

Chicago – Detroit/Pontiac Corridor Service Development Plan

Executive Summary

The Michigan Department of Transportation (MDOT) has developed a Service Development Program for the Chicago-Detroit/Pontiac High Speed Rail Corridor that consists of:

- A corridor-wide “service” NEPA study, and
- A Corridor Service Development Plan (SDP)

The Service NEPA document and the Corridor SDP have been developed by the internal staff of MDOT with minimal input from outside consultants. The key members of the MDOT staff have been involved with the planning of the Midwest Regional Rail Initiative (MWRRI) since its inception in 1996. MDOT is confident that the efforts in the production of these documents and the associated applications will position the State of Michigan to receive ARRA grants to assist in providing improved reliability, reduced travel times, and increased amenities to passenger rail users in Michigan. MDOT intends to use the ARRA funds to advance Michigan’s Service Development Program, which consists of a coordinated and comprehensive grouping of projects that will result in significant infrastructure improvements to existing services. The Corridor SDP, along with the applications, provides a business and investment justification for improving the Chicago-Detroit/Pontiac Corridor as part of the MWRRI Phase 1 and in accord with the July 27, 2009 Memorandum of Understanding executed by the eight governors of the MWRRI and the Mayor of the City of Chicago.

The projects grouped into the Service Development Plan are as follows:

1. Planned improvements on the CN portion of the corridor (Pontiac to Milwaukee Junction) include rehabilitation and replacement of rail, replenishing track ballast, replacement of rail ties, upgrades to signalization, and grade crossing improvements.
2. West Detroit Connection Track Project (Milwaukee Junction through West Detroit including Delray and CP Yd) involves connecting Conrail Shared Assets Operations and CN railroads at West Detroit Junction and constructing one mile of new track eastward to the Vinewood Interlocking. Property acquisition, several crossovers, Beaubien Interlocking, Milwaukee Junction, Delray, and CP Yd will also be constructed as part of this project. In addition, the current ABS will be converted to CTC signaling between Milwaukee Junction and West Detroit Junction.
3. Planned improvements on the CSAO portion (West Detroit Junction to Dearborn) include rehabilitation and replacement of rail, replenishing track ballast, replacement of rail ties, upgrades to signalization, and grade crossing improvements.
4. Planned improvements on the NS portion of the corridor (Dearborn to Kalamazoo) include rehabilitation and replacement of rail, replenishing track ballast, replacement of rail ties, upgrades to signalization, grade crossing improvements, and extension of the positive train control system. In

addition, MDOT will seek acquisition/control of this segment to ensure the integrity of the high speed passenger rail corridor.

5. Planned improvements on the Amtrak portion of the corridor (Kalamazoo to Porter) include track improvements, upgrades to signalization, and grade crossing improvements.
6. Construction of the Englewood Flyover in Illinois to eliminate a chokepoint with commuter rail traffic in Chicago.
7. Acquisition of up to 10 new sets of train equipment to replace existing equipment used in Michigan services. Acquisition of this train equipment will be consistent with Section 305 of PRIIA, which calls for the establishment of a standardized Next Generation rail corridor equipment pool. In addition, the procurement will be consistent with the MWRRI service development plan.
8. Construction of new stations at Troy and Dearborn; rehabilitated station at Battle Creek.

The Chicago-Detroit/Pontiac Corridor Service Development Plan has been prepared in concert with the “overarching” MWRRI Service Development Plan that justifies the initial investment needed for the implementation of the MWRRI Phase 1 corridors. As explained in this Corridor SDP (Chapter 1: Program Rationale), MDOT and the MWRRI states have refined the MWRRI Phase 1 because of the environmental constraints existing in the Chicago to Porter segment (South of the Lake Corridor- SOLC) of Norfolk Southern right-of-way. The MWRRI states have submitted a joint track 1b application for ARRA funds to conduct PE/NEPA studies to understand and resolve the complex issues within the SOLC. However, even with these constraints, the MWRRI can move forward with service goals to improve reliability, reduce travel time and add amenities for the users of the system within the corridors of the MWRRI Phase 1. MDOT is joining in this effort with this Service Development Plan that satisfies the MWRRI goals.

The full time permanent jobs created based on the implementation of the MWRRI System Plan are detailed in the MWRRI SDP. Full time permanent jobs are productivity jobs as differentiated from construction jobs created to construct the project. As described in Section 11.4 of the Project Notebook, the construction jobs impact (assessed by Input Output RIMS II methodology) is much smaller than the permanent jobs impact. Nonetheless, as shown in Exhibit 11-29, implementation of the MWRRI System over a 10-year period was estimated to create 152,063 person-years of work, or an average of 15,206 jobs each year. This impact on construction jobs has been estimated as each corridor’s pro-rata share of overall MWRRS capital cost. The impact of permanent jobs created is presented in the Corridor SDP, as well as the application for funding.

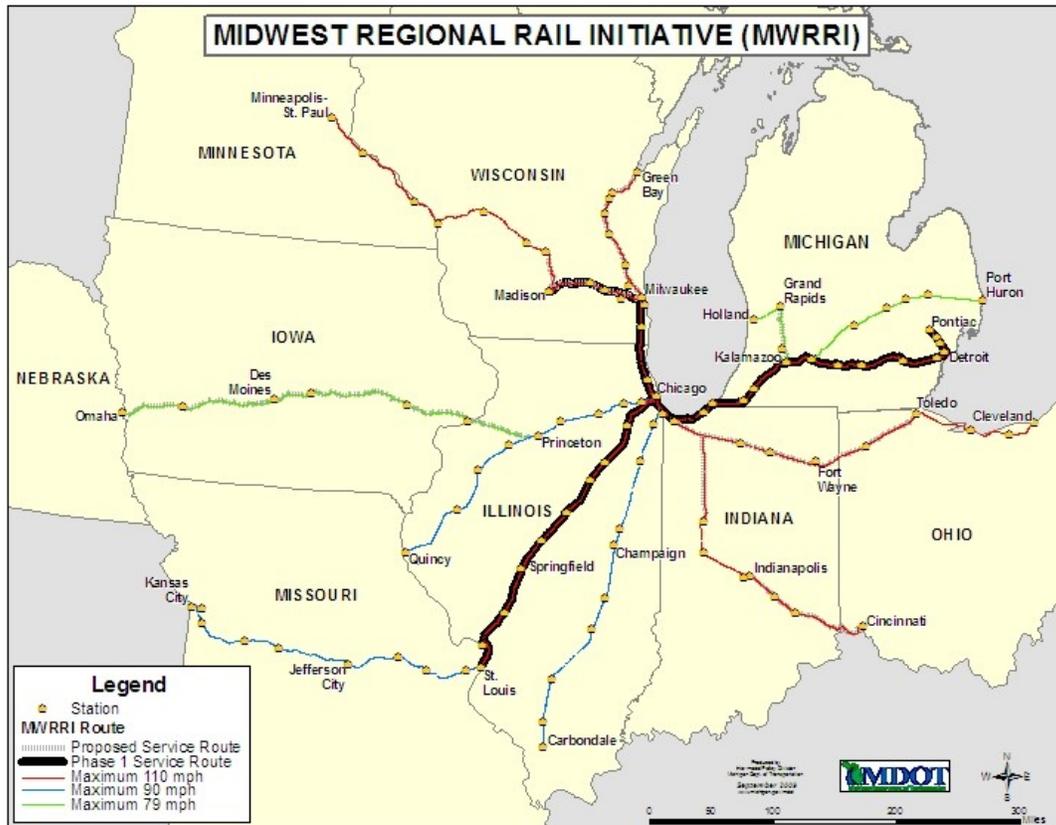
Chapter 1: Program Rationale

1.1 Purpose

Four state transportation agencies-Illinois Department of Transportation, Indiana Department of Transportation, Michigan Department of Transportation and Wisconsin Department of Transportation-propose to implement Phase I of the Midwest Regional Rail Initiative System Plan. The Federal Railroad Administration (FRA), an operating administration within the U.S. Department of Transportation, has

agreed to serve as the lead federal agency for the project. The MWRRI is an ongoing effort to develop an improved and expanded passenger rail system in the Midwest. Phase I of the MWRRI is defined as the implementation of high speed train service up to 110 mph on the following routes (see Exhibit 1):

Exhibit 1. Midwest Regional Rail Initiative System Plan: Phase 1



Chicago-St. Louis:

Increase service from 5 round trips to 8 round trips.

