Feasibility Report on Proposed Amtrak Service
Chicago-Milwaukee-LaCrosse-Twin Cities-(St. Cloud)

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May 6, 2015

Chicago-Milwaukee-Twin Cities-(St. Cloud)
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I. Introduction and Background

This report was prepared by the National Railroad Passenger Corporation (Amtrak) in response to a study request from the Minnesota Department of Transportation (MnDOT) in May 2012. The study's purpose was to determine the feasibility of adding a "Second Frequency" intercity passenger train service between Chicago Union Station (CUS) and the Minnesota Twin Cities Area, including St. Cloud, MN. This route for one additional daily train each way would be the same as the route currently used by Amtrak's *Empire Builder Service* via Milwaukee and LaCrosse, Wisconsin, and Winona and Red Wing, Minnesota. It would be state-supported in compliance with the requirements of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), Section 209. Among other requirements in Section 209, any expenses in excess of revenues in the operation of the service must be funded by the State(s) for which the trains are operated.

To assist readers' understanding of Amtrak's study process, Exhibit 1 provides an overview of the elements of a typical Amtrak feasibility study.

This study began shortly after the signing of a formal contract, on May 3, 2012, between MnDOT and Amtrak. In addition to the parties to the contract, other study participants include funding partners Wisconsin Department of Transportation (WISDOT) and La Crosse County, WI. Other stakeholders for the study include the City of LaCrosse, WI, Illinois Department of Transportation (IDOT), Canadian Pacific Railroad (CPR), BNSF Railway (BNSF), Metra Commuter Service (Metra) in Chicago, Minnesota Commercial Railroad (MNNR) in St. Paul, Union Pacific Railroad (UP), and Ramsey County Regional Railroad Authority (RCRRA).

II. Study Purpose and Nature of Feasibility Study

Amtrak corridor feasibility studies typically originate in the form of a request by a recognized state or regional governmental authority or agency that is responsible for state transportation – usually the Department of Transportation (DOT) or its equivalent. Amtrak's policy for commencing a new corridor feasibility study is to enter into an agreement with the requesting agency specifying, along with various contract conditions, a scope of work, the timeline for completion, and terms of payment to Amtrak for study costs.

The nature or purpose of a corridor study is to assist a state in determining the "feasibility" (viability, prospects for success, initial and on-going costs, and reasonableness) of a specific passenger train service proposed by the state. The study is to develop a high level, order-of-magnitude assessment of schedules, ridership, revenue, infrastructure investments, operating costs, and equipment needs (railcars and locomotives) based on routes, station stops, and frequencies of service selected by the state, the feasibility study develops a high level, order-of-magnitude assessment of schedules, ridership, revenue, infrastructure investments, operating costs, and equipment needs (railcars and locomotives). Such studies are not intended to be in-depth evaluations resulting in detailed cost and financial analyses, operating parameters, long term revenue/ridership forecasts, highly detailed infrastructure assessments, and engineering documents or financial reports that are "contract ready". Rather, they are intended to assist states in deciding whether the apparent merits of the

proposal can justify the next steps of implementation. The study is also not intended to be the sole basis of future contracts between the state and the host railroads, between the state and Amtrak, or between Amtrak and the host railroads. Furthermore, because the time lapse between release of a feasibility report and implementation of service could be lengthy, many of the conditions at the time of the feasibility study could be invalid by the date of service implementation and may have to be revisited.

Deliverables are presented in summary form and are developed through a process that combines Amtrak historical experience, modeling, and empirical data from comparable operations, calculations based on rail industry standards and practices, and current costs.

It is presumed that the state, local communities, developers, host railroads, or various combinations of those will be responsible for providing station facilities, including platforms, if they do not currently exist. Amtrak offers guidance for the development of station facilities on its web site, www.greatamericanstations.com, but does not provide actual station design services.

Although there have been general operational discussions with the host railroads and preliminary capacity modeling, the specific infrastructure improvement proposals, it should be noted that draft schedules and other railroad-related comments in this report have not been negotiated or agreed upon. Information reflects only the findings and best judgment recommendations of the study team. Should further progression of the proposal be desired, detailed discussions and formal contract negotiations will have to be initiated with those rail carriers. Implementation of service is also subject to the time required to procure rolling stock, complete the package of infrastructure improvements ultimately agreed to, and recruit and train any additional needed personnel. Finally, a funding source to provide on-going financial support for the service would also have to be identified by the State.

III. Corridor Characteristics

III.A. Route Overview

MnDOT requested that Amtrak evaluate four route and terminal station scenarios.

- Scenario 1: Chicago to St. Cloud with stops at Union Depot in St. Paul and Minneapolis' Target Field Station.

- Scenario 2: Chicago to St. Cloud with stops at Union Depot in St. Paul and Fridley Northstar Station

- Scenario 3: Chicago to Target Fields Station with a stop at Union Depot in St Paul.

- Scenario 4: Chicago to Union Depot in St. Paul

Not including the Twin Cities-St. Cloud areas, all other station stops east of St. Paul in the provisional schedules are the same as those currently served by Amtrak's *Empire Builder*

Service, with the exception of an additional stop at the Milwaukee Airport Rail Station. Exhibit 2 provides aerial views, photos and schematics of the entire study corridor with alternative routes and station stops in the Twin Cities-St. Cloud areas.

General Service / Operational Assumptions

All station stops between St. Paul and Chicago in the provisional schedules are the same as those currently served by Amtrak's Empire Builder Service, with the exception of the addition of a stop at the Milwaukee Airport Rail Station. In the Twin Cities-St. Cloud areas, Minneapolis Target Field Station and Fridley, MN would be additional stations not currently served by Amtrak.

The train operation along the corridor will operate at a maximum authorized speed not to exceed 79 mph. This is consistent with Amtrak's current Empire Builder train operations.

Alternative Routes 1 and 3 will require a "push-pull" locomotive configuration due to the inability to turn equipment consists at certain proposed Minnesota terminal stations. This arrangement provides for a locomotive unit on each end of the train, or a locomotive on one end and a non-powered control unit (NPCU) or bi-level cab car on the other end. Wye tracks for turning equipment are located in close proximity to all termini locations, but the feasibility of utilizing these wye tracks in a timely fashion may be limited due to heavy freight traffic.

This study assumes the proposed new frequencies will not accommodate checked baggage.

This study assumes the equipment consist will include a food service car (café, lounge or bistro car) with food and beverage service but will not include a full diner.

This study assumes the train consist will utilize bi-level Superliner-type equipment, similar to that used in the Empire Builder consist.

This study assumes that no use of Amtrak-owned equipment is available and that state-owned equipment will be used.

This study assumes two operational differences form the Empire Builder; no extended rest stop in Winona, and no multiple stops at a single station.

Study Corridor

Geographically, the study corridor extends northward from Chicago to Milwaukee then mostly westward through central Wisconsin and eastern Minnesota to the Twin Cities and then northwest to St. Cloud. Track ownership breaks down as follows: Amtrak (less than 1 mile) at Chicago Union Station, Metra (32 miles), Canadian Pacific Railroad (386 miles), MNNR (1 mile) and Burlington Northern Santa Fe (67 miles). The overall corridor length from Chicago Union station to St. Cloud is 486 miles as described in Table 1. CPR mainline tracks represent roughly 80% of the corridor trackage from Chicago to St. Cloud and 85% of the corridor trackage between Chicago and St. Paul. Section X discusses host railroad infrastructure in greater detail. Near Union Depot in St. Paul, the Second Frequency trains would operate over a short section (about 1500 feet) of a connecting track owned track owned by UP and dispatched by BNSF.

Table 1: Track Ownership

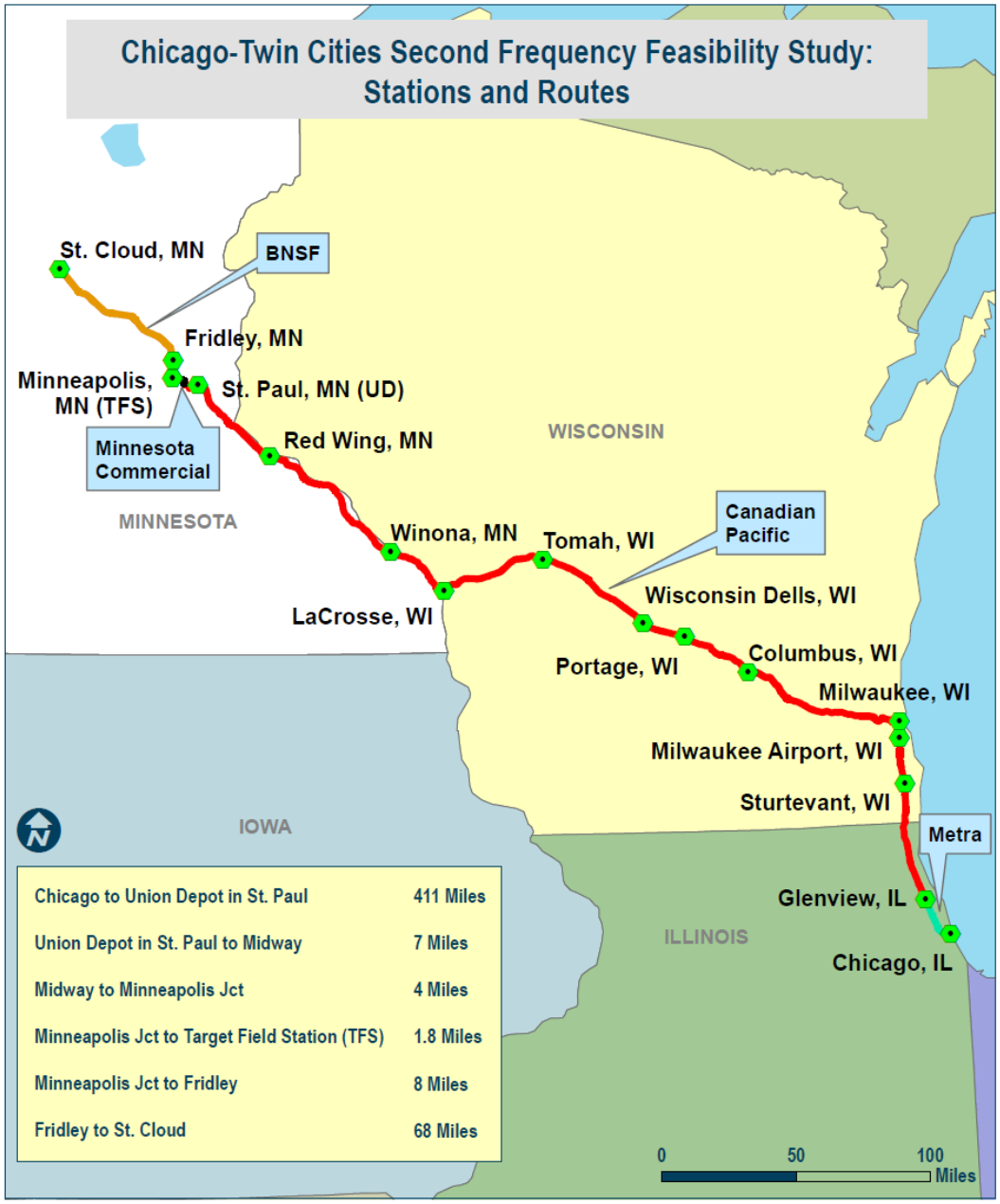
Host Railroad	Railroad Subdivision	Line Segment	Route Miles
AMTRAK	Amtrak Chicago Terminal	Chicago Union Station	1
METRA	Milwaukee District North Line	Chicago Union Station to Rondout	32
CPR	C&M, Watertown, Tomah, River, Merriam Park	Rondout to Division St.	377
UP	Albert Lea	Division St. to Union depot	0.25
RCRRA	Union Depot	Union Depot to Robert St.	0.5
CPR	Merriam Park	Robert St. to Merriam Park Jct.	5.5
MNNR	Minnesota Commercial Railway	Merriam Park Jct to St. Anthony Jct	1.75
BNSF	St. Paul, Staples	St. Anthony Jct to St. Cloud	67
		TOTAL ROUTE	**485**

Beginning at the corridor's east terminus, Chicago Union Station (CUS), Amtrak owns all of the station trackage north to the Canal Street grade crossing, a total route distance of 0.6 miles. From Canal Street, the next 32 miles of the corridor are double track main lines, with a 5-mile segment of triple track between Canal Street and Tower A5 (milepost 5.4), all owned by Metra. The Metra line is a very high density route that currently handles approximately 98 train movements daily between Tower A5 and Rondout. The traffic mix includes approximately 22 freight trains, 16 intercity passenger trains (Amtrak), and 60 Metra commuter trains. The segment between CUS and Tower A5 can have as many as 120 train movements daily, including equipment moves between CUS and shop facilities, and is a significant constraint to Metra and Amtrak train operations.

At Rondout, IL right of way ownership changes from Metra to CPR and remains so for the 386 miles to Merriam Park Junction in St. Paul. The segment from Rondout to Pewaukee, WI (20 miles west of Milwaukee) is all double track main line. Of the remaining CPR route west of Pewaukee, only 43 route miles are double tracked while the other 243 miles are single track with passing sidings that average about 12,000 to 14,000 feet in length. A number of these sidings are constructed with jointed rail. All CPR mainline tracks are signaled and interlocked with train operations controlled by a Centralized Traffic Control (CTC) system. At Hastings, MN, where the route crosses the Mississippi River, the CPR line is single track for 11 miles to Newport, MN, and is paired with BNSF track from Hastings through Hoffman Interlocking, which is approximately 20 miles. The paired tracks, while separately owned by CPR and

BNSF, function as a double track railroad. From Newport to Hoffman, the two tracks are side by side, but between Hastings and Newport the northerly CPR track profile is straighter and more direct than the southerly BNSF track, which tends to follow the Mississippi River over a circuitous route. Depending on the level of freight train activity on each main line, Amtrak passenger trains can be dispatched over either line. The corridor from Hastings to Hoffman Interlocking, including the separated lines between Hastings and Newport, is controlled by BNSF dispatchers.

Corridor Map



Other Ongoing Studies on the Corridor

In 2011, MnDOT submitted to the Federal Railroad Administration (FRA) an "Alternatives Selection Report for the Milwaukee-Twin Cities High-Speed Rail (HSR) Corridor Program". The conclusion of that report, which now has FRA approval, was that the current Amtrak *Empire Builder* route was the preferred route for the development of a Service Level Environmental Impact Statement (Tier 1 – EIS) NEPA document.

The proposed train service analyzed by this study would use the same route and thus conforms with, and is supported by, the Alternatives Selection Report. A positive Record of Decision (ROD) for the Tier 1 – EIS will support the further development of conventional and high-speed intercity passenger service on this corridor.

In addition, on the segment of the corridor between Chicago and Milwaukee, the Wisconsin DOT, Illinois DOT, and Federal Railroad Administration, in partnership with Amtrak, are conducting an Environmental Assessment and Service Development Plan that considers the addition of more Amtrak "Hiawatha" Service frequencies between Chicago and Milwaukee. The intent is to increase the current seven daily Hiawatha round trips to 10 daily round trips. The additional frequencies could be added all at once or be phased in over a period of time not yet determined. If phased, each added frequency has an associated package of infrastructure improvements.

Discussion of Alternative Route Scenarios

While 85% of the route from Chicago to St. Paul will be identical to that of the *Empire Builder* trains, at the request of MnDOT, this study evaluates four alternative scenarios for route and station stops between and including St. Paul and St. Cloud.

Scenario 1: Chicago-St. Cloud with intermediate stops at Union Depot in St. Paul and at the Minneapolis Target Field Station.

This alternative route would use the tracks of four host carriers: Metra, CPR, MNNR, and BNSF, plus the jointly owned track in Union Depot.

The new Union Depot in St. Paul is designed for efficient train access to and from mainline tracks at both ends of the station site. However, access to the Target Field station in downtown Minneapolis is problematic. As illustrated in Exhibit 2, a train serving Target Field Station must leave the east-west BNSF St. Paul Subdivision at Minneapolis Junction and make a 1.6-mile side trip to Target Field station. In order to continue the trip beyond Target Field, the train must either make a backup move to Minneapolis Junction or have a "push-pull" equipment configuration, i.e., a locomotive at each end of the train or a locomotive on one end and a cab (control) car on the other end. Whether the train backs up to Minneapolis Junction or the locomotive engineer swaps ends of the train at Target Field station and "heads out" to Minneapolis Junction, the move consumes a significant amount of time and is detrimental to the overall schedule. Compounding the time lost to the move itself is the potential for the Second Frequency train to be delayed by freight trains or Northstar commuter trains as it awaits permission to re-enter the BNSF Midway Subdivision mainline at Minneapolis Junction. Because of this complexity in operating, additional evaluation of service to Target Field station is recommended by this study to

compare the loss of schedule time and higher operating cost with potentially higher ridership and revenue for this alternative.

Another challenge in serving the Target Field station is BNSF capital costs for infrastructure improvements between Minneapolis Junction and Target Field station. Section X discusses this further.

In this alternative, St. Cloud is the west end terminus station. Because currently there is no available space near the Amtrak Station for a layover facility for equipment, this study assumes that a site can be located within a short distance of the station, perhaps at the BNSF Yard located approximately 1.5 miles west of the station. Section X contains an estimated cost for constructing a new St. Cloud layover facility that would require a single track approximately 650 feet in length. The St. Cloud Amtrak station currently has a platform on only one of the two main tracks.

Between Minneapolis (St. Anthony Junction) and St. Cloud, BNSF has identified required infrastructure improvements that the host railroad considers essential for the implementation of a new *Second Frequency Service* on the BNSF route segment. The costs associated with these improvements are addressed in Section X.

The existing BNSF portion of the corridor is largely a double track railroad. However, BNSF has indicated that two segments of single track will require construction of a second or third main track to accommodate the proposed *Second Frequency Service*. These segments are between Becker and Big Lake (10.5 miles) and between Coon Creek Junction and "Interstate" (6 miles). Interstate is at the west end of the BNSF Northtown Yard near the I-694 Interstate Highway crossing.

Scenario 2: Chicago-St. Cloud with intermediate stops at Union Depot and at Fridley, MN Northstar Station

The goal for this scenario was to determine if a north Minneapolis suburb station could 1) meet train and station operations requirements, including parking, 2) provide better train access and require lower capital cost than the Target Field station Alternative, 3) have minimal impact to the overall schedule, and 4) generate attractive ridership numbers. The Fridley Station currently has a platform on only one of the two main tracks, and Amtrak schedules would have to be closely coordinated with Northstar schedules. In effect, the Fridley Station was selected for inclusion in the study to serve as a reasonable "place holder", as other Northstar stations may prove to be feasible as well. These include both existing and future stations in communities such as Coon Rapids, Anoka and Ramsey.

