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APPENDICES

Appendix A – Proposed Operating Plan and Assumptions

Other referenced materials are contained in applicable tabbed sections of the Very Small Starts submittal package.

Great Transit Grand Tomorrows Study

Alternatives Analysis Report

E1.0 EXECUTIVE SUMMARY

Beginning in early 2003, the Interurban Transit Partnership, also known as *The Rapid*, initiated the Great Transit Grand Tomorrows (GT2) Study. The purpose was to identify the need for a future transit investment in the Greater Grand Rapids Metropolitan Area. This planning process was a first step under Federal Transit Administration (FTA) “New Starts” guidelines necessary for partial federal funding of a potential transportation improvement project. The GT2 Study was a cooperative effort supported and funded by the FTA, Michigan Department of Transportation (MDOT), Wege Foundation, and Urban Cooperation Board.

The GT2 Study has advanced over the past few years, with a narrowing and screening of possible transit modes, corridors, and alignments. At the same time, the FTA’s New Starts program has evolved, becoming more stringent and competitive. In addition, a “Small Starts” program has recently emerged, presenting federal funding opportunities for smaller transit projects. The change in FTA’s program prompted *The Rapid* to identify a potential “Very” Small Starts project for the GT2 Study.

Per the *Interim Guidance and Instructions for Small Starts*, this document presents the “Alternatives Analysis” process by which a wide range of transportation options was evaluated against needs and goals for the GT2 Study Area, finally narrowing to Bus Rapid Transit (BRT) in the South Corridor as the Locally Preferred Alternative (LPA). The LPA was adopted by *The Rapid* Board of Directors on January 24, 2007 and included in the Grand Valley Metro Council’s (GVMC) regional Long Range Transportation Plan on April 9, 2007 by a unanimous vote of the Council members.

E2.0 BACKGROUND

The Rapid and other area officials began the GT2 Study in response to numerous planning efforts, some of which identified a need to evaluate potential corridors for a future major transit investment. The study was intended to serve as a regional forum for exploring issues associated with corridor transit improvements and for refining the multi-modal public transportation vision that was initiated in the regional Long Range Transportation Plan.

E3.0 AGENCY COORDINATION AND PUBLIC OUTREACH

Significant interagency coordination and public outreach efforts were conducted over the course of the study. The Public Transportation Tomorrow (PTT) Task Force, consisting of public and private sector community leaders, provided important policy guidance. The PTT Advisory Committee, comprised of planning and engineering professionals from participating agencies,

offered technical input. Major employers were involved through *The Rapid's* Employers Advisory Council. Updates also were provided to *The Rapid* Board of Directors and the GVMC.

In addition, briefings were held with local, regional, state and federal agencies. Additional stakeholders representing a wide range of community interests also were consulted, including neighborhood and business associations, chambers of commerce, universities and other educational institutions, health organizations, religious congregations, environmental groups, disability communities, major property owners, and employers. Furthermore, GT2 information booths were displayed at community events and activity centers. Community meetings were also conducted to obtain feedback and participation from the general public.

E4.0 SCREENING OF ALTERNATIVES

The GT2 Study has involved the evaluation of multiple transit modes, geographic corridors and alignment options. With established evaluation criteria, technical analysis, and public input, the alternatives were narrowed down through a “tiered” process. Figure E4-1 outlines this “Alternatives Analysis” process that was conducted for the GT2 Study.

A full range of 12 transit options was initially identified for the study. Early public input and screening eliminated five modes from further consideration – monorail, heavy rail, MagLev, automated guideway, and personal rapid transit – based on high cost and unproven technology. The remaining seven modes were evaluated in Tier 1 using established goals and criteria. Based on the Tier 1 analysis, commuter rail was removed from the GT2 Study because this type of transit service typically operates in corridors ranging from 30 to over 75-miles long. These lengths extended well beyond the GT2 Study Area. Thus, commuter rail trains similar to Amtrak or Metra in Chicago would be very ineffective and overly expensive to implement in the smaller GT2 corridors. This mode could be reconsidered as part of a larger tri-county regional effort.

Eight initial corridors were also formulated early in the GT2 Study. However, after public input, two more corridors were added: East Beltline and 44th Street. From there, the 10 corridors were evaluated in Tier 1 based on population and employment, as well as travel demand. In some cases, portions of a corridor performed better than the entire corridor, resulting in sub-corridors. Furthermore, some members of the community requested that major activity centers be considered in Tier 1. Based on this analysis and feedback, the Rockford, East, East Beltline, 44th Street, and Northwest corridors, as well as the northern portion of the Ridge Corridor were eliminated from further evaluation in the GT2 Study. These corridors could be reconsidered for future bus service improvements as part of *The Rapid's* annual service planning process.

The Tier 1 analysis and screening of the various transit modes and study corridors was completed in February 2004. Detailed information and presentations on the Tier 1 screening process were provided to *The Rapid* Board of Directors, Task Force, Advisory Committee, Employers Advisory Council, and other key stakeholders in February and March. The Tier 1 recommendations were revised based on input received and approved by the Task Force on April 22, 2004.

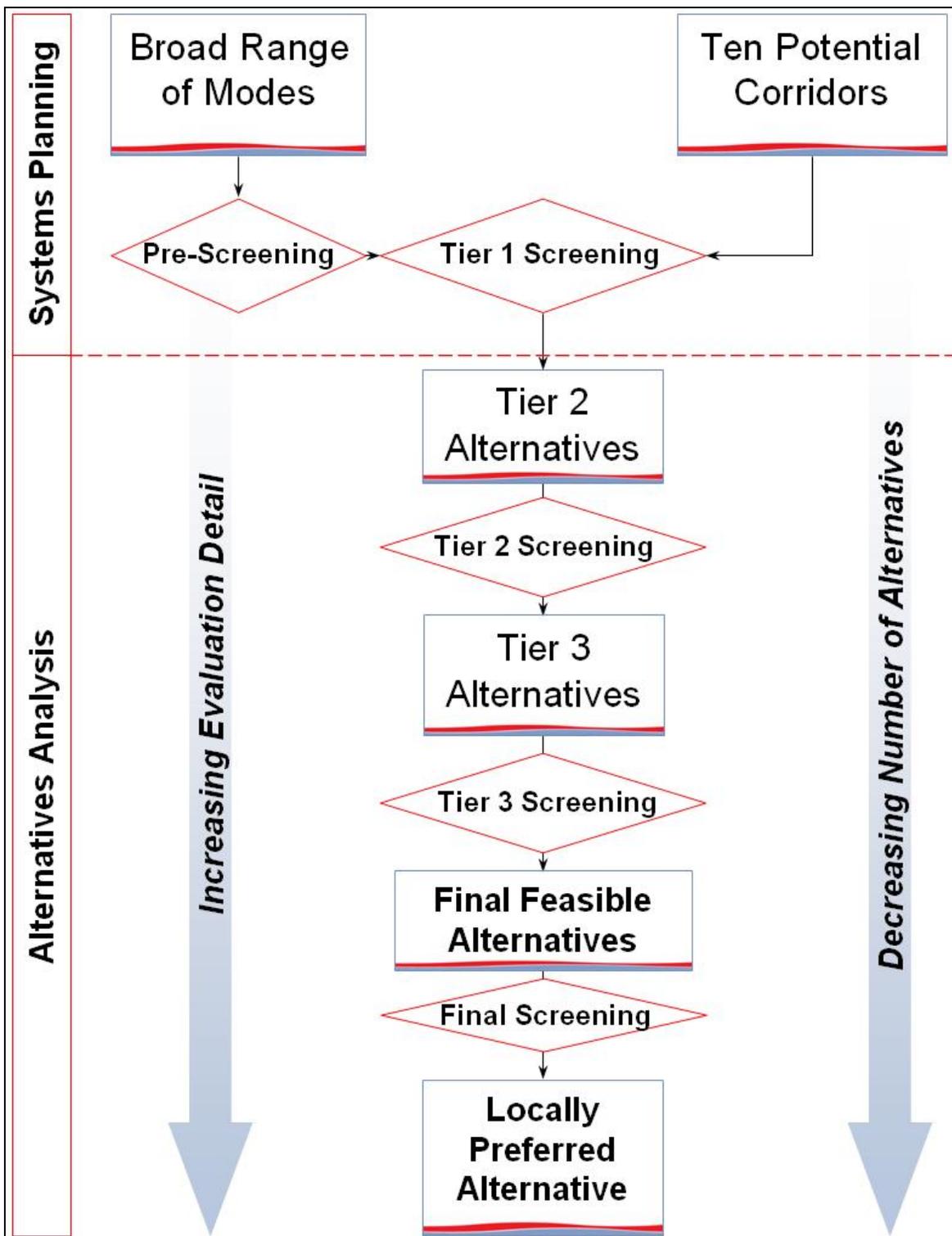


Figure E4-1: Alternatives Analysis Process

Tier 2 began after approval of the Tier 1 screening in late-April 2004. The remaining Tier 2 corridors were evaluated using key criteria, such as major activity centers, population characteristics, land use consistency, development potential and park-and-ride opportunities. The analysis concluded that the East Grand Rapids/Kentwood and South corridors ranked highest in comparison to the other corridors. As a result, these areas moved forward for further consideration in Tier 3 because they would have the best potential to support an enhanced transit investment in the FTA's New Starts process. The other corridors – Ridge Sub, Southwest and Allendale – were eliminated from the study. These three corridors could possibly be reevaluated by *The Rapid* for future bus service improvements. Following input by the study committees and other stakeholders, the Task Force approved the Tier 2 recommendations on June 24, 2004.

From June to September 2004, four potential transportation options were evaluated in Tier 3: enhanced bus/bus rapid transit (BRT), streetcar, light rail transit (LRT) and diesel multiple units (DMU). Routes for these transit modes were mapped along existing road and rail rights of way in the two remaining corridors: East Grand Rapids/Kentwood and South. Several alignment alternatives were considered along US-131, Division Avenue, existing rail lines, Lake Drive, Wealthy Street, Breton Street, East Paris, and the East Beltline. These alignment alternatives were evaluated based on major activity centers, land use consistency, development potential, population and employment, roadway congestion, ridership forecasts, right-of-way constraints, environmental implications (air quality, noise, vibration, water resources, etc.), and estimated costs. Based on the Tier 3 findings, enhanced bus/BRT and streetcar were recommended to advance into the “Final Screening” phase. These two modes were recommended for evaluation in the East Grand Rapids/Kentwood Corridor on various streets and in the South Corridor on Division and Clyde Park. After stakeholder briefings and three public meetings in September 2004, the Tier 3 recommendations were endorsed by the Advisory Committee, Task Force, *The Rapid* Board of Directors, the six member agency cities, and the GVMC in late 2004 through early 2005.

As part of the Final Screening process, the Tier 3 recommendations were refined to focus on Division Avenue for the South Corridor and Wealthy Street for the East Grand Rapids/Kentwood Corridor. BRT had an option for trolleybuses that would draw electric power from an overhead contact system. All of the alternatives assumed substantial stations, traffic signal priority, low floor vehicles, and branding of vehicles, stations, and signage. Final Screening criteria included estimated capital costs, operating and maintenance costs, total annualized cost, existing ridership in the corridor, and projected ridership.

During Final Screening, the FTA issued Interim Guidance for Very Small Starts projects. The Final Screening analysis revealed that only BRT in the South Corridor could qualify as a Very Small Starts project, with a refinement of the design and cost estimates.

Based on the Final Screening and potential for Very Small Starts funding, the Task Force recommended BRT in the South Corridor as the Locally Preferred Alternative for the GT2 Study in August 2006. Through December of that same year, design assumptions were refined, a Minimum Operating Segment was developed, and revised cost estimates were prepared to meet the Very Small Starts criteria, while continuing to achieve the purpose, need and goals of the GT2 Study. The revised LPA was approved by *The Rapid* Board on January 24, 2007.

E5.0 LOCALLY PREFERRED ALTERNATIVE

During the final screening phase, one alternative met the purpose, need and goals for the GT2 Study, as well as fit the criteria for Very Small Starts – Bus Rapid Transit in the South Corridor. As a result, this BRT project was adopted as the LPA for the GT2 Study. It would have the following features consistent with Very Small Starts requirements:

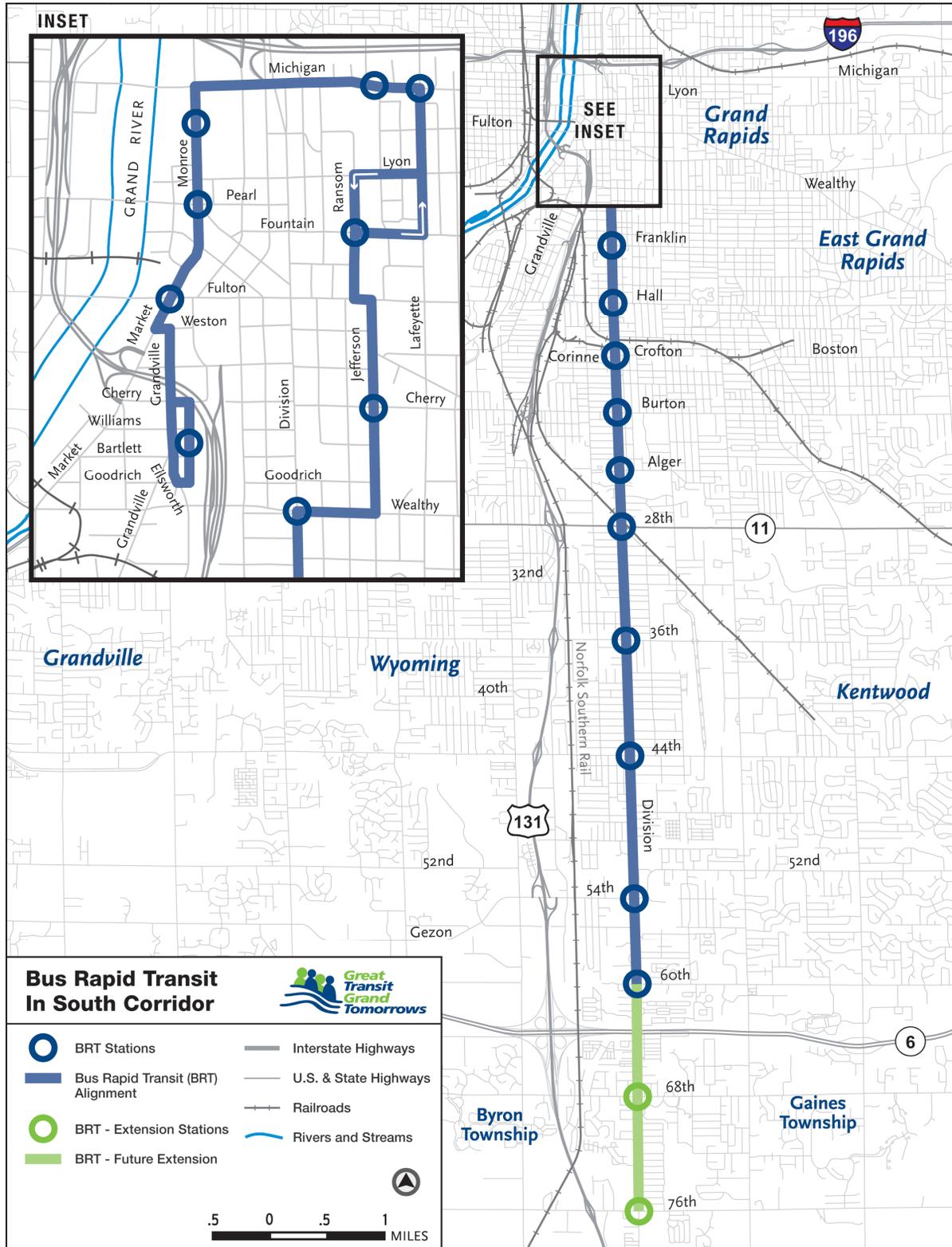
- Substantial stations
- Traffic signal priority
- Low floor vehicles
- Branding of vehicles, stations and signage
- 10 minute peak and 15 minute off-peak headways
- Serves a corridor with over 7,250 average weekday riders (FY2006)
- Costs less than \$50 million in total and \$3 million per mile (exclusive of vehicles)

As shown in Figure E6-1, the BRT line is approximately 9.87 miles in length. It would primarily use Division Avenue from 60th to Wealthy Street in downtown Grand Rapids. To serve downtown, the alignment would generally head north from Wealthy, running on various streets to Michigan Avenue. It would turn west on Michigan and then south on Monroe to Grandville Avenue. The route would continue south on Grandville, ultimately terminating at *The Rapid* Central Station.

E6.0 FINANCIAL PLAN

Financial planning was conducted in accordance with FTA's Interim Guidance for Very Small Starts projects, which requires a project sponsor to demonstrate their capability to construct and operate the proposed LPA. More specifically, *The Rapid* must have sufficient available funds for the local share of capital costs or present a reasonable plan to secure local funding. The local share must be committed before receiving FTA's approval for construction. Furthermore, as the additional operating and maintenance cost of the LPA is greater than five percent of *The Rapid's* overall operating budget, a financial plan has been developed for the additional operating and maintenance cost. *The Rapid* must also be in good financial condition, as documented in three years of audited financial statements.

The Financial Plan was developed with these guidelines in mind, identifying the funding sources and establishing the financial capacity of *The Rapid* to construct and operate the LPA. The proposed BRT project is estimated to receive \$32.1 million (YOE dollars) or 80 percent funding of capital costs from federal Very Small Starts, matched by \$8.0 million or 20 percent from local sources. Additionally, the proposed BRT project would constitute nine percent of the systemwide operating and maintenance costs. The Financial Plan identifies revenues from a variety of potential sources to fund the on-going operation and maintenance of the proposed BRT project, including passenger fares, state operating funds (projected at 30% for the first full year of operation), dedicated property tax, and a small amount through advertising revenue.



E7.0 NEXT STEPS

Following inclusion of the LPA in the GVMC's regional Long Range Transportation Plan, the key next steps and milestones in the overall project development process are:

- Environmental Class of Action Determination
- Very Small Starts Application for Entry into Project Development
- Project Development Agreement with FTA
- Preliminary Engineering and Final Design
- Commitment of Local Funding Share
- Project Construction Grant Agreement with FTA
- Start Construction
- Vehicle Procurement
- BRT Service Begins

If these steps are successfully implemented and achieved, BRT service in the South Corridor could begin operation in the year 2012.

