

Twin Cities-Milwaukee-Chicago Intercity Passenger Rail Service

Purpose and Need Statement

July 2017



Prepared by:

HNTB CORPORATION

■ 100+ YEARS OF INFRASTRUCTURE SOLUTIONS

Contents

1 Introduction and Background	4
1.1 Introduction	4
1.2 Project Background	7
1.3 Related Studies	7
2 Project Purpose	9
3 Project Need	9
3.1 Transportation Mode Choice	10
3.1.1 Highway.....	10
3.1.2 Commercial bus service	11
3.1.3 Commercial airline service.....	13
3.1.4 Long-distance and intercity passenger rail service	14
3.2 TCMC Corridor Population and Economic Growth	16
3.3 Rail Transportation Choices	18
3.3.1 Train schedule and frequency.....	18
3.3.2 Empire Builder Travel Characteristics	18
3.4 Ridership and Capacity of Empire Builder Service	19
4 References	23

Figures

Figure 1: Amtrak Empire Builder Route and Stations between St. Paul and Chicago	5
Figure 2: Travel Characteristics, Empire Builder	19
Figure 3: Empire Builder and TCMC Corridor Ridership, 2010-2016 (FY)	20

Tables

Table 1: Railroad Ownership within TCMC Corridor.....	7
Table 2: Related Corridor Studies	8
Table 3: Highway Travel Time Between St. Paul and Cities Served by Existing Empire Builder Service.....	11
Table 4: Intercity Bus Providers	12
Table 5: Amtrak Empire Builder Schedule (Twin Cities to Chicago), Daily.....	14
Table 6: Travel Time Between Stations on Hiawatha Service Train No. 332	15
Table 7: Primary Causes of Delay, Empire Builder FY (2011-2016)	15
Table 8: Employment – Metropolitan Statistical Areas	17

Table 9: Travel Demand Forecast in the TCMC Corridor 17
Table 10: Empire Builder Ridership Within the TCMC Corridor, 2010-2016 (FY) 20
Table 11: Empire Builder Ridership Between Stations in TCMC Corridor, 2016 (FY) 21
Table 12: Capacity of TCMC Corridor 2012 – 2015 (FY)..... 21
Table 13: Summary of Comparison of Ridership to Revenue Between Empire Builder and TCMC Route,
2015 (FY) 22

1 Introduction and Background

1.1 Introduction

The Minnesota Department of Transportation (MnDOT), Wisconsin Department of Transportation (WisDOT) and Illinois Department of Transportation (IDOT), in cooperation with the Federal Railroad Administration (FRA), Ramsey County Regional Railroad Authority (RCRRA), Minnesota High Speed Rail Commission, and La Crosse Area Planning Committee (LAPC) are evaluating intercity passenger rail service within the Twin Cities-Milwaukee-Chicago (TCMC) corridor in order to better serve those cities and intermediate Amtrak station communities along the corridor (“Project”).

The TCMC corridor is an approximately 418-mile short-distance rail corridor connecting major metropolitan regions of Minneapolis and St. Paul (Twin Cities), Milwaukee, and Chicago and providing service to smaller cities of Red Wing and Winona in Minnesota, La Crosse, Tomah, Wisconsin Dells, Portage, Columbus, and Milwaukee (Airport) in Wisconsin, and Glenview in Illinois (See Figure 1). The TCMC corridor currently is served by Amtrak’s long-distance *Empire Builder* service that operates between Chicago, IL and Seattle, WA and Portland, OR. This service provides one trip per day in each direction. It operates at a maximum speed of 79 miles per hour (mph) and makes stops at the stations that are evaluated as part of the TCMC service, with the exception of not stopping at the General Mitchell International Airport in Milwaukee. The schedule, train rolling stock and amenities for the *Empire Builder* service are oriented toward the long-distance travel market between Chicago and Seattle/Portland, rather than the short-distance, intercity rail market between Chicago, Milwaukee and the Twin Cities that would be served by the TCMC service. The *Empire Builder* service in the TCMC corridor can also experience arrival and departure delays as a result of conditions occurring outside of the TCMC corridor.

Amtrak operates short-distance, intercity passenger rail service on the *Hiawatha* corridor between Milwaukee and Chicago.¹ This service provides seven round trips per day Monday through Saturday and six round trips per day on Sunday. WisDOT and IDOT are evaluating the addition of up to three round trips per day to this service.²

Figure 1 shows the existing route and stations served by Amtrak’s *Empire Builder* that is proposed for the new TCMC intercity passenger rail service between the Twin Cities and Chicago. TCMC maximum operating speed would be 79 mph, consistent with operations on the current *Empire Builder* service.

¹ <http://amtrakhiawatha.com/>

² FRA, WisDOT and IDOT recently completed a Draft Environmental Assessment (EA) that evaluates the addition of up to three additional roundtrips of the existing *Hiawatha Service* intercity passenger rail corridor between Chicago and Milwaukee. <http://wisconsindot.gov/Documents/projects/multimodal/rail/chi-mil-ea.pdf>

Figure 1: Amtrak *Empire Builder* Route and Stations between St. Paul and Chicago



Passenger trains provide long-distance, short-distance, intercity travel, daily commuter trips, or local urban transit services. These services include a diversity of vehicles, operating speeds, right-of-way requirements, and service frequency. Several terms are used throughout this document as follows:

- Corridor – the existing rail and surrounding area between the Twin Cities (Minneapolis and St. Paul) and Chicago
- Route – a specific alignment that a rail or bus uses within a corridor

- Project – the additional proposed intercity passenger rail service to the *Empire Builder* service between the Twin Cities, Milwaukee and Chicago
- Intercity passenger rail – this is defined as rail passenger transportation, except commuter rail passenger transportation (49 U.S. Code 24102(4)). For purposes of this document, this term refers to service that connects cities and station stops in and between St. Paul, Milwaukee and Chicago.
- Long-distance route – is defined as routes of more than 750 miles between endpoints operated by Amtrak as of the date of enactment of the Passenger Rail Investment and Improvement Act of 2008 (49 U.S. Code 24102 (7)(c)).
- Short-distance corridor or route – is defined as routes not more than 750 miles between endpoints, operated by—Amtrak or another rail carrier that receives funds under 49 U.S. Code Chapter 244 (49 U.S. Code 24102 (7)(d)).
- Fiscal Year – data provided by Amtrak is reported in Amtrak Fiscal Year, which is from October through September, unless otherwise noted

The purpose and need for the Project defines why the Project has been undertaken and the transportation problems that the Project aims to resolve; it is also a critical component of defining and evaluating the reasonable alternatives for the Project.³ Proposed alternatives that do not meet the purpose and need for the Project will be dismissed and not studied further. Alternatives that meet the purpose and need will be further evaluated, ultimately leading to the identification of a preferred alternative. The purpose and need statement is organized in the following sections:

Project Background (Section 1.2): Summarizes the operational history of passenger rail service and railroad ownership in the TCMC corridor.