Unlike the access problems at Target Field station, Fridley, Anoka and other Northstar stations are adjacent to the BNSF mainline track, which allows for a short dwell time at the station for passenger transfer. Exhibit 2, Sheets 10 and 11 describe the layout at Fridley Station and the availability of parking.

Scenario 3: Chicago-Minneapolis (TFS) with an intermediate stop at Union Depot in St. Paul

This third alternative establishes Target Field station as the western-most station stop for a Second Frequency Service. This station is better suited as a terminus station than as an intermediate station stop as described in Scenario 1. With Target Field station as the west

terminus, the inbound train arrives, de-boards passengers, and immediately moves to a layover facility, either at or near the station or at Amtrak's Midway facility.

Scenario 4: Chicago-St. Paul (UD)

Operationally, terminating the Second Frequency Service at Union Depot in St. Paul would be the easiest scenario to implement. Also, it would be the lowest infrastructure capital investment alternative. The renovation of the historic station, completed at the end of 2012, included building two station tracks and two stub tracks for equipment storage. Final track and signal connections between the Depot tracks and the mainline tracks were completed in April, 2014 with Amtrak's Trains #7 and #8 beginning daily service to Union Depot in St Paul on May 7, 2014.

With ample capacity at Union Depot in St Paul, no further station infrastructure investment would be required to add the Second Frequency service there. For layover and servicing, the train consists would be deadheaded to the Midway facility about 7 miles west of Union Depot. Additionally, in lieu of Midway as the layover location (owned by Amtrak), the facilities at Union Depot could potentially support layover of this train, but at a cost for a servicing track. Also to note, this would eliminate the 7-mile movement both to and from Midway. Furthermore, a wye is available at Midway, potentially eliminating the need for a push/pull consist.

Alternative Routes and the East Metro Capacity Study

The East Metro Capacity Study is an ongoing initiative for the improvement of rail capacity and fluidity in the rail corridor from Hastings, MN to the areas just west and north of Hoffman Interlocking, which is located along the Mississippi River near Union Depot in St. Paul. Sheet 2 of Exhibit 2 describes the East Metro Study Corridor schematically.

Many projects and subprojects are associated with these planned future infrastructure improvements that, in total, are estimated to cost roughly $875 million (in 2014 dollars) if all projects were to be constructed at once. Because the study expects the various projects to be constructed in phases over many years, however, the ultimate cost will be much greater than $875 million. (The exact amount cannot be determined due to the unknown timing of funding availability and sequencing of projects.)

Reasons for a phased approach are varied, but the key triggers for individual project implementation are funding availability and rates of growth of both freight and passenger trains. The current Empire Builder service and potential Second Frequency service could certainly benefit from some of these projects, as would freight operations in general.

In 2013, Ramsey County, Minnesota estimated that these projects to improve fluidity through the yard for passenger and freight would cost $49.9 million. (Source: East Metro Rail Capacity Study, 2012). However, the startup of a Second Frequency service alone is not considered by this feasibility study to be contingent upon the implementation of any particular East Metro project. That said, if the timing of the proposed new passenger service is far enough into the future, it is possible that continued freight traffic growth,

together with a new passenger frequency, could trigger the need for infrastructure improvements in the East Metro area.

Typically, startup of a new state-supported passenger service requires 3 to 5 years from the decision date to go forward with implementation, but in this case it could be less since this startup is on an existing corridor with existing stations. BNSF and CPR have initiated several capital projects in the East Metro over the last year. CPR is extending the length of five tracks within their Dunn Yard and adding a sixth. This will improve mainline capacity by allowing longer freight trains to access the yard without splitting and blocking the mainline for extended periods. Additionally, in 2015 BNSF plans to convert a yard track within Dayton's Bluff Yard to a 3rd Main track. These projects will substantially improve mainline capacity and fluidity in the area.

The full East Metro Rail Capacity Study can be located at the following website:

http://www.co.ramsey.mn.us/rail/docs/2012_FINAL_REPORT_East_Metro_Rail_Capacity_Study.pdf

III.B. Demographics and Transportation Alternatives

One of the primary characteristics of a successful intercity rail passenger corridor is a substantial population in the key cities served. The metropolitan area of Chicago has a population of 9,537,289, while the other major metropolitan areas have populations as follows; Milwaukee 1,569,659, St. Paul and Minneapolis 3,459,146, for a total of approximately 14.6 million people. Table 2 provides the populations of these and other cities along the proposed route of the Second Frequency. (Source: U.S. Census Bureau 2013 estimates).

Table 2

Metropolitan Statistical Areas (MSA) and Populations	Population (2013 est.)
Chicago, IL (MSA)	9,537,289
Glenview, IL	45,000
Milwaukee, WI (MSA)	1,569,659
Columbus, WI	5,100
Portage, WI	10,400
Wisconsin Dells, WI	2,700
Tomah, WI	9,200
LaCrosse, WI	51,400
Winona, MN	27,600
Red Wing, MN	16,500
Minneapolis/St. Paul, MN (MSA)	3,459,146
Fridley, MN	27,200
St. Cloud, MN	66,600
Combined MSAs & Cities	14,827,794

Competitive Transportation Modes:

Amtrak currently operates the Empire Builder Service between Chicago, the Twin Cities and St. Cloud. This service consists of one daily train each way. The current Empire Builder schedule provides for a trip time of 8 hours 16 minutes between Chicago Union Station and Union Depot in St. Paul.

Two major interstate highways, I-90 and I-94, intertwine to serve the Twin Cities-Milwaukee-Chicago Corridor. Posted maximum speed limits are generally 65-70 mph. Non-stop drive time from the Twin Cities to Chicago is roughly 7 hours. If the auto trip includes stops for fuel and meals, Amtrak trip time compares favorably with auto travel.

Three major bus lines – Greyhound, Megabus and Trailways offer a total of 13 daily departures each way. The average trip time ranges between 8 and 12 hours. Bus fares are significantly lower than current Amtrak and airline fares, but the travel time is substantially longer.

Four major airlines – American, Delta, Southwest and United – operate an average of 37 one-way flights daily between Minneapolis-St. Paul International Airport and Chicago's O'Hare and Midway International Airports. Typical flight times are 90 minutes. Between MSP Airport and Milwaukee's General Mitchell International Airport, Delta operates an average of 6 daily flights and Southwest an average of 3 daily flights.

III.C Route Inspections

A route inspection trip was conducted during the first week of April 2012. Participants included CPR engineering and operations personnel, consulting engineers, as well as MnDOT and Amtrak representatives. The observations and discussions from the inspection trip have been supplemented by information provided by HDR Engineering's on-going Tier 1 Environmental Impact Statement (EIS) High Speed Rail studies along the corridor and by direct input on infrastructure and operations from CPR, BNSF, MNNR and Metra.

The purpose of the inspection trip was to share general operating information about the route and to gain insight into existing infrastructure conditions. Typically, these joint inspections and preliminary discussions with corporate and local operating and engineering personnel allow for general infrastructure and operating information to be collected and documented.

The field inspections were conducted from a "hi-rail" vehicle (a vehicle equipped with flanged rail wheels to allow travel on railroad tracks). The inspections were not detailed route surveys and were intended only for the development of high level, order-of-magnitude estimates of infrastructure conditions, quantities and costs.

IV. Station Facilities

For most of the corridor, the existing station facilities are more than adequate to accommodate the addition of a Second Frequency train. However, certain municipalities are contemplating station improvements or have improvements underway.

According to CPR, additional daily passenger train frequencies on the segment of the Chicago-Milwaukee corridor that entails a stop at the Milwaukee Airport Station will necessitate construction of a second platform along the second main track in this area. Construction plans for a second platform and pedestrian overpass are in the planning process. At the existing Milwaukee Station, work commenced in the fall of 2014 to replace the existing Train Shed and add improvements to the existing platforms.

BNSF has indicated that increased passenger train service at the Target Field Station will require an additional track in the platform area because Northstar commuter trains are fully utilizing the existing station track capacity.

The Fridley Northstar Station or other potential station stops west of Minneapolis will require further vetting by the State to determine the adequacy of the facilities for handling a new Amtrak intercity train service. Exhibit 2 (Sheet 1) describes the location of station stops considered in this study. Regarding station platform design and construction, it should be noted that requirements in the United States Department of Transportation's (USDOT) Final Ruling on the Americans with Disabilities Act (ADA) regulations, specifically Docket OST-2006-23985, must be met. In this regulation, the USDOT requires that new commuter and intercity rail stations shall provide level-entry boarding to all accessible cars in each train using the station.

The implementation of Passenger Information Display Systems (PIDS) at stations and platforms is at the discretion of each local station municipality and/or the State DOT. Amtrak will assist the municipalities and States in the planning and implementation of PIDS, but does not participate in the capital funding of PIDS systems for State-supported passenger rail services. A standard train crew would consist of one engineer, one conductor, one assistant conductor, and one lead service attendant. Some scenarios would require a crew change in Winona.

V. Crew Labor: Train & Engine (T&E) & LSA (Lead Service Attendant).

Staffing of Amtrak Personnel:

Amtrak will hire and train sufficient personnel for train operations, on-board services, mechanical work, and cleaning services (the latter is sometimes handled through contracts with outside firms) to meet the schedule requirements requested by the State. This includes a sufficient number of employees to cover vacation and holiday periods as well as enabling a 7-day per week service. A standard train crew would consist of one engineer, one conductor, one assistant conductor, and one lead service attendant. Some scenarios would require a crew change in Winona.

VI. Schedules

As this Feasibility Study commenced, the State DOTs provided to Amtrak the proposed station stops and approximate initial terminal departure times. These times were vetted and refined by Amtrak operations and scheduling staff to develop the final Feasibility Study schedules presented in Table 3.

The overall trip schedule for the Second Frequency is very similar to Amtrak's Empire Builder schedule, with a few exceptions. The current departure schedules for Empire Builder Trains are early morning from Union Depot in St. Paul for #7 (eastbound) and early afternoon from Chicago for #8 (westbound). The Second Frequency departures will be separated from #7 and #8 by 4 to 5 hours with the eastbound train leaving in early afternoon and the westbound train leaving in the morning.

It should be noted that, at the request of MnDOT and WISDOT, schedules were developed for all four scenarios with two alternative departure times for the eastbound train from Union Depot in St. Paul. The departure times from UD at 2:25 PM (Option A) and 12:25 PM (Option B) were evaluated for impact on ridership and revenue. The market demand results suggest the earlier 12:25 PM departure (Option B) is forecast to produce the higher ridership and revenue. Between Chicago and St. Paul, the station stops for the Second Frequency will be the same as those of the Empire Builder trains with one exception. An added station stop will occur at the Milwaukee Airport Station. Between St. Paul and St. Cloud, the Second Frequency station stops are addressed in Section III.A.

TABLE 3 – SCHEDULES

These schedules are for modeling and study purposes only.
Schedule Option A - Dp CHI Westbound 9:25A;
Dp Union Depot Eastbound *2:25P*

WESTBOUND ® denotes receive passengers only			Scenario 1	Scenario 2	Scenario 3	Scenario 4	Empire Builder #7
Chicago, IL	CHI	Dp	9:25A	9:25A	9:25A	9:25A	2:15P
Glenview, IL	GLN		R 9:47A	R 9:47A	R 9:47A	R9:47A	R 2:39P
Milwaukee Airport, WI ®	MKA		10:33A	10:33A	10:33A	10:33A	…
Milwaukee, WI ®	MKE	Ar	10:49A	10:49A	10:49A	10:49A	R 3:45P
	MKE	Dp	10:54A	10:54A	10:54A	10:54A	R 3:55P
Columbus, WI	CBS		12:01P	12:01P	12:01P	12:01P	5:05P
Portage, WI	POG		12:30P	12:30P	12:30P	12:30P	5:34P
Wisconsin Dells, WI	WDL		12:47P	12:47P	12:47P	12:47P	5:52P
Tomah, WI	TOH		1:25P	1:25P	1:25P	1:25P	6:30P
La Crosse, WI	LSE		2:07P	2:07P	2:07P	2:07P	7:14P
Winona, WI	WIN		2:49P	2:49P	2:49P	2:49P	7:50P
Red Wing, MN	RDW		3:51P	3:51P	3:51P	3:51P	8:52P
St. Paul, MN (Union Depot)		Ar	4:42P	4:42P	4:42P	4:52P	10:03P
		Dp	4:47P	4:47P	4:47P	…	10:10P
Minneapolis, MN (Target Field)		Ar	5:27P	…	5:32P	…	…
		Dp	5:37P	…	…	…	…
Fridley, MN			…	5:38P	…	…	…
St. Cloud, MN	SCD	Ar	7:00P	6:45P	…	…	12:34A
EASTBOUND **(D) denotes discharge passengers only**			**Empire Builder #8**	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**
St. Cloud, MN	SCD	Dp	5:14A	12:22P	12:37P	…	…
Fridley, MN			…	…	1:38P	…	…
Minneapolis, MN (Target Field)		Ar	- - -	1:35P	- - -	…	…
		Dp	- - -	1:45P	- - -	1:45P	…
St. Paul, MN (Union Depot)		Ar	7:52A	2:20P	2:20P	2:20P	…
		Dp	8:00A	***2:25P***	***2:25P***	***2:25P***	***2:25P***
Red Wing, MN	RDW		8:54A	3:13P	3:13P	3:13P	3:13P
Winona, WI	WIN		10:11A	4:16P	4:16P	4:16P	4:16P
La Crosse, WI	LSE		10:47A	4:51P	4:51P	4:51P	4:51P
Tomah, WI	TOH		11:26A	5:31P	5:31P	5:31P	5:31P
Wisconsin Dells, WI	WDL		12:08P	6:13P	6:13P	6:13P	6:13P
Portage, WI	POG		12:27P	6:34P	6:34P	6:34P	6:34P
Columbus, WI	CBS		12:57P	7:02P	7:02P	7:02P	7:02P
Milwaukee, WI (D)	MKE	Ar	D 2:07P	8:20P	8:20P	8:20P	8:20P
	MKE	Dp		8:25P	8:25P	8:25P	8:25P
Milwaukee Airport, WI ®	MKA		…	8:37P	8:37P	8:37P	8:37P
Glenview, IL	GLN			D 9:20P	D 9:20P	D 9:20P	D 9:230P…
Chicago, IL	CHI	Ar	3:55P	9:54P	9:54P	9:54P	9:54P

These schedules are for modeling and study purposes only.

Schedule Option B – Dp CHI Westbound 9:25A;

Dp Union Depot Eastbound ***12:25P***

WESTBOUND ® denotes receive passengers only			Scenario 1	Scenario 2	Scenario 3	Scenario 4	Empire Builder #7
Chicago, IL	CHI	Dp	9:25A	9:25A	9:25A	9:25A	2:15P
Glenview, IL	GLN		R 9:47A	R 9:47A	R 9:47A	R 9:47A	R 2:39P
Milwaukee Airport, WI ®	MKA		10:33A	10:33A	10:33A	10:33A	…
Milwaukee, WI ®	MKE	Ar	10:49A	10:49A	10:49A	10:49A	R 3:45P
	MKE	Dp	10:54A	10:54A	10:54A	10:54A	R 3:55P
Columbus, WI	CBS		12:01P	12:01P	12:01P	12:01P	5:05P
Portage, WI	POG		12:30P	12:30P	12:30P	12:30P	5:34P
Wisconsin Dells, WI	WDL		12:47P	12:47P	12:47P	12:47P	5:52P
Tomah, WI	TOH		1:25P	1:25P	1:25P	1:25P	6:30P
La Crosse, WI	LSE		2:07P	2:07P	2:07P	2:07P	7:14P
Winona, WI	WIN		2:49P	2:49P	2:49P	2:49P	7:50P
Red Wing, MN	RDW		3:51P	3:51P	3:51P	3:51P	8:52P
St. Paul, MN (Union Depot)		Ar	4:42P	4:42P	4:42P	4:52P	10:03P
		Dp	4:47P	4:47P	4:47P	…	10:10P
Minneapolis, MN (Target Field)		Ar	5:27P	…	5:32P	…	…
		Dp	5:37P	…	…	…	…
Fridley, MN			…	5:38P	…	…	…
St. Cloud, MN	SCD	Ar	7:00P	6:45P	…	…	12:34A

EASTBOUND (D) denotes discharge passengers only			Empire Builder #8	Scenario 1	Scenario 2	Scenario 3	Scenario 4
St. Cloud, MN	SCD	Dp	5:14A	10:22A	10:37A	…	…
Fridley, MN			…	…	11:38A	…	…
Minneapolis, MN (Target Field)		Ar	…	11:35A	- - -	…	…
		Dp	…	11:45A	- - -	11:45A	…
St. Paul, MN (Union Depot)		Ar	7:52A	12:20P	12:20P	12:20P	…
		Dp	8:00A	***12:25P***	***12:25P***	***12:25P***	***12:25P***
Red Wing, MN	RDW		8:54A	1:13P	1:13P	1:13P	1:13P
Winona, WI	WIN		10:11A	2:16P	2:16P	2:16P	2:16P
La Crosse, WI	LSE		10:47A	2:51P	2:51P	2:51P	2:51P
Tomah, WI	TOH		11:26A	3:31P	3:31P	3:31P	3:31P
Wisconsin Dells, WI	WDL		12:08P	4:13P	4:13P	4:13P	4:13P
Portage, WI	POG		12:27P	4:34P	4:34P	4:34P	4:34P
Columbus, WI	CBS		12:57P	5:02P	5:02P	5:02P	5:02P
Milwaukee, WI	MKE	Ar	D 2:07P	6:20P	6:20P	6:20P	6:20P
	MKE	Dp	…	6:25P	6:25P	6:25P	6:25P
Milwaukee Airport, WI	MKA		…	6:37P	6:37P	6:37P	6:37P
Glenview, IL	GLN			D 7:23P	D 7:23	D 7:23P	D7:23P
Chicago, IL	CHI	Ar	3:55P	7:57P	7:57P	7:57P	7:57P

Both of these schedules were modeled by MnDOT's contractor using Train Performance Calculator (TPC) and Rail Traffic Controller (RTC) programs. During the modeling process, it was discovered that a third schedule, similar to alternative B but with slightly different departure times, was the most operationally efficient schedule and required the least amount of infrastructure improvements to achieve appropriate performance for passenger and freight trains. This "optimized" schedule has departure from Chicago at 10:15 AM and from St. Paul at 11:46. Note: The "optimized" schedule was not part of the Amtrak evaluations.