Chicago-Milwaukee-Madison:

Increase service from 7 round trips to 10 round trips to Milwaukee; provide 6 new round trips to Madison.

Chicago-Detroit:

Increase service from 3 round trips to 6 round trips, (currently operating on a portion of the Amtrak segment at 95 mph, with an increase to 110 mph in late 2009).

The existing transportation network in these study corridors includes highway (auto and bus) and air modes, and limited passenger rail service between all city pairs, excepting the Milwaukee-Madison segment, which is not currently served by passenger rail.

The US Department of Transportation, Federal Railroad Administration's (FRA) High Speed Intercity Passenger Rail Program (HSIPR) provides an opportunity to implement a number of the corridors identified in MWRRI System Plan. While the MWRRI recommended these corridors as part of its Phase I Implementation, various financial and development issues have resulted in refinements within Phase 1 and Phase 3 and the delay in the implementation of Phase 2. Phase 1 refinements were necessary due

to the complexity of the Chicago Terminal Limits, particularly environmental and capacity issues between Chicago and Rondout on the Chicago-Milwaukee-Madison corridor, Chicago and Dwight on the Chicago-St Louis corridor, and Chicago and Porter on the Chicago-Detroit corridor. The MWRRRI states submitted a Track 1B application titled Chicago Terminal Limits PE/NEPA (Illinois is the lead state) to resolve these complex issues. Therefore, the MWRRRI states have coordinated their Track 2 applications with the intention to “jumpstart” the development of the entire MWRRRI System Plan in accordance with the long term planning effort . The refinements in the MWRRRI implementation plan focused on assuring that the major corridors emanating from the Chicago Hub are included in the “jumpstart”, including the Chicago to Detroit/Pontiac High Speed Rail Corridor.

The original MWRRRI Phase 1 for the Chicago-Detroit/Pontiac Corridor had 6 round trip trains per day between Chicago to Detroit/Pontiac operating at a maximum speed of 110 mph. Due to capacity constraints and associated environmental issues within the Chicago Terminal Limits (South of the Lake Corridor), the phasing of this corridor has been refined to maintain the current 3 round trip trains per day between Chicago and Detroit/Pontiac and complete significant improvements within the corridor consistent with the associated environmental documentation. These significant improvements consist of a coordinated and comprehensive grouping of projects that eliminate a series of chokepoints between Chicago and Porter, and improve track conditions and signals between Porter and Ann Arbor resulting in operations in this segment (Porter to Ann Arbor) at a maximum speed of 110 mph. The Chicago to Detroit/Pontiac Corridor traverses Oakland, Wayne, Washtenaw, Jackson, Calhoun, Kalamazoo, Van Buren, Cass, and Berrien counties. It serves the Michigan cities of Pontiac, Birmingham, Royal Oak, Detroit, Dearborn, Ann Arbor, Jackson, Albion, Battle Creek, Kalamazoo, Dowagiac, Niles and New Buffalo, connecting these cities to the Chicago hub.

Development of the Chicago-Detroit/Pontiac High Speed Rail Corridor is to help meet future regional travel needs in this corridor through improvements to the level and quality of regional passenger rail service. The proposed action offers an opportunity to provide reliable and competitive passenger rail service as an attractive alternative transportation choice by:

- Meeting travel demand
- Decreasing travel times
- Improving reliability
- Providing amenities to improve passenger ride quality and comfort.

1.2 Needs

1.2.1 Travel Demand in the Chicago-Detroit/Pontiac Corridor

MDOT projects that by the year 2030 population and employment in the I-94 corridor between Chicago and Detroit will grow 3.4% and 6.7%, respectively. During that same time frame, total daily vehicle-miles of travel is expected to increase 35%.¹ MDOT has estimated that travel on interstate freeways has increased 55 percent since 1990, with 35 percent of the average vehicle miles traveled occurring under

¹ Michigan Department of Transportation.

congestion conditions. With the anticipated increase in traffic, MDOT expects that congestion on the freeway system will continue to increase.²

In northwest Indiana, between 1980 and 2000, population decreased one percent, but traffic volumes on major highways in the region increased about 50 percent. The Northwestern Indiana Regional Planning Commission (NIRPC) recognizes that part of this demand is the result of the region's strategic location at the southern end of Lake Michigan. Many of the nation's transportation systems converge in the region, making orderly flow of goods and services a priority for transportation planning in the region. According to the NIRPC's long range transportation plan, three of the seven major east-west transcontinental interstate highways cross through northwest Indiana. Trunk lines of three major eastern railroads pass through the region.³

1.2.2 Decrease Travel Times

The preference surveys conducted over the last several years identified several important factors that influence the success of high speed rail service in the Midwest. Travel time and reliability are the primary factors that determine the choice of transportation mode.

Therefore, MDOT proposes a passenger rail system that will provide a mix of travel times and train schedules to accommodate business as well as leisure travelers. Improved travel times and increased frequency of service will serve to foster connectivity throughout the Chicago-Detroit/Pontiac Corridor and strengthen its overall attractiveness and performance. When compared with travel times of the current passenger rail service, travel time savings with the refined Phase 1 improvements in this corridor represent a 60 minute saving in time between Chicago and Detroit. The table below illustrates travel time reductions achieved by these improvements to rail infrastructure proposed under the refined Phase 1. Improvements to infrastructure and mitigation of freight capacity issues can reduce rail travel times so they compare favorably with those of other travel modes. A comparison of estimated travel times between the various modes are illustrated in Exhibit 2.

² Michigan Dept. of Transportation. June 2007. [MI Transportation Plan: Moving Michigan Forward, 2005-2030.](#)

³ Northwestern Indiana Regional Planning Commission. 2006. [Northwestern Indiana Long Range Transportation Plan-Connections 2030.](#) pages 3-2 to 3-3.

Exhibit 2. Travel Time Comparisons between Travel Modes (Chicago-Detroit/Pontiac)

Mode	Estimated Travel Time Downtown to Downtown One-way	Estimated Total Travel Time	Passenger Rail Estimated Travel Time Comparison
Passenger Rail Walk/Auto Segment ¹ Station Segment Train Segment ² Auto Segment	15 minutes Downtown Chicago to Union Station 10 minutes 4 hours-46 minutes 15 minutes from New Center station to Downtown Detroit	5 hours-26 minutes	--
Auto and Parking	4 hours-30 min. to 5 hours	4 hours-30 min. to 5 hours	4 minutes to 34 minutes slower than train
Bus³ Auto/Walk Segment Station Segment Bus Segment Auto/Walk	15 minutes to downtown bus station 10 minutes 7 hours-10 minutes 15 minutes bus station to downtown	7 hours-50 minutes	3 hours-24 minutes slower than train.
Air Auto/Transit Segment Airport Segment Air Segment ⁴ Airport segment Auto Segment	1 hour Downtown Chicago to O'Hare Airport 1.5 hours 1 hour-15 minutes Detroit/Wayne Airport-O'Hare Airport 15 minutes 40 minutes to Detroit Wayne Airport to Downtown Detroit	4 hours-40 minutes	14 minutes slower than train

¹ Travel time estimates for walk, auto and station segments obtained from Milwaukee-Madison Passenger Rail Corridor Project Environmental Assessment, WisDOT ID 0410-40-40/0499-10-39, <http://www.dot.state.wi.us/projects/d1/hsrail/environ.htm>

² Travel time estimates for train segment are based on Midwest Regional Rail System, *Executive Report*, September 2004.

