding effect of the aging demographic.

- Gratiot Avenue has a high number of pedestrian and bicycle crashes along the corridor, with approximately 4.3% of all crashes along the corridor involving a pedestrian or bicyclist. This number could be reduced by attracting additional motorists to transit, focusing bus service in exclusive guideways, providing safe pedestrian connections to and from stations and transfer points, and promoting the use of transit by bicyclists.

NEED #2 – PROVIDE FREQUENT, RELIABLE, ONE-SEAT TRANSIT SERVICE THAT GENERATES ADDITIONAL TRIPS AND ATTRACTS NEW RIDERS TO TRANSIT

Two main transit routes operate along Gratiot Avenue between Mount Clemens and Downtown Detroit: DDOT Route 34, between Downtown Detroit to 8 Mile Road, and SMART Route 560, which provides local service between 23 Mile Road in Macomb County and Downtown Detroit. SMART Route 565 follows the Route 560 alignment but is a commuter route service with only three morning inbound and three afternoon outbound trips. The functionality of these routes, both individually and as a system, can be inefficient and lack the ability as a mode to compete with automobiles.

- Current bus service can be slow, unreliable and crowded during peak hours. Users have expressed the desire for more frequent service. Even with headways of 10-minutes headways on DDOT Route 34 and SMART Route 560, crush loads are common during peak periods.

- There is currently no continuous SMART service between Macomb County and Detroit throughout the entire day. During the weekday mid-day, SMART service arrives every 15 minutes and DDOT service arrives every 12 minutes at the 8 Mile Road interface location of SMART and DDOT. Transfer wait times between DDOT to SMART can be as long as 12-15 minutes. Transfer times for Saturday and Sunday increase to 20 to 30 minutes between the two services.

- The average travel time for DDOT Route 34 is 45 minutes between 8 Mile Road and Downtown Detroit, while the average travel time for SMART Route 560 is 31 minutes between M-59 and 8 Mile and 62 minutes between M-59 and Downtown Detroit. Average travel time for automobiles is 52 to 57 minutes between M-59 to Downtown Detroit.

- While Gratiot Avenue experiences limited traffic congestion along Gratiot Avenue, paralleling I-94 experiences significant congestion. During the mid-day, a trip along I-94 between M-59 and Downtown Detroit takes around 25 minutes; however, during rush hour, this trip often takes 70 minutes, with the most congested segments located in Detroit. Reconstruction along I-94 is expected to begin in 2017 and cause further delay and congestion in the corridor. Provision of rapid transit can increase the “person” capacity of Gratiot Avenue.

NEED #3 - STIMULATE ECONOMIC DEVELOPMENT ALONG THE CORRIDOR

Portions of the Gratiot Avenue corridor have been hit hard in the last fifteen years, resulting in population loss along the Gratiot Avenue corridor including the cities of Detroit and Mount Clemens. However, the corridor has experienced gains in employment.

Nationally, rapid transit investment has been shown to increase economic development within a corridor by $3-4 dollars for every $1 dollar spent (American Public Transportation Association - Public Transportation: Moving America Forward, 2010). A transit investment in the corridor has the potential to help increase economic development along this corridor.

- The number of homes within the City of Detroit has decreased by nearly 35,000 in the last 15 years. As a result, population density along the corridor is lower in Detroit than in Macomb County.

- Residential vacancy in the City of Mount Clemens nearly doubled, from 6.2 percent to 11.4 percent, between 2000 and 2010, coinciding with the recession and housing crisis of 2008.

- While population is expected to decrease in the corridor, employment within the Gratiot Avenue corridor is expected to increase by nearly 7 percent. Employment growth is expected to be higher in various communities along the corridor, with a 14 percent increase in Clinton Township and a 13 percent increase in Mount Clemens.

NEED #4 - RETAIN AND ATTRACT PEOPLE OF ALL AGES TO THE AREA BY INCREASING THE QUALITY OF LIFE

The communities along the Gratiot Avenue corridor have lost approximately 26 percent of their population during the last fifteen years. Studies have shown that adding enhanced transit along a corridor, with the placement of stations in strategic locations will retain and attract more people to a corridor.

- According to an American Public Transportation Association survey, most millennials prefer to utilize transit or biking over utilizing a car. Communities that attract this specific demographic offer a multitude of transportation choices, including access to good public transit.

- More millennials are also looking for ways to reduce their footprint on the environment by choosing multi-modal means of transportation, with a larger percentage utilizing non-motorized transportation than any other age group that has access to an automobile.

- With an increasing senior population expected within the corridor, it is important to provide additional transportation options to retain and also assist this demographic.

NEED #5 - DEVELOP A TRANSIT SYSTEM THAT IMPROVES CONNECTIVITY BETWEEN ORIGINS AND KEY DESTINATIONS, INCLUDING MAJOR REGIONAL EMPLOYERS

Several significant destinations along Gratiot Avenue between Downtown Detroit and M-59 could be better served by improved transportation options. These destinations include:

- Major Employers: General Motors, Blue Cross/Blue Shield, Quicken Loans, Macomb County, Faygo, Better Made Snack Foods

- Downtown Districts: Detroit, Eastpointe, Roseville, Mount Clemens, Gratiot DDA in Clinton Township

- Major Shopping: Eastern Market, Macomb Mall, Gratiot Plaza Shopping Center, The Shops at Northeast Village Shopping Center

- Recreational: Dequindre Cut Greenway, Conner Creek Greenway, Metro Parkway Trail, Clinton River Spillway Trail, Lincoln Memorial Park, Better Made Snack Foods, Michigan Military Technical & Historical Society, Michigan Transit Museum, Sanders Chocolate & Ice Cream Shoppe, Selfridge Military Air Museum, Crocker House Museum

- Educational: Detroit Public Library, Roseville Public Library, Eastpointe Public Library, Baker College, Oakland Community College, Macomb Community College, East Detroit High School, Mount Clemens High School, Catherine C. Blackwell Institute, Dianne M. Pellerin Center

- Medical Facilities: Detroit Medical Group, Henry Ford Macomb Hospital, Select Specialty Hospital, Professional Medical, StoneCrest Center

- Community Services: Smart Senior Services, Matrix Human Services, Michigan Department of Human Services, Operation Get Down, Bethlehem House, Franklin-Wright Settlements, Detroit

Housing Commission, Clinton Township Senior Center, Roseville Senior Center, Macomb County Action Center

2.3 Project Goals and Objectives

The following goals and objectives 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 Gratiot Avenue Corridor.

TABLE 2-1: PROJECT GOALS AND OBJECTIVES

Goal	Objective
Provide a reliable alternative to driving	Improve on-time performance and frequency of service
Provide transportation options for people that cannot drive or do not have access to a car	Increase transit accessibility
Stimulate economic development along the corridor	Provide transit service that can influence more mixed-use development along the corridor.
Retain and attract people of all ages to the area	Provide flexible, reliable transportation options
Provide a service that is competitive with vehicular travel times	Improve transit travel times and speeds within the study area
Provide one-seat transit service between Macomb County and Detroit during the mid-day	Reduce the number of transit trips that require a transfer
Develop a transit system that improves connectivity between origins and key destinations, including major regional employers	Provide convenient and accessible transit service to activity centers
Improve safety for all users along the corridor including those using transit, non-motorized, and vehicular	Identify improvements at high crash locations and separate modes where feasible, provide a system with security features at stations
Reduce traffic congestion within the region	Provide additional transit options that are competitive with the automobile to promote a mode-shift
Develop a rapid transit system that is economically viable for the region	Provide transit service that can be constructed, operated and maintained at low costs
Provide a transit service that is integrated with a multi-modal transportation network	Provide connections to non-motorized facilities that are along or cross the corridor and design a system that can enhance the non-motorized experience along Gratiot Avenue.

