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Local Planning and High-Speed Rail: Responses and Perceptions in a Developing Amtrak Corridor

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LOCAL PLANNING AND HIGH-SPEED RAIL: RESPONSES AND PERCEPTIONS IN A DEVELOPING AMTRAK CORRIDOR

by

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Incremental speed increases have been a main focus of Amtrak in recent years. Now operating at 110 mph within three different service lines in the United States, Amtrak is making progress toward achieving maximum speeds within rail corridors. This study focuses on Amtrak's Wolverine service line which operates daily passenger rail service between Chicago, Illinois and Detroit/Pontiac, Michigan. Specifically, this study will look at six cities connected by this service that are east of Chicago. The six cities examined in this research are Hammond, Indiana, Michigan City, Indiana, New Buffalo, Michigan, Niles, Michigan, Dowagiac, Michigan, and Kalamazoo, Michigan. This segment of the rail corridor is currently the only area in which trains travel at speeds of up to 110 mph. This study focuses on recent speed increases within this segment of the Chicago-Detroit corridor and the effects of these speed increases on local planning. Interview data from local planning officials combined with a quantitative analysis of transit-oriented development characteristics from individual cities are used to understand the differing variations of responses and perceptions to the developing high-speed corridor. Results show significant differences between certain groups of cities and reveal specific reasons as to the nature of the cities' differing planning responses.

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John-Luke D'Ambrosio

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INTRODUCTION

The idea of high-speed rail (HSR) in the United States is a relative concept. In 1964, the Japanese Shinkansen line achieved speeds of 130 mph (210 km/h) in its initial run between Tokyo and Osaka (Nakamura and Ueda 1989). The French TGV-*Sud Est* passenger train achieved speeds of 236 mph (381 km/h) in 1981 and later the TGV-*Atlantique* reached 320 mph (515 km/h) in 1990 (Nakamura and Ueda 1989). In 2007, the TGV-*Est* reached a world record 357 mph (574 km/h). To date, the fastest passenger train in the United States is Amtrak's Acela Express connecting Washington D.C. and Boston, MA which reaches a top speed of 150 mph (240 km/h) (Federal Railroad Administration, 2009). Compared to these other passenger rail systems throughout the world, the United States system is significantly slower. This thesis focuses on a segment of the Chicago-Detroit Amtrak corridor and its recent development and progression to higher speeds and more frequent and reliable service.

The concept of HSR in the United States is not a novel one. Since the establishment of the National Railroad Passenger Corporation (Amtrak) in 1971, the United States has been interested in the development and implications of HSR throughout the world. For a number of reasons, the past 40 years has seen little advancement in the development of true HSR systems in the United States. One of the main reasons for this lack of advancement has been the absence of dedicated federal advocacy and financial

commitment. During this time European and Asian countries have invested massively in the development of this technology. However, a resurgence of enthusiasm and planning related to HSR in the United States has slowly been advancing over the past two decades. Developments over the past five years have arguably been the most indicative and promising of future HSR implementation throughout the country (Brookings Institute, 2013). Newly passed legislation such as the PRIIA (Passenger Rail Investment and Improvement Act) of 2008 and the ARRA (American Recovery and Reinvestment Act) of 2009 lay the ground work and allocate the funding necessary for future developments of HSR in the United States. To date, there are 10 federally designated HSR corridors that are eligible to receive funding for research and development. These corridors are spread throughout the country include the Pacific Northwest, California, South Central, Chicago Hub Network, Gulf Coast, Florida, Southeast, Keystone, Empire, and Northern New England corridors.

Figure 1: Map of Federally Designated High-Speed Rail Corridors

Source: Vision for High-Speed Rail in America, Federal Railroad Administration, 2009.

The scope of this study will encompass the federally designated Chicago-Detroit corridor (280 miles). Amtrak's Wolverine service line operates along this corridor and includes 16 intermediate stops between Chicago and Detroit reaching a top speed of 110 mph in one segment between Porter, Indiana and Kalamazoo, Michigan. The corridor is shown in Figure 1 and Appendix B.

The Federal Railroad Administration (FRA) defines HSR corridors within three categories which will be discussed in the next section of this paper. The three categories

are Core Express, Regional, and Emerging/Feeder corridors. Core Express corridors are categorized by frequent express service between major population centers 200-600 miles apart, operating on dedicated right of ways and reaching top speeds of at least 150 mph (Federal Railroad Administration, 2009). Regional corridors are characterized by relatively frequent service on both dedicated and shared track reaching top speeds of 110-150 mph. Emerging/Feeder corridors are developing corridors with strong potential for future Core Express or Regional service that operate on primarily shared track with speeds up to 110 mph. According to the FRA, the Chicago-Detroit corridor is categorized as an emerging/feeder corridor that will ultimately be developed to achieve speeds up to 110 mph. Current plans forecast improvements along the corridor that will cut the current Chicago-Detroit travel time by 2 hours (Michigan Department of Transportation, 2014).

Significant incremental speed increases and corridor improvements have taken place in the Chicago-Detroit corridor in the past five years. This recent incremental development of the corridor provides the potential for a transitional period within the corridor and the intermediate cities connected by it. With many high-speed rail studies focusing on macro-economic and logistical effects of high-speed rail infrastructure this research seeks to identify the potential impact of such a high-speed rail corridor on individual cities. This research will fill a gap by analyzing individual cities and the potential effects of an improved Amtrak corridor on them. This type of individualized

and local based research has not been conducted in any other designated high-speed rail corridor.

This thesis analyzes the Chicago-Detroit corridor and six intermediate cities connected by the Amtrak service. The goal of this research is to understand the ways in which these intermediate cities are planning for and anticipating the changes taking place within the Chicago-Detroit corridor. This thesis has two main research questions. To what extent have speed increases influenced planning, policies, and programs of communities within the corridor? What explains the variations and differing categories of planning responses among communities within the corridor? These questions are motivated by recent developments within the Chicago-Detroit corridor including speed increases and track improvements as well as the larger plan to fully implement 110mph service between Chicago and Detroit. The six cities chosen for this research are seemingly in a position to take advantage of these significant corridor enhancements as they are the six cities directly east of Chicago along the corridor. This research is motivated by the idea that significant improvements to the Chicago-Detroit corridor may yield additional benefits to intermediate cities, specifically those closer to the economic sphere of the Chicago area.

This thesis is organized into six chapters. The following chapter contains the background information relevant to this research including a brief history of Amtrak and its current status within the United States. The literature review details other relevant research regarding several topics including high-speed rail (HSR) and transit-oriented

development. The methodology chapter outlines and details the methods used from data collection to analysis. This chapter include both a quantitative and qualitative component. The next chapter contains individual case studies of each of the six cities used in the research. This chapter provides specific information for each of the six cities. The final chapter is the discussion and includes the major findings and conclusions of the research.

BACKGROUND

Major high-speed rail research and development did not begin until the 1990s in the United States. It is no surprise that because of the widespread success of HSR systems in Europe and Japan throughout the second half of the 20th century, the United States began to understand the implications of HSR. It should be noted that the first intercity passenger rail system in the United States (Amtrak) was established seven years after the Japanese Shinkansen traveled 315 miles from Tokyo to Osaka in just under four hours (Federal Railroad Administration, 2009).

Amtrak

The National Railroad Passenger Corporation (Amtrak) was established in 1971 following the Rail Passenger Service Act of 1970 (Rail Passenger Service Act, 1970). The Rail Passenger Service Act was passed as a result of a significant sustained decline in private passenger rail service during the period of 1920-1970 (Congressional Budget Office, 2003). In the most basic sense, the establishment of Amtrak was a quasi-nationalization of passenger rail service throughout the country. The Rail Passenger Service Act along with Amtrak saved a dying industry of passenger rail in the United States. As rail travel became less popular, in large part due to the advent of the automobile becoming the primary mode of transportation in the 1950s, many private passenger railroads began merging or going out of business altogether. Combined with

the beginning of construction on the National Interstate Highway System in 1956, the mode of passenger rail as a primary means for travel had almost disappeared completely by the early 1960s (Congressional Budget Office, 2003). Initial predictions for Amtrak were negative and the consensus of the time was that the public/private partnership would not last. Amtrak remained popular among existing passenger rail users and gained modest support following its inception. Amtrak has much outlived its forecasted lifespan but has failed to establish itself as an exclusive private entity and receives millions of dollars in appropriations by the federal government. However, the status of Amtrak had significantly changed over the past 15 years. From 1997 to 2012, Amtrak's total ridership has increased 55.1 percent (Brookings Institute, 2013). Additionally, the relationship dynamic between States, Amtrak, and the Federal government created by the Passenger Rail Investment and Improvement Act (2008) has significantly changed the way in which states are now participating in passenger rail development. With an unofficial National Rail Plan released in 2009 (Federal Railroad Administration), the United States is making strides towards advancing passenger rail development. Continued federal advocacy and state partnerships can help to continue passenger rail development and ultimately move toward a national high-speed rail network (Brookings Institute, 2013).

Research and development of HSR in the United States began in the Northeast Corridor (NEC) of the national passenger rail system. With the passage of the Intermodal Surface Transportation Efficiency Act of 1991, focus was eventually placed on five corridors suitable for research and development of HSR systems. These five original

HSR corridors are; the Midwest corridor linking Chicago, IL with Detroit, MI, St. Louis, MO and Milwaukee, WI, the Florida corridor linking Miami with Orlando and Tampa, the California corridor linking San Diego and Los Angeles with the Bay Area and Sacramento via the San Joaquin Valley, the Southeast corridor connecting Charlotte, NC, Richmond, VA, and Washington, DC, and the Pacific Northwest corridor linking Eugene and Portland, OR with Seattle, WA and Vancouver, BC, Canada. These corridors were based on existing passenger rail routes and were focused on major population centers. Five more federally designated high-speed rail corridors were announced in 1998 as part of the Transportation Equity Act for the 21st Century (TEA-21), to create a total of 11 corridors nationwide. The corridors added in 1998 are; the Gulf Coast corridor, the Keystone corridor from Philadelphia to Harrisburg, PA, the Empire State corridor from New York City, NY to Albany, NY to Buffalo, NY, an extension of the Southeast corridor from Charlotte to Greenville, SC to Atlanta, GA to Macon, GA, and from Raleigh to Columbia, SC and to Savannah, GA and Jacksonville, FL, an extension of the Midwest corridor from Milwaukee, WI to Minneapolis/St. Paul, MN, and extension of the Chicago Hub corridor (Midwest) to Indianapolis, IN and Cincinnati, OH. These corridors are essentially identical to the FRA designated corridors for HSR given in the more recent *Vision for High Speed Rail in America* (Federal Railroad Administration 2009). The NEC was the first area of the United States to utilize a "high-speed" train. Amtrak's Acela Express began service in December of 2000 reaching a top speed of 150 mph. The Acela Express operates between Washington, D.C. and Boston, Massachusetts including 14 intermediate stops. The train operates at 150 mph on only 2 sections of track

along the line with its average speed equaling around 75 mph. Current travel time on the Acela express between Washington D.C. and Boston is 7 hours (450 miles). The Acela Express is currently the only train in the United States that is designated, according to the U.S. Department of Transportation, as "high-speed". Additional HSR studies emerged out of the 1990s including California and Midwestern based proposals. The California High-Speed Rail Authority was formed in 1996 and later the Midwest Interstate Passenger Rail Commission in 1998.

Federal Initiatives: PRIIA and ARRA

The enactment of the Passenger Rail Investment and Improvement Act (PRIIA) of 2008 represents the most significant federal commitment to passenger rail development in the United States since the creation of Amtrak in 1970. PRIIA established three new grant programs for funding high-speed and intercity passenger rail improvements including the Intercity Passenger Rail Service Corridor Capital Assistance Program and the High-Speed Rail Corridor Development program. These grant programs allow not only individual states but groups of states, interstate compacts, and public intercity passenger rail (IPR) agencies established by one or more states to apply for grant funds for capital improvements to improve all types of IPR service. In regard to the High-Speed Rail Corridor Development Program, applicable projects for these grant funds must be located on a federally designated HSR corridor as well as be directed to improve IPR service to achieve speeds of at least 110 mph. The American Recovery and Reinvestment Act of 2009 (ARRA) was an appropriation of an initial $787 billion aimed at stimulating

the economy and creating jobs. This number would later be increased to $840 billion. Of the total $840 billion appropriated, $36 billion was allocated for transportation related projects with $8 billion of that dedicated to HSR/IPR. Additional annual appropriations have provided $2.1 billion bringing the total to $10.1 billion. ARRA represents the first appropriations for the grant programs established in PRIIA as well as a starting point for serious federal commitments.

FRA Designations

There are eleven federally designated HSR corridors within the United States. These are the Pacific Northwest, California, South Central (Texas), Gulf Coast, Florida, Chicago Hub Network (including Chicago-Detroit), Southeast, Northeast (NEC), Keystone, Empire, and Northern New England corridors. The Keystone and Empire corridors are located in close proximity to the NEC. To date, nearly 85% of HSR/IPR investment is concentrated on six specific corridors (Federal Rail Administration 2012). These are Los Angeles-San Francisco, Seattle-Portland, Chicago-St. Louis, Chicago-Detroit, Boston-Washington D.C. (NEC), and Charlotte-Washington D.C. The FRA categorizes these corridors into three different levels relating to HSR development and speed, Core Express, Regional, and Emerging/Feeder. Core Express designations operate trains between at speeds of at least 150 mph within corridors of 200-600 miles on primarily dedicated track (not shared with existing passenger or freight rail). Regional designations (Chicago-Detroit) operate trains at speeds up to 150 mph within corridors of 100-500 miles on both shared and dedicated track. Emerging/Feeder designations operate

trains up to 110mph within developing corridors of 100-500 miles on primarily shared track (Federal Rail Administration, 2012). The next section details the Chicago-Detroit Amtrak corridor and is the focus of this research. The Chicago-Detroit corridor is a part of the Chicago Hub Network of designated high-speed rail corridors. Other Midwest high-speed corridors include the Chicago-St. Louis and Chicago-Indianapolis corridors.

Chicago-Detroit Corridor

The Chicago-Detroit corridor is currently considered an emerging/feeder designation. Amtrak's Wolverine service line operates between these two cities and completes the 280 mile trip one way in about 5.5 hours. As of February 2012, trains regularly operate at 110 mph in areas between Kalamazoo, MI and Porter, IN. Substantial investments are being made within the Chicago-Detroit corridor which will eventually bring 235 miles of the corridor to these speeds of 110 mph. These investments include purchasing and rehabilitating track, upgrading signal systems, and improving stations. These investments are ultimately forecasted to bring about a 2 hour trip time reduction and improved passenger experiences (Michigan Department of Transportation, 2014).

Prior to the formation of Amtrak in 1971, passenger trains in the Chicago-Detroit corridor operated under the Michigan Central Railroad (MCRR). The Michigan Central Railroad originated in Detroit in 1836 and later reached Chicago in 1852. Similar to many other passenger rail routes throughout the country at the time, the Chicago-Detroit corridor contained a significantly more amount of stops and frequencies compared to intercity passenger rail today. The Michigan Central Railroad would eventually be bought

by the New York Central Railroad which in turn would become the Penn Central railroad.

The first major step in the development of high-speed rail in the Chicago-Detroit corridor was the introduction of Positive Train Control Technology on a segment of rail outside of Dowagiac, MI in 1997 (Trains, 1997). Positive Train Control (PTC) technology allows trains to become more interactive with the rails in which they travel on in order to increase safety and maximize speeds when possible. This technology combined with track improvements and enhanced train equipment is what ultimately will allow for the higher speeds within the corridor and more reliable service. This is a main goal of current Michigan Department of Transportation (MDOT) and Amtrak efforts. In February of 2012 the first Amtrak train within the corridor traveled at 110 mph. This event signified the culmination of track work and PTC installation within the corridor that had been steadily advancing in light of the recently enacted PRIIA in 2008. The Chicago-Detroit corridor is unique in that it contains rail track that is exclusively owned and operated by Amtrak. This is an uncommon situation in the United States as a majority of rail track is owned and operated by private rail companies such as Norfolk Southern and Union Pacific. The section of track that is owned by Amtrak and MDOT is located between Porter, IN and Dearborn, MI. Up until December of 2012, this portion of track extended only from Porter, IN to Kalamazoo, MI. The additional 135 mile segment of track between Kalamazoo and Dearborn was purchased from Norfolk Southern in December 2012. The Amtrak and MDOT ownership of this segment of rail has allowed

for the development of higher speeds, improved track, and more reliable service. Current efforts within the corridor are forecasted to bring the entire segment from Porter, IN to Dearborn, MI to speeds of 110 mph. In September 2014, a Tier 1 Draft Environmental Impact Statement was released by the Michigan Department of Transportation for the Chicago-Detroit/Pontiac Passenger Rail Corridor Program. This EIS is the most recent step in the development of the corridor to higher speeds and more reliable service.

LITERATURE REVIEW

This chapter will review the body of literature that has been completed and which focuses on several passenger rail and rail transportation subjects. This includes passenger rail developments both in the United States and abroad, the impact of high-speed rail on local communities, the impacts of land values in station areas, the economic effects of high-speed rail, and transit oriented development. These studies are of significance to this thesis in that they provide examples of implications of rail transportation from throughout the world. In modern literature on transportation, such themes as land values, economics, and transit-oriented development are common in passenger rail research. These experiences and conditions of existing rail transportation systems are directly related to the potential development of the Chicago-Detroit corridor and many other corridors throughout the United States.

The existing literature focusing on intercity passenger rail (Amtrak) in the United States is limited. Historically, the body of research that has been conducted surrounding rail transportation in the United States has largely focused on transit systems including light rail, heavy rail, and commuter rail. In order to form a more comprehensive view of rail based transportation within the context of this thesis, these transit based studies contribute a large portion of this review.

High-Speed Rail

European and Asian High-Speed Rail

There are several established high-speed rail systems throughout the world, all occurring in Europe and Asia. Many of these systems date back to the 1960s and 1970s such as the Japanese Shinkansen and the French TGV. The fact that many of these systems have been in place for over 50 years has allowed planning and transportation researchers to analyze the effects and implications of such systems on a variety of social and economic measures. This research is relevant to this thesis in that it provides some of the evidence and reasoning behind the argument for increased advocacy for high-speed rail in the United States. This section looks at research from some of these high-speed rail applications throughout the world.

The Japanese Shinkansen high-speed rail line was the first rail line with dedicated track specifically for high-speed rail. In the decades that followed its inception, several studies began to look at the impacts of the system in areas such as population distribution and economic effects. One study looks at station area development and land values in station areas along the Shinkansen route 25 years after its beginning (Nakamura and Ueda 1989). This study examined proximal development in station areas as well as commercial land values and found a significant increase in development in station area locations as opposed to non-station area locations along the route. This study also found a 67 percent increase in commercial land values combined with a 2.6 percent increase in per capita income in station areas. Five years earlier, another study looked at overall

ridership of the Shinkansen line (Hirota 1984). This study found significant ridership increases that included an increase in passengers per kilometer (millions) from 11,000 in 1965 to 35,000 in 1975. Another study of the Shinkansen line found a 22 percent increase in station area population growth compared to non-station areas (Brotchie 1991).