³ Average bus travel time

⁴ Based on, Northwest Airlines, <http://res.nwa.com/App/FlightSearchResults>, Accessed September 2007

1.2.3 Improve Reliability

According to MWRRI surveys, business air travelers value reliability substantially more than non-business air travelers and all rail travelers. Therefore, the success of the Chicago-Detroit/Pontiac Corridor to attract ridership is closely linked to providing on-time performance that is competitive with airline on-time performance. A potential added benefit of intercity passenger rail in the Chicago-Detroit/Pontiac Corridor is that it can typically operate in poor weather conditions, providing a reliable alternative to air travel in inclement weather.⁴ Severe weather and congestion rarely cause delays in passenger rail service and there is normally minimal waiting time at stations.⁵

However, there are several infrastructure and operational constraints along the corridor that must be addressed to improve reliability of the existing intercity passenger rail service. MDOT would improve reliability through corridor improvements by constructing sidings, crossovers, interlockings, turnouts, and additional mainline trackage.

⁴ Midwest Regional Rail Initiative. June 2004. MWRRI Project Notebook, Page 4-8

⁵ Midwest Regional Rail Initiative. June 2004. MWRRI Project Notebook Page 4-31.

In Michigan, relatively short sidings for passenger train to passenger train meets, as well as relatively long distances between sidings create the potential for delays due to waiting for opposing traffic. Another capacity constraint is related to the fact that there are no sidings between Battle Creek and Kalamazoo. There is also the potential for freight train and passenger train congestion through Battle Creek and congestion delays in the Detroit area, especially at interlockings.⁶

Amtrak's annual On-Time Performance Reports and Minutes of Delay statistics for Amtrak's operations between Chicago and Detroit were analyzed for six trains over the period 2004-2006. Amtrak's on-time performance was approximately 50%. The reports indicate that the top reasons for delay were freight train interference, passenger train interference, and cable and signal (C&S) work due to defects.⁷ Delays due to freight interference can be expected to grow. An MWRRRI analysis projects freight traffic between Chicago and Porter, Indiana to grow between 2% and 5% annually. This increase is expected to lead to greater congestion and delay for both passenger and freight trains. Infrastructure improvements, including new tracks, are required to accommodate both passenger and freight service growth.⁸

The MWRRRI's potential mitigation options along the Chicago-Detroit/Pontiac route include infrastructure improvements between Chicago and Porter, Indiana and extension of sidings and double track, upgrading turnouts, and the construction of new trackage in Michigan. MWRRRI analysis indicates that freight trains would still need to be carefully slotted between Battle Creek and Kalamazoo, as will passenger trains coming into and out of Chicago.⁹

1.2.4 Provide Amenities

The MWRRS plan for improved passenger rail ridership also includes continuing focus on amenities. Technological advances, along with an increased attention to customer satisfaction, have led to considerable improvements to on-board amenities.¹⁰ In addition to improved performance and reliability, an expanded suite of amenities allows passengers to work and relax comfortably while on the train. The following are examples of on-board amenities that would respond to customer expectations and satisfaction.

- Food and beverage service
- Open seating and airline-type business class seating
- Large flexible compartments
- Receptacles for computers and other communication equipment
- Wireless internet access
- Audio-visual monitors at seats for news, entertainment, and informational programs
- Special vibration-absorbing mountings and soundproofing to reduce noise levels

⁶ Midwest Regional Rail Initiative. June 2004. MWRRRI Project Notebook. Pages 6-51 - 6-53

⁷ On-Time Performance and Minutes of Delay Statistics, May 2007 letter from Michael W. Franke (Senior Director, Amtrak)

⁸ HNTB, December 2004, Detroit-Chicago High Speed Rail Corridor Study Update "South of the Lake Corridor"

⁹ Midwest Regional Rail Initiative. June 2004. MWRRRI Project Notebook. Pages 6-52, 6-53

¹⁰ Midwest Regional Rail Initiative. June 2004. MWRRRI Project Notebook. Pages 1-1, 3-6

These features add to passenger comfort. Investments to improve amenities are expected to increase ridership and revenues as the high quality service would attract travelers into the rail market.¹¹

1.2.5 Promote Economic Development

The direct investment in infrastructure, equipment, and facilities will result in reduced travel times between city pairs, improved service quality in terms of passenger amenities, quality of ride and station conditions, and community improvements through transportation-related development. Key to regional economic improvement is the reduction in travel time which will provide quicker access to business, cultural and tourism centers, and improved mobility throughout the corridor. This access will support existing industries, foster growth of new small businesses, and encourage large businesses to distribute their operations more widely throughout Michigan. Improved access will assist Michigan universities in their roles as centers of higher learning, research, business development, and medical service. Increases service frequencies combined with the rail corridor improvements is expected to lead to rising property values and significant public-private development opportunities near stations.¹²

Chapter 2: Service/Operating Plan and Prioritized Capital Plan

2.1 Service Goals

The service goal of this project is to increase reliability and decrease travel times in the Chicago-Detroit/Pontiac Corridor by 2013 without increasing frequency of service. The frequency of service cannot be increased because of environmental constraints in the Chicago-Porter segment. All operators and host railroads (Amtrak, Norfolk Southern, Conrail Shared Assets Operations, and Canadian National) intend for the existing intercity passenger rail service and rail freight service to be more reliable than currently operating within the corridor. The significant improvements planned in the corridor are complementary to future expansion plans in the corridor.

2.1.1 Proposed Route

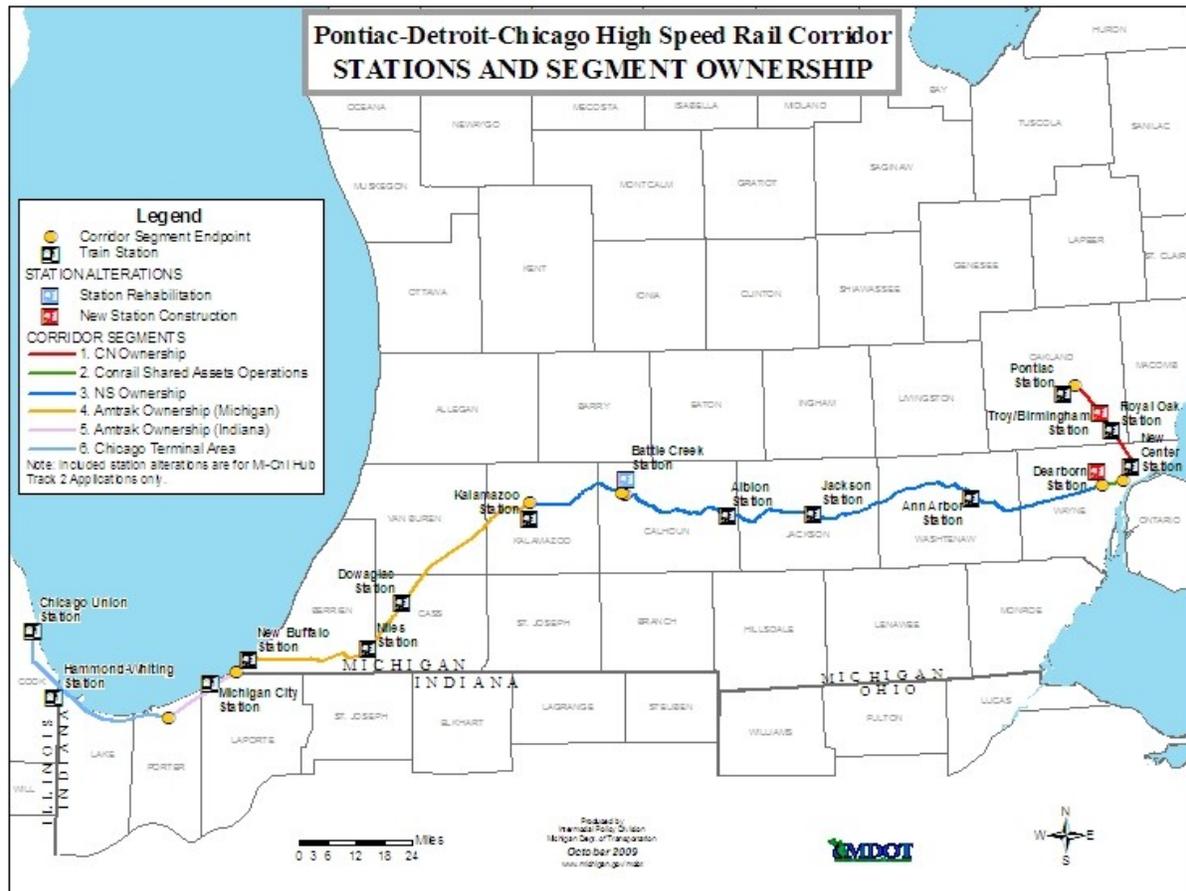
The proposed route is the existing corridor for Amtrak service between Chicago Union Station and Pontiac, Michigan. After departing the Amtrak-owned property at Chicago Union Station, it continues on the right of way of Norfolk Southern to Porter, Indiana; on Amtrak-owned right of way to Kalamazoo, Michigan; on Norfolk Southern right of way to Dearborn; on Conrail shared Assets Operations right of way to West Detroit Junction; on Canadian National to Pontiac, Michigan.

