

Multi-Modal Transportation Systems Plan Final Report (Task 4.3)



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1.0 Introduction

The preferred multi-modal transportation system plan expands the scope of the project's technical transportation documents to include all modes of transportation. To date, the focus of the transportation reports has been primarily on personal automobile movement and the road system. This makes sense considering it addresses the large majority of trips in the region. However, the goals of the Grand Vision reach far beyond this specific focus. Multi-modal transportation planning begins by including all of the transportation planning done to date and expands on it with the addition of pedestrian and bicycle facilities, transit service and freight transportation. It expands the focus of transportation beyond traffic and vehicle mobility to consider the larger issues of access and designing for all users and related issues such as safety, economic prosperity and quality of life issues.

Planning for roads, transit, pathways and sidewalks, and freight movement is well done by dedicated professionals and volunteers alike. Freight traffic, personal automobiles and pedestrians all use the same urban street system. Each has a unique set of needs and goals as well as separate funding sources and advocates. Multi-modal transportation planning integrates the transportation systems into a collective whole and considers the needs of all users. It is a balancing act and involves compromises between competing interests. Multi-modal transportation planning provides an opportunity to strengthen the region's economy; to maximize the return on investment from limited transportation funding; to preserve capacity on the existing road system; to provide mobility and accessibility choices to all residents in the region; and improve the quality of life in the region.

The economic strength of the region is built on its transportation network. The combination of air cargo, rail and semi-truck services provides a range of opportunities to bring raw materials, supplies and goods into the region and to export goods and products out of the region to markets throughout the state, the nation and the world. This system supports the full gamut of economic activities from manufacturing and agriculture to healthcare and professional offices to hotels and retail stores. The transportation system also moves people from home to work in cars and buses. An efficient transportation system supports a reliable regional workforce. Diversity in the transportation system offers mode choices to support a range of abilities, income levels and lifestyle preferences.

A majority of personal trips in the region are made using personal automobiles. Semi-trucks and smaller delivery trucks use the roads to reach destinations in the region. Buses use the road system to provide transit service. Each road lane has a limited carrying capacity and congestion on the road is directly, although not exclusively, related to the number of vehicles it serves. Road capacity is increased by adding lanes but road capacity is preserved by making more efficient use of the existing road system. It is not always possible to expand the capacity of the road system due to limitations imposed by environmental constraints, the built environment, available funding resources or a combination of all three. It is not always desirable to expand the capacity in core urban areas where the need for vehicle mobility is tempered by competing interests such as creating a safe and active pedestrian environment. Multi-modal transportation plans use tools to preserve road capacity in areas where it is not possible or desirable to expand capacity.

This report uses the technical data developed in the previous tasks and expands the discussion to include multi-modal elements of the transportation system. In addition to the introduction, the report is organized into two different sections. First, there is a discussion section presented in a narrative format and organized by topic. Then, there is an illustrative section presented in a graphic format to demonstrating the application of those ideas. The information is written so that it is valuable to residents throughout the six-county region.

In the discussion section, a one or two page narrative overview is provided on each topic listed in the Grand Vision's scope of services. The description is written so that it is valuable to community members interested in multi-modal transportation but who are not necessarily transportation engineers or professional planners. In most cases, the information presented is an overview and an introduction to the subject. For those interested in more information, the text usually contains references to websites, organizations, local and state offices, and publications.

The illustrative section of the report contains examples are of how multi-modal elements can be applied along the corridors of significance. These examples are provided for the sole purpose of demonstrating multi-modal concepts through the use of visual tools. They are provided to enhance the narrative text section. **These are not intended as action items and should not be interpreted as recommendations for implementation.**

In the illustrative section, one section or location was selected along each corridor. The cover sheet provides a graphic guide to the corridors and identifies the focus area location along each corridor. Each focus area is based on an aerial map and includes possible design modifications and explanatory text. Focus areas were selected to demonstrate different concepts including sidewalk gaps, school sites, pathways, and safety improvements. Although the text block addresses a single topic, multiple concepts are identified on most maps.

In some instances, the issue of environmental constraints impacts specific multi-modal systems planning initiatives. The addition of pathways and the limitation of development sites adjacent to the roadway are two examples that are identified in the illustrative section of this document. In the illustrative examples, environmental impact considerations are identified when they are present. In many case, however, multi-modal transportation planning is done within the limits of the built environment and has no notable environmental impact. When there are no concerns or impacts related to environmental constraints, there is no additional data or commentary provided.

2.0 Multi-modal transportation topics

2.1 Safety

The question of safety in a multi-modal transportation plan centers on providing an environment for people of all abilities to move through the system without conflicts. When the topic of safety is addressed in a transportation document, it often begins and ends with a discussion of the crashes. Certainly, it is an essential consideration for safety. The safety goal of a multi-modal transportation plan will always be to eliminate or reduce the number and severity of crashes for all travel modes.

Any area with a history of conflicts involving pedestrians or bicyclists should receive special consideration for corrective action. In these areas, the cause of the conflict needs to be identified. Corrective actions can then be selected that respond to the cause. Even when there is not a crash, there are areas of potential conflict any time the travel paths for vehicular traffic and non-motorized traffic cross paths. Intersections and other street crossings are primary examples.

Safety design features including crosswalks, curb radius reduction, signal and signs can all improve pedestrian and bicycle safety at street crossings. There is extensive literature available on design for pedestrian safety. One resource is the Federal Highway Administration (FHWA) which offers a resource on safety at <http://safety.fhwa.dot.gov>. Another resource is The *Michigan Pedestrian and Bicycle Safety Action Plan* which was developed by the Governor's Traffic Safety Advisory Commission in January 2009. It is a policy document that calls for the development of several toolbox resources.

Safety can be improved by designing roads for slower travel speeds. Slower travel speeds reduce the likelihood of a crash and reduce the severity in the event of a crash. Design features such as narrow travel lanes, on-street parking and street trees result in reduced travel speeds. Travel speeds and speed limits may not be the same but law enforcement can be another tool to reduce speeds.