VII. Ridership/Revenue Forecast Summary

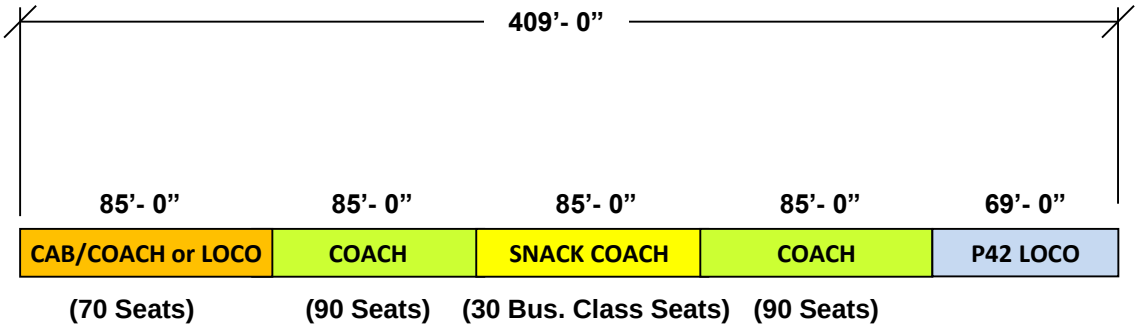
Ridership and Ticket Revenue forecasts summarized in Table 5 are based in part on the community populations in Table 2 and the schedules defined in Table 3. Ridership and ticket revenue forecasts for proposed passenger rail have been prepared using a "National Corridor Model" developed by AECOM for Amtrak and various states for corridor passenger rail forecasting throughout the US. An application of this model was developed for the Second Frequency Feasibility Study to evaluate proposed new passenger rail services based on the following key inputs:

- Station Locations
- Passenger Rail Timetable, providing departure/arrival times by train and station and thus defining:
  - travel time.
  - frequency.
  - departure/arrival time-of-day slots.
- Average Fares, based on observed average yields per mile in existing Amtrak markets within the Midwest.
- Population, employment, and income of each market served.
- Service characteristics of competing modes – auto, air, and bus.

VIII. Rolling Stock and Maintenance

Equipment Availability:

The proposed scenarios would require two equipment sets to operate, which would require two diesel locomotives, four bi-level coaches, two bi-level snack coaches, and two bi-level cab coaches. All route alternatives assume trainsets will be in "push-pull mode", with one locomotive and one cab/coach (or a second locomotive). The equipment consist will include a food service car (café business class) with food and beverage service but will not include a full service diner. This study assumes the train consist will utilize bi-level Superliner-type equipment, similar to that currently used on the *Empire Builder*. The following schematic describes the proposed equipment consist with dimensions and seating capacity.



Total Capacity = 280 seats.

For purposes of developing the required capital investments to begin the service, it was presumed that the States would purchase the required cars and locomotives, as Amtrak cannot guarantee that it will have excess equipment available at the startup of this service. If Amtrak-owned equipment becomes availalble in the future, the states would need to determine whether to pursue the new equipment (shown in the table below) with the associated costs or operate the service with Amtrak equipment. The following Table 4 reflects the purchase of 10 total pieces of new equipment.

Table 4

New Midwest Bi-Level & Locomotive Equipment Acquisition for CHI-MN 2nd Frequency

	Cafe/Business	Coach	Cab/Bag/Coach	Locomotive	Total
Unit Price	$3,318,000	$2,977,000	$3,365,000	$8,300,000	NA
Quantity	2	4	2	2	10
Total	$6,636,000	$11,908,000	$6,730.000	$16,600,000	$41,874,000
			(If using existing P-42 locomotives		($25,274,000)
Spare parts, Field Warranty Service					$300,000
Subtotal					$42,174,000
Contingency: 10%					$4,217,000
Total					**$46,391,000**

Car & Locomotive Maintenance and Turnaround

Car and locomotive maintenance and turnaround costs are forecast by Planning and Costing based on the units used, unit trips, and operated train miles statistics. For car maintenance, costs are based on Amtrak's experience with Pacific Surf liner equipment, which is similar to the bi-level cars the states have on order. Mechanical costs are forecast to be $2.25 million for Scenarios 1A, 1B, 2A & 2B, and $2.200 million for Scenarios 3A, 3B, 4A & 4B. If any of these scenarios are considered further, more detailed estimates will need to be developed with input from Amtrak's Mechanical Department.

IX. Operating Expense/Subsidy Requirement

The estimated annual costs to operate a proposed Second Frequency Service were developed by Amtrak in accordance with the schedules defined in Table 3. Among the key determinants of projected annual operating costs are: (1) the length of route; (2) the number of daily frequencies to be operated; (3) the projected types and quantities of equipment required to support operations; (4) equipment cycling; (5) crew base requirements and scheduling synergies; and (6) desired level of service amenities, such as food/beverage service. Projected expenses associated with operations over this route are summarized in Section XII, and the estimated ridership and the relationship between revenue, operating cost, and required state support (subsidy) is described in Table 5.

TABLE 5

Financial Summary by Scenario

Scenario	1-A	1-B	2-A	2-B	3-A	3-B	4-A	4-B
(route)	CHI-SPU-MIM-SCD		CHI-SPU-FID-SCD		CHI-SPU-MIM		CHI-SPU	
Ridership	143,300	185,100	143,200	180,300	137,000	177,600	117,800	155,500
Revenue	$7,459,000	$9,083,000	$7,455,000	$8,688,000	$7,001,000	$8,513,000	$5,522,000	$6,811,000
Operating Cost	$13,337,000	$13,715,000	$13,309,000	$13,618,000	$12,618,000	$12,976,000	$12,131,000	$12,448,000
State Operating Support	$5,878,000	$4,632,000	$5,855,000	$4,930,000	$5,617,000	$4,460,000	$6,609,000	$5,637,000

Notes:

Numbers are annual totals and State Support totals do not include annual capitalized maintenance for equipment costs, estimated to be an additional $1,000,000.

X. Proposed Capital Infrastructure Improvements

The introduction of new or expanded intercity passenger service on any corridor requires an evaluation of infrastructure as it relates to track capacity and track condition (including bridges and signals) as a necessary step in due diligence. The proposed service would likely require capital improvements to station facilities and railroad physical plant. While specific railroad infrastructure improvements are subject to negotiation with the host railroad, this

report provides high-level cost estimates for capital improvements divided among four route segments:

- Chicago to Milwaukee
- Milwaukee to Union Depot
- Union Depot to St. Cloud
- Minneapolis Junction to Target Field Station

Chicago to Milwaukee

This route segment is composed primarily of track owned by Metra (32 miles) and CPR (54 miles). The route is double track with CTC signal controls and a maximum allowable speed of 79 mph. At the time of this report, a separate study of this corridor segment conducted by WisDOT, Illinois DOT, and Federal Railroad Administration, in partnership with Amtrak, is considering the addition of more Amtrak "Hiawatha" Service frequencies between Chicago and Milwaukee. The intent is to increase the current seven daily Hiawatha round trips to 10 daily round trips. This would require a program of infrastructure improvements to increase capacity that is currently under discussion. The Canadian Pacific has indicated that the addition of one daily round trip train on the corridor segment would necessitate some improvements, including the construction of a second platform at the Milwaukee Airport Station. Discussions continue regarding required infrastructure for Chicago-Milwaukee corridor.

For the purposes of this Feasibility Study, this report will include an estimate for an 850-foot second platform and overhead pedestrian bridge at Milwaukee Airport Station. Amtrak estimates the cost would be roughly $10 million for the platform and bridge.

As of the time of this writing, no additional improvements have been identified on Metra's portion of the route for one additional frequency.

Milwaukee to Union Depot in St. Paul

For this segment, MnDOT's consultant HDR, performed operations modeling using a Railroad Traffic Controller model of the Milwaukee-Union Depot in St. Paul corridor segment. As previously discussed in Section VI, both Amtrak schedule options A & B along with HDR's new optimized schedule were modeled. This analysis identified locations between Milwaukee and Union Depot in St Paul where infrastructure improvements may be necessary and tested the impact of several previously identified infrastructure improvements provided by the railroads on train operations and performance. For most of this route segment, the proposed service would operate over approximately 380 miles of CPR tracks, although there are roughly 18 miles of paired/shared tracks with BNSF between St. Croix

Junction (near Hastings) and Union Depot. Exhibit 2/Sheet 2 describes schematically this 18-mile segment.

A high-level cost estimate of needed infrastructure improvements between Milwaukee and Union Depot segment was provided by Minnesota DOT's consultant HDR for the three schedules. These range from $85.2 for their "Optimized" schedule, $131.5 for the Option A schedule and $164.9 for the Option B schedule.

(Conceptual capital infrastructure cost estimates for the Milwaukee to Union Depot in St. Paul segment are order of magnitude and based on HDR's October 2014, Rail Traffic Controller simulation modeling.)

Union Depot in St Paul to St. Cloud

The route from Union Depot to St. Cloud involves 3 railroads – CPR, MNNR, and BNSF. Northstar Commuter trains also utilize this route between Minneapolis Junction and Big Lake. For the addition of a single frequency, this report assumes no additional improvements are required on the CPR and MNNR track segments. However, it should be noted that this assumption is made without the benefit of train simulation modeling and a detailed capacity analysis. The BNSF has indicated the following infrastructure improvements are required to accommodate the one additional frequency.

Construct a third main track between Interstate and Coon Creek, a distance of 6 miles. Amtrak estimates this cost to be $36 million in 2014 dollars. While a third main track would be beneficial to a second frequency, it would likely not be the sole driver in the need for a third track in this area.

Construct a second main track between Becker and Big Lake, a distance of 10.5 miles, with at least one set of crossovers between the two points. Amtrak estimates this cost to be $63 million in 2014 dollars. BNSF plans to construct this project as part of its 2015 capital plan. Additionally, BNSF has started construction on two new higher speed main tracks between St. Anthony and Minneapolis Junction, and will convert the existing slower speed single main track to a yard lead.

Minneapolis Junction to Target Field Station

In order to serve Target Field station as proposed in Scenarios 1 and 3, BNSF has indicated the current infrastructure between Minneapolis Junction and the station, approximately 1.6 miles in length, will have to be improved and expanded. This route segment currently consists of one mainline track and one storage track, approximately 1 mile in length. BNSF requires:

Construction of full double track capability from Target Field station to Minneapolis Junction, with perhaps the double tracking of some if not all of Minneapolis Junction. This would entail upgrading the existing storage track to mainline track condition. Amtrak

estimates the cost to be about $8 million in 2014 dollars. BNSF plans to complete this work as part of its 2015 capital plan.

Construction of an additional Target field station track, in that all existing track at the station are currently occupied by Northstar Commuter Service. Amtrak estimates the cost to be about $8 million in 2014 dollars.

Construction of a new storage track that replicates the existing storage track capacity at a location determined by the BNSF. Amtrak estimates the cost to be $3 million in 2014 dollars.

Layover Facilities

Amtrak's existing facilities in Chicago will be the primary maintenance, servicing and fueling location for all scenarios. Layover facilities at the northern termini, shown for each scenario below, will also be required for routine fueling, cleaning, and servicing.

Scenario 1: For the purpose of this study, the layover location in St. Cloud is assumed to be the BNSF Yard west of the station. However, only preliminary discussions with BNSF have occurred and there are no agreements between BNSF and Amtrak to allow for a yard layover at this time. Locomotives will require refueling by tanker truck at St. Cloud. Routine cleaning and servicing will also be required in St. Cloud. An allowance for the estimated cost to create a St. Cloud layover facility is $650,000.

Scenario 2: The layover requirements are the same as Scenario 1.

Scenario 3: The layover location for this scenario is Amtrak's former Midway Station site. The estimated infrastructure costs associated with a Midway layover is $300,000.

Scenario 4: The layover location for this scenario is Amtrak's former Midway Station site. The layover requirements are the same as scenario 3.

The infrastructure improvements for the various segments that combine to make up the four different scenarios are summarized in Table 6.

TABLE 6

Infrastructure Capital Projects

Project No.	Location	Description of Infrastructure Improvement	Cost Estimate $ (millions)		
			Low ("Optimized schedule")_	Medium (Schedule Option B)	High (Schedule Option A)
1	CPR Milwaukee Airport Station	850-foot second platform & pedestrian bridge	10.0	10.0	10.0
2	CPR Milwaukee to UD	Various capacity improvements	85.0	132.0	165.0
3	BNSF Interstate to Coon Creek	Various capacity improvements	36.0	36.0	36.0
4	BNSF Big Lake to Becker	Construct 2nd main track plus crossover 10.5 miles	63.0	63.0	63.0
5	BNSF Minneapolis Jct. to TFS	Convert storage track to mainline	8.0	8.0	8.0
6	BNSF/Northstar TFS	Construct new station track and platform	8.0	8.0	8.0
7	BNSF Wayzata Sub	Construct new storage track for TFS	3.0	3.0	3.0

XI. Mobilization Costs (one-time expense)

A number of up-front expenses would be incurred by Amtrak, should the corridor service be funded and implemented. These include personnel recruitment and training, radio equipment, uniforms for on-board personnel, etc. These estimated costs are listed below:

Training & Qualification Expenses for Train, Engine and Onboard Services Personnel, Mechanical; procurement of uniforms, Radios and other miscellaneous equipment $750,000

XII. Summary Table of Key Numbers

SCENARIO 1

This section summarizes key elements of the route between Chicago and St. Cloud via Target Field Station in Minneapolis.

Length of Route (miles)	489
Number of Host Railroads	4
Proposed Scheduled Running Time (hours: minutes)	9:35

Capital for Infrastructure Improvements: ($ millions)

Low- Model "C" Optimized Schedule. (DP St. Paul 11:46am) – (DP CHI 10:15am)	$210.2
Medium- Model "B" Schedule. (DP St. Paul 12:25pm) – (DP CHI 9:25am)	$256.5
High-Model "A" Schedule. (DP St. Paul 2:15pm) – (DP CHI 9:25am)	$289.9
Capital for Layover Facility	$0.65
Capital for Equipment Procurement (2 Round Trips)	$46.4

"Order of Magnitude" Total Capital Cost ($ millions)

Low – Model "C" Optimized Schedule. (DP St. Paul 11:46am) – (DP CHI 10:15am)	$257.2
Medium – Model "B" Schedule. (DP St. Paul 12:25pm) – (DP CHI 9:25am)	$303.5
High – Model "A" Schedule. (DP St. Paul 2:15pm) – (DP CHI 9:25 am)	$336.9

Estimated Equipment Capitalized Maintenance Annual Cost ($ millions) $1.0

	Option A ($ millions)	Option B ($ millions)
Estimated Annual Ridership	143,300	185,100
Estimated Annual Revenue	$7.459	$9.083
Estimated Annual Operating Expense	$13.337	$13.715
Estimated Annual Operating Subsidy	$5.878	$4.632

SCENARIO 2

This section summarizes key elements of the route between Chicago and St. Cloud via the Fridley, MN Northstar Station.

Length of Route (miles)	486
Number of Host Railroads	4
Proposed Scheduled Running Time (hours: minutes)	9:20

Capital for Infrastructure Improvements: (millions)

Low – Model "C" Optimized Schedule. (DP St. Paul 11:46am)-(DP CHI 10:15am)	$194.2
Medium – Model "B" Schedule. (DP St. Paul 12:25pm) – (DP CHI 9:25am)	$240.5
High – Model "A" Schedule. (DP St. Paul 2:15pm) – (DP CHI 9:25am)	$273.9
Capital for Layover Facility	$0.65
Capital for Equipment Procurement (2 Round Trips)	$46.4

"Order of Magnitude" Total Capital Cost ($ millions)

Low – Model "C" Optimized Schedule. (DP St. Paul 11:46am)-(DP CHI 10:15am)	$241.2
Medium – Model "B" Schedule. (DP St. Paul 12:25pm) – (DP CHI 9:25am)	$287.5
High – Model "A" Schedule. (DP St. Paul 2:15pm) – (DP CHI 9:25am)	$320.9
Estimated Equipment Capitalized Maintenance Annual Cost ($ millions)	$1.0

	Option A ($ millions)	Option B ($ millions)
Estimated Annual Ridership	143,200	180,300
Estimated Annual Revenue	$7.455	$8.688
Estimated Annual Operating Expense	$13.309	$13.618
Estimated Annual Operating Subsidy	$5.855	$4.930

SCENARIO 3

This section summarizes key elements of the route between Chicago and Target Field Station in Minneapolis.

Length of Route (miles)	424
Number of Host Railroads	4
Proposed Scheduled Running Time (hours: minutes)	8:09

Capital for Infrastructure Improvements:

Low-HDR Model "C" Optimized Schedule. (DP St. Paul 11:46am)-(DP CHI 10:15am)	$ 114.2
Medium-HDR Model "B" Schedule. (DP St. Paul 12:25pm) – (DP CHI 9:25am)	$ 160.5
High – Model "A" Schedule. (DP St. Paul 2:15pm) – (DP CHI 9:25am)	$ 193.9

Capital for Layover Facility	$0.3
Capital for Equipment Procurement (2 Round Trips)	$46.4

"Order of Magnitude" Total Capital Cost ($ millions

Low – Model "C" Optimized Schedule. (DP St. Paul 11:46am)-(DP CHI 10:15am)	$ 160.9
Medium – Model "B" Schedule. (DP St. Paul 12:25pm) – (DP CHI 9:25am)	$ 207.2
High – Model "A" Schedule. (DP St. Paul 2:15pm) – (DP CHI 9:25am)	$ 240.6

Estimated Equipment Capitalized Maintenance Annual Cost ($ millions) $1.0

	Option A ($ millions)	Option B ($ millions)
Estimated Annual Ridership	137,000	177,600
Estimated Annual Revenue	$7.001	$8.515
Estimated Annual Operating Expense	$12.618	$12.976
Estimated Annual Operating Subsidy	$5.617	$4.460

SCENARIO 4

This section summarizes key elements of the route between Chicago and Union Depot in St. Paul.