The Chicago-Detroit/Pontiac Corridor traverses Oakland, Wayne, Washtenaw, Jackson, Calhoun, Kalamazoo, Van Buren, Cass, and Berrien counties. It serves the Michigan cities of Pontiac, Birmingham, Royal Oak, Detroit, Dearborn, Ann Arbor, Jackson, Albion, Battle Creek, Kalamazoo, Dowagiac, Niles and New Buffalo, connecting these cities to the Chicago hub. This corridor serves Michigan City and Hammond in Indiana.

¹¹ Midwest Regional Rail Initiative. June 2004. MWRRI Project Notebook. Page 2-7, 4-10

¹² MWRRI State of Michigan Brochure, Page 2

Exhibit 3. Corridor Ownership & Stations



2.1.2 Proposed Train Operations

Today, the development of Michigan service is “slot constrained” due to limited capacity on the Chicago-Porter segment of the route. Development of an interim plan building toward the full Phase I implementation includes limiting train frequencies to the current three round trips per day. However, speed improvements to 110-mph will be implemented on the Porter to Ann Arbor portion of the route, and additional improvements implemented east of Ann Arbor, to reduce the overall schedule time to 5:36, as shown in the attached train schedules. While the train frequency is cut in half to the frequency proposed in the original MWRRI Phase 1, the scheduled running time is almost as fast as that envisioned by the original MWRRS Phase I implementation.

2.1.3 Proposed Train Schedules

The train schedules developed show an overall schedule time of 5 hours:36 minutes between Chicago and Pontiac, a decrease of approximately 60 minutes compared to the current Amtrak schedule (see Exhibit 4). This meets the Service Development Program goal of reduced travel times.

Exhibit 4. Proposed Train Schedules

Chicago–Detroit/Pontiac 3 Round Trips w/ 5:36 Schedule

23-Sep-09

All times are CST

Station - Read Down	Train Number		350	352	254
	Milepost	Schedule Time	Daily	Daily	Daily
CHICAGO, IL - UNION STATION	0.0	0:00	7:30	12:16	18:00
Gary, IN - Regional Airport	23.0	0:25	7:55	12:41	18:25
Michigan City, IN	52.8	0:53	8:23	13:09	18:53
Niles, MI	89.8	1:31	9:01	13:47	19:31
Dowagiac, MI	102.3	1:42	9:12	13:58	19:42
Kalamazoo, MI	138.3	2:12	9:42	14:28	20:12
Battle Creek, MI	161.0	2:22	9:52	14:38	20:22
Albion, MI	185.6	2:57	10:27	15:13	20:57
Jackson, MI	206.5	3:19	10:49	15:35	21:19
Ann Arbor, MI	243.5	3:52	11:22	16:08	21:52
Dearborn, MI	273.5	4:21	11:51	16:37	22:21
DETROIT, MI	282.7	4:39	12:09	16:55	22:39
Royal Oak, MI	292.8	5:02	12:32	17:18	23:02
Birmingham, MI	297.1	5:15	12:45	17:31	23:15
PONTIAC, MI	305.4	5:36	13:06	17:52	23:36

Station - Read Up	Train Number		351	353	355
	Milepost	Schedule Time	Daily	Daily	Daily
CHICAGO, IL -UNION STATION	305.4	0:00	11:24	16:16	23:03
Gary, IN - Regional Airport	282.4	0:25	10:58	15:50	22:37
Michigan City, IN	251.7	0:53	10:30	15:22	22:09
Niles, MI	215.7	1:31	9:52	14:44	21:31
Dowagiac, MI	203.2	1:42	9:41	14:33	21:20
Kalamazoo, MI	167.2	2:12	9:11	14:03	20:50
Battle Creek, MI	144.5	2:22	9:01	13:53	20:40
Albion, MI	119.8	2:57	8:26	13:18	20:05
Jackson, MI	98.9	3:19	8:04	12:56	19:43
Ann Arbor, MI	61.9	3:52	7:31	12:23	19:10
Dearborn, MI	31.9	4:21	7:02	11:54	18:41
DETROIT, MI	22.7	4:39	6:44	11:36	18:23
Royal Oak, MI	12.6	5:02	6:21	11:13	18:00
Birmingham, MI	8.3	5:15	6:08	11:00	17:47
PONTIAC, MI	0.0	5:36	5:47	10:39	17:26

2.1.4 Chicago-Detroit Pontiac Corridor Station Locations and Intermodal Connections

Exhibit 5 identifies the planned station locations and total ridership forecast associated with each of the stations in Base and Forecast years (based on the three daily round trips). Some of the stations will offer Intermodal options, such as Detroit and Ann Arbor, which are identified as having feeder bus connectivity. Several corridor stations are intermodal today, including Battle Creek and Kalamazoo.

Exhibit 5. Station Locations & Forecasted Activity

<i>General Characteristics</i>					
<i>Station Names¹</i>	<i>State</i>	<i>County</i>	<i>Address²</i>	<i>Zip Code</i>	<i>Feeder Bus</i>
Chicago Union	Illinois	Cook	225 South Canal St.	60661	n
Gary, Airport	Indiana	Lake		46406	n
Michigan City	Indiana	LaPorte	100 Washington Street	46360	n
Niles	Michigan	Berrien	598 Dev St.	49120	n
Dowagiac	Michigan	Cass	100 East Railroad St.	49047	n
Kalamazoo	Michigan	Kalamazoo	459 North Burdick St.	49007	n
Battle Creek	Michigan	Calhoun	104 Capital Ave. S.W.	49017	n
Albion	Michigan	Calhoun	300 North Eaton St.	49224	n
Jackson	Michigan	Jackson	501 East Michigan Ave.	49201	n
Ann Arbor	Michigan	Washtenaw	325 Depot St.	48104	y
South Detroit Suburbs (Dearborn)	Michigan	Wayne	16121 Michigan Ave.	48126	n
Detroit	Michigan	Wayne	11 West Baltimore Ave.	48202	y
North Detroit Suburbs (Royal Oak)	Michigan	Oakland	201 South Sherman Ave.	48069	n
Birmingham *	Michigan	Oakland	449 South Eton St.	48009	n
Pontiac	Michigan	Oakland	1600 Wide Track Circle	48342	n