Education and training can be another tool to improve safety. Organizations in a position to reach out to drivers, pedestrians and bicyclists can offer publications, seminars, and web resources. *Safety Town* is one example of a program designed to teach pre-school and elementary aged children about road safety. Public awareness campaigns might originate with community leaders, school districts, or public safety officials. Communication tools along the travel route including traffic signs, billboard messaging, or changeable message boards are other tools.

Whether it's a corridor, a block or an intersection, safety issues blend into every other part of a multi-modal transportation system.

2.2 System demand

System demand within a multi-modal system plan can identify future demand on the transportation system through the use of the travel demand model. It can also be an action to increase efficiency in the transportation system. For the purpose of this section, the focus will be on the latter. In this case, system

demand is also termed Mobility Management. The emphasis of Mobility Management is moving people and goods rather than on personal motor vehicle trips. It is inclusive of a wide range of transportation modes including walking, bicycling, carpool and public transit.

A system demand approach to transportation planning looks for opportunities to address system deficiencies with an extensive toolbox. One goal is to address congestion within the transportation system. The toolbox includes additional road lanes and increased parking capacity but extends beyond these traditional approaches to preserving available road capacity. This system demand approach can be applied within the existing system and also when making decisions about investments in the transportation system.

For the existing system, the goal is to efficiently manage the demand for travel within the existing physical infrastructure of the transportation system. This may mean shifting from one mode to another, one route to another or one time to another. Tools to encourage these shifts can either encourage preferred behavior or penalize travel on peak routes at peak times. Municipalities, employers and non-profit organizations can all initiate these programs. Toolbox examples are available from a variety of resources including the Federal Highways Administration (<http://www.fhwa.dot.gov>) and the Victoria Transport Policy Institute (<http://www.vtpi.org>).

When additional capacity is needed, the goal is to identify investments in the transportation system that will bring about a cost effective solution to reducing transportation congestion. The solutions include transit improvements, investment in pedestrian infrastructure and rideshare programs. Solutions also include investments in Intelligent Transportation System (ITS) equipment such as changeable message signs. The idea behind this approach is that if a strategy can reduce traffic demand by 10%, it is considered equally with an infrastructure project that would provide a 10% increase in road capacity. This approach is especially valuable in areas where it is not possible or desirable to add physical capacity to the road. Another related term is “least cost planning” or “integrated planning.”

The transportation system is about the mobility of people and goods around the region. Efficiency and safety are primary considerations. But the transportation system has many ripple effects in the community. There are environmental impacts of the transportation system as personal vehicles are powered by fossil fuels and cause carbon emissions. The transportation system is also associated with a sedentary lifestyle that impacts public health. The transportation system provides an opportunity for social equality when it offers access to those who drive. It also contributes to livable communities by creating places people like to be and lifestyle choices. System demand management may be used to address this range of other transportation related goals as well.

2.3 Mobility and accessibility

While they are related, the terms mobility and accessibility are not interchangeable. They are not the same thing. Mobility is physical movement or physical travel or the movement of people or goods. It can be defined narrowly as vehicular movement or more broadly to include walking, cycling, public transit, ridesharing, taxis, automobiles, trucks and other travel modes. The narrowest definition of vehicular

movement is also termed “traffic.” Accessibility is the measure of the cost or effort required to reach a destination, a service or an activity.

These terms are important in the development of transportation policy. From the perspective of “Mobility”, the aim of transportation policy is the efficient movement of goods and services. It is inclusive of a range of transportation modes but values the speed and efficiency of travel. Mobility is improved when trip times are decreased. Traditional transportation planning focuses primarily on vehicular mobility. Mobility is one part of accessibility but mobility is really a means and an end. Accessibility is the ability to reach or access services or opportunities rather than the movement itself. Accessibility places a value on transportation modes according to their ability to meet users' needs including cost, fitness, and energy conservation as well as trip time. There are ways to increase accessibility other than making trips easier and faster.

Another part of accessibility is the availability of mobility substitutes. This includes opportunities to reach a desired good or service without making a trip. Examples include first, telecommuting rather than traveling to an office, or second mail ordering of products or downloading electronic products instead of traveling to a store. A third factor in accessibility is land use patterns or the geographic distribution of services and activities. Denser land use patterns create shorter trips which increase access. A fourth factor in accessibility is transportation system connectivity, which is a measure of the directness of links and the density of connections in path or road network.

In rural settings where trips are longer and transportation options are limited to vehicular travel, accessibility will correlate closely with vehicular mobility. In areas such as urban centers where trips are shorter and mode choices are available, accessibility may increase as mobility decreases.

These terms are important in the discussion of transportation policy. Communities and transportation agencies should take time to understand these terms as part of the policy discussion as it will impact the program goals. Accessibility does not necessarily favor longer trips or faster modes if shorter trips and slower modes provide adequate access. It supports the broadest use of transport funding, including mobility management and land use management strategies, should they increase accessibility.

2.4 Emergency services and parking

Multi-modal transportation planning seeks to provide mobility for all users. Emergency service vehicles including fire trucks are part of the user group of public roads. Discussions of specific corridor designs should include meaningful input and direction from emergency service providers to address their specific needs and concerns.

Corridor planning for multi-modal transportation has been termed “complete streets.” The website for the National Complete Streets Coalition (www.completestreets.org) includes question and answer text to address the topic of compatibility between complete streets design and emergency services vehicles. The answer points out several areas where streets designed for multi-modal transportation and emergency vehicles complement each other.

