High-Speed Intercity Passenger Rail Program
Chicago to Iowa City

Service Development Plan

August 6, 2010

Contents

ES.1 Letters from Illinois and Iowa Governors ..... ES 1-1

ES.2 Executive Summary: The Chicago to Iowa City High-Speed Intercity Passenger Rail Program 1-4

ES.3 Summary of the Service's Fulfillment of the FRA's Evaluation and Selection Criteria ..... ES 1-5

Evaluation Criteria ..... ES 1-5

Public Benefits ..... ES 1-5

1a. Transportation Benefits ..... ES 1-5

1b. Other Public Benefits ..... ES 1-7

2. Sustainability of Benefits ..... ES 1-8

3. Project Delivery ..... ES 1-9

Selection Criteria ..... ES 1-10

Fulfillment of DOT Strategic Goals ..... ES 1-10

Region/Location ..... ES 1-11

Innovation/Resource Development ..... ES 1-11

Partnership/Participation ..... ES 1-11

Federal Funding and State Investments ..... ES 1-12

Summary ..... ES 1-12

1 The Requirement for the Program 1-1

1.1 Introduction 1-1

1.2 Purpose, Need, and Rationale 1-2

1.3 Identification of Alternatives 1-2

1.4 Population and Geography of the Service Area 1-3

1.5 Existing Corridor Transportation Options and Corridor Intermodal Connections 1-4

1.6 Transportation Demand Analysis 1-5

2 Qualifications of the States of Iowa and Illinois to Implement and Maintain the Service 2-1

2.1 Eligibility 2-1

2.2 Agreements between the States and Enabling Legislation 2-1

2.2.1 Iowa Enabling Legislation - 2-2

2.2.2 Illinois Enabling Legislation 2-3

2.3 Financial Responsibility 2-5

2.4 Cost Sharing and Matching Funds Agreements 2-5

2.5 Prior Experience with Rail and with Large Projects 2-5
2.6 Understanding of the Commitment 2-6
2.7 Public Support and Public Involvement Obtained 2-7
3 Environmental Compliance 3-1
3.1 Introduction 3-1
3.2 NEPA Compliance Summary 3-1
3.3 Public Involvement Summary 3-3
4 Transportation Delivery Plan 4-1
4.1 Route Selection 4-1
4.2 BNSF Railway Portion of the Route 4-1
4.2.1 Background 4-1
4.2.2 Present Day 4-2
4.3 Iowa Interstate Railroad 4-4
4.3.1 Background 4-4
4.3.2 Present Day 4-5
4.4 Rail Traffic Controller Analysis 4-7
4.4.1 Delay Ratios: 4-19
4.5 Infrastructure Needs 4-20
4.6 Communications and Signaling 4-23
4.7 Eola Main Track Capacity Improvement Project 4-24
4.8 Passenger Stations 4-26
4.9 Iowa City Layover Facility 4-26
4.10 Passenger Train Schedule Development 4-26
4.10.1 Background 4-26
4.10.2 Operating Plan 4-27
4.11 Passenger Train Schedules Discussion 4-29
4.12 Future Increased Passenger Train Frequency and Higher Operating Velocities 4-33
4.12.1 90 mph 4-34
4.12.2 110 mph 4-35
4.12.3 Results of RTC Modeling for 90 and 110-mph Speeds 4-35
4.12.4 Increased Frequency 4-38
4.13 Infrastructure Improvements Required to Support the Schedule 4-39
4.13.1 Overview 4-39

4.13.2 Existing Conditions 4-39
4.13.3 Proposed Infrastructure Improvements 4-42
4.13.4 Right-of-Way 4-46
4.13.5 Cost Estimate 4-46
4.14 Signaling, Train Control, and Positive Train Control 4-47
4.14.1 Background 4-47
4.14.2 Station Locations and Improvements 4-49
4.15 Trainsets and Equipment Plan 4-52
4.15.1 Equipment Plan – Locomotives and Passenger Cars 4-52
4.15.2 Standard Consist 4-53
4.15.3 Performance of the Standard Consist on the Chicago – Iowa City Corridor 4-54
4.16 Capital Cost Estimates 4-54
4.16.1 Capital Spares for Rolling Stock 4-55
4.17 Train Operations and Maintenance Provisions and Cost Estimates 4-56
4.18 Equipment Maintenance and Provisioning 4-58
4.18.1 Car and locomotive maintenance costs: 4-58
4.18.2 Station Operating and Maintenance Cost Breakdown 4-59
4.19 Ridership and Revenue Projections 4-61
4.19.1 Ridership and Revenue Estimate Methodology 4-63
4.19.2 Ridership Estimate Validation 4-64
4.19.3 Revenue Methodology and Validation 4-65
5 Public Benefits of the Service 5-1
5.1 Introduction 5-1
5.2 The “GreenLine” Concept and its Role in the Future of Iowa and Illinois 5-1
5.3 Return on Public Investment of the Program 5-2
5.4 Jobs Creation and Economic Impact of the Service 5-4
5.5 Contribution of the Service to Livable Communities 5-4
5.6 Environmental Sustainability of the Service 5-6
6 Program Delivery Plan 6-1
6.1 General Approach of the States of Iowa and Illinois 6-1
6.2 Project Schedule and Phasing 6-1
6.3 Program Management Plan and Project Financial Plan 6-5
6.4 Approach to Fulfilling Specific FRA Requirements 6-6