E8.0 OTHER CONSIDERATIONS

During the course of the GT2 Study, opportunities for transit improvements emerged in some other corridors. While they may not qualify as a Very Small Starts project, *The Rapid* could consider these possible enhancements as part of their annual service planning cycle or long range planning process. Following is a list of these potential transit improvements:

- **Ridge Sub-Corridor** – Alpine Avenue from downtown Grand Rapids to 6 Mile Road in Alpine Township could be ideal for enhanced bus service with signal synchronization improvements to better serve existing commercial and retail uses.
- **Southwest Corridor** – This corridor from downtown Grand Rapids to Hudsonville may be suited for express bus service since it consists of suburban communities linked by an interstate. Express buses could pick up passengers at park-and-ride lots located near I-196 and then continue into downtown on the freeway. Commuter Rail service may be another possibility for future consideration; this service typically operates in corridors from 30 to over 75-miles long. Thus, it could be reevaluated as part of a larger tri-county regional effort.
- **Allendale Corridor** – Service to Grand Valley State University (GVSU) operates similar to express bus in that it travels long distances and makes limited stops between the university and downtown Grand Rapids. This bus service could be enhanced by using such things as articulated vehicles to accommodate the significant student patronage generated by GVSU.
- **Downtown Grand Rapids** – A potential streetcar circulator could be an appropriate transit solution to enhance access to employment, educational, and entertainment venues in downtown Grand Rapids. This downtown streetcar circulator could be pursued by *The Rapid*, in cooperation with the City of Grand Rapids.

Great Transit Grand Tomorrows Study

Alternatives Analysis Report

1.0 INTRODUCTION

Beginning in early 2003, the Interurban Transit Partnership, also known as *The Rapid*, initiated the Great Transit Grand Tomorrows (GT2) Study. The purpose was to identify the need for a future transit investment in the Greater Grand Rapids Metropolitan Area. This planning process was a first step under Federal Transit Administration (FTA) “New Starts” guidelines necessary for partial federal funding of a potential transportation improvement project. The GT2 Study was a cooperative effort supported and funded by the FTA, Michigan Department of Transportation (MDOT), Wege Foundation, and Urban Cooperation Board.

The GT2 Study has advanced over the past few years, with a narrowing and screening of possible transit modes, corridors, and alignments. At the same time, the FTA’s New Starts program has evolved, becoming more stringent and competitive. In addition, a “Small Starts” program has recently emerged, presenting federal funding opportunities for smaller transit projects. The change in FTA’s program prompted *The Rapid* to identify a potential “Very” Small Starts project for the GT2 Study.

Per the *Interim Guidance and Instructions for Small Starts*, this document presents the “Alternatives Analysis” process by which a wide range of transportation options was evaluated against needs and goals for the GT2 Study Area, finally narrowing to Bus Rapid Transit (BRT) in the South Corridor as the Locally Preferred Alternative (LPA). The LPA was adopted by *The Rapid* Board of Directors on January 24, 2007 and included in the Grand Valley Metro Council’s (GVMC) regional Long Range Transportation Plan on April 9, 2007. The tabbed section labeled “Proof of Local Action” contains the resolutions and letters of support for the project.

2.0 STUDY CONTENTS

From this point forward, the contents of the GT2 Study are organized into the following sections:

- **Study Area** – delineates the geographic area that was evaluated in the study.
- **Purpose and Need Statement** – establishes purpose, need and goals for study.
- **Agency Coordination and Public Outreach** – highlights interagency coordination and public outreach efforts conducted over course of study.
- **Screening of Alternatives** – summarizes results of the Tier 1, Tier 2 and Tier 3 evaluation, as well as the Final Screening analysis that lead to LPA.
- **Locally Preferred Alternative** – presents key features of approved LPA.
- **Financial Plan** – identifies the potential funding sources needed to construct, operate and maintain the LPA.
- **Next Steps** – describes near- and long-term steps in overall project development.
- **Other Considerations** – reveals other service enhancements that *The Rapid* may want to consider for future implementation.

3.0 STUDY AREA

The GT2 Study Area, as shown in Figure 3-1, included six cities currently served by *The Rapid*:

- East Grand Rapids
- Grand Rapids
- Grandville
- Kentwood
- Walker
- Wyoming

In addition, the Study Area was comprised of 12 nearby townships and communities in Kent and Ottawa counties:

- Ada Township
- Allendale Township
- Alpine Township
- Byron Township
- Caledonia Township
- Cascade Township
- Gaines Township
- Georgetown Township
- Grand Rapids Township
- Plainfield Township
- City of Rockford
- Tallmadge Township

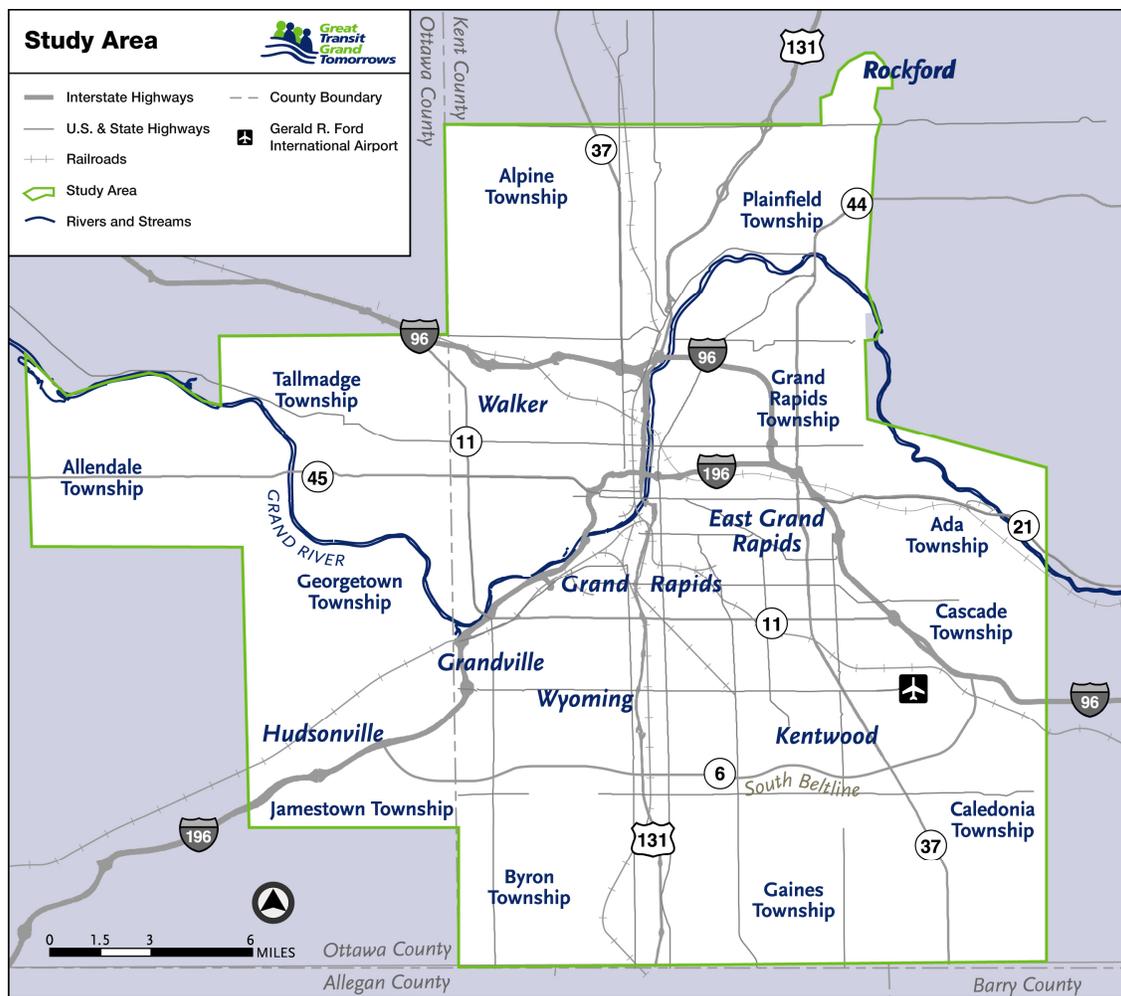


Figure 3-1: GT2 Study Area

4.0 PURPOSE AND NEED STATEMENT

During the Final Screening phase, the study's purpose and need was refined to focus on the South Corridor. It presents a clear description and assessment of the transportation problems and opportunities to improve transit service in the corridor, along with goals to measure the effectiveness of the project in meeting the purpose and need.

Concisely, the purpose of this project is to provide access to centers of employment and extensive educational opportunities in downtown Grand Rapids especially for low-income populations while also providing the transportation foundation for economic development in the corridor. Centers of employment include St. Mary's Health Care campus with 5,000 jobs, "Health Hill" with 8,000 jobs and over \$1 billion in medical-related construction underway (in 2007), and the core of downtown Grand Rapids with 20,000 jobs. Outside of the downtown area, economic development would be bolstered with a higher-capacity transit system. Transit allows higher density housing in station areas, mixed-use land development, and reduced parking demand (with correspondingly more land area for development).

The following text expands on this summary and provides supporting data.

4.1 Purpose

The GT2 Study was intended to be the first phase of an overall project development process that could possibly culminate in future implementation of a LPA, consisting of a transit investment in the South Corridor (Figure 4-1). The aims of the GT2 Study include the following:

- Employ a wide-ranging public outreach effort that allows the entire community to understand the issues at stake and participate in developing a solution;
- Explore the need for fixed guideway or other transit improvements, and identify a corridor that provides the best opportunity for such improvements, if warranted;
- Develop a toolbox for the locally preferred investment strategy that builds on land use and comprehensive planning efforts, and contributes to economic development as well as overall quality of life in the region; and
- Initiate the multi-phase process required to ensure future eligibility for partial federal funding of an enhanced transit investment as part of the FTA's Very Small Starts program.

4.2 Need and Opportunities for Transportation Improvements

Previous study phases identified key transportation-related issues in the South Corridor. These problems and opportunities that establish the need for transportation improvements in the South Corridor are:

- Population and employment
- Major activity centers
- Congestion and mobility
- Economic development potential
- Transit dependent communities
- Existing transit ridership
- Transit supportive land use

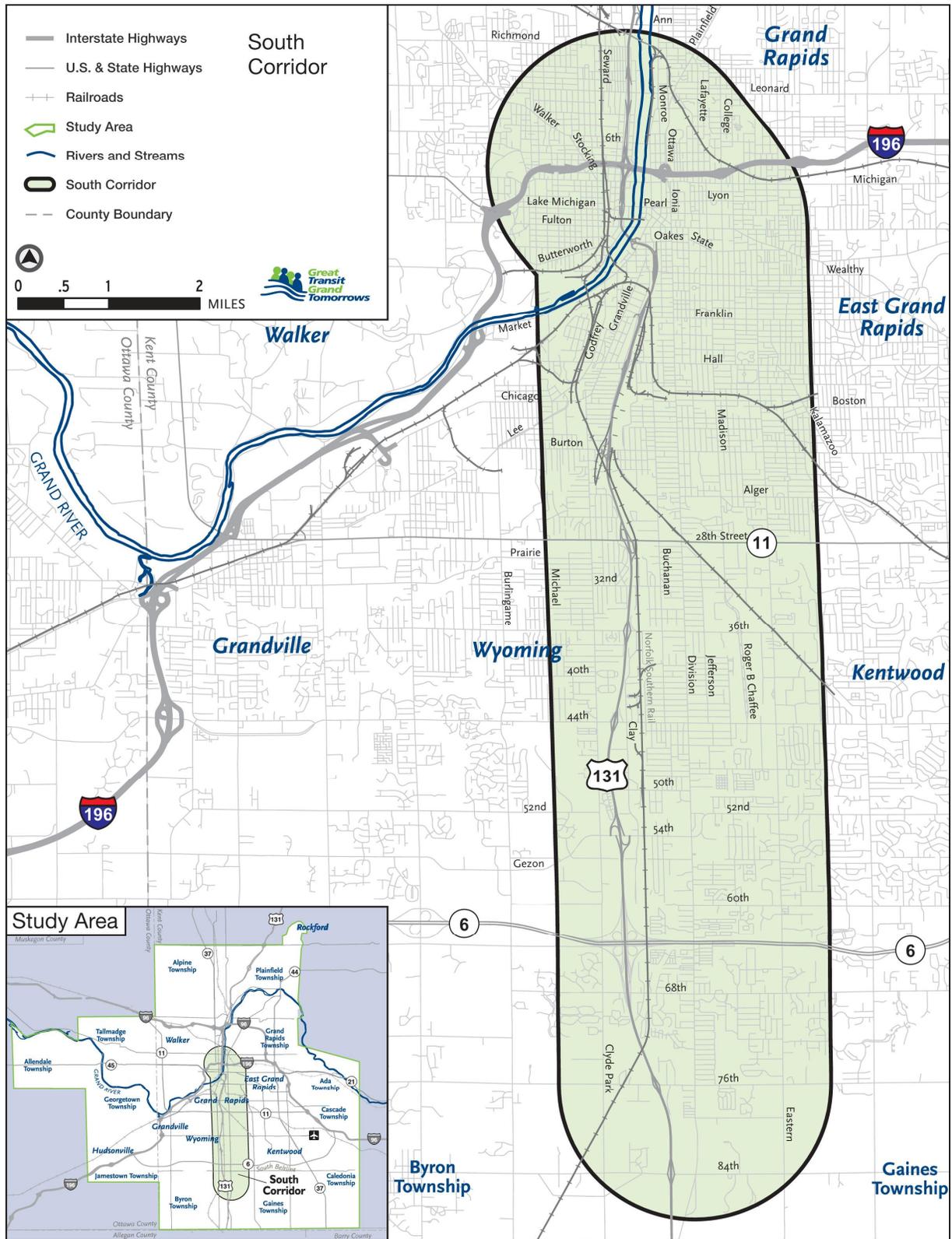


Figure 4-1: South Corridor

4.2.1 Population and Employment

The need for an enhanced transit investment is driven first and foremost by continuing growth in the greater Grand Rapids region. The *Grand Rapids-Muskegon-Holland Metropolitan Statistical Area (MSA)* consists of Allegan, Kent, Muskegon and Ottawa counties in West Michigan. The MSA had a year 2000 population of 1,089,000, which is projected to rise 20 percent to 1,312,000 by 2025. Among the 11 metropolitan areas in the Upper Midwest with over one million residents, the Grand Rapids-Muskegon-Holland MSA has experienced the highest population and employment growth rates, both in the 1990s and from 1970 to 2000. During the latter period, total employment grew by 120 percent, nearly three times as much as population.

Of the three Metropolitan Planning Organizations (MPOs) within the MSA, the largest is the Grand Valley Metro Council, which serves 35 jurisdictions in greater Grand Rapids, including the 18 that make up the GT2 Study Area. As shown in Table 4-1, these Study Area jurisdictions are projected to grow from 648,000 residents in 2000 to 847,000 in 2030, a 31 percent increase.

Grand Rapids is the second largest city in the State of Michigan, containing 36 percent of the GT2 Study Area population. Downtown Grand Rapids is the largest employment center in the four-county MSA, with 66,000 jobs projected by 2030. As the business hub of Kent County, it is the likely terminus or principal transfer point for a transit system, especially for people living in the South Corridor. Based on the information in Table 1, the South Corridor is expected to have a population of 227,000 in 2030, including 35,000 residents in downtown Grand Rapids. During this same timeframe, the number of jobs in the South Corridor is estimated to be 159,000.

Table 4-1: Population and Employment Growth, 2000 to 2030					
	2000	2015	Growth 2000 to 2015	2030	Growth 2000 to 2030
Population					
Regional	648,000	747,000	15%	847,000	31%
South Corridor¹	194,000	210,000	8%	227,000	17%
Downtown	29,000	32,000	10%	35,000	21%
Employment					
Regional	369,000	422,000	14%	475,000	29%
South Corridor¹	130,000	145,000	16%	159,000	22%
Downtown	56,000	61,000	9%	66,000	19%

¹Includes Downtown Central Business District.

Source: GVMC Travel Demand Model; AECOM Consult, 2006.

Table 4-2 reveals that the highest population and employment densities are located in downtown Grand Rapids, which is critical to support an enhanced transit investment. In the year 2030, the downtown is projected to have 11 persons per acre and 21 jobs per acre. However, as shown in Figure 4-3, population densities range from 15 to 44 persons per acre along most of Division Avenue, with pockets in downtown over 44. Furthermore, Figure 4-4 shows greater than 100 jobs per acre in most of the core downtown area; although, these land use densities decrease further south in the corridor, diminishing at 28th Street for population and just past the downtown area for jobs.

Table 4-2: Population and Employment Densities, 2015 and 2030				
	2015		2030	
	Persons / Acre	Jobs / Acre	Persons / Acre	Jobs / Acre
Regional	1.16	0.65	1.31	0.73
South Corridor¹	4.53	3.11	4.89	3.42
Downtown	10.27	19.56	11.15	21.27

¹Includes Downtown Central Business District.

Source: GVMC Travel Demand Model; AECOM Consult and DMJM Harris, 2006.

Table 4-3 presents the projected households and jobs within one quarter mile of Division Avenue, US-131 and the Norfolk Southern rail line for the years 2015 and 2030. Division Avenue will have a higher number of nearby households (11,400) and jobs (50,800) in 2030 versus the Norfolk Southern rail line and US-131, which are primarily in industrial areas. A medium density residential development located at Franklin and Division is shown in Figure 4-2.

Table 4-3: Households and Jobs within 1/4 Mile of Major Roadways and Rail Line, 2015 and 2030				
Major Roadways and Rail Line in South Corridor	2015		2030	
	Households	Jobs	Households	Jobs
Division Avenue	10,300	47,100	11,400	50,800
Norfolk Southern Rail	7,100	44,600	7,700	47,300
US-131	6,900	46,100	7,500	48,800

Source: GVMC Travel Demand Model; AECOM Consult and DMJM Harris, 2006.