Related Studies (Section 1.3): Provides a summary of the Amtrak Feasibility Report conducted for the TCMC corridor, as well as identification of other related studies.

Project Purpose (Section 2): Provides the purpose for addressing the Project’s need statements. The Project alternatives must meet the Project’s purpose and need statements.

Project Need (Section 3): Identifies the needs for the Project and supporting data for these needs.

The additional frequency on the TCMC corridor is supported in the requirements of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), Section 209. The Project is also prioritized as an Advanced Planning corridor in the draft *Minnesota State Rail Plan* (MnDOT, 2015) and a “short-term” project in the *Wisconsin Rail Plan 2030* (WisDOT, 2014).

³ Multiple route alternatives have been studied previously as part of the Midwest Regional Rail Initiative (MWRRI) and the Final Alternatives Selection Report (Quandel, 2012). This report formed the basis for identification of the TCMC Project proposed to operate on the Empire Builder route. Further alternatives analysis for the proposed TCMC Project will focus on potential service alternatives for this route. Refer to the MWRRI and associated materials located here for additional information: <http://www.dot.state.mn.us/passengerrail/mwrri/phase7.html>

1.2 Project Background

The existing long-distance Amtrak *Empire Builder* service has been operational since the 1920s and currently serves stations at St. Paul, Red Wing and Winona in Minnesota, La Crosse, Tomah, Wisconsin Dells, Portage, Columbus, and Milwaukee in Wisconsin, and Glenview and Chicago in Illinois. The existing intercity Amtrak *Hiawatha Service* has been operational since 1989 and currently serves stations at Milwaukee, Milwaukee Airport and Sturtevant in Wisconsin and Glenview and Chicago in Illinois. Ridership for the segment of the *Empire Builder* that would be served by the TCMC service was 111,438 in fiscal year 2016. Ridership for the *Hiawatha Service* was 815,196 in calendar year 2016. The *Chicago-Milwaukee Intercity Passenger Rail Program Draft Environmental Assessment* proposes to add up to three additional round-trips per day between Chicago Union Station and the Milwaukee Intermodal Station on the *Hiawatha Service* (FRA, 2016). While the additional capacity between Chicago and Milwaukee addresses ridership on the *Hiawatha* corridor, it does not address the intercity service needs between Milwaukee and the Twin Cities.

The TCMC corridor is approximately 410 miles and connects St. Paul, Minnesota and Chicago, Illinois through Milwaukee, Wisconsin. The rail route is owned by several freight and passenger railroads (see Table 1). To add intercity passenger rail service throughout the TCMC corridor, the additional passenger rail service must serve capacity needs of the host freight railroads that own and operate on the track infrastructure, as well as integrate with the existing long-distance *Empire Builder* service and the existing and planned intercity *Hiawatha Service*.

Table 1: Railroad Ownership within TCMC Corridor ¹

Host Railroad	Railroad Subdivision	Line Segment	Route Miles
Amtrak	Amtrak Chicago Terminal	Chicago Union Station, Chicago, IL	1
Metra (Chicago Transportation Authority)	Milwaukee District North Line	Chicago Union Station to Rondout, IL	32
Canadian Pacific Rail (CPR)	C&M, Watertown, Tomah, River, Merriam Park	Rondout, IL to Division St., St. Paul, MN	377
Union Pacific (UP)	Albert Lea	Division St. to Union Depot in St. Paul, MN	.25
		Total Route	410.25

¹ CPR mainline track represents 85% of the corridor trackage between Chicago and St. Paul. Near Union Depot in St. Paul, trains would operate over a short section (about 1500 feet) of a connecting track owned by UP and dispatched by BNSF.

Source: Amtrak. May 2015. *Feasibility Report on Proposed Amtrak Service Chicago-Milwaukee-La Crosse-Twin Cities - (St. Cloud)*

1.3 Related Studies

In 2015, MnDOT and WisDOT requested Amtrak to study the feasibility of adding a “second frequency” intercity passenger train service between Chicago Union Station and the Minnesota Twin Cities Area, including St. Cloud, MN. The resulting *Feasibility Report on Proposed Amtrak Service Chicago-Milwaukee-La Crosse-Twin Cities - (St. Cloud)* solidified the feasibility of the corridor to support

additional train frequencies (Amtrak, 2015).⁴ As part of the feasibility report, MnDOT requested Amtrak to review schedules that complement the *Empire Builder* schedule, with arrival and departure times at the endpoints that maximize ridership potential and avoid congested time slots at Chicago Union Station. According to the feasibility report, the second frequency departure times from points of origin would need to be generally four to six hours before or after current *Empire Builder* departure times. The added daily round-trip train service studied by Amtrak was the same route currently used by Amtrak’s *Empire Builder* service. The results of the feasibility report concluded favorable ridership and revenue anticipated for all route scenarios evaluated, recommending the Chicago to St. Paul route for the reasons noted above.

Based on this report, MnDOT and WisDOT concluded the service terminating in St. Paul is the most feasible route scenario for initial start-up service, citing lower capital costs and less complexity of railroad operations and infrastructure issues (MnDOT/WisDOT, 2015). Additionally, MnDOT and WisDOT recommended further evaluation of the service between Chicago Union Station and Union Depot in St. Paul, including further operations modeling, determination of infrastructure improvements and costs, environmental documentation, and development of a service development plan.

Numerous studies that include the TCMC corridor have been completed over the past 15 years. Most studies identified the need to improve infrastructure and mitigate freight capacity issues. The existing *Empire Builder* route between the Twin Cities and Chicago was identified as the preferred route for an intercity passenger rail frequency (Quandel, 2012). A list of the related studies applicable to the TCMC corridor are provided in Table 2.

Table 2: Related Corridor Studies

Year	Report Title	Website
1991	Tri-State Study of HSR Service (IL-MN-Wis DOTs)	https://trid.trb.org/view.aspx?id=357752
2000	Tri-State Study II: HSR Feasibility Study for Chicago – Milwaukee – Twin Cities Corridor (MnDOT & WisDOT)	http://www.dot.state.mn.us/planning/railplan/docs/Tri-State%20II%20Rail%20Study%202000%20-%20Appendices.pdf
2004	Midwest Regional Rail Initiative (MWRRI)	http://www.dot.state.mn.us/passengerrail/mwrri/index.html
2009	High Speed Rail Strategic Plan (FRA)	http://www.fra.dot.gov/eLib/Details/L02833
2009	Tri-State III HSR Study Minnesota Segment Assessment	https://www.co.olmsted.mn.us/boardofcommissioners/bdpktArchive/Documents/8%20Tri-State%20III%20HSR%20Study%20TEMS%20Sep%202009.pdf

⁴ In addition to MnDOT and WisDOT, the feasibility report included partners IDOT, the city and county of La Crosse, WI, and RCRRA, as well as collaboration from railroad owners and operators CPR, BNSF Railway (BNSF), Metra, Minnesota Commercial Railway (MNNR) in St. Paul, and UP.