6.4.1 DBE Requirement 6-6
6.4.2 Davis-Bacon Requirement 6-6
6.4.3 Buy America Requirements 6-7
6.5 Agreements with Responsible Stakeholders 6-7
6.5.1 Agreements between Public Agencies 6-7
6.5.2 Construction Agreements 6-8
6.5.3 Operating Agreements 6-8
6.6 Contracting Methods and Means 6-10
6.6.1 Contracts Let by Public Agencies 6-11
6.6.2 Contracts Let by a Railroad 6-11
ES.4 Appendix A ..... A
ES.5 Appendix B ..... B
ES.6 Appendix C C
ES.7 Appendix D ..... D
ES.8 Appendix E ..... E
ES.9 Appendix F ..... F
ES.10 Appendix G ..... G
ES.11 Appendix H ..... H

List of Tables

Table 1.6-1: Total Trips in the Chicago-Des Moines-Omaha Corridor, for the Year 2000 (Rounded to nearest 1000) 1-5
Table 1.6-2: Travel Demand between City Pairs: Chicago, the Quad Cities, and Iowa City (2010 and 2035) 1-6
Table 1.6-3: Total Ridership and Estimated Diversions, Chicago-Quad Cities-Iowa City, by Mode 1-7
Table 4.2-1: BNSF Interlocking Locations, Chicago and Mendota Subdivisions 4-3
Table 4.3-1: IAIS Siding Locations and Current Characteristics, Wyanet to Iowa City 4-7
Table 4.4-1: Delay Ratios Generated by BNSF's RTC Modeling, Chicago to Wyanet 4-8
Table 4.4-2: Base Case Delay Ratios 4-19
Table 4.4-3: Delay Ratios 4-20
Table 4.5-1: Reference Table of Infrastructure Improvements to IAIS Freight Train Operational Patterns and Conflicts with Proposed Passenger Schedule 4-22
Table 4.11-1: Amtrak 2008 Initial 4-Hour, 58-Minute Schedule 4-30
Table 4.11-2: 79 MPH Chicago-Iowa City via BNSF and IAIS – Proposed Improved Schedule 4-31
Table 4.12-1: Maximum Passenger-Train Velocity Obtainable on Curves of Varying Degree 4-33

Table 4.12-2: Curves that Affect a 90 mph Maximum Operating Speed 4-34
Table 4.12-3: Overall Trip Times Assuming Two Terminal Stations (Chicago and Iowa City) and Seven Intermediate Stations (La Grange Road, Naperville, Plano, Mendota, Princeton, Geneseo, Moline) 4-38
Table 4.16-1: Chicago-Iowa City Passenger Service Equipment Cost (Generated August 2, 2010) 4-55
Table 4.17-1: Independently Assessed Probable Costs 4-57
Table 4.19-1: Amtrak Ridership and Revenue Projections for the Chicago-Iowa City Service, Compared to Prior Estimates 4-62
Table 4.19-2: Ridership and Revenue Projections 4-63
Table 4.19-3: Year 2015 Planning Level Ridership Projections 4-65
Table 6.2-1: Program Implementation Schedule 6-3

List of Figures

Figure 4-1: BNSF RTC Base Case – Chicago to Wyanet, No Chicago-Iowa City Trains 4-9
Figure 4-2: BNSF RTC Base Case, Chicago to Wyanet, With Chicago-Iowa City Trains 4-10
Figure 4-3: BNSF RTC Proposed Case, With Chicago-Iowa City Trains and Eola Main Track Improvements 4-11
Figure 4-4: 79 mph Eastbound Passenger Train TPC (proposed main track upgrades included) 4-13
Figure 4-5: 79 mph Westbound Passenger Train TPC (proposed main track upgrades included) 4-14
Figure 4-6: IAIS Wyanet-Iowa City RTC Base Case (Freight Only) 4-15
Figure 4-7: IAIS Wyanet-Iowa City RTC Base Case, with Passenger Trains (Passenger has No Priority) 4-16
Figure 4-8: IAIS Wyanet-Iowa City Base Case, with Passenger Trains (Passenger has Priority) 4-17
Figure 4-9: IAIS Wyanet-Iowa City RTC Proposed Case, with Passenger Trains, Proposed Infrastructure, and Freight Train Growth 4-18
Figure 4-10: Hypothetical 90 MPH TPC Run Naperville to Iowa City 4-36
Figure 4-11: Hypothetical 110 MPH TPC Run Naperville to Iowa City 4-37

ES.1 Letters from Illinois and Iowa Governors

CHESTER J. CULVER
GOVERNOR

OFFICE OF THE GOVERNOR

PATTY JUDGE
LT. GOVERNOR

August 05, 2010

Honorable Ray LaHood, Secretary
U.S. Department of Transportation
1200 New Jersey Ave. S.E.
Washington, DC 20590

RE: Iowa/Illinois HSIPR Grant Request for Chicago to Iowa City Passenger Rail Service

Dear Secretary LaHood:

On behalf of the State of Iowa and the Iowa Department of Transportation (DOT), I am writing in support of a High-Speed Intercity Passenger Rail (HSIPR) Program competitive grant application. This application will be submitted jointly between Iowa DOT and Illinois DOT on August 6, 2010.