Length of Route (miles)	411
Number of Host Railroads	4
Proposed Scheduled Running Time (hours: minutes)	7:30

Capital for Infrastructure Improvements: ($ millions)

Low-HDR Model "C" Optimized Schedule. (DP St. Paul 11:46am)-(DP CHI 10:15am)	$ 95.2
Medium-HDR Model "A" Schedule. (DP St. Paul 12:25pm) – (DP CHI 9:25am)	$141.5
High-HDR Model "B" Schedule. (DP St. Paul 2:15pm) – (DP CHI 9:25am)	$174.9
Capital for Equipment Procurement (2 Round Trips)	$46.4
Capital for Layover Facility	$0.3

Order of Magnitude" Total Capital Cost ($ millions)

Low-HDR Model "C" Optimized Schedule. (DP St. Paul 11:46am)-(DP CHI 10:15am)	$141.9
Medium-HDR Model "A" Schedule. (DP St. Paul 12:25pm) – (DP CHI 9:25am)	$188.3
High-HDR Model "B" Schedule. (DP St. Paul 2:15pm) – (DP CHI 9:25am)	$221.6

Estimated Equipment Capitalized Maintenance Annual Cost ($ millions) $1.0

	Option A ($ millions)	Option B ($ millions)
Estimated Annual Ridership	117,800	155,500
Estimated Annual Revenue	$5.522	$6.811
Estimated Annual Operating Expense	$12.131	$12.448
Estimated Annual Operating Subsidy	$6.609	$5.637

Exhibit 1

AMTRAK FEASIBILITY STUDY PROCESS

ITEM	TASK	TASK ACTIVITY
1	STUDY REQUEST & CONTRACT	Amtrak is formally requested by one or more recognized state agencies (typically the state DOT) to perform a feasibility study for intercity passenger train service within a specified corridor, and the state(s) and Amtrak begin negotiations for the development of study contract terms, statement of work, and study fee. The state(s) provide to Amtrak the route(s) to be studied, the desired station stop cities, the desired frequency of service, and the desired maximum authorized speed (MAS) for the route. Specific station site locations within each station stop city is not required to perform the study, but can be helpful to the study team.
2	HOST RAILROAD NOTIFICATION	Host railroad notifications are made to host railroads that would be involved in or affected by the proposed operation of intercity passenger train service within the requested study corridor. The purpose and parameters of the study are outlined, and follow-up meetings are suggested to plan inspection trips, gather data, and estimate the level of capacity analysis that will be required.
3	ROUTE HISTORY & DEMOGRAPHICS	Upon completion of a feasibility study contract, Amtrak will begin gathering information on route history and on local demographics of the municipalities to be served by the proposed intercity passenger train service. States will typically provide to Amtrak any past studies or data that may be relevant to the feasibility study.
4	DATA COLLECTION	Amtrak will begin to work with the host railroads to collect employee timetables, track charts, and other infrastructure and operating data needed for report preparation.
5	ROUTE INSPECTION	Amtrak arranges with host railroads to make a physical inspection, including hi-rail trips where appropriate, of the proposed corridor route. During the inspection trip Amtrak and the host railroad will begin a dialogue about the impact of new or expanded passenger train service on the corridor and the infrastructure improvements needed to meet both freight and passenger train operational goals.
6	PROVISIONAL TRAIN SCHEDULES	Amtrak will develop a provisional passenger train schedule based on the route and city station stops selected by the state(s), the number of frequencies and approximate departure times selected by the state(s), and a passenger train maximum authorized speed (MAS) agreed to by the state(s) and host railroads. The term "provisional", within the context of this study, implies the schedule will be realistic and doable; however, it is understood that the schedule may not be fully optimized due to the inherent time constraints and depth of research limitations of a feasibility study.
7	CAPACITY ANALYSIS	Host railroads will typically perform RTC modeling of the proposed service and route to evaluate the impact of proposed new passenger train operations on the existing and future freight train operations. This work may be done in-house by the host railroad or contracted to a consultant. The cost of RTC modeling is passed through to the states. Upon receipt of capacity analysis results from the host railroads, Amtrak, in cooperation with the host railroads, will technically analyze the results and assess whether the proposed infrastructure improvements (and costs) appear reasonable and whether adjustments to train schedules could reduce infrastructure costs.
8	AMTRAK FINANCE & OPERATIONS	Provisional schedules, frequency of service, and number of trainsets for the proposed service is forwarded to Amtrak's Financial and Operations Groups. Finance and Operations jointly identify the quantity and costs for equipment, train and on-board crews, crew new hires, and crew training. Amtrak Finance undertakes a ticket pricing study, which includes identification of Amtrak's total operating costs and required ticket prices.
9	REVENUE RIDERSHIP ANALYSIS	Amtrak utilizes a qualified consultant to develop ridership and revenue estimates based on the provisional schedule, service frequency, and the Amtrak-vetted host railroad capacity analysis results, all of which are developed prior to the revenue/ridership analysis.
10	ROLLING STOCK & EQUIPMENT MAINTENANCE	Based on provisional train schedules, agreed upon by the host railroads, and train consists developed from ridership data, Amtrak will develop a plan for equipment rotation, servicing, maintenance, and layover facilities, and will identify the associated capital costs required for implementation.
11	INFRA-STRUCTURE	AMTRAK will work with Host Railroads and their consultants to identify infrastructure improvements, and an associated "order of magnitude" capital cost estimate, necessary to meet requirements of PRIIA, Section 207, for on-time performance and train delay standards
12	DRAFT REPORT FOR AMTRAK REVIEW	Amtrak incorporates the relevant comments into the draft report and circulates it internally for review and approval. This process usually takes about 30 days.
13	DRAFT REPORT FOR STATE REVIEW	Upon completion of the internal Amtrak review, the draft report is forwarded to the state(s) for review and approval with or without comments and/or changes. Typically, 30 days is allowed for review and approval of the draft report by the state.
14	FINAL REPORT	Once Amtrak receives the state's comments on the draft report, a Final Report is prepared and submitted to the state(s). The Final Report will incorporate appropriate comments and/or changes from the State's review of the Draft Report, provided the comments/changes do not substantially alter the key components of the report, such as route, schedule, station stops, infrastructure capital, operating costs, etc.

Evaluation of a Second Daily Intercity Passenger Rail Frequency between Minnesota and Chicago

Executive Summary of Amtrak Feasibility Report

and

State Partners Conclusions and Recommendations

Minnesota Department of Transportation

Wisconsin Department of Transportation

July 2015

Table of Contents

I. Executive Summary of the Feasibility Report on Proposed Amtrak Service Chicago-Milwaukee-La Crosse-Twin Cities-(St. Cloud)

Background

The Minnesota Department of Transportation, in partnership with the Wisconsin Department of Transportation (WisDOT) and La Crosse County, Wisconsin (WI), requested Amtrak to complete a feasibility study of adding a second daily intercity passenger train between the Twin Cities (or St. Cloud, Minnesota (MN)) and Chicago, Illinois (IL). The proposed service would generally follow the existing *Empire Builder* route through Illinois and Wisconsin, but could terminate in Minnesota at Union Depot in St. Paul, Target Field Station in Minneapolis, or at the Amtrak station in St. Cloud. The purpose of a second daily train is to offer more options to travelers in the corridor by providing better eastbound reliability and increased train frequency. Potential mobility benefits of the proposed service include:

- Increased schedule options from the existing one daily round-trip to two daily round-trips between the Twin Cities, Chicago and intermediate stations
- More reliable service with better on-time performance (particularly eastbound)
- More convenient travel times for shorter, regional trips
- More seating capacity on the corridor relieving pressure during peak periods
- Improved connections between other trains, intercity buses, local public transit, and air service

Purpose of the Study

The project sponsors asked Amtrak to prepare a feasibility study that develops a high level, order-of-magnitude assessment of schedules, ridership, revenue, infrastructure investments, operating costs, and equipment needs (railcars and locomotives) associated with adding a second daily train between St. Cloud, the Twin Cities and Chicago. This assessment will assist the project sponsors in determining whether or not to move the project to the next steps toward implementation.

As required in Section 209 of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), all corridors less than 750 miles require state sponsorship (state operating support) to cover any operating losses. The 2nd daily train service would be a regional "state-supported" Section 209 corridor, as opposed to an Amtrak long-distance train (like the *Empire Builder)* that is funded through Amtrak's federal appropriation. The information in this report is not intended to be the sole basis of an agreement between the partners, Amtrak or hosts railroad, but rather serves as a basis for understanding the ridership and financial implications of starting such a service. This study is a first step toward deciding whether or not to establish a second round-trip frequency following the same route as the *Empire Builder*.

Overview of Corridor and Existing Conditions

The corridor is currently serviced once a day in each direction by Amtrak's *Empire Builder* long distance train between Seattle, Washington/Portland, Oregon and Chicago. This is the only passenger rail service that serves the Twin Cities-Chicago corridor in its entirety. The *Empire Builder* primarily uses the BNSF Railway between St. Cloud and St. Paul, the Canadian Pacific Railway between St. Paul and Rondout, IL, and Metra between Rondout, IL and Chicago, IL. The *Empire Builder* makes station stops in St. Cloud,

MN, St. Paul, MN; Red Wing, MN; Winona, MN; La Crosse, WI; Tomah, WI; Wisconsin Dells, WI; Portage, WI; Columbus, WI; Milwaukee, WI; Glenview, IL and Chicago, IL. Eastbound *Empire Builder* service often experiences delays that negatively affect on-time performance due to freight congestion west of St. Cloud, MN. In addition, the single round-trip frequency provides little schedule flexibility to travelers in the corridor. Despite these issues, the majority of passengers getting on or off at stations in Minnesota, Wisconsin, and Illinois are going to or coming from stations within the Chicago-Twin Cities corridor segment, indicating demand for regional travel. Ridership on the *Empire Builder* within the Chicago-Twin Cities corridor segment is relatively high, often exceeding 100,000 annually.

Feasibility Study Process and Assumptions

Per the request of the project partners, the study assumes the second round-trip frequency would serve the same station stops as the *Empire Builder* service between Chicago and St. Paul with the addition of the Milwaukee Airport Rail Station. The study examines four route and terminal station scenarios west of St. Paul. These options include:

- Scenario 1: Chicago-St. Cloud with stops at Union Depot in St. Paul and Minneapolis' Target Field Station.
- Scenario 2: Chicago-St. Cloud with stops at Union Depot in St. Paul and Fridley Northstar Station
- Scenario 3: Chicago-Target Field Station with a stop at Union Depot in St Paul.
- Scenario 4: Chicago-Union Depot in St. Paul

Figure 1 displays the corridor encompassing all four route scenarios, with station stops and the host railroads.

Figure 1: Corridor Map

Train Schedule Options

Schedules for the second round-trip frequency service are designed to complement the current *Empire Builder* schedule, with arrival and departure times at the endpoints that maximize ridership potential. The elapsed time schedule is similar to that of the current *Empire Builder*, with second frequency departure times from the points of origin generally 4-6 hours before or after current *Empire Builder* departure times. Schedules were developed for all four station scenarios with two alternative departure times for the eastbound train from Union Depot in St. Paul. The study evaluated departure times from Union Depot at 2:25 PM (Option A) and 12:25 PM (Option B) for impact on ridership and revenue. The market demand results suggest the earlier 12:25 PM departure (Option B) is forecast to produce the higher ridership and revenue. Figure 2 shows the schedule options for the Second Frequency, including the origins and endpoints to differentiate the route alternatives.

Figure 2: Route Origin/Endpoint Alternatives & Schedule Options

Westbound	**Scenario 1: Chicago-St. Cloud via Minneapolis** ***Schedule Option A and B***	**Scenario 2 Chicago-St. Cloud via Fridley** ***Schedule Option A and B***	**Scenario 3 Chicago-Minneapolis** ***Schedule Option A and B***	**Scenario 4 Chicago-St. Paul** ***Schedule Option A and B***	***Empire Builder Train #7***
Chicago, IL Union Station	***9:25 AM***	***9:25 AM***	***9:25 AM***	***9:25 AM***	*2:15 PM*
St. Paul, MN Union Depot	***4:42 PM***	***4:42 PM***	***4:42 PM***	***4:52 PM***	*10:03 PM*
Minneapolis, MN Target Field Station	5:27 PM	--	5:32 PM	--	--
Fridley, MN	--	5:38 PM	--	--	
St. Cloud, MN	7:00 PM	6:45 PM	--	--	*12:34 AM*

*Intermediate stations are not shown. See the Amtrak Feasibility Report for intermediate station times.

Eastbound	**Scenario 1: Chicago-St. Cloud via Minneapolis**		**Scenario 2 Chicago-St. Cloud via Fridley**		**Scenario 3 Chicago-Minneapolis**		**Scenario 4 Chicago-St. Paul**		***Empire Builder Train #8***
	Schedule Option A	***Schedule Option B***	***Schedule Option A***	***Schedule Option B***	***Schedule Option A***	***Schedule Option B***	***Schedule Option A***	***Schedule Option B***	
St. Cloud, MN	12:22 PM	10:22 AM	12:37 PM	10:37 AM	--	--	--	--	*5:14 AM*
Fridley, MN	--	--	1:38 PM	11:38 AM	--	--	--	--	--
Minneapolis, MN Target Field Station	1:45 PM	11:45 AM	--	--	1:45 PM	11:45 AM	--	--	--
St. Paul, MN Union Depot	***2:25 PM***	***12:25 PM***	***2:25 PM***	***12:25 PM***	***2:25 PM***	***12:25 PM***	***2:25 PM***	***12:25 PM***	*8:00 AM*
Chicago, IL Union Station	***9:54 PM***	***7:57 PM***	***9:54 PM***	***7:57 PM***	***9:54 PM***	***7:57 PM***	***9:54 PM***	***7:57 PM***	*3:55 PM*

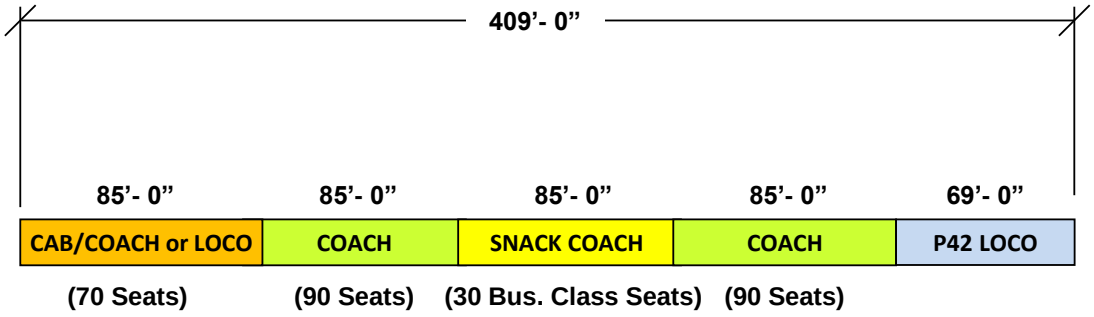
Route alternatives and schedule options were modeled using Train Performance Calculator (TPC) and Rail Traffic Controller (RTC) programs. The modeling process indicated that a third schedule, similar to schedule option B but with slightly different departure times, was the most operationally efficient schedule. This "optimized" schedule required the least amount of infrastructure improvements to achieve appropriate performance for passenger and freight trains. The schedule has a westbound departure from Chicago at 10:15 AM and from eastbound from St. Paul at 11:46. Details of the "optimized" schedule can be found in Figure 6. The "optimized" schedule was not part of the Amtrak ridership and financial evaluations; however capital costs for this scenario were generated.

Equipment Needs

The second round-trip frequency as proposed would require two train consists, which would include a total of two diesel locomotives, four bi-level coaches, two bi-level snack coaches, and two bi-level cab coaches. All route alternatives assume train consists will be in "push-pull mode", with 1 locomotive and 1 cab/coach (or a second locomotive). The equipment consist will include a food service car (café/ business class) but will not include a full service diner. The study assumes the train consist will utilize bi-

level Superliner-type equipment, similar to that currently used on the *Empire Builder*. Figure 3 describes the proposed equipment consist with dimensions and seating capacity.

Figure 3: Train Consist



Source: Amtrak Total Capacity = 280 seats.

For the purpose of developing estimates of required capital investment, it was presumed that the states would acquire the cars and locomotives. This is in part due to the fact that Amtrak cannot guarantee that it will have equipment available. If Amtrak-owned equipment becomes available, the states would determine whether to acquire new equipment, or operate the service with Amtrak equipment.

Financial Results

Ridership, Revenue, and Operating Support

Figure 4 below shows forecast ridership, revenue, and operating support for each route and schedule scenario. The annual ridership for all scenarios compares favorably with annual ridership on existing state-supported intercity passenger rail routes in other states with one round-trip per day.

The state operating support and payment estimates are total for all states supporting the route. These are high-level planning estimates. More detailed estimates will be required in the next phase of study. The funding split among the states will also be determined during or after the next phase of study.

Figure 4: Ridership, State Operating Support, and State Payment

Route Scenario	Scenario 1: Chicago-St. Cloud via Minneapolis		Scenario 2: Chicago-St. Cloud via Fridley		Scenario 3: Chicago-Minneapolis		Scenario 4: Chicago-St. Paul	
Schedule Option	***Schedule Option A***	***Schedule Option B***	***Schedule Option A***	***Schedule Option B***	***Schedule Option A***	***Schedule Option B***	***Schedule Option A***	***Schedule Option B***
Ridership	143,300	185,100	143,200	180,300	137,000	177,600	117,800	155,500
Revenue	$7,459,000	$9,083,000	$7,455,000	$8,688,000	$7,001,000	$8,513,000	$5,522,000	$6,811,000
Operating Cost	$13,337,000	$13,715,000	$13,309,000	$13,618,000	$12,618,000	$12,976,000	$12,131,000	$12,448,000
States Operating Support	$5,878,000	$4,632,000	$5,855,000	$4,930,000	$5,617,000	$4,460,000	$6,609,000	$5,637,000
Equipment Capitalized Maintenance*	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000
Total Estimated States Payment	$6,878,000	$5,632,000	$6,855,000	$5,930,000	$6,617,000	$5,460,000	$7,609,000	$6,637,000
**Order of Magnitude Conceptual Estimate*								

Capital Investment Needs

Implementing the 2nd *Empire Builder* round-trip frequency service would require capital investment for railroad infrastructure capacity improvements, potential train equipment acquisition, and a layover facility in Minnesota. Figure 5 shows high-level conceptual estimates of capital investment needs to implement the 2nd frequency for each route and schedule scenario. The infrastructure capacity improvements that drive the estimated infrastructure costs are conceptual and order-of-magnitude. The analysis for estimating these infrastructure improvements and costs was not intended to arrive at an optimal set of improvements, but rather to provide a high-level order of magnitude estimate for planning purposes. The analysis used a broad list of projects provided by stakeholders and selected from that list those projects that could reduce delays. The next phase of study will look in more detail at alternative improvements that may be more cost effective and test those using simulation modeling. The equipment acquisition estimates are from the Illinois DOT procurement of bi-level cars and locomotives for existing routes. If Amtrak equipment is used, the equipment acquisition cost would be eliminated.