Year	Report Title	Website
2009	Amtrak North Coast Hiawatha Passenger Rail Study	https://www.amtrak.com/ccurl/492/133/NorthCoastHiawathaServiceStudy.pdf
2010	MN Comprehensive Statewide Freight and Passenger Rail Plan (MnDOT & FRA)	http://www.dot.state.mn.us/planning/railplan/resources.html
2011	Draft Purpose and Need Statement for Milwaukee to Twin Cities (MnDOT & FRA)	http://www.dot.state.mn.us/passengerrail/mwrri/files/Appendix%20B%20-%20P&N.pdf
2012	Final Alternatives Selection Report; Milwaukee - Twin Cities High-Speed Rail Corridor Program (MnDOT, WisDOT)	http://www.dot.state.mn.us/passengerrail/mwrri/phase7.html
2012	East Metro Railroad Capacity Analysis (RCRA)	https://www.ramseycounty.us/sites/default/files/Projects%20and%20Initiatives/2012_FINAL_REPORT_East_Metro_Rail_Capacity_Study.pdf
2015	Minnesota State Rail Plan 2015 (MnDOT)	http://www.dot.state.mn.us/planning/railplan/resources.html
2015	Feasibility Report on Proposed Amtrak Service – Chicago-Milwaukee-La Crosse-Twin Cities - (St. Cloud)	http://www.dot.state.mn.us/passengerrail/pdfs/2nd-train-feasibility-report%20.pdf
2016	Chicago-Milwaukee Intercity Passenger Rail Service EA (WisDOT)	http://wisconsindot.gov/Pages/projects/multimodal/rail-chi-mil/default.aspx

2 Project Purpose

The purpose of the Project is to address gaps in the regional transportation system by operating a second daily roundtrip on the same route as the existing long-distance Chicago-Seattle/Portland *Empire Builder* service to connect the Twin Cities, Milwaukee and Chicago by providing riders one daily roundtrip between Chicago Union Station and Union Depot in St. Paul that would be cost-effective to implement, operate and maintain. The proposed service would address population increases and economic growth projected within the corridor by providing a second daily roundtrip passenger rail service approximately four to six hours apart from the existing *Empire Builder* schedule to provide flexibility and convenience oriented towards intercity travel within the TCMC corridor. It would serve the Twin Cities, Milwaukee and Chicago, and intercity stations of Red Wing and Winona in Minnesota, La Crosse, Tomah, Wisconsin Dells, Portage, and Columbus in Wisconsin, and Glenview in Illinois. At Milwaukee, the proposed service would integrate with the existing *Hiawatha Service* that stops at Sturtevant and the General Mitchell Airport in Wisconsin before serving stations at Glenview and Chicago in Illinois. The proposed second frequency would begin at Union Depot in St. Paul in order to avoid the travel time delays that can occur due to the long distances and freight delays sometimes experienced by the daily *Empire Builder* as it travels from the West Coast to St. Paul.

3 Project Need

The need for the Project was developed based on findings from previous studies that identified a lack of passenger rail service options to support existing and future rail ridership between the Twin Cities and

Chicago, as well as expected growth in automobile congestion and increased airport delays within the TCMC corridor. Amtrak conducted a feasibility study that assessed schedule options, ridership, revenue, infrastructure investments, operating costs, and equipment needs (railcars and locomotives) for four route scenarios between Chicago Union Station and the Twin Cities Area, including St. Cloud, MN (Amtrak, 2015). This study indicated favorable ridership and revenue for a second frequency service and identified that a service between St. Paul and Chicago provided the lowest capital infrastructure costs. MnDOT and WisDOT conducted an evaluation of the Amtrak study and concluded that this route also has the least amount of complexity due to fewer interactions with host railroads, rail congestion, and capacity issues (MnDOT/WisDOT, 2015). Based on the Amtrak study and the recommendations of MnDOT and WisDOT, a second frequency daily train, and the associated infrastructure improvements, would establish a frequency that is more convenient for an intercity travel than currently offered by the *Empire Builder* service, provides better on-time performance than offered by the *Empire Builder*, and provides opportunities for non-auto travel within the TCMC corridor and to connect to nearby destinations.

The need for the Project is based on the following transportation gaps:

- The communities between the Twin Cities and Chicago have limited non-auto transportation options for trips to the Twin Cities, Milwaukee and Chicago, and the once-daily round trip does not provide adequate connections to nearby destinations or international airports in Milwaukee and the Twin Cities;
- Population increases and economic growth projected within the TCMC corridor would create additional travel delays on highways and roadways, and strain airline services;
- One daily round trip passenger rail service between the Twin Cities and Chicago does not provide schedule choices for existing and future intercity travelers, as well as other travelers within the region; and
- The *Empire Builder* service reaches near capacity conditions during peak travel months and travel demand is projected to increase within the TCMC corridor.

3.1 Transportation Mode Choice

The TCMC service is intended to provide a new intercity passenger rail service, which will provide an additional transportation option to the existing modes within the corridor, as well as provide valuable connections to major population centers within Minnesota, Wisconsin and Illinois. There are numerous existing transportation options for travel between the Twin Cities and Milwaukee and Twin Cities and Chicago; however, these become limited when considering access to the intercity locations along the TCMC corridor. Sections 3.1.1 through 3.1.4 describe the existing transportation modes, capacity constraints and connectivity for these modes.

3.1.1 Highway

Two major interstate highways, I-90 and I-94, intertwine to serve the TCMC corridor. The estimated travel time between the Twin Cities and Chicago is approximately 6 hours and 30 minutes, without congestion or other delays. However, automobile trips are subject to decreased travel time reliability due to traffic congestion in the Twin Cities, Milwaukee and Chicago. Table 3 provides approximate non-stop drive times between the cities served by the *Empire Builder* long-distance service. Travel by the

TCMC intercity service is expected to provide comparable travel times when compared to travel by automobile. However, the passenger rail service would not be impacted by construction activity, traffic congestion or weather conditions.

In the Midwest, winter weather causes delays for roadway traffic, impacting all modes of travel that use the snow-covered roadways. Winter travel along roadways can be interrupted by vehicle accidents, bus delays and an increase in overall time to clear roadways, parking lots and sidewalks, among other facilities and infrastructure. Train corridors are more weather resilient to severe winter weather because frequent train use of rail tracks keeps snow and ice from building up.

Another factor impacting travel by automobile is the time and cost associated to locate parking in metropolitan areas such as St. Paul and Chicago.