The HSIPR grant application is for new and enhanced passenger rail services from Chicago, Illinois to Iowa City, Iowa via the Quad Cities. HSIPR funding would support continued environmental impact analyses, track infrastructure construction and improvements, layover facility construction, equipment acquisition and station improvements to implement service. HSIPR funding, made available through the FY 2010 DOT Appropriations Act, would fund up to eighty percent of this project. The remaining funding necessary for match will be provided by the Iowa DOT and Illinois DOT.

Iowa has been an active and dedicated partner with the other Midwestern states in both the long-standing Midwest Regional Rail Initiative and the more recent Midwest High-Speed Rail Steering Group. The Chicago to Iowa City route is an important element of the vision to further develop the Chicago Hub regional intercity passenger rail concept, long supported by the Midwest Regional Rail Initiative. The concept includes passenger rail corridors that serve the multi-state Midwestern region along with passenger rail connections to the East and West Coast, the Gulf Coast and Canada.

The Chicago Hub vision is supported by eight Midwestern states and the City of Chicago as documented in a Memorandum of Understanding (MOU) finalized in July 2009; I am proud to have joined my Midwest partners in signing that MOU. To advance and support the Midwestern efforts, the Midwest High-Speed Rail Steering Group was formed last year and is working together to provide guidance, leadership, and advocacy

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in support of the Region's long-range high-speed and intercity passenger initiatives. Iowa and the other Midwest states understand the importance of and are strongly committed to approaching passenger rail solutions from a regional perspective.

This project's success would be the important first step in initiating passenger rail service across Iowa and would allow Iowa to fulfill its vision for expanded passenger rail service as documented in the 2009 State Rail Plan, State Transportation Plan and the Midwest Regional Rail Initiative planning documents. The states of Iowa and Illinois are committed to implementing passenger rail service between Chicago and Iowa City, as evidenced by Illinois Governor Quinn and I signing a two-state MOU in July 2009 pledging to work together to make this route a reality.

Both states are further committed and actively working to implement service on this corridor that expands the green and sustainable principles inherent in passenger rail transportation and strongly advocated by you and the Administration. We have established the proposed Chicago to Iowa City service as the "GreenLine" and developed a vision to proactively seek innovative and sustainable solutions to our transportation needs. As such, we are seeking opportunities to pilot new, sustainable practices such as testing new equipment that can use bio-fuels, supporting smart growth practices, and using recycled materials on construction projects.

The implementation of this HSIPR project would help create jobs, improve our nation's transportation infrastructure and assist in providing transportation alternatives to the citizens of Iowa and the Midwest, all within the framework of livable, sustainable practices and communities. I ask that this application be given your full consideration.

Sincerely,

Chester J. Culver
Governor of Iowa

Cc: Nancy Richardson, Iowa Department of Transportation

Illinois

Iowa

August 5, 2010

Administrator Joseph C. Szabo
Federal Railroad Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Administrator Szabo,

As Governors of Illinois and Iowa, we are writing to support our states' joint application for FY2010 funding to construct a passenger rail route between Chicago, IL and Iowa City, IA. The route is an important part of the multi-state Midwest Regional Rail Initiative (MWRRI), an effort started 15 years ago to connect Midwesterners through reliable, fast and frequent train service.

The proposed route will introduce new green products and practices to passenger train service that will help our local economies. As Illinois and Iowa are national leaders in corn and soybean production, using biofuels and soy-based lubricants will not only help the environment, but create new jobs for the people of our states. Other key initiatives for the project include using recycled materials in the construction of trains, serving locally grown produce in train dining cars and using recyclable and bio-degradable containers in food service.

The economic benefits of investments in a Midwest rail network cannot be overstated. The rail network between Iowa and Illinois will attract new private real estate development that will help reshape the entire region, and will revitalize our towns and cities with pedestrian-friendly business districts. The Midwest, with a large, skilled labor pool and a robust supply chain, offers rail car manufacturers an ideal opportunity to re-establish a 21st Century Midwest rolling stock industry. Illinois' and Iowa's valuable connections to capital and business centers, as well as access to world-class university research, will create incentives for new companies and more jobs for Midwesterners.

Despite very difficult budget conditions in both states, Illinois and Iowa have committed state funding toward construction of the route between Chicago, IL and Iowa City, IA. Illinois announced in January that it would use $45 million from its state capital plan for construction on the route. Iowa has also committed $20 million to match a federal investment.

Illinois and Iowa have always been great neighbors to each other. We are anxious to build this new connection to create economic opportunities and transportation alternatives for residents in both states, within the framework of livable, sustainable practices and communities. We appreciate your consideration of our application, and we eagerly anticipate your decision.

Sincerely,

Pat Quinn

Pat Quinn, Governor of Illinois

Chet Culver

Chester J. Culver, Governor of Iowa

ES.2 Executive Summary: The Chicago to Iowa City High-Speed Intercity Passenger Rail Program

The $310,503,000 Chicago-Iowa City Passenger Rail Service Development Program of the States of Iowa and Illinois will establish by 2015 passenger rail service between Chicago, the Quad Cities of Illinois and Iowa, and Iowa City, Iowa, 219.5 miles. The service will be hosted by BNSF Railway (BNSF) and Iowa Interstate Railroad (IAIS), and operated by Amtrak. New stations will be established at Geneseo, Illinois, Moline, Illinois (serving the Quad Cities), and Iowa City, Iowa, in cooperation with enthusiastic local partners. The service will be part of the Midwest Regional Rail Imitative (MWRRI) designated by the Secretary of Transportation as a high-speed rail corridor in 1992.