More specifically, the land use patterns and connected street patterns associated with improved accessibility both benefit emergency service providers. Studies have shown that higher densities and compact land use patterns result in shorter trips and shorter response times (see below). Additionally, the connected grid street patterns provide more route choices for emergency vehicles. If one street is not accessible, there are other options just a short block away. Also, the lower travel speeds along the corridor can result in fewer accidents for EMS vehicles, which studies have indicated occur at high rates at signalized intersections.¹

There are two specific examples of a collaborative process between planning and emergency service providers. In Fresno, California, narrower streets were proposed to enhance “walkability.” Planners researched the topic and then performed field simulations to demonstrate how the two could work well together. Also, a recent study from the *American Journal of Preventive Medicine* explored how the longer trip lengths associated with suburban development increased EMS response time and delayed ambulance arrival.²

The Congress for the New Urbanism (CNU) has been active in this discussion at the national level. Working with the Environmental Protection Agency’s Smart Growth program and fire marshals from across the United States, CNU created the *Emergency Response and Street Design Initiative*. The goal of the initiative is to pursue common ground and strategize how narrower, more walkable streets can serve – and even improve access for – emergency vehicles. More resources can be found on the Initiative’s website ([Emergency Response and Street Design Initiative](#)). CNU and the Institute of Transportation Engineers (ITE) have worked together to develop a new set of recommended practices for the design of urban streets. The guidebook, *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities*, is available for purchase or free download at www.cnu.org/streets or at www.ite.org.

Vehicle trips begin and end in a parking space. Parking is provided for residential, business, institutional, and recreational uses. It may be provided in connection with a specific use or as part of a public parking system. The discussion about parking was brought to the national planning spotlight most recently with the publication of “*The High Cost of Free Parking*” by Donald Shoup in 2005.³ This work challenges parking practices that have been in place since the 1950s including quantity and pricing. Intermodal transportation systems consider parking in terms of corridor design, quantity, cost and connection to land use patterns and associated destination points.

¹ *An Analysis of Emergency Vehicle Crash Characteristics*. Amalia Vrachnou. Thesis submitted to the Faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of Master of Science in Civil Engineering. Falls Church, Virginia. August 7, 2003.

² “Urban Sprawl and Delayed Ambulance Arrival in the U.S.” *American Journal of Preventative Medicine*. Trowbridge, Matthew J. Gurka, Matthew J. and O’Connor, Robert E. Volume 37, Issue 5, Pages 428-432, November 2009 ([http://www.ajpm-online.net/article/S0749-3797\(09\)00489-9/abstract](http://www.ajpm-online.net/article/S0749-3797(09)00489-9/abstract)).

³ Donald Shoup (2005), *The High Cost of Free Parking*, Planners Press (www.planning.org)

Design: Parking spaces can be provided as on-street parking within public road rights-of-way. These spaces may be provided parallel to the curb or at an angle. Spaces provided outside of the public rights-of-way are termed “off-street parking.” These spaces can be provided by public agencies or private entities. Access can be provided without restriction or can be limited to those with permission or those willing to pay a required fee.

Parking spaces can be provided in surface parking lots directly at ground level or can be designed in a ramp or structured parking where spaces are provided in tiered stories above ground or even below ground. Parking ramps can be exclusively dedicated to parking uses or can be part of a mixed-use structure.

In addition to providing parking spaces, on-street parking is a design tool for multi-modal streets. The parking area creates a buffer between pedestrians and vehicles. It also slows or calms traffic by narrowing the real or perceived width of the travel lane and by slowing traffic as drivers prepare to park. On-street parking increases accessibility but is at odds with transportation goals of vehicular mobility. It provides parking in a central business district and provides pedestrian access to resources located there. Because it provides parking for the district as a whole, it reduces the need for surface parking spaces on individual sites. A related benefit is the increase in area available for development.

Quantity: Local zoning regulations usually establish a minimum number of parking spaces for every use. This practice has been challenged recently based on Shoup’s work and others. Critics contend that minimum parking requirements are too high and result in an oversupply of asphalt, inflated development costs, sprawling land use patterns, and environmental degradation. As a result, some ordinances have reevaluated minimum numbers, provided for more shared parking or reduced parking opportunities or shifted to maximum parking numbers. Commercial lending institutions and national chain stores also have minimum parking requirements which also drive parking quantities.

The availability of parking is part of the supply and demand equation of the transportation system. If abundant, free parking is available at a destination, travelers are not discouraged from driving personal vehicles. Conversely, if the parking supply is limited or if there is a cost for parking, travelers may be discouraged from driving personal vehicles.

Cost: There have been a variety of studies that have addressed the question of how much cost is associated with parking. In spite of the resulting range of numbers, it is clear that surface parking is the least expensive, and that parking garages cost significantly more with below grade parking being the most expensive option. In 2006, one source at Northwestern University stated that “It costs an average of \$4,000 per space to build surface parking lots, \$20,000 per space for above-grade garages and \$30,000 to \$40,000 for below-grade garages.”⁴ The Victoria Transportation Policy Institute calculated a national average cost of \$15,552 per parking space in a parking structure.⁵ The cost of land is part of the

⁴ <http://www.northwestern.edu/newscenter/stories/2006/01/parking.html>

⁵ *Transportation Cost and Benefit Analysis II – Parking Costs*, Victoria Transport Policy Institute, 5 April 2010 (<http://www.vtpi.org/tca/tca0504.pdf>)

equation which can create a vast difference in the equations. In his book, *The High Cost of Free Parking*, Shoup comments that the money spent to build parking spaces in the U.S. is more than the value of all of the cars using those spaces and may even be more than the value of the roads. It is just this type of observation that has shaken the planning community into rethinking development requirements and investment priorities.

Location: Parking in suburban locations or serving strip developments is provided independently for each storefront. These auto-oriented development styles mean that a separate vehicle trip is required to reach each destination. This is largely a function of land use patterns which are primarily market driven by development costs and available services. It may result in part from land use requirements for minimum lot frontage, minimum number of parking spaces, and prohibition of mixed-uses.