2.4 Project Decision-Making

This project was initiated and led by the RTA and was supported by two committees that provided technical guidance and policy oversight: 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. They worked with the RTA, the 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.

TABLE 2-2: PROJECT DECISION-MAKING PROCESS

<table>
<tr><th colspan="2">Project Decision-Making Process</th></tr>
<tr><td colspan="2">RTA Board of Directors</td></tr>
<tr><td colspan="2">Gratiot Avenue Transit Study Project Team
RTA Staff
WSP | Parsons Brinckerhoff Team</td></tr>
<tr><td>Policy Advisory Committee
Municipal Elected Officials
Agency Leadership
Corridor Organization Leadership</td><td>Technical Advisory Committee
Municipal Staff
Agency Staff
Corridor Organization Staff</td></tr>
</table>

2.5 Summary of Stakeholder Involvement

The primary objective for the Gratiot Avenue Transit Study community engagement has been to involve local and regional stakeholders in a meaningful conversation about developing Gratiot Avenue as one of the three southeast Michigan rapid transit corridors and tying the route into the regional system for optimal travel for all users.

The community engagement strategy has included:

- Listening to stakeholder concerns and aspirations
- Reviewing and incorporating existing community development, land use and other plans that may impact transit planning along the corridor and in the surrounding area
- Making the case for the corridor (Gratiot Avenue) and regional transportation by providing 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.

Through inclusive stakeholder engagement tactics, the project 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 region. This engagement allowed the project team was able to determine specific public needs associated with the project, such as:

- Route alternatives on Main Street and Gratiot Avenue in Mt. Clemens
- Route alternatives that serve key destinations within downtown Detroit, including the Renaissance Center, the Central Business District, the Entertainment District, and the Rosa Parks Transit Center

- Selection of the Dedicated Lane Median Running alternative as the preferred runningway
- Selection of stations that best serve the existing and future interests of each corridor community
- Selection of stations that could best accommodate park-and-ride facilities within each community
- Importance of on-street parking impacts for each community along the corridor
- Importance of providing "last mile" shuttle service north of M-59 to 23 Mile Road
- Importance of ensuring that the Gratiot Avenue BRT line will connect to the other rapid transit corridors
- Importance of providing service to Detroit Metro Airport for all flight schedules and second/third shift employees

The following public engagement activities have been conducted to date as part of the Gratiot Avenue Transit Study.

TABLE 2-3: PUBLIC ENGAGEMENT ACTIVITY SUMMARY TABLE

Location	Date
Macomb County Planning	April 1, 2015
City of Mount Clemens Staff	April 1, 2015
City of Eastpointe Staff	April 2, 2015
Clinton Township Staff	April 9, 2015
City of Roseville Staff	April 16, 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
City of Detroit Public Meeting at Matrix Center	June 9, 2015
Eastern Market	June 13, 2015
Eastern Market	June 16, 2015
Eastern Market	June 23, 2015
Mount Clemens DDA	July 1, 2015
Art of Resilience Festival, Detroit	July 25, 2015
City of Detroit Precinct 5 Neighborhood Meeting	September 2, 2015
City of Detroit Precinct 11 Neighborhood Meeting	September 8, 2015
City of Detroit Department of Neighborhoods	September 16, 2015
Eastern Market Public Meeting	September 30, 2015
Roseville Public Meeting	September 30, 2015
Detroit Matrix Center Public Meeting	October 1, 2015
City of Detroit Precinct 9 Neighborhood Meeting	October 1, 2015
Detroit Economic Growth Corporation	October 30, 2015

Location	Date
Matrix Center Halloween Event	October 30, 2015
East Outer Drive Community Association Meeting	October 31, 2015
DDOT Bus Survey	October 2015
Gratiot Avenue Business Association (GABA)	November 4, 2015
Eastern Market 2025 Public Meeting	November 4, 2015
Joint Mount Clemens / Clinton Township Planning Commission	November 4, 2015
City of Detroit Precinct #5 Neighborhood Meeting	November 4, 2015
Mount Clemens / Clinton Township TOD Workshop	November 9, 2015
Detroit TOD Workshop	November 10, 2015
Eastpointe DDA Meeting	November 10, 2015
Roseville/Eastpointe TOD Workshop	November 10, 2015
Macomb Area Communities for Regional Opportunities (MACRO)	November 12, 2015
Clinton Township Board Meeting	November 16, 2015
Downtown Detroit Commuter Popups	November 17 - 20, 2015
Eastpointe City Council Meeting	November 17, 2015
Advancing Macomb Network Event	November 19, 2015
Detroit Future City	November 23, 2015
Roseville City Council Meeting	November 24, 2015
City of Detroit Planning Department	November 30, 2015
Mt. Clemens DDA	December 9, 2015
Macomb County Planning	December 9, 2015,
Detroit Catholic Pastoral Alliance	December 10, 2015
City of Detroit Precinct #9 Neighborhood Meeting	December 3, 2015
Bingo With Benson	December 11, 2015
RTA Citizens Advisory Committee	December 14, 2015
Downtown Detroit Workshop	December 15, 2015
Mount Clemens City Commission	December 21, 2015
MDOT Meeting	February 12, 2016
MDOT Meeting	February 26, 2016
RTA PSCC Meeting	March 9, 2016
RTA Board Meeting	March 17, 2016
RTA CAC Meeting	March 28, 2016
March 2016 Open Houses	March 29, 2016 – April 2, 2016
Mount Clemens City Commission	April 18, 2016
Eden Gardens Community Meeting	April 21, 2016
Gratiot Woods Community Meeting	April 21, 2016
Clinton Township Board of Trustees Meeting	April 25, 2016
Roseville City Council Meeting	April 26, 2016
RTA PSCC Meeting	May 12, 2016

TABLE 2-4: GRATIOT AVENUE TECHNICAL COMMITTEE MEMBERS

Name	Community / Organization
Carlo Santia	Clinton Township
Elizabeth Vogel	Clinton Township
Casey McNeill	Detroit Department of Transportation
Ashok Patel	Detroit
Jean Paul Harang	Detroit
Prasad Nannapaneni	Detroit
Cornelius Henry	Detroit People Mover
Joseph Merucci	Eastpointe
Steve Duchane	Eastpointe
Ryan Epstein	M1 Rail
Sommer Woods	M1 Rail
Steve Cassin	Macomb County
John Culcasi	Macomb County
Adam Merchant	Macomb County Department of Roads
John Abraham	Macomb County Department of Roads
Jim Schultz	Michigan Department of Transportation
Brian Tingley	Mount Clemens
Jennifer Neal	Mount Clemens
Steve Brown	Mount Clemens
Brandon Jonas	Roseville
Gerald Hasspacker	RTA Citizens Advisory Committee
Arthur Divers	RTA Citizens Advisory Committee
Alex Bourgeau	SEMCOG
Natalie Youakim	SEMCOG
Fred Barbret	SMART