The initial Chicago-Iowa City passenger-train service will consist of two roundtrip trains daily, operating at a maximum speed of 79 mph. Ridership is estimated by Amtrak at 246,800 passengers in the Program's opening year of 2015, and 447,000 passengers per year by 2045. Amtrak's estimate of ridership was completed in 2008 and was based on a lower level of investment with a longer trip time. Public benefits generated by the Program, even with the conservative ridership projections, substantially outweigh the Program's capital, operating, and maintenance costs. For the 30-year period from first day of operation, the Program is predicted to generate $656.7 million in benefits for a benefit to cost ratio of 1.70.

Public benefits include:

- 896,401,930 fewer vehicle miles
- $99.6 million in vehicle operating costs savings
- 10,791,109 fewer gallons of gasoline and diesel fuel consumed

The new service has unusually unified, broad public and political support from the political, economic, and civic leadership of Illinois and Iowa at a state and local level. Iowa's Passenger Rail Advisory Committee, which represents cities, counties, and development agencies throughout Iowa, and Iowa's railroads, have joined in emphatic support of the Program. Under the leadership of Governor Quinn and Governor Culver, the state legislatures have chosen to direct state funds to the Program even in light of severe budget challenges. State and local financial commitment to the project's capital is at least $20.6 million from Iowa, $38.8 million from Illinois, and $2.7 million from the local communities.

From all possible viewpoints, the Program has unusually low costs of implementation and high public benefits. The alignment of the route is already suited to high-speed passenger-train operation, and previously hosted passenger trains that exceeded 100-mph speeds. Freight train congestion is unusually low. Running times, station access to major traffic sources such as the University of Iowa, and travel patterns are all favorable to a high initial ridership. The States envision future increases in maximum speed to 90 and 110 mph, increases in frequency to five roundtrips per day, and extension of the service to Omaha, Nebraska.

ES.3 Summary of the Service's Fulfillment of the FRA's Evaluation and Selection Criteria

The 2010 Notice of Funding Availability (NOFA) identified the Evaluation and Selection Criteria that the Federal Railroad Administration (FRA) will use to review and rate grant applications. Iowa and Illinois Departments of Transportation (DOTs) have compared their Grant Application and this Service Development Plan for the Chicago-Iowa City Intercity Passenger Rail Service Development Program to the Evaluation and the Selection Criteria, and as discussed below, have demonstrated that the Program meets all of the selection criteria and deserves favorable consideration for funding by FRA.

Evaluation Criteria

The FRA established a set of evaluation criteria to rate applications. The evaluation criteria assist the FRA in performing a systematic evaluation of the cost and benefits of the proposed new service. The Evaluation Criteria consider the Public Benefits, the Sustainability of the Benefits, and the Project Delivery Approach. Chapter 4 of this Service Development Plan provides a detailed discussion of the estimated cost for the Chicago – Iowa City Intercity Passenger Rail Service Development Program (Program). Chapter 5 of this Service Development Plan discusses in detail the extensive and wide ranging public benefits of the new service. Chapter 6 of this Service Development Plan describes the project delivery approach and the sustainability of the benefits.

Public Benefits

The evaluation of public benefits includes both the transportation benefits, and other public benefits. The transportation benefits include the service outcomes of the Program as well as the extent to which the Program supports other established transportation priorities. The other public benefits evaluate the extent to which the Program benefits other recognized societal goals. Net public benefits are estimated at $263.2 million over the 30-year time horizon at a 7 percent discount rate, or a benefit-cost ratio of 1.70.

1a. Transportation Benefits

As described in detail in this Service Development Plan, the new Chicago – Iowa City Service Development Program will provide substantial transportation benefits to the Illinois and Iowa region. The Program will restore passenger rail service to the Quad Cities[1] of Illinois and Iowa and to Iowa City, Iowa, two population centers that have not had passenger rail service for 32 years in the case of the Quad Cities, and 39 years in the case of Iowa City. Iowa and Illinois DOTs intend to develop the new service sequentially to introduce higher speeds, frequency, and corridor length. The sequential approach enables early institution of passenger-rail transportation patterns and coordinate investments by cities, and avoidance of stranded infrastructure, public, and private investment that would likely result were the Program to be

[1] The Quad Cities is a population center of composed of Moline, Illinois; Rock island, Illinois, Davenport, Iowa, and Bettendorf, Iowa

delayed to such time as there is funding available for a de novo 110-mph, high-frequency, final geographic extent Program. The initial operation of the Program will have a maximum speed of 79 mph and offer two round trips per day; however, the infrastructure and equipment planned to support the Program is capable of supporting or being modified cost-effectively to support step-wise increases to 90 and 110 mph (outside of urban areas), greater train frequencies, and extension beyond Iowa City. In addition the Chicago–Iowa City Service will support the development of the Chicago Hub Network, a designated high speed rail corridor being planned and developed by a coalition of nine Midwest states, called the Midwest Regional Rail System (MWRRS).

Because the Program will create a new service, its effect on existing rail passenger service will be limited to the increase in connectivity provided by adding one additional corridor to existing Amtrak and Metra services at the Chicago Hub, and corridors currently being constructed or improved under the aegis of the MWRRS. Chicago is a major regional hub for existing Amtrak long distance and intercity passenger service with 50 Amtrak trains (Monday through Saturday; 48 on Sunday) operating to and from Chicago Union Station at present.