Figure 4-2: Housing at Franklin and Division

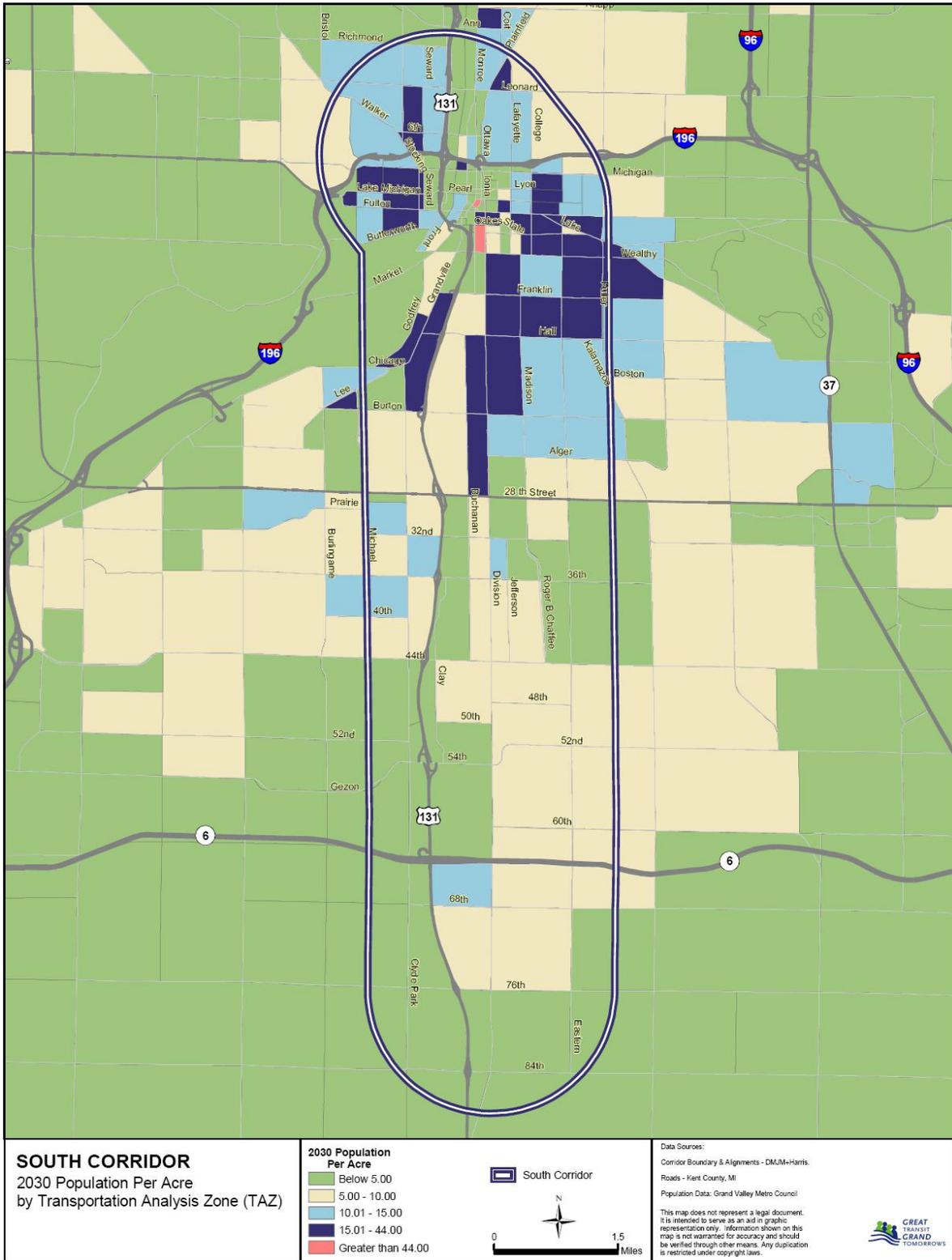


Figure 4-3: Population per Acre in South Corridor, 2030

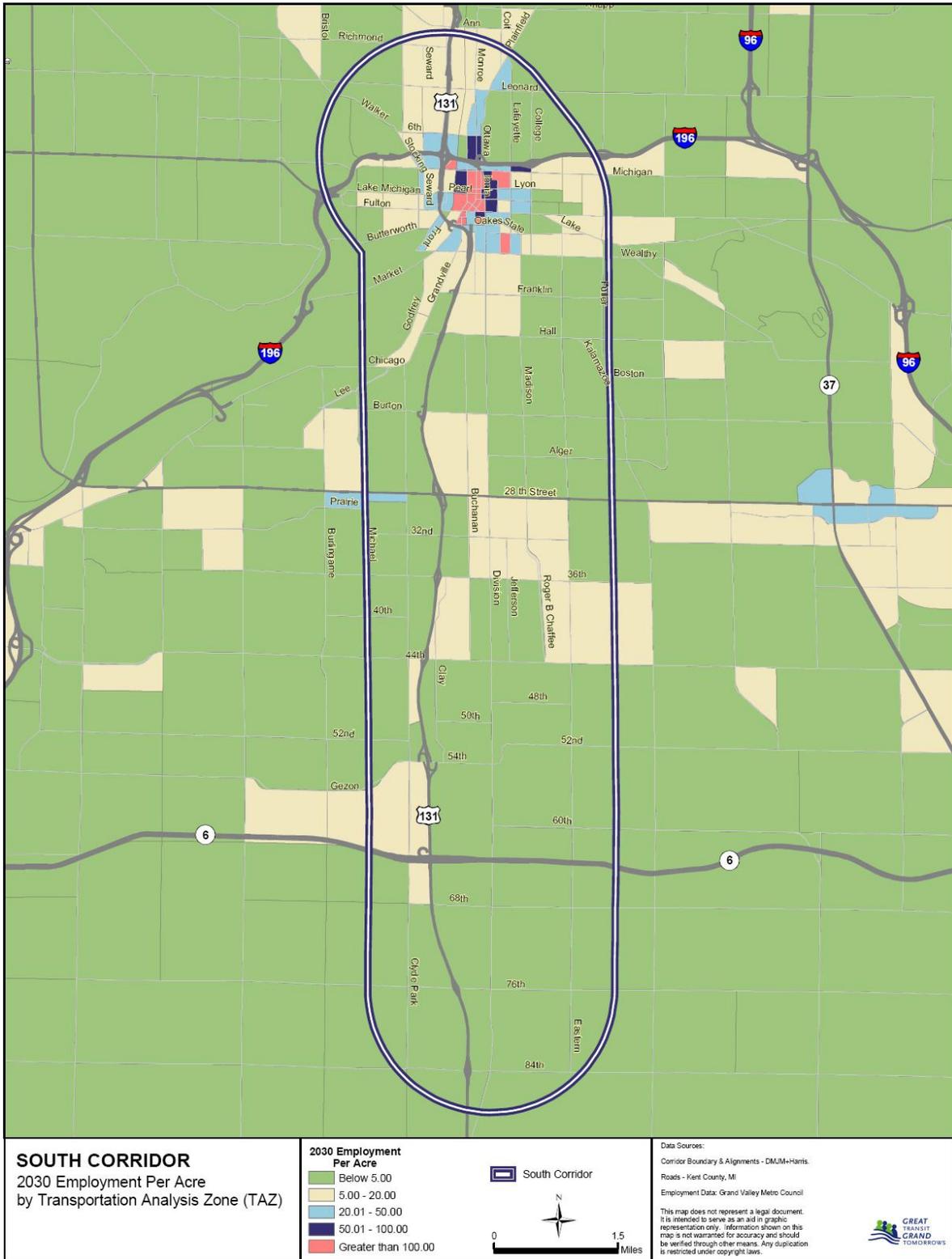


Figure 4-4: Employment per Acre in South Corridor, 2030

4.2.2 Transit Dependent Communities

Table 4-4 identifies the transit dependent and environmental justice communities for the GT2 Study Area as a whole, with a comparison to the South Corridor and downtown Grand Rapids. This information shows high percentages of transit dependent and environmental justice communities for the South Corridor in the year 2000. The corridor exceeded the Study Area in six of the eight transit dependent categories, including students (21%), no-car households (11%), mobility impaired population (9%), households below poverty (14%), minority population (34%), and public transportation users (2%). The concentrations are even greater in the downtown area. These transit dependent and environmental justice communities would benefit from an enhanced transit investment in the South Corridor.

Table 4-4: Transit Dependent and Environmental Justice Communities, 2000			
Population Characteristics	Study Area	South¹	Downtown
% Population 65+ Years Old	10.53%	8.33%	6.95%
<i>Total 65+</i>	60,074	15,100	2,891
<i>Total Population</i>	570,432	181,335	41,581
% Population Students 1-12 Grade	20.01%	20.53%	17.71%
<i>Total 1st to 12th Grade</i>	108,831	35,202	6,956
<i>Total Pop 3 years & over</i>	543,917	171,473	39,279
% Population College Students	7.35%	5.78%	7.79%
<i>Total Undergrad, Grad & Prof Students</i>	39,957	9,906	3,059
<i>Total Pop 3 years and over</i>	543,917	171,473	39,279
% No-Car Households	7.41%	10.64%	16.56%
<i>Total HH w/No Vehicle Available</i>	12,234	6,528	2,371
<i>Total Occupied Housing Units</i>	165,038	61,375	14,318
% Mobility-Impaired Population	6.43%	8.89%	10.83%
<i>Population with Disability</i>	36,663	16,115	4,504
<i>Total Population</i>	570,432	181,335	41,581
% Households Below Poverty (1999)	8.36%	14.02%	21.24%
<i>Total Households Below Poverty</i>	17,564	9,406	3,568
<i>Total Households</i>	210,012	67,103	16,797
% Minority Population	17.08%	33.52%	37.57%
<i>Total Minority Population</i>	97,406	60,775	15,622
<i>Total Population</i>	570,432	181,335	41,581
% Using Public Transportation	1.17%	2.37%	4.50%
<i>Total Using Public Transportation</i>	3,313	1,992	884
<i>Workers 16 years & over</i>	283,766	84,129	19,637

¹Includes Downtown Central Business District.
Note: Numbers in **bold** are greater than the Study Area.
Source: Census 2000 Summary File 3; DMJM Harris, 2004.

4.2.3 Major Activity Centers

Major activity centers are also found throughout the South Corridor as listed in Table 4-5. This includes special non-work trip generators such as universities, museums, hospitals, etc. and large employers that would produce typical weekday work trips. The downtown Grand Rapids area has the greatest number of major activity centers, with the Van Andel Arena and DeVos Place Convention Center as the most notable special event venues. The Van Andel Arena (Figure 4-5) has a 12,000 plus capacity and attracts the biggest names in family shows, concerts, and sporting events. DeVos Place provides 1-million-square feet of space on a 13-acre riverfront site, ideally equipped for meetings, conventions, trade shows, performing arts, and touring events.



Figure 4-5: Van Andel Arena

Numerous colleges, universities, hospitals, and research centers have also made Grand Rapids one of the forefront leaders in the medical industry. Michigan Hill generates many research and medical jobs, as well as school and hospital trips.

Enhanced transit would help link residents living in the South Corridor to the jobs, cultural events, medical facilities, universities, and other activities in downtown shown on Figure 4-6. This is especially true for the high transit dependent population in the corridor.

Table 4-5: Major Activity Centers in South Corridor, 2006	
Special Generators (non-work trips)	Major Employers (work trips)
<ul style="list-style-type: none"> • Van Andel Arena • DeVos Place Convention Center • GVSU Pew Campus • VanAndel Museum Center • Gerald R. Ford Museum • Art Museum • Michigan Hill: Spectrum Butterworth Campus, GVSU School of Nursing, DeVos Children's Hospital, Van Andel Research Center • Grand Rapids Community College • Kendall College • Davenport University • St. Mary's Health Care Center • Amway Grand Plaza Hotel • Metro Hospital 	<ul style="list-style-type: none"> • U.S. Postal Service • Grand Rapids City Hall • Kent County • Federal Building • General Motors Corp. • Steelcase, Inc. • Gordon Food Service • United Parcel Service • Spartan Stores, Inc.

Source: The Right Place, Inc., November 2003; DMJM Harris, 2006.

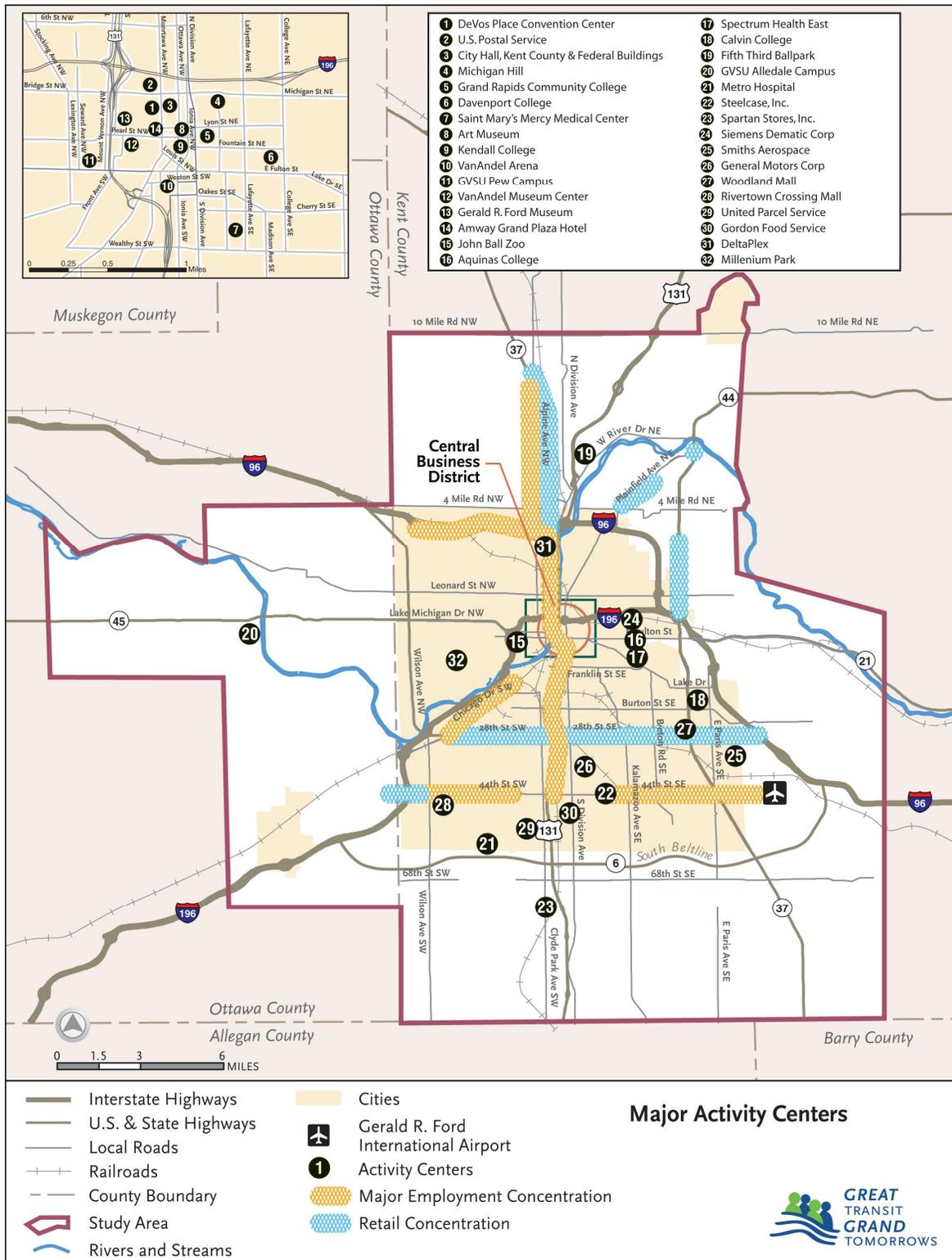


Figure 4-6: Major Activity Centers in Study Area, 2006

4.2.4 Existing Transit Ridership

In 2005, *The Rapid* operated 19 fixed bus routes, carrying almost 6.5 million annual riders. In that same year, average weekday ridership was approximately 16,300. Table 4-6 highlights the five bus routes that run in the South Corridor, including #1 Division, #2 Kalamazoo, #3 Madison, #4 Eastern, and #10 Clyde Park. Service levels on these routes ranged from 15 to 30 minutes during the peak and 15 to 45 in the off-peak. They accounted for nearly 6,700 weekday boardings or 41.2 percent of *The Rapid's* systemwide ridership in 2005. The highest number of riders was generated on Route #1 along Division Avenue, which made up 13.7 percent of the system total.

Ridership in the greater Grand Rapids area has continued to grow, more than doubling in the last 10 years. In the past couple of years, average weekday boardings grew 6.8 percent from 2003 to 2005. The South Corridor experienced an even greater rise of 12.3 percent during that same timeframe. Enhanced transit service and increased frequencies can attract even more riders in the South Corridor, as it would become more available and convenient for passengers.

Route #	Route Name	AM Headways (minutes)	Midday Headways (minutes)	2003 Weekday Boardings	2005 Weekday Boardings	Percent Change 2003 to 2005
1	Division Ave	15	15	2,061	2,231	+8.2%
2	Kalamazoo	30	30	1,535	1,687	+9.9%
3	Madison	30	45	398	431	+0.3%
4	Eastern	30	30	1,042	1,379	+32.3%
10	Clyde Park	30	30	936	977	+4.4%
Total South Corridor				5,972	6,705	+12.3%
Total System				15,229	16,260	+6.8%
South Corridor Percent of Total				39.2%	41.2%	+2.0%

Source: *The Rapid*, 2003 and 2005.



Figure 4-7: Existing Bus Riders

4.2.5 Congestion and Mobility

One of the principal impacts of sprawl, with its reliance on the private automobiles for nearly all trips, consists of increasing traffic congestion and longer travel times. These in turn make the region a less desirable place to live and work and reduce economic competitiveness. According to the Mobile Metro 2020, suburban households in the region are acquiring more second and third cars to enhance their mobility, reflecting the lack of alternatives in lower density areas. Between 1980 and 1990, vehicle ownership in Kent County grew nearly twice as fast as the population (23 percent versus 13 percent). Increasing dependence on the private auto, if left unchecked, will result in congested regional roadways, especially during peak travel periods.

In the absence of expensive highway construction, a 162 percent increase in total daily vehicle hours of travel (VHT) is forecast for the 1990 to 2015 period. This far exceeds the projected growth rate of 29 percent for population and 37 percent for employment over the same timeframe. Similarly, the average trip time is expected to double from 11.2 minutes to 22.4 minutes. Judging by the experience of other urban areas, the impact will probably be magnified during peak commute hours. The Michigan Department of Transportation projects that, by 2025, peak traffic conditions on the I-196 and US-131 regional freeways will deteriorate from “moderately congested” to “severely congested.” As a result, commuters will find their quality of life reduced as they spend more time in traffic at the expense of their personal lives.