Studies such as these are significant to the future of high-speed rail in the United States. Such research identifies the long-term benefits and growth impacts that a high-speed rail system can have on a region. The effects of these high-speed rail systems abroad have direct comparisons to the type of benefits and effects that the Chicago-Detroit corridor would experience at both the regional and city level.

Several European and Asian studies focus on the regional aspect of high-speed rail and the effects that such systems have at a higher geographic level. These regional effects include population growth, accessibility, ridership, connectivity, and economic effects. One study of the French TGV found increases in ridership between Paris and Saint-Etienne of 100 percent and between Paris and Lyons of 150 percent (Bonnafous 1987). Another study found increases in ridership on the Swedish Svealand HSR after it replaced a standard passenger rail line. This study found the Svealand line yielded a sevenfold increase in regional rail travel as compared to passenger rail line that it replaced (Froidh (2005). This study also found the Svealand's market share with the automobile increase from 6 percent to 30 percent. In terms of regional connectivity as a result of high-speed rail, two studies look at regional accessibility and cohesion between connected and non-connected cities. Ortega, Lopez, and Monzon (2012) look at the

Spanish Galacian HSR corridor in terms of both national and corridor level connectivity. The authors find positive accessibility and cohesion increases at both levels and find areas not connected by HSR to be negatively polarized within the region. Similarly, a study on the United Kingdom's InterCity 125/225 HSR also looks at connectivity within the London region (Chen and Hall 2011). The authors look at the impact of the HSR line on economic measures such as gross value added (GVA), employment, and property values and find overall increases in cities connected by HSR in the London region compared to non-connected cities. The study looks at these measures in terms of before and after these cities were connected to London by rail. The study also finds the most significant economic benefits come from cities that were previously not connected by rail or cities that were brought within one hour of London.

Enhanced rail connectivity within the Chicago-Detroit corridor may yield similar regional economic and accessibility effects as other HSR systems have in countries abroad. A major effect of faster trains and improved service within the Chicago-Detroit corridor would be enhanced connectivity between intermediate cities and the large terminal cities of Chicago and Detroit.

United States High-Speed Rail

The intercity passenger rail system in the United States has remained largely unchanged since the creation of Amtrak in 1971 Only in recent years has the topic of high-speed rail gained any real plausibility in terms of federal advocacy and funding.

Federal initiatives such as the ARRA (2009) and PRIIA (2008) have substantially contributed to this. Renewed interest in passenger rail investments can be attributed to a variety of factors most notably rising energy costs and environmental concerns along with congestion mitigation and the need for enhanced intercity connectivity. In this regard, the body of literature emerging from the United States focusing on high-speed rail has often looked towards other countries, for the most part in Europe and Asia. Of the limited research that has been done on high-speed rail systems in the United States, it largely focuses on the potential benefits of systems that are not yet in place. A few studies have looked at the California High-Speed Rail project in terms of potential benefits and implications of such a system (Kantor 2008; Nuworsoo and Deakin 2009). These studies largely use foreign high-speed rail systems as a lens in which to view the development of California's own system. Kantor (2008) identifies several potential economic benefits of a regional high-speed rail system including the development of agglomeration economies in areas near HSR stations as well as positive effects on income disparity in geographically separated product and labor markets. As many other similar studies do in terms of potential high-speed rail systems, Kantor (2008) outlines the major benefits from the California High-Speed Rail project as mode-shift benefits, congestion reduction benefits, and market accessibility benefits. Nurworsoo and Deakin (2009) use international comparisons in Lyon, France and Hong Kong, China to draw similarities as to the potential for economic and social benefits in the California High-Speed Rail project. The authors identify key lessons that could be applied to station area

development in the California project including the idea of multimodal accessibility as a catalyst for increased development and economic benefits.

Additional research has also been conducted that provides recommendations for policy makers in the United States in regard to high-speed rail systems. One study looks at several high-speed rail systems abroad in order to provide insight to United States policy makers as to the motivation, costs, and impacts of such projects (Albalate and Bel 2012). This study provides detailed analysis of several large high-speed rail systems including the Japanese Shinkansen, the French TGV, and the Spanish AVE and provides recommendations for future implementation of high-speed rail systems in the United States, most notably the California High-Speed Rail project. While this particular studies focuses on large scale truly dedicated high-speed rail projects throughout the world, insights such as modal share regarding air travel and economic implications for intermediate cities are relevant to the Chicago-Detroit corridor. Albalate and Bel find that in major high-speed rail projects in France and Spain modal share of air traffic fell from 31 percent to 7 percent and from 29 to 21 percent respectively. The study also found that when freight rail operations and logistical conditions are positively affected as a result of track upgrades and improved flow within the corridor, the positive effects of passenger rail operations are increased. This conclusion is directly related to the Chicago-Detroit corridor as the corridor is being developed both to improve the passenger and freight rail operations in the region. A major factor in the reliability and on time performance of passenger trains in the Chicago-Detroit corridor is the operation of freight rail.

Another study looks at the potential for HSR in the United States' midwest and uses the Amtrak Northeast Corridor (NEC) to draw similarities and differences (Mathur and Srinivasan 2009). This study outlines several limitations that midwestern HSR efforts experience that areas in the NEC do not. The authors state that the private freight rail industry poses, among others, significant right of way (ROW) problems in the efficient implementation of high-speed rail and that midwest HSR planning efforts can learn from other United States' HSR experiences. This includes California's passage of a bond measure funding purchases of land for separate ROW and for the construction of new HSR rail lines.

For the most part, this type of research consisting of reviewing foreign high-speed rail systems in comparison to future United States developments has been somewhat recent. This is most likely associated with the recent surge in federal advocacy and funding for high-speed rail projects in the United States. While the development of the Chicago-Detroit corridor will not be that of a true high-speed rail system with a completely grade separated right-of-way and trains traveling at speeds of 250 mph, this research provides larger scale insights and experiences as to the potential effects of an improved passenger rail corridor. As the United States does not have any existing internal high-speed rail systems, development of such systems can be compared and contrasted to those systems abroad which have been in existence and operational for many decades.

Economic Effects

Along with the environmental and social benefits that a high-speed rail system could have on a particular geography, such transportation investments are often viewed and analyzed based on their economic implications. Since the beginning of research being conducted on high-speed rail systems throughout the world, economics has been a central theme in analyzing the effects of such transportation infrastructure. This research includes the potential economic effects that a high-speed rail system may have as well as the actual effects that have occurred.

The economic effects of high-speed rail and transportation infrastructure can be viewed at several different scales ranging from immediate station area effects to the larger regional effects. The regional economic effects of high-speed rail are often looked at in terms of the interconnectedness of cities linked within the system and their relationship with other cities in the region. A few studies look at the effects of a high-speed rail system on smaller and medium sized intermediate cities within a high-speed corridor. Haynes (1997) looks at several established high-speed rail systems abroad and concludes that medium sized cities within a HSR corridor may suffer unintentional consequences of increased economic attraction from larger more dynamic cities. Similarly, another study finds HSR connections to have potential negative economic consequences for medium sized intermediate cities (Albalate and Bel 2012). The authors find that the largest cities within the network might receive limited gains with the possibility of economic activity being drained from smaller intermediate cities.

Garmendia, et al. (2008) looks at the metropolitan region surrounding Madrid, Spain. In this case the authors find that small intermediate HSR cities experience greater initial benefits when compared to larger cities within the region. Other regional factors include accessibility to major economic centers and other transportation systems that increase accessibility to high-speed rail. Blum, Haynes, and Karlsson (1997) find that increased accessibility via high-speed rail ultimately leads to increased commuting in cities within 20 to 40 minutes of each other. The authors also find that success of HSR linkages between major economic centers is highly dependent on regional transport surrounding the linked cities.

The importance of these studies is in their focus on smaller intermediate cities within a HSR corridor. As almost all HSR contain small or medium sized intermediate cities, these studies provide some context as to the dynamics of the Chicago-Detroit corridor and the potential impacts that HSR may have on it.

Passenger transportation research often analyzes local economic effects in terms of transportation or transit investments. Specific to this thesis, there are two key studies that have been conducted specifically on Amtrak corridors and the economic implications on local economies. One recent study analyzed all the Amtrak stations in the State of Michigan and the existing and potential benefits from the station (Isley, Singh, and Taylor 2009). This report provides individual economic case studies of Michigan communities containing Amtrak stations including every community located along the Wolverine service line. The authors' study advocates for increased research and

development of existing stations to bolster economic development and transit-oriented development (TOD). Multiple economic factors are quantified for each station's community including local business revenues as well as travel cost savings related to users of the train. This study provides recommendations for the successful and efficient development of land area surrounding the Amtrak stations in light of recent federal and state advocacy for Amtrak rail development. Another study looked at the Amtrak Heartland Flyer service between Oklahoma City, Oklahoma and Fort Worth, Texas and the economic impacts of the service on local economies (Morgan and Sperry 2011). The authors find that the Amtrak service contributes substantially to the local economies with passengers spending more than $18 million per year as a result of their use of the service.

Transit-Oriented Development

Transit-Oriented Development (TOD) is a common area of research in transportation and transit systems. The term transit-oriented development was first used by Peter Calthorpe in his 1993 book, *The Next American Metropolis: Ecology, Community, and the American Dream*. Transit-oriented developments may look and function differently depending on location, type of transit, and other factors but the basic make-up of such a development is generally agreed upon. Essentially, a transit-oriented development is characterized by a dense, mixed use, pedestrian-friendly area near or adjacent to a transit stop (Calthorpe 1993; Dunphy et al. 2004). In the literature, TOD research is largely focused on rail-based transit including heavy rail, commuter rail, and

light rail systems. Perhaps it is not surprising that research and literature on TOD in terms of inter-city passenger rail (Amtrak) is very limited and almost non-existent.

While the majority of TOD research has focused on fixed rail transit systems, Amtrak is generally an inter-city rail service while heavy rail, and light rail are generally intra-city systems. Commuter rail typical traverses multiple cities in within a large metropolitan region and is sometimes referred to as suburban rail. Light rail systems typically operate similar to streetcar systems and feature less boardings and alightings compared to heavy rail systems. Many light rail systems operate within a single city and feature less intensive infrastructure than heavy or commuter rail systems. Light rail systems also can operate within multiple cities within a region. Examples of light rail systems include the Phoenix METRO, Minneapolis METRO, and Denver's RTD. Heavy rail systems operate on much more intensive infrastructure and feature higher levels of boardings and alightings. Heavy rail systems include almost all subway and elevated mass transit systems found in systems such as the Chicago CTA and New York's MTA. Commuter rail systems are found in large metropolitan regions and operate between a city center or downtown area and its surrounding suburbs. Commuter rail differs from light rail in that it is larger, has a lower frequency of service, shares rail track right of way with freight rail, and traverses longer distances to the outer suburbs. Examples of commuter rail systems include the New York MTA's Long Island Railroad, New Jersey's NJT commuter rail, and Chicago's METRA commuter rail.

Frequencies of Amtrak trains throughout a single day are much less than a typical commuter or subway system and cannot compete with the sheer volume of passengers that intra-city rail systems experience. This is not to say that there are no opportunities for traditional TOD in Amtrak station areas, rather acknowledging the differences between inter-city and intra-city rail systems.

The existing literature on TOD holds value for this thesis as it is relevant to the developing HSR corridor. The potential exists for existing station locations within the Chicago-Detroit Amtrak corridor to experience new growth and development as a result of increased frequency and reliability of Amtrak trains. Several TOD studies have been conducted on land values in areas surrounding transit stations. A study on changes in property values in Santa Clara County, California measured square footage of development in TOD areas along commuter and light rail lines (Cervero and Duncan 2009). The authors found that being within walking distance of a light rail station in Santa Clara County increased land values an average of 23 percent and 120 percent for commuter rail stations. Another study on light rail in Denver, Colorado analyzes the effects of a recently introduced light rail system on TOD (Goetz and Ratner 2013). The authors analyze strategic TOD plans put in place by the city and find substantial increases in growth in areas surrounding light rail stations. Another study analyzes the effects of rail stations on property values in a TOD area in Naples, Italy (Pagliara and Papa 2010). The authors find that significant increases occur among property values in TOD areas as

compared to non-TOD control areas and that all values of housing retail and office properties increased between 2001 and 2008 with the advent of new light rail stations.

Other studies have looked at land values in anticipation of new transit systems being constructed or implemented. Kitterll (2012) studies vacant land values in Phoenix, Arizona and examines the effects of the recently introduced light rail system on property values. The author finds that vacant land values within Phoenix experienced a substantial positive increase during the 1998-2008 phase of land acquisition and rail alignment for the rail route. Using price per square foot of vacant and undeveloped commercial land areas surrounding the planned station areas, the author found an average of 117% increase in Phoenix and a 429 percent increase in Tempe. Similarly, another study examines the effect of advance TOD and its relationship to the Phoenix light rail planning and construction (Atkinson and Kuby 2011). The authors find that the concept of utilizing TOD practices in advance of actual construction and implementation was found to have a positive influence on eventual TOD development of areas around rail stations. The authors outline the benefits for this type of practice for future situations similar to Phoenix as it is the first time that a government/planners have utilized such a practice.

Synthesis

This chapter has reviewed the literature on high-speed rail systems concentrating on United States and European and Asian systems, economic effects of HSR, and transit-oriented development (TOD). This literature review has provided insights regarding the type of research that is relative to high-speed rail both abroad and in the United States.

Such studies are directly related to the type of development that is currently occurring within the Chicago-Detroit corridor. As there are no true high-speed rail systems in the United States, often studies that deal with passenger rail development in the United States turn to other countries and their experiences with high-speed rail. Transit-oriented development research is something that is prevalent in the United States and largely focuses on intra-city rail systems. This research relates to the developing Chicago-Detroit Amtrak corridor as TOD is a significant theme that local planners are concerned with. Experiences from around the country dealing with similar situations regarding rail transport have relevance to this thesis. Similarly, the economic implications of high-speed rail systems are useful when attempting to make connections between foreign applications and the current development of the corridor. As stated before, there is lack of locally specific research regarding passenger rail in the United States. This thesis focuses on one particular Amtrak corridor and the potential implications of high-speed rail development. This thesis will contribute to the growing body of literature regarding HSR in the United States that has seen a surge in recent years as a result of increased federal advocacy and overall general public interest. Continuing development and funding of higher-speed passenger rail systems in the United States has improved and increased in the years since 2008 and the passing of PRIIA. This thesis will attempt to gain insight into a developing corridor and contribute to the lack of locally specific Amtrak related research. The next section will describe the methodology used in this research.

METHODOLOGY

In order to answer the research questions a methodology was developed that incorporated both qualitative and quantitative elements. The qualitative element of this research utilized a semi-structured interview process while the quantitative element used a GIS-based methodology. This section will discuss these two different methodologies in detail and will explain how they were used to answer the research questions. This section will also discuss the rationale for the study area selection.

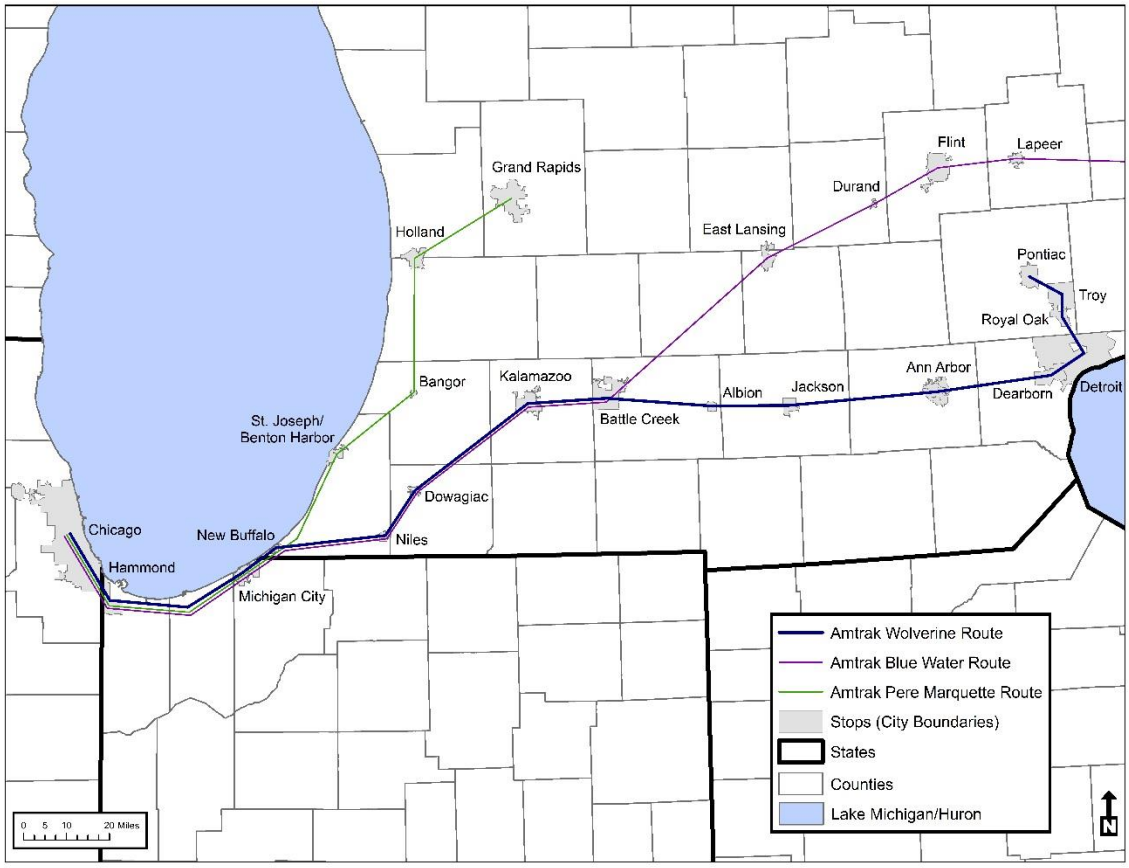
The focus of this research is centered on the developing high-speed rail corridor between Chicago and Detroit, specifically the intermediate cities between Chicago and Kalamazoo. Research questions were developed that aimed at the level of individual communities within this corridor. The research questions are; 1. To what extent have speed increases influenced planning, policies, and programs of communities within the corridor? 2. What explains the variations and differing categories of planning responses among communities within the corridor?

Study Area

Out of the 16 intermediate communities within the Amtrak corridor including Chicago and Detroit, six communities were selected for this research. The six cities west of and including Kalamazoo, Michigan were selected for the study area. These cities are Kalamazoo, Dowagiac, Niles, New Buffalo, Michigan City, and Hammond. Figure 1

shows the entire Chicago-Detroit corridor along with the other two Michigan Amtrak corridors.

Figure 1: Chicago-Detroit Amtrak Corridor



Four out of the six cities are located in Michigan with the other two, Michigan City and Hammond, located in Indiana. These cities were selected for further analysis because they are located within the Amtrak Wolverine (Chicago-Detroit) corridor and have a current Amtrak stop. These cities were also selected because of their position within the

corridor (proximity to Chicago) and because of the existing conditions of the rail corridor between Chicago and Kalamazoo. As stated before, prior to December 2012, the Amtrak owned corridor extended between Porter, Indiana and Kalamazoo, Michigan. This was later extended to Dearborn, Michigan in 2013. Because of the track ownership prior to 2013 and the improvements and speed increases that had been made in the Porter to Kalamazoo segment, Amtrak trains were regularly running at 110mph and experiencing improved travel times between cities in this segment. Combined with their existing closer proximity to Chicago compared to other cities along the corridor such as Dearborn or Jackson and the levels of higher speed service that were already operating in this segment, these six cities were selected. Chicago was excluded from this portion of the research as the main focus was on the intermediate cities within the corridor.