The Program's new service is expected to have an opening year ridership of 246,800 passengers, and is expected to offer a total trip time as brief as 4 hours, 5 minutes. Illinois DOT and Iowa DOT plan to increase the initial service level frequency of two round trips per day to five round trips per day as ridership demand grows, and as speed increases and corridor extension create additional ridership demand. In addition, planned increase in train speeds will also provide substantial service improvement.

The vast majority of the passengers on the new service will be diverted from private vehicles, and will reduce traffic levels on Interstate 80 or Interstate 88. In the Chicago region, both of these roadways are highly congested. The new service will have a favorable impact on highway congestion and highway safety, with an estimated highway safety benefit of approximately $7.4 million per year. About 24 percent of the ridership will be diverted air travelers, which will reduce demand on critical airline slots at O'Hare International Airport and Chicago Midway Airport that can be repurposed to long-haul airline services, and result in 89,943 tons reduced greenhouse gas emissions (CO_2).

The Chicago-Iowa City passenger service connects the important regional population and business centers of Iowa City, the Quad Cities, and Chicago. Union Station has outstanding intermodal connectivity to all of the transportation modes serving Chicago, including direct transfers to Metra commuter trains, the Chicago Transit Authority (CTA) heavy-rail rapid-transit system, and the downtown and suburban bus system. Direct connections to Chicago's two major commercial airports are provided from stations within a block of Chicago Union Station by CTA's heavy-rail system. The service will additionally provide service to the major suburban station at Naperville. This creates connectivity to Chicago's suburban bus system and provides excellent access to Chicago's outer beltways, enabling passengers arriving from or destined to Chicago's northern suburbs or Indiana to avoid Chicago's downtown freeway and street congestion. Chicago Union Station will be the hub for all of the Chicago Hub Network (MWRRS)

high-speed passenger rail corridors, further enhancing the transportation connectivity of the Chicago to Iowa City passenger rail service.

The Quad Cities station will be in Moline, Illinois, adjacent to the existing Moline Centre Station. This centre provides connectivity to the Quad Cities bus system and provides connectivity to future commuter rail and ferry operations. In addition, intercity long distance and regional bus service operates from the Moline transportation center. In Iowa City, the station is located in the heart of downtown Iowa City within easy walking distance of the University of Iowa and the local bus system. Regional connectivity is anticipated to be provided by single-ticket Thruway bus service from Cedar Rapids and Des Moines. The communities of Moline and Iowa City have active plans to enhance the livability of the cities by expanding transit oriented development and the access to public transportation. The service also provides a rail transportation option to connect Iowa City to the Quad Cities.

Both Illinois and Iowa are active in the Section 305 Passenger Rail Investment and Improvement Act of 2008 (PRIIA) Next Generation Equipment Committee and the equipment purchased for the new service will be consistent with the recommendations from the Committee. In addition, Illinois and Iowa are part of the MWRRS and the equipment purchased for this new service will be compatible and part of the MWRRS equipment pool.

The new service will use rail lines owned by Amtrak, BNSF, and IAIS. The route from Chicago Union Station to Wyanet, Illinois uses Amtrak trackage to exit Union Station, and then enters BNSF's Chicago Subdivision, triple-track main line. This route currently has Metra Commuter service to Aurora, Illinois, Amtrak corridor service to Quincy, Illinois, and Amtrak long-distance service to Oakland, California, and Los Angeles. Iowa and Illinois DOT developed the set of infrastructure improvements through a detailed evaluation of existing infrastructure, field investigations with Amtrak, BNSF and IAIS, and Rail Traffic Controller (RTC) modeling by BNSF and the States. The only improvements envisioned on the BNSF portion of the route are at Eola (near Aurora, Illinois), and the connection to IAIS at Wyanet, Illinois. The Eola Main Line Improvements are needed to create capacity necessary to enable the Program's trains to maintain their proposed schedule without significant delays. The investment in the Wyanet Connection is required to connect the BNSF rail line to the IAIS rail line (the two lines are grade-separated and at present do not connect). Improvements on the IAIS from Wyanet to Iowa City are needed to obtain the desired passenger rail operating speeds and avoid conflicts with IAIS freight service. By the service date BNSF expects to have completed the installation of Positive Train Control (PTC) on its section of the route. PTC will be implemented on the IAIS as part of the set of improvements required for the new service.

1b. Other Public Benefits

In addition to the substantial transportation benefits, the Chicago–Iowa City Service Development Program will provide substantial public benefits. The 2009 Service Level Environmental Assessment describes in detail the substantial environmental benefits of the new rail service. The Program will result in the diversion of approximately 148,000 vehicle trips and 59,000 airline trips per year, resulting in a substantial energy savings and a reduction in greenhouse gas emissions. Iowa and Illinois DOT, along with the communities of Moline and

Iowa City are committed to implementing a "GreenLine" vision for new service, as discussed in the "GreenLine" attachment to the Grant Application. This concept includes a commitment from the communities to implement a wide range of sustainable solutions in the station designs and operations. The new passenger service complements the communities planning and investment in livable communities. Moline has developed a "GreenLine" station concept that implements sustainability principles in the development of the new passenger rail station. In addition the new passenger service is part of Moline's Green Enterprise Zone which encourages transit-oriented development and sustainable businesses. Iowa City worked with EPA and Rebuild Iowa to develop a smart growth plan called the Riverfront Crossings District which includes the passenger train station. Iowa City's plan includes transit-oriented development centered on the station. The City intends to return the historic former Chicago, Rock Island & Pacific railroad station to use as the passenger rail station. The new rail line will also provide access for lower income riders to the medical services in Iowa City.