Table 3: Highway Travel Time Between St. Paul and Cities Served by Existing Empire Builder Service

City	Travel Time ¹	Distance (miles)
Red Wing, MN	54 minutes (0:54)	45
Winona, MN	126 minutes (2:06)	106
La Crosse, WI	144 minutes (2:24)	150
Tomah, WI	151 minutes (2:31)	162
Wisconsin Dells, WI	191 minutes (3:11)	206
Portage, WI	210 minutes (3:30)	228
Columbus, WI	240 minutes (4:00)	260
Milwaukee, WI	295 minutes (4:55)	327
Glenview, IL	360 minutes (6:00)	393
Chicago, IL	361 minutes (6:13)	399

¹ Travel times reflect best case scenarios during non-peak travel times with no delays.

I-94 and I-90 have sufficient capacity within the major cities; however, volumes in the segments approaching the Twin Cities, Milwaukee and Chicago result in traffic delays during peak periods that increase travel times. Congestion between Milwaukee and Chicago is expected to continue to increase through 2035 between 10% and 49%, depending on the route (FRA, WisDOT, IDOT, 2016). Anticipated expansion of roadways will not be adequate to address congestion and increased travel times.

3.1.2 Commercial bus service

Numerous bus companies operate within the TCMC corridor. Commercial bus companies provide service to the larger cities, but do not provide service to all of the smaller cities along the TCMC corridor that are served by the *Empire Builder*. This results in a lack of transportation options for the population traveling to and from these smaller cities, increasing reliance on auto travel. Table 4 identifies the commercial bus companies and availability of their services in the cities within the TCMC corridor that are served by the *Empire Builder*.

Table 4: Intercity Bus Providers

Amtrak Station	Jefferson Lines	Lamers Bus Lines	Tornado Bus Company	Trailways/Greyhound	Coach USA	Amtrak Thruway Bus	Megabus
Minneapolis, MN	Served			Served		Served ^a	Served
St. Paul, MN	Served			Served		Served ^a	Served
Red Wing, MN							
Winona, MN	Served					Served	
La Crosse, WI	Served ^b					Served	
Tomah, WI				Served ^c			
Wisconsin Dells, WI				Served ^d			
Portage, WI		Served ^e					
Columbus, WI		Served ^e		Served			
Milwaukee, WI	Served	Served	Served	Served			Served
Milwaukee (airport)	Served	Served			Served		
Glenview, IL							
Chicago, IL			Served	Served	Served		Served

^a services Minneapolis airport

^b one bus per day in each direction to Twin Cities, Madison, and Milwaukee

^c three buses per day in each direction to Twin Cities, Milwaukee, Chicago

^d one bus per day in each direction to Twin Cities, Milwaukee, Chicago

^e one bus per day in each direction, service to Milwaukee, Chicago and Twin Cities requires connection in Madison, WI

As illustrated in Table 4, bus services between the Twin Cities and Chicago include the services listed below (all schedules accessed May 2017). Bus travel times are also included. Bus travel times vary depending on the number and location of stops for the bus service. For the travel times below, the shortest time is reported.

- Jefferson Lines serves the Twin Cities stopping in Rochester and La Crosse Wisconsin. They serve La Crosse, Sparta, Baraboo and Madison and Milwaukee on the same route to the Cities, serving both St. Paul and downtown Minneapolis (Route 0965). Jefferson Lines also serves Winona, (Route 0965), Tomah (Route 4731, 4737, 4909)). Travel time from St. Paul to La Crosse is approximately 3 hours and 5 minutes. (Jefferson Lines)
- Lamers bus line serves the state of Wisconsin including communities of Madison and Milwaukee but not with direct or regular services. Travel time from Portage to Milwaukee is approximately 2 hours and 45 minutes. (Lamers).
- Tornado Bus Company has stops in Milwaukee and Chicago. Travel time between Milwaukee and Chicago is approximately 1 hour and 50 minutes. (Tornado Bus)
- Trailways and Greyhound Lines serve between downtown St. Paul and downtown Chicago and communities along the route including Tomah, Wisconsin Dells, Milwaukee, and Madison, WI. Travel times from Minneapolis are as follows for both bus services:
 - Tomah is approximately 3 hours and 10 minutes
 - Wisconsin Dells is approximately 4 hours and 45 minutes

- Milwaukee is approximately 5 hours and 45 minutes (Trailways, Greyhound).
- Coach USA serves the General Mitchell International Airport in Milwaukee and the Chicago O’Hare airport. Coach USA also serves smaller communities along the rail line but none at an *Empire Builder* station location. Travel times are not available (Coach USA).
- Amtrak Thruway Bus meets the train at certain stations to provide service to multiple connection destinations. The bus overlaps with existing train service between St. Paul, Rochester, Winona, MN and La Crosse, WI (Amtrak *Empire Builder* Schedule). The Jefferson Lines and Lamers services listed above operate as Amtrak Thruway services.
- Megabus serves Minneapolis and St. Paul, MN Milwaukee, WI and downtown Chicago, IL with express bus service. Travel time from St. Paul to Milwaukee and Chicago are approximately 6 hours and 10 minutes, and 8 hours, respectively (Megabus).

As with automobile travel, bus travel is impacted by roadway conditions, traffic congestion and weather conditions.

3.1.3 Commercial airline service

Four major airlines operate flights between the Twin Cities and Chicago (i.e., American, Delta, Southwest, and United). They operate an average of 37 one-way flights daily between MSP and O’Hare (ORD) and MSP and Midway International Airport (MDW). Typical flight times are 90 minutes, without delays, for all airlines. Between MSP and Milwaukee’s General Mitchell International Airport (MKE), Delta operates an average of 6 daily flights and Southwest an average of 3 daily flights. Flight times are typically 70 minutes, without delays. American and United operate approximately 20 non-stop flights between MKE and ORD daily, and flight times are typically 45 to 55 minutes without delays. Aside from Minneapolis, Milwaukee, and Chicago, commercial airline service at intermediate communities along the TCMC corridor is limited to La Crosse Regional Airport, which has up to 3 departures to Minneapolis daily operated by Delta and 3 departures to Chicago daily operated by American. Flight time is typically 80 minutes to Minneapolis and 70 minutes to Chicago.

In addition to in the air travel time, air travel times also include travel to the airport and passing through security checkpoints. Depending on the time of year, arrival between one and two hours is typically recommended prior to a flight to check-in to clear security. Further, travel times can be several hours longer between the smaller cities along the corridor to drive to the closest airports, increasing total air travel times.

As with auto and bus travel, airline service can be impacted by weather, mechanical and other delays. For example, ORD in Chicago reports delays of 42% of flights in winter months (Economist, 2016). Some airline carriers experienced 60% or more of their flights delayed more than 30 minutes in January and February between MSP and ORD (BTS, 2015). Additionally, similar to the long-distance *Empire Builder* service, delays from elsewhere in the country can also impact air travel at airports within the TCMC corridor. Current airline service between these cities is not expected to change and there are no plans for additional commercial airports to be built within the region.