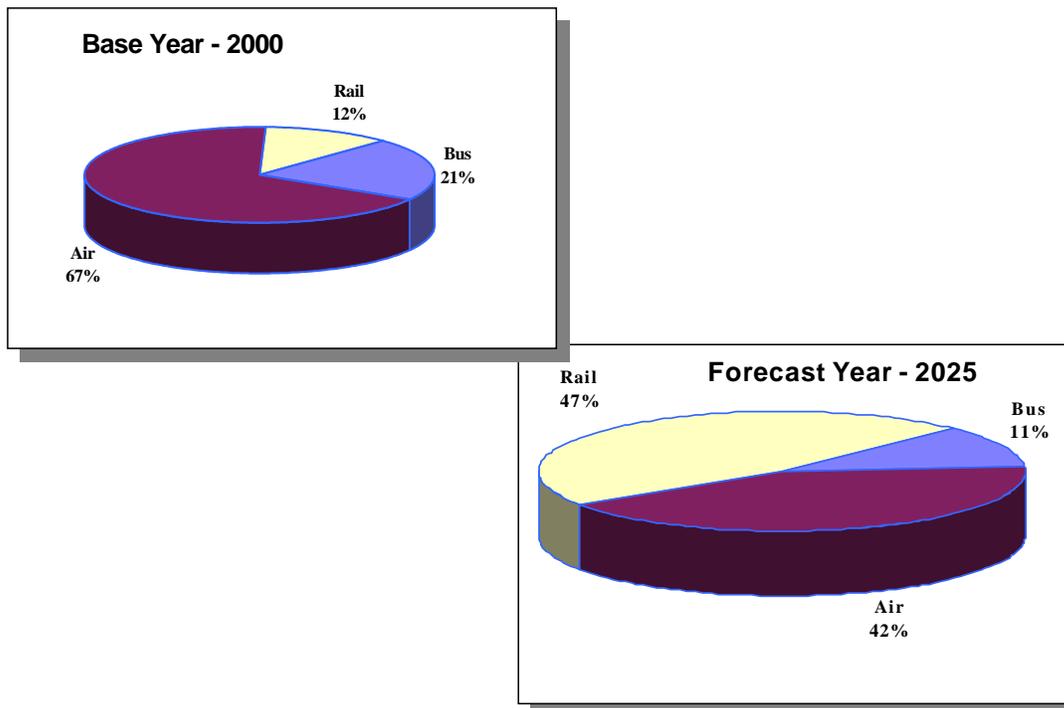
<i>Volume of Trips²</i>				
<i>Station Names¹</i>	<i>State</i>	<i>Year 2004</i>	<i>Year 2020</i>	<i>Year 2040</i>
Chicago Union	Illinois	-	697,301	897,948
Gary, Airport	Indiana	0	7,343	9,666
Michigan City	Indiana	2,085	12,842	16,564
Niles	Michigan	16,600	28,240	36,026
Dowagiac	Michigan	1,944	7,977	10,238
Kalamazoo	Michigan	75,345	129,522	166,059
Battle Creek	Michigan	43,847	75,940	97,888
Albion	Michigan	1,021	6,998	9,024
Jackson	Michigan	22,752	37,618	48,820
Ann Arbor	Michigan	108,498	175,669	226,683
Dearborn	Michigan	65,509	123,209	157,496
Detroit	Michigan	53,729	143,536	184,034
Royal Oak	Michigan	17,575	56,670	73,776
Pontiac	Michigan	16,112	37,178	48,541

The MWRRRI has completed a detail analysis of the potential of connectivity of intercity passenger rail to other modes of transportation. The passenger rail market analysis confirms there is a substantial market for intercity travel between all the cities on the MWRRRI System. In many markets, the MWRRRI System provides a faster and more cost-effective alternative to auto and bus travel. Furthermore, the MWRRRI System provides a more cost-effective means of travel than air in many of the smaller, urban areas on or near an MWRRRI System corridor.

In the 2000 base year, 498 million trips within the Midwest region, 98 percent were made by auto; 1.3 percent by air; 0.4 percent by bus and 0.3 percent by rail. Auto trips include a large number of relatively short trips (100 to 150 miles), while the public modes generally include longer trip lengths, typically 150 to 250 miles for bus and rail and 250 to 500 miles for air. In other words, while the market share of the public modes is small (2.0 percent for air, rail and bus), the public modes have a larger share of the total vehicle or passenger miles, and therefore account for a much larger proportion of the person miles traveled. Of the public modes, for the existing market, 67 percent of the trips are made by air, 21 percent by bus and 12 percent by rail.

Of the total rail ridership forecast for 2025, 6 percent is a result of the natural growth of travel demand in the region, 10 percent is due to increased mobility or induced demand, and 84 percent is due to diverted demand. Induced demand is defined as those trips that would not have been made without the introduction of the MWRRRI System, while diverted demand is the result of travelers changing travel mode. Of the diverted demand for the MWRRRI System, 57 percent is from auto, 23 percent from bus and 20 percent from air (see Exhibit 6).

Exhibit 6. Base and Forecast Year Market Shares for the Public Modes



MWRRS implementation would add significant capacity to augment the capacity of the existing highway and air systems. While most of the rail travel diversion would come from automobile, the MWRRRI System would provide a moderate level of airport congestion relief as well.

Since air service is increasingly focused on trips over 300 miles, the MWRRRI System tends to complement rather than compete with air service in the Midwest. Even so, the convenience of direct downtown-to-downtown accessibility provided by the system will enable it to divert some short-haul air traffic to rail. Most of the air impact would come from reduction of very short flights that offer marginal profitability to the airlines anyway. Since the MWRRS would be more efficient than air for many of these short trips under 300 miles, this would allow airlines and airports to redeploy assets to more economically productive uses.

There would be some shift of long haul trips from bus to rail as well. However, the overall use of bus service in the Midwest would be likely to grow through development of a feeder bus network, like the one that already exists in California. This would connect the MWRRRI System to smaller outlying communities, which would likely result in an increased overall usage of a restructured bus network. Greyhound participated in development of this feeder bus plan and has indicated its support for it.

2.2 Operational Analyses

Base level delays were calculated at 980 minutes for the corridor. The addition of the MWRRRI System (full build out of the Michigan corridors) brought the total delay to 3,500 minutes, a 350 percent increase over the forecast base.

The increase in delays with addition of the MWRRRI System passenger traffic was attributable to the following:

Chicago: Congestion on the Chicago line and in the Chicago terminal area. Intermodal trains are particularly important on this route and tend to operate in fleets both eastbound and westbound to meet tight cutoff and departure times.

Passenger Meets: Short sidings or lack of sidings for passenger-to-passenger train meets create the potential for delays in waiting for opposing traffic.

Kalamazoo: There are no sidings between Battle Creek and Kalamazoo. With Port Huron branch line trains (Blue Water) operating between Battle Creek and Kalamazoo, the result is 28 passenger trains per day on this line. In addition, splitting the trains results in a 20-minute gap on eastbound trains, creating a significant potential bottleneck, particularly for any freight traffic operating during the day. The limited windows available for freight operations, except for the hours between 1 and 5 a.m., result in little time for on-line local switching. The lack of slots will lead to fleeting of the few freight trains operating on the line, which may compound delays.

Battle Creek: Potential freight and passenger train congestion through Battle Creek.

Sidings: East of Battle Creek toward Detroit, there are relatively long distances between sidings.

Detroit: Though perhaps not as severe as Chicago, the Detroit area also faces congestion delays, especially at major interlockings.

Freight train delays were about 2 percent more than the pre-MWRRS conditions without any significant schedule adjustments. This value is well within the margin of error for this analysis. (Project Notebook Section 6.20 Pg.6-51, 6-52, 6-53 and 6-54)

This preliminary operations analysis confirmed the field inspections completed by Amtrak and MDOT staff that improvements made within the grouping of projects in Michigan were consistent with the analysis and needed to improve reliability and reduce travel time in the Michigan portion of the corridor.

2.3 Capital Needs

2.3.1 Existing Conditions

From Chicago Union Station, the route follows Amtrak to 21st Street, the NS Chicago Line to Porter, Amtrak's Michigan Line to Kalamazoo, the NS Michigan Line to just outside Detroit (with a short stretch in Battle Creek on the CN South Bend Subdivision), followed by a trip on the Conrail Shared Assets Michigan Line and North Yard Branch, CN Shoreline subdivision through Amtrak Woodward Avenue Station, with the final leg into Pontiac on the CN Holly Subdivision.