2. Sustainability of Benefits

The Sustainability of Benefits criteria seeks to evaluate the likelihood that the benefits discussed above will be realized.

As discussed in this Service Development Plan, Illinois and Iowa DOT are confident that the new passenger rail service will deliver the substantial benefits discussed above. The states have prepared a Project Management Plan (attached to the Grant Application) focused on putting in place the management team and control systems required for the successful delivery of the program. In addition the Grant Application includes a Financial Management Plan that demonstrates the financial viability of the Program. Both Iowa DOT and Illinois DOT have substantial experience in delivering large and complex transportation programs.

Both Illinois and Iowa have strong support for investments in passenger rail. Illinois has provided $282,369,399 in financial support since 1972 for passenger rail. Iowa has been an active participant in the MWRRI[2], and has provided financial support for the high-speed passenger rail planning effort since 1996. In addition, the Iowa legislature has demonstrated a strong commitment to the Program with its legislative commitment of $2.0 million for 2011, $6.5 million for 2012, and $20 million during the next four years. As demonstrated in the Agreement in Principle, both Iowa and Illinois are committed to providing the operating subsides required to make the new service successful.

The Grant Application and this Service Development Plan is the culmination of a comprehensive planning process that started with the state rail plans for Iowa and Illinois, which identified the new service as a priority for each state that was required to meet the transportation access, sustainability, community livability, and economic development goals of both states. The planning effort also included detailed evaluation of how the new service would fit into the overall Chicago Hub Network. The MWRRI identified the new service as a critical feeder route for the Chicago hub and the Midwest's high-speed passenger rail corridor. The estimate of the

[2] http://www.dot.state.mn.us/passengerrail/onepagers/midwest.html

substantial benefits of the new service to both users and non-users is described in the Service Development Plan.

As described in detail in this Service Development Plan, the set of improvements has been developed to allow for the implementation of the Program, provide for the future increase in the frequency and speed of the service, and accommodate possible extensions of the service to other Iowa communities. In addition, Iowa and Illinois DOTs worked closely with Amtrak and the host railroads to avoid any degradation to the freight service and preserve the ability of the host railroads to expand service in response to market forces. Agreements in Principle are attached that spell out the how the States will interact with all of the key partners.

3. Project Delivery

The Project Delivery criterion evaluates the approach to the delivery of the Program and assesses the risks to both budget and schedule.

Both Iowa DOT and Illinois DOT have extensive experience in partnering with the federal government and local communities to deliver complex transportation projects. A detailed Project Management Plan is attached to the Grant Application that sets forth how the states intend to deliver this Program.

The states have had extensive discussion with FRA staff concerning the Program and have determined that the successful implementation of the Program will not require any waivers of Federal railroad safety regulations. Both Illinois DOT and Iowa DOT have substantial experience, as outlined in this Service Development Plan, with delivery of FRA financial assistance programs. Illinois DOT is currently working with the FRA to deliver the Chicago to St. Louis High Speed Passenger Rail Program. In 2009, Iowa administered $9.6 million of FRA Disaster Assistance Grants to assist in the recovery of flood damages to Iowa's railroads. In addition, Iowa DOT is working with FRA on a $17 million passenger rail grant to install additional crossovers on BNSF's Ottumwa Subdivision in southern Iowa to improve Amtrak *California Zephyr* on-time performance.

Iowa and Illinois DOTs have included a Program schedule in this Service Development Plan. The schedule is aggressive but given the experience and commitment of the states the schedule is reasonable. Both Illinois DOT and Iowa DOT have consultant teams in place that can supplement the DOTs' resources to provide the technical capabilities required to deliver the Program. The states spent an extensive amount of time working with the host railroads and Amtrak to evaluate the corridor and establish a set of Projects that will be required to implement the Program. The states conducted field visits with Amtrak and the host railroads' operations and engineering officers to reach consensus in the field on the exact type of improvements required. The states also worked extensively with the communities of Geneseo, Moline, and Iowa City to integrate the Program and new station stops into the communities' planning processes. Iowa and Illinois DOTs and the consultant teams met with the communities and conducted detailed analysis of the station locations. The results of the extensive coordination with the stakeholders and field work are reflected in the attached set of conceptual plans.

In 2009 the states completed a Tier 1 System Level Environmental Assessment (EA). Based on FRA's review of the 2009 System Level EA, the states conducted additional data collection, field work, and analysis on the Wyanet Connection. In addition, because the Eola Main Line Improvements were originally part of the Chicago Terminal grant application, the 2009 System Level EA discussed the Eola Main Line Improvements from the context of a related action. Iowa and Illinois DOTs conducted additional field investigations and analysis of both the Wyanet Connection and the Eola Main Line Improvements and developed conceptual mitigation plans to offset impacts, all of which is documented in the 2010 supplemental information for the 2009 System Level EA. The states are confident that based on the 2009 System Level EA and the supplemental Information, the FRA will be able to conclude that the Chicago–Iowa City Intercity Passenger Rail Service Development Program will not have significant adverse environmental impacts.