Parking in urban centers is more likely to promote parking once and walking to several destinations. Mobility is limited by traffic congestion and the use of community parking spaces that are not associated with single destinations. However, accessibility is higher as many destinations are located within walking distance.

Parking can also be provided in conjunction with a transit station or a transit stop. A park-and-ride facility is designed for mobility but has little or no development in a walkable area. Transit Oriented Design (TOD) provides parking as part of a larger urban development node. These areas are more accessible but mobility is limited in a pattern similar to a downtown or main street area. The quantity of available parking and the associated fee structure will balance the demand for park-and-ride mobility with the opportunity for accessible village development around transit.

2.5 Employment and shopping

Planning for multi-modal systems is in part a function of developing transportation infrastructure for all users. Another part of developing a vibrant, multi-modal transportation system is creating a complementary land use pattern. The location of employment and shopping destinations has an impact on the multi-modal transportation system. This text will address land use patterns for employment and shopping that will support pedestrian, bicycle and transit travel. The issues are related but not identical to the motorized and non-motorized travel.

Pedestrians, bicyclists and transit riders need routes that are safe, comfortable and interesting. Safety and comfort are provided through dedicated route infrastructure (sidewalks, pathways, bike lanes) and supporting elements for transit stops such as benches and shelters. Interest is provided by the land use patterns and feature that complement the trip for people outside of vehicles. Pedestrian scale architectural design, retail window displays, front building line locations, landscaping, public art and plaza areas are all contributing elements. Shopping and employment locations need to be located in these environments to be accessed by pedestrians, bicyclists and transit riders.

Pedestrians and bicyclists will also choose trips that are reasonable in length. The term “pedestrian shed” is used by planners to mean the geographic area that can be reached by pedestrians with a short

walk. The actual trip length definition can vary from five to fifteen minutes. The physical ability of individuals varies as will the distance covered in a fifteen minute walk. Bicyclists can cover more distance during the same time but the trip length measurement for the majority of cyclists is probably still applicable. As a result, non-motorized trips will be supported by land use patterns that create short trip lengths. This is done by locating origin and destination points—housing, shopping, services and employment—in proximity to each other. Mixed use developments, mixed-use urban districts, and smaller minimum lot sizes can all aid in the creation of shorter trips. Traditional land use regulations may prevent this from happening through segregated use districts and large minimum lot width and area requirements.

Shorter trips will also be appealing to transit riders. This means locating those same origin and destination points—housing, services, shopping and employment—around transit stops or in clusters that can be served by transit. The creation of regional transit connectors between villages and between villages and city centers will also be supported by this land use pattern.

In urban centers with lots of shopping and employment destinations, vehicular traffic can be congested. Also, parking locations are likely to be centralized rather than associated with a single use. This combination can encourage travelers to make trips using transit, bicycles or walking.

2.6 Recreation

Recreation is central to the lifestyle and the economy of the Grand Traverse Region. The region enjoys a wealth of natural resources and recreation facilities ranging from national lakeshore to local parks. Recreation supports the regional quality of life and the region's economy. This section provides information about the role of recreation in the region. When planning a multi-modal transportation network, consideration should be given to providing access to these recreational resources. This includes transit service and non-motorized connections. More information about organizations providing transit services, transportation agencies and trail networks is available in the section titled "Non-motorized Transportation."

During the Grand Vision, community values were explored and identified in the Values Report created by Harris Interactive dated November 2008. When describing the value of recreation, the report described survey results this way: *Residents value natural beauty, outdoor recreational opportunities, the clean lakes and rivers and open space that lets them lead a healthier, outdoors lifestyle. As a result they can feel more relaxed and enjoy a greater peace of mind and personal happiness.* This was shared by 30% of residents in the region which was the highest category. Clearly, it is important that residents in the region have access to recreation facilities.

Recreation is also a major contributor to the regional economy. Tourists visit the region to enjoy the natural resources and enjoy the scenic beauty. Michigan State University's Department of Community, Agriculture, Recreation and Resources Studies (CARRS) estimates the economic impact of recreation on counties within the state. In the year 2000, Grand Traverse County ranked seventh of all Michigan

counties with an estimated annual tourism spending of \$234 million.⁶ Other counties in the Grand Vision study area had the following estimated rank and dollar values associated with tourism spending in millions: Antrim County (31st) \$67.8; Leelanau County (34th) \$63.7; Benzie (40th) \$58.8; Wexford County (42nd) \$50.1; Kalkaska (67th) \$28.6.⁷ From this perspective, access to recreation should also be provided for visitors.

Throughout the region, there are public and private recreation resources. The regional planning office at the NWMCOG, county planning offices, local planning offices, and Chamber of Commerce offices all have inventories of existing recreational facilities. Transportation and recreation planning should include consideration of access to these facilities both for residents and visitors.

2.7 Education

Educational institutions are densely populated developments during class hours with many of the student body unable to drive. Safety for the student population is a primary concern. For both of these reasons, multi-modal transportation planning needs to pay special attention to school buildings and campus locations in the planning area.

Safe Routes to School (SR2S) is an international movement—and now a federal program— whose particular purpose is to make it safe, convenient and fun for children to bicycle and walk to school. Extensive information is available at the organization's website: www.saferoutesmichigan.org. Some highlights are included here for informational purposes.

A free toolkit is available for download at the SR2S website. It is also available to schools in printed form on request. The toolkit provides resources and step-by-step instructions for the SR2S program. There are many modules to build momentum for the project including building community support and polling children and parents about how kids get to school. For many schools, the Walk to School Day event in October is part of the program. After the first few steps, there is a walking audit where volunteers get outside and look around at conditions for walking and biking. Checklists help evaluate a series of conditions for safety and accessibility both on the school property and on nearby routes to school. The program results in an action plan for improvements and grant funding is available for implementation.