Figure 5: Conceptual Planning-level Capital Investment Need Estimates

Route Scenario	Length (miles)	Capital for Railroad Infrastructure Improvements Conceptual Estimates			Layover Facility	Equipment Procurement*
		Low ("optimized" schedule)	Medium (Schedule Option B)	High (Schedule Option A)		
Scenario I: Chicago-St. Paul-Minneapolis-St. Cloud	489	$210,000,000	$257,000,000	$290,000,000	$650,000	$46,400,000
Scenario 2: Chicago-St. Paul-Fridley-St. Cloud	486	$194,000,000	$241,000,000	$274,000,000	$650,000	$46,400,000
Scenario 3: Chicago-St. Paul-Minneapolis	424	$114,000,000	$161,000,000	$194,000,000	$300,000	$46,400,000
Scenario 4: Chicago-St. Paul	411	$95,000,000	$142,000,000	$175,000,000	$300,000	$46,400,000
**Assumes purchase of bi-level cars and locomotives for service. If existing Amtrak equipment is used, these costs would not be incurred.*						
Key						
Low	Optimized Schedule (from railroad capacity modeling): Depart St. Paul 11:46 AM, Depart Chicago 10:15 AM					
Medium	Schedule Option B: Depart St. Paul 12:25 PM, Depart Chicago 9:25 AM					
High	Schedule Option A: Depart St. Paul 2:25 PM, Depart Chicago 9:25 AM					

Summary

While the route scenarios terminating in St. Cloud and Minneapolis Target Field Station had lower state operating payment, the high-level conceptual analysis of infrastructure capacity needs indicates that they would have higher capital requirements. Scenario 4 terminating in St. Paul had the lowest capital infrastructure costs. For all scenarios, the level of capital investment would likely require federal funding. If federal funds come from a grant, this would likely amount to 80% of total capital costs with a 20% state/stakeholder funding match.

A benefit-cost analysis was not included as part of the feasibility study. This will be a required component of the next phase of work.

II. State Partners Conclusions and Recommendations

Conclusions

The *Feasibility Study on Proposed Amtrak Service Chicago-Milwaukee-La Crosse-Twin Cities-(St. Cloud)* results indicate favorable ridership and revenue for all route scenarios evaluated. The results compare favorably with annual ridership on similar corridors across the country. The state operating payment estimates are planning level only, but are in line with other services. There will be capital infrastructure needs on the corridor to accommodate the additional trains while not unduly impairing freight traffic. These capital improvements will also improve reliability of both passenger and freight rail traffic. The estimates for infrastructure improvements in the feasibility report are not intended to arrive at an optimal set of improvements or costs, but rather to provide a high-level order-of-magnitude estimate for preliminary planning purposes. The next phase of study will look in more detail at alternative improvements that may be more cost effective and test those using simulation modeling.

Ridership and revenue are higher for the St. Cloud and Minneapolis route scenarios (Scenarios 1, 2, and 3), resulting in lower state operating payments. However, the capital costs are significantly higher. The complexity of railroad operations and infrastructure issues are considerably greater west of St. Paul because of the number of host railroads, rail congestion, and capacity issues in the Twin Cities area. For these reasons, Scenario 4, with service terminating in St. Paul, is the most feasible route scenario for an initial start-up service, with potential extensions to Minneapolis and St. Cloud in the future.

Recommendations

Based on the results of the technical report, MnDOT and WisDOT staff recommend moving forward with the next phase of study to determine infrastructure improvements and cost through additional simulation modeling and fulfill environmental requirements in order to be eligible for federal funding. This includes further operations modeling and railroad coordination, environmental clearance of the yet-to-be determined infrastructure improvements, and a service development plan. Staff recommend the following for the next phase of work:

- Complete next phase of study on an initial start-up service between Chicago and St. Paul Union Depot, serving all existing stations plus the Milwaukee Airport Rail Station.
- Advance the "optimized schedule" into the next phase of study. Figure 6 shows the "optimized schedule" that was modeled by MnDOT's Consultant. The "optimized schedule" minimizes infrastructure needs and has departure/arrival times similar to Amtrak's schedule "option B". It can be used as a basis for more detailed modeling and schedule development. ***Note***: The schedule is planning level only. Schedules will be refined during further study.
- Determine how the trains will be operationally integrated with the *Hiawatha Service* between Milwaukee and Chicago in the next phase of study.
- As part of the next phase of work, determine cost sharing of the state operating support and capital costs.
- Further refine capital needs through coordination with the Federal Railroad Administration (FRA) and the host railroads.

- Continue forward with at least the following two options for equipment; 1) acquisition of new locomotives and bi-level cars as part of the Midwest equipment pool, 2) utilization of existing Amtrak equipment. Other options may also be explored.
- Consider additional study of extensions to Minneapolis Target Field Station and/or St. Cloud after fulfilling the study requirements for a start-up Chicago-St. Paul service.

Figure 6: "Optimized" Schedule Modeled by MnDOT Consultant

Westbound Schedule		Eastbound Schedule	
Station	**Departure time**	**Station**	**Departure time**
Chicago, IL Union Station	10:15 AM	St. Paul Union Depot	11:46 AM
Glenview, IL	10:37 AM	Red Wing, MN	12:34 PM
Milwaukee Airport Rail Station	11:29 AM	Winona, MN	1:43 PM
Milwaukee Intermodal Station	11:49 AM	La Crosse, WI	2:20 PM
Columbus, WI	12:56 PM	Tomah, WI	3:05 PM
Portage, WI	1:35 PM	Wisconsin Dells, WI	3:48 PM
Wisconsin Dells, WI	1:55 PM	Portage, WI	4:06 PM
Tomah, WI	2:34 PM	Columbus, WI	4:35 PM
La Crosse, WI	3:17 PM	Milwaukee Intermodal Station	5:45 PM
Winona, MN	4:01 PM	Milwaukee Airport Rail Station	5:55 PM
Red Wing, MN	5:03 PM	Glenview, IL	6:46 PM
St. Paul Union Depot	6:15 PM	Chicago, IL Union Station	7:14 PM

Note: Schedule is planning level only. Schedules will be refined during further study.

Figure 7 below displays the estimated ridership, revenue, and costs of the route scenario and schedule option recommended for further study.

Figure 7: Conceptual planning-level estimated capital costs, ridership, revenue, and operating support for the recommended scenario

Conceptual Capital Cost for Infrastructure Improvements Estimate	$95 million
Equipment	$46.4 million*
Layover facility	$.3 million
Ridership	155,500**
Revenue	$6.8 million**
Operating Cost	$12.4 million**
Annual capitalized maintenance costs	$1 million
Combined estimated annual total operating support for all states*	***$6.6 million***

*Assumes acquisition of new equipment. If existing Amtrak equipment is able to be used, the $46.4 million cost would not be incurred and the total capital and start-up cost estimate would be $95.5 million.

**Estimated operating support for the optimized schedule was not modeled by Amtrak. However, due to the similarity between the optimized schedule and Amtrak schedule option B, schedule option B operating costs and ridership/revenue forecasts are used as a proxy for the optimized schedule. These estimates are planning level only.

Next Steps and Timing

DOT staff have identified the following next steps and timeframes to advance the next phase of work for the 2nd *Empire Builder* frequency:

- Work with FRA to determine the appropriate NEPA and service planning action for the next phase of work. *Spring 2015.*
- Develop scope and complete procurement for the next phase of work. *Summer 2015*
- Complete the next phase of study, funded jointly by MnDOT and WisDOT. The outcome of the study should be eligibility for federal funding for final design, construction, and implementation of the service. *Summer 2015 – Fall 2016.*

If the states decide to implement the service and secure funds for operating support, the next steps following completion of environmental clearance and service development planning would be to apply for federal funding for capital improvements and secure matching funds. If federal funding is secured, this would be followed by final design and construction.

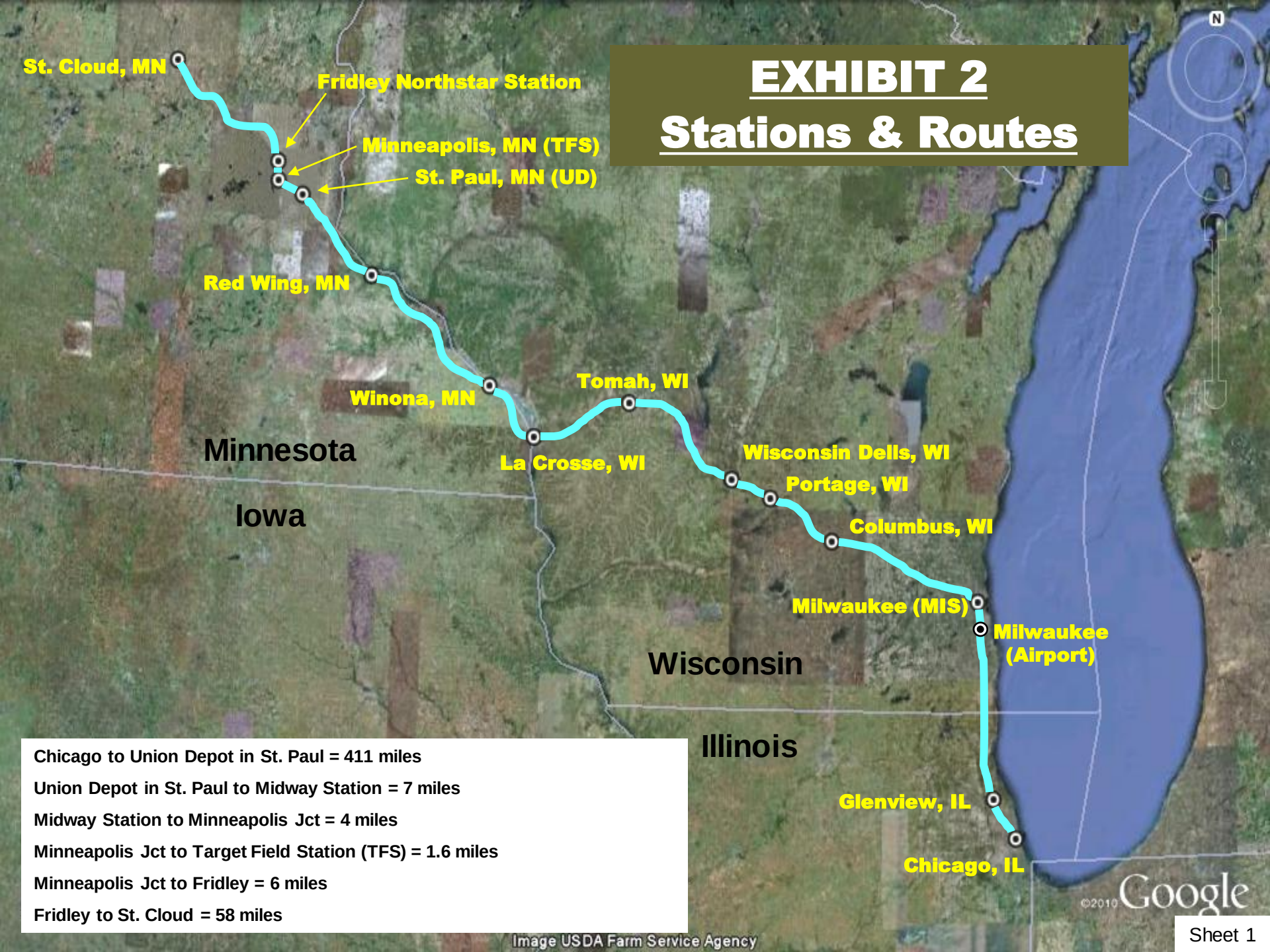


EXHIBIT 2
Stations & Routes
St. Cloud, MN
Fridley Northstar Station
Minneapolis, MN (TFS)
St. Paul, MN (UD)
Red Wing, MN
Winona, MN
Tomah, WI
La Crosse, WI
Wisconsin Dells, WI
Portage, WI
Columbus, WI
Milwaukee (MIS)
Milwaukee (Airport)
Glenview, IL
Chicago, IL
Minnesota
Iowa
Wisconsin
Illinois
Chicago to Union Depot in St. Paul = 411 miles
Union Depot in St. Paul to Midway Station = 7 miles
Midway Station to Minneapolis Jct = 4 miles
Minneapolis Jct to Target Field Station (TFS) = 1.6 miles
Minneapolis Jct to Fridley = 6 miles
Fridley to St. Cloud = 58 miles
Image USDA Farm Service Agency
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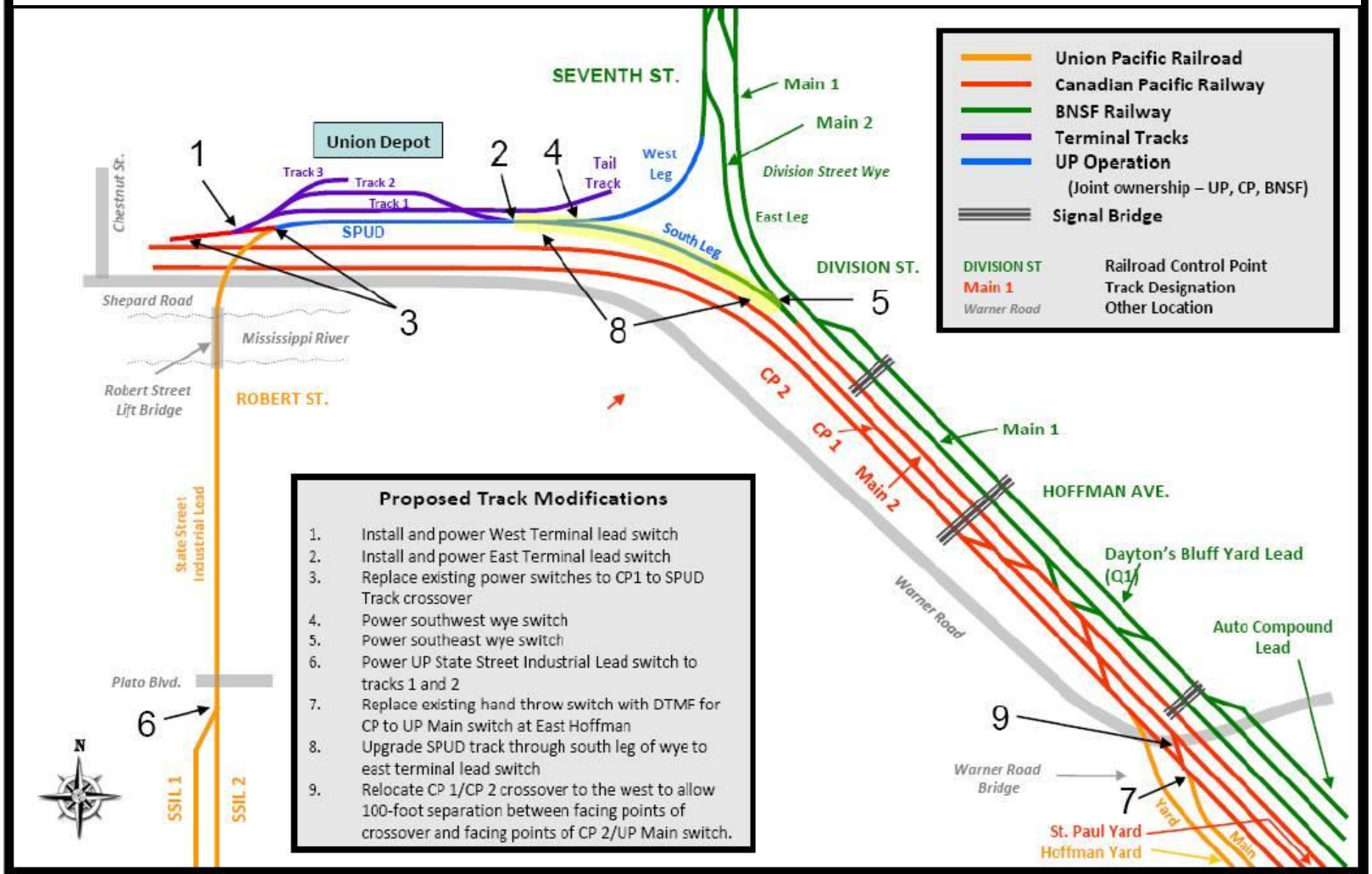
Union Depot in St. Paul
MNNR
PAIRED CPR BNSF
SPUD TRACK
Hastings to St. Paul
(East Metro Area)
Maplewood
Woodbury
West St Paul
South St Paul
Washington
Mendota Heights
Newport
Inver Grove Heights
Cottage Grove
Eagan
Rosemount
Apple Valley
St. Croix Jct
Hastings
CPR
BNSF
Hiawatha Ave
Lafayette Fwy
Dodd Rd
Courthouse Blvd
CPR: Canadian Pacific Railroad
BNSF: BNSF Railway
PAIRED CPR BNSF: Shared Tracks Dispatched by BNSF
SPUD TRACK: Track Jointly Owned by CPR/BNSF/UP
MNNR: Minnesota Commercial Railroad
Sheet 2