Congestion is typically measured in terms of Level of Service (LOS) and is categorized from “A” to “F.” LOS A is generally free flow traffic with little or no delay, while LOS F is congested traffic with a high level of delay. The measure of LOS varies depending on whether the facility is a freeway, multilane facility, or signalized facility. For example, Table 4-7 shows the LOS criteria for signalized intersections. The 2000 Highway Capacity Manual provides more information on LOS for all of the various types of facilities in the South Corridor.

A LOS analysis for the South Corridor shows that traffic congestion is expected to worsen from the year 2000 to 2025 due to population and job growth. US-131 (Figure 4-8) and Division Avenue ranged from LOS C to E in the year 2000, as shown in Figure 4-9. However, LOS deteriorations to “F” are projected to occur by the year 2025, as delineated in Figure 4-10. Enhanced transit service in the South Corridor would divert some people from their cars to buses, thereby alleviating some of this congestion and improving mobility.

Table 4-7: LOS Criteria for Signalized Intersections		
LOS	Interpretation	Delay (seconds/vehicle)
A	Progression is extremely favorable and most vehicles arrive during the green phase; most vehicles do not stop at all; short cycle lengths may contribute to low delay.	≤ 10
B	Good progression, short cycle lengths, or both; more vehicles stop than with LOS A.	> 10 and ≤ 20
C	Fair progression, longer cycle lengths, or both; the number of vehicles stopping is significant, though many still pass through without stopping.	> 20 and ≤ 35
D	Longer delays result from some combination of unfavorable progression, long cycle lengths, or high volume/capacity (v/c) ratios; many vehicles stop.	> 35 and ≤ 55
E	High delay values generally indicate poor progression, long cycle lengths, and high v/c ratios; individual cycle failures are frequent occurrences.	> 55 and ≤ 80
F	This level often occurs with over saturation when arrival flow rates exceed the capacity of the intersection; poor progression and long cycle lengths may be major contributing factors to such delay levels.	> 80

Source: Highway Capacity Manual 2000.



Figure 4-8: Existing Recurring Congestion on US-131

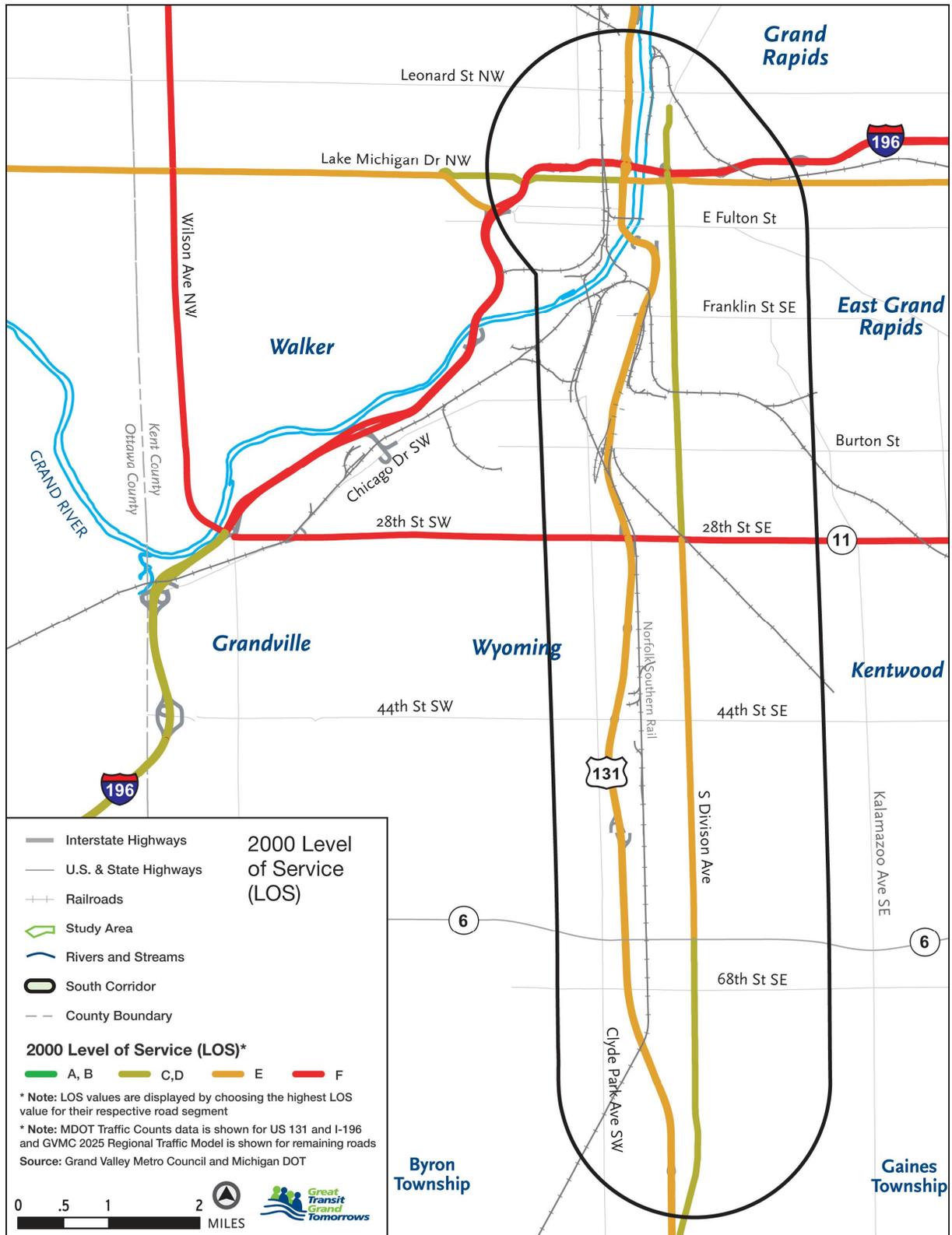


Figure 4-9: 2000 Level of Service

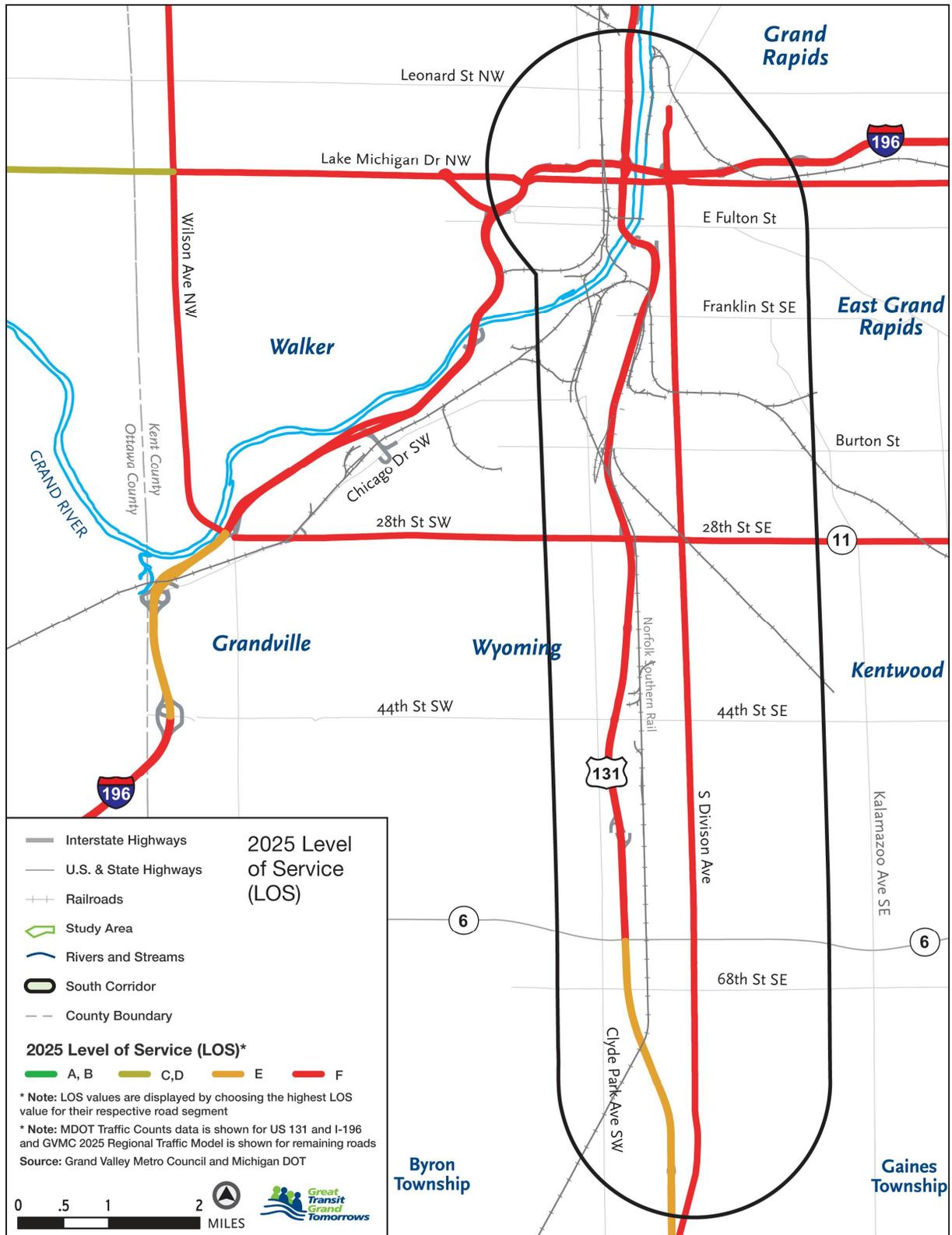


Figure 4-10: 2025 Level of Service

4.2.6 Transit Supportive Land Use

The accelerating suburbanization of socioeconomic growth in greater Grand Rapids and the larger four-county MSA has raised concerns about desirable regional development patterns, the negative impacts of sprawl and long-range preservation of the high quality of life enjoyed by area residents. Throughout the metropolitan area, residential developments have sprung up behind roadway corridors that are typically lined with service and commercial areas or higher-intensity residential uses, while community and regional activity centers have developed at the intersections of major arterial roadways or freeway interchanges. This pattern of development leaves residents and employees with few travel alternatives to their cars. If such land use and transportation patterns continue, demand for roads will soon exceed not only the region's existing capacity, but also its ability to provide new capacity.

An assessment of land use patterns, plans, and policies for local jurisdictions in the South Corridor found that more transit supportive development is adjacent to Division Avenue versus US-131. These land use patterns are expected to continue in the future as depicted in Figure 4-12, which shows medium density residential, mixed use and commercial frontage on Division Avenue north of 28th Street. While pockets of medium density residential and commercial uses exist further south on Division Avenue, they primarily transition to medium low density residential. However, the downtown Grand Rapids Central Business District (Figure 4-11) contains the most transit supportive land use development patterns in the corridor, with higher density office and residential buildings.

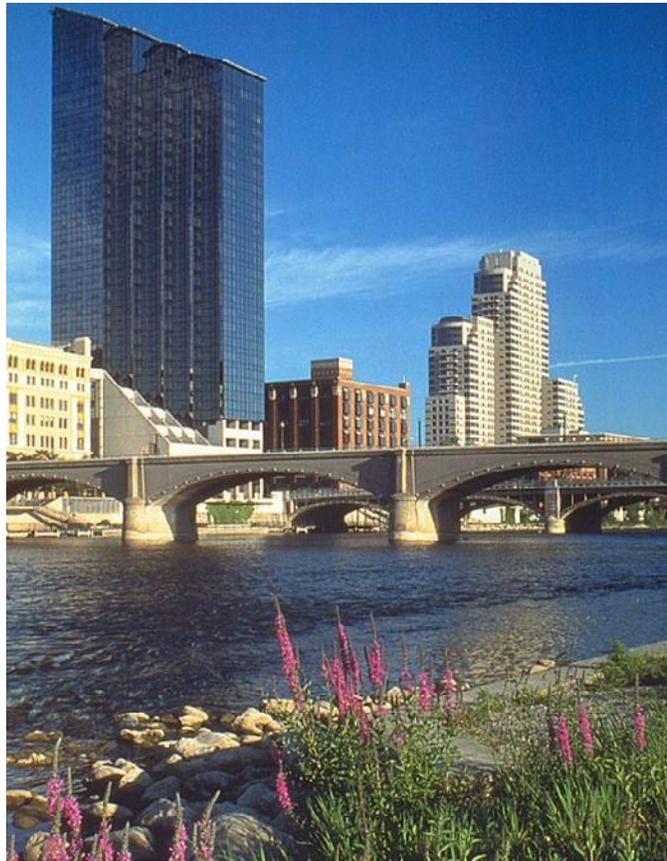


Figure 4-11: Downtown Grand Rapids

The jurisdictions in the South Corridor have plans that support transit-friendly development, with some emphasis placed along Division Avenue – historically the main gateway into Grand Rapids. The City of Grand Rapids encourages dense development along transit routes in the corridor, and Kentwood revised their master plan to include transit-oriented development (TOD) in several corridors including Division. Wyoming is attempting to create a less auto-oriented area centered on Michael and 28th, west of Clyde Park, US-131, and Division Avenue, and is also amending its master plan to include TOD. Gaines Township is primarily auto-oriented, concerned about traffic volumes and rapid growth, but updated their zoning to facilitate transit-friendly design. Byron Township mentions transit with regard to accessing employers along US-131.

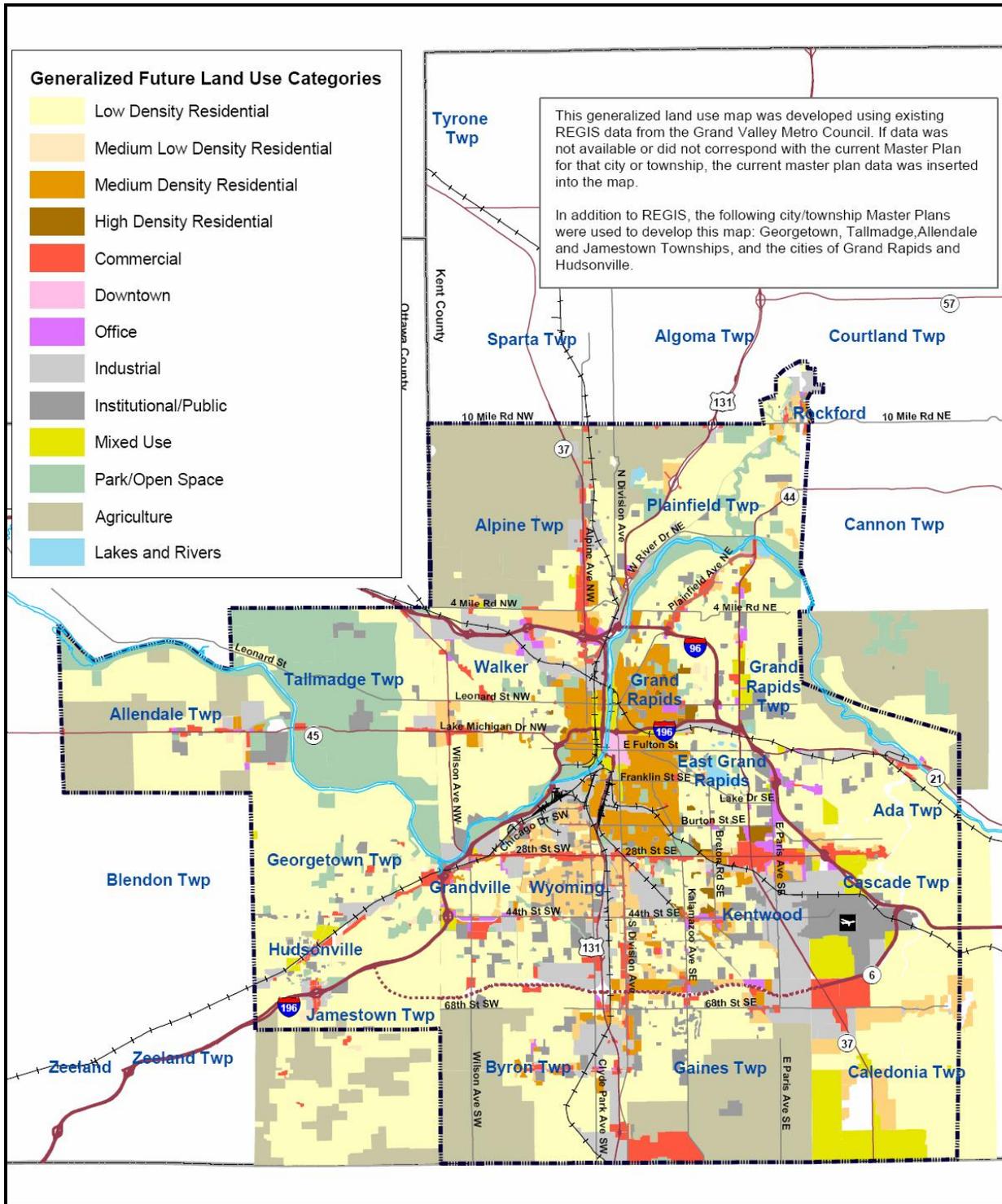


Figure 4-12: Future Land Use Categories

4.2.7 Economic Development Potential

In addition to transit supportive land use plans and policies, potential development and redevelopment opportunities were identified in the South Corridor. Over the last 10 years, downtown Grand Rapids has seen a resurgence of development, with the Van Andel Arena acting as a major catalyst and focal point. The DeVos Place Convention Center has generated other opportunities. This includes a high density residential development just north of I-196, as well as a mixed use development on Monroe Center that contains ground floor retail with housing above. Warehouses in the downtown area are continuing to be converted to offices and residential uses.

More redevelopment potential exists along Division Avenue, as shown in Figure 4-13. This strip of land is located in a Renaissance Zone, which is distressed area virtually tax free for businesses or residents presently in or moving into a zone. Figure 4-14 identifies the Renaissance Zones in the South Corridor. Most of the property is zoned commercial in the Renaissance Zones, with few residential areas. The establishment of these zones creates significant redevelopment opportunities, particularly along a much blighted Division Avenue that contains many deteriorating buildings and neighborhoods.