The program in Michigan began in 2003 as a tool to help stem the escalating rate of obesity and health problems related to a lack of physical activity in Michigan's school-age children. The chance to walk and bicycle to school provides children with an opportunity for regular exercise. In addition to health benefits, research has connected physical activity with readiness to learn in the classroom. Safety is a part of the SR2S program as well. It includes instruction for children on how to be safe when walking and biking.

Michigan Trails and Greenways Alliance (www.michigantrails.org) and Michigan State University teamed up last year to map the trails and their proximity to Michigan's elementary and middle schools. If a trail is

⁶ <http://web4.canr.msu.edu/mgm2/econ/Mlindex.htm>

⁷ <http://web4.canr.msu.edu/mgm2/econ/Mlindex.htm>

aligned between the school and the neighborhood where a student lives, a trail may only need a short connector in order to become a prime “safe route to school.”

School siting and site plan review is an issue that is receiving more attention by the planning community. The trend nationally has been to locate schools away from city centers where large school sites are available for the development of single story school buildings as well as athletic fields and facilities. There are several ripple effects from the trend in school siting. First, new schools are being built outside of walkable urban centers. Second, more children are riding the bus or being driven to school. Third, suburban housing developments build up around the new school sites. Often, these neighborhoods do not have pedestrian connections to the nearby schools. In Michigan, the role of the planning commission in the site plan review process is on an advisory level only as described in Act 451 of 1976 (380.1263). Goals of connecting school locations with non-motorized transportation need to be met cooperatively rather than through prescriptive measures.

2.8 Housing opportunities

A multi-modal system plan should consider connections to residential areas. Additionally, new housing units should have development densities and locations that can be supported by a variety of transportation modes. Planning can be done based on the pedestrian-shed which considers distances based on one-quarter and one-half mile radius or based on 5-15 minute walks.

For existing housing areas, multimodal planning at the small area scale can look for opportunities to expand multi-modal connections. One step is to identify connections to uses and existing transportation networks. Another step is to identify ways to make the connections. Connections to other uses include other residential developments, educational and recreational facilities, and commercial and employment nodes. Connections to existing networks include multi-modal trails, sidewalks and transit stops. Connections can be provided by completing gaps in the local grid street network, creating or expanding a sidewalk system or by creating connections to a multi-use trail or bike lane.

For new housing, multi-modal transportation opportunities can be expanded through location and density. Walkable housing units are located within a pedestrian shed area that also includes existing and planned nodes of employment and commercial service. This could be a downtown area, a major intersection or a main street. These are also likely to be areas of existing or planned transit service which expands mode choices. Opportunities for higher density residential development will allow for the creation of more walkable housing units in the same geographic area. Mixed use development is a tool that permits residential and commercial uses in the same building. Areas with low development densities and long distances from development nodes will have limited mode choices.

When planning for the design of new housing developments, transportation connections should be part of the review process for both internal and external connections. For internal connections, guiding principles and technical design requirements for streets and sidewalks can be applied. Examples include requiring road stub connections to future development on adjacent properties and limiting or prohibiting cul-de-

sacs. For public roads, these standards will be applied by the local road agency. Local units of government should coordinate with those agencies to achieve the desired results.

For external connections, community multi-modal transportation plans can be supported by zoning requirements and applied during the review process. This can help provide connections from new development to existing or planned trail systems. In some cases, trail sections can be planned into the design of private housing developments. This may be done voluntarily by the developer or may be the result of a negotiated density bonus. Communities should consult with professional planners and legal counsel for specific direction.

2.9 Connectivity of area communities

Connectivity of area communities is a question that needs to be answered at a regional scale rather than by local planning commissions. There are several organizations and planning efforts that are important to this conversation. Local units of government should reach out to neighboring communities and regional organizations to further conversations about connections between communities. This section identifies existing resources in the Grand Vision region that work to connect area communities with non-motorized and transit options.

In 2008, the Northwest Michigan Council of Governments (NWMCOG) developed the Regional Non-Motorized Transportation Plan and Strategy for a thirteen county region including the six counties in the Grand Vision study area. The plan was funded by the Michigan Department of Transportation (MDOT) to encourage coordination between units of government and some of the various private nonprofit groups in MDOT's North region. The plan was adopted and a map was created for each county with an inventory of existing roads, trails, recreational facilities and other information. Recommended trail development routes are shown on the map.

Public road and transit agencies are at the heart of planning and constructing non-motorized transportation infrastructure. Federal transportation dollars flow through the State of Michigan and on to local transportation agencies. Multi-modal pathways, streetscape enhancement projects and bus shelters are all examples of projects that are regularly funded through transportation dollars and executed by transportation agencies. As such, the Michigan Department of Transportation, City of Traverse City, Grand Traverse County Road Commission, and the Leelanau County Road Commission have been and will continue to be vital to the success of the pathway system in the region.

TART Trails, Inc. is a regional leader in developing a system of non-motorized travel opportunities. Their mission statement reads: *Enriching the Traverse region by providing a network of trails, bikeways and pedestrian ways, and encouraging their use.* TART has plans to extend trails out from Traverse City in every direction based on the map available on the TART Trails website (www.traversetrails.org). The Leelanau Trail shows a future connection north to Peshawbestown. The Boardman Trail shows a future expansion west to Interlochen, Thompsonville and the Betsie Valley Trail as well as a southern expansion to Cadillac and Grand Rapids. The TART Trail shows an eastward expansion to Elk Rapids, Charlevoix and Mackinaw City.

In addition to the TART Trails organization, there are other trail organizations in the Grand Vision area. The Top of Michigan Trails Council includes Antrim County in future trail routes (<http://www.trailscouncil.org>). Kalkaska is home to the KART Trail that connects to the TART Trail system. The Betsie Valley Trail in Benzie County is supported by a “friends group” (<http://www.betsievalleytrail.org>).