3.1.4 Long-distance and intercity passenger rail service

The only existing passenger rail service that operates between the Twin Cities and Chicago is Amtrak’s *Empire Builder*, which provides long-distance service between Chicago and Seattle/Portland. This once daily round trip service provides limited passenger schedule options between Chicago Union Station and Union Depot in St. Paul. The current service departs Chicago daily at 2:15 PM and arrives in St. Paul at 10:03 PM (departing for the continued trip westbound at 10:20 PM). The return train departs St. Paul at 8:00 AM and arrives in Chicago at 3:55 PM (see Table 5).

The existing long-distance service operates on a schedule that is not oriented towards intercity travel within the TCMC corridor and does not provide options for travelers to choose different schedules between the Twin Cities and Milwaukee or Chicago. For example, passengers traveling from Chicago, Milwaukee or La Crosse to St. Paul would need to stay in St. Paul for two nights in order to make a half-day business meeting due to the late arrival of the *Empire Builder* into St. Paul and early morning departure from St. Paul. Table 5 shows the schedule for the existing once daily round trip long-distance service between Union Depot in St. Paul and Chicago Union Station. The travel time between St. Paul and Chicago is approximately 8 hours. Travel time to and from intercity stations can be calculated from Table 5. For example, travel from St. Paul to Wisconsin Dells is approximately 4 hours.

Table 5: Amtrak *Empire Builder* Schedule (Twin Cities to Chicago), Daily

Station	Westbound Train Departures (Read Up)	Eastbound Train Departures (Read Down)
St. Paul/Minneapolis, MN	Dep. 10:20 PM Arr. 10:03 PM	8:00 AM
Red Wing, MN	8:49 PM	8:54 AM
Winona, MN	7:47 PM	10:11 AM
La Crosse, WI	7:11 PM	10:47 AM
Tomah, WI	6:27 PM	11:26 AM
Wisconsin Dells, WI	5:49 PM	12:08 PM
Portage, WI	5:31 PM	12:27 PM
Columbus, WI	5:02 PM	12:57 PM
Milwaukee, WI	3:52 PM	2:07 PM
Glenview, IL	2:39 PM	3:12 PM
Chicago, IL	2:15 PM	Arr. 3:55 PM
Total Travel Time Between St. Paul and Chicago	7 hours and 55 minutes	

Source: Amtrak *Empire Builder* Schedule, October 8, 2016.

There is no intercity passenger rail service for the entire TCMC corridor, however, the *Hiawatha Service* provides service between Chicago and Milwaukee, as described in Section 1. With a maximum operating speed of 79 mph, the trip between Chicago and Milwaukee takes approximately 1 hour and 30 minutes. Travel times between stations vary slightly depending on the train number. Table 6 provides the travel time between stations for the Monday-Friday peak hour Train Number 332 between Milwaukee and Chicago.

Table 6: Travel Time Between Stations on Hiawatha Service Train No. 332

Station	Northbound Train Departures	Travel Time between Stations
Milwaukee Intermodal Station	8:05 AM	10 minutes
Milwaukee Airport Rail Station	8:15 AM	13 minutes
Sturtevant, WI	8:28 AM	38 minutes
Glenview, IL	9:06 AM	28 minutes
Chicago, IL	9:34 AM	
Total Travel Time Between Milwaukee and Chicago		1 hour 29 minutes

Source: Amtrak Hiawatha Service Schedule, October 15, 2016.

In addition to the limited schedule of the *Empire Builder* service, the service can suffer from poor on-time performance due to factors west of St. Paul, such as delays incurred from the long-distance nature of the service and freight traffic that also operates on the rail track (see Table 7). These delays can make it difficult for the traveler using the service for short-distance, intercity travel between St. Paul, Milwaukee, Chicago, and the smaller cities in between. Between 2011 and 2016, the average on-time performance for the *Empire Builder* service was 54%, with a low of 27% in 2014 and a high of 83% in 2016 (Amtrak, 2016). This on-time performance is impacted by several factors including freight train interference, speed restrictions and other causes. While the TCMC service would not address on-time performance issues of the *Empire Builder* service, it would provide a new intercity passenger rail service that is not dependent on the long-distance service.

Table 7: Primary Causes of Delay, *Empire Builder* FY (2011-2016)

Delays	2011	2012	2013	2014	2015	2016
Freight train interference ¹	37%	31%	29%	55%	33%	25%
Speed restriction due to defect, slow orders ²	19%	28%	36%	15%	35%	21%
Hold for guaranteed connection ³	13%	10%	11%	17%	14%	5%
No delay or waiting on time ⁴	5%	10%	7%	1%	6%	33%
Other ⁵	26%	20%	17%	11%	12%	16%
Total	100%	100%	100%	100%	100%	100%

Source: Amtrak, 2016.

¹Defined as a delay when a passenger train must wait because a freight train is in the way.

²Defined as a delay when a passenger train has to operate below the designated speed limit due to the condition of the track being below standard.

³Defined as a delay at endpoints of passenger train (e.g., Chicago, Seattle and Portland) due to delays in passengers arriving from guaranteed connections to board *Empire Builder* Service.

⁴Defined as a delay due to passenger train arriving at destination prior to scheduled arrival time which results in additional time at the station prior to departure at scheduled departure time. This type of delay does not impact scheduled departure time.

⁵This category encompasses other causes for delay including, but not limited to, signal failures, commuter train/passenger train interference, weather, or track maintenance.

The single round-trip schedule of the long-distance *Empire Builder* and the variability in schedule for the eastbound train can make connecting to other scheduled modes challenging. For instance, Wisconsin has worked with Amtrak to implement intercity bus connections (Amtrak Thruway) with *the Empire Builder* and state-supported intercity bus routes. One example of this is the effort to provide an Amtrak Thruway bus service with the existing Madison-Green Bay bus route and the *Empire Builder* at the Columbus, WI Amtrak station. This would provide connections to/from the *Empire Builder* to Madison, WI and other cities. A connection is possible in one direction to/from Madison, but not in the other direction due to the variability of the *Empire Builder* schedule and resulting inability to guarantee connections, as well as the limited schedule times.

Adding a new intercity passenger rail train would double the passenger rail schedule options to connect with existing intercity bus routes and other scheduled services. It would also provide an eastbound train with less variability in schedule than a train that is coming all the way from Seattle/Portland over several different host railroads. The additional departure and arrival times at stations with intercity bus service would make connections to bus services at stations feasible (i.e., less layover time) and enable connections that are currently not possible with the single long-distance passenger rail round-trip and a bus route with a single round-trip.