Union Depot in St. Paul – Track Layout & Ownership

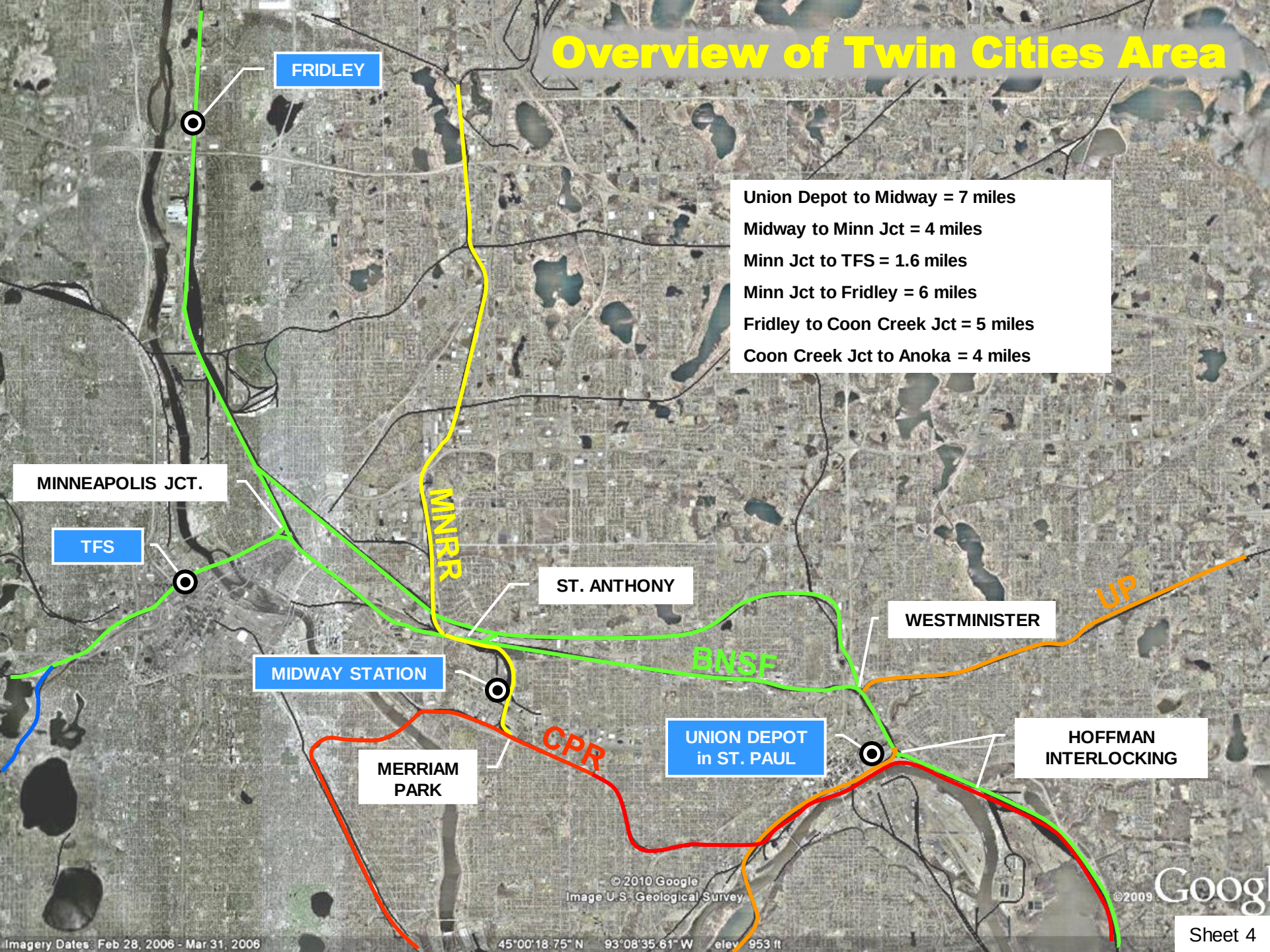


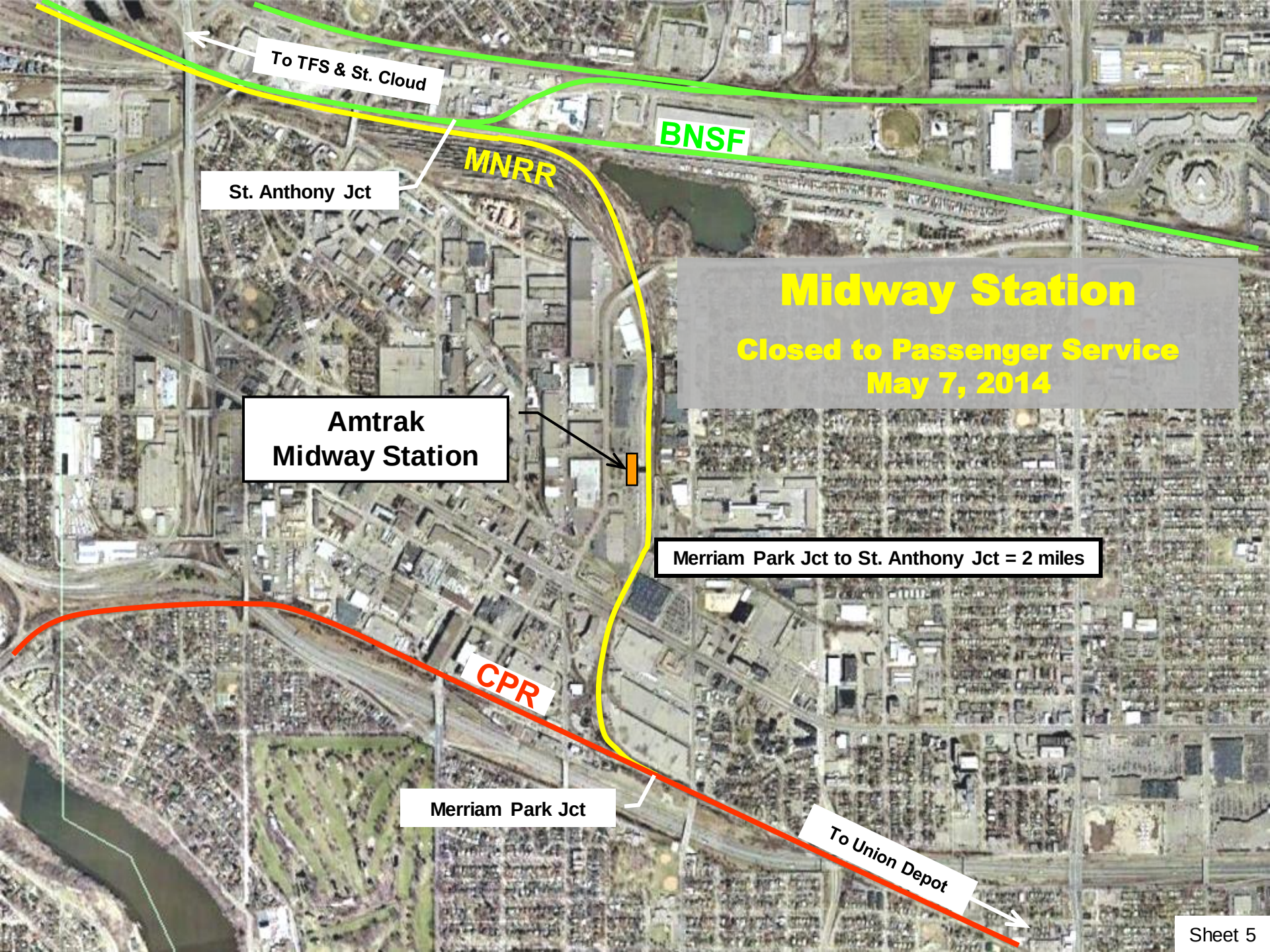
Proposed Track Modifications

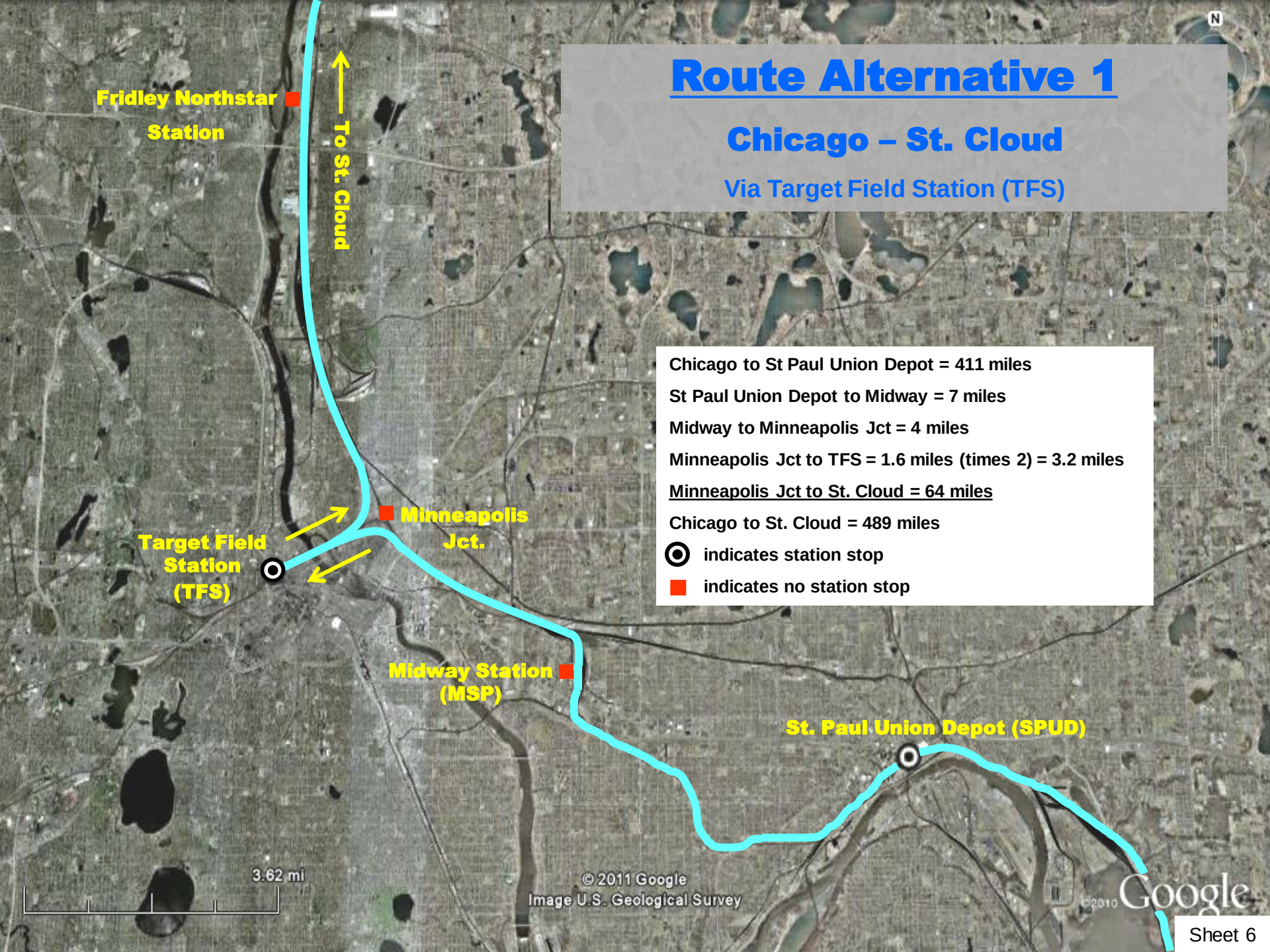
1. Install and power West Terminal lead switch
2. Install and power East Terminal lead switch
3. Replace existing power switches to CP1 to SPUD Track crossover
4. Power southwest wye switch
5. Power southeast wye switch
6. Power UP State Street Industrial Lead switch to tracks 1 and 2
7. Replace existing hand throw switch with DTMF for CP to UP Main switch at East Hoffman
8. Upgrade SPUD track through south leg of wye to east terminal lead switch
9. Relocate CP 1/CP 2 crossover to the west to allow 100-foot separation between facing points of crossover and facing points of CP 2/UP Main switch.

(Note: All power and snow melter equipped switches will be integrated with the appropriate railroad's signaling and central dispatch system. The specific modifications to the signal system associated with these improvements have not been identified.)

Overview of Twin Cities Area




To TFS & St. Cloud
BNSF
MNRR
St. Anthony Jct
Midway Station
Closed to Passenger Service
May 7, 2014
Amtrak
Midway Station
Merriam Park Jct to St. Anthony Jct = 2 miles
CPR
Merriam Park Jct
To Union Depot


Route Alternative 1
Chicago – St. Cloud
Via Target Field Station (TFS)
Fridley Northstar Station
To St. Cloud
Minneapolis Jct.
Target Field Station (TFS)
Midway Station (MSP)
St. Paul Union Depot (SPUD)
Chicago to St Paul Union Depot = 411 miles
St Paul Union Depot to Midway = 7 miles
Midway to Minneapolis Jct = 4 miles
Minneapolis Jct to TFS = 1.6 miles (times 2) = 3.2 miles
Minneapolis Jct to St. Cloud = 64 miles
Chicago to St. Cloud = 489 miles
indicates station stop
indicates no station stop
3.62 mi
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Minneapolis Jct. to TFS
To St. Cloud
Hall Island
Boom Island
Minneapolis Jct
BNSF
Target Field Station
1.6 Miles
Nicollet Island
TARGET FIELD
Hennepin Island
Minneapolis, MN
Minneapolis

Minneapolis Jct. to TFS

North Bridge at Nicollet Island

(facing North)

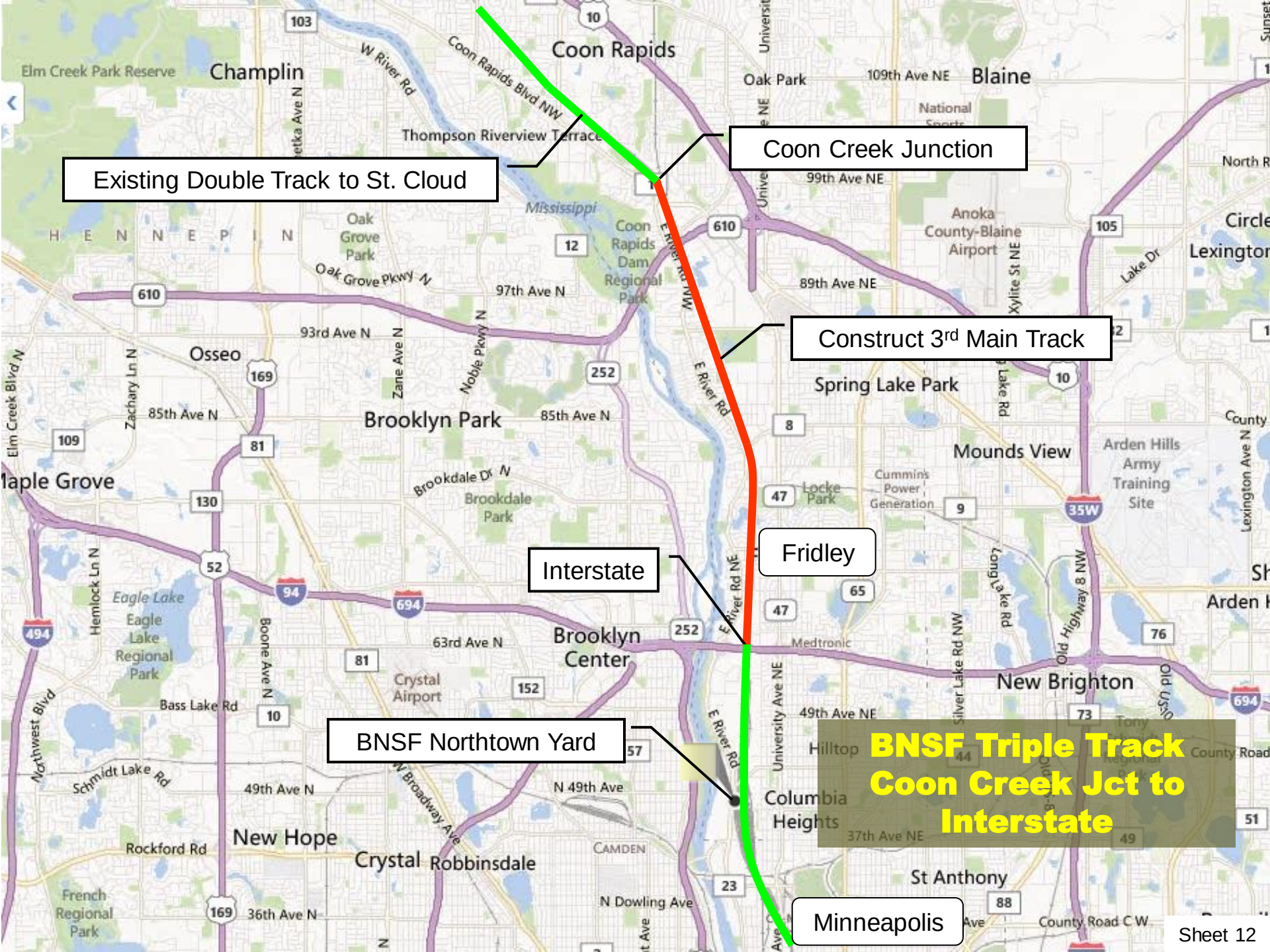
Minneapolis Jct. to TFS

South Bridge at Nicollet Island

(facing South)

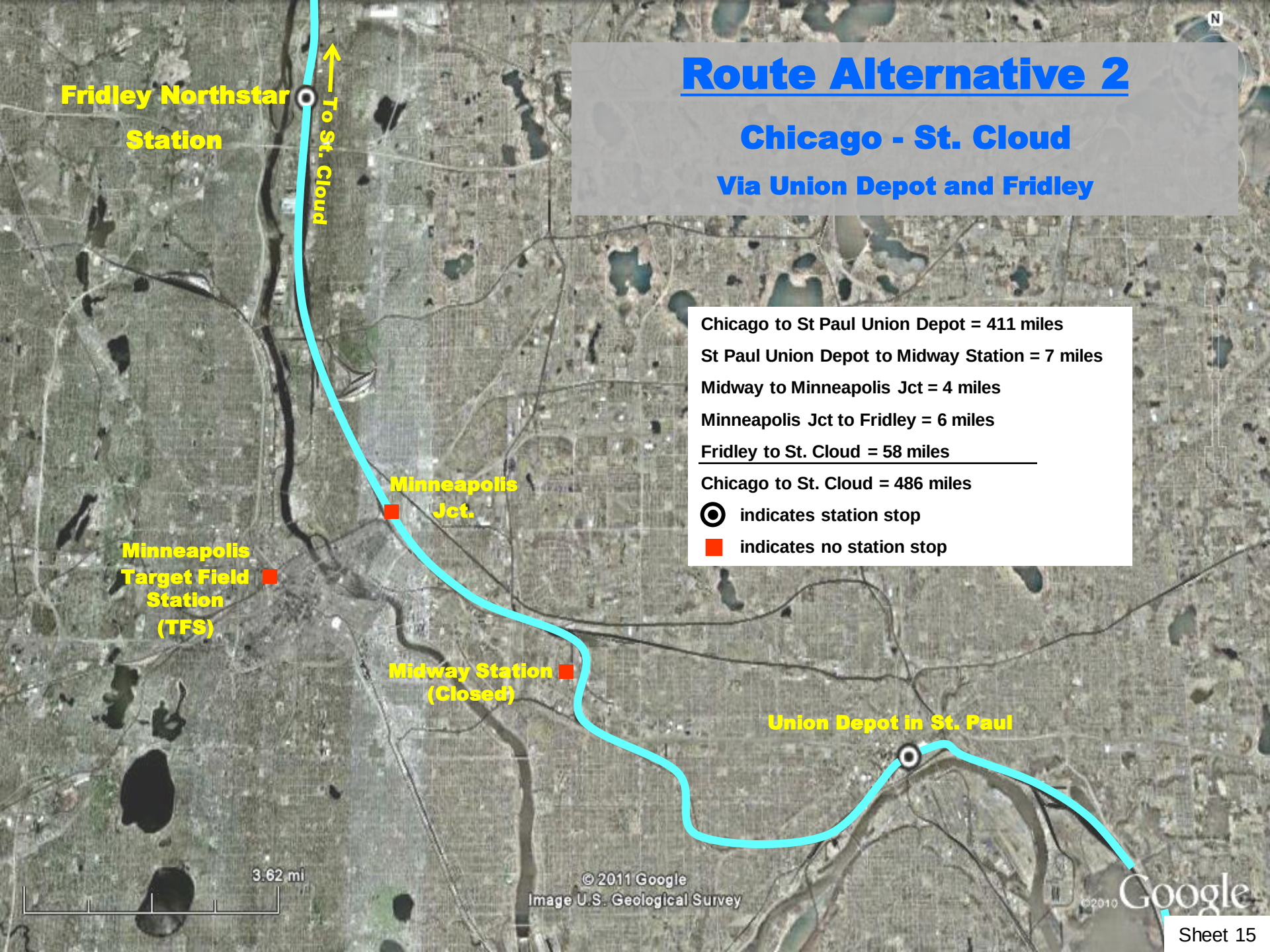
Minneapolis Target Field Station (TFS)