Transit is another tool to connect communities. The Bay Area Transportation Authority (BATA) provides transit service to Grand Traverse and Leelanau Counties. A quote on the BATA website (www.bata.net) describes the organization’s plans for the future this way: *Public transit needs to be for the general good and fit into an overall plan that links into economic development and is a key component of what is considered a healthy community. We want all of the stakeholders of BATA to understand why we're here, what we can do for them and how they can work with us to help realize the vision.*

BATA offers fixed route service around Traverse City and has recently added a new express route to move people quickly around the core area and reduce transfer times. BATA also offers three regional connectors that provide service routes for morning and evening commutes from Fife Lake in southeast Grand Traverse County, from Northport and from Empire in Leelanau County into Traverse City. Since most employment in the six-county Grand Vision study area is located in and around Traverse City, many people travel from outside the urban core and outside the county to work each day. Services like this one directly support connections between communities and the regional development pattern of the Grand Vision.

The Benzie Bus (<http://www.benziebus.com>) offers connections between villages in the county and also offers service into Traverse City daily. Traverse City stops include Munson Medical Center and the BATA Transfer station. Antrim County Transportation (ACT) offers dial-a-ride service daily within the county and transportation to medical appointments in Traverse City on Tuesdays and Thursdays. Kalkaska Public Transportation offers transit service in Kalkaska County. Cadillac and Wexford County jointly operate the Cadillac/Wexford Transit Authority (CWTA). It offers dial-a-ride service and is experimenting with some fixed route service. CWTA has opened a new regional bus transfer center in downtown Buckley.

Regional connectors support employees who travel to work around the region. The U.S. Census reports average travel time to work by county. The average travel time in the State of Michigan is 24.1 minutes. In Grand Traverse County and Wexford where employment centers are located, the numbers are below the state average at 20.5 and 20.9 minutes respectively. In Leelanau County where many residents live in or near the Traverse City urban area, the average travel to work is 22.6 minutes. In Antrim County, the time is similar at 23.0 minutes. In Benzie and Kalkaska Counties, residents are travelling farther to jobs. The 2000 Census travel to work reports average travel time as 25.4 minutes for Benzie County and 28.2 minutes for Kalkaska County.

The Grand Vision calls for concentrated nodes of development around the region. These development nodes result in land use patterns that can be more effectively served by fixed-route transit service.

2.10 Ride sharing and transit

The Bay Area Transportation Authority (BATA) is the transit provider organization for Grand Traverse and Leelanau Counties and the largest transit provider in the six-county Grand Vision study area. This is commensurate with the population base being served. There are transit service providers in Antrim, Benzie, Kalkaska and Wexford Counties as well. More information about these providers is listed in this report section titled "Connectivity of Area Communities."

BATA provides fixed route service within the TC-TALUS boundary area as well as village connector services. Village connectors are offered by several other regional transit agencies with service into Traverse City and Cadillac. Both of these services are important components in achieving the regional transportation and land use vision. Transit service offers mobility choice and preserves capacity on the existing road system both in congested downtown areas and along connector corridors between villages and the central cities.

Currently, a proposal is being considered to amend the Michigan Zoning Enabling Act, to require consideration of public transit, and public transportation facilities and agencies in master plans. Another amendment proposal is being made separately that requires a transit evaluation to be part of the site plan review process. As drafted, the main provision reads, "...a zoning ordinance of the local unit of government shall require, as part of any site plan review, consideration of the proximity of adequate public transportation to the proposed land use or activity." This amendment sets a new "best practice" standard for including transit considerations in the zoning review process.

Ridesharing or carpooling is another tool to reduce the number of personal vehicles on the road. This practice allows private individuals to arrange to ride together in a single car and share the cost of travel. People began carpooling in large numbers in the 1970s in response to rising gas prices. The informal practice was evidenced by cars parked on the side of the road near highway exits. The Michigan Department of Transportation (MDOT) responded by creating the Michigan Carpool Parking Lot Program as a pilot program in 1974 with 11 carpool parking lots. Today there are 235 carpool parking lots located across the state. Several areas have a Local Rideshare Office (LRO) to organize and promote ridesharing in the region. LROs are most often administered through the Metropolitan Planning Organization (MPO). The six-county region is not currently served by a LRO but the creation of an LRO for the six-county region would directly support the Grand Vision's transportation and land use goals. The MichiVan program is available in the region. This program supplies fully insured passenger vans to commuter groups of 5-15 people for a monthly fee paid by participants. It is open to the public and more information is available on MDOT's web page. Also, the Northwest Michigan Council of Governments offers www.Ride.net as a resource for offering or seeking a ride. Promotion of existing programs is a simple step towards implementation of the Grand Vision.

2.11 Non-motorized transportation (including bicycle and pedestrian)

Creating a system of opportunities for non-motorized travel takes a cooperative effort from the many agencies and organizations connected to it. The transportation system is created through a collection of

public and private agencies working within different funding systems, geographic areas and responsibilities.

There are road agencies at the state, county and local levels. The Michigan Department of Transportation (MDOT) oversees a network of state roads. Each county has a road commission responsible for the associated county road system. Cities and Villages are responsible for streets within their jurisdictions. Each of these road agencies works within its area of influence to provide a road system to serve motorized and non-motorized modes of transportation. Road agencies are legally required to spend at least 1% of their transportation budget on non-motorized infrastructure such as sidewalks, pathways and bike lanes. Local and regional transportation agencies can adopt their own minimum standards for non-motorized spending that exceeds the 1% minimum.

Private advocacy organizations can also provide leadership and work across organizational and geographic boundaries to promote non-motorized transportation infrastructure and opportunities. At the state level, organizations such as the League of Michigan Bicyclists and the Michigan Trails and Greenway Alliance offer leadership and support. In the six-county region, TART Trails Inc. is a leader in this arena. Created in 1998, TART dedicates its efforts to developing a network of trails for recreation and transportation and advocating for pedestrians and cyclists. More information is available at <http://www.traversetrails.org>. Groups and clubs including the Cherry Capital Cycling Club promote walking and biking activities.