Qualitative Analysis

The qualitative element of this research utilized a semi-structured interview process involving relevant members of the study communities including planning directors, community development directors, and city managers. Preliminary research was done to determine all potential interviewees within the study communities that would have the most information and knowledge regarding planning activities within the context of the research questions. The potential interviewees were all from planning departments, community development departments, or city manager departments. Recruitment e-mails were sent to all potential interviewees from each of the six cities in the study area. Follow up phone calls and correspondence was made to confirm

scheduling for the interviews. Interviews took place in five out of the six cities. Interview data was not collected for the city of Dowagiac, Michigan. Despite several attempts to establish a connection with the City of Dowagiac, an interview was never scheduled. Interviews were completed with the Assistant City Manager of New Buffalo, MI, Director of City Planning of Hammond, IN, Planning Director of Michigan City, IN, Community Development Director of Niles, MI, and the Deputy City Manager of Kalamazoo, MI. Interviews took place on site in four out of the five cities with one interview taking place by phone.

The interview questions were the same for all five cities and the interviewees. The list of questions can be found in Appendix B. The interview questions were constructed to gain a comprehensive understanding of the role of Amtrak service within the city and its perspective on the developing high-speed corridor.

The interviews were voice recorded and later transcribed. The transcribed interviews were uploaded into qualitative data analysis software, QDA Miner. The QDA Miner software allowed the interview data to be easily coded and organized for analysis. The analysis of the interview data consisted of qualitative content analysis. This analysis utilized an inductive category creation process in which a coding process was applied to the transcribed interview data (Miles and Huberman, 1994). Key themes and passages relevant to the research questions were initially coded and then grouped into categories. These categories were grouped into larger categories which served as the basis for the creation of a spectrum of variation to which each individual city was assigned (Coffey

and Atkinson, 1996). These emergent categories of the spectrum of variation are Anticipatory of High-Speed Rail, Uncertain of the role of High-Speed Rail within the City, and Indifferent/Unresponsive. These categories were formed based on the content of the interview and the subcategories created from the interview transcripts. The spectrum of variation was created to address the differences among the six study area cities and to substantiate the coding process.

Quantitative Analysis

A quantitative analysis was also conducted using a GIS methodology to address an additional variable of comparison among the six study area cities. Consistent with the transit-oriented development element of this thesis, measures of community walkability are necessary when assessing sites' existing conditions related to TOD. Using GIS, this methodology estimated Pedestrian Catchment Areas (PCA) within the six communities. Transit-oriented development is a key element of this research as it provides some insight as to the way in which individual communities view the development of the corridor. The quantitative analysis portion of this research helps to compare the existing conditions within each city as it relates to transit-oriented development and how each city may be able to take advantage of the developing Amtrak high-speed rail corridor.

Both the interviews and the quantitative analysis are designed to help answer the research questions. The interviews are conducted to understand the ways in which TOD is being considered by each city as well as other plans, ideas, and attitudes toward the developing corridor. The quantitative analysis identifies the current conditions and

physical design elements related to potential TOD development. The combination of these two approaches helps to answer both research questions. 1. To what extent have speed increases influenced planning, policies, and programs of communities within the corridor?; 2. What explains the variations and differing categories of planning responses among communities within the corridor? This data helps to explain the variation of these cities by identifying which cities are considering potential TOD development and also the ways in which cities are approaching the development of the corridor.

Pedestrian Catchment Areas (PCA)

Pedestrian Catchment Areas are theoretically walkable zones that can be mapped to show the actual area that can be accessed from the road network from a fixed point, in this case the Amtrak stations (Schlossberg 2006). The basic PCA is determined by dividing the total area of a buffer distance from the station, in this case a half mile, by the area of the actual traversable road network within the buffer distance. The half mile distance was used in this analysis as it has been an accepted and substantiated distance for a significant number of TOD related studies (Schlossberg 2006).

Street Classification

This methodology utilizes the Network Analyst Extension within GIS to build the road networks within the six communities and to determine the PCA. The data that is used is the 2014 TIGER (Topologically Integrated Geographic Encoding and Referencing) roads layer data which includes within it the classification of the streets as

well as the segment length. The street classification is important in this analysis as it is necessary to determine the roads to include or exclude in the PCA. Within the TIGER data is a street classification system labeled MTFCC (MAF/TIGER Feature Class Code). This system classifies the street types ranging from interstates (S1100) to alleys (S1700). In this analysis, all of the interstate and limited access roads are deleted prior to creating any network to determine the PCAs. These roads are deleted as they are not suitable for pedestrian access. The remaining roads are classified as major and minor roads and are included in the PCA calculation. The distinction between the major and minor roads in this analysis is significant. This becomes important when calculating the Impeded Pedestrian Catchment Area (IPCA) which will be detailed later in this section. Major roads are categorized to be roads of impedance and are considered to be less pedestrian friendly (Schlossberg, 2006). Impedance roads are defined as main arterials which are usually in the U.S., State, or County Highway system. These roads have one or more lanes of traffic in each direction, may or may not be divided, and usually have at-grade intersections with many other roads and driveways (United States Census Bureau). The more pedestrian friendly roads which are considered in this analysis as minor roads are defined as local neighborhood roads, rural roads, or city streets. These roads are generally paved non-arterial streets or roads that usually have a single lane of traffic in each direction and may be privately or publicly maintained (United States Census Bureau).

Service Areas

The PCA is the result of the Network Analyst function that creates a service area from the station location. In GIS the service areas are visualized using polygons that are created from the extent that the traversable network reaches. This is different from the buffer that is created from the station location in that it is accounting for the traversable distance within the grid network. In this way the PCA is significantly smaller than the general half mile radial from the station. In addition to the PCA, which takes into account all of the roads within the half mile buffer, the Impeded Pedestrian Catchment Area (IPCA) uses only the minor pedestrian friendly roads, excluding any major roads within the network. This IPCA measure shows the result of the road networks when the major roads are eliminated from being possible options for pedestrians. The idea behind calculating the IPCA is to identify the influence of the major pedestrian-hostile roads within a potential pedestrian service area and its effect on the resulting traversable network (Schlossberg 2006). Both the PCA and IPCA were determined for all six of the study communities and then compared. The comparison of the PCA and the IPCA reveals the influence of major arterial roads on the overall traversable network. Similar PCA and IPCA values are characteristic of a road network within the buffer that is largely unchanged with the presence of major arterial streets. The larger the decline between the two values, the more of an influence major roads have on the walkable network. This is to say that a community with corresponding PCA and IPCA scores of 0.35 and 0.33 is a community where the traversable network is largely uninfluenced by the major arterial

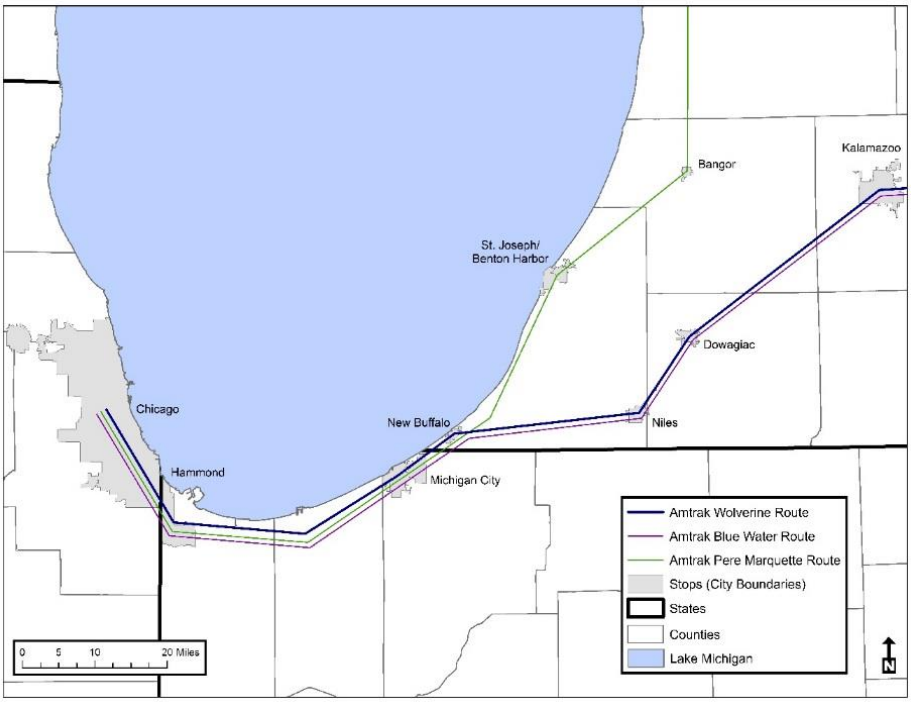
roads. It should be noted that according to Schlossberg (2006), there has not been enough research to determine an optimal PCA score but it is suggested that a minimum score of 0.50-0.60 is a useful threshold (CNU 1998 and Schlossberg 2004). The PCA can be converted into a percentage to show the amount of traversable road coverage within the buffer.

Additional variables that were calculated for this portion of the analysis are minor road density, major road density, population density, and block length. These variables are combined with the PCA and IPCA values to for a generalized assessment of the sites' existing physical characteristics regarding transit-oriented development. These variables were also calculated using GIS. The case studies of each of the six city sites contain a visual representation of the PCA and IPCA values as well as a more detailed discussion about all of the variables calculated.

CASE STUDIES

This chapter provides case studies of each of the six individual communities used in this research. The case studies consist of sections on location and demographics, history, passenger rail, station location and existing conditions, ridership, and planning. The quantitative analysis of using the PCA and IPCA scores yielded distinct results that are explained in this chapter. Findings from this analysis show major differences between the six cities as well as some similarities. The PCA and IPCA are used in this research as an overall measure of walkability and TOD readiness regarding high-speed rail. Combined with the qualitative analysis of the interview data, the case studies provide a detailed examination of each city as it relates to the potential for high-speed rail. The cities are addressed in an eastward direction from Chicago beginning with Hammond, IN and ending with Kalamazoo, MI. Figure 2 shows the six city study area.

Figure 2: Map of Six City Study Area



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Hammond, Indiana

Location and Demographics

The City of Hammond is located in Lake County Indiana with a population of 80,830 as of the 2010 Census. The City is situated at the northwestern tip of the state about 20 miles south of Chicago and is bordered to the north by Lake Michigan. Hammond covers 24.9 square miles with a population density of 3,545.2. Between 2000 and 2010 the population decreased 2.7% from 83,048 to 80,830. The median income in 2010 was $38,539 (United States Census Bureau). Table 1 shows the demographic data for Hammond as well as the other five cities.

Table 1: Demographic Data for the Six City Study Area

	Hammond, IN	Michigan City, IN	New Buffalo, MI	Niles, MI	Dowagiac, MI	Kalamazoo, MI
Population (2000)	83,048	32,900	2,200	12,204	6,147	77,145
Population (2010)	80,830	31,479	1,883	11,600	5,879	74,262
% Change	-2.7	-4.3		-4.9	-4.4	-3.7
Housing Units (2000)	34,139	14,221	1,426	5,531	2,631	31,798
Housing Units (2010)	32,945	14,435	1,692	5,428	2,674	32,433
% Change	-3.5	1.5	18.7	-1.9	1.6	2.0
Median Income (2000)	35,528	33,732	41,658	31,208	29,926	31,189
Median Income (2010)	38,539	35,433	39,976	31,757	32,020	29,919
% Change	8.5	5.0	-4.0	1.8	7.0	-4.1
Population Density (2000) (people/sq. mile)	3,626.6	1,678.6	916.7	2,104.1	1,536.8	3,123.3
Population Density (2010) (people/sq. mile)	3,545.2	1,606.1	753.2	2000	1,306.4	3,006.6
% Change	-2.2	-4.3	-17.8	-4.9	-15.0	-3.7
Wolverine Ridership (2010)	3,058	1,348	1,517	5,640	582	44,392

Source: United States Census Bureau

History

In 1851 the Hammond area was originally established as a stagecoach stop for travelers heading toward Chicago and beyond. The area was largely unsettled until 1869 when the George H. Hammond Company began operations of a slaughterhouse which would serve as a major employment center (Great American Stations, 2014). The City was incorporated in 1883. Hammond and its neighbors Whiting, East Chicago, and Gary grew out of the heavy concentration of industrial and refining activity that positioned

itself along the northwest Indiana lakeshore beginning in the late 1800s. Hammond's population grew rapidly from the very beginning reaching 111,698 in the 1960s but has been in decline ever since (Encyclopedia of Chicago, 2014).

Passenger Rail

Passenger rail service in Hammond began in 1851 with the Michigan Central Railroad reaching the city from Detroit on its way into Chicago. For over 100 years passenger rail service continued in Hammond until the stopping of service in the late 1960s. The formation of Amtrak and the start of its nationwide service in 1971 did not include a stop in Hammond. Amtrak service would not begin in the city until 1982. Presently, Hammond is the first stop for Amtrak trains leaving Chicago heading for Detroit. The trip time via rail is 48 minutes to reach Chicago and 4 hours and 54 minutes to reach Detroit, a distance of 304 miles. The Hammond station is located on Norfolk Southern owned trackage between Porter, Indiana and Chicago. As of June 9, 2014 the Amtrak Wolverine service stops four times daily. This is equivalent to two complete Chicago-Detroit round trips.

Station Location and Existing Conditions

The Hammond station is officially designated as Hammond-Whiting on all Amtrak timetables and schedules as Hammond's municipal neighbor to the east is the City of Whiting. The station is entirely located within the City of Hammond but shares this designation with Whiting as many of Hammond's residents on the north side of the City associate themselves with Whiting instead of Hammond. Hammond is almost eight

times larger in area than Whiting (3.23 square miles) and has over 70,000 more people. The train station is located on the northern edge of the City of Hammond less than 500 feet from Lake Michigan and is adjacent to Hammond's Horseshoe Casino. The station consists of an enclosed structure and parking lot with 10 short term and 103 long term spaces associated with it. The station was built in 1982, the same year that Amtrak service began in Hammond. The station was designed according to a standard Amtrak station plan that was used in the construction of many other stations during that time period. Figures 4, 5, and 6 show the station and platform from three different views.

Figure 3: View of Hammond Station Platform

Hammond station platform, looking west. Source: Author.

Figure 4: View of Hammond Station Building

Hammond station building. Source: Author.

Figure 5: View of Hammond Station Platform

Hammond station, looking east. Source: Author.

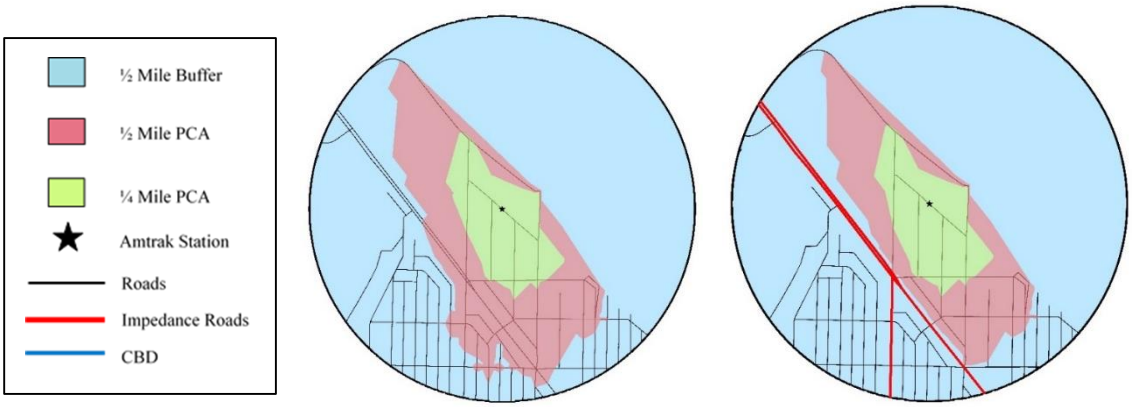
A GIS-based physical assessment of TOD type characteristics was conducted for a 0.5 mile area surrounding the station. The results of this assessment are listed in the table below (Table 2),(Appendix E). Appendix E shows all of the results of the physical environment assessment for all of the six city 0.5 mile areas.

Table 2: TOD Characteristics within 0.5 mile of the Hammond Station

Minor Roads (miles)	7.16
Major Roads (miles)	1.25
Minor Road Density	9.12
Average Block Length (feet)	445
Pedestrian Catchment Area (PCA)	0.29
Impeded Pedestrian Catchment Area (IPCA)	0.23
Population Density (square mile) (City)	3,545.2

The existing characteristics of the Hammond 0.5 mile station area are among the least favorable in terms of connectivity and walkability among the six localities in this study. The pedestrian catchment area (PCA) and impeded pedestrian catchment area (IPCA) are the two most significant indicators within the scope of this analysis. Consistent with the definition and description of the PCA and IPCA, this measure is a basis for a broad level analysis of walkability within a community. Figures 7 and 8 show the PCA and IPCA service areas for Hammond.

Figure 6: Hammond PCA Figure 7: Hammond IPCA



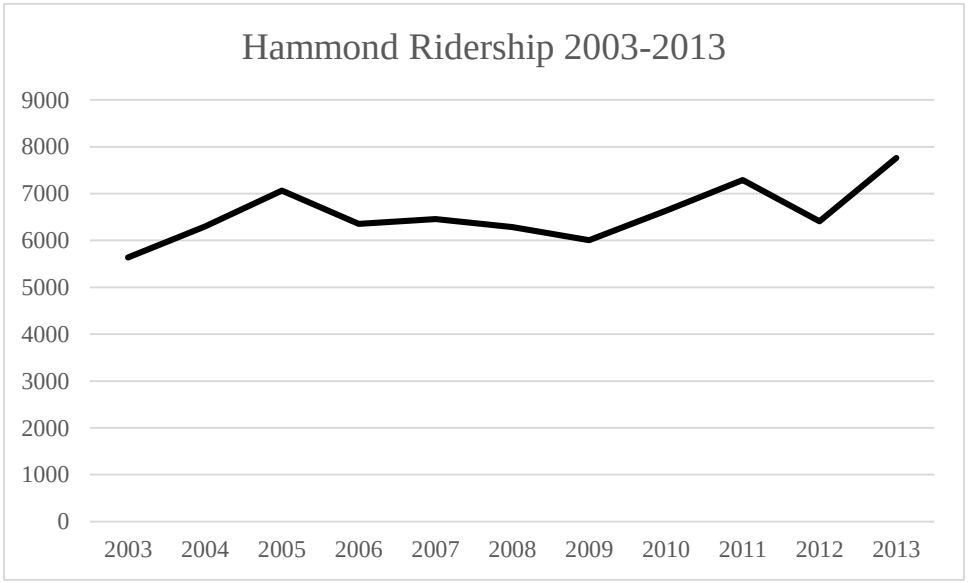
Hammond's PCA score of 0.29 is below the 0.30 that has been established in the literature as a minimum threshold. Hammond's IPCA score is 0.23. The influence of impedance streets on Hammond's traversable network is minimal. However, both the PCA and IPCA scores indicate a less than ideal traversable network.