Construct New TFS Station Track
TFS Station
Target Field
New Station Track


Existing Double Track to St. Cloud
Coon Creek Junction
Construct 3rd Main Track
Fridley
Interstate
BNSF Northtown Yard
Minneapolis
BNSF Triple Track
Coon Creek Jct to
Interstate
Champlin
Coon Rapids
Blaine
Osseo
Brooklyn Park
Maple Grove
Spring Lake Park
Mounds View
Brooklyn Center
New Brighton
Columbia Heights
New Hope
Crystal
Robbinsdale
St Anthony
Oak Grove Park
Coon Rapids Dam Regional Park
Anoka County-Blaine Airport
Arden Hills Army Training Site
Eagle Lake Regional Park
Brookdale Park
Crystal Airport
Locke Park
Cummins Power Generation
Medtronic
Hilltop
CAMDEN
French Regional Park
Elm Creek Park Reserve
Thompson Riverview Terrace
Oak Grove Pkwy N
97th Ave N
93rd Ave N
85th Ave N
63rd Ave N
49th Ave N
N 49th Ave
99th Ave NE
89th Ave NE
49th Ave NE
37th Ave NE
36th Ave N
Bass Lake Rd
Schmidt Lake Rd
Rockford Rd
N Dowling Ave
Medtronic
Tony
Sheet 12


St. Cloud, MN
Existing St. Cloud Amtrak Station
Raymond Ave NE
5th Ave NE
Crescent St NE
Columbia Ave NE
Lincoln Ave NE
8th Ave SE
7th Ave SE
Columbia Ave SE
10
Wilson Ave NE
3rd Ave NE
E St Germain St
1st St SE
5th Ave SE
2nd St SE
To St. Paul
© 2013 Google


St. Cloud Station
to BNSF Yard
Amtrak Station
Potential Layover Track at BNSF Yard (TBD)
To St. Paul
St N
13th St N
9th Ave N
Wilson Ave NE
St Germain St
3rd St
25th Ave N
1st St N
Wilson Ave SE
2nd St N
3rd St N
St Cloud, MN, USA
Saint Cloud
7th St S
Cooper Ave S
1st St S
Killian Blvd SE
23
25th Ave S
University Dr S


Route Alternative 2
Chicago - St. Cloud
Via Union Depot and Fridley
Fridley Northstar Station
To St. Cloud
Minneapolis Jct.
Minneapolis Target Field Station (TFS)
Midway Station (Closed)
Union Depot in St. Paul
Chicago to St Paul Union Depot = 411 miles
St Paul Union Depot to Midway Station = 7 miles
Midway to Minneapolis Jct = 4 miles
Minneapolis Jct to Fridley = 6 miles
Fridley to St. Cloud = 58 miles
Chicago to St. Cloud = 486 miles
indicates station stop
indicates no station stop
3.62 mi
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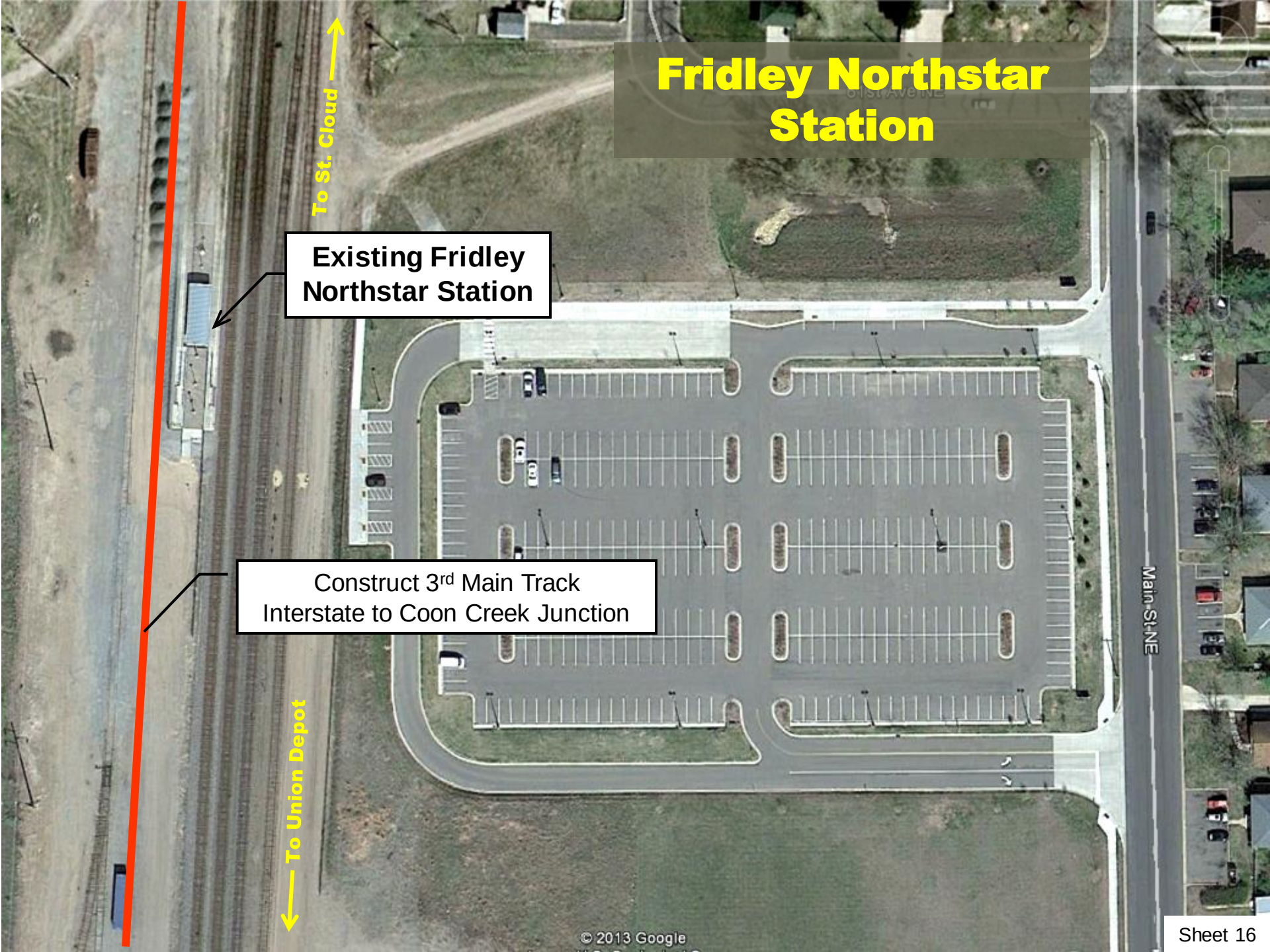
Fridley Northstar Station
To St. Cloud
Existing Fridley Northstar Station
Construct 3rd Main Track Interstate to Coon Creek Junction
To Union Depot
Main St NE
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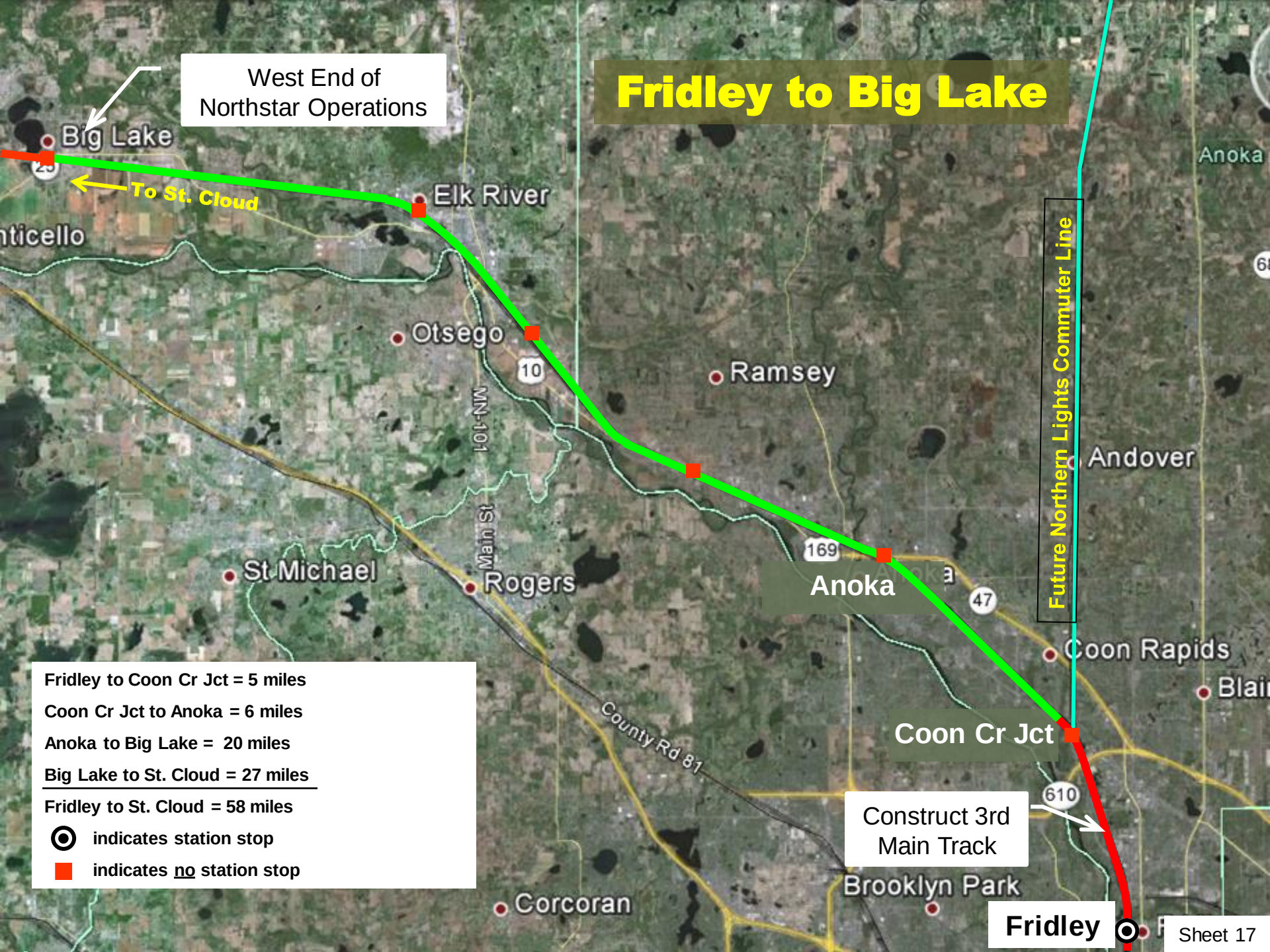
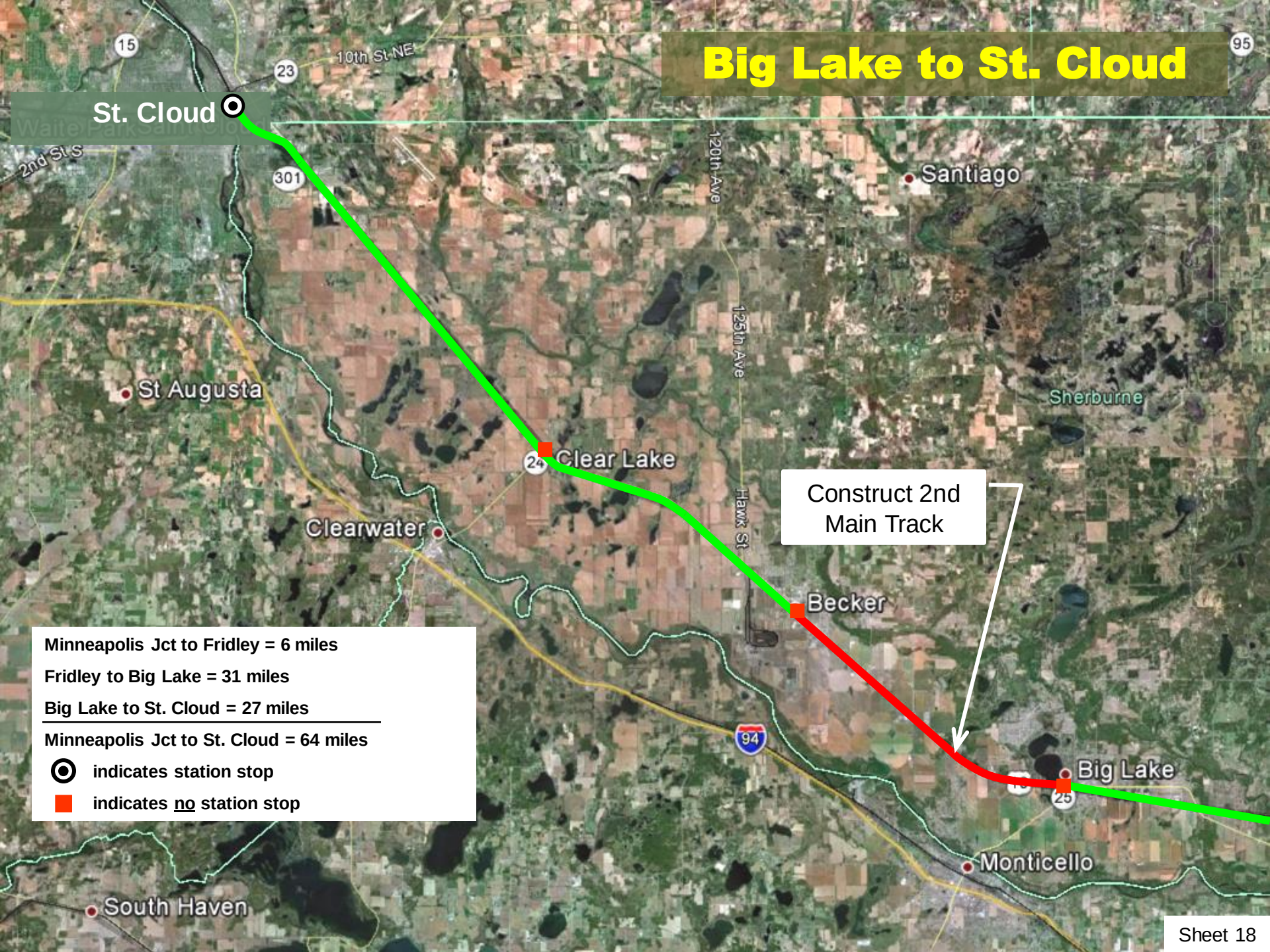

Fridley to Big Lake
West End of Northstar Operations
Big Lake
To St. Cloud
Elk River
Otsego
Ramsey
Andover
Anoka
Future Northern Lights Commuter Line
St Michael
Rogers
Main St
MN-101
County Rd 81
Coon Rapids
Coon Cr Jct
Construct 3rd Main Track
Brooklyn Park
Fridley
Corcoran
Fridley to Coon Cr Jct = 5 miles
Coon Cr Jct to Anoka = 6 miles
Anoka to Big Lake = 20 miles
Big Lake to St. Cloud = 27 miles
Fridley to St. Cloud = 58 miles
indicates station stop
indicates no station stop
Sheet 17


Big Lake to St. Cloud
St. Cloud
15
23
10th St NE
95
2nd St S
301
120th Ave
Santiago
125th Ave
St Augusta
Sherburne
24
Clear Lake
Hawk St
Construct 2nd
Main Track
Clearwater
Becker
Minneapolis Jct to Fridley = 6 miles
Fridley to Big Lake = 31 miles
Big Lake to St. Cloud = 27 miles
Minneapolis Jct to St. Cloud = 64 miles
indicates station stop
indicates no station stop
94
Big Lake
25
Monticello
South Haven


Alternative 3
Chicago - Minneapolis
Via Union Depot in St. Paul
Chicago to St Paul Union Depot = 411 miles
St Paul Union Depot to Midway = 7 miles
Midway to Minn Jct = 4 miles
Minn Jct to TFS = 1.6 miles
Chicago to TFS = 424 miles
indicates station stop
indicates no station stop
Minneapolis Target Field Station (TFS)
Minneapolis Jct.
Midway Station (Closed)
Union Depot in St. Paul
3.62 mi
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Image U.S. Geological Survey
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Alternative 4
Service Terminates at Union Depot in St. Paul
Fridley Northstar Station
Minneapolis Jct.
Minneapolis Target Field Station (TFS)
Midway Station (Closed)
Union Depot in St. Paul
Chicago to St. Paul Union Depot = 411 miles
indicates station stop
indicates no station stop
3.62 mi
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Image U.S. Geological Survey
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EXHIBIT 3

Corridor Photographs

(Set 1)

CPR MP 63 (facing E.)
Typical Double Track
Chicago - Milwaukee

Pewaukee MP 104.3
(facing W.)
End Double Track


Nashotah Siding
MP 113.0 (facing W.)
Jointed Rail

Cooney Siding East Switch
MP 119.6 (facing W.)