The incorporation of all users in street design is an approach that has been termed “complete streets.” This approach considers the needs of pedestrians, bicyclists, people with disabilities and transit users in road projects. In Michigan, Governor Jennifer Granholm signed Public Act 135 of 2010, directing the Michigan DOT to develop a Complete Streets policy. Local units of government have the opportunity to formally adopt the same policy approach. The Ingham County Road Commission and the City of Novi have done this already.

There is a wealth of considerations when designing pedestrian and bicycle networks. Whether along a single corridor or in a designated area, the presence of a sidewalk alone does not guarantee its use. Physical design is one consideration to provide accessibility for people with all abilities. The United States Access Board is an excellent resource for this topic (<http://www.access-board.gov/>). Other factors include safety, continuity, visual interest, amenities, directness and security. The Federal Highway Administration offers resources on design at <http://www.fhwa.dot.gov/environment/bikeped/design.htm>.

The American Planning Association’s Planners Advisory Service produced a document titled *Complete Streets: Best Policy and Implementation Practices*.⁸ Chapter 5 of the document, “Making the Transition: Planning for Change and Addressing Problems,” is available for free download at (<http://www.completestreets.org/webdocs/resources>)

⁸ *Complete Streets: Best Policy and Implementation Practices*, APA Planner’s Advisory Service, Report #559, Barbara McCann and Suzanne Rynne, Editors.

2.12 Freight and commercial rail, water and air transportation

Multi-modal transportation includes transportation systems that move freight and commercial packages through the transportation system. This set of considerations is focused on moving goods rather than people. It is an essential component of the region's economic activity and strength. It operates on a larger scale than personal vehicle travel and can sometimes conflict with other transportation mobility issues.

Transportation and land use planning should consider locations for freight terminals and businesses with freight service. Locations served by rail, air service, sea ports and major roads are ideal. Space may need to be preserved through land use planning to minimize future conflicts and to allow for future expansion and additional economic development. Planning efforts should also consider the impact on those roads carrying semi-truck traffic. Specialized models can predict the impact of freight on proposed developments and future road conditions.

In the Grand Vision transportation reports, freight movements are accounted for in addressing the future capacity of the transportation system by including an estimated commercial percentage of total traffic using a given roadway segment. The future roadway network is expected to carry between 5% and 8% commercial traffic, depending on where the roadway is located in the study area. Details of the percentages used for capacity analysis are available in the task 3.6 Transportation Gap Analysis report.

This percentage calculation reflects the presence of semi-truck traffic on the road system. They may be associated with a freight service operation in the region or they may be carrying supplies directly to commercial or industrial business operations. In some cases, cargo from semi-trucks is transferred to smaller trucks for final local delivery. In other cases, deliveries are made during off-peak hours. There are, nonetheless, times when semi-trucks are travelling in urban areas during peak traffic hours. Major travel routes for truck traffic need roads designed to accommodate semi-truck traffic movement including turning movements and passing lanes. At times, these design features can seem contrary to pedestrian and bicycle multi-modal goals. That is at the crux of multi-modal planning—planning for all modes of transportation.

The Great Lakes Central (GLC) railroad provides freight rail service to the Traverse City area on track owned by the State of Michigan. The tracks were purchased by the state in the late 1970s and early 1980s to preserve rail service in the area. A report titled "Preserving Options: Maintaining Rail Corridors in Northwest Michigan" was prepared for the Northwest Michigan Council of Governments in 2002 and a review was included in the Grand Vision's Task 1 Report. At that time, the tracks were leased by the Tuscola & Saginaw Bay Railway Company (TSBY). Highlights of the report are included here.

In the 1870s and 1880s, rail lines become active in northwest Lower Michigan carrying lumber and agricultural products out of the region and bringing tourists in from Michigan and neighboring states. Rail use began to decline after World War II and continued as the automobile industry and the highway system grew. More recently, only a few businesses reported using the railroad for freight shipments out of Grand Traverse County. A 1995 survey of shippers in the Grand Traverse area found six rail users in the region. Of the six, three utilized rail for lumber transport, and two shippers moved machinery and

scrap metal by rail. The existing tracks are in poor repair which further discourage their use. The “Preserving Options” report described rail use as *minimal and non-existent* (p 2).

Nonetheless, the “Preserving Options” report found: “The preservation of rail service and rail right-of-way enhances regional opportunities for transportation, economic development and recreation” (p 3). At the same time, the report describes the long-term economic viability of the rail lines north of Wexford County as “questionable” (p 8). The report explores benefits to freight movement; addressing future transportation needs; potential economic benefits to production and manufacturing; and tourism and recreation. If these corridors are lost, the report notes that they would be difficult if not impossible to restore. However, the State of Michigan is currently divesting itself of railroads and the associated right of ways supported by the provisions of Public Act 235 of 1998. If the region is intent on preserving rail lines, it needs to make its position clear and explore resources to overcome the financial obstacles.

A rail map for the State of Michigan is available from the Michigan Economic Development Corporation website showing the rail lines in the six-county region as short line railroads which are also called Class III railroads. Current freight traffic includes fruit and other perishables, scrap metal, and lumber.

Currently, MDOT is beginning its development of a Michigan State Rail Plan. The comprehensive plan will establish state policy involving freight and passenger rail transportation, including commuter rail operations. It will present priorities and strategies to enhance or preserve rail service that benefits the public, and will serve as the basis for future federal and state rail investments in Michigan. Grand Vision working groups have also started to investigate opportunities for expanded rail service in the region.

With an abundance of water in the region, commercial freight movement by ship is a part of the region’s history although it is not currently active. Traverse City is home to the Great Lakes Maritime Academy, Michigan’s state maritime academy, where students are trained as deck and engineering officers for the commercial shipping industry. Elsewhere in the six-county region, Point Betsie in Benzie County marks the entrance to the Manitou Passage which was once a vital shipping channel. It is no longer used by large commercial vessels but the lighthouse remains a functional US Coast Guard navigational aid and historic landmark.