The NS Chicago Line, the CN line in Battle Creek and the Conrail lines in the Detroit region are all double-track with crossovers. Crossovers are situated every two to three miles near Chicago to every four to seven miles near Porter on the Chicago Line. Furthermore, the Detroit region has multiple crossovers. The remaining route is single-track with passing sidings.

The Amtrak line has eight sidings roughly 10 to 12 miles apart. While the line between Battle Creek and Kalamazoo is double-track on both ends, there are no sidings on the 16 miles of single track in between. East of Battle Creek has five sidings between three to 17 miles apart. There are intermodal yards on the NS Chicago Line at 55th Street and Park Manor and Livernois freight yard in Detroit. Traffic control is CTC throughout with Incremental Positive Train Control currently in revenue service as part of an FRA demonstration project on the Amtrak Michigan line.

Outside of the Chicago and Detroit regions, the traffic on this route is largely passenger. Even before Conrail was formed in the late 1970's, the Penn Central had shifted most of its freight south between Detroit and Chicago via Toledo. Since Conrail (now CSAO) didn't want to include this line segment in their network, Amtrak acquired ownership of the Porter to Kalamazoo line. Amtrak currently operates four round trips per day on this route, including the *Blue Water*¹³ between Chicago and Battle Creek. Amtrak service changes however, have no effect on the line capacity simulation that was performed since future MWRRS schedules and not current Amtrak schedules are what was simulated.

¹³ The *Blue Water* replaced a longer-distance international train to Toronto, the *International*.

Freight train operations on this corridor were modeled as follows: five total trains per day between Porter and Kalamazoo, 15 per day between Kalamazoo and West Detroit, 32 per day between West Detroit and Milwaukee Junction and 16 per day between Milwaukee Junction and Pontiac. This is intended to reflect a peak day freight operation. The only Amtrak train modeled was the *International*. CN traffic in Battle Creek was not modeled due to the short length of the route shared with the MWRRS.

MWRRRI System trains operate at 110-mph with seven roundtrips daily between Chicago Union Station and Pontiac, nine round trips per day between Chicago and Detroit, and one daily round trip between Chicago and Battle Creek. Mainline trains were assumed to operate between Kalamazoo and Chicago with the branch line trains coupled. Where MWRRRI System trains operate intermixed with freight traffic in multiple track territory, only one track will be upgraded to 110-mph.

Another factor to consider here is that the entire route is the same as the current Amtrak route from Chicago to Detroit and Pontiac. This has led to well-established procedures for operating passenger trains despite the multiple railroads involved. The Amtrak ownership of the Porter-Kalamazoo line and height restrictions help to keep freight traffic relatively low, with the exception of the areas around Chicago, Battle Creek and Detroit.

2.3.2 Proposed Track 2 Improvements Prioritized

Infrastructure

1. West Detroit Connection Track Project (Milwaukee Junction through West Detroit including Delray and CP Yd) involves connecting Conrail Shared Assets Operations and CN railroads at West Detroit Junction and constructing one mile of new track eastward to the Vinewood Interlocking. Property acquisition, several crossovers, Beaubien Interlocking, Milwaukee Junction, Delray, and CP Yd will also be constructed as part of this project. In addition, the current ABS will be converted to CTC signaling between Milwaukee Junction and West Detroit Junction.
2. CREATE P1. Construction of the Englewood Flyover in Illinois to eliminate a chokepoint with commuter rail traffic in Chicago.
3. Planned improvements on the NS portion of the corridor (Dearborn to Kalamazoo) include rehabilitation and replacement of rail, replenishing track ballast, replacement of rail ties, upgrades to signalization, grade crossing improvements, and extension of the positive train control system. In addition, MDOT will seek acquisition/control of this segment to ensure the integrity of the high speed passenger rail corridor.
4. Planned improvements on the CSAO portion (West Detroit Junction to Dearborn) include rehabilitation and replacement of rail, replenishing track ballast, replacement of rail ties, upgrades to signalization, and grade crossing improvements.
5. Planned improvements on the CN portion of the corridor (Pontiac to Milwaukee Junction) include rehabilitation and replacement of rail, replenishing track ballast, replacement of rail ties, upgrades to signalization, and grade crossing improvements.
6. Planned improvements on the Amtrak portion of the corridor (Kalamazoo to Porter) include track improvements, upgrades to signalization, and grade crossing improvements.

Equipment

Acquisition of up to 10 new sets of train equipment to replace existing equipment used in Michigan services. Acquisition of this train equipment will be consistent with Section 305 of PRIIA, which calls for the establishment of a standardized Next Generation rail corridor equipment pool. In addition, the procurement will be consistent with the MWRRI service development plan.

Stations

1. Construction of new station at Troy.
2. Construction of new station at Dearborn.
3. Rehabilitation of existing station at Battle Creek.

2.3.3 Estimated Capital Costs for Projects and Project Groups

The capital costs associated with the infrastructure improvements are as follows:

- West Detroit Connection Track (\$64,277,825)
- CREATE P1 (\$136,919,168)
- NS Improvements & Acquisition (\$357,807,478)
- CSAO Improvements (\$3,445,154)
- CN Improvements (\$13,905,994)
- Amtrak Improvements (7,541,643)

The acquisition of equipment which consists of up to 10 trainsets will cost \$361,008,536. Station costs will be as follows:

- Troy-new station (\$10,343,398)
- Dearborn-new station (\$34,707,972)
- Battle Creek-rehabilitated station (\$3,540,887)

2.3.4 Assumptions Associated with Capital Costs

A general assumption applied to all capital costs was that owners management-environmental, engineering, program management, construction management, and contingency amounted to 31 percent of the capital cost of the improvement. For the NS Improvements & Acquisition Project it was assumed that the acquisition cost would be \$150 million.

2.3.5 Capital Needed for Full Build-Out of Corridor

In 2010 dollars, the capital cost for the full build out of the Chicago-Detroit/Pontiac Corridor infrastructure will be \$1.310 billion. This includes track work, signaling, positive train control, grade crossing closures and enhancements, and stations. Equipment acquisition costs will be \$351 million for the additional trainsets needed to operate 20 trains daily in the Chicago-Detroit/Pontiac Corridor. Increasing the level of service from three daily round trips to six will be triggered by the completion of the Environmental Impact Statement for the South-of-the-Lake, subsequent final engineering, construction of the needed infrastructure improvements, and acquisition of the needed trainsets. This should occur by 2015 or 2016. Increasing the level of service to six daily round trips would complete Michigan's implementation of Phase 1 of the MWRRI System Plan. Full build out to 20 trains daily occurs in Phase 5 of the MWRRI System Plan.

2.3.6 Estimate of Cyclic Capital Needs

Implementation of Michigan's Track 2 application would keep service frequency at its current level. Consequently, Amtrak would be responsible for the cyclic capital needs as the Chicago-Detroit/Pontiac Corridor is part of Amtrak's basic system.

2.4 Chicago- Detroit/Pontiac Financial Results and Operating Statistics

Exhibits 7 and 8 detail the projected financial performance of the Chicago-Detroit/Pontiac Corridor. The ridership and revenue projections include ramp-up factors of 50% for the first year and 90% for the second year. The full level of forecast ridership is not attained until the third year of operations. The financial performance of Michigan service will improve after Phase 5, when speed and capacity improvements on the proposed South-of-the-Lake upgrade shorten the Chicago schedule by ½ hour and permit launching of Michigan branch line services, both of which will improve the forecasted train load factors.