The Chicago–Iowa City Intercity Passenger Rail Service Development Program will have ridership of over 246,800 passengers, will have 90 percent or greater on-time performance, will reduce highway traffic on the congested Chicago highway network, and provide substantial public, economic, community livability, and environmental benefits. The states have developed a Project Management Plan and a Financial Management Plan and the stakeholder agreement necessary to successfully develop the project. Iowa and Illinois DOTs, along with their partners strongly believe that this Program is ready for funding and commencement.

Selection Criteria

The 2010 Notice of Funding Availability identified the criteria that the FRA Administrator will use to select Programs for funding. The selection criteria are: Fulfillment of DOT Strategic Goals, Region/Location, Innovation/Resource Development, Partnership/Participation, and Prior Federal Funding and State Investments. The Chicago – Iowa City Intercity Passenger Rail Service Development Program is well aligned with each of these criteria.

Fulfillment of DOT Strategic Goals

The new service is extremely well aligned with the DOTs' strategic goals. The Program will generate over $7.4 million in transportation safety benefits from reduced traffic on congested Chicago-area roadways. The Program will return a critical piece of transportation infrastructure to a state of good repair. By connecting the Quad Cities and Iowa City to the economic and commercial opportunities in Chicago, the Program will help promote the economic competitiveness of western Illinois and eastern Iowa. As documented in the many letters of support attached to the Grant Application, provision of a new modal connection between Iowa City, the Quad Cities, and Chicago provides a much-needed travel option for an important segment of the population that either does not have access to a personal automobile, cannot afford to use airline service, or is reluctant to travel on highways during the Midwest's severe winters. The Program supports the planning efforts of both Moline and Iowa City to help develop livable cities by enhancing the multimodal connectivity in the communities. In addition, the Program advances passenger rail and the Chicago Hub Network high-speed rail corridor.

Region/Location

The Chicago–Iowa City Passenger Rail Service Development Program will benefit the rural areas of western Illinois and eastern Iowa by helping to connect the population and business centers of those rural regions to the Chicago region. Investment in the Program will help expand the livability of the rural locations. The Program is also an important component of the rail plans for both Illinois and Iowa and is specifically identified as a priority in the Iowa DOT 10-year Strategic Passenger Rail Plan. The Program is also a recognized corridor in the Midwest Regional Rail System, being developed by nine Midwestern states acting through the Midwest Regional Rail Initiative. The Program will expand the connectivity of the existing Amtrak passenger rail network and the MWRRS by providing a connection through Chicago Union Station.

Innovation/Resource Development

Both Iowa and Illinois are participants in the Next Generation Equipment Committee and are committed to purchasing rolling stock that is consistent with the recommendations from the committee. The States are working with their community partners to establish a "GreenLine" vision for the new passenger rail service. This vision, which is discussed in detail in the Grant Application, includes new and innovative technology to reduce energy use and help promote livable communities. The signal and communications improvements which will be put in place prior to the implementation of the new service include PTC and warning-device enhancement at grade crossings. The planning for the new service included the development of an RTC model of the rail network to evaluate the various improvement options and to design the passenger service. This modeling effort is discussed in detail in Chapter 4 of this Service Development Plan. In addition both Iowa DOT and Illinois DOT have made the investment to staff their rail offices with the experienced and talented management and professionals required to successfully deliver the service outcomes outlined in the Grant Application and this Service Development Plan.

Partnership/Participation

The new service connects eastern Iowa and western Illinois with Chicago and is the result of a long standing partnership between Illinois DOT and Iowa DOT. Both Governor Quinn, and Governor Culver, as discussed in their attached endorsement letters, are committed to making the Program a success. Iowa DOT and Illinois DOT also have formed outstanding partnerships with the host railroads and Amtrak, and their cooperation and participation in establishing this Service Development Plan has been substantial. All of the partners in this new service have worked tirelessly to advance the planning and ensure that the service outcomes are in line with the expectations. The partnerships supporting the Program also include the communities of Geneseo, Moline, and Iowa City, and all three have a long history of planning, financial, and political support for the service. Throughout the planning for the new service states have continually engaged and informed the stakeholder groups. The Program enjoys a broad range of local support as documented in the many letters of support for the Program.

Federal Funding and State Investments

Both Iowa and Illinois have made substantial investment in passenger rail that will be fully leveraged by the new service. Both states are partners in the MWRRI and have invested fully in the regional planning effort to implement the recognized Chicago Hub Network high-speed passenger rail corridor. Because the Program is a key component of the MWRRS, it will connect through Chicago Union Station with the Midwest's expanding high-speed rail network. In addition, the Program will use equipment and rolling stock that is fully compatible with the Midwest regional equipment pool. Net public benefits are estimated at $263.2 million over the 30-year time horizon at a 7 percent discount rate, or a benefit-cost ratio of 1.70. Illinois DOT is pursuing the development of a high-speed route between Chicago and St. Louis, as well as routes to other Midwestern cities, which will create synergy with the Program.

Summary

As discussed above and demonstrated in the Grant Application and this Service Development Plan, the Chicago–Iowa City Intercity Passenger Rail Service Development Program is well aligned with the FRA's Evaluation Criteria and the Selection Criteria. The Program enjoys broad support from Illinois, Iowa, the local communities, the host railroads, and Amtrak. The Program will help expand economic opportunities in the communities served and will provide critical transportation services to the underserved low income segment of the population. As demonstrated above, the Grant Application deserves favorable consideration.