TABLE 2-5: GRATIOT AVENUE POLICY COMMITTEE MEMBERS

Name	Community / Organization
Melissa Roy	Advancing Macomb
Bob Cannon	Clinton Township
Dan Dirks	Detroit Department of Transportation
Councilman Benson	Detroit
Councilman Spivey	Detroit
Councilwoman Castaneda-Lopez	Detroit
Councilwoman Sheffield	Detroit
Jed Howbert	Detroit
Marcell Todd	Detroit
Maurice Cox	Detroit
Tiombe Nakenge	Detroit
Tammy Carnrike	Detroit Regional Chamber
Barbara Hansen	Detroit People Mover
Cardi DeMonaco	Eastpointe
Mary Van Haaren	Eastpointe
Suzanne Pixley	Eastpointe
Paul Childs	M1 Rail
John Paul Rea	Macomb County
Mark Hackel	Macomb County

Name	Community / Organization
Bob Hoepfner	Macomb County Department of Roads
Drew Buckner	MDOT
Rita Screws	MDOT
Tony Kratofil	MDOT
Barb Dempsey	Mount Clemens
Scott Adkins	Roseville
Carmine Palombo	SEMCOG
Robert Cramer	SMART
Rudy Hobbs	Wayne County

TABLE 2-6: GRATIOT AVENUE CORRIDOR STUDY TECHNICAL AND POLICY COMMITTEE MEETINGS

Meeting	Date
Joint Technical and Policy Committee Meeting	April 22, 2015
Technical Committee Meeting	June 3, 2015
Technical Committee Meeting	July 1, 2015
Policy Committee Meeting	July 15, 2015
Joint Technical and Policy Committee Bus Tour	August 5, 2015
Technical Committee Meeting	September 2, 2015
Technical Committee Meeting	October 7, 2015
TOD Workshops	November 9 – 11, 2015
Joint Technical and Policy Committee Meeting	December 2, 2015
Joint Technical and Policy Committee Meeting	January 20, 2016
Joint Technical and Policy Committee Meeting	February 24, 2016
Joint Technical and Policy Committee Meeting	April 20, 2016

TABLE 2-7: TOTAL RTA SOCIAL MEDIA ACTIVITY SUMMARY TABLE

Social Media Platform	Activity		
Facebook	Likes	Impressions	
	3,224	896,000	
Twitter	Followers	Retweets	Mentions
	452	1,100	2,700
YouTube	Views		
	512		

3 Evaluation Process and Results

3.1 Alternative Development and Evaluation Process Overview

The Gratiot Avenue Transit Study is following a three-step method to develop and identify the LPA:

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

The evaluation criteria associated with each step are 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 and will identify the Preferred Alternative(s), and the third step will evaluate the Preferred Alternative(s) against federal criteria to determine the Locally Preferred Alternative. This three-step process results in the identification of an LPA that not only meets locally-identified project purpose and needs, but is also competitive for federal funding.

TABLE 3-1: EVALUATION CRITERIA SUMMARY

Goal	Tier 1: Fatal Flaw Analysis (Qualitative)	Tier 2: Detailed Evaluation (Qualitative And Quantitative)	Tier 3: Refine The LPA (Qualitative And Quantitative)
Provide a reliable alternative to driving	Reliability / Improve on-time performance	Service Plan Opportunities Transit travel time	
Provide transportation options for people that cannot drive or do not have access to a car	Social Equity / Accessibility	Proximity to/number of zero car and transit dependent households	
Stimulate economic development along the corridor	Economic development potential	Land use and economic development opportunities	
Retain and attract people of all ages to the area	Flexibility / Reliability	Service Plan Opportunities Transit travel time Connections to multi-modal systems	
Provide a service that is competitive with vehicular travel times	Potential for Mode Shift	Transit travel times Ridership	
Provide one-seat transit service between Macomb County and Detroit during the mid-day	Frequency	Service Plan Opportunities	
Develop a transit system that improves connectivity between origins and key destinations, including major regional employers	Local and Regional Connectivity	Connections to key origins and destinations along corridor Connections to Transit Centers and other routes	
Improve safety for all users along the corridor including those using transit, non-motorized, and vehicular	Safety / Security	Safety impacts to transit, non-motorized and vehicular Security enhancements	
Reduce traffic congestion within the region	Potential for Mode Shift	Potential for reduction in traffic congestion	
Develop a rapid transit system that is economically viable for the region	Cost to Build, Operate and Maintain	Cost to Build, Operate and Maintain Cost effectiveness Community Support	*FTA competitiveness (based on Cost-Effectiveness criteria)
Provide a transit service that is integrated with a multi-modal transportation network	Multi-modal connectivity	Connections to non-motorized system Existing and Potential Walkability	

*Consistent with FTA New Starts/Small Starts criteria

3.2 Tier 1 Definition and Evaluation of Alternatives

3.2.1 TIER 1 ALTERNATIVES

EXPRESS BUS

Express Bus service would operate within the existing right-of-way of Gratiot Avenue and would represent an expanded and enhanced version of current SMART service along the corridor. Buses would operate in mixed-traffic and would be intended to serve longer, commuter-based trips with frequent headways during the AM and PM peak hours. Stations would be spaced every two (2) to five (5) miles and would include simple bus shelters and seating. The maximum peak hour directional capacity of Express Bus service would be 500 passengers.

FIGURE 3-1: EXPRESS BUS

BUS RAPID TRANSIT (BRT)

Bus Rapid Transit (BRT) service would operate within the existing right-of-way of Gratiot Avenue and would represent an elevated level of transit from current local bus operations. BRT vehicles would operate both in mixed-traffic and dedicated lanes and would be intended to serve short, medium, and long distance trips, with 10 minute headways during the AM and PM peak hours. Stations would be spaced every half (1/2) mile to one (1) mile, but would be of higher design with some amenities included. The maximum peak hour directional capacity of BRT would be 1,350 passengers.

FIGURE 3-2: BRT

PREMIUM BUS RAPID TRANSIT (PREMIUM BRT)

Premium Bus Rapid Transit (Premium BRT) would operate within the existing right-of-way of Gratiot Avenue but would primarily function in dedicated lanes separate from vehicular traffic. Premium BRT would be intended to serve short, medium, and long distance trips, with 10 minute or better headways during the AM and PM peak hours. Stations would be spaced every half (1/2) mile to one (1) mile, and would be of higher design with a variety of amenities, including level boarding, weather protection, off-board fare collection, and real-time travel information. The maximum peak hour directional capacity of Premium BRT would be 2,000 passengers.

FIGURE 3-3: PREMIUM BRT

STREETCAR

Streetcar service would operate within the existing right-of-way of Gratiot Avenue and would represent a major capital transit investment along the corridor. Streetcars would operate in mixed-traffic and would be intended to primarily serve short distance trips, with 10 minute headways during the AM and PM peak hours. Stations would be spaced every quarter (1/4) mile to half (1/2) mile, and would be of higher design with a variety of amenities, including level boarding, weather protection, off-board fare collection, and real-time travel information. The maximum peak hour directional capacity of Streetcar would be 1,500 passengers.