**Exhibit 7. Projected Financial Results (Financial Statement): Chicago-Detroit/Pontiac Corridor
3 RT on 5:36 Schedule for 10 years**

Revenue (Thousands 2002 \$)	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Base Revenue	\$22,476	\$22,761	\$23,051	\$23,344	\$23,641	\$23,941	\$24,246	\$24,554	\$24,866	\$25,182
Air Connect	\$175	\$178	\$180	\$182	\$184	\$187	\$189	\$192	\$194	\$196
OBS	\$1,798	\$1,821	\$1,844	\$1,868	\$1,891	\$1,915	\$1,940	\$1,964	\$1,989	\$2,015
Express Parcels net revenue	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Bus Feeder system	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Revenue	\$24,449	\$24,760	\$25,075	\$25,394	\$25,716	\$26,043	\$26,374	\$26,710	\$27,049	\$27,393
Expenses (Thousands 2002 \$)										
Energy & Fuel	\$1,326	\$1,326	\$1,326	\$1,326	\$1,326	\$1,326	\$1,326	\$1,326	\$1,326	\$1,326
Train Equipment Maintenance	\$5,643	\$5,643	\$5,643	\$5,643	\$5,643	\$5,643	\$5,643	\$5,643	\$5,643	\$5,643
Train Crew	\$2,259	\$2,259	\$2,259	\$2,259	\$2,259	\$2,259	\$2,259	\$2,259	\$2,259	\$2,259
OBS	\$1,332	\$1,341	\$1,349	\$1,358	\$1,366	\$1,375	\$1,384	\$1,393	\$1,402	\$1,410
Service Admin	\$3,436	\$3,479	\$3,524	\$3,568	\$3,614	\$3,660	\$3,706	\$3,753	\$3,801	\$3,849
Sales and Marketing	\$1,311	\$1,327	\$1,344	\$1,361	\$1,379	\$1,396	\$1,414	\$1,432	\$1,450	\$1,469
Track & ROW Maintenance	\$8,190	\$8,190	\$8,190	\$8,190	\$8,190	\$8,190	\$8,190	\$8,190	\$8,190	\$8,190
Station Costs	\$3,315	\$3,315	\$3,315	\$3,315	\$3,315	\$3,315	\$3,315	\$3,315	\$3,315	\$3,315
Insurance Liability	\$2,225	\$2,239	\$2,254	\$2,268	\$2,282	\$2,297	\$2,311	\$2,326	\$2,341	\$2,356
Operational Profit	\$1,387	\$1,395	\$1,402	\$1,410	\$1,418	\$1,425	\$1,433	\$1,441	\$1,449	\$1,457
Bus Feeder system	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Expenses	\$30,425	\$30,515	\$30,607	\$30,699	\$30,792	\$30,887	\$30,982	\$31,079	\$31,177	\$31,275
Net Cash Flow	# (\$5,976)	(\$5,755)	(\$5,532)	(\$5,306)	(\$5,076)	(\$4,844)	(\$4,608)	(\$4,369)	(\$4,127)	(\$3,882)

**Exhibit 8. Projected Financial Results (Operating Statistics): Chicago-Detroit/Pontiac Corridor
3 RT on 5:36 Schedule for 10 years**

Financial & Operating Statistics	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Operating Ratio	0.80	0.81	0.82	0.83	0.84	0.84	0.85	0.86	0.87	0.88
Load Factors (PM/SM)	73.2%	74.1%	75.1%	76.0%	77.0%	78.0%	79.0%	80.0%	81.0%	82.0%
Average Ticket Price	\$32.14	\$32.14	\$32.14	\$32.14	\$32.14	\$32.14	\$32.14	\$32.14	\$32.14	\$32.14
Cost Per Passenger Mile (Yield)	\$0.2424	\$0.2400	\$0.2377	\$0.2355	\$0.2332	\$0.2310	\$0.2288	\$0.2266	\$0.2245	\$0.2224
Average Trip Length (Miles)	178.1	178.1	178.1	178.1	178.1	178.1	178.1	178.1	178.1	178.1
Total Passenger Trips (Thousands)	705	714	723	732	741	751	760	770	780	790
Passenger Miles (Millions)	126	127	129	130	132	134	135	137	139	141
Seat Miles (Millions)	172	172	172	172	172	172	172	172	172	172
Train Miles (Thousands)	572	572	572	572	572	572	572	572	572	572
Cost Per Train Mile	\$53.22	\$53.38	\$53.54	\$53.70	\$53.86	\$54.03	\$54.19	\$54.36	\$54.53	\$54.71
Cost Per Passenger	\$43.17	\$42.75	\$42.34	\$41.93	\$41.53	\$41.14	\$40.75	\$40.36	\$39.98	\$39.60
Total Revenue per Train Mile	\$42.76	\$43.31	\$43.86	\$44.42	\$44.98	\$45.55	\$46.13	\$46.72	\$47.31	\$47.91
Passenger Revenue per Train Mile	\$39.62	\$40.12	\$40.63	\$41.15	\$41.67	\$42.20	\$42.74	\$43.28	\$43.83	\$44.39
Revenue per Passenger Mile	\$0.1948	\$0.1948	\$0.1948	\$0.1948	\$0.1948	\$0.1948	\$0.1948	\$0.1948	\$0.1948	\$0.1948
Passenger Revenue per Passenger Mile	\$0.1804	\$0.1804	\$0.1804	\$0.1804	\$0.1804	\$0.1804	\$0.1804	\$0.1804	\$0.1804	\$0.1804

2.5 Chicago-Detroit/Pontiac Economic and Public Benefits

Economic and Public Benefits have been estimated for Chicago-Pontiac, as a share of the overall Benefits that have previously been estimated for the fully built-out MWRRS system. Job creation was estimated using *Economic Rents* methodology in the updated Chapter 11 of the Project Notebook. Exhibit 11.23 reported the employment impact, increase in household income, and increase in property value associated with each MWRRS station (see exhibits 9 & 10). These estimates were developed for a fully-built out MWRRS network as envisioned by Phase 7.

2.5.1 Job Creation

It is noted that Chicago Union Station comprises approximately 26% of the total job creation of the Midwest Region; the remaining 74% of job creation occurs in outlying areas. For every 2.8 jobs created in outlying areas, one job is created in downtown Chicago. Job creation for individual corridors was estimated by summing the Job creation for the stations along each corridor. Then the corridor’s share of downtown Chicago jobs could be estimated by applying the 1.0:2.8 ratio just described. This enables the estimation of productivity-related job creation associated with each corridor segment.

As described in Section 11.4 of the Project Notebook, the construction jobs impact (assessed by Input Output RIMS II methodology) is much smaller than the permanent jobs impact. Nonetheless, as shown in Exhibit 11-29, it was estimated to create 152,063 person-years of work, or an average of 15,206 jobs for each year of the assumed 10-year deployment period for the system. This impact on temporary construction jobs has been estimated as each corridor’s pro-rata share of overall MWRRS capital cost.

Data specific to the Chicago-Detroit/Pontiac Corridor yielded the following job creation figures:

		1 st Full Year	5 th Full Year	10 th Full Year
<u>Improvement</u>	<u>Construction</u>	<u>Permanent</u>	<u>Permanent</u>	<u>Permanent</u>
West Detroit Connection Track	70	460	690	805
CREATE P1	200	1350	2025	2375
NS Improvements	265	1770	2650	3100
CSAO Improvements	12	70	110	130
CN Improvements	20	130	200	240
Amtrak Improvements	10	68	100	120
Equipment	NA	NA	NA	NA
Troy Station	106	700	1100	1275
Dearborn Station	350	2400	3800	4400
Battle Creek Station	45	300	450	525
Total	1078	7248	11125	12970

The process used in deriving the created jobs by improvement consisted of the following:

- 1st Full Year equals total cost /\$36,000 x .343
- Construction equals 1st Full Year x .15
- 5th Full Year equals 1st Full Year x 1.5
- 10th Full Year equals 5th Full Year plus 25% of 1st Full Year

2.5.2 Benefit/Cost Ratio

Capital costs have been updated based on a current cost for the Porter to Pontiac segment of \$893.4 million. Stated in \$2002 (for consistency of comparison to prior MWRRS costs, using a deflation factor of 1.44) this amount would be reduced to \$620.4 million. This compares to a capital cost of \$777.8 million (including a portion of the South of the Lake expenditure) that was included in the original Project Notebook-based estimate. As a result, the capital cost basis for the proposed 3 train 110-mph service has actually *declined* to a factor of 79.8% of its original cost, although it no longer includes any Chicago to Pontiac cost, so the number of trains that can be operated are limited to their current level of 3 round trips per day.