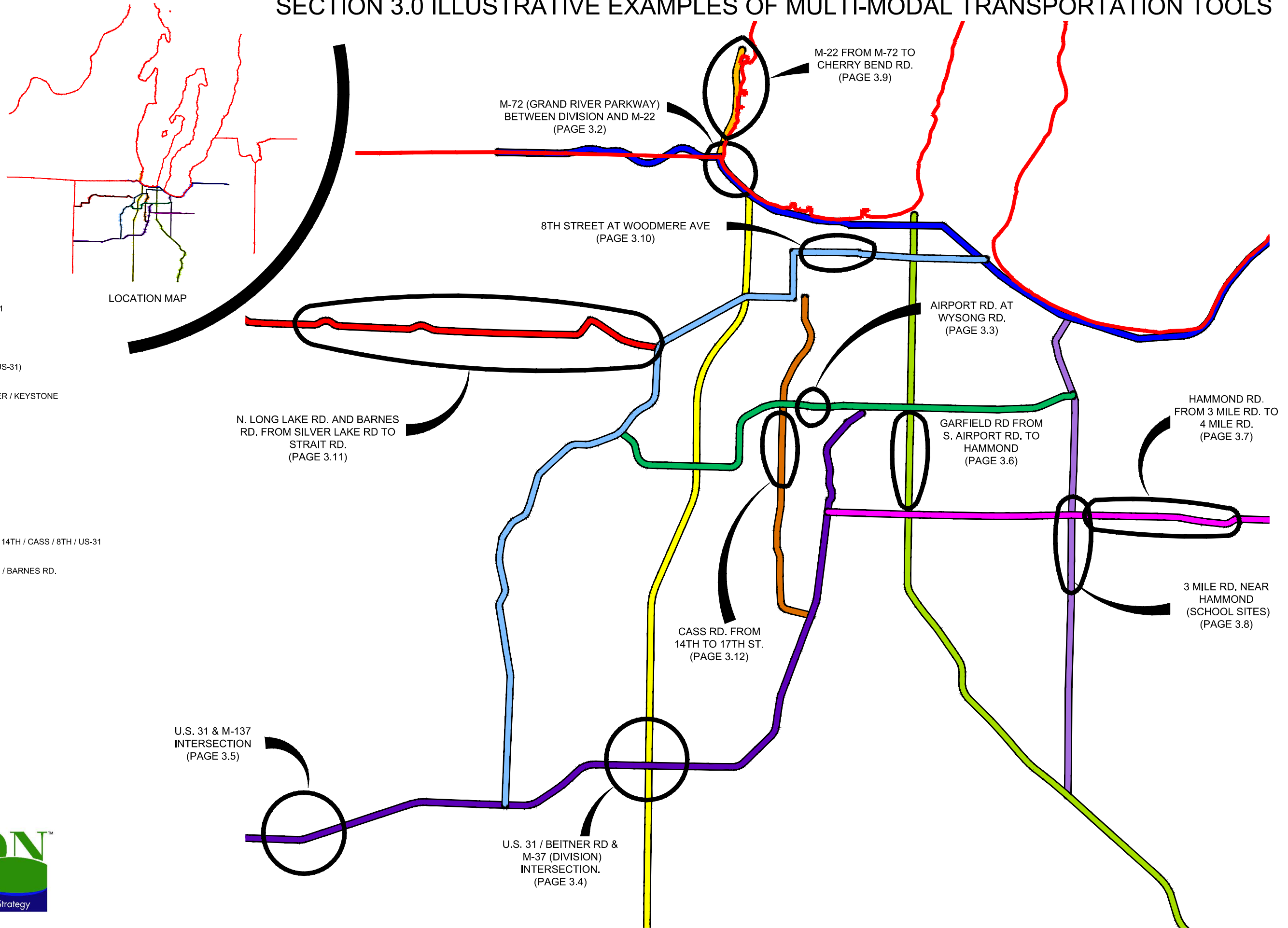
Air freight service is provided at the Cherry Capital Airport. In addition to being the only commercial service airport in the six-county region, it is a Port of Commerce for shipping. Commercial parcel carriers United Parcel Service (UPS) and Federal Express (FedEx) both fly out of the airport multiple times each day. A private carrier service also flies on weekdays from the airport. The current airport Master Plan includes future plans to add a cargo facility. The State of Michigan Aeronautics freight division maintains statistical data about the freight movement through the Cherry Capital Airport.

3.0 Illustrative examples of multi-modal transportation tools

This section provides a series of illustrative examples of the concepts discussed in Section 2.0. Some illustrative examples shown here are carried forward as project recommendations in the Task 5.1 Report. One location on each of the corridors of significance was selected. There is a central topic supported by text presented on each map. Other features, notes and ideas are also provided in callout boxes. In some cases, additional photographs or design details are also provided.

The illustrative examples are just that. They are provided to illustrate how a concept could be applied in a potential location. It is provided to communicate the idea rather than to recommend a specific action at a specific location. There may be a range of other factors that impact the ability to implement the ideas as presented.

SECTION 3.0 ILLUSTRATIVE EXAMPLES OF MULTI-MODAL TRANSPORTATION TOOLS



- CORRIDOR 1
M-72 / M-22 / US-31
- CORRIDOR 2
S. AIRPORT RD.
- CORRIDOR 3
DIVISION (M-37 / US-31)
- CORRIDOR 4
W. US-31 / BEITNER / KEYSTONE
- CORRIDOR 5
GARFIELD RD.
- CORRIDOR 6
HAMMOND RD.
- CORRIDOR 7
3 MILE RD.
- CORRIDOR 8
M-22
- CORRIDOR 9
W. SILVER LAKE / 14TH / CASS / 8TH / US-31
- CORRIDOR 10
N LONG LAKE RD. / BARNES RD.
- CORRIDOR 11
CASS RD.