The additional train would also make more rail-air connections possible at the Milwaukee Airport Rail Station. It would also allow travelers to reach MSP by connecting to the METRO Blue Line LRT at Union Depot in St. Paul. The reliability of the service and the on-time performance of an intercity passenger rail service would reduce the variability in schedule that results from the *Empire Builder* service, making it possible to time train service with flights schedules.

For those not traveling by personal vehicle, there are a lack of transportation options for travel to and from these smaller cities within the TCMC corridor. While commercial bus and airline services are available, these do not fully serve these smaller cities that have travel demand to/from the larger cities because of consistent variability in the *Empire Builder* schedule, as well as between the smaller cities. However, by using existing passenger rail infrastructure, the additional train service will connect people to centers of activity not served only served by automobiles.

3.2 TCMC Corridor Population and Economic Growth

Population and economic growth are projected to increase within the TCMC corridor, placing a burden on existing transportation infrastructure as travel demand increases for all modes. State populations are expected to grow from 5.4 to 6.2 million in Minnesota and 5.8 to 6.5 million in Wisconsin by 2040 (MN State Demographers Office and WI Department of Administration DSC).⁵

As the population ages and there are increases in the number of people that are unable to or choose not to drive, additional travel options become necessary to meet the growing demand. In Minnesota, “in the coming two decades, the under 18 populations will grow modestly, gaining about 28,000 between 2015

⁵ Forecasts were completed for WI in 2013. The forecast provided State Projections from 2010 to 2040. MN forecast updated in December 2016.

and 2035. Meanwhile, the state's 65 and older population will grow much more rapidly, adding more than half a million people over those same years. In 2035, the older adult (65+) group will eclipse the child (0-17) population for the first time in our state's history" (MN State Demographic Center, 2016). In Wisconsin, the same heavy growth is forecasted for elderly populations (age 65 and older) nearly doubling by 2040, increasing from 777,500 to 1,535,500 (WI Demographers Service Center, 2013). In addition to an increase in population that cannot or chooses not to drive, the number of trips by cars, trucks, and other roadway vehicles (buses, RVs) is projected to increase within the TCMC corridor, which will put pressure on existing transportation options in the form of increased congestion and travel times and a corresponding decrease in safety. According to the *Wisconsin Rail Plan 2030*, vehicle miles traveled on Wisconsin roads is expected to increase by 34% by 2030 (WisDOT, 2014). Congestion in the Twin Cities in Minnesota is also steadily increasing year after year and is expected to continue to increase based on population growth and economic activity (MN Go, 2016).

While the economic downturn of 2008 brought employment declines, the recent trends are upward and economic growth is expected to continue. The three Metropolitan Statistical Areas (MSAs) along the TCMC corridor experienced greater than 7% employment growth between 2010 and 2015. With this increase in employment, the population of the major cities is expected to increase. Table 8 provides total employment and recent trends in employment in the MSAs in the corridor.

Table 8: Employment – Metropolitan Statistical Areas

Major Cities (MSA)	2000	2010	2015	00 to 10 % Change	10 to 15 % Change
Minneapolis /St. Paul	1,706,000	1,699,500	1,859,775	-0.4%	+9%
Milwaukee	777,504	727,475	786,545	-6%	+8%
Chicago	4,554,000	4,352,500	4,660,743	-4%	+7%

Source: US Bureau of Labor Statistics, 2015

Table 9 shows the total travel demand forecasts for 2015 to 2050 for the Twin Cities-Milwaukee-Chicago corridor. The average annual growth in travel demand is forecasted at 1.45% between 2015 and 2050.

Table 9: Travel Demand Forecast in the TCMC Corridor

	2015	2025	2030	2035	2040
Total Travel Market (person trips)	217 million	250 million	272 million	294 million	359 million

Source: Transportation Economics & Management Systems, Inc. 2017

This forecasted employment and economic growth will result in increasing demand for existing transportation modes within the corridor. With limited travel mode choices and dependence on auto travel, there will be a resulting increased congestion on roadways and increased travel times, leading to the need for more diverse transportation mode choices. The major airports within the corridor (i.e., MSP

and MKE) are also congested, and passenger boardings are expected to increase each year. As Minnesota and Wisconsin populations grow the need for additional transportation options becomes a critical factor for this growth and connectivity. The competitive travel time and the frequency of passenger rail service can accommodate a portion of the demand.

3.3 Rail Transportation Choices

3.3.1 Train schedule and frequency

The new round-trip within the TCMC corridor would complement the existing *Empire Builder* long-distance service with a schedule providing an intercity frequency that is approximately 4 to 6 hours apart from the existing *Empire Builder* schedule to provide flexibility and convenience oriented towards passenger rail travel within the TCMC corridor. The additional round-trip would also need to integrate with the existing and future proposed *Hiawatha Service* schedule.⁶ This will be examined as part of further analysis completed for the TCMC service.

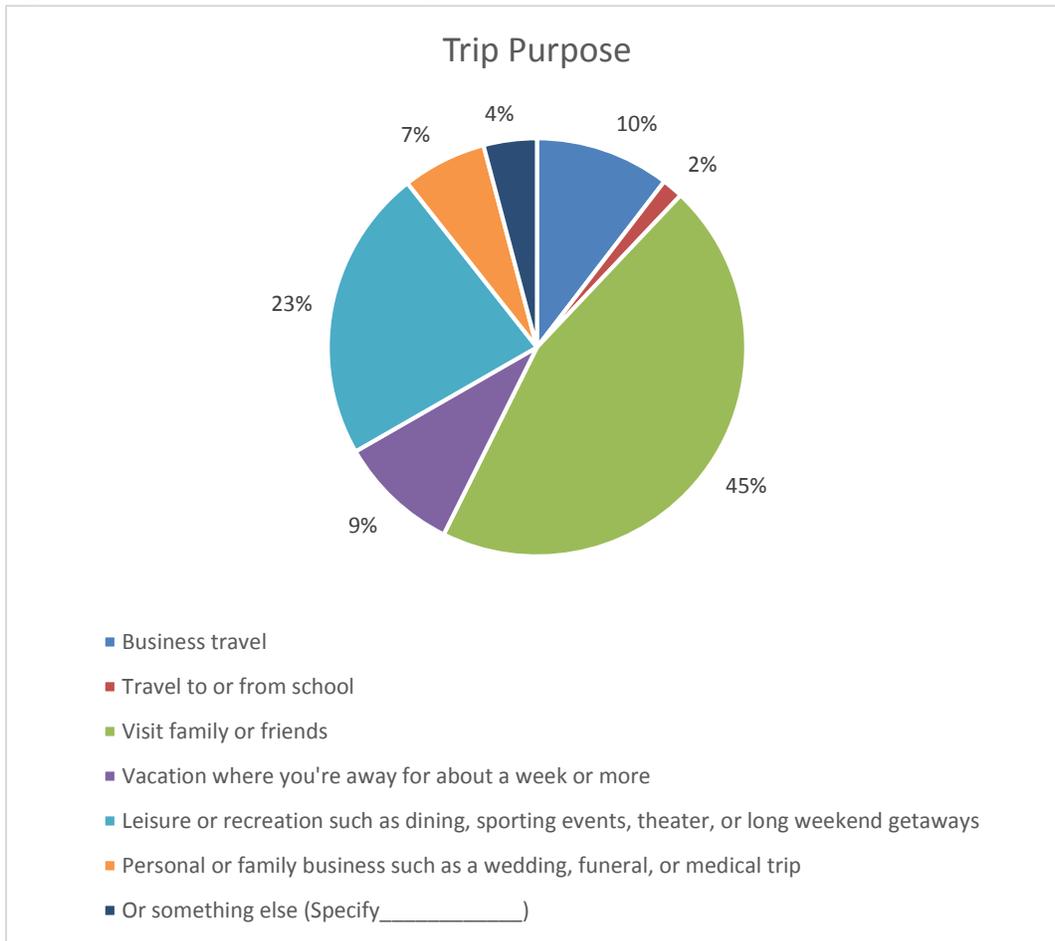
3.3.2 Empire Builder Travel Characteristics