Figure 4-13: Renaissance Zone at Division and Wealthy

Since Division Avenue represents a high transit dependent population, the cities recognize the need to ensure that any new developments support transit. Joint planning between the cities of Grand Rapids, Wyoming and Kentwood are continuing to evaluate the redevelopment opportunities along Division Avenue north of 28th Street, with the area between Wealthy and Burton designated as a Renaissance Zone. Redevelopment of retail uses could possibly be initiated in the vicinity of 44th and Division in Kentwood. Many redevelopment opportunities also exist in the City of Wyoming along Division, including a 25-acre site between 56th and 60th, 15 acres at 54th, 4 to 5 acres between 32nd and 36th and 6 acres at Buchanan. An enhanced transit investment has the potential to spur development and redevelopment opportunities in the South Corridor, improving the quality of life for economically depressed neighborhoods.

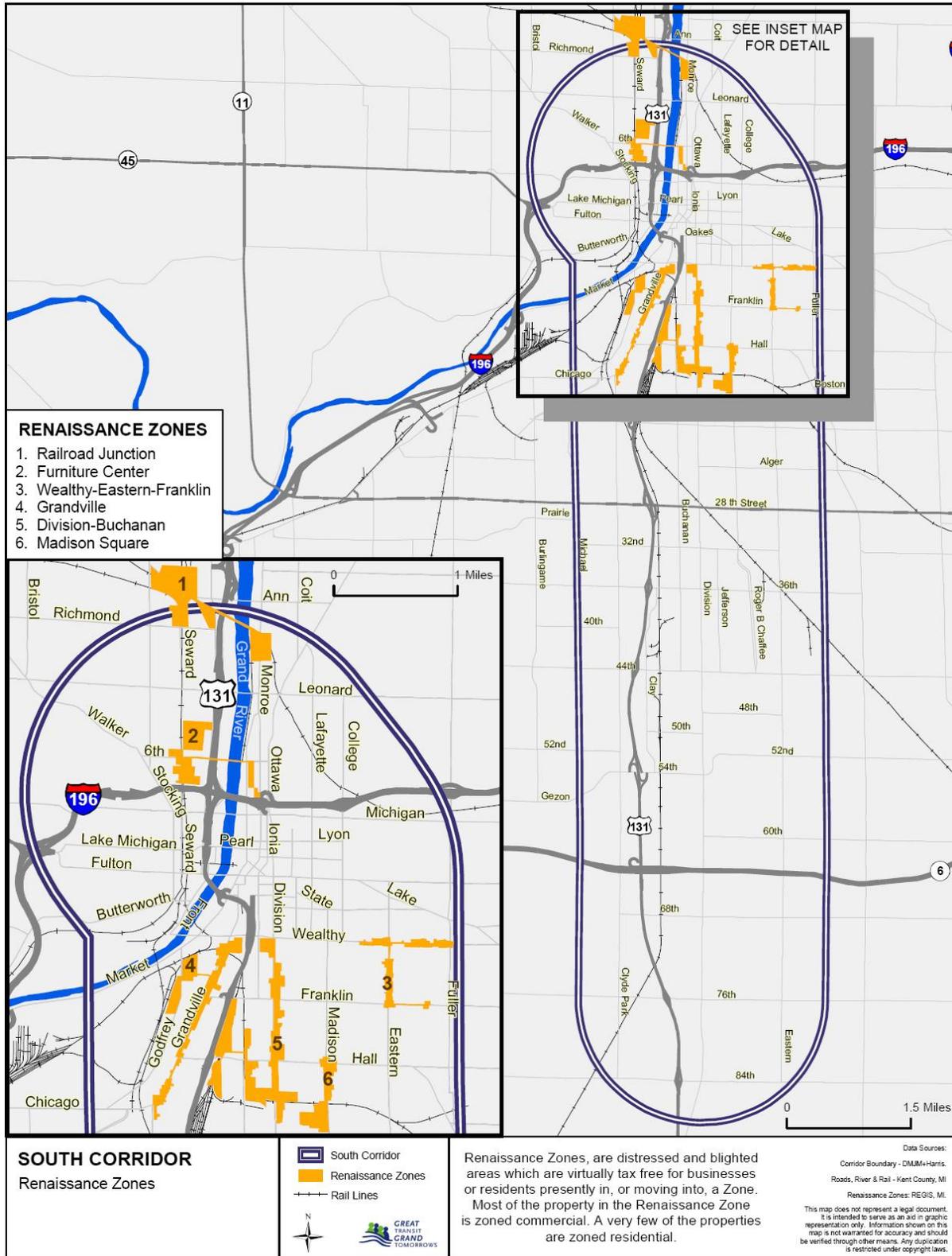


Figure 4-14: Renaissance Zones

4.3 Project Goals

The following goals for a potential transit investment in greater Grand Rapids were established early in the GT2 Study process:

- Improve mobility and connections
- Improve transportation choices for all residents
- Preserve and enhance communities and neighborhoods
- Protect and improve the environment
- Promote transit-supportive land use patterns
- Stimulate economic development, redevelopment and revitalization
- Develop a feasible, affordable, and cost-effective system.

The purpose of the GT2 Study was to initiate the process of meeting these goals through an enhanced transit investment, and to build broad consensus for a strategy that can help achieve the goals most effectively. As a result, these goals were used to establish criteria and evaluate the potential transportation improvements considered in the study, ensuring the proposed BRT project meets the overall purpose and need of the corridor.

5.0 AGENCY COORDINATION AND PUBLIC OUTREACH

A comprehensive public outreach program was developed to engage the decision-makers, agencies, neighborhoods, businesses, interest groups, and other parties potentially affected by the outcome of the GT2 Study. It established an open, meaningful, and collaborative dialogue throughout the decision-making process. The entire public outreach process and comments received have been documented in Summary of Public Comments Reports. The first report contains public outreach information from June 2003 to April 2004, the second extends from April to June 2004, and the third covers June to October 2004.

5.1 Public Transportation Tomorrow Task Force

The Public Transportation Tomorrow (PTT) Task Force was established by *The Rapid* to serve as the primary decision-making body for the GT2 Study. Members of the Task Force represent public and private sector community leaders from the Study Area, region, state, and federal levels. They will ultimately be responsible for mobilizing the resources necessary to implement the final recommendations of the study. Therefore, the Task Force includes representatives from groups or entities with a major public policy or economic development interest in the Greater Grand Rapids Metropolitan Area.

Updates have also been provided to policy committees, councils, and boards throughout the study process. This has included *The Rapid* Committees and Board, GVMC Committees and Board, local jurisdictions, and other local, regional, state, and federal agencies upon request.

5.2 Public Transportation Tomorrow Advisory Committee

The PTT Advisory Committee was established by *The Rapid* to provide technical input and guidance for the study. Members include planning and engineering professionals from jurisdictional agencies, as well as members of the Transportation Improvement Program, technical and policy committees from the GVMC. As is the case for the Task Force, the Advisory Committee includes participants that have a major public policy or economic development interest in the Greater Grand Rapids Metropolitan Area. Members of this group also represent organizations, agencies, and jurisdictions that may have responsibilities in implementing elements of the recommended investment strategy.

In addition to the existing Advisory Committee, other meetings with key staff from local, regional, state, and federal agencies were conducted. The local jurisdictions provided input relative to redevelopment and land use policies along the corridors. Special agency meetings to discuss and resolve issues influencing key decisions also were held. Specifically, discussions took place with the cities of East Grand Rapids, Grand Rapids, Grandville, Kentwood, Walker, and Wyoming, Byron and Gaines townships, Kent County, GVMC, MDOT, and FTA.

5.2.1 Community Involvement

A major, critical element of the public outreach program was to obtain feedback and participation from the community. A few different forums and approaches were undertaken to accomplish this broader level of public involvement. *The Rapid's* Employers Advisory Council was used to engage key business leaders in the Greater Grand Rapids Metropolitan Area. Other key stakeholders representing a wide range of community interests were consulted, including neighborhood and business associations, chambers of commerce, universities and other educational institutions, health organizations, religious congregations, environmental groups, disability communities, major property owners, and employers. In particular, study updates were provided to the following community groups:

- Grand Valley State University
- The Right Place's Manufacturers' Council
- West Michigan Regional Planning Council
- Macatawa Area Express (MAX)
- Faith in Motion
- GRAND Action Board
- SOURCE and SE Area Partners
- Concerned Citizens for Improved Transit
- Neighborhood Business Alliance
- West Michigan Environmental Action Coalition
- Disability Advocates
- Area Agency on Aging
- Urban League
- Grand Rapids Chamber
- Kentwood/Wyoming Chamber
- Area Agency on Aging
- Gerald R. Ford International Airport (Figure 5-1).



Figure 5-1: Gerald R. Ford International Airport

Community meetings were also conducted in June 2003 and September 2004 to involve the general public. These meetings were advertised via media outlets such as newspapers, radio, and television. Additionally, meeting notifications were mailed to all study committees, stakeholders, and interested citizens. The website, e-mail, and hotline number also contained information about the meetings.

In addition to key stakeholder and public meetings, all members of the community were invited to provide their input through a variety of non-meeting formats. This involved the following outreach activities:

- Maintaining the study website, e-mail, and hotline
- Encouraging agency staff to provide update presentations at existing community forums
- Distributing information at community events and festivals
- Displaying information booths at major activity centers such as universities, colleges, etc.
- Implementing bus advertising campaign to draw attention to website (Figure 5-2)
- Integrating and coordinating input with other regional and local planning processes.

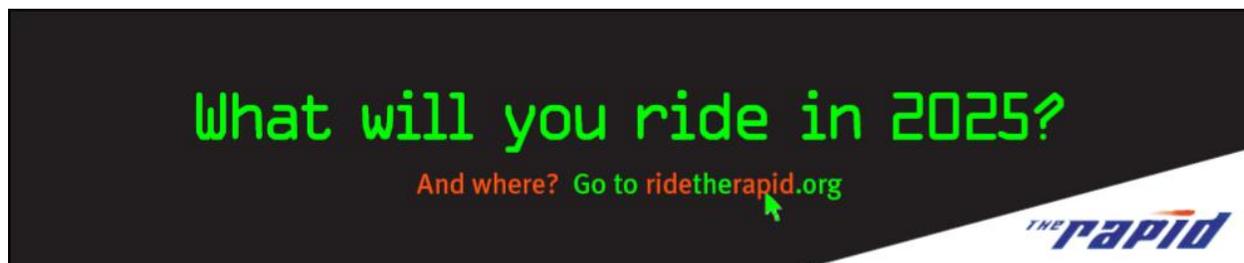


Figure 5-2: Bus Advertising Campaign

5.2.2 Media Coverage

The GT2 Study ignited a lot of media coverage. This included calendar listings for the public meetings in the Advance, WWMT.com, WOODTV.com, WCSG Radio, On The Town and Grand Rapids Press. Articles also appeared in the North College Block Club newsletter, Grand Rapids Business Journal, Mi Biz West, and Grand Rapids Press. Radio coverage consisted of WGUV, WJNZ, WOOD, and WYCE. Television spots also were shown on WOOD TV 8, WXMI TV Fox 17, and WZZM TV 13.

6.0 SCREENING OF ALTERNATIVES

The GT2 Study has involved the evaluation of multiple transit modes, geographic corridors and alignment options. With established evaluation criteria, technical analysis, and public input, the alternatives were narrowed down through a “tiered” process. Figure 6-1 outlines this “Alternatives Analysis” process that was conducted for the GT2 Study.

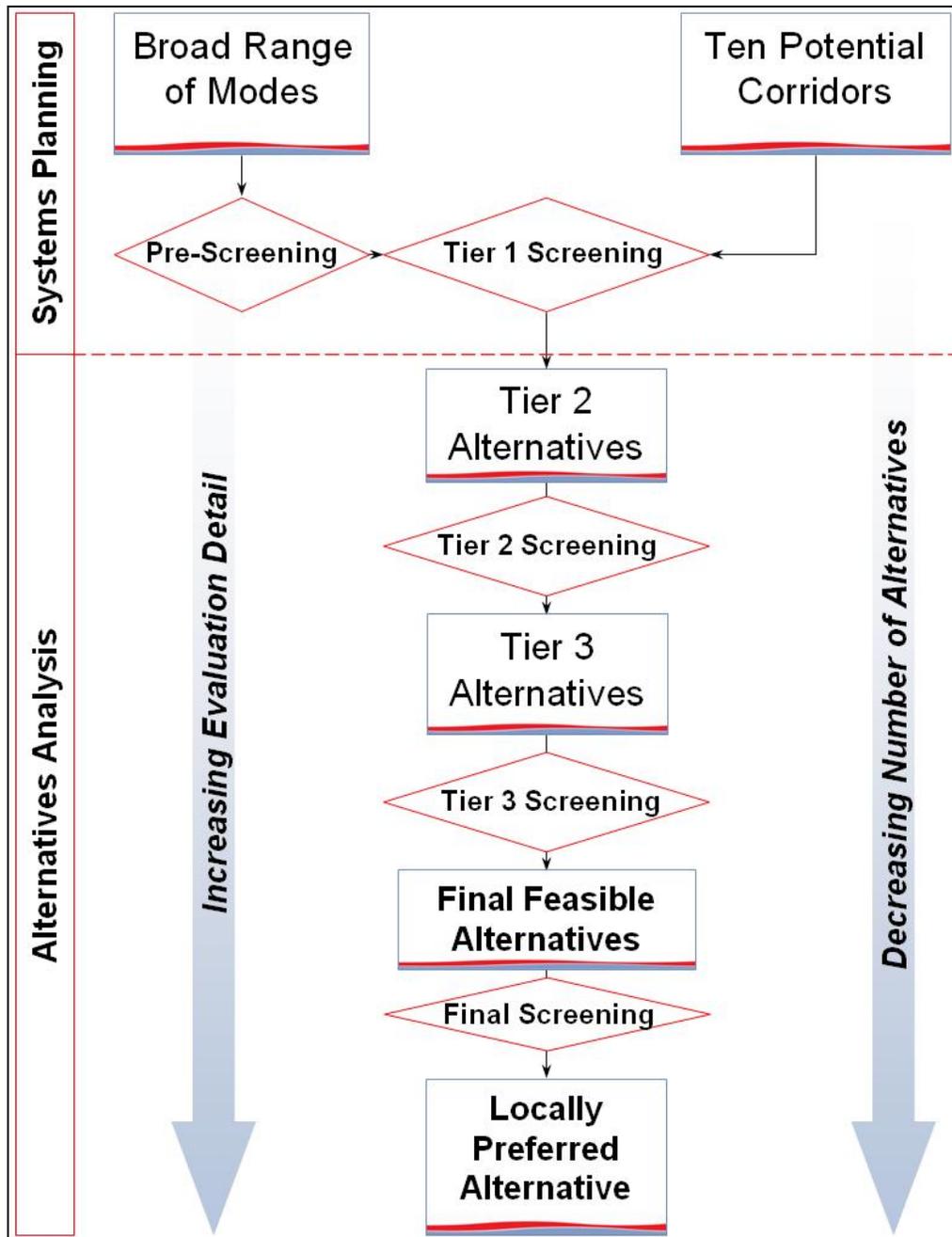


Figure 6-1: Alternatives Analysis Process

6.1 Pre-Screening and Tier 1 Analysis

A full range of 12 transit options was initially identified for the GT2 Study. A pre-screening was conducted on these modes to focus as quickly as possible on the more feasible technologies for the Grand Rapids area and to address the transportation needs in the Study Area. Two criteria were used to pre-screen the broad range of modes and technologies: (1) proven viability in North American revenue service and (2) scale of annualized costs for a representative length corridor. Based on this early screening and public input, five modes were eliminated from further consideration – monorail, heavy rail, MagLev, automated guideway, and personal rapid transit. Table 6-1 summarizes the pre-screening evaluation.

Mode	Pre-Screening Criteria		
	Proven Technology for North American Urban Transit	Comparative Scale of Annualized Cost	Carry Forward to Tier 1 Evaluation
Local Bus	Yes	Low	Yes
Enhanced Bus	Yes	Low	Yes
Express Bus	Yes	Low	Yes
Bus Rapid Transit	Yes	Low to Moderate	Yes
Light Rail Transit	Yes	Moderate	Yes
Streetcar	Yes	Moderate	Yes
Heavy Rail	Yes	Very High	No
Commuter Rail (traditional)	Yes	Moderate	Yes
Commuter Rail (self-propelled)	Yes	Moderate	Yes
Automated Guideway Transit	Yes	High	No
Monorail	Yes	High	No
MagLev	No	Not available	No
Personal Rapid Transit	No	Not available	No

Source: DMJM Harris, 2004.

The remaining seven modes were evaluated in Tier 1 using established goals and criteria. Tier 1 screening criteria included typical costs, capacity, potential safety impacts, typical speed, right of way requirements, potential environmental impacts, expandability and flexibility, community integration, economic development opportunities, urban design, and public support. Based on the Tier 1 analysis, commuter rail was removed from the GT2 Study because this type of transit service typically operates in corridors ranging from 30 to over 75-miles long. These lengths extended well beyond the GT2 Study Area. Thus, commuter rail trains similar to Amtrak or Metra in Chicago would be very ineffective and overly expensive to implement in the smaller GT2 corridors. This mode could be reconsidered as part of a larger tri-county regional effort.

Eight initial corridors were also formulated early in the GT2 Study. However, after public input, two more corridors were added: East Beltline and 44th Street. From there, the 10 corridors shown in Figure 6-2 were evaluated in Tier 1 based on population and employment, as well as travel demand. Table 6-2 presents a summary of this Tier 1 analysis of the corridors. In some cases, portions of a corridor performed better than the entire corridor, resulting in sub-corridors. Furthermore, some members of the community requested that major activity centers be considered in Tier 1. Based on this analysis and feedback, the Rockford, East, East Beltline, 44th Street, and Northwest corridors, as well as the northern portion of the Ridge Corridor were eliminated from further evaluation in the GT2 Study. These corridors could be reconsidered for future bus service improvements as part of *The Rapid's* annual service planning process.