Based on the variables used in this analysis, the 0.5 mile area around the Hammond station scores low in terms of physical characteristics related to TOD type development. The station is located in an area of minimal commercial activity other than the Horseshoe Casino. Hammond has the lowest IPCA score, the least amount of minor roads, the lowest minor road density, and the longest block length out of all of the six station locations.

Ridership

Amtrak ridership in Hammond has increased over the past ten years (FY2003-2013). During that time period Hammond's ridership increased from 5,635 to 7,763 (37.8%) (MDOT Rail Statistics, 2014). Figure 9 shows Hammond's ridership from the Chicago to Detroit corridor. Appendix F shows ridership for all six cities.

Figure 8: Hammond Ridership



Source: MDOT Rail Statistics, 2014

Planning and the Future of Rail Service

The interview data revealed several themes regarding the relationship between the City of Hammond and the Amtrak rail service. These themes include the presence of more viable transit modes into Chicago, problems and issues caused by current rail conditions, lack of planning related to Amtrak service, anticipating the termination of

Amtrak service, not anticipating or planning for TOD type development, and disconnect with the Indiana Department of Transportation (INDOT). This section will discuss these themes using extracted concepts as well as interview excerpts.

Planning

In the interview with Hammond's Director of City Planning Brian Poland, he indicated that Hammond's long range planning does not include any element passenger rail service or the potential for high-speed rail through the city. The most recent comprehensive plan for the City of Hammond was the Comprehensive Land Use Plan which was adopted in 1992. This plan was unavailable to review for this study. The plan was unavailable to the Hammond Public Library and could not be located.

Viable Alternative Transit Modes

One of the most significant themes from the interview with Mr. Poland was the presence of the South Shore Line as the primary mode of rail transit into Chicago. The South Shore Line is a commuter rail line consisting of 19 stations that operates between South Bend, Indiana and Chicago. The South Shore Line is operated by the Northern Commuter Transportation District (NICTD).

As far as rail service for passengers, the primary rail service that takes commuters into the City of Chicago is the South Shore electric railroad. The Amtrak service is not considered to be as significant to us. The stop is there (Amtrak), up in Robertsdale. I don't know exactly technically how it's classified, but it basically only stops if they know that somebody is there. It's not something on a regular basis that they stop at. It does not really serve any commuter purposes by any regular basis. It is a

siding for them to stop where someone is going from Chicago to elsewhere. So in that sense, that's why we don't really consider it to be as significant from a planning standpoint (Brian Poland, Interview, 12/16/13).

The Amtrak Wolverine service currently has only two round trip trains that stop in Hammond, neither of which would allow commuters the opportunity of traveling into Chicago during the morning hours. The South Shore Line (NICTD) has a total of 35 daily frequencies through Hammond.

Problems and Issues Caused by Current Rail Conditions

The City of Hammond has several at-grade rail crossings that contribute to some traffic flow and congestion issues within the City. Amtrak, freight rail, and South Shore Line trains all have at-grade crossings within Hammond. Mr. Poland identified the existence of these crossings and the overall context of trains passing through the City as more of a hindrance than a benefit.

As far as how we deal with trains in general not specifically to rail service, they're kind of like a necessary evil. They are there and we have to deal with them… Up in that corridor there's a whole bunch of railroad tracks, most of that is freight obviously, except for the Amtrak line. Again it's just something that we have to deal with. The trains are there, they've been there for 100 plus years. You know if we had the opportunity to do something differently with trains we certainly would. That way we open up our lakefront for further development. But they're more of an impediment than anything to us (Brian Poland, Interview, 12/16/13).

Transit-Oriented Development

In the interview Mr. Poland expressed that it was his understanding that there was a possibility that Amtrak service would be terminated in Hammond in the future. Because of this the possibility for any kind of transit-oriented development around the Amtrak station would not be possible.

Again, I don't see that here. It's definitely not in Hammond. Again, the station is not highly utilized there. There's not enough people going there that make that useful. My information may or may not be current but my understanding was that if they do the high speed rail they will close the Hammond stop. So there's no opportunity for TOD development or anything like that because they're going to close it… But like I said, from a regional perspective, I think it makes sense for the station to be in Gary. But by the same token because of the geographical limitations I don't see a TOD development happening up there (near the Hammond station) (Brian Poland, Interview, 12/16/13).

The train station is currently bordered by the Horseshoe Casino to northwest, a single family residential neighborhood to the south and a Unilever Plant to the southwest. Mr. Poland indicated that there have been plans in the past to redevelop portions of the area surrounding the station but have never been fully implemented or realized.

…Years ago when the casino was talked about, everything was promoted as "this would be a great economic development boom" and you'd have all this development occur with it, around it, hotels and all of these people coming there. And it never really happened in the context in which it was portrayed to happen. Partially because of the geographic limitations. We tried to develop redevelopment plans that would help

stimulate growth there and that just has not really happened (Brian Poland, Interview, 12/16/13).

Closing the Station

Mr. Poland expressed his opinion as to the possibility that Amtrak service in Hammond would be terminated in the future and that the station would be closed. Additionally, Mr. Poland mentions low ridership numbers and that the termination of service would ultimately go largely unnoticed in the community.

My information may or may not be current but my understanding was that if they do the high speed rail they will close the Hammond stop. So there's no opportunity for TOD development or anything like that because they're going to close it. What I'm most familiar with is that they want to consolidate the train into, basically to go into the City of Gary at the airport and have coordinated or intermodal facilities for people to benefit from that… Like I said I'm not sure if that's current or if it's written down. This is going back a couple years when I was much more involved with it but that's what we were hearing. Basically from the concept that if you want the train to go faster you're going to stop less times. And that the volume of passengers that actually use the Hammond stop is minimal and doesn't justify making it a formal stop…over the years they have talked about reducing services over general budgetary issues, they've talked in the past about closing the station. Because the ridership is not there (Brian Poland, Interview, 12/16/13).

Relationship with Associated Agencies

The political climate within the State of Indiana as well as Hammond's relationship with the Indiana Department of Transportation (INDOT) were both discussed in terms of the Amtrak service. Key elements of this theme include a disconnect from

INDOT and difficulty in Hammond's relationship with INDOT. Mr. Poland indicated that because of Hammond's proximity to the Chicago metropolitan area, Hammond is sometimes considered to be somewhat of an extension of Chicago and is treated as such from other government agencies such as INDOT. Mr. Poland expressed his belief that this may be a reason of why Hammond as well as Michigan City are not as involved as other communities located in the State of Michigan. As these Indiana cities as more influenced by the economic sphere of Chicago, it may be that the State of Indiana does not see the benefits of an enhanced connection into Chicago. Other organizations such as the Indiana High-Speed Rail Association are advocates of High-Speed Rail and are proponents of the development of several regional corridors. The relationship between communities' and their associated Departments of Transportation will be discussed further in the following chapter.

Michigan City, Indiana

Location and Demographics

Michigan City, Indiana is located in LaPorte County in northwest Indiana about 60 miles east of Chicago. Michigan City's population was 31,479 in 2010, a 4.3% decrease from 32,900 in 2000. The city covers 22.9 square miles and borders Lake Michigan to the north. The population density of Michigan City is 1606.1 (people per square mile) and the median income in 2010 was $35,433 (United States Census Bureau) (Appendix C).

History

The land that would eventually become Michigan City was purchased in 1830 with the intention of creating a harbor on Lake Michigan as well as providing easy transport of supplies to homesteaders in central Indiana. Michigan City was officially incorporated in 1836 and was established as a stopping point for travelers moving westward. Michigan City continued to grow with the advent of the Michigan Central Railroad that would come through the city in the early 1850's. In 1852, the firm of Haskell, Barker and Aldridge built a major factory to produce freight railroad cars. This firm would be Michigan City's largest and longest lasting business employing over 3,500 people in 1907 (Michigan City History and Architecture, 2014).

Passenger Rail

Passenger rail service began in Michigan City in the early 1850s with the Michigan Central Railroad passing through the city on its way to Chicago. For over 100

years passenger rail service continued in Michigan City until the stopping of service in the late 1960s (Great American Stations, 2014). The formation of Amtrak and the start of its nationwide service in 1971 did not include a stop in Michigan City. Amtrak service would not begin in the city until 1981. Presently, Michigan City is the second stop for Amtrak trains leaving Chicago heading for Detroit. The trip time via rail is 1 hour and 33 minutes to reach Chicago and 4 hours and 25 minutes to reach Detroit. The Michigan City station is located on the Amtrak owned corridor between Porter, Indiana and Dearborn, Michigan. As of June 9, 2014 the Amtrak Wolverine service stops three times daily. This is equivalent to one complete Chicago-Detroit round trip with one additional frequency.

Station Location and Existing Conditions

The Michigan City station is located in the northern part of the city near Lake Michigan. The station is adjacent to the Michigan City Generating Station near the point at which Trail Creek meets Lake Michigan. The station is located on the northern edge of the central business district and is within 0.5 mile of Michigan City's Blue Chip Casino. The station is a shelter-type structure with a concrete platform. There is a dedicated parking lot with 14 long-term and 14 short-term spaces. The station sits next to a former Michigan Central Railroad Depot that currently houses a local restaurant. The former MCRR depot is sometimes confused for an Amtrak station and waiting room but does not serve any Amtrak purposes. Figures 10, 11, and 12 show the station and platform from three different views.

Figure 9: View of Michigan City Station Platform

Michigan City platform, looking east. Source: Author.

Figure 10: View of Michigan City Station Platform

View of Michigan City platform from parking lot, looking west. Source: Author.

Figure 11: View of Michigan City Station Platform

View of platform from across tracks, looking west. Source: Author.

A GIS based physical assessment of TOD type characteristics was conducted for a 0.5 mile area surrounding the station. The results of this assessment are listed in the table below (Table 4),(Appendix E).

Table 3: TOD Characteristics within 0.5 mile of the Michigan City Station

Minor Roads (miles)	8.05
Major Roads (miles)	1.2
Minor Road Density	10.25
Average Block Length (feet)	327
Pedestrian Catchment Area (PCA)	0.47
Impeded Pedestrian Catchment Area (IPCA)	0.25
Population Density (square mile) (City)	1606.1

The existing characteristics of the Michigan City 0.5 mile station area show variation between favorable and unfavorable features related to connectivity and walkability. The pedestrian catchment area (PCA) and impeded pedestrian catchment area (IPCA) are the two most significant indicators within the scope of this analysis. Consistent with the definition and description of the PCA and IPCA, this measure is a basis for a broad level analysis of walkability within a community. Figures 13 and 14 show the PCA and IPCA service areas for Michigan City.

Figure 12: Michigan City PCA

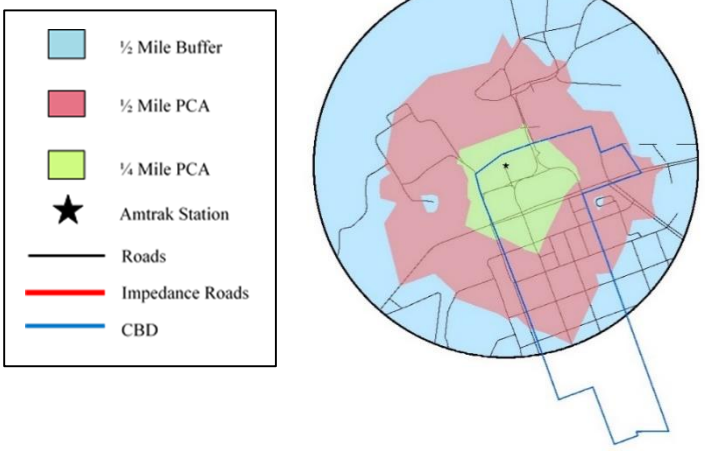


Figure 13: Michigan City IPCA

Michigan City's PCA score of 0.47 is well above the 0.30 that has been established in the literature as a minimum threshold. Michigan City's IPCA score of 0.25 is below the 0.30 threshold and shows the heavy influence of impedance streets on the traversable network. The main impedance street in the Michigan City service area is U.S 12, a highway that runs diagonally through the city. U.S. 12 is not a completely

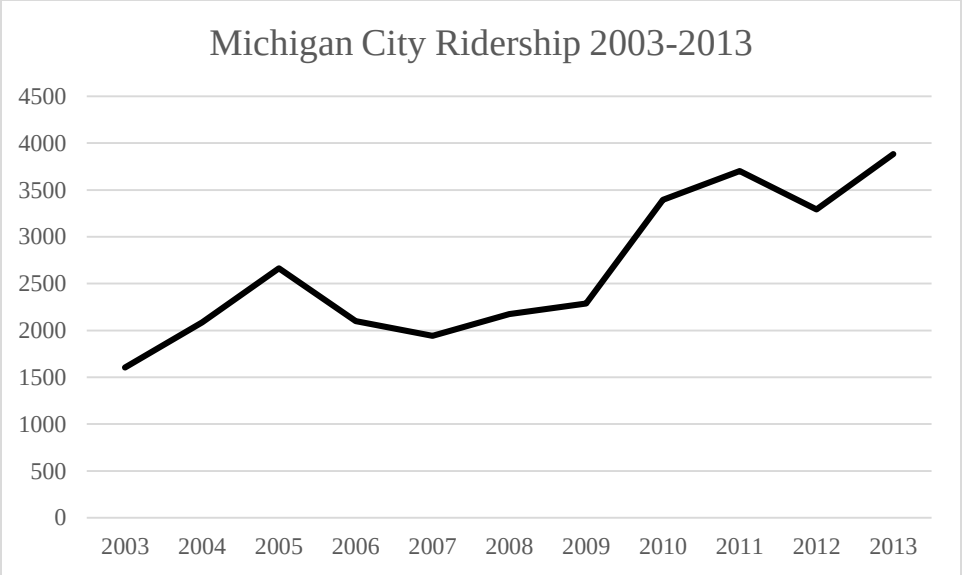
pedestrian unfriendly road as there are crosswalks at most of the intersections and sidewalks that line the roadway. Ultimately U.S. 12 is a four lane highway and is considered an impedance street in this analysis.

Based on the variables used in this analysis, the 0.5 mile area around the Michigan City station scores average in terms of physical characteristics related to TOD type development. Michigan City's minor road density is the second lowest among the six study localities with Hammond being the lowest. The presence of U.S. 12 as an impedance street significantly subtracts from the pedestrian friendly traversable network. Advantages of the station location include the fact that it is located within the central business district while also being in close proximity to a high level of recreational activity near the Lake Michigan waterfront.

Ridership

Amtrak ridership in Michigan City increased by 141.8% in the years 2003-2013 from 1,606 to 3,883 (MDOT Rail Statistics, 2014). Figure 18 shows Michigan City's ridership from the Chicago to Detroit corridor.

Figure 14: Michigan City Ridership



Source: MDOT Rail Statistics, 2014

Planning and the Future of Rail Service

The interview data revealed two main themes in terms of Michigan City and the developing high-speed rail corridor. These two themes are retaining Amtrak service within the City and planning for high-speed rail. This section will discuss these themes using extracted concepts as well as interview excerpts.

Planning

In the interview with Michigan City's Director of Planning and Redevelopment Craig Phillips, Mr. Phillips identified that Michigan City does not currently have an updated master plan. The most recent comprehensive plan that applies to Michigan City is the 2008 LaPorte County Countywide Land Development Plan. Other relevant plans include the Michigan City Lake Michigan Gateway Plan (2014) and the Michigan City

Downtown Action Agenda (2013). Both the Lake Michigan Gateway Plan and the Downtown Action Agenda plan are focused on an extensive redevelopment of the downtown area as well as the station area but do not specifically address any Amtrak service within the city. The station area redevelopment plans are not contingent on the continuing of Amtrak service within the City. Mr. Phillips identified the absence of planning around the Amtrak service was in part due to the fact that the City has not been given a lot of information about the developing high-speed rail corridor and its impact on Michigan City. Mr. Phillips indicated that there are many unknowns in terms of how the Amtrak service will be affected in Michigan City with the development of the high-speed rail corridor and that any planning regarding the Amtrak service would come as a result of more information being provided.

So we just don't have a lot of information and so we haven't done a lot of planning as a result of that specific to this project because there's a lot of unknowns. So in the event that we retain a stop in Michigan City and they retain the Wolverine service, if they do retain that in Michigan City then I think we would probably do more planning to find out what the cost and benefit of that would be (Craig Phillips, Interview, 01/14/14).

Continuing Amtrak Service

Mr. Phillips indicated that it was unclear whether Michigan City would remain an Amtrak stop on the Wolverine corridor as a result of the developing high-speed corridor but indicated that he is hopeful that the service would be retained.

We hope they'll retain service and the stop in Michigan City and we'd be thrilled if we were the only stop in Northwest Indiana. Because there would be another reason for

people to actually come to Michigan City. So that's a huge benefit to us if they retain that service (Craig Phillips, Interview, 01/14/14).

Similar to Hammond, Michigan City is unsure of whether or not the Amtrak service will continue in the future. The City has not been given a great deal of information regarding the developing corridor and therefore has not begun to specifically plan for any continuation or termination of service.

New Buffalo, Michigan

History

New Buffalo, Michigan is a City of 1,883 people located in Berrien County Michigan, about 70 miles east of Chicago (United States Census Bureau). The city is situated on the eastern shore of Lake Michigan with an area of 2.5 square miles. The population in 2000 was 2,200, a decrease of 14.4% between 2000 and 2010. New Buffalo's median income in 2010 was $39,976 with a median age of 48.4 (Appendix D).

The area around New Buffalo and the larger Berrien County was home to several Indian tribes dating back to the 1600s. The New Buffalo area was accidentally discovered by a ship Captain from New York on his way to Chicago in 1834. The Village was later incorporated in 1836 and was established as a tourist town for travelers en route to Chicago (Great American Stations, 2014).

Passenger Rail

Passenger rail service in New Buffalo dates back to 1849 when the Michigan Central Railroad reached the Village. Originally this was the planned terminus of the MCRR which originated in Detroit but was later extended to Chicago in 1852. During the short time that the MCRR terminated in New Buffalo, the Village thrived and experienced an economic boom in commercial development (Great American Stations, 2014). The Village was the last stop for travelers on their way to Chicago, who would utilize alternative modes for the remaining stretch of their trip. When the MCRR was connected to Chicago in 1852, the economic boom slowed and less people stopped or

moved to New Buffalo (New Buffalo Township, 2014). Passenger trains continued to service New Buffalo until 1971 when service ceased with the creation of Amtrak. Passenger service would resume in 1984 with Amtrak operating its Pere Marquette service between Chicago and Grand Rapids. In 2009 the New Buffalo Amtrak station was moved from the outer edges of the city to the downtown area. With this move the Amtrak service was switched from the Pere Marquette to the Wolverine and Blue Water services. New Buffalo is the third stop for Amtrak trains leaving Chicago heading for Detroit and the first stop for trains leaving Chicago heading for Port Huron. The trip time via rail is 1 hour and 50 minutes to reach Chicago and 4 hours to reach Detroit (Amtrak 2014). The New Buffalo station is located on the Amtrak owned rail corridor between Porter, Indiana and Dearborn, Michigan. As of June 9, 2014 the Amtrak Wolverine Service stops five times daily with an additional two stops from the Blue Water Service. This is equivalent to two complete Chicago-Detroit round trips and one complete Chicago-Port Huron round trip with one additional Chicago-Detroit frequency.