1 The Requirement for the Program

1.1 Introduction

Illinois and Iowa developed the requirements for the Program through comprehensive assessment of their values, goals, and resources. The States have each undergone numerous alterations in the last 25 years, some of which include: growing urbanization; demographic shifts; changes in traditional employment sectors; a surge in personal travel; an expanded global economy; increasing construction, maintenance, and fuel costs; and climate change awareness. The states recognize their need to take steps to promote sustainability and community; make communities more livable; gain energy independence; reduce greenhouse gas emissions; and remain robust and competitive in national and international spheres.

An efficient, fluid, and well-maintained transportation system is critical to the economic success and long-term sustainability of both states. Existing transportation infrastructure in Chicago, Illinois, western Illinois, and eastern Iowa is becoming more constrained, and it will not hold pace with growing, long-term demand. Capacity at Chicago's two major airports – O'Hare and Midway – is compromised by the frequent arrival and departure of regional services (like those operating from Cedar Rapids, Iowa, and Moline, for example). Traffic volumes on Interstates 80 and 88 – the two major highways linking Illinois and Iowa – have surged in recent years, particularly in the Chicago and Quad Cities metropolitan areas. Recent economic conditions; scarcity of Federal, state, and local funding; and public values and sentiment have hindered adequate expansion to existing airport and highway infrastructure in the last 20 years. The citizens of both states have called for a viable, cost-effective, and environmentally friendly solution to a brewing transportation dilemma.

Initiation of a competitive and comprehensive passenger rail service between Chicago, the Quad Cities, and Iowa City has been identified as a way to meet the broad needs of the traveling public by providing a safe and cost-effective alternative that will ease the demand placed upon other transportation modes. Such a network will generate opportunities in communities and the business, education, and tourism sectors; offer travelers a viable and desirable alternative to traditional highway and commercial air modes; connect with existing public transportation systems in large metropolitan areas; provide access to natural and cultural resources; preserve capacity and expansion potential for freight railroads; and create construction jobs and permanent economic expansion.

Illinois and Iowa have long demonstrated an established, effective, open, and transparent public involvement process concerning transportation improvements. The states have partnered in the Chicago – Iowa City High Speed Intercity Passenger Rail Program (which is strongly endorsed by the Governors and Legislatures of Illinois and Iowa and has been listed in State Transportation Plans and State Railroad System Plans) to develop a cohesive strategy to implement passenger rail logically and carefully. The process to restore passenger rail service in the corridor began with designation of Chicago as the hub of a high-speed rail network for the Midwest in 1992 and the states' participation in the MWRRI in 1996, and continued with Amtrak feasibility studies, which were completed for the Chicago-Quad Cities and Chicago-Iowa City segments in 2008. All efforts to reinstate the service will take into account the requirements of

all stakeholders in the corridor, including citizens; elected officials; community, labor, and business leaders; civic and economic-development organizations; Federal, state, and local regulatory agencies; Amtrak (designated passenger service operator); and the freight railroads hosting passenger rail service.

1.2 Purpose, Need, and Rationale

The purpose and need of the Chicago – Iowa City High Speed Intercity Passenger Rail Program, which is in concert with the Midwest Regional Rail Initiative and defined in a Tier 1 Service Level National Environmental Policy Act (NEPA) Environmental Assessment completed for the corridor, is to expand existing and develop new regional passenger rail service to help meet future travel demands in the Midwest generally and improve connectivity between Illinois and Iowa particularly. The Program would create a competitive rail transportation alternative and would meet needs for more efficient travel between Chicago and Iowa City by:

- Providing improved reliability and convenience for rail passengers
- Reducing travel times
- Increasing safety through improved signaling and infrastructure
- Providing a much-needed travel alternative in a critically important economic region of the country
- Reducing highway congestion and reducing highway and air emissions as travelers choose rail
- Contributing to economic growth and strengthening manufacturing, service, and tourism in Illinois and Iowa
- Improving access between communities in Illinois and Iowa, especially for segments of the population that have proportionately lower automobile ownership and access to air travel, including the students, the elderly, low-income families, and tourists
- Serving as the impetus for significant public/private development opportunities near stations
- Promoting connectivity with other transportation modes, including municipal transit agencies, other intercity and long-distance Amtrak rail services, intercity bus services, and major airports

The purpose of the Program is to re-establish passenger rail services from Chicago to Iowa City. The proposed Chicago to Iowa City service would be a component of the Chicago – Omaha corridor, which is one part of the vision established by the MWRRI to expand existing and develop new regional passenger rail service to meet existing and future travel demands in the Midwest. This project will expand and create a rail transportation alternative to supplant private automobile, bus, and air travel between Chicago and Iowa City, and intermediate points, and to create new transportation opportunities and capability for people who cannot meet their transportation needs with private automobile, bus, and air modes.

1.3 Identification of Alternatives

The route of the proposed passenger-rail service in this Service Development Plan was chosen to provide the highest level of connectivity, transit time, and convenience for the highest number

of potential users, to enhance and mirror existing high-use transportation patterns, and to provide the best match between infrastructure needed by the proposed service and existing infrastructure availability. Accordingly, the proposed service connects Chicago with the Quad Cities, and Iowa City. It recognizes and enhances a high-density transportation pattern that has been established for more than 150 years. And it leverages existing infrastructure to the highest possible degree. Transportation needs that are currently not met, or not met adequately, also influenced the route selection.

Principal transportation challenges