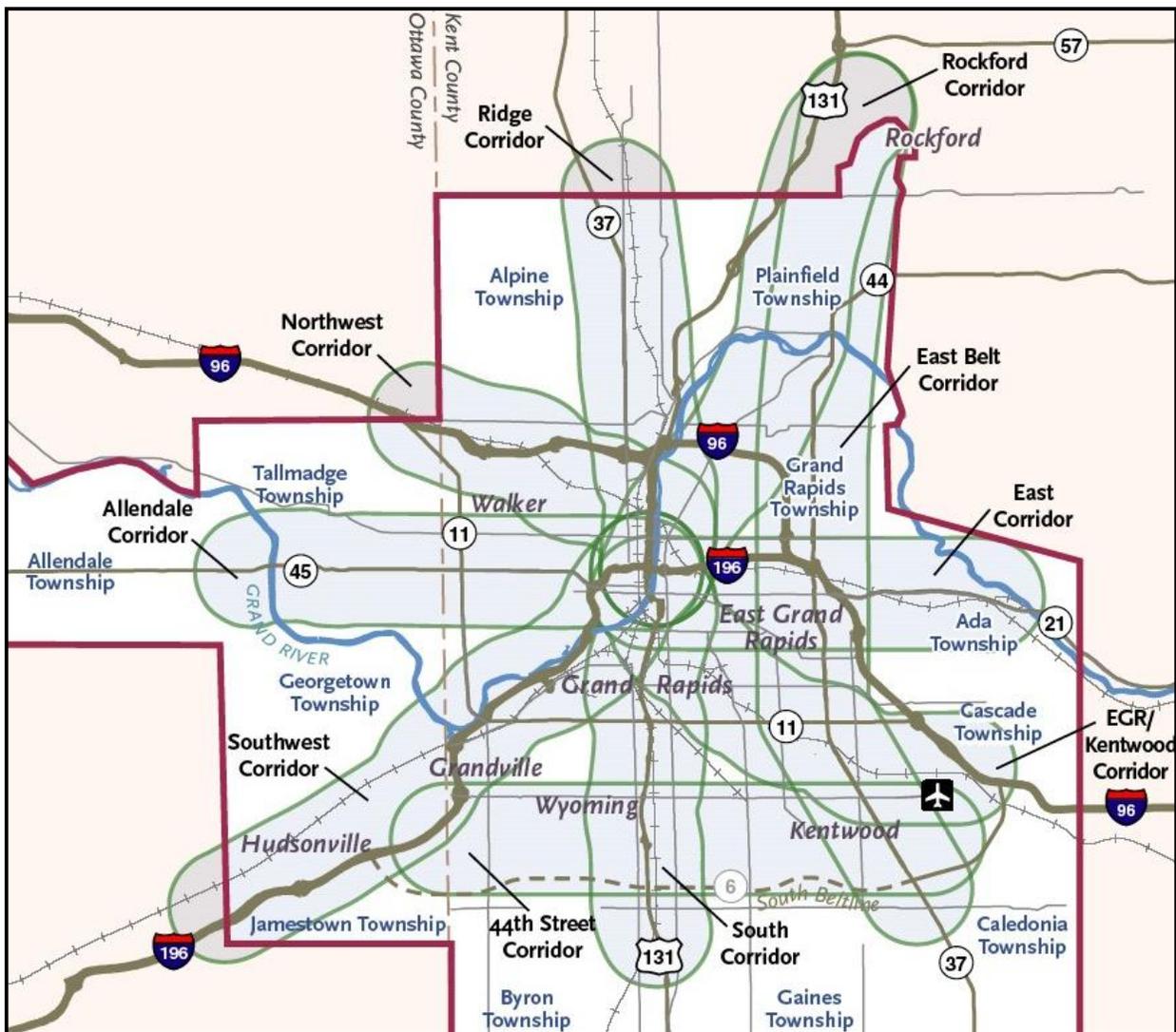


Figure 6-2: Tier 1 Corridors

Table 6-2: Summary of Tier 1 Analysis of Corridors

Corridors		Travel Demand		Density		Total		Overall Rank
		Work Trips/Mile	Total Trips/Mile	Pop./Acre	Emp./Acre	Pop.	Emp.	
Rockford	Full	○	○	○	○	●	●	L
	Partial	○	●	●	●	○	○	M
East Belt	Full	○	○	○	○	●	○	L
East	Full	○	○	○	●	●	●	L
	Partial	○	○	●	●	○	○	M
EGR-Kentwood	Full	●	●	●	○	●	●	M
	Partial	●	●	●	●	●	●	H
44th Street	Full	○	○	○	○	●	●	L
South	Full	●	●	●	○	●	●	M+
	Partial	●	●	●	●	●	●	H
Southwest	Full	●	●	○	●	●	●	M+
	Partial	●	●	●	●	○	●	M+
Allendale	Full	○	○	○	●	○	○	L
	Partial	●	●	●	●	○	○	M
Northwest	Full	●	●	●	●	○	●	M-
	Partial	●	●	●	●	○	●	H
Ridge	Full	○	○	●	●	●	●	L
	Partial	●	●	●	●	○	○	H

Legend

● = High ● = Medium ○ = Low

Overall Rank is displayed as L = Low, M = Medium, and H = High.

Source: DMJM Harris, 2004.

The Tier 1 analysis and screening of the various transit modes and study corridors was ultimately completed in February 2004. More thorough information on this analysis can be found in the Memorandum on Pre-Screening and Tier 1 Evaluation of Modes (December 23, 2003) and the Memorandum on Tier 1 Corridors Evaluation (March 23, 2004). This information and presentations on the Tier 1 screening process were provided to *The Rapid* Board of Directors, Task Force, Advisory Committee, Employers Advisory Council, and other key stakeholders in February and March. The Tier 1 recommendations were revised based on input received and approved by the Task Force on April 22, 2004.

6.2 Tier 2 Analysis

After approval of the Tier 1 screening, the remaining Tier 2 corridors highlighted on Figure 6-3 were evaluated using key criteria, such as major activity centers, population characteristics, land use consistency, development potential and park-and-ride opportunities. This analysis is summarized in Table 6-3 and more fully described in the Memorandum on Tier 2 Analysis of Remaining Modes and Corridors (May 25, 2004). It concluded that the East Grand Rapids/Kentwood and South corridors ranked highest in comparison to the other corridors, and as a result, these areas moved forward for further consideration in Tier 3 because they would have the best potential to support an enhanced transit investment in the FTA's New Starts process. The other corridors – Ridge Sub, Southwest and Allendale – were eliminated from the study. These three corridors could possibly be reevaluated by *The Rapid* for future bus service improvements.

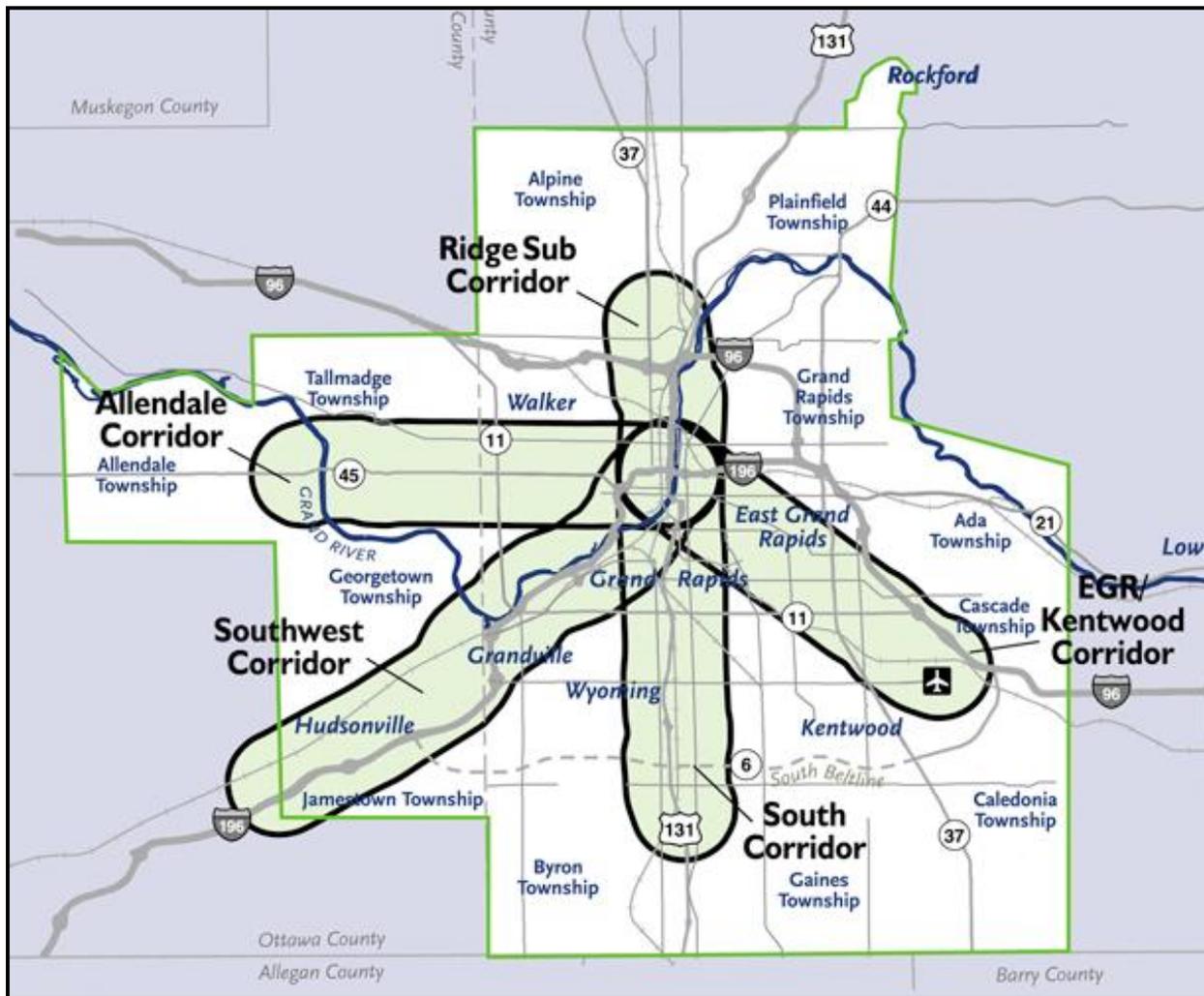


Figure 6-3: Tier 2 Corridors

Table 6-3: Summary of Tier 2 Corridor Analysis

Corridors	Evaluation Criteria					Remain in Study
	Major Activity Centers	Population Characteristics	Land Use Consistency	Development Potential	Park-and-Ride Opportunities	
Downtown	High	Medium-High	Medium-High	Medium-High	Not Applicable	Yes
Ridge	Low	Low	Low-Medium	Low	Medium	No
EGR/Kentwood	Medium-High	Medium-High	Medium	Medium-High	Low	Yes
South	Medium	Medium-High	Medium-High	High	Low-Medium	Yes
Southwest	Low	Medium	Low	Low-Medium	Medium	No
Allendale	Low-Medium	Low	Low-Medium	Low-Medium	Low-Medium	No

Legend

High = Ranks highest in comparison to other corridors.

Medium = Ranks moderately well in comparison to other corridors.

Low = Ranks lowest/worst in comparison to other corridors.

Source: DMJM Harris, 2004.

The remaining bus and rail modes were matched against the Tier 2 corridors, as presented in Table 6-4. All six modes were recommended for further study in the East Grand Rapids/Kentwood and South corridors. However, express bus would not be appropriate in East Grand Rapids/Kentwood because there is no existing expressway in the corridor. Following input by the study committees and other key stakeholders, the Task Force approved the Tier 2 corridor and modal recommendations on June 24, 2004.

Table 6-4: Summary of Modes Appropriate for Tier 2 Corridors

Corridors	Modes					
	Bus				Rail	
	Local	Enhanced	Express	BRT	LRT	Streetcar
Downtown	Yes	Yes	No	Yes	Yes	Yes
Ridge Sub	Yes	Yes	No	No	No	No
East Grand Rapids/Kentwood	Yes	Yes	No	Yes	Yes	Yes
South	Yes	Yes	Yes	Yes	Yes	Yes
Southwest	Yes	No	Yes	No	No	No
Allendale	Yes	Yes	Yes	No	No	No

Source: DMJM Harris, 2004.

6.3 Tier 3 Analysis

Following approval of the Tier 2 screening, the remaining corridors and modal alternatives were analyzed in Tier 3 from June to September 2004. Four potential transportation options were evaluated: enhanced bus/bus rapid transit (BRT), streetcar, light rail transit (LRT) and diesel multiple units (DMU). Routes for these transit modes were mapped along existing road and rail rights of way in the two remaining corridors (Figure 6-4): East Grand Rapids/Kentwood and South. Several alignments were considered along US-131, Division Avenue, existing rail lines, Lake Drive, Wealthy Street, Breton Street, East Paris, and the East Beltline. These alignment alternatives were evaluated based on major activity centers, land use consistency, development potential, population and employment, roadway congestion, ridership forecasts, right-of-way constraints, environmental implications (air quality, noise, vibration, water resources, etc.), and estimated costs. A summary of this analysis is found in Table 6-5 and documented more fully in the Memorandum on the Tier 3 Analysis from September 2004.

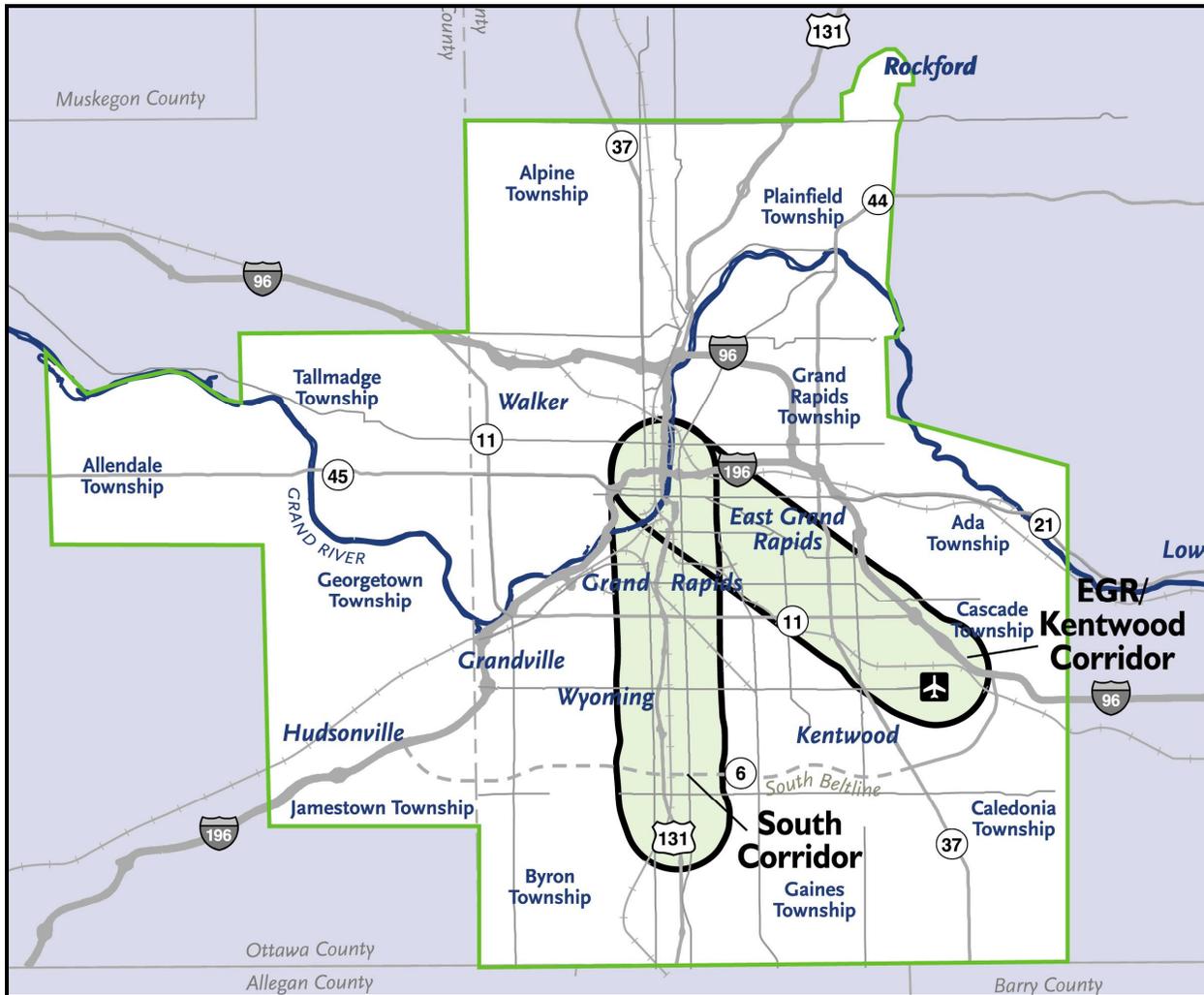


Figure 6-4: Tier 3 Corridors

Table 6-5: Summary of Tier 3 Analysis

Corridor / Alignment Alternative	Major Activity Centers	Land Use Consistency	Development Potential	Population and Jobs	Roadway Congestion	Ridership Forecasts	Right of way Constraints	Environmental Implications	Costs (Operating/ Capital)	Retain for Next Phase
EGR/Kentwood										
BRT on Various Streets	High	Medium - High	Medium - High	Medium - High	High	5,200 – 6,600	Medium	No Fatal Flaw	\$5.3-\$6.5M \$101M	Yes
Streetcar on Various Streets	High	Medium - High	Medium - High	Medium - High	High	4,900 – 6,300	Medium	No Fatal Flaw	\$13.5-\$15.8M \$258M	Yes
LRT on Various Streets	High	Medium - High	Medium - High	Medium - High	High	4,700 – 6,000	Medium - Low	No Fatal Flaw	\$12.5-\$15.3M \$388M	No
LRT on CSX Railroad	Low	Low	Low	Low	High	4,700 – 6,600	Low	No Fatal Flaw	\$7.5-\$8.5M \$374M	No
DMU on CSX Railroad	Low	Low	Low	Low	High	2,200 – 3,500	Low	No Fatal Flaw	\$7.7-\$9.5M \$360M	No
South										
BRT on Division	Medium - High	Medium - High	High	Medium - High	High	4,800 – 5,900	Medium	No Fatal Flaw	\$4.1-\$5.1M \$84M	Yes
Streetcar on Division	Medium - High	Medium - High	High	Medium - High	High	4,600 – 5,600	Medium	No Fatal Flaw	\$8.7-\$10.6M \$206M	Yes
LRT on NS Railroad	Low	Low	Low	Low	High	4,000 – 5,700	Low	No Fatal Flaw	\$7.0-\$7.9M \$392M	No
DMU on NS Railroad	Low	Low	Low	Low	High	1,800 – 2,800	Low	No Fatal Flaw	\$7.5-\$8.4M \$363M	No
LRT on US-131	Low	Low	Low	Low	High	4,100 – 5,800	Low	No Fatal Flaw	\$6.8-\$7.4M \$1,614M	No

Legend

High = Ranks highest in comparison to other alignment alternatives.