Station Location and Existing Conditions

The train station is located in the heart of the central business district in the downtown area. Compared to its previous location, the station is located 0.6 miles north or where it originally was. The station is a shelter-type structure with a concrete platform. There is no building associated with the station. There is an adjacent parking lot with 25 long-term and 25 short-term spaces available. Figures 16, 17, and 18 are photographs of the station from three different views; from the station parking lot, from the station

platform, and from the intersection of the main cross street.

Figure 15: View of New Buffalo Station Platform

View from station platform, looking east. Source: Author.

Figure 16: View of New Buffalo Station Platform

View of station platform from across the street. Source: Author.

Figure 17: View of New Buffalo Station Platform

View of station platform, looking south. Source: Author.

A GIS based physical assessment of TOD type characteristics was conducted for a 0.5 mile area surrounding the station. The results of this assessment are listed in the table below (Table 4).

Table 4: TOD Characteristics within 0.5 mile of the New Buffalo Station

Minor Roads (miles)	10.66
Major Roads (miles)	0.9
Minor Road Density	13.57
Average Block Length (feet)	349
Pedestrian Catchment Area (PCA)	0.55
Impeded Pedestrian Catchment Area (IPCA)	0.43
Population Density (square mile)(City)	753.2

Among the variables calculated in this physical assessment, New Buffalo yields favorable conditions in terms of connectivity and walkability. The pedestrian catchment area (PCA) and impeded pedestrian catchment area (IPCA) are the two most significant indicators within the scope of this analysis. Consistent with the definition and description of the PCA and IPCA, this measure is a basis for a broad level analysis of walkability within a community. Figures 19 and 20 show the PCA and IPCA service areas for New Buffalo.

Figure 18: New Buffalo PCA

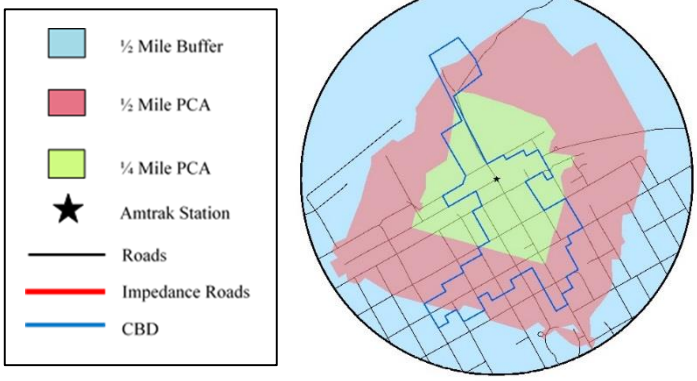
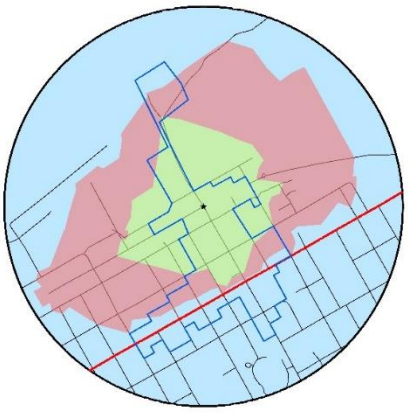


Figure 19: New Buffalo IPCA



New Buffalo's PCA score of 0.55 is well above the 0.30 that has been established in the literature as a minimum threshold. New Buffalo's IPCA score is 0.43, also above the 0.30 threshold. As the IPCA reflects the influence of impedance streets on the

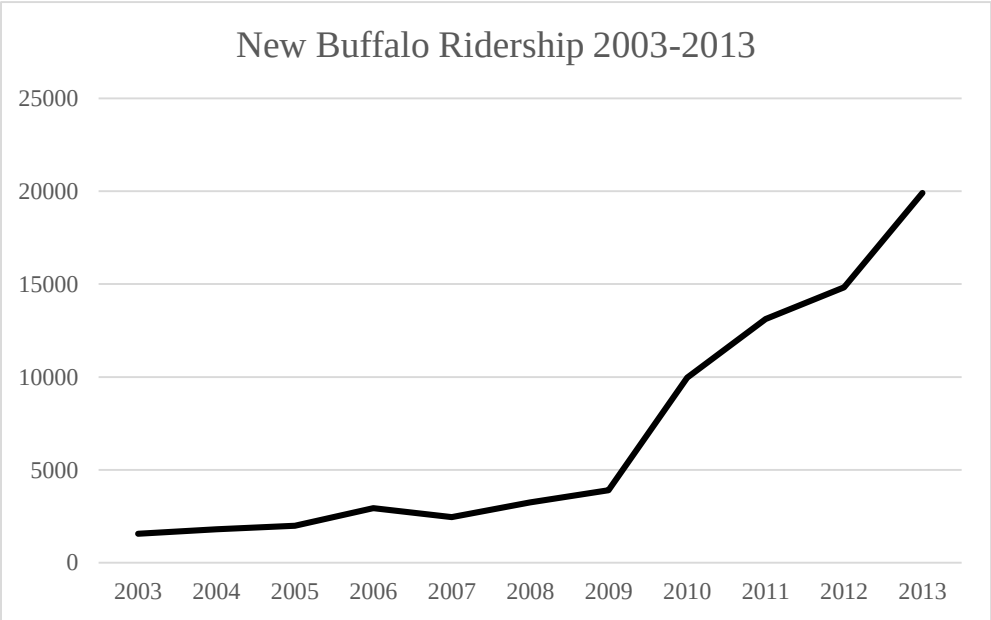
traversable network, an IPCA score of over 0.30 reflects a network that is not heavily influenced by such street types.

Based on the variables used in this analysis, the 0.5 mile area around the New Buffalo station scores high in terms of physical characteristics related to TOD type development. The station is located in a highly traversable network with short block lengths and minimum influence of impedance streets. The station is located along the main commercial corridor within the central business district.

Ridership

Amtrak ridership in New Buffalo has grown astronomically over the past ten years (FY2003-2013). During that time period New Buffalo's ridership increased from 1,567 to 19,902 (1,170%) (MDOT Rail Statistics, 2014). The overwhelming factor in this increase was the relocation of the Amtrak station from the outer edge of the City to the downtown area in 2009. The relocation of the station shifted the services provided by Amtrak and increased the frequency of trains from one daily round trip to four. Figure 21 (Appendix E) illustrates New Buffalo's ridership from the Chicago-Detroit, Chicago-Port Huron, and Chicago-Port Huron-Toronto corridors. As of April 2004, service to Toronto has ceased and the corridor terminates in Port Huron.

Figure 20: New Buffalo Ridership



Source: MDOT Rail Statistics, 2014

Planning and the Future of Rail Service

The City of New Buffalo is actively involved and interested in the developing high-speed rail corridor. The interview data revealed several themes consistent with planning for and capitalizing on high-speed rail development within the corridor. These themes include collaboration with associated agencies on rail based projects, seeking funding for rail based projects, transit-oriented development, identifying existing community assets related to rail, planning for and anticipating high-speed rail, and developing commuter rail into Chicago. This section will discuss these themes using extracted concepts and themes as well as interview excerpts.

Planning

New Buffalo's current master plan was adopted in 2003 and contains small amounts of discussion regarding the Amtrak service. At the time of the creation and adoption of the plan, the station was still located on the edge of the city as opposed to its current downtown location. The master plan however, still references the possibility of high-speed rail in the future and its potential impacts on the City.

> *Although the City can expect continued high levels of part time residents for the foreseeable future, a number of trends may result in formerly seasonal residents taking up full time residency in the city…they include…the very real possibility of high-speed passenger rail service being introduced between Detroit and Chicago* (New Buffalo Master Plan 2003).

Additionally, the 2003 master plan mentions the possibility of 100 mph (+) trains and the development of a "transit village" in the area formerly occupied by the station.

In the interview with Assistant City Manager Ryan Fellows, Mr. Fellows indicated that New Buffalo was in the process of updating its master plan. He indicated that the updated plan would ultimately include a more substantial section on the Amtrak service and its relationship to New Buffalo as well as Chicago. "Right now we're working on updating the city's master plan…In our goals section were going to have a goal that specifically states that we're working towards building a commuter level of rail service" (Ryan Fellows, Interview, 12/04/13).

Other planning initiatives relating to the Amtrak service include New Buffalo's rezoning of the central business district to better connect with the Amtrak station as well

as transit-oriented development plans including a downtown streetscape and infrastructure plan.

Commuter Rail

A major theme that emerged from the interview with Mr. Fellows was the potential for commuter rail services into and out of Chicago. As stated before, New Buffalo is anticipating this type of development in the future and has already incorporated it into the newest version of the master plan. Mr. Fellows identified the positive outlook that New Buffalo is taking regarding the future of the high-speed rail development and its impact on the city's desire to develop commuter type trips into Chicago.

> *When you get this bottleneck cleaned up and you get the short trip between New Buffalo and downtown Chicago, it's going to basically be a commuter level of service…That's what we're looking forward to. When that happens we'll basically have where people could work in Chicago, downtown Chicago, and live here. And that will really change everything I think. It will really make it for almost a suburb, pretty much literally a suburb of Chicago when that happens* (Ryan Fellows, Interview, 12/04/13).

Mr. Fellows indicated that he believed that some people are already making the commute from New Buffalo into Chicago. He also identified the increase in ridership both in New Buffalo and within the corridor as a benefit to the City's goal of developing this type of commuter service.

Collaboration with Associated Agencies on Rail-Based Projects

There are two specific instances in which New Buffalo has coordinated and collaborated with other parties on Amtrak based initiatives. The relocation of the station

to the downtown area in 2009 significantly enhanced the relationship between the Amtrak service and the City of New Buffalo. The relocation of the station involved a public-private partnership involving the City of New Buffalo, a private developer, MDOT, and Amtrak. Since the opening of the station in the downtown location, ridership numbers in New Buffalo have significantly increased. The second major instance occurred in 2013 when the City of New Buffalo applied for TIGER Grant (Transportation Investment Generating Economic Recovery) funding in coordination with MDOT and Amtrak. The application was for funding to construct additional trackage that would allow for additional frequencies of Amtrak trains through New Buffalo. The application was denied but Mr. Fellows indicated that it is a project that is needed and will eventually be funded.

Transit-Oriented Development

The City of New Buffalo is hoping to capitalize on the developing high-speed rail in terms of transit-oriented development. The existing conditions within New Buffalo are favorable to this type of development and in some cases there are certain elements of TOD that have already been established. Following the relocation of the station to the downtown area, several new developments have been established mostly consisting of residential developments surrounding the train station. These developments were intentionally designed in anticipation of commuter type Amtrak trips into Chicago (Amtrak 2014). As stated before, New Buffalo's rezoning of the central business district was intentionally designed to further incorporate the train station. New Buffalo also has a

downtown streetscape and infrastructure plan which include goals of enhanced pedestrian friendliness and walkability, key components of transit-oriented development.

We rezoned our central business district to go further to the west to lead up to Willard street so it would connect with the other rail crossing area so that it could be that kind of transit oriented development (TOD) of trying to build the downtown and the higher density residential and the core of it to try to utilize that rail connection (Ryan Fellows, Interview, 12/04/13).

Existing Community Assets

Another significant theme that emerged from the interview with Mr. Fellows was the identification of several assets specific to New Buffalo and its relationship with the Amtrak service. These assets include the idea of Michigan as being a vacation destination, the idea of New Buffalo being an "escape" from Chicago, the train station's connection to the casino and local hotels, the train station's proximity to the City's marina, and the train station's downtown location. Mr. Fellows emphasizes the significance of New Buffalo as being an "escape" from Chicago.

I think we (New Buffalo) will always have an edge on Michigan City or anywhere in Indiana because we bill ourselves as the gateway to Michigan. You're from Chicago and you're coming up this way this is your escape from whatever woes or stresses you have back home. Whether that's commuting through rush hour traffic or whatever the problem is, the crush of people. When you are Indiana you are still in the industrial heartland, the industrial beltway. You're in smokestack country. And to some extent even when you're in the Indiana dunes national lakeshore, the state park, still when you're on the beach you look up and you see smoke stacks. I think that takes away some of that, the allure of that. When you get past the Indiana state line, mentally you are also transported to this vacation winter-water-wonderland that Michigan has always been (Ryan Fellows, Interview, 12/04/13).

Niles, Michigan

History and Demographics

The City of Niles is a small town located in Berrien County in southwest Michigan. The city sits upon the St. Joseph River and is located just 3 miles north of the Indiana state line, about 94 miles east of Chicago. As of 2010 the population of Niles was 11,600 with the city encompassing 5.8 square miles (United States Census Bureau). The median household income in 2010 was $31,757 with a median age of 36.1 (Appendix D).

Niles' origins date back to the late 1600s when the French established Fort St. Joseph as a trading post adjacent to the St. Joseph River in what is present day Niles (City of Niles, 2014). Pioneers moving westward eventually platted and incorporated Niles as a Village on August 1, 1829 (Niles Master Plan, 2004). It was later incorporated as a city in 1835 (Niles Master Plan, 2004). In addition to Fort St. Joseph, Niles is home to an additional 13 historical landmarks listed on the State and/or National Register of Historic Places and is one of Michigan's oldest communities (Niles Master Plan 2004).

Passenger Rail

Passenger rail service in Niles dates back to 1848 (Great American Stations, 2014). In that year, the city was connected with the Michigan Central Railroad which was being built westward from Detroit with the intent of reaching Chicago. The connection to Chicago was established in 1852. Since 1848, passenger trains have continued to service Niles, a period of over 150 years (Great American Stations, 2014). Presently, Niles is the

fourth stop for Amtrak trains leaving Chicago either heading for Detroit or Port Huron. The trip time via rail is 1 hour and 50 minutes to reach Chicago from Niles and 3 hours and 40 minutes to reach Detroit (Amtrak 2014). The Niles stop is located on the Amtrak owned rail corridor between Porter, Indiana and Kalamazoo, Michigan. The station that was built in 1892 still occupies the same site and remains largely unchanged. It is registered with the National Register of Historic Places (1979) and has been used for location shots in 3 movies, most recently in 1990 (Great American Stations, 2014). As of January 13, 2014 the Amtrak Wolverine Service stops 5 times daily with an additional 2 stops from the Blue Water Service.

Station Location and Existing Conditions

The train station is located about 0.5 miles north of the downtown core of the city and is mostly surrounded by areas of low-density residential properties. Directly across from the station on the opposite side of the tracks is an Amtrak maintenance facility. There is a parking lot on the station property with 40 long term and 40 short term parking spaces available. The station and parking lot are both owned by Amtrak. Figures 22, 23, and 24 are photographs of the station from three different views; from the station parking lot, from the station platform, and from the intersection of the arterial road that connects with the parking lot.

Figure 21: View of Niles Station Platform

View of station building from center platform, looking east. Source: Author.

Figure 22: View of Niles Station Platform

View from station building looking across the tracks. Source: Author.

Figure 23: View of Niles Station Platform

View of station building from platform. Source: Author.

A GIS based physical assessment of TOD type characteristics was conducted for a ½ mile area surrounding the station. The results from this assessment are listed in the table below (Table 5).

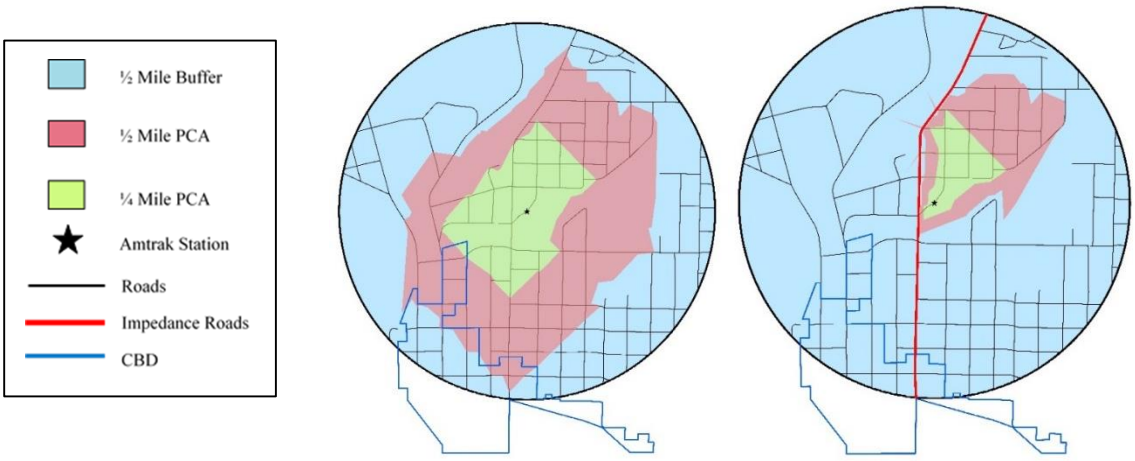
Table 5: TOD characteristics within ½ mile of the Niles Station

Minor Roads (miles)	13.94
Major Roads (miles)	1.03
Minor Road Density	17.75
Average Block Length (feet)	347
Pedestrian Catchment Area (PCA)	0.48
Impeded Pedestrian Catchment Area (IPCA)	0.12
Population Density (square mile)(City)	2000

Within the six city study area and in comparison to the same values calculated for the other five sites, the existing conditions within Niles yield some advantages and limitations regarding transit-oriented development. The pedestrian catchment area (PCA) and impeded pedestrian catchment area (IPCA) are the two most significant indicators within the scope of this analysis. Consistent with the definition and description of the PCA and IPCA, this measure is a basis for a broad level analysis of walkability within a community. Figures 25 and 26 show the PCA and IPCA service areas for Niles.