Due to the schedule and frequency of long-distance passenger rail service, the largest percentage of riders in the TCMC corridor are traveling for leisure, when schedule is not a key requirement. The limited schedule and frequency of the *Empire Builder* service misses the opportunity to provide intercity service that could be used by leisure, business or school travelers that depend on the convenience of the schedule (see Figure 2). Currently, *Empire Builder* business and school ridership is considerably lower than the leisure and vacation ridership.

Travel by business professionals remains low within the TCMC corridor, in part due to the single round-trip option for business travelers that departs from Chicago at 2:15 PM, Monday-Friday and arrives in St. Paul at approximately 10:00 PM, departing for Chicago again at 8:00 AM the next morning. The *Empire Builder* schedule also creates difficult scheduling for the interim stops within the corridor as the train service provides interim stations with late afternoon travel to Minneapolis/St. Paul. An intercity frequency within the TCMC corridor would provide options to address the travel requirements of leisure, business and school travelers that prioritize schedule in making mode choices.

⁶ Hiawatha Services Schedule, effective October 15, 2016. <https://www.amtrak.com/ccurl/192/381/Hiawatha-Service-Schedule-101516,0.pdf>

Figure 2: Travel Characteristics, Empire Builder



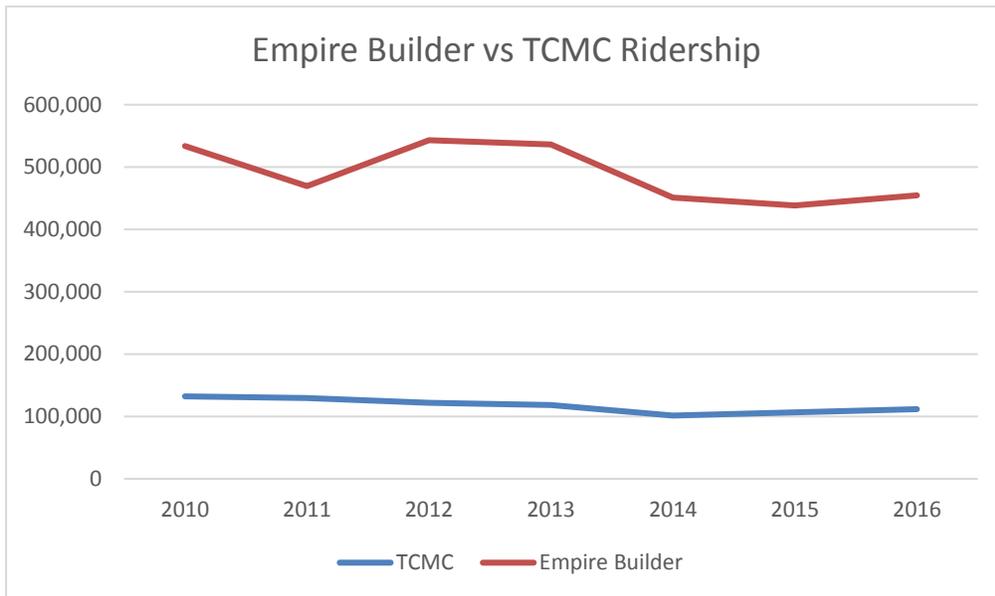
Source: Amtrak, 2016⁷

3.4 Ridership and Capacity of *Empire Builder* Service

Figure 3 illustrates the historical ridership between 2010 and 2016 for the *Empire Builder* service and the TCMC portion of the *Empire Builder* ridership, inclusive of passengers for both coach and sleeper tickets. The travel demand in the TCMC corridor remained relatively consistent between 2010 and 2016 despite fluctuations in ridership for the *Empire Builder* service, and travel demand within the TCMC corridor is forecasted to increase through 2040, as shown in Table 9.

⁷ Data based on market research and analysis conducted by Amtrak between November 2014 and August 2016.

Figure 3: Empire Builder and TCMC Corridor Ridership, 2010-2016 (FY)¹



Source: Amtrak, 2016

¹ See Table 10 for specific ridership numbers.

Table 10 provides the daily (2010-2016) *Empire Builder* ridership at stations within the TCMC corridor and identifies those passengers that use the *Empire Builder* service to travel exclusively within the TCMC corridor. On average, 24% of *Empire Builder* ridership that begins in the TCMC corridor stays within the TCMC corridor.

Table 10: Empire Builder Ridership Within the TCMC Corridor, 2010-2016 (FY)

Year (FY)	Empire Builder	TCMC Corridor	Percentage Within TCMC Corridor
2010	533,493	132,217	25%
2011	469,167	129,682	28%
2012	543,072	121,984	22%
2013	536,391	118,111	22%
2014	450,932	101,415	22%
2015	438,376	106,734	24%
2016	454,625	111,438	25%

Source: Amtrak, 2016

Table 11 provides ridership numbers between certain origin and destination pairs within the TCMC corridor. For example, in 2016, ridership for people travelling between St. Paul and Chicago was 26,785 riders. This represents 24% of ridership within the TCMC corridor and 6% of total ridership for the *Empire Builder* service. While this represents the highest ridership percentage within the TCMC corridor, ridership between smaller cities such as La Crosse, Tomah and Winona illustrate that riders are also making connections to the smaller intercity destinations along the corridor.