Medium = Ranks moderately well in comparison to other alignment alternatives.

Low = Ranks lowest/worst in comparison to other alignment alternatives.

Note: Costs shown in millions in 2004 dollars.

Source: DMJM+Harris, AECOM Consult, and Manuel Padron and Associates, August 2004.

Based on the Tier 3 findings, enhanced bus/BRT and streetcar were recommended to advance into the “Final Screening” phase. These two modes were recommended for evaluation in the East Grand Rapids/Kentwood Corridor on various streets and in the South Corridor on Division and Clyde Park, as delineated in Figure 6-5. Both corridors have ridership generators that could potentially support an enhanced transit investment, including major activity centers, population and job concentrations, and development opportunities. Furthermore, the street alignments for enhanced bus/BRT and streetcar have fewer right of way constraints in comparison to the railroad and US-131 options, and as a result, cost less. After stakeholder briefings and three public meetings in September 2004, the Tier 3 recommendations were endorsed by the Advisory Committee, Task Force, *The Rapid* Board of Directors, the six member agency cities, and the GVMC in late 2004 through early 2005.

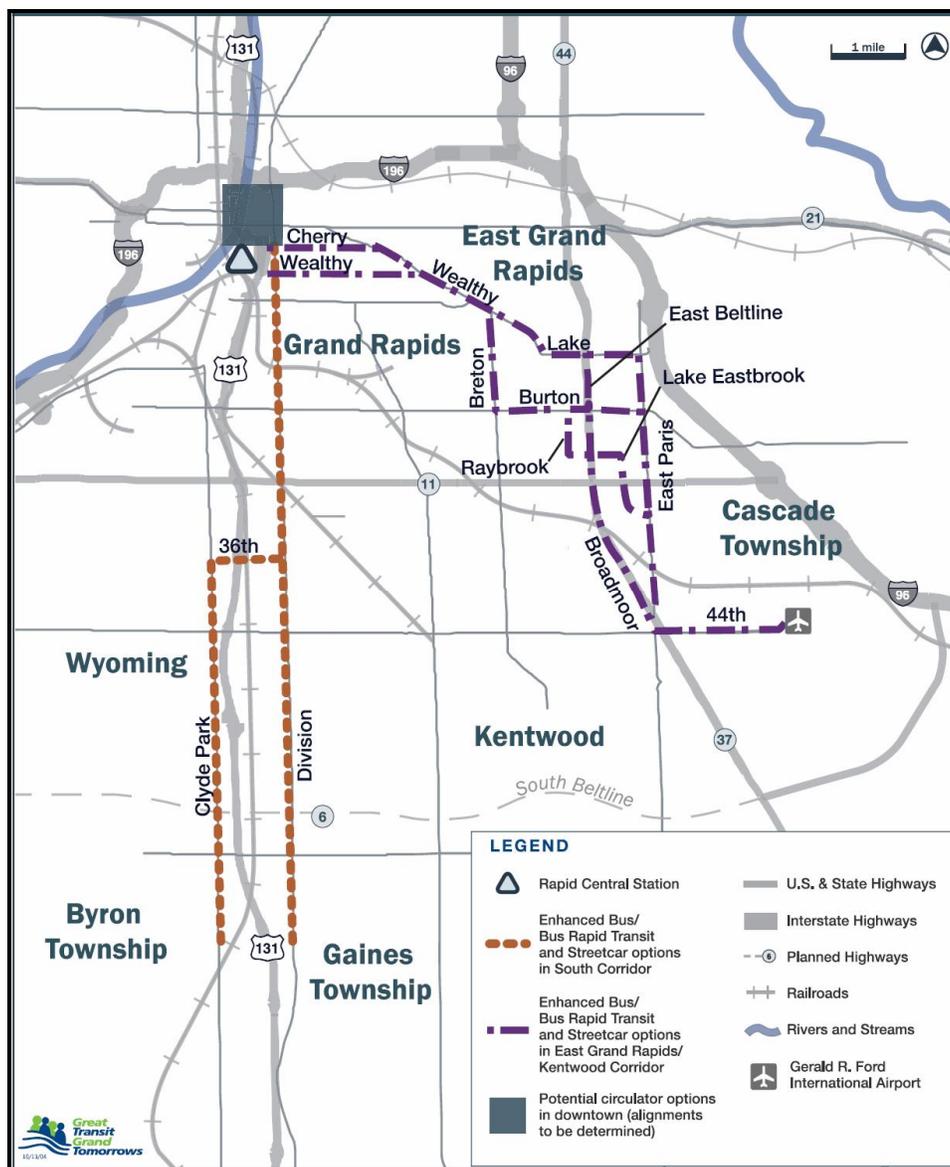


Figure 6-5: Alignment Alternatives for Final Screening

6.4 Final Screening Analysis

As part of the Final Screening process, the Tier 3 recommendations were refined to focus on Division Avenue for the South Corridor and Wealthy Street for the East Grand Rapids/Kentwood Corridor (renamed Southeast Corridor). BRT had an option for trolleybuses that would draw electric power from an overhead contact system. All of the alternatives assumed substantial stations, traffic signal priority, low floor vehicles, and branding of vehicles, stations, and signage. Final Screening criteria included estimated capital costs, operating and maintenance costs, total annualized cost, existing ridership in the corridor, and projected ridership. Table 6-6 summarizes the evaluation criteria, with more detailed analysis found in multiple supporting technical memorandums.

During Final Screening, the FTA issued Interim Guidance for Very Small Starts projects. The Final Screening analysis revealed that only BRT in the South Corridor could qualify as a Very Small Starts project, with a refinement of the design and cost estimates.

Based on the Final Screening and potential for Very Small Starts funding, the Task Force recommended BRT in the South Corridor as the Locally Preferred Alternative for the GT2 Study in August 2006. Through December of that same year, design assumptions were refined, a Minimum Operating Segment was developed, and revised cost estimates were prepared to meet the Very Small Starts criteria, while continuing to achieve the purpose, need and goals of the GT2 Study. The revised LPA was approved by *The Rapid* Board on January 24, 2007.

Table 6-6: Summary of Final Screening Analysis			
Corridor / Key Criteria	Mode		
	BRT	Trolleybus	Streetcar
Southeast Corridor Alignment			
Total Capital Cost (2006\$)	\$66.6	\$87.3	\$144.5
Annual Operating and Maintenance Cost (2006\$)	\$1.2	\$1.1	\$2.8
Estimated Annualized Cost (2006\$)	\$6.8	\$8.0	\$14.3
Existing Corridor Ridership (2005) ¹	2,184	2,184	2,184
Projected Average Weekday Ridership (2015)	2,700-3,700	2,700-3,700	2,700-3,700
South Corridor Alignment			
Total Capital Cost (2006\$)	\$101.8	\$143.8	\$244.0
Annual Operating and Maintenance Cost (2006\$)	\$2.5	\$2.3	\$5.8
Estimated Annualized Cost (2006\$)	\$10.6	\$13.8	\$25.3
Existing Corridor Ridership (2005) ²	6,705	6,705	6,705
Projected Average Weekday Ridership (2015)	2,400-3,600	2,400-3,600	2,400-3,600

¹Routes 5, 6 and 15.

²Routes 1, 2, 3, 4, and 10.

Source: *The Rapid*, DMJM Harris, AECOM Consult and Connetics Transportation Group, 2006.

7.0 LOCALLY PREFERRED ALTERNATIVE

During the Final Screening phase, one alternative met the purpose, need and goals for the GT2 Study, as well as fit the criteria for Very Small Starts – Bus Rapid Transit in the South Corridor. As a result, this BRT project was adopted as the LPA for the GT2 Study. It would have the following features consistent with Very Small Starts requirements:

- Substantial stations
- Traffic signal priority
- Low floor vehicles
- Branding of vehicles, stations and signage
- 10 minute peak and 15 minute off peak headways
- Serves a corridor with over 7,250 average weekday riders (FY2006)
- Costs less than \$50 million in total and \$3 million per mile (exclusive of vehicles)

As shown in Figure 7-2, the BRT line is approximately 9.87 miles in length. It would primarily use Division Avenue from 60th to Wealthy Street in downtown Grand Rapids. To serve downtown, the alignment would generally head north from Wealthy, running on various streets to Michigan Avenue. It would turn west on Michigan and then south on Monroe to Grandville Avenue. The route would continue south on Grandville, ultimately terminating at *The Rapid* Central Station. This section describes the LPA in greater detail, including the project alignment and guideway improvements, station locations and enhancements, vehicle needs, storage and maintenance facility requirements, operating assumptions, and cost estimates.

7.1 Alignment and Guideway Improvements

Beginning on the south end, the recommended BRT alignment would proceed from 60th Street north on Division Avenue through the cities of Kentwood, Wyoming, and Grand Rapids. In order to serve the core downtown area, the route would deviate from Division at Wealthy Street, where it would head east. It would then turn north onto Jefferson Avenue, with a slight jog west onto Fulton Street before continuing north on Ransom Avenue. The alignment would then run east on Fountain Street to Lafayette Avenue. After running north on Lafayette, it would then turn west on Michigan Avenue to Monroe Avenue, which turns into Market Avenue. After a slight turn east onto Weston Street, the alignment would travel south Grandville Avenue to Ellsworth Avenue, from Ellsworth to Goodrich Street, and Goodrich to *The Rapid* Central Station. Location of the northern terminus at Central Station would allow cross-platform transfers to most of *The Rapid's* fixed bus routes.



Figure 7-1: *The Rapid* Central Station

It is assumed that the BRT alignment would use existing travel lanes as shown in Figure 7-3. During peak hours, BRT vehicles would have exclusive lanes for transit use. Outside of peak hours, they would travel in mixed traffic. In order to improve travel times, traffic signal priority is proposed. The system, based on vehicle speed and distance to the intersection, would determine if holding a green signal or providing an early green signal would allow the BRT vehicle to pass through the intersection. The traffic signal priority system would also permit an early green signal for BRT vehicles leaving stations on the approach side of an intersection. In addition, BRT vehicles would be offered left-turn priority at certain intersections along the alignment. A passive system is assumed where no action by the BRT driver is needed.

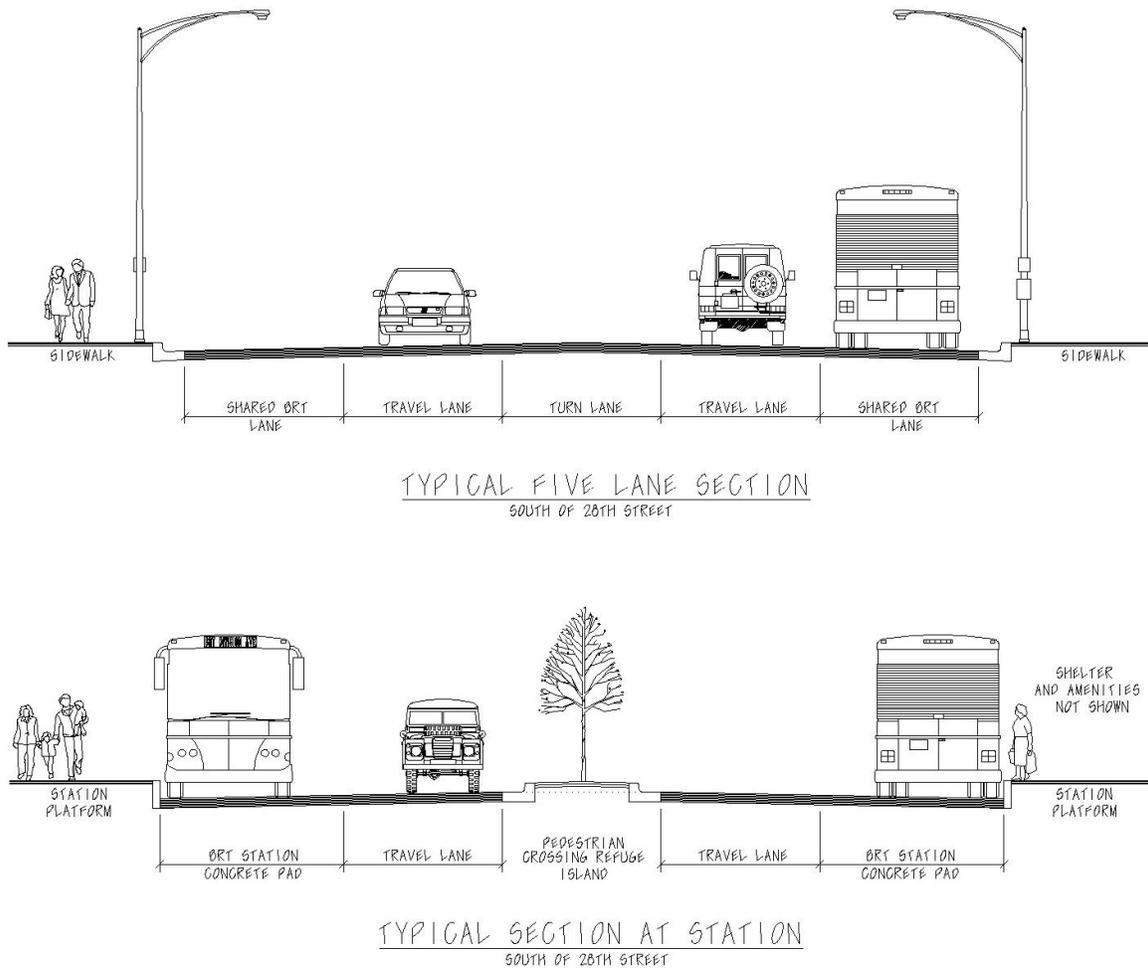


Figure 7-3: Selected Cross Sections for BRT

To provide a smooth ride quality along the alignment, milling and resurfacing portions of the BRT lane is proposed. Either in recent years or as part of the five-year program, 3.5 miles of the route would have already been reconstructed. Thus, milling and resurfacing of these reconstructed segments would not be needed. Of the remaining route length, field reviews indicate that ride quality would benefit from milling and resurfacing of approximately 50 percent of the BRT lanes.

7.2 Station Locations and Enhancements

Stations are proposed at approximate one mile intervals south of 28th Street and each half mile north of 28th Street. In total, 19 BRT stations (including Central Station) are proposed as shown previously in Figure 6-5. The station locations along Division Avenue would allow connections with existing cross-town routes on 44th, 28th, and Burton streets. The proposed stations would include a boarding platform, sheltered waiting area, ticket vending machines, and route maps. Traveler information would be displayed using global positioning from the vehicles and intelligent transportation system (ITS) display of next vehicles. A concrete pad is proposed along the station length to prevent rutting of asphalt pavement and degradation of ride quality. When a station is located in an area with existing on-street parking, a station “bump out” would be constructed to bring the boarding location to the outer driving lane.

A “branding” of the BRT project is proposed to distinguish it as an enhanced service over *The Rapid’s* existing fixed bus routes. This would include enhancements to the station amenities and signage. Figure 7-4 shows an enhanced BRT station in Kansas City. Where appropriate, the stations could be integrated with new developments along the alignment.



Figure 7-4: Enhanced BRT Station in Kansas City

It should be noted that park and ride facilities are not proposed with the project, although three locations could possibly allow park and ride facilities in the future at 76th, 68th, and 54th streets. These three locations are easily accessible from US-131.

7.3 Vehicle Needs

Although subject to refinement in future project development phases, the proposed service is assumed to use a 40-foot BRT vehicle, with low floor boarding and multiple doors similar to the New Flyer DE40LF. Figure 7-5 is an example of this bus, which is a diesel-electric hybrid. All vehicles would be furnished with radio communication systems and global positioning system (GPS) units that allow real-time reporting and location tracking. Furthermore, BRT vehicles would be included in the branding scheme, along with the stations and signage. Based on the operating assumptions, the proposed project would require 10 BRT vehicles.



Figure 7-5: New Flyer DE40LF

7.4 Storage and Maintenance Facility Requirements

Storage and maintenance facilities would be required for the new BRT vehicles, particularly since existing bus facilities are already at capacity. The new facility would need to accommodate both light and heavy maintenance activities.

Even though existing facilities are at capacity, savings could possibly be realized by assigning daily cleaning and inspection, as well as light maintenance and repairs to the new BRT facility. Heavy repairs and overhauls could be made at existing facilities. Potential sites for storage and maintenance facilities have not been identified at this stage of analysis. Future site selection should examine minimization of non-revenue movements in order to provide an efficient and effective system, thereby reducing operating costs. Figure 7-6 is the old streetcar facility on Hall Street that was used for storage and maintenance activities.



Figure 7-6: Old Streetcar Shop on Hall Street near Division Avenue

7.5 Operating Assumptions

In general, transit operations for the proposed BRT project would operate in the outside travel lane. As previously discussed, this lane would be dedicated to transit vehicles during peak hours, other than automobiles crossing the lane to park or make a right turn. In non-peak hours, transit vehicles would travel in mixed traffic with automobiles.

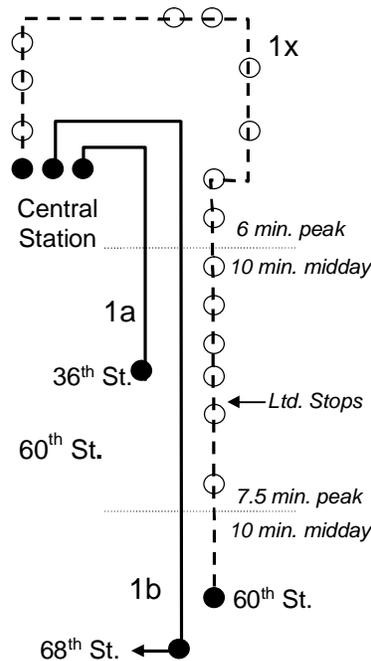
Table 7-1 shows the proposed operating hours and frequency for the BRT route on weekdays, Saturdays and Sundays. The new BRT service would be integrated with the existing local bus Route 1, which would have slight modifications to better circulate in downtown. Figure 7-7 provides a schematic of the proposed operating patterns in the South Corridor on an average weekday. As shown, the existing Route 1 would have local service from Central Station south to 60th Street at 30 minute peak and midday headways (line 1b), plus a short-turn service from Central Station to 36th Street at 30 minute peak headways (line 1a). The new BRT route (line 1x) would provide a frequency of 10 minutes during the peak and 15 minutes midday. Combined frequencies in the corridor between downtown and 36th Street would be 6 minutes in the peak and 10 minutes midday.

The estimated travel time for the 9.87 mile BRT route is approximately 35 minutes for a one-way trip. The average operating speed, including dwell time at station stops would be just over 16.6 miles per hour. Outside of downtown along Division Avenue, the average operating speed would be around 20.5 miles per hour. In general, BRT would run 10 to 20 percent faster than the existing Route 1 due to limited stops, exclusive travel lanes, and signal prioritization.

Appendix A contains the detailed operation plan and assumptions for the proposed BRT project.

Table 7-1: Proposed BRT Operating Hours and Frequency		
Day of Week	Time Period	Frequency in Minutes
Weekday		
Early AM	5:00-5:45 AM	15
AM Peak	5:45-8:45 AM	10
Midday	8:45 AM-2:45 PM	15
PM Peak	2:45-5:45 PM	10
Early Evening	5:45-6:30 PM	15
Evening	6:45-11:30 PM	30
Saturday		
Morning	6:00-9:00 AM	30
Midday	9:00 AM-6:00 PM	30
Evening	6:00-10:00 PM	30
Sunday		
Daytime	7:00 AM-7:00 PM	30

Source: Connetics Transportation Group, 2007.



1a = 30 peak/no midday
 1b = 30 peak/30 midday
 1x = 10 peak/15 midday

Figure 7-7: Proposed Route Patterns

7.6 Existing Transit Ridership

The Rapid's 19 fixed bus routes carried a record breaking 7.5 million annual riders in 2006, an increase of nearly a million over 2005. Average weekday ridership was 17,809, 9.5 percent more than in 2005 (Table 7-2). As previously discussed, *The Rapid* runs five bus routes in the South Corridor: #1 Division, #2 Kalamazoo, #3 Madison, #4 Eastern, and #10 Clyde Park. Service levels on these routes remained at 15 to 30 minutes during the peak and 15 to 45 in the off-peak. They accounted for 7,250 weekday boardings or 40.7 percent of *The Rapid's* systemwide ridership in 2006. The methodology and results of benefiting ridership analysis can be found in the tabbed section labeled "Benefiting Riders." Figure 7-8 shows some existing transit riders at *The Rapid* Central Station.

Route #	Route Name	AM Headways (minutes)	Midday Headways (minutes)	2005 Weekday Boardings	2006 Weekday Boardings	Percent Change 2005 to 2006
1	Division Ave	15	15	2,231	2,341	+4.9%
2	Kalamazoo	30	30	1,687	1,844	+9.3%
3	Madison	30	45	431	453	+5.1%
4	Eastern	30	30	1,379	1,523	+10.4%
10	Clyde Park	30	30	977	1,089	+11.5%
Total South Corridor				6,705	7,250	+8.1%
Total System				16,260	17,809	+9.5%
South Corridor Percent of Total				41.2%	40.7%	-0.5%

Source: *The Rapid*, 2005 and 2006.



Figure 7-8: Existing Riders at *The Rapid* Central Station

7.7 Cost Estimates

7.7.1 Capital Costs

Table 7-3 provides a summary of the total capital costs, which reflect the description of the BRT project discussed above. Based on the proposed design assumptions, the total project cost is estimated at \$36.3 million in 2007 dollars and \$40.1 million in year-of-expenditure (YOE) dollars. This translates to \$3.0 million and \$3.4 million per mile without vehicles in 2007 and YOE dollars, respectively. The total capital cost and cost per mile (2007 dollars) both meet FTA's thresholds for Very Small Starts projects, which must have a total capital cost of less than \$50 million including all project elements and less than \$3 million per mile exclusive of rolling stock. The detailed capital costs can be found in the tabbed section labeled "Capital Costs."

Table 7-3: Total Capital Costs		
	Costs in 2007\$	Costs in YOE\$
Project Characteristics		
Length (miles)	9.87	9.87
Number of Stations (including Central Station)	19	19
Number of Vehicles (including spares)	10	10
Capital Construction Costs		
Guideway Elements	\$1,760,000	\$2,000,000
Yards and Shops	\$6,160,000	\$6,800,000
Systems	\$4,400,000	\$4,900,000
Stations	\$7,450,000	\$8,200,000
Vehicles	\$6,400,000	\$7,000,000
Utilities	\$100,000	\$110,000
Right-of-Way	\$490,000	\$590,000
Engineering, Design, and Administration	\$6,210,000	\$6,800,000
Unallocated Contingency	\$3,330,000	\$3,700,000
TOTAL	\$36,300,000	\$40,100,000
Unit Costs		
Cost per mile	3,300,000	\$4,100,000
Cost per mile without vehicles	3,000,000	\$3,360,000
Cost per mile without shop or vehicles	2,400,000	\$2,670,000

Source: DMJM Harris, 2007.

7.7.2 Operating and Maintenance Costs

In addition to one-time capital costs for construction and implementation, BRT service in the South Corridor is estimated to cost \$2.72 million for annual operations and maintenance (O&M). The additional costs attributable to BRT vehicle and station maintenance adds about 10 percent over existing local bus service. After accounting for \$843,300 in state operating assistance, the net O&M cost to *The Rapid* for BRT in the South Corridor is estimated to be \$1.88 million in 2007 dollars. These annual O&M cost estimates are presented in Table 7-4, with the details found in Appendix A.

Table 7-4: Annual Operating and Maintenance Costs			
Service/ Characteristics	Statistics	Unit Cost	Annual O&M Cost in 2007\$
BRT Service			
Revenue Bus Hours	32,300	\$75.43	\$2,436,400
Revenue Bus-Miles	445,400	\$0.211	\$94,000
Fleet Vehicles ¹	10	NA	NA
Stations	19	\$10,000	\$190,000
Total BRT Service:			\$2,720,400
Minus State Operating Assistance (31%)²:			-\$843,300
Net Annual O&M Costs:			\$1,877,100

¹Eight peak service vehicles plus two spare vehicles for a total fleet of ten BRT vehicles.

²State operating assistance of 31 percent is applied.

Source: Connetics Transportation Group, 2007.

8.0 FINANCIAL PLAN

Financial planning was conducted in accordance with FTA's Interim Guidance for Very Small Starts projects, which requires a project sponsor to demonstrate their capability to construct and operate the proposed LPA. More specifically, *The Rapid* must have sufficient available funds for the local share of capital costs or present a reasonable plan to secure local funding. The local share must be committed before receiving FTA's approval for construction. As the projected additional operating and maintenance cost of the LPA is greater than five percent of *The Rapid's* overall operating budget, a financial plan has been developed. *The Rapid* must also be in good financial condition, as documented in three years of audited financial statements.

The Financial Plan was developed with these guidelines in mind, identifying the funding sources and establishing the financial capacity of *The Rapid* to construct and operate the LPA. The proposed BRT project is estimated to receive \$32.1 million (YOE dollars) or 80 percent funding of capital costs from federal Very Small Starts, matched by \$8.0 million or 20 percent from state and local sources. Additionally, the proposed BRT project would constitute approximately 9.0 percent of the systemwide operating and maintenance costs.

The Financial Plan identifies revenues from a variety of potential sources to fund the on-going operation and maintenance of the proposed BRT project. In addition to state capital and operating grants and passenger fares, the most likely source of funding is an increase in the existing property tax millage which supports *The Rapid*. Voters in the six ITP jurisdictions have approved millage increases for *The Rapid* in the past (0.20 mills increase in November 2003 and, most recently, 0.95 mills renewal and 0.17 mills increase in May 2007), and political leaders in the region believe voters will approve additional financial support for transit. Moreover, a change to Michigan statute in 2006 now allows such transit-supportive taxes to be levied for a period of up to 25 years before requiring reauthorization by voters (the previous maximum term was 5 years), which allows cities and agencies to leverage those guaranteed future revenues into long-term bond funding.

The proposed BRT project is within the capacity of the ITP jurisdictions to undertake via property tax funding. The proposed non-federal share of the capital cost of the BRT project is \$8.0 million, and the annualized cost of this share (over a 20 year period at a 5% interest rate) is \$0.65 million. By comparison, the ITP jurisdictions generate approximately \$9.4 million from the current ITP property tax millage of 0.95 mills. Even if the ITP jurisdictions receive no state capital support and are responsible for funding the full 20 percent non-federal share of the project's capital costs, this would only require a millage increase of approximately 0.07 mills.

The tabbed section "Project Financial Plan" contains the complete Financial Plan.

9.0 MEETING CORRIDOR NEEDS AND ACHIEVING PROJECT GOALS

Per Very Small Starts requirements, this section provides an assessment of the effectiveness of the proposed BRT project in solving the problems or taking advantage of the opportunities in the South Corridor. This is demonstrated through an analysis of the likelihood of the proposed BRT project in achieving the project goals, as well as any uncertainties that may be involved. The following goals for a potential transit investment in the South Corridor are:

- Improve mobility and connections
- Improve transportation choices for all residents
- Preserve and enhance communities and neighborhoods
- Protect and improve the environment
- Promote transit-supportive land use patterns
- Stimulate economic development, redevelopment and revitalization
- Develop a feasible, affordable, and cost-effective system.

These goals were used to establish criteria and evaluate the potential transportation improvements considered in the pre-screening, Tier 1, Tier 2, Tier 3 and Final Screening phases. As a result, the Alternatives Analysis process ensures that the selected LPA meets the overall purpose and need of the corridor. The subsections that follow provide a discussion and qualitative assessment based on the information and criteria applied throughout the GT2 Study.

9.1 Improve Mobility and Connections

The proposed BRT project offers an enhanced commute trip, establishes reliable and convenient service, and maximizes transit mobility and connections, thus providing an attractive alternative to the automobile and congested roadways. BRT would run 10 to 20 percent faster on average than existing buses due to limited stops, exclusive travel lanes, and signal prioritization. It would also have improved headways, with combined frequencies of 6 minutes in the peak and 10 minutes midday between downtown and 36th Street. Central Station would accommodate transfers to most buses, and stations along Division Avenue would connect with existing cross-town bus routes. Enhanced BRT service with these increased frequencies and intermodal links would attract more transit riders to the system, as it would become more available and convenient for passengers. With worsening traffic conditions, it would divert some people from their cars to buses, thereby alleviating congestion and improving mobility in the corridor.

9.2 Improve Transportation Choices for All Residents

An enhanced transit investment would support the continuing population and job growth in the greater Grand Rapids region, as well as in the South Corridor. Grand Rapids is the second largest city in the State of Michigan and the business hub of Kent County, with a significant concentration of major activity centers. Therefore, it is the terminus and principal transfer point for the proposed BRT system, especially for the high percentages of transit dependent and environmental justice communities living in the South Corridor. These communities would benefit from an enhanced transit investment, connecting people to their jobs, cultural events, medical facilities, universities, and other activities in downtown Grand Rapids and throughout the corridor.

9.3 Preserve and Enhance Communities and Neighborhoods

The proposed BRT project would have a greater presence in the communities and neighborhoods than existing bus service in the South Corridor. The BRT stations would consist of a boarding platform, sheltered waiting area, ticket vending machines, route maps and ITS visual displays. A “branding” of the BRT project is also proposed, which would involve enhancements to station amenities, signage, and vehicles. Where appropriate, the stations could be integrated with adjacent land uses and any new developments along the alignment, enhancing the character of nearby communities and neighborhoods.

With that said, BRT would have potential impacts to environmental justice communities since it would be routed directly through these neighborhoods. Potential construction impacts along the route could encompass noise, traffic, parking loss, access issues, and air quality. However, any construction impacts would be temporary and are not expected to be that severe. Appropriate mitigation measures would be implemented to minimize potential impacts during the construction period. Once completed, these communities and neighborhoods would benefit from improved transit service.

9.4 Protect and Preserve the Environment

No other environmental “fatal flaws” or significant impacts appear to exist that would prohibit implementation of the proposed BRT project. If anything, air quality improvements could be achieved by using diesel-electric hybrid buses, which would have cleaner vehicle emissions than existing diesel-powered buses. In addition, a potential transit investment could decrease corridor-wide fuel consumption by diverting some people from automobiles to transit.

Yet, many cultural resources are located in the corridor, which would need to be protected and preserved. Numerous historic sites and districts could be impacted in downtown Grand Rapids. Schools, parks, trails and bikeways are also found along Division Avenue. Potential impacts to these cultural resources would need to be considered during construction and on-going operation, but none seem to be insurmountable to implementing the BRT project.

9.5 Promote Transit-Supportive Land Use Patterns

The downtown Grand Rapids Central Business District contains transit supportive land use development patterns, with high density office and residential buildings. In the year 2030, densities would be over 44 persons per acre and greater than 100 jobs per acre in the core downtown area. Medium density housing, mixed use and commercial frontage are found the length of Division Avenue north of 28th Street. These land use densities would help support an enhanced transit investment in the corridor.

Additionally, local jurisdictions have plans to promote more transit-friendly development along Division Avenue – historically the main gateway into Grand Rapids. The City of Grand Rapids has a transit-oriented development plan that encourages dense, mixed-use development along transit routes in the corridor. Kentwood and Wyoming are amending their plans to include transit-oriented development in several corridors including Division Avenue. Therefore, the proposed BRT project would serve transit-supportive land uses, now and into the future.

9.6 Stimulate Economic Development, Redevelopment and Revitalization

In addition to transit-supportive land use plans and policies, many economic development and redevelopment opportunities are in the South Corridor, and since Division Avenue represents a high transit dependent population, the cities recognize the need to ensure that any new developments support transit. Joint planning between the cities of Grand Rapids, Wyoming and Kentwood are continuing to evaluate potential land use development projects adjacent to Division Avenue. The tax relief offered by Renaissance Zones generates significant redevelopment opportunities, particularly for a much blighted Division Avenue that contains many deteriorating buildings. An enhanced transit investment could spur revitalization efforts, improving the quality of life for economically depressed neighborhoods.

9.7 Develop a Feasible, Affordable, and Cost-Effective System

The BRT project meets FTA's cost effectiveness thresholds for Very Small Starts projects, which must have a total capital cost of less than \$50 million including all project elements and less than \$3 million per mile exclusive of rolling stock. Furthermore, *The Rapid* has demonstrated their capability to construct and operate the proposed project as shown in the financial plan. Thus, BRT is a feasible and affordable project, contributing to the cost efficiency of *The Rapid's* bus system.

10.0 SUMMARY AND CONCLUSIONS

The Locally Preferred Alternative of Bus Rapid Transit in the South Corridor meets the overall purpose and need for the GT2 Study, along with the established goals for the project. BRT in the South Corridor will achieve the project goals by improving mobility and connections, expanding transportation choices, enhancing communities and neighborhoods, protecting the environment, promoting transit-supportive land use, stimulating economic revitalization, and developing a cost-effective system.

Moreover, the proposed BRT project meets FTA’s Very Small Starts criteria. The features of the BRT project, as summarized in Table 10-1 include substantial transit stations, traffic signal priority, low-floor vehicles, branding of the proposed service, 10 minute peak and 15 minute off-peak headways, existing corridor ridership over 7,250, and costs less than \$50 million in total and \$3 million per mile (minus vehicles). A Financial Plan demonstrates *The Rapid’s* financial stability, along with their ability to construct, operate and maintain the new BRT service. Meeting these FTA requirements is necessary for the proposed project to be eligible for Very Small Starts funding.

Table 10-1: Summary of Project Features for BRT in the South Corridor	
Route Length in Miles	9.87
Number of Stations (including Central Station)	19
Number of Vehicles (including spares)	10
Peak Headways in Minutes	10
Midday Headways in Minutes	15
Existing Corridor Ridership in 2006	7,250
Total Capital Costs in Millions (2007\$)	\$36,300,000
Cost Per Mile in Millions Minus Vehicles (2007\$)	\$3,000,000
Annual Operating & Maintenance Costs in Millions (2007\$)	\$2,720,400

Source: *The Rapid*, DMJM Harris, and Connetics Transportation Group, 2007.

11.0 NEXT STEPS

Following inclusion of the LPA in the GVMC’s regional Long Range Transportation Plan, the key next steps and milestones in the overall project development process are:

- Environmental Class of Action Determination
- Very Small Starts Application for Entry into Project Development
- Project Development Agreement with FTA
- Preliminary Engineering and Final Design
- Commitment of Local Funding Share
- Project Construction Grant Agreement with FTA
- Start Construction
- Vehicle Procurement
- BRT Service Begins

If these steps are successfully implemented and achieved, BRT service in the South Corridor could begin operation in the year 2012.

12.0 OTHER CONSIDERATIONS

During the course of the GT2 Study, opportunities for transit improvements emerged in some other corridors. While they may not qualify as a Very Small Starts project, *The Rapid* could consider these possible enhancements as part of their annual service planning cycle or long range planning process. Following is a list of these potential transit improvements:

- **Ridge Sub-Corridor** – Alpine Avenue from downtown Grand Rapids to 6 Mile Road in Alpine Township could be ideal for enhanced bus service with signal synchronization improvements to better serve existing commercial and retail uses.
- **Southwest Corridor** – This corridor from downtown Grand Rapids to Hudsonville may be suited for express bus service since it consists of suburban communities linked by an interstate. Express buses could pick up passengers at park-and-ride lots located near I-196 and then continue into downtown on the freeway. Commuter Rail service may be another possibility for future consideration; this service typically operates in corridors from 30 to over 75-miles long. Thus, it could be reevaluated as part of a larger tri-county regional effort.
- **Allendale Corridor** – Service to Grand Valley State University (GVSU) operates similar to express bus in that it travels long distances and makes limited stops between the university and downtown Grand Rapids. This bus service could be enhanced by using such things as articulated vehicles to accommodate the significant student patronage generated by GVSU.
- **Downtown Grand Rapids** – A potential streetcar circulator could be an appropriate transit solution to enhance access to employment, educational, and entertainment venues in downtown Grand Rapids. This downtown streetcar circulator could be pursued by *The Rapid*, in cooperation with the City of Grand Rapids.