Figure 24: Niles PCA

Figure 25: Niles IPCA



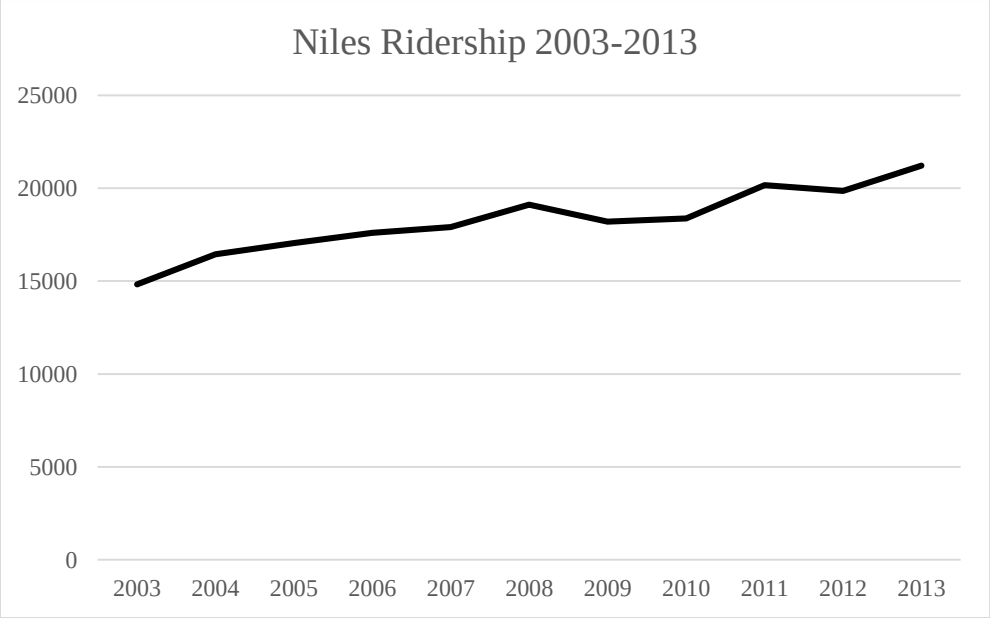
Niles PCA score of 0.48 is well above the 0.30 that has been established in the literature as a minimum threshold. As discussed previously however, the IPCA is a more accurate measure of the actual traversable network within a community as it eliminates non-pedestrian friendly roads such as main arterials like U.S., State, or County highways.

Niles' IPCA score of 0.12 can initially be viewed as significantly non-pedestrian friendly. This calculation should be caveated with the fact that the station is located on Michigan Highway M-51. M-51 bisects the City of Niles from north to south and is otherwise the main road that pedestrians would traverse to access the downtown area from the station. It is a fair assessment to say that M-51 does not discourage pedestrians from walking or biking along the roadway. There are sidewalks on either side along the entire length of road within the city and bike lanes in some areas. The elimination of M-51 as a traversable street in the IPCA calculation is the reason that the IPCA score is significantly lower. The same type of calculation was also conducted strictly using the sidewalk network within one quarter mile of the station. This analysis yielded similar values that mirror the PCA and IPCA analysis that used only the street network. The presence of a walkable network surrounding the station is an advantage that Niles has. Negative conditions include the aforementioned presence of M-51 as an impedance street that may hinder the station's true ability to adequately serve pedestrians. The station's distance from the downtown core of the city is also a negative aspect of the station location. The Niles station is the second furthest from the downtown core of the city among the six communities with the furthest of these distances being in Hammond, Indiana. Advantages of the station include its historic nature and landmark status within the city. Niles also enjoys a high level of ridership which is discussed in the next section. The presence of a walkable network within the half mile radius is a benefit as well. Both the street and sidewalk PCA scores are indicators of a strong traversable and walkable network in the station area.

Ridership

Consistent with the recent overall growth in ridership within the Chicago to Detroit corridor, Niles' ridership has seen a significant increase over the past 10 years (FY2003-2013). Between that time period Niles' ridership increased from 14,821 to 21,222 (43.2%) (MDOT Rail Statistics, 2014). Figure 7 (Appendix E) illustrates Niles' ridership from the Chicago-Detroit, Chicago-Port Huron, and Chicago-Port Huron-Toronto corridors. As of April 2004 service to Toronto has ceased and the corridor terminates in Port Huron.

Figure 26: Niles Ridership



Source: MDOT Rail Statistics, 2014

Planning and the Future of Rail Service

The City of Niles is very much engaged with and cognizant of the developing high-speed corridor and its potential impact on connected communities. There are a

variety of themes that emerged from the interview data pertaining to Niles' planning for high-speed rail and the ways in which they might capitalize on the service. These themes include collaboration with associated agencies on rail based projects, seeking funding for rail based projects, transit-oriented development, identifying existing community assets related to rail, planning for and anticipating high-speed rail, and developing commuter rail into Chicago. This section will discuss these themes using extracted concepts and themes from the interview data.

Planning for and Anticipating High-Speed Rail

Beginning with Niles' past planning, their current master plan was completed in 2004 and dedicates a small but significant amount of discussion to the future of the Amtrak service. The Master Plan recognizes the potential for future high-speed rail within the corridor and briefly identifies economic and development opportunities. The following passage is the first of only two mentions of the Amtrak service and the developing high-speed rail corridor.

> *A proposed high-speed rail connection to Chicago (making the trip in under 45 minutes) will open the door to many new possibilities for the area, both in terms of residential development and in business and industry. According to the Chicago Amtrak office, the rail lines from Chicago to Niles have already been upgraded for the high-speed capabilities* (Niles Master Plan 2004).

In the interview with Community Development Director Juan Ganum, he states that they are working on updating their master plan and that the updated plan will include a much

more extensive section dedicated to high-speed rail. In regard to relevant conversations and planning dialogue, Mr. Ganum indicated that the recent train speed increases and other developments within the corridor have stimulated and influenced additional conversations relating to the developing corridor and its future impact on the city.

> *Because we've been talking about high speed rail service for so long in Southwest Michigan we incorporated some language about high speed rail, anticipating high speed rail, and redeveloping certain areas to take advantage of that (in the 2004 plan). We're getting ready to update the plan and I guarantee you that the next iteration of our master plan is going to have a much more robust section on high speed rail service than we had in the 2004 plan because were getting closer (to its implementation)* (Juan Ganum, Interview, 12/13/13).

Collaboration with associated agencies on rail based projects

The Amtrak maintenance yard that is located directly across from the station was also a topic that was discussed at length in the interview with Mr. Ganum. He indicated that Niles would like to have Amtrak relocate this facility as it is somewhat of an eye-sore for passengers boarding and alighting from the trains. The relocation of this Amtrak facility is an important issue to Niles and is rooted in their desire to develop this area into mixed use and TOD type development.

> *We want their maintenance facility out of here so we can attract a developer to that will want to create a TOD mixed use development right across from the station* (Juan Ganum, Interview, 12/13/13).

Amtrak has indicated that they are willing to move this facility provided they receive adequate funding and resources to do so. Mr. Ganum indicated that a committee has been formed including members local officials from Niles, MDOT and Amtrak to study the relocation of this facility. The formation of this committee represents a strong intent to move forward with rail based projects and is an indication of a high level of commitment in regard to capitalizing on the development of the corridor. This committee is also representative of Niles seeking funding for rail based projects.

Transit-Oriented Development

Niles has identified the area currently occupied by the Amtrak maintenance facility as an area that is viewed as prime for future development. The City is of the belief that this type of development across from the station will spur a "domino effect" within the area. Providing that the City is able to acquire the land across from the station, they are looking to specifically attract a developer that would want to build a mixed-use/TOD type development in this area. Niles is looking to use this first TOD type development as a catalyst for further development in the area. This Amtrak facility is directly referenced in the 2004 Master Plan.

> *The Amtrak property and areas around the train depot have been identified as a Neighborhood Center with a mix of uses. This has been an underutilized area within the City for years. To stimulate investment, the City should develop a sub-area plan for the depot development to better define the intended use and character in the area* (Niles Master Plan 2004)

Mr. Ganum has also identified the possibility of suburban development in areas further away from the station as a result of high-speed rail. This includes the development of residential properties related to the potential of commuter rail development into Chicago. This will be discussed in the next section.

Commuter Rail into Chicago

The City of Niles has a strong desire to develop a commuter base into and out of Chicago. Niles is very much aware of the time savings into Chicago that the high-speed rail service will provide and hopes to capitalize on this development. In the interview Mr. Ganum explicitly stated that they would like to eventually market themselves to Chicago residents who may want to continue to work in Chicago but possibly live in a less dense and less urban environment.

I always thought that the best way to position ourselves would be to market to Chicagoans that were interested in living in a small town and having the same type of commute that they've got in Chicago today. And you're only talking about a small percentage of people that you have to pull out, that will want to say yes to that kind of change. I think we can really capitalize on it (Juan Ganum, Interview, 12/13/13).

Additionally, this concept is briefly discussed in the 2004 Master Plan.

The potential of a high-speed rail link to the Chicago market cannot be overestimated. Many weary Chicago commuters spend at least 45 minutes behind the wheel daily never to escape the oppressive sprawl of that metropolis. Niles offers an extremely inviting alternative which, with the high speed link, could transform the

community and its surroundings with investment, jobs and new population (Niles Master Plan 2004).

Identifying Existing Community Assets

There are several existing factors that Niles considers to be assets to the potential benefits of the developing high-speed rail corridor. The station in Niles is historic in nature and is quite possibly one of the nicest stations in the State of Michigan. This view is shared by the City and is reflected in the substance of the interview. The station is located in the center of the City's low-income area and is being targeted for redevelopment. Mr. Ganum references the concept of gentrification and the high potential for it in the area surrounding the station. This concept is linked to the desire of the City to acquire the land across from the station to begin development. Niles physical location within the region also benefits the city in terms of the Amtrak scheduling. Mr. Ganum suggests that riders come from neighboring communities that may not have Amtrak service or have less than ideal service (fewer stops or difficult scheduling into Chicago). Niles views this migration of riders from neighboring communities as an asset that other communities in the region do not share. Another self-identified asset of the community is its appeal to potential commuters to Chicago. Mr. Ganum states that Niles views itself as somewhat of an escape from the congested metropolis of Chicago and feels that there is a potential to tap into the market of Chicagoans that may wish to relocate to Niles where commuting to Chicago is still possible. This is combined with another asset in that Niles believes that it is poised to benefit more than any other community within the corridor

other than New Buffalo. Niles is in an advantageous position along the corridor in that it is closer in to Chicago. This specific location within the corridor and its relationship to commuter rail is discussed in more detail in the next chapter.

Dowagiac, MI

Demographics and History

Dowagiac, Michigan is a small city in southwestern Michigan located in Cass County about 40 miles southwest of Kalamazoo. In 2010 Dowagiac's population was 5,879, a decline of 4.4% from its 2000 population of 6,147. Dowagiac covers 4.5 square miles with a population density of 1,306.4. Dowagiac's median income in 2010 was $32,020 with a median age of 32, 22.7% of residents being 55 years or older (United States Census Bureau).

Not unlike many other locations in the southwest Michigan, the Dowagiac area was originally inhabited by members of the Potowatomie prior to the arrival of the first permanent American settlers. The first settlers arrived in the Dowagiac area in 1821 and the village was incorporated in 1835 (Greater Dowagiac Chamber of Commerce, 2014). Dowagiac grew as a manufacturing town centered on the mills and the Dowagiac creek with the Michigan Central Railroad coming to Dowagiac in 1848 on its way to Chicago. Dowagiac was incorporated as a city in 1877 (Greater Dowagiac Chamber of Commerce, 2014). The Pokagon Band of the Potowatomie still maintains a large presence in southwest Michigan with Dowagiac serving as their headquarters.

Passenger Rail

Passenger rail service in Dowagiac began in 1848 when it was connected with the Michigan Central Railroad (Great American Stations, 2014). The Michigan Central Railroad was being built westward from Detroit and would ultimately reach Chicago in

1852. Passenger rail service has continued from 1848 to the present day, a time period of over 150 years. Dowagiac is the fifth stop for Amtrak trains leaving Chicago heading for Detroit and the third stop for trains leaving Chicago heading for Port Huron. The trip time via rail is 2 hours and 15 minutes to reach Chicago and 3 hours and 57 minutes to reach Detroit (Amtrak 2014). The Dowagiac station is located on the Amtrak owned rail corridor between Porter, Indiana and Dearborn, Michigan. As of June 9, 2014 the Amtrak Wolverine service stops three times daily with an additional two stops from the Blue Water service. This is equivalent to one round trip each from the Chicago-Detroit and Chicago-Port Huron trains with one additional Chicago-Detroit frequency.

Station Location and Existing Conditions

The Dowagiac Amtrak station is located in downtown Dowagiac. The original station was built in 1903 and was placed on the National Register of Historic Places in 1993 (Great American Stations, 2014). In 1995, the depot was rehabilitated and restored to its current condition. The station features the depot building and a dedicated parking lot with 75 long term and 75 short term parking spaces. Also occupying the station building is the Dowagiac Chamber of Commerce office. Figures 28, 29, and 30 show the station building and surrounding area.

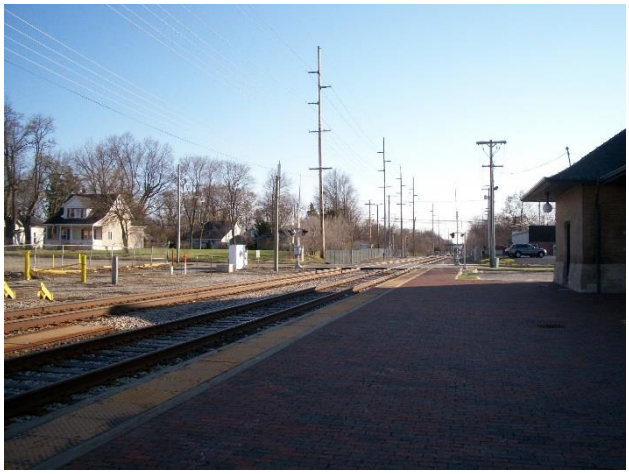
Figure 27: View of Dowagiac Station Platform

View of station building from across tracks. Source: Author.

Figure 28: View of Dowagiac Station Platform

View from station platform, looking northeast. Source: Author.

Figure 29: View from Dowagiac Station Platform



View from station platform, looking southwest. Source: Author.

A GIS based physical assessment of TOD type characteristics was conducted for a 0.5 mile area surrounding the station. The results of this assessment are listed in the table below (Table 6).

Table 6: TOD Characteristics within 0.5 mile of the Dowagiac Station

Minor Roads (miles)	14.79
Major Roads (miles)	1.18
Minor Road Density	18.83
Average Block Length (feet)	320
Pedestrian Catchment Area (PCA)	0.57
Impeded Pedestrian Catchment Area (IPCA)	0.34
Population Density (square mile)(City)	1,306.4

The existing characteristics of the Dowagiac 0.5 mile station area are among the most favorable between the six station areas in terms of connectivity and walkability. The pedestrian catchment area (PCA) and impeded pedestrian catchment area (IPCA) are the

two most significant indicators within the scope of this analysis. Consistent with the definition and description of the PCA and IPCA, this measure is a basis for a broad level analysis of walkability within a community. Figures 31 and 32 show the PCA and IPCA service areas for Dowagiac.

Figure 30: Dowagiac PCA Figure 31: Dowagiac IPCA

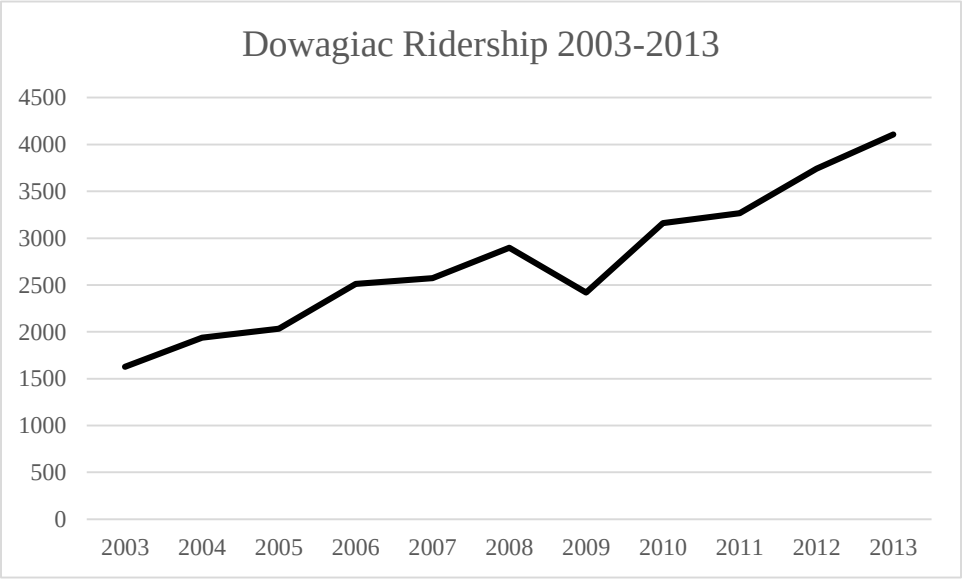
Dowagiac's PCA score of 0.57 is well above the 0.30 that has been established in the literature as a minimum threshold and is the second highest PCA score of the six station areas. Essentially all of the ¼ mile traversable network is unimpeded by any major roads. The main source of impedance in this ½ mile buffer area is highway M-62, which borders the central business district to the north. This road is a state highway and is somewhat pedestrian unfriendly. As with other networks within the six city study area, these roads are used as impedance roads for the IPCA calculation. M-62 features sidewalks along both sides of the highway and some crosswalks near the edges of the central business district. Overall, the network surrounding the Dowagiac station is

pedestrian friendly and features some of the most favorable values in terms of transit-oriented development.

Ridership

Amtrak ridership in Dowagiac increased by 152.5% in the years 2003-2013 from 1,627 to 4,108 (MDOT Rail Statistics, 2014). Figure 21 (Appendix E) shows Dowagiac's ridership from the Chicago-Detroit, Chicago-Port Huron, and Chicago-Port Huron-Toronto corridors. As of April 2004, service to Toronto has ceased and the corridor terminates in Port Huron.

Figure 32: Dowagiac Ridership



Source: MDOT Rail Statistics, 2014

Planning and the Future of Rail Service

Interview data from Dowagiac was not able to be gathered within the scope of time for this study. Limited information as to the City's attitudes or perceptions towards

high-speed rail development was found either. However, it was discovered that significant investment was made in the 1990s to redevelop Dowagiac's central business district, a portion of which specifically upgraded the Amtrak station building and surrounding area. This "Depot Drive Redevelopment Project" saw $1.8 million in construction projects and downtown enhancements with the idea that high-speed rail would eventually come to Dowagiac. The mayor of Dowagiac, Donald Lyons, has publicly supported and advocated for the development of high-speed rail and the potential benefits it could present the city.

Kalamazoo, Michigan

Demographics and History

Kalamazoo, Michigan is a mid-sized city in southwestern Michigan located in Kalamazoo County about halfway between Chicago and Detroit. In 2010 Kalamazoo's population was 74,262, a decline of 3.7% from its 2000 population of 77,145 (United States Census Bureau). Kalamazoo covers 25.1 square miles with a population density of 3,006.6. Kalamazoo's median income in 2010 was $29,919 with a median age of 26.2, 20.1% of residents being between 20-24 years old (United States Census Bureau) (Appendix D).

Similar to other locations in southwest Michigan, the area currently occupied by the City of Kalamazoo was long inhabited by members of the Potawatomie prior to the arrival of the first European Americans. The first non-indigenous settlement began in 1829 with the Village of Bronson being established later in 1831 (City of Kalamazoo, 2014). The Village of Bronson was later changed to the Village of Kalamazoo and was incorporated in 1843. Kalamazoo would later be incorporated as a city in 1884 (City of Kalamazoo, 2014). In the late 19th century Kalamazoo was home to thriving paper product and pharmaceutical industries. Western State Normal School opened in 1903 and would later become Western Michigan University in 1957.