Watertown MP 131.2 (facing E.)
UP Crossing - Begin Double Track

Watertown Yard MP 131.2 (facing W.)
Wisconsin & Southern RR in background


Near Reeseville Marsh
MP 137.3 (facing W.)
Double Track at Walton Road
137.3

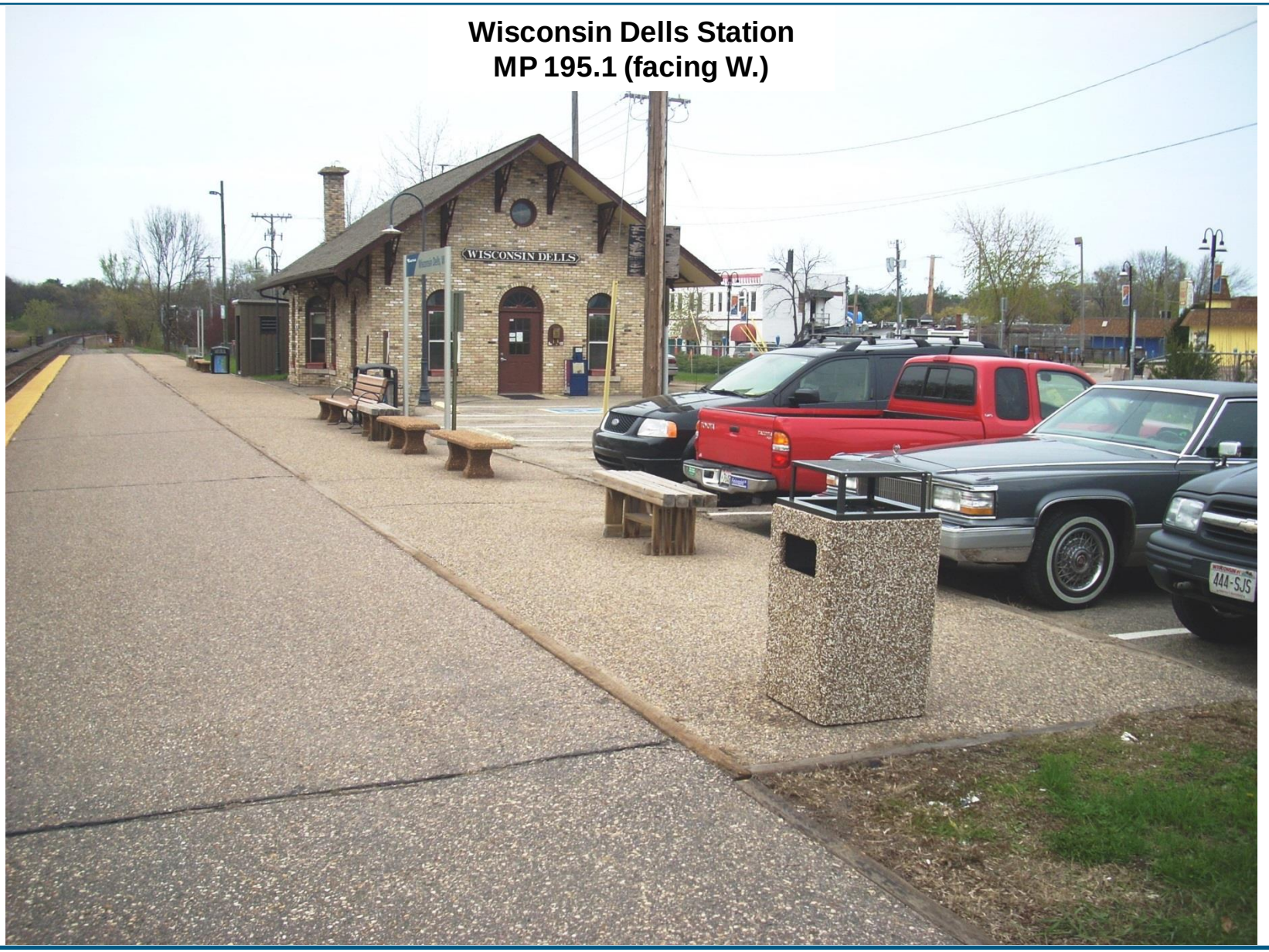
Fall River MP 156.7 (facing W.)
Equilateral Turnout near Seier Road

Portage Jct. MP 177.0 (facing W.)
U.S. 51 OH Bridge in background

Portage Station
MP 178.2 (facing E.)

Portage Yard
MP 178.3 (facing W.)

Wisconsin Dells Station
MP 195.1 (facing W.)



New Lisbon
MP 221.1.1 (facing W.)
Junction with CN


Tomah Station

Tomah Station Parking

Tomah Station Platform

Camp Douglas Industry Track
MP 227.2 (facing W.)
Washburn Street

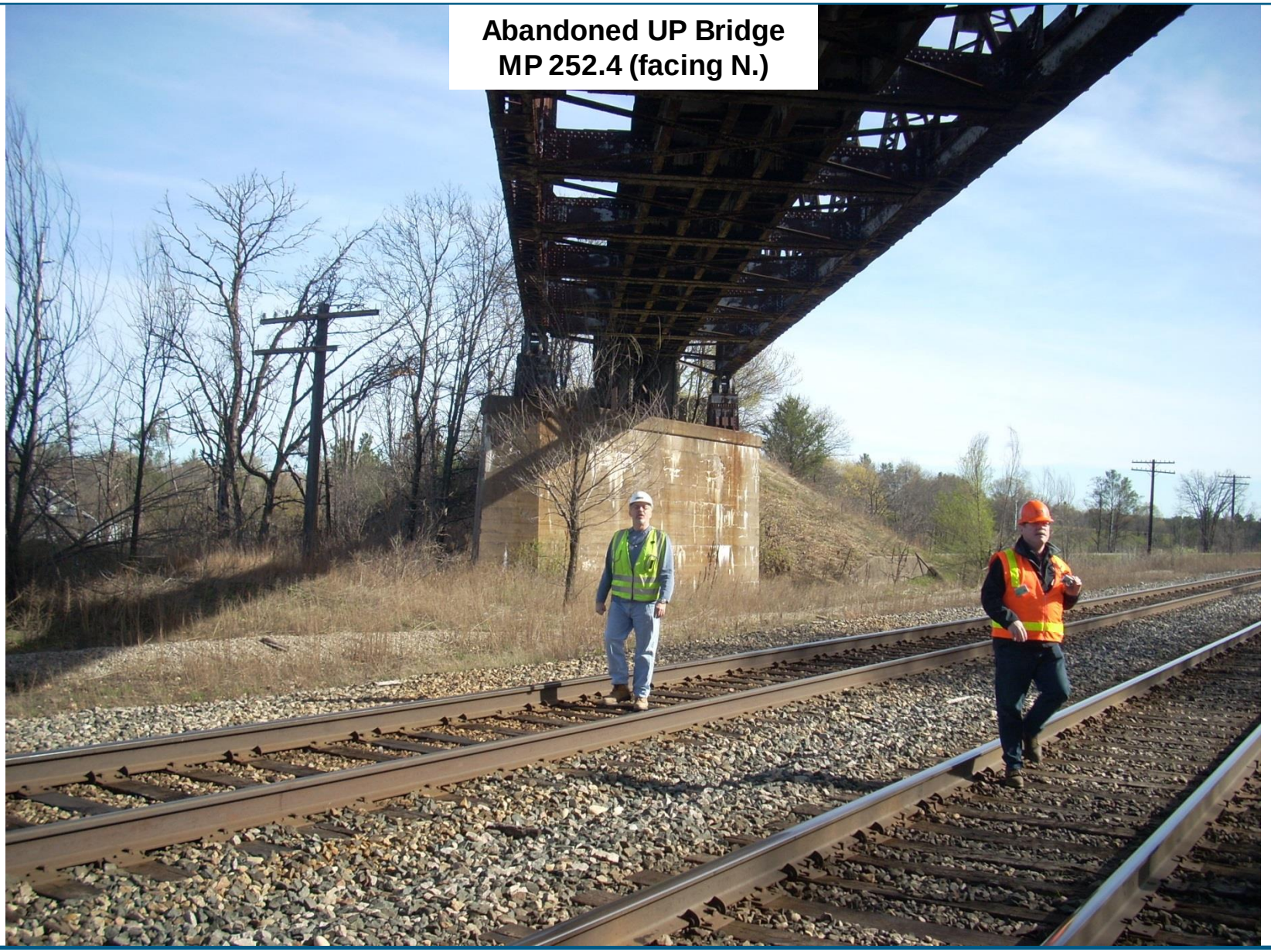

Tunnel City
MP 243.8 (facing W.)
TUNNEL CITY
BEGIN
C T C
CPR
UP

Unimin Fracking Sand Mine
MP 246.0 (facing W.)

Raymore, Begin Double Track
MP 246.3 (facing W.)

#20 Equilateral Turnout

Abandoned UP Bridge
MP 252.4 (facing N.)




West Salem
MP 271.3 (facing W.)
#8 Eastbound
154
AMTRAK

LaCrosse - Grand Crossing
MP 280.0 (facing W.)
BNSF Crossing

BNSF Yard at Grand Crossing
MP 280.0 (facing N.)


CPR Yard at Grand Crossing
MP 280.0 (facing W.)

LaCrosse Station
MP 281.0 (facing E.)

LaCrosse Station Parking

Black River Bridge
MP 282.0 (facing W.)

Mississippi River Bridge – W. Span
MP 283.3 (facing W.)


“Bridge Switch”
MP 283.6 (facing W.)
CPR Marquette Sub
To St. Paul


River Junction
MP 285.0 (facing E.)
To Chicago
CPR Marquette Sub

EXHIBIT 3
Corridor Photographs
(Set 2)

River Junction West MP 288.0 (facing W.)
End CPR Tomah Sub, Begin CPR River Sub

Dresbach, MN MP 289.0 (facing W.)

Winona Station MP 308.2

Winona Station Platform (facing W.)

Winona Station Parking
(facing E.)

Winona Tower CK
MP 310.3 (facing E.)


Goodview
MP 312.7 (facing W.)
CPR Goodview Sub
To St. Paul

Minnesota City Siding, E. End
MP 314.8 (facing W.)

Minnesota City Siding, E. End
New Bridge after 2008 Floods

Camp Lacupolis MP 345.2
Dangerous Crossing due to poor sight distances

Camp Lacupolis
MP 345.1 (facing E.)

Camp Lacupolis
MP 345.3 (facing W.)


Lake City
MP 353.8 (facing E.)
STOP
CREW AT WORK

Red Wing Station & Parking Lot
MP 370.7

Public Parking Garage
Behind Station

CPR Red Wing Yard West of Station Platform

Grain Elevator Tracks East of Station Platform

Casino at Sturgeon Lake Road, MP 378.6
Proposed Grade Separation with Space for 4 Tracks

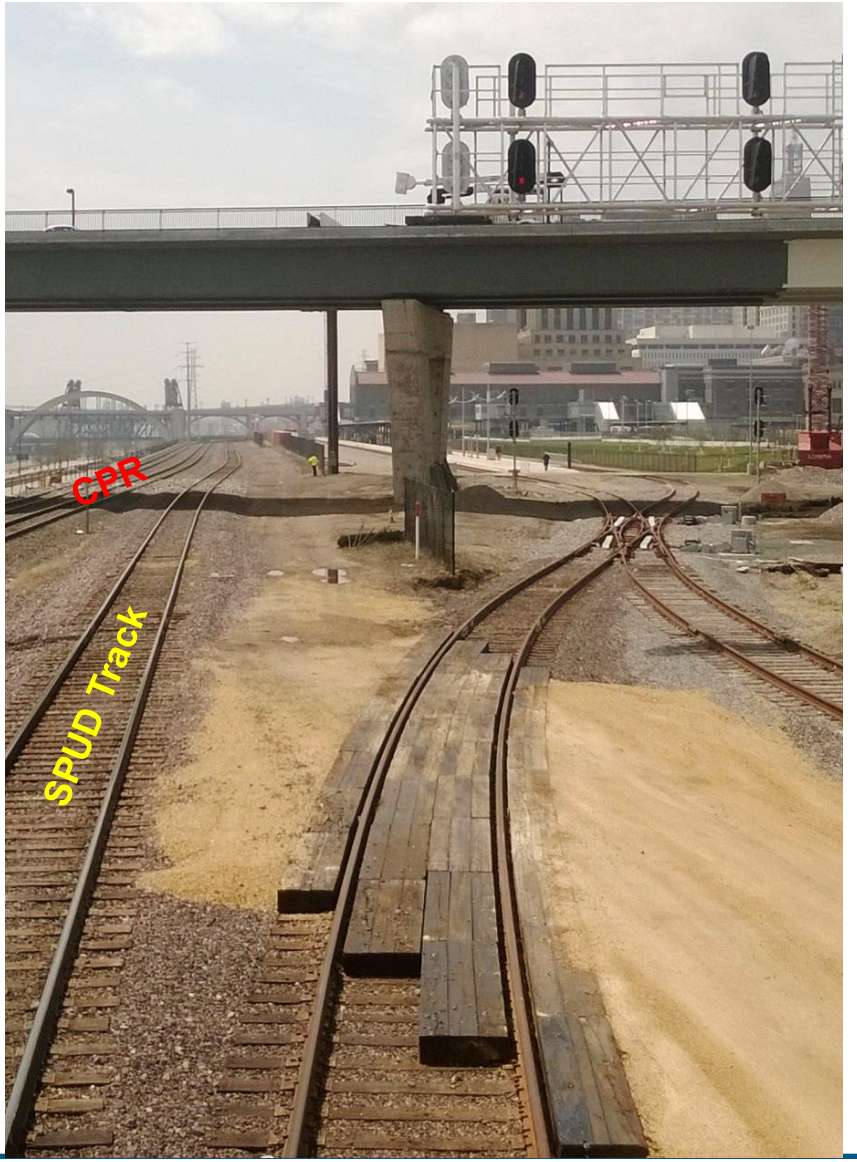
Hastings, MP 391.3 (facing W.)
Single Track Mississippi River Bridge

West End of GM Auto Facility
MP 399.0 (facing W.)

East End CPR St. Paul Yard
MP 407.4 (facing E.)

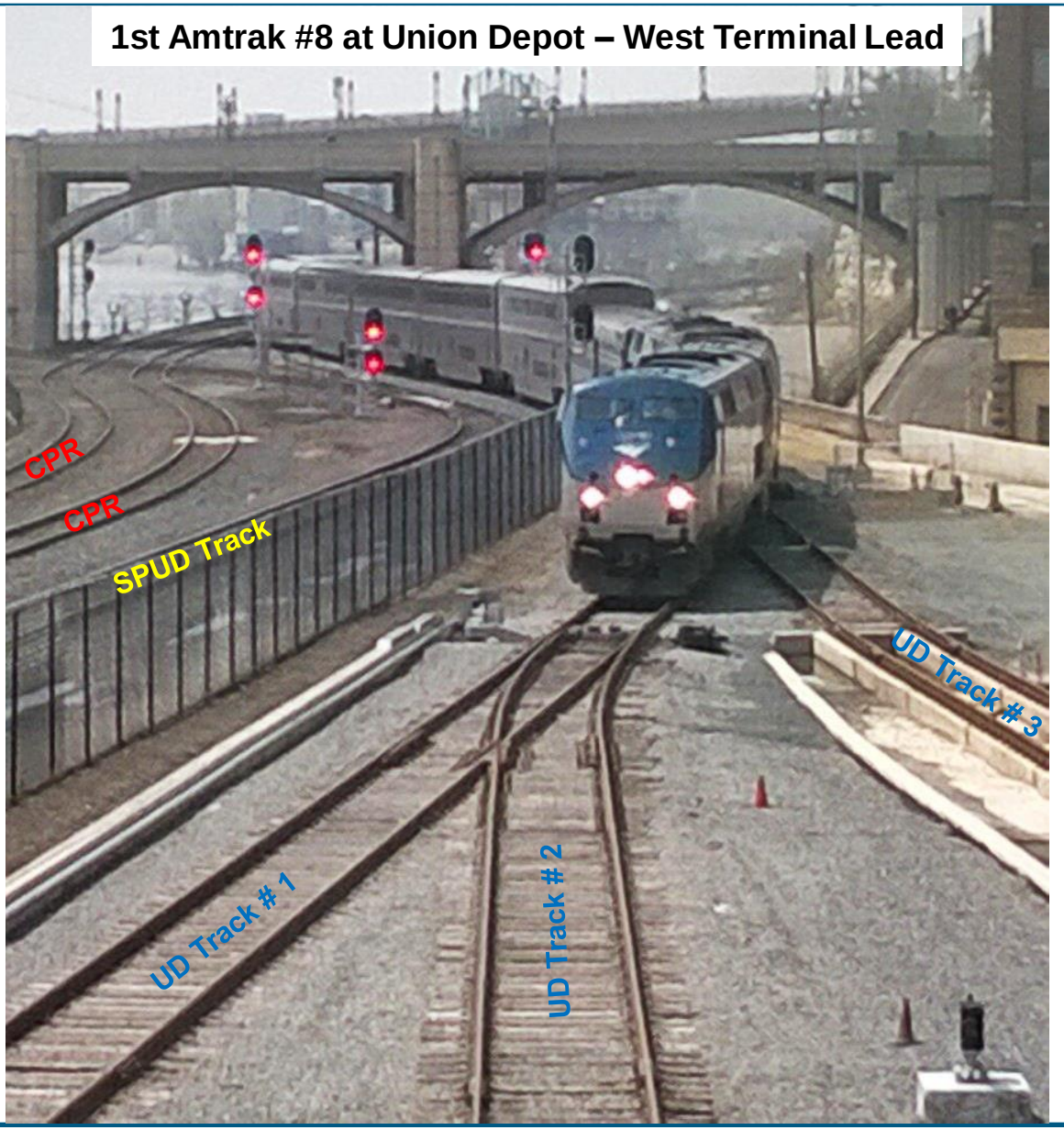
CPR St. Paul Yard

Union Depot in St. Paul - East Terminal Lead



East End Union Depot Platform in St. Paul

1st Amtrak #8 at Union Depot – West Terminal Lead



BNSF - Fridley Northstar Station (facing W.)

Fridley Northstar Station
(facing E.)

Coon Rapids Northstar Station
(facing E.)

Big Lake Northstar Station (facing E.)

St. Cloud Station (facing W.)

St. Cloud Station Platform (facing W.)