Based on this assessment, it can be seen that the Benefit/Cost ratio remains positive (>1.00) for a discounting rate of 3.9% but drops below 1.00 if a 7.0% rate were assumed. It should be noted, however, that this estimate does not reflect the impact of higher fuel prices and ridership forecasts that have been in effect for the past several years. If the ridership and revenue forecasts were updated, it is anticipated that the Benefit/Cost calculation would rise above 1.00 for both 3.9% and 7.0% discounting rates.

Using the overall 1.80 Benefit/Cost ratio for the MWRRRI System (Exhibit 11.2 in the Project Notebook) as the starting point, a preliminary Benefit/Cost ratio was developed. This calculation is not the same as a stand-alone Benefit/Cost ratio, rather its intent is to assess the relative contribution of each corridor to the overall MWRRRI System performance. To develop a corridor-specific estimate, the capital cost was scaled to reflect each corridor's share of overall capital cost; while train miles scaled all other aspects. Train miles were used because of the variable impact of ramp-up factors and other transient effects on the short-term revenue and ridership forecasts for initial implementation years, so this was considered to be a more consistent measure for a first-cut estimate. The calculation can, however, be further refined in the future by incorporating more corridor-specific data.

The benefit to cost analysis assumes removing the construction cost of the Englewood Flyover since it benefits other corridors (Amtrak, Metra, freight railroads) in addition to the Chicago-Detroit/Pontiac Corridor. Therefore, using a present value of 3.9 percent, the result is a positive benefit/cost ratio of 1.11 (see Exhibit 10).

Exhibit 9. Socio-Economic Characteristics (2002)

2002 Socio-economic Characteristics (zones) ²					
Station Names ¹	State	Population	Employment	Average Household Income (2002 \$)	Average Residential Property Value (2002 \$)
Chicago Union	Illinois	4,168,445	1,900,442	\$71,059	\$211,452
Gary, Airport	Indiana	716,607	334,823	\$61,198	\$129,456
Michigan City	Indiana	133,703	64,426	\$56,407	\$121,537
Niles	Michigan	43,648	17,395	\$56,485	\$126,865
Dowagiac	Michigan	106,950	52,752	\$54,631	\$115,646
Kalamazoo	Michigan	241,055	122,658	\$61,142	\$135,500
Battle Creek	Michigan	205,886	97,253	\$55,746	\$117,341
Albion	Michigan	36,688	17,180	\$54,106	\$105,512
Jackson	Michigan	306,563	143,904	\$58,788	\$127,377
Ann Arbor	Michigan	489,468	262,016	\$80,447	\$220,043
South Detroit Suburbs (Dearborn)	Michigan	719,734	307,546	\$60,019	\$129,360
Detroit	Michigan	2,124,240	946,162	\$63,579	\$142,509
North Detroit Suburbs (Royal Oak)	Michigan	621,062	331,694	\$93,017	\$236,346
Birmingham *	Michigan	N/A	N/A	N/A	N/A

2000 Socio-economic Characteristics (city) ²					
Station Names ¹	State	City Population	City Population Size	Population Density	Density Category
Chicago Union	Illinois	2,896,016	Large	12,752	High
Gary, Airport	Indiana	102,746	Small	2,047	Medium
Michigan City	Indiana	32,900	Small	1,679	Low
Niles	Michigan	12,204	Small	2,104	Medium
Dowagiac	Michigan	6,147	Small	1,537	Low
Kalamazoo	Michigan	77,145	Small	3,123	High
Battle Creek	Michigan	53,364	Small	1,247	Low
Albion	Michigan	9,144	Small	2,032	Medium
Jackson	Michigan	36,316	Small	3,272	High
Ann Arbor	Michigan	114,024	Small	4,223	High
South Detroit Suburbs (Dearborn)	Michigan	97,775	Small	4,007	High
Detroit	Michigan	951,270	Medium	6,854	High
North Detroit Suburbs (Royal Oak)	Michigan	60,062	Small	5,090	High
Birmingham *	Michigan	19,291	Small	4,019	High

Exhibit 10. Economic Rent

Economic Rent Results ¹				
Station Names	State	Increase in Employment (# of people)	Increase in Household Income (ml of 2002 \$)	Increase in Property Value (ml of 2002 \$)
Chicago Union	Illinois	1,444-2,168	242-363	1,150-1,725
Gary, Airport	Indiana	400-605	8-12	32-48
Michigan City	Indiana	130-195	2.6-3.9	12-18
Niles	Michigan	95-145	1.9-2.8	9-13
Dowagiac	Michigan	65-95	1.2-1.9	6-9
Kalamazoo	Michigan	595-890	12-18	53-80
Battle Creek	Michigan	425-635	8.5-13	40-57
Albion	Michigan	45-70	0.9-1.3	4-6
Jackson	Michigan	205-310	4-6	18-28
Ann Arbor	Michigan	535-805	11-16	48-72
South Detroit Suburbs (Dearborn)	Michigan	400-600	8-12	36-54
Detroit	Michigan	850-1,275	17-25	76-114
North Detroit Suburbs (Royal Oak)	Michigan	300-455	6-9	27-40
Birmingham *	Michigan	3-4	0.06-0.08	0.3-0.4
Total		5,492-8,252	323-484	1,511-2,264

Exhibit 11. Benefit/Cost Analysis

MICHIGAN Chicago-Detroit w/3 trains and Updated Capital Cost		
Benefit Cost Parameters	40-Year Net Present Value	
	@3.9%	@7.0%
Benefits		
MWRRS User Benefits		
Consumer Surplus	\$0.21	\$0.12
System Revenues	0.43	0.24
Other Mode User Benefits		
Airport Congestion	0.08	0.05
Highway Congestion	0.14	0.08
Resources Benefits		
Airlines	0.047	0.026
Emissions	<u>0.032</u>	<u>0.021</u>
Total Benefits	\$0.95	\$0.55
Costs		
Capital	\$0.49	\$0.41
Capital Track Maintenance	0.02	0.02
Operating	<u>0.34</u>	<u>0.20</u>
Total Costs	\$0.86	\$0.63
Cost Benefit Ratio	1.11	0.87

*Billions of 2002\$

Chapter 3: Implementation Plan

The implementation plan for Chicago-Detroit/ Pontiac service is the first phase of planned MWRRI Phase 1 service extensions. The initial priority is on implementation of the eastern half of the corridor and the Chicago end of the corridor (Englewood Flyover). Constructing the West Detroit Connection Track and Englewood Flyover improvements could begin in 2010. The NS improvements are critical in order to maintain a quality 79 mph service and to move toward 110 mph train speeds. At the same time, two of the three station projects are located in the greater Detroit area. This emphasis is evidenced in the fact that 60 percent of the funding being requested is allocated to these areas (see Exhibit 12).

Exhibit 12. Track 2 Improvements Schedule (2009-2013)

<u>Improvement</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>Total</u>
West Detroit Connection Track	1.64	2.34	23.84	24.06	12.40	\$64.28
CREATE P1 (Englewood Flyover)	4.40	35.79	63.83	32.90	0.0	\$136.92
NS Improvements & Acquisition	3.04	188.45	66.89	68.95	30.47	\$357.81
CSAO Improvements	0.05	1.13	1.64	0.67	0.00	\$3.50
CN Improvements	0.00	0.21	0.76	7.67	5.27	\$13.91
Amtrak Improvements	0.11	1.40	2.43	2.50	1.12	\$7.54
Equipment	0.00	34.50	142.20	146.55	37.76	\$361.01
Troy Station	.51	3.00	4.84	2.00	0.00	\$10.34
Dearborn Station	1.72	11.35	15.38	6.25	0.00	\$34.71
Battle Creek Station	0.14	1.52	1.31	0.56	0.00	\$ 3.54
Total	\$11.61	\$279.69	\$322.32	\$292.11	\$87.03	\$993.50