Passenger Rail

Passenger rail service in Kalamazoo began in 1846 when it was connected with the Michigan Central Railroad (Great American Stations, 2014). The Michigan Central

Railroad was being built westward from Detroit and would ultimately reach Chicago in 1852. The connection to Chicago in 1852 situated Kalamazoo almost exactly halfway between Chicago and Detroit which contributed to the City's economic prosperity in the late 19th and early 20th centuries. Passenger rail service in Kalamazoo has continued from 1846 to the present day, a time period of over 150 years. Kalamazoo is the sixth stop for Amtrak trains leaving Chicago heading for Detroit and the fourth stop for trains leaving Chicago heading for Port Huron. The trip time via rail is 2 hours and 20 minutes to reach Chicago and 3 hours and 10 minutes to reach Detroit (Amtrak 2014). The Kalamazoo station is located on the Amtrak owner rail corridor between Porter, Indiana and Dearborn, Michigan. As of June 9, 2014 the Amtrak Wolverine service stops six times daily with an additional two stops from the Blue Water service. This is equivalent to three complete Chicago-Detroit round trips and one complete Chicago-Port Huron round trip.

Station Location and Existing Conditions

The Kalamazoo Amtrak station is located in downtown Kalamazoo. The station is part of the city's multimodal transit center which also serves the Metro transit bus system as well as Greyhound. The current station building was part of a new construction and renovation of the former Michigan Central Railroad Depot that was built there in 1887 (Great American Stations, 2014). The former depot was later purchased from the Penn Central Railroad in the 1970s by the City of Kalamazoo (Great American Stations, 2014). The present Kalamazoo Transportation Center was completed in 2006. The station building maintains many of the original historical and architectural features from the

original MCRR depot and contains a large waiting room and ticket office. There is a dedicated parking lot with 30 short term spaces. The Metro transit bus terminal is opposite from the Amtrak platform and is the terminal for all 19 Metro transit bus routes. Figures 34, 35, and 36 show the station, platform, and bus terminal.

Figure 33: View of Kalamazoo Station Platform

View of station building from across the street. Source: Author.

Figure 34: View of Kalamazoo Station Platform

View of station building from across tracks/platform. Source: Author.

Figure 35: View of Kalamazoo Bus Terminal

View of bus terminal connected to station building. Source: Author.

A GIS based physical assessment of TOD type characteristics was conducted for a 0.5 mile area surrounding the station. The results of this assessment are listed in the table below (Table 7).

Table 7: TOD Characteristics within 0.5 mile of the Kalamazoo Station

Minor Roads (miles)	16.7
Major Roads (miles)	3.12
Minor Road Density	21.26
Average Block Length (feet)	329
Pedestrian Catchment Area (PCA)	0.65
Impeded Pedestrian Catchment Area (IPCA)	0.39
Population Density (square mile)(City)	3,006.6

The existing characteristics of the Kalamazoo 0.5 mile station area are among the most favorable between the six station areas in terms of connectivity and walkability. The pedestrian catchment area (PCA) and impeded pedestrian catchment area (IPCA) are the two most significant indicators within the scope of this analysis. Consistent with the definition and description of the PCA and IPCA, this measure is a basis for a broad level analysis of walkability within a community. Figures 37 and 38 show the PCA and IPCA service areas for Kalamazoo.

Figure 36: Kalamazoo PCA

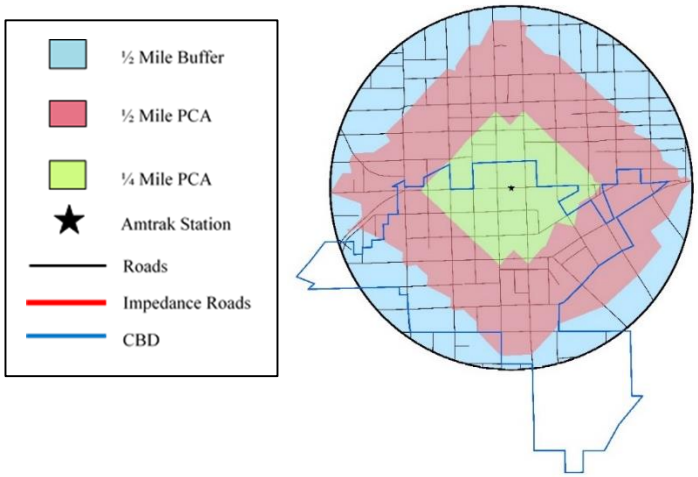
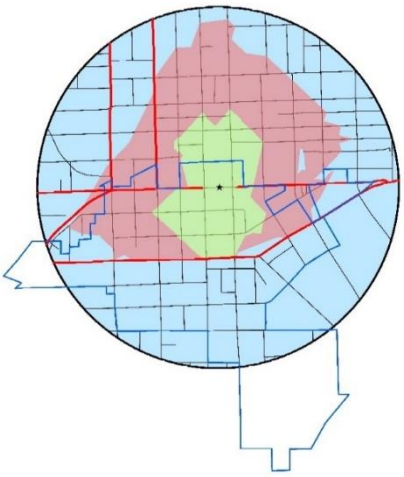


Figure 37: Kalamazoo IPCA



Kalamazoo's PCA score of 0.65 is well above the 0.30 that has been established in the literature as a minimum threshold and is the highest PCA score of the six station areas. Kalamazoo's IPCA score of 0.39 is also above the 0.30 threshold but is a substantial decrease from the PCA of 0.65. This shows the influence of impedance streets

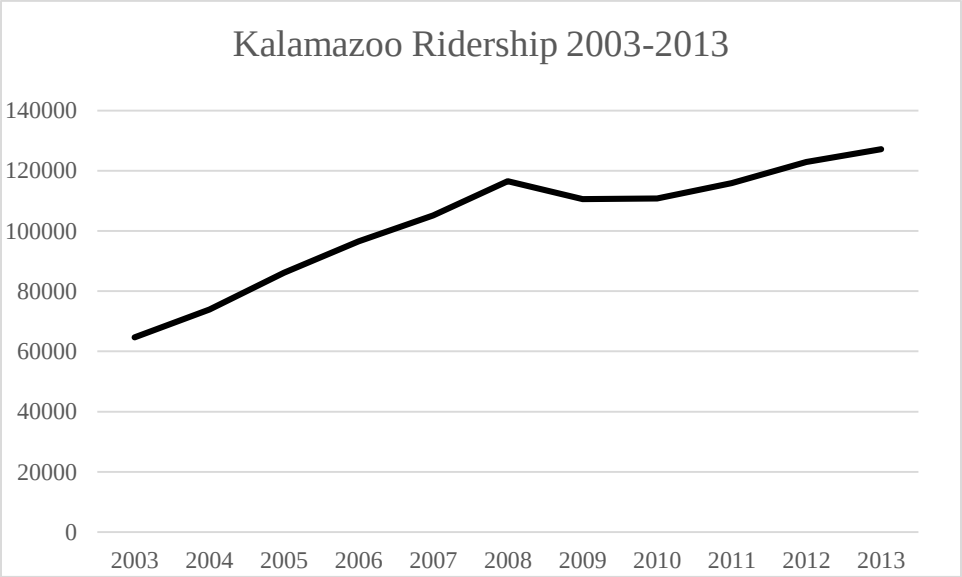
in the Kalamazoo 0.5 mile area as being somewhat influential. The main impedance street in this 0.5 mile area is M-43 which runs directly through the heart of downtown Kalamazoo and runs adjacent to the station property. M-43 is not a completely pedestrian unfriendly road as there are crosswalks at most of the intersections and sidewalks that line the roadway. However, M-43 is considered an impedance street in this analysis as it is designated as a state highway. In this area of Kalamazoo, M-43 is also considered the business loop for Interstate 94 that otherwise bypasses the city entirely.

The road network within downtown Kalamazoo as well as the 0.5 mile station area is denser and more grid-like as compared to the other locations in this study. A more grid-like road network will yield higher PCA scores as well as higher minor road densities. Based on the variables used in this analysis, the 0.5 mile area around the Kalamazoo station yields some of the most favorable conditions in terms of physical characteristics related to TOD type development. Among the five variables used in this analysis, Kalamazoo scores the most favorably in every category except major road density and IPCA.

Ridership

Amtrak ridership in Kalamazoo increased by 96.52% in the years 2003-2013 from 64,689 to 127,126. Figure 39 (shows Kalamazoo's ridership from the Chicago-Detroit, Chicago-Port Huron, and Chicago-Port Huron-Toronto corridors. As of April 2004, service to Toronto has ceased and the corridor terminates in Port Huron.

Figure 38: Kalamazoo Ridership



Planning and the Future of Rail Service

The City of Kalamazoo is viewing the development of the high-speed rail corridor as eventually being beneficial to both the city as well as the region. The interview data revealed several themes specific to Kalamazoo and how it is hoping to benefit from the high-speed rail corridor and how the service will influence activity in the Kalamazoo region. These themes include regional benefits that high-speed rail will bring, developing commuter rail into Chicago, planning for and anticipating high-speed rail, and transit-oriented development. This section will discuss these themes using extracted concepts and themes as well as interview excerpts.

Planning

Kalamazoo's current master plan was adopted in 2010 and contains some language regarding high-speed rail and its potential impact on the city. The mentions of high-speed rail in the plan are mainly acknowledging the idea that high-speed rail would ultimately benefit Kalamazoo. A specific action item in the plan broadly outlines the need to collaborate with other southwest Michigan communities as well as MDOT, and Amtrak to eventually see high-speed rail in the region realized. Jeff Chamberlain, Deputy City Manager of Kalamazoo, identifies high-speed rail as being in the most recent plan.

So there's a transportation section in that, and I believe there's some language on the HSR. So I guess it's something that we've put into our long range plans, so as an acknowledgement. I don't think we've changed any of our plans based on it per say. So yes we've got it factored in as a positive thing for Kalamazoo, but as far as any land use changes or anything along those lines, we haven't made any changes in our plans for that yet (Jeff Chamberlain, Interview, 04/21/14).

Commuter Rail

In the interview with Mr. Chamberlain, the idea of high-speed rail influencing commuter activity from Kalamazoo into Chicago was discussed. Mr. Chamberlain identified this type of activity developing as being a real possibility and that Kalamazoo along with other communities within the corridor have begun talking about it.

This may be kind of an overarching answer, but people are talking a lot in general about the potential for HSR here in Kalamazoo, you know what does that mean? Could we ever see a day where people live in the Kalamazoo region and work in Chicago

or work in Ann Arbor? It's an intriguing question now. That people are thinking well maybe it could happen. Maybe that could be a scenario where people are doing business in Chicago and there taking the train back and forth, likewise with Ann Arbor and Detroit area. So I think people are starting to see that as something that we can hopefully use for leverage for improving downtown and marketing downtown (Jeff Chamberlain, Interview, 04/21/14).

Mr. Chamberlain was more optimistic that high-speed rail would most likely influence the development of bedroom communities in areas that were already closer in to Chicago. He did not preclude Kalamazoo from that group however, and stated that the successful implementation of high-speed rail might influence the way in which Kalamazoo would look at the potential for commuter type ridership.

But if the HSR became a success, you could maybe see something like that. Hey we've got the Kalamazoo promise, free college…if HSR was successful, I could envision actually marketing campaigns that say, hey, live in Kalamazoo work in Chicago, go to college for free for your kids, enjoy the great quality of life here, but have the benefits of Chicago (Jeff Chamberlain, Interview, 04/21/14).

Regional Benefits

A major theme that emerged from the interview with Mr. Chamberlain was the regional benefits that high-speed rail may bring to Kalamazoo and the surrounding area. Mr. Chamberlain identified several regional aspects including quality of life in the Kalamazoo area that might ultimately benefit from the development of high-speed rail.

Well I think from the ridership standpoint, what we always look at is that do people have options? So if they're going to go to Chicago or Ann Arbor do people have

options? We look at it from the city's standpoint as the more options that people have the better. That way, hey maybe I don't want to take the car but I live close to Kalamazoo so I can take the train, that's a good thing. So I think what we see is for downtown and the business community and just the community as a whole, is having this as another option adds to the positive quality of life, people can take it if they want to… But we're hoping that in the long run that it's just another positive attribute to downtown that we can use to say hey we've got a great downtown and a great college and university community here, great neighborhoods, easy access to 94, easy access to the HSR. But it's all part of the big package (Jeff Chamberlain, Interview, 04/21/14).

Mr. Chamberlain also suggested that the development of high-speed rail may play an important role in the retention of major businesses in the area and that at least one local economic development group, Southwest Michigan First, has been utilizing the development of high-speed rail as an positive attribute to the region.

Their goal is to really bring in employers, and kind of the bigger companies and things like that. But they've been touting the potential for HSR as an economic development tool. So you'll see in their marketing materials and things like that of the potential for HSR as another asset for the Kalamazoo region of why companies should locate here. So we look at that as a way to benefit the Kalamazoo region especially when you've got larger employers like Stryker and Pfizer, those types of companies here that if they can have access to primarily Chicago but also Ann Arbor, then that's another good reason to help keep those big companies here in the Kalamazoo area (Jeff Chamberlain, Interview, 04/21/14).

Transit-Oriented Development

The train station in Kalamazoo is located on the north side of the downtown area and is located in a somewhat under developed portion of the downtown. Mr. Chamberlain reiterates the fact that the north side of the downtown has been looked at in the past as an area that is ideal for redevelopment and that the developing high-speed rail corridor has influenced the city to look at the area around the train station.

I think what it has done, is it's made us look at the area around the train station downtown. We've done some downtown planning work. DKI has a downtown plan and theirs is online also. So I think we see the potential for new development around there. At one point there was a plan for an arena just a couple blocks away from the train station. So I think that Northside of downtown is kind of being looked at as having development potential… there's basically 4 city blocks kind of on the northwest side of downtown. Then you've got the train station and then as you move towards the river you've got some additional vacant land and you've got some new developments. So it's seen as the HSR could be another positive influence on the redevelopment of what used to be kind of an industrial area on the Northside of our downtown area. So nothing that is happening right away, but it's kind of seen as one more positive step for that part of downtown that hopefully will over the years encourage more development to come there (Jeff Chamberlain, Interview, 04/21/14).

The regional benefits that the high-speed rail corridor might bring to Kalamazoo play a more significant role than localized or transit-oriented developments that might occur in the station area. Mr. Chamberlain does not anticipate that high-speed rail will have an immediate transformative effect on the station area or on any localized developments in the downtown area. As stated before, he suggests that the high-speed rail

will have a much larger regional effect and that any immediate benefits would most likely be seen at a regional level. This does not preclude the idea that high-speed rail will have no localized effect on the downtown area, but rather that the City is not anticipating or planning for these types of improvements.

I guess what we just don't know is if it (HSR) going to be a small benefit for a small segment of the community or is it going to have this big transformative effect. In an ideal planning world you'd think it would have this transformative effect. But we're not doing like transit-oriented planning, like you hear about in other communities like Portland or Denver other places like that, where you've got this new transit stop and then all of a sudden the real estate markets sky rocket around it…I think when we look at HSR it's more of is it going to have more of a regional benefit. And hopefully as HSR does take off it might have some more localized improvement around the train station. Now is a real estate investor going to come and build a new 8 story apartment condo complex a block away because of that? Probably not because of that. But were not honestly anticipating a huge transformative effect around the train station because of HSR (Jeff Chamberlain, Interview, 04/21/14).

DISCUSSION

This study focuses on the developing high-speed rail corridor between Chicago and Detroit and the individual cities connected by it. This research is aimed at identifying individual cities' planning responses and perceptions of the developing corridor and explaining the differences and variation among them. Through the qualitative interview process and the quantitative physical site assessment this research yielded multiple key findings within the scope of the six city study area. This chapter will provide a discussion of these key findings as well as recommendations for future research, limitations of the study, key policy recommendations, and final conclusions.

Findings

The research questions were developed in order to address the individual cities' planning and perceptions to the developing high-speed rail corridor as well as identify variation among them. Individual case studies were completed for each of the six cities in which multiple themes were discussed on an individual basis. This section will provide a more comprehensive synthesis of the six individual cities as it relates to the research questions and will outline the major findings of the research.

Michigan vs. Indiana

The study area consisted of six individual cities within the Chicago to Detroit Amtrak corridor. The cities included four two Indiana cities and four Michigan cities. A

major finding of this research is the differences in these two categories of cities regarding planning and perceptions of the developing high-speed rail corridor. A key element of this finding is the somewhat inverse relationship between distance to Chicago and active planning and anticipation regarding the developing corridor. The interview data provides substantial evidence that the Michigan communities involved in this study (New Buffalo, Niles, Dowagiac, Kalamazoo) are significantly more engaged and aware of the potential benefits that the high-speed corridor may provide. This evidence is discussed in detail in the previous chapter containing the individual case studies of the six cities. There are two reasons for this difference between Michigan and Indiana cities.

Northern Indiana Commuter Transportation District

The first reason for the difference of planning responses and perceptions between Michigan and Indiana cities connected by the Amtrak service is the presence of the Northern Indiana Commuter Transportation District (NICTD) in both Hammond, Indiana and Michigan City, Indiana. This commuter rail service also known as the South Shore Line operates between South Bend, Indiana and Millennium Station in downtown Chicago. The existence of this mode of transit into Chicago is a significant factor in terms of connectivity into Chicago that is only present in Indiana cities. This service is the primary rail service that people use to commute into and out of Chicago from Indiana. While the Amtrak service is present within both Hammond and Michigan City, the primary way for residents to travel to Chicago is the South Shore Line. The South Shore Line provides a significantly higher number of frequencies as well as a higher level of

reliability in comparison to the Amtrak service. This notion is supported by data from the interview with the Director of City Planning for Hammond, Indiana.

Because this connection to Chicago is largely important to Indiana cities and has been established for over 100 years, the Amtrak service into Chicago is less significant and plays less of a role within Hammond and Michigan City. Cities in Michigan do not currently have a commuter-type rail service into Chicago. The only connection by rail into Chicago is via the Amtrak service. Amtrak is an inter-city passenger rail service and does not operate any kind of regular commuter-type service outside of the Northeast corridor between Boston and Washington D.C. The fact that the Amtrak service is the only rail service that connects cities in Michigan to Chicago is a significant factor when comparing Michigan to Indiana cities. Consistent with the theme of developing commuter rail type trips into Chicago that emerged from the interviews with officials in Michigan cities, it is apparent that the cities within Michigan are hoping to capitalize on the potential commuter type activity that the high-speed rail service might provide. This is a theme that is specific to only the Michigan cities within the study area. The Indiana cities of Hammond and Michigan City already have a commuter rail system and infrastructure and the potential benefits of the high-speed rail corridor are less likely to come from any increases in commuter type activity from the Amtrak service. In terms of commuter-type activity, cities in Michigan have more to gain in terms of an enhanced rail connection into Chicago compared to cities in Indiana.

Michigan Department of Transportation (MDOT)

The second reason for the differences between Michigan and Indiana cities is because of the Michigan Department of Transportation (MDOT) and its role in the development of the Chicago to Detroit high-speed rail corridor. The idea of developing the Chicago to Detroit Amtrak corridor into a higher-speed passenger rail corridor has been in existence since the early 1990s. In 1997, the first positive train control (PTC) systems were installed in a segment of rail near Dowagiac, MI, funded in part by MDOT, which served to stimulate conversations about the future of high-speed rail in the region. Since that time MDOT has played a major role in the funding and development of the high-speed corridor and has been touting its benefits to the public. With regard to the development of the high-speed rail corridor MDOT is the lead state agency in a partnership that includes the Illinois Department of Transportation (IDOT), the Indiana Department of Transportation (INDOT), and the Federal Railroad Administration (FRA). Most significantly, MDOT has been involved with the increase to 110 mph within the Amtrak owned rail corridor and also with the transfer of ownership of the 135 mile segment of track between Kalamazoo and Dearborn from Norfolk Southern to MDOT. This speed increase and track acquisition signify perhaps the two most important events that have taken place within the last five years with regard to the development of the high-speed corridor.