Table 11: Empire Builder Ridership Between Stations in TCMC Corridor, 2016 (FY)

Origin and Destination Pairs		Ridership	Ridership % of Total TCMC Corridor	Ridership % of Total Empire Builder Corridor
St. Paul, MN	Chicago, IL	26,785	24%	6%
La Crosse, WI	Chicago, IL	11,901	11%	3%
Tomah, WI	Chicago, IL	8,597	8%	2%
Wisconsin Dells, WI	Chicago, IL	7,358	7%	2%
Winona, MN	Chicago, IL	7,306	7%	2%
St. Paul, MN	Milwaukee, WI	5,842	5%	1%
Columbus, WI	Chicago, IL	4,615	4%	1%

Source: Amtrak, 2016

The use of the *Empire Builder* service for local travel within the TCMC corridor can lead to inefficient use of its available capacity, as seats that are sold for intercity passengers within the TCMC corridor may end up going unoccupied for the remainder of the trains' route to and from the West Coast. Additionally, the amenities and rolling stock design on the *Empire Builder* service (e.g., seating density, food service) are oriented to long-distance passengers at significantly higher cost-per-seat-mile than is typical for short-distance intercity passenger rail service.

The capacity of the TCMC corridor is shown in Table 12. The average load factor (ALF) represents the average of daily ridership compared to available seats between St. Paul and Chicago. The peak load factor (PLF) represents the average of the maximum ALF for the year. As shown by this data, the *Empire Builder* consistently operates above 60% capacity on a daily basis between St. Paul and Chicago and can exceed 90% capacity during peak periods in the summer.

Table 12: Capacity of TCMC Corridor 2012 – 2015 (FY)

Calendar Year	ALF	Highest ALF ¹	PLF	Highest PLF ¹
2012	62.8%	75.4%	78.9%	93.8%
2013	61.5%	76.1%	76.9%	91.4%
2014	54.1%	73.9%	76.5%	87.4%
2015	60.7%	82.9%	79.2%	98.6%

Source: Amtrak, 2016

¹ Highest ALF and PLF occurred in July of each year.

Table 13 provides a comparison of ridership, revenue and passenger miles of the TCMC corridor and *Empire Builder* service in FY 2015. During this period, riders within the TCMC corridor generated approximately 30 million passenger miles and \$6 million in revenue. This data illustrates the comparatively high percentage of ridership contained solely within the TCMC corridor (24%) to the lower revenue percentage (11%) generated by riders within the TCMC corridor. This data indicates that passengers travelling within the TCMC corridor do not spend as much (e.g., tickets and amenities) as passengers using the longer-service *Empire Builder* despite the TCMC passenger occupying the longer

distance seat. The addition of a new short-distance passenger train service operating within the TCMC corridor would provide more seating availability for the longer-distance traveler on the *Empire Builder* service, as well as additional capacity for the short-distance TCMC corridor passenger.

Table 13: Summary of Comparison of Ridership to Revenue Between Empire Builder and TCMC Route, 2015 (FY)

	Ridership	Revenue	Passenger Miles
<i>Empire Builder</i> Route	438,376	\$51,798,583	316,964,083
TCMC Route	106,734	\$5,881,193	29,835,267
TCMC as % of Empire Builder	24.0%	11%	9%

Source: Amtrak, 2016

4 References

Amtrak. May 2015. *Feasibility Report on Proposed Amtrak Service Chicago-Milwaukee-La Crosse-Twin Cities - (St. Cloud)*. <http://www.dot.state.mn.us/passengerrail/pdfs/2nd-train-feasibility-report%20.pdf>

Amtrak. August 1, 2016. *Empire Builder Schedule, Chicago and Portland/Seattle*. <https://www.amtrak.com/ccurl/187/788/Empire-Builder-Schedule-100816.pdf>

Bureau of Transportation Statistics (BTS). January - February 2015 Regularly Schedule Flights with More than 50% Delayed Arrivals of More than 30 Minutes. MSP-ORD. http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/subject_areas/airline_information/chronically_delayed_flights/html/2015_01_02.html

Coach USA, station locations. 2016. <http://www.coachusa.com/>. Accessed May 2017.

Economist, 2014. Based off of Bureau of Transportation Statistics. <http://www.economist.com/blogs/gulliver/2014/11/flight-delays>

FRA, WisDOT and IDOT. November 2016. *Chicago-Milwaukee Intercity Passenger Rail Program Draft Environmental Assessment*. <http://wisconsindot.gov/Documents/projects/multimodal/rail/chi-mil-ea.pdf>

Greyhound. Stations, 2016. <https://www.greyhound.com/>. Accessed May 2017.

Jefferson Lines, Bus Stops. Where We Go. <https://www.jeffersonlines.com/>. Accessed May 2017.

Lamers, The Passenger Professionals. Locations. 2016. <http://www.golamers.com/locations/>. Accessed May 2017.

Megabus. Station locations. 2016. <http://us.megabus.com/>. Accessed May 2017.

MN (Minnesota) Go. Draft plan, updated 2016. <http://minnesotago.org/final-plans/mnship-final-plan/chapter-2>

MN (Minnesota) State Demographic Center. "MN Data". "Most Recent Population" excel sheet. <http://mn.gov/admin/demography/data-by-topic/population-data/our-projections/>. Accessed November 2016.

MnDOT. March 2015. *Minnesota State Rail Plan, Draft*. <http://www.dot.state.mn.us/planning/railplan/resources.html>

MnDOT and WisDOT. July 2015. *Evaluation of a Second Daily Intercity Passenger Rail Frequency between Minnesota and Chicago, Executive Summary of Amtrak Feasibility Report and State Partners Conclusions and Recommendation*. <http://www.dot.state.mn.us/passengerrail/pdfs/2nd-train-feasibility-summary.pdf>

Midwest Regional Rail Initiative (MWRRI). September 2004. *Midwest Regional Rail System*.
<http://www.dot.state.mn.us/passengerrail/mwrri/index.html>

Quandel Consultants, LLC. October 26, 2011. Revised November 1, 2012. *Final Alternatives Selection Report: Identification of Reasonable and Feasible Passenger Rail Alternatives*.
<http://www.dot.state.mn.us/passengerrail/mwrri/phase7.html>

Tornado Bus Company. 2016. <http://tornadobus.com/index.php>. Accessed May 2017.

Trailways, Bus Stop Locations. 2016. Minnesota, Illinois, Wisconsin.
<https://webstore.trailways.com/locations.asp?state=MN>. Accessed May 2017.

Transportation Economics & Management Systems, Inc. January 2017. *Milwaukee-Twin Cities Passenger Rail EIS Ridership and Revenue Sensitivity Analysis Technical Report*. Draft, available by request.

WI (Wisconsin) Department of Administration, DSC (Demographics Services Center).
http://doa.wi.gov/Documents/DIR/Demographic%20Services%20Center/Estimates/OfficialFinalEsts_2016_summ.pdf

WisDOT. March 2014. *Wisconsin Rail Plan 2030*.
<http://wisconsin.gov/Pages/projects/multimodal/railplan/default.aspx>