FIGURE 3-4: STREETCAR

LIGHT RAIL

Light Rail service would operate within the existing right-of-way of Gratiot Avenue but would function in dedicated guideways separate from vehicular traffic. Light Rail would be intended to serve short, medium, and long distance trips, with 10 minute headways during the AM and PM peak hours. Stations would be spaced every one (1) to two (2) miles, and would be of higher design with a variety of amenities, including level boarding, weather protection, off-board fare collection, and real-time travel information. The maximum peak hour directional capacity of Light Rail would be 4,000 passengers.

FIGURE 3-5: LIGHT RAIL

COMMUTER RAIL

Commuter Rail service would operate within existing rail rights-of-way that run parallel to Gratiot Avenue. Commuter Rail would be intended to serve longer, commuter-based trips with frequent headways during the AM and PM peak hours. Stations would be spaced every two (2) to five (5) miles, and would be of higher design with a variety of amenities, including level boarding, weather protection, off-board fare collection, and real-time travel information. The maximum peak hour directional capacity of Commuter Rail would be 10,000 to 20,000 passengers.

FIGURE 3-6: COMMUTER RAIL

3.2.2 TIER 1 EVALUATION CRITERIA AND SUMMARY RESULTS

Each mode was evaluated against each evaluation criterion on a pass or not pass basis. A mode that received two or more "not pass" rankings was be assigned an overall assessment of "defer." An overall assessment of "defer" means that the overall mode does not meet the stated purpose and need of this study and will not be carried further as an option. However, any mode that is deferred at this time may meet the needs of future studies. The modes that "pass" were carried forward into the Tier 2 Detailed Definition and Evaluation Phase of the project. A detailed summary of the Tier 1 Evaluation is illustrated in Table 3-2.

TABLE 3-2: TIER 1 EVALUATION SUMMARY RESULTS

Mode	Overall Assessment	Reason for Deferral
Express Bus	Defer	• Would not improve on-time performance • Would not improve accessibility • Would not improve economic development • Low potential for mode shift • Would not provide a one-seat ride all day • Would not improve local and regional connectivity • Lower improvement in safety and security • Would not improve connections to other modes
BRT	Pass	--
Premium BRT	Pass	--
Streetcar	Defer	• Would not have flexibility • High capital cost to serve the entire corridor
Light Rail	Defer	• Would not have flexibility • High capital cost to serve the entire corridor

Mode	Overall Assessment	Reason for Deferral
Commuter Rail	Defer	• Would not improve accessibility • Would not improve economic development • Would not have flexibility • Would not provide a one-seat ride all day • Would not improve local and regional connectivity • High capital cost to serve the entire corridor • Would not improve connections to other modes

Based on this evaluation, ***BRT*** and ***Premium BRT*** were advanced to the Tier 2 Definition and Evaluation of Alternatives.

3.3 Tier 2 Definition and Evaluation of Alternatives

3.3.1 TIER 2 ALTERNATIVES

NO BUILD

The No Build alternative would be comprised of all the transit improvements within the Gratiot 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:

- DDOT Route 34 – Gratiot
- SMART Route 560 – Gratiot Local
- SMART Route 565 – Gratiot Limited

The No Build alternative assumes no changes to existing stop spacing for any existing transit routes operating within the Gratiot Avenue corridor. Local bus service includes a range of bus stop facilities for riders, including combinations of shelters, signage, seating, trash receptacles and route and schedule information. Passenger amenities and shelters are not, however, currently provided at all key stops and transfer points. Additional shelters are therefore recommended at several locations as part of the No Build alternative.

The No Build alternative will continue to operate in mixed traffic along the Gratiot Avenue corridor, and will continue to use existing 40-foot low-floor diesel buses. Older vehicles would be replaced in compliance with FTA guidance based on available funding. This alternative will continue to accept on-board fare payment, and no changes or updates to existing technology would be included.

BUS RAPID TRANSIT – MIXED TRAFFIC CURB RUNNING

The BRT – Mixed Traffic Curb Running alternative would operate in existing general purpose lanes adjacent to the curb and would share space with vehicular traffic and local bus service. Figure 3-7 illustrates this concept.

FIGURE 3-7: MIXED TRAFFIC CURB RUNNING

The service will operate at 10 minute frequency during the weekday peak, 15 minute frequency during the midday, 20 minute frequency during weekends, and 60 minute frequency during late night. Service plans evaluated as part of this alternative include:

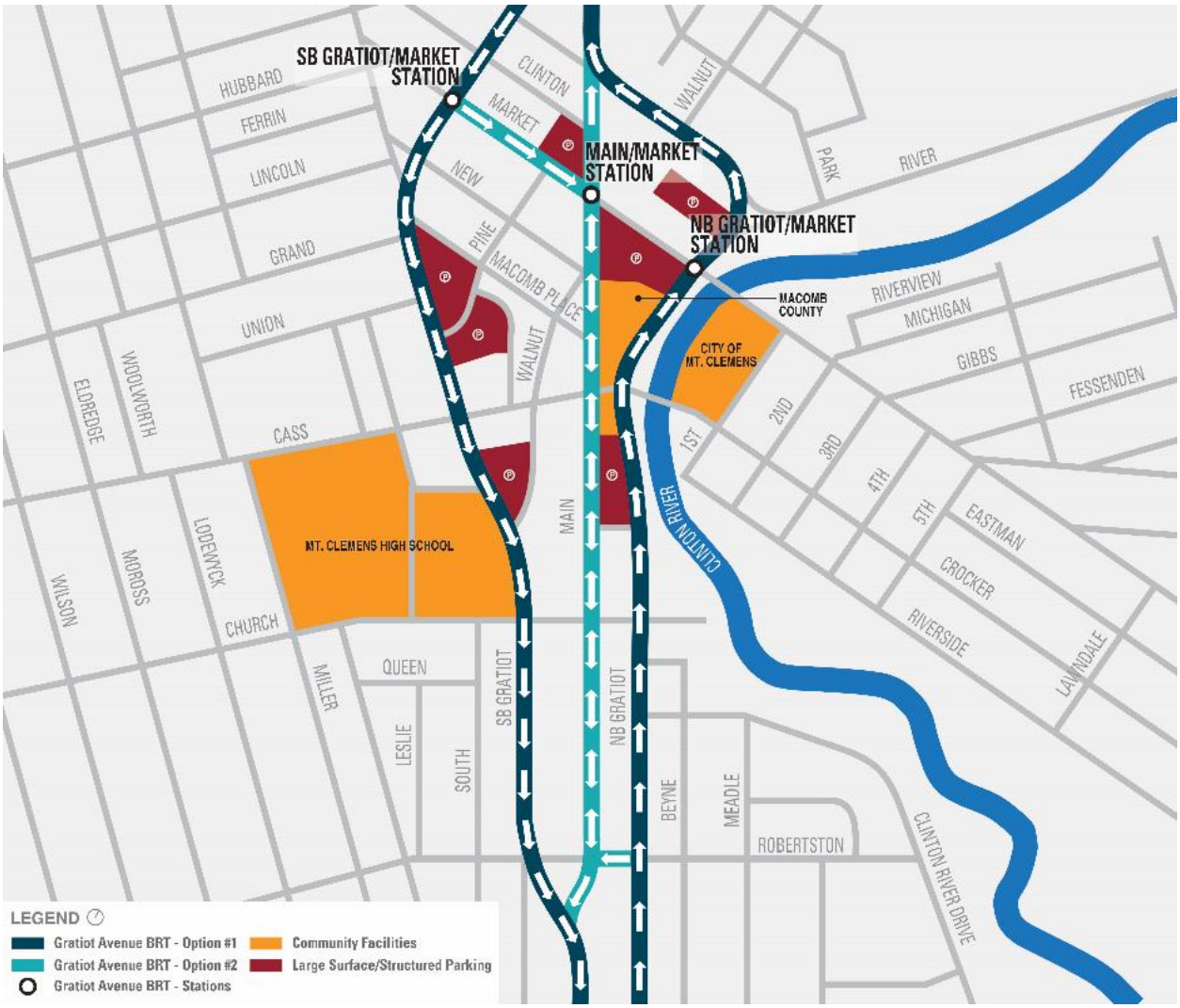
- Service Plan A: Detroit to M-59 via Gratiot Avenue
- Service Plan B: Detroit to M-59 via Gratiot Avenue and Main Street (within Mt. Clemens)

Figure 3-8 illustrates these two service plan options.

To achieve the travel time advantage goals of this project, stations will be spaced approximately one mile apart and will be placed in areas with activity centers and other trip generators. Stations will be designed to include recognizable shelters with weather protection, off-board fare collection, level boarding, real-time bus location information, seating, safety upgrades, route and schedule information, and bicycle parking.

BRT vehicles would use existing roadways and traffic lanes and would operate in the same manner as buses in the current system, by loading and unloading passengers on the right-hand side of the bus and roadway. This 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.

FIGURE 3-8: MOUNT CLEMENS OPTIONS



BUS RAPID TRANSIT – DEDICATED LANE CURB RUNNING

The BRT – Dedicated Lane Curb Running alternative would operate in a dedicated transit lane adjacent to the curb. The transit lane will not be grade-separated, but will be visually distinctive from general purpose lanes through the use of lane markings and posted signage. Figure 3-9 illustrates this runningway type.

FIGURE 3-9: DEDICATED LANE CURB RUNNING

General vehicular traffic will be still able to access the lane for right turns at intersections and access to driveways and parking lots along the length of the alignments. Local bus service would also be allowed to utilize the lane. The service will operate at 10 minute frequency during the weekday peak, 15 minute frequency during the midday, 20 minute frequency during weekends, and 60 minute frequency during late night. Service plans evaluated as part of this alternative include:

- Service Plan A: Detroit to M-59 via Gratiot Avenue
- Service Plan B: Detroit to M-59 via Gratiot Avenue and Main Street (within Mt. Clemens)

To achieve the travel time advantage goals of this project, stations will be spaced approximately one mile apart and will be placed in areas with activity centers and other trip generators. Stations will be designed to include recognizable shelters with weather protection, off-board fare collection, level boarding, real-time bus location information, seating, safety upgrades, route and schedule information, and bicycle parking.

BRT vehicles would operate in the same manner as buses in the current system, by loading and unloading passengers on the right-hand side of the bus and roadway. This 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 LANE MEDIAN RUNNING

The BRT – Dedicated Lane Median Running alternative would operate in a dedicated transit lane adjacent to the median. The transit lane will not be grade-separated, but will be visually distinctive from general purpose lanes through the use of lane markings and posted signage. Left turns will be limited to signalized intersections in order to mitigate potential conflicts between the transit vehicles and left-turning general traffic. Figure 3-10 illustrates this runningway options.

FIGURE 3-10: DEDICATED LANE MEDIAN RUNNING BRT

The service will operate at 10 minute frequency during the weekday peak, 15 minute frequency during the midday, 20 minute frequency during weekends, and 60 minute frequency during late night. Service plans evaluated as part of this alternative include:

- Service Plan A: Detroit to M-59 via Gratiot Avenue
- Service Plan B: Detroit to M-59 via Gratiot Avenue and Main Street (within Mt. Clemens)

To achieve the travel time advantage goals of this project, stations will be spaced approximately one mile apart and will be placed in areas with activity centers and other trip generators. Stations will be designed to include recognizable shelters with weather protection, off-board fare collection, level boarding, real-time bus location information, seating, safety upgrades, route and schedule information, and bicycle parking.

BRT vehicles would operate by loading and unloading passengers on either the right-hand side of the bus or the left-hand side of the bus, depending on the final station design. This 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 LANE CENTER RUNNING

The BRT – Dedicated Lane Center Running alternative would operate in a dedicated transit lane at the center of the roadway. The transit lane will not be grade-separated, but will be visually distinctive from general purpose lanes through the use of lane markings and posted signage. Left turns will be limited to signalized intersections in order to mitigate potential conflicts between the transit vehicles and left-turning general traffic. Figure 3-11 illustrates this runningway option.

FIGURE 3-11: DEDICATED LANE CENTER RUNNING BRT

The service will operate at 10 minute frequency during the weekday peak, 15 minute frequency during the midday, 20 minute frequency during weekends, and 60 minute frequency during late night. Service plans evaluated as part of this alternative include:

- Service Plan A: Detroit to M-59 via Gratiot Avenue
- Service Plan B: Detroit to M-59 via Gratiot Avenue and Main Street (within Mt. Clemens)

To achieve the travel time advantage goals of this project, stations will be spaced approximately one mile apart and will be placed in areas with activity centers and other trip generators. Stations will be designed to include recognizable shelters with weather protection, off-board fare collection, level boarding, real-time bus location information, seating, safety upgrades, route and schedule information, and bicycle parking.

BRT vehicles would operate by loading and unloading passengers on either the right-hand side of the bus or the left-hand side of the bus, depending on the final station design. This 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.

3.3.2 TIER 2 EVALUATION CRITERIA AND SUMMARY RESULTS

Each alternative was evaluated against each evaluation criterion on a quantitative basis, with each metric tailored to the specific criterion. The evaluation criteria that were used to analyze each alternative included transportation impacts, operations and maintenance costs, capital costs, ridership, environmental impacts, and station area impacts. The following six technical memoranda (tech memos) were developed for the Tier 2 Evaluation and summarized for this report:

- Tech Memo #1: Transportation
- Tech Memo #2: Operations and Maintenance Costs
- Tech Memo #3: Capital Costs
- Tech Memo #4: Ridership
- Tech Memo #5: Environmental Impacts
- Tech Memo #6: Station Area

The aforementioned Tech Memos can be found on the RTA's website at www.rtamichigan.org. Key results and findings from these analyses include:

- **Transportation:** The analysis of transportation impacts associated with each alternative revealed that the Dedicated Lane Median Running alternative tested the highest against each evaluation criteria. The dedicated lane would produce the most competitive BRT travel times (approximately 52 – 56 minutes end-to-end), ensuring efficient and reliable service throughout the corridor. Additionally, the removal of traffic lanes in Detroit to accommodate dedicated BRT lanes would not adversely impact traffic operations, as 20 to 30 percent of traffic is expected to divert to alternate routes. While this alternative would remove approximately 42% of on-street parking (as do the other alternatives), there are off-street parking facilities in 90% of those locations that will mitigate the loss of any on-street spaces. The analysis also revealed that the Dedicated Lane Median Running alternative would have the least impact to vehicular safety and would represent an improved condition for pedestrians and bicyclists.

- **Operations and Maintenance Costs:** Total O&M costs, including operating increases to the local service providers, range between $17.5 and $18.0 million per year, depending on the runningway type. The O&M costs for the Dedicated Lane Median Running alternative are approximately $500,000 less per year due to reduced maintenance costs of the median-adjacent lane and the travel time savings associated with dedicated lanes.

- **Capital Costs:** Total capital costs range between $190 million to $284 million, depending on the runningway type. The capital costs for the Mixed Traffic Curb Running alternative are approximately $50 million less than any of the dedicated lane alternatives as less reconstruction of the roadway would be required.

- **Ridership:** Potential ridership on the system was evaluated to understand the differences between the runningway and service plan alternatives. Metrics from existing transit service providers along the Gratiot Avenue corridor from DDOT and SMART were used to determine the existing daily ridership that was used as a basis for this analysis. Projected daily ridership for each alternative ranges between 12,270 and 13,590, depending on the runningway type and service plan. Projected ridership for the dedicated lane alternatives is approximately 1,000 higher than the Mixed Traffic Curb Running alternative.

- **Environmental Impacts:** 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.

- **Station Area:** Twenty-six potential station locations were identified and evaluated as part of the Station Area memo. The stations that performed the highest were those located in areas with existing transit, high population density, high employment density, high transit dependent population density, and development potential. The results of this analysis indicate that 19 of the 26 station locations will be advanced as part of the LPA.

A detailed summary of the Tier 2 Evaluation is illustrated in Table 3-3 on the following page.

Given the evaluation results and the input from the public and committees, it is recommended that the ***Dedicated Lane Median Running*** alternative and both the ***Mt. Clemens – Gratiot Avenue*** and ***Mt. Clemens – Main Street*** route alternatives be moved forward for further evaluation. Additionally, route alternatives within downtown Detroit are under review by the RTA.

TABLE 3-3: TIER 2 EVALUATION SUMMARY RESULTS

	Service Plan A				Service Plan B			
		Dedicated				Dedicated		
Transportation	**Mixed**	**Curb**	**Median**	**Center**	**Mixed**	**Curb**	**Median**	**Center**
Travel Time *(minutes)*	60 - 77	55 - 61	52 - 56		60 - 77	55 - 61	52 - 56	
# of Intersections with LOS E / F *(count)*	1	1	7	7	1	1	7	7
Parking *(% spots removed)**	4%	39%	39%	39%	4%	42%	42%	42%
Impact to Bike Facilities *(avg)***	Pos	Sig Pos	Sig Pos	Sig Pos	Pos	Sig Pos	Sig Pos	Sig Pos
Impact to Ped Facilities *(avg)***	No Chg	Sig Pos	Sig Pos	Sig Pos	No Chg	Sig Pos	Sig Pos	Sig Pos
Operations & Maintenance Costs								
Annual Cost *(millions)*	$18.00	$18.00	$17.50	$18.00	$18.00	$18.00	$17.50	$18.00
Capital Costs								
Total Cost *(millions)*	$192.00	$240.00	$257.00	$284.00	$190.00	$237.00	$254.00	$282.00
Cost per Mile *(millions)*	$7.79	$9.72	$10.40	$11.51	$7.93	$9.90	$10.60	$11.76
Ridership								
BRT Ridership *(estimate)*	12,270	13,475	13,475	13,475	12,195	13,425	13,475	13,475
Environmental								
Sensitive Lands *(acres)*	16,954				16,954			
Cultural & Historic Resources *(count)*	146				146			
Station Area								
Population *(sum tot. pop. w/in .5 mi of stations)****	88,394				88,394			
Employment *(sum tot. employ. w/in .5 mi of stations)****	81,035				81,035			
Transit Dependent Households *(sum tot. HH w/in .5 mi of stations)****	7,957				7,957			
Development Potential *(average station score, 8 possible points)*	4.08				4.08			

* Potential for localities to choose between bike facilities or on-street parking spaces
** No change, Some Positive Impact, Significant Positive Impact
*** Some double counting occurs due to station area overlap

3.4 Tier 3 Definition and Evaluation of Alternatives

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 opportunities for federal funding through FTA New Starts / Small Starts.

3.4.1 RECOMMENDED ALTERNATIVE REFINEMENTS

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

Following the Tier 2 Evaluation, the preferred alternative was advanced to the Tier 3 Evaluation, which is meant to evaluate the LPA in more detail by utilizing criteria and technical data that are required in FTA Small Starts and New Starts project rating process. The Tier 3 Evaluation generally validates the LPA through the following steps:

BUS RAPID TRANSIT – DEDICATED LANE MEDIAN RUNNING

- Refined traffic and transit operational analysis considering final adjustments and conditions of preferred alternative
- Refined capital costs considering final adjustments and conditions of preferred alternative
- Refined O&M costs considering final adjustments and conditions of preferred alternative
- Application of a validated travel demand model for ridership estimates
- Validated environmental impact analysis of preferred alternative
- Validated station area analysis of station areas included in preferred alternative

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 BRT projects in Michigan, with projects built in Grand Rapids and in design in Lansing. A key criteria 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 3-4 uses that as a benchmark for rating competitiveness. A more complete financial plan for this project would need to be developed at a later date based on regional transit funding levels and priorities.

TABLE 3-4: SMALL STARTS COMPETITIVENESS

Criteria Indicators	Gratiot BRT
Total Capital Cost (2014$)	$252 million
Assumed FTA Capital Cost (50%)	$126 million
Annual O&M Cost	$17.5 million
Average Weekday Ridership	13,500
Cost Effectiveness (annualized cost per rider)	$1.33
Potential FTA Small Starts Rating	Medium-High

To qualify for FTA funding, each project would eventually be evaluated on a host of other FTA "project justification" criteria as shown in Table 3-5 below. The projects would be rated as part of entry into the Project Development process for Small Starts.

TABLE 3-5: SMALL STARTS PROJECT JUSTIFICATION CRITERIA AND SUBFACTORS

Project Justification Criteria	Metrics
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 travelled 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 within ½ mile of station areas to the proportion of "legally binding affordability restricted" housing in the counties through which the project travels

Source: US Federal Transit Administration

4 The Locally Preferred Alternative

Bus Rapid Transit – Dedicated Lane Median Running was selected as the locally preferred alternative for Gratiot Avenue. Service Plan A: Detroit to M-59 via Gratiot Avenue and Service Plan B: Detroit to M-59 via Gratiot Avenue and Main Street (within Mt. Clemens) are both being advanced for further evaluation. The preferred route is 23 miles long. Figure 4-1 shows the LPA route and stations. Figure 4-2 illustrates the two Mt. Clemens routes. Figure 4-3 illustrates a generalized concept of the LPA runningway.

FIGURE 4-2: MOUNT CLEMENS ROUTES

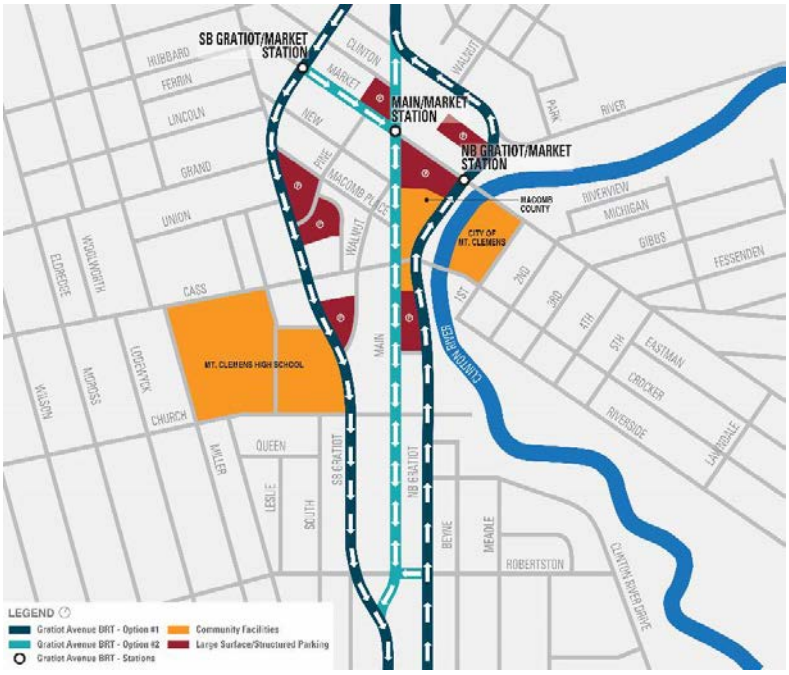


FIGURE 4-1: LPA ROUTE AND STATION LOCATIONS

FIGURE 4-3: LPA RUNNINGWAY CONCEPT (DEDICATED LANE MEDIAN RUNNING)

TABLE 4-1: GRATIOT AVENUE BRT LPA CHARACTERISTICS

Gratiot Avenue Bus Rapid Transit		
Total Length	23 Miles	
Number of Stations	19 Stations	
Operational Characteristics	**Peak Hour Headway**	**Off Peak Hour Headway**
	10 Minutes	15 - 60 Minutes
Travel Time	**Peak Hour BRT Travel Time**	**Peak Hour Auto Travel Time**
	52 minutes - 56 minutes	52 minutes - 57 minutes
Capital Cost	$252,438,970*	
Operating and Maintenance Cost	$17.50	
Environmental Impacts	Low	
Park and Ride Locations	M-59 Metro Parkway Macomb Mall 8 Mile Road McClellan Avenue	
Parking Spaces Impacted	1,033	
Estimated BRT Weekday Ridership	13,500	

Estimated Corridor Weekday Ridership	17,930 boardings per day (+7,375 over baseline)
FTA Cost Effectiveness (Small Starts)	$1.33 (Medium-High)

*Capital Cost differs from Tier 2 Summary Report and Tech Memo #3: Capital Costs due to reduction in stations from 26 to 19

4.1 Operating Characteristics

The Gratiot Avenue BRT line will operate at 10 minute frequency during the weekday peak, 15 minute frequency during the midday, 20 minute frequency during weekends, and 60 minute frequency during late night. Additional service, outside of the Gratiot Avenue BRT line, would also be added to act as feeder service to the communities along the Gratiot Avenue corridor. Additionally, other bus routes would facilitate long distance connections between the corridor communities and Metro Airport and key destinations within Macomb, Oakland, Washtenaw, and Wayne Counties.

4.2 Travel Time Estimates

The Gratiot Avenue BRT line will travel the corridor from downtown Detroit to M-59 in 52 to 56 minutes, depending on the direction of travel. This represents a 32% improvement in travel time compared to existing bus service, made possible by fewer stops, dedicated transit lanes, and transit signal priority. Table 4-2 shows the travel time, distance, and average speed of Gratiot Avenue BRT and existing bus service.

TABLE 4-2: GRATIOT AVENUE BRT TRAVEL TIME

Mode	Total Travel Time	One-Way Distance (miles)	Average MPH
Existing Bus	65 – 75 min (peak) 75 – 95 min (off-peak & weekends)	23	16 – 19
Gratiot Avenue BRT	52 – 56 min	23	26 – 27

4.3 Capital Cost Estimate

The Gratiot Avenue BRT is expected to cost $252 million to construct ($10.5 million per mile). Costs for stations, vehicles, and professional services (design, engineering, and construction) make up about half of the total capital costs for the LPA. A large investment in systems will allow for transit signal priority, off-board fare collection, and the needed communications hardware. Unallocated contingency is another large expenditure, but was purposefully kept conservative at this point in the study. Table 4-3 shows the breakdown of capital costs by SCC code.

TABLE 4-3: GRATIOT AVENUE BRT CAPITAL COST SUMMARY

Standard Cost Category	Description	Cost
SCC 10	Guideway and track elements	$27,933,323
SCC 20	Stations, stops, and terminals	$23,845,687
SCC 30	Support facilities	$5,525,000

Standard Cost Category	Description	Cost
SCC 40	Sitework and special conditions	$45,033,291
SCC 50	Systems	$52,042,457
SCC 60	Right-of-Way, land, existing improvements	$4,057,200
SCC 70	Vehicles	$22,585,500
SCC 80	Professional services	$35,626,098
SCC 90	Unallocated Contingencies	$28,632,332
SCC 100	Finance charges	$7,158,083
Total Capital Cost		**$252.44 million**
Total Capital Cost Per Mile		**$10.52 million**

4.4 Operations and Maintenance Costs

The Gratiot Avenue BRT line is expected to cost $17.5 million per year to operate and maintain. Table 4-4 shows the detailed total O&M costs for the LPA.

TABLE 4-4: GRATIOT AVENUE BRT OPERATIONS AND MAINTENANCE COSTS

Service	Alternative	
	Annual O&M Costs: No Build ($Millions)	**Annual O&M Costs: Dedicated Lane Median Running ($Millions)**
BRT	$0	$14.8
SMART Local	$0.5	$2.7
TOTAL	$0.5	$17.5
Inc. Difference		$17.0

4.5 Ridership

Metrics from existing transit service along the corridor from DDOT and SMART were used to determine daily ridership for the Gratiot Avenue BRT line. The ridership estimate for the Gratiot Avenue BRT LPA was updated by using the recalibrated version of the E6C+ model with 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 13,500 boardings.

TABLE 4-5: GRATIOT AVENUE BRT STATIONS

Gratiot Avenue BRT Stations	General Overview	Nearby Destinations	Land Use	Economic Development Potential	Transit Connections	Potential Park & Ride Location	Street Character	Population Density	Employment Density	Bike/Ped Accessibility
M-59	M-59 represents a major east-west regional thoroughfare and a priority corridor for the RTA. As one of the more heavily traveled thoroughfares in Macomb County, a station at M-59 has excellent potential to accommodate a park-and-ride facility as well as operating as a central node to connect Macomb County with the Gratiot BRT line.	Selfridge Air Force Base, The Mall at Partridge Creek, Macomb Community College	Suburban Residential / Retail	Low	1	Yes	Four travel lanes in each direction, wide landscaped median, no street parking, non-continuous sidewalks	1,398	1,177	Low
Downtown Mt. Clemens	Downtown Mt. Clemens is one of the major population and activity centers along Gratiot Avenue. Home to offices for Macomb County and the City of Mt. Clemens as well as an active downtown district, this station area has the potential to attract a significant number of riders and serve major destinations near the northern terminus of the BRT line.	Macomb County Administration Buildings, Macomb County Circuit Court, Mt. Clemens City Hall, Downtown Mt. Clemens commercial/retail, Clinton River	Downtown Urban	High	1	-	One travel lane in each direction, angled street parking, continuous sidewalks	3,149	3,594	High
South River	Located directly south of the Clinton River, this location will serve adjacent residential neighborhoods and provide connections to the Clinton River and regional trail network	Clinton River, Clinton River Spillway Trail	Suburban Residential / Retail	Low	1	-	Three travel lanes in each direction, no street parking, continuous sidewalks	2,741	3,123	Medium
Metro Parkway	Metro Parkway represents a major east-west regional thoroughfare and transit connection. A station at Metro Parkway will provide connections to the regional trail network and has excellent potential to accommodate a park-and-ride facility	Metro Parkway / Freedom Trail	Suburban Residential / Retail	Low	1	Yes	Four travel lanes in each direction, wide landscaped median, no street parking, continuous sidewalks	2,632	697	Medium
15 Mile	15 Mile represents a major east-west regional thoroughfare and transit connection. A station at 15 Mile will provide connections to Baker College and Clintondale High School	Baker College, Clintondale High School	Suburban Residential / Retail	Low	2	-	Four travel lanes in each direction, wide landscaped median, no street parking, continuous sidewalks	2,680	1,214	Low
Macomb Mall	A station adjacent to Macomb Mall north of Masonic Boulevard will provide connections to employment centers in/adjacent to the mall and Sam's Club to the southeast	Macomb Mall, Sam's Club	Suburban Residential / Retail	Medium	4	Yes	Four travel lanes in each direction, wide landscaped median, no street parking, continuous sidewalks	2,135	2,654	Low
12 Mile	12 Mile represents a major east-west regional thoroughfare and transit connection. A station at 12 Mile will provide connections to Roseville City Hall and the nearby retail.	Roseville City Hall, Roseville Plaza Shopping Center	Suburban Residential / Retail	Low	2	-	Four travel lanes in each direction, wide landscaped median, no street parking, continuous sidewalks	4,085	1,953	Low
Utica Junction	Utica Junction represents Roseville's downtown district and an area of investment priority for the city. A station at the nexus of Utica Junction will provide connections to existing and future downtown retail and commercial uses.	Downtown Roseville retail/commercial	Urban Residential / Retail	High	1	-	Four travel lanes in each direction, wide landscaped median, street parking, continuous sidewalks	4,674	1,761	Medium
10 Mile	10 Mile represents a major east-west regional thoroughfare. A station near 10 Mile will serve adjacent residential neighborhoods and provide a connection to nearby I-696.	I-696	Suburban Residential / Retail	Low	2	-	Four travel lanes in each direction, wide landscaped median, no street parking, continuous sidewalks	4,684	1,880	Low
9 Mile	9 Mile represents a major east-west regional corridor and Eastpointe's downtown district. A station near 9 Mile will provide connections to Downtown Eastpointe and multiple community facilities.	Downtown Easpointe retail/commercial, Eastpointe City Hall, Eastpointe Memorial Library, East Detroit High School, St. Peters Lutheran Church	Suburban Residential / Retail	Medium	2	-	Four travel lanes in each direction, wide landscaped median, street parking, continuous sidewalks	5,355	1,645	Low
8 Mile	8 Mile represents a major east-west regional corridor. A station near 8 Mile will serve adjacent residential neighborhoods and will represent a major transfer point to SMART/DDOT service.	SMART/DDOT major crosstown routes	Urban Residential / Retail	Medium	3	Yes	Four travel lanes in each direction, wide landscaped median, no street parking, continuous sidewalks	5,256	1,478	Medium
7 Mile	A station near 7 Mile will serve adjacent residential neighborhoods with high concentrations of transit-dependent households as well as community facilities and neighborhood retail.	Michigan Department of Human Services, The Shops at Northeast Village Shopping Center	Urban Residential / Retail	Medium	4	-	Two travel lanes in each direction, narrow landscaped median, street parking or bike lanes, continuous sidewalks	4,704	1,328	Medium

Gratiot Avenue BRT Stations	General Overview	Nearby Destinations	Land Use	Economic Development Potential	Transit Connections	Potential Park & Ride Location	Street Character	Population Density	Employment Density	Bike/Ped Accessibility
McNichols	A station near McNichols will serve adjacent residential neighborhoods with high concentrations of transit-dependent households as well as community facilities and Assumption Grotto Catholic Church.	Assumption Grotto Catholic Church, Matrix Human Services	Urban Residential / Retail	Medium	4	-	Two travel lanes in each direction, narrow landscaped median, street parking or bike lanes, continuous sidewalks	4,259	1,176	Medium
Outer Drive	A station near Outer Drive will serve adjacent residential neighborhoods with high concentrations of transit-dependent households as well as the Coleman A. Young International Airport and major employer Better Made Snack Foods.	Coleman A. Young International Airport, Better Made Snack Foods	Urban Residential / Retail	Medium	5	-	Two travel lanes in each direction, narrow landscaped median, street parking or bike lanes, continuous sidewalks	3,312	1,135	Medium
McClellan	A station near McClellan will serve adjacent residential neighborhoods with high concentrations of transit-dependent households as well as the Blackwell Institute, Nativity of Our Lord and major employer Better Made Snack Foods. This station will also provide a connection to nearby I-94.	I-94, Blackwell Institute, Nativity of Our Lord, Better Made Snack Foods	Urban Residential / Retail	Medium	4	Yes	Two travel lanes in each direction, narrow landscaped median, street parking or bike lanes, continuous sidewalks	3,351	812	Medium
Warren	Warren represents a major east-west regional thoroughfare and transit connection. A station near Warren will represent a major transfer point to SMART/DDOT service.	Dueweke Park, DDOT major crosstown routes	Urban Residential / Retail	Low	6	-	Two travel lanes in each direction, narrow landscaped median, street parking or bike lanes, continuous sidewalks	2,890	1,096	Medium
Mack	A station near Mack will serve adjacent residential neighborhoods with high concentrations of transit-dependent households as well as major employer Faygo Beverages.	Faygo Beverages	Urban Residential / Retail	Low	6	-	Two travel lanes in each direction, narrow landscaped median, street parking or bike lanes, continuous sidewalks	1,958	1,090	Medium
Eastern Market	Eastern Market is a regional attraction and employment center. A station north of Russell Street will serve the entire Eastern Market district as well as neighboring residential and commercial uses.	Eastern Market, Lafayette Park, Brewery Park, Crain's Communications	Downtown Urban	High	7	-	Two travel lanes in each direction, narrow landscaped median, street parking or bike lanes, continuous sidewalks	4,290	5,598	High
Bricktown	A station near Bricktown will provide direct access to major employment/activity centers within the eastern portion of Downtown Detroit and will represent a major transfer point to SMART/DDOT/DPM service.	Greektown, Greektown Casino/Hotel, Ford Field, Comerica Park, 36th District Court, 3rd Judicial Circuit Court, Renaissance Center, Blue Cross Blue Shield, Downtown Detroit retail/commercial	Downtown Urban	High	6	-	Two travel lanes in each direction, narrow landscaped median, street parking, continuous sidewalks	4,185	39,047	High

5 Next Steps

5.1 Approval and Adoption of the LPA

The RTA Board of Directors will consider the recommended LPA during May of 2016, allowing the RTA and Gratiot 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 Gratiot 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.

5.3 Request Entry into FTA Small / New Starts

The Gratiot 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 Michigan 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 Gratiot 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.