The role that MDOT plays in the development of the corridor affects the local Michigan municipalities differently than those of Indiana. Compared to the other

organizations involved with the high-speed rail corridor development, MDOT's role is much more prominent and involved. This concept has affected the local municipalities in that they are much more aware and involved with the project. Examples include Niles' involvement with MDOT and Amtrak in the relocation of a maintenance facility in anticipation of high-speed rail and New Buffalo's TIGER Grant application to construct additional rail infrastructure in anticipation of high-speed rail. Both of these examples have been cited in the previous chapter containing the case studies of the six individual cities. The interview data also suggests that there may be a lack of involvement or interest in the development of the high-speed corridor from INDOT. This may be a significant factor in the differences in responses and perceptions between Michigan and Indiana cities.

Categories of Variation

Consistent with the theme of differences between Michigan and Indiana cities within the study area, categories of variation utilized in the analysis of the interview data reflect this same theme. The categories of variation throughout the six city study area are Anticipatory of High-Speed Rail, Uncertain of the role of High-Speed Rail within the City, and Indifferent/Unresponsive. With the exception of Dowagiac which is unable to be categorized because of the lack of interview data, all three of the Michigan cities fall under the Anticipatory of High-Speed Rail category. Michigan City falls under the Uncertain of the role of High-Speed Rail within the City category and Hammond falls under the Indifferent/Unresponsive category. This placement of cities within these

categories reflects the other major findings regarding differences between Michigan and Indiana cities. The categories of variation somewhat define the importance of the development of the high-speed rail corridor to the individual cities with the 'Anticipatory' category reflecting a higher importance and the 'Indifferent/Unresponsive' category reflecting a lower importance. As only the Michigan cities fall under the 'Anticipatory' category, this may reinforce the idea of differences between Michigan and Indiana cities.

Limitations and Recommendations for Future Research

This research contains limitations that will be addressed in this section. These limitations refer to the scope of the study area, the sample size of interviewees, and the measures of the physical environment assessment.

Scope of the Study Area

The Chicago to Detroit Amtrak corridor consists of 16 stops including both Chicago and Detroit. This research focused only on the six intermediate stops on the western half of the corridor between Chicago and Kalamazoo (Hammond, Michigan City, New Buffalo, Niles, Dowagiac, Kalamazoo). Future research may seek to ask the research questions to the additional ten cities and communities within the corridor including Chicago and Detroit. While the higher speed trains currently only operate within the Chicago to Kalamazoo segment of the corridor, future developments and speed increases are in the near future for the entire corridor. Future research that addresses the remaining ten cities and communities may create a better understanding of the dynamics

of the corridor and the cities connected by the Amtrak service. Future research of the remainder of the corridor may also reveal additional comparisons between the Michigan and Indiana cities as well as more focused assessment of strictly Michigan cities.

Sample Size

The targeted interviewees for this research consisted of members of planning departments, economic development departments, city manager departments, and community development departments. Future research may seek to expand this targeted sample to include real estate developers, local business owners, and residents of the city. Including these groups in potential future research may create a more comprehensive view of the potential impact of high-speed rail within the city. These groups may also contribute knowledge or opinions that may not have been possible to acquire by only interviewing members of municipal departments of government.

Measures of the Physical Environment Assessment

The measures used in this research to assess the physical environment in regard to potential transit-oriented development included Pedestrian Catchment Area (PCA) and Impeded Pedestrian Catchment Area (IPCA), minor and major road density, population density, and block length. All of these variables combined provide a generalized assessment of the physical environment and its transit-oriented development potential. Future research may seek to include additional measures such as land-use composition, effective walking area (EWA), floor-area ratio (FAR), and sidewalk network. If

combined with the measures included in this research, it may serve as a more refined assessment of the area surrounding the train stations as it relates to transit-oriented development and walkability.

In spite of these limitations, there are several opportunities for these cities to capitalize on the development of the corridor to more reliable service and increased speeds. The next section details these recommendations and the various ways in which these six cities can position themselves to benefit in the future.

Key Policy Recommendations

With the recent release of the Tier 1 Draft Environmental Impact Statement for the Chicago-Detroit/Pontiac High-Speed Rail Corridor Program, the development of the Amtrak corridor to higher speeds is steadily taking shape. As pointed out in the key findings section of this chapter, certain cities within the corridor are in a better position to take advantage of the recent developments and plans for the future of the corridor. Cities like New Buffalo and Niles are in a position to capitalize on the possible increase in commuter type rail travel into Chicago with the development of higher speeds within the corridor. Unlike Hammond and Michigan City, who already have a commuter rail connection into Chicago via the South Shore Line, New Buffalo and Niles should continue to plan for the future implementation of an Amtrak schedule that would support commuting into and out of Chicago. Indeed, there is evidence from the interview data that this type of activity is already occurring. In New Buffalo, recent residential development have been established near the downtown area and Amtrak station strictly

for this purpose. The land area around the Niles Amtrak station is being looked at for redevelopment once the Amtrak maintenance facility is able to be moved. Niles should implement TOD best practices in the development of this area to support the possibility and high likelihood that an increase in commuter type trips into Chicago will occur.

Three out of the six study area cities have their Amtrak stations located in the downtown area. These cities are New Buffalo, Dowagiac, and Kalamazoo. These cities should view the development of the Amtrak corridor as an opportunity for TOD development in the station areas. Current plans laid out in the preliminary Tier 1 EIS for the corridor aim for the implementation of ten daily round trip frequencies by the year 2035, more than triple the current round trip frequencies. The development of the corridor to ten daily round trip frequencies will undoubtedly change the dynamics of rail travel within the corridor. Frequent and convenient access to both Chicago and Detroit that competes on a financial and time savings level with that of the automobile has the potential to dramatically change the way intermediate size cities utilize Amtrak. Cities along the corridor should begin to plan for such changes in the development of their downtown areas especially near the train stations. Mixed-use developments should be planned for in station areas along with TOD best practices such as the elimination or reduction of parking requirements for new residential buildings in the downtown area. Cities such as New Buffalo and Niles should plan to promote and advertise their cities to Chicago residents who may prefer the one hour trip by rail from Michigan rather than a one and a half hour commute via automobile from a far western suburb of Chicago.

In terms of transit-oriented development in each of the cities, certain locations are currently in a better position to take advantage of the future implementation of ten round trip frequencies. Transit-oriented development is not something that is frequently discussed when talking about an Amtrak corridor with very few daily frequencies. This dynamic is certain to change however with the continuing development of the corridor and the future forecasts of ten daily round trip frequencies. This substantial increase in frequencies will have a significant impact on the development of station areas. Cities like New Buffalo, Dowagiac, and Kalamazoo are in the best position to take advantage of transit-oriented development regarding the Amtrak service as their stations are located in their downtown areas. These cities should continue to plan for high density, mixed use, walkable, and pedestrian friendly developments in these station areas. The potential increase in commuter activity into Chicago and the significant increase in frequencies can only enhance these cities opportunities to capitalize on the high-speed corridor.

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APPENDIX A

Interview Questions

1. Does your city's long range planning include plans based on forecasts of improved rail service?

2. Has the potential for faster and more frequent trains in the future stimulated any plans, policies, or programs in your city?

3. Have recent developments within the corridor influenced any planning, policies, or programs in your city? Why/not?

4. Does the speed increase to 110 mph stimulate any additional planning dialogue related to potential benefits of higher speed rail in your city? Why/not?

5. Does the overall increase in ridership within the corridor directly affect your city in any way?

6. Is your city likely to benefit in any way from faster trains and more frequent service? In what ways?

7. Are there other communities along the corridor that are more likely to benefit from faster trains and more frequent service? Which ones?

8. In your city, what existing factors will make higher speed rail either beneficial or non-beneficial? Existing land use? Population size? Distance from Chicago?

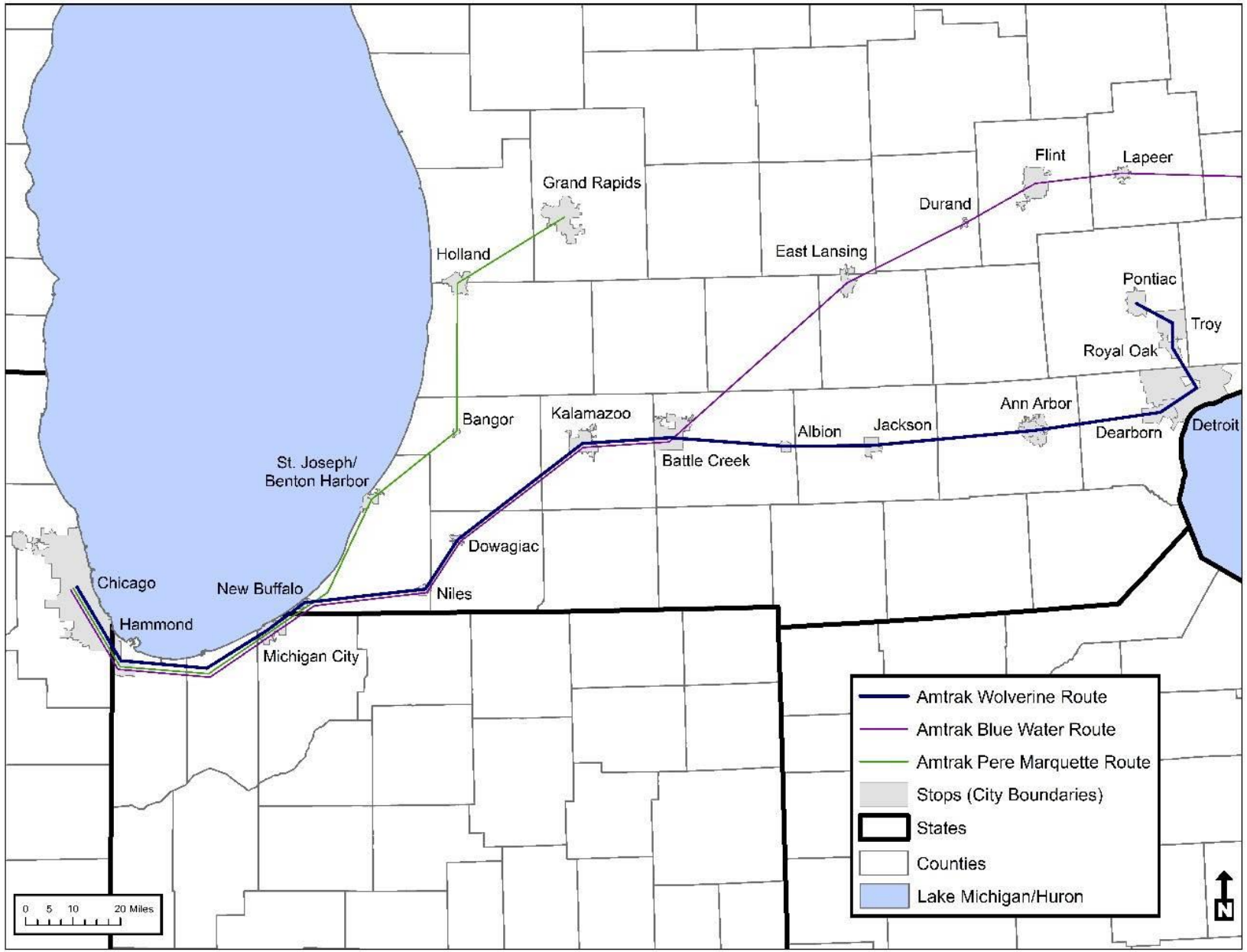
9. To what extent have the plans to implement 110 mph service in the segment between Kalamazoo and Dearborn added to any discussions related to potential future benefits of higher speed rail in your city?

10. What plans or policies could be implemented by other organizations such as INDOT, MDOT, IDOT or Amtrak that would significantly impact your city's future planning regarding rail service?

11. To what extent does your city coordinate with other planning institutions in terms of rail service/planning? DOT? County? MPO?

APPENDIX B

Map of Chicago-Detroit Corridor



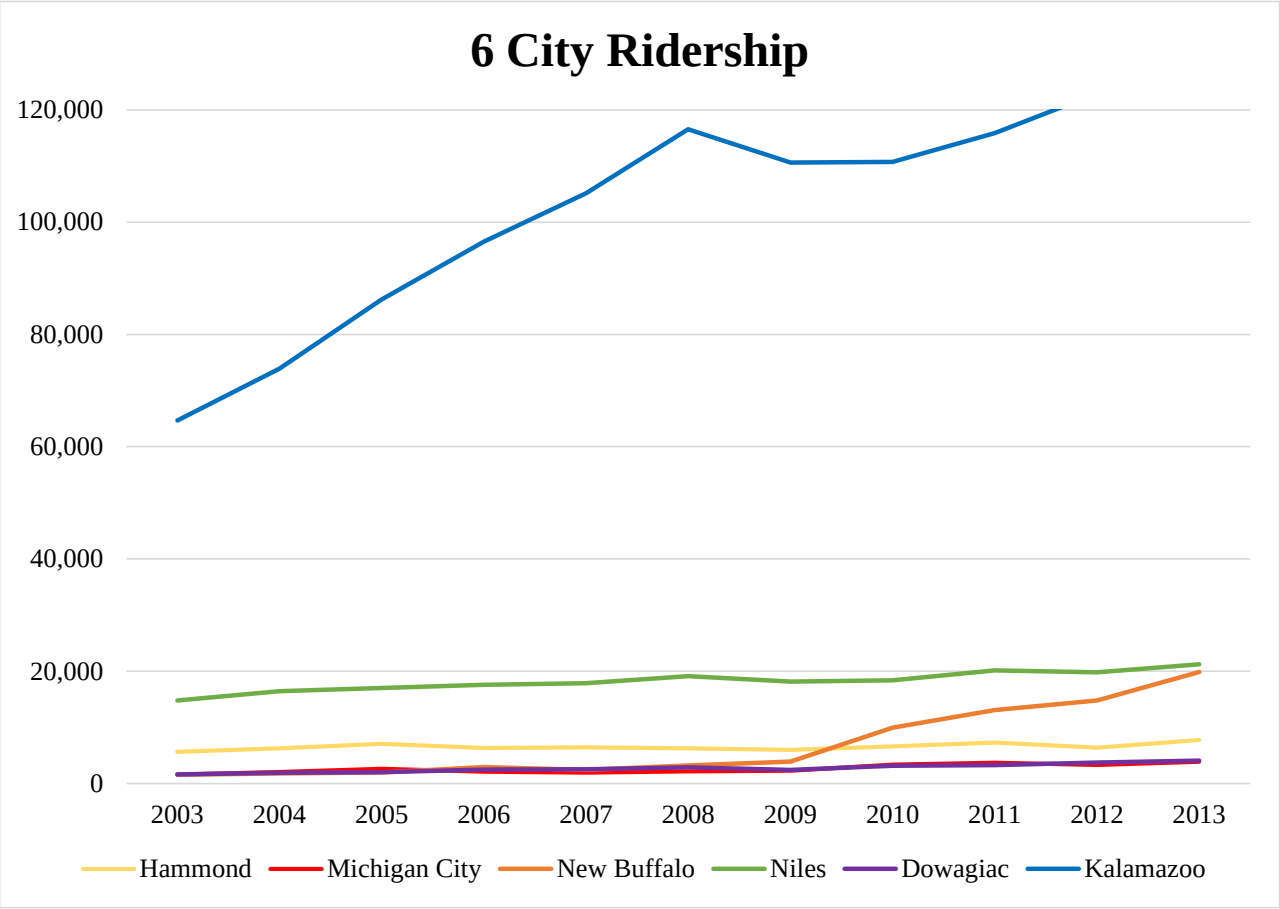
APPENDIX C

Demographics of the 6 City Study Area

	Hammond, IN	Michigan City, IN	New Buffalo, MI	Niles, MI	Dowagiac, MI	Kalamazoo, MI
Population (2000)	83,048	32,900	2,200	12,204	6,147	77,145
Population (2010)	80,830	31,479	1,883	11,600	5,879	74,262
% Change	-2.7	-4.3		-4.9	-4.4	-3.7
Housing Units (2000)	34,139	14,221	1,426	5,531	2,631	31,798
Housing Units (2010)	32,945	14,435	1,692	5,428	2,674	32,433
% Change	-3.5	1.5	18.7	-1.9	1.6	2.0
Median Income (2000)	35,528	33,732	41,658	31,208	29,926	31,189
Median Income (2010)	38,539	35,433	39,976	31,757	32,020	29,919
% Change	8.5	5.0	-4.0	1.8	7.0	-4.1
Population Density (2000) (people/sq. mile)	3,626.6	1,678.6	916.7	2,104.1	1,536.8	3,123.3
Population Density (2010) (people/sq. mile)	3,545.2	1,606.1	753.2	2000	1,306.4	3,006.6
% Change	-2.2	-4.3	-17.8	-4.9	-15.0	-3.7
Wolverine Ridership (2010)	3,058	1,348	1,517	5,640	582	44,392

APPENDIX D

Ridership for 6 City Study Area



APPENDIX E

Physical Environment Assessment Results

	Minor Roads (Miles)	Major Roads (Miles)	Minor-Major Road Ratio	Minor Road Density (street miles per area)	Pedestrian Catchment Area Score (PCA)	Impeded Pedestrian Catchment Area Score (IPCA)	Average Block Length (feet)	Difference in PCA to IPCA Change
Hammond, IN	7.16	1.25	5.73	9.12	0.29	0.23	329	0.06
Michigan City, IN	8.05	1.2	6.71	10.25	0.47	0.25	327	0.22
New Buffalo, MI	10.66	0.9	11.8	13.57	0.55	0.43	349	0.12
Niles, MI	13.94	1.03	13.53	17.75	0.48	0.12	347	0.36
Dowagiac, MI	14.79	1.18	12.53	18.83	0.57	0.34	320	0.23
Kalamazoo, MI	16.7	3.12	5.35	21.26	0.65	0.39	329	0.26

APPENDIX F

Human Subjects Institutional Review Board (HSIRB) Approval Letter

Date: March 28, 2013

To: D. Scott Smith, Principal Investigator
John-Like D'Ambrosio, Student Investigator for thesis

From: Amy Naugle, Ph.D., Chair

Re: Approval not needed for HSIRB Project Number 13-03-25

This letter will serve as confirmation that your project "Local Planning Perceptions on Amtrak's Recent Speed Increases" has been reviewed by the Human Subjects Institutional Review Board (HSIRB). Based on that review, the HSIRB has determined that approval is not required for you to conduct this project because you are analyzing urban planning practices and not collecting personal identifiable (private) information about individuals.

Thank you for your concerns about protecting the rights and welfare of human subjects.

A copy of your protocol and a copy of this letter will be maintained in the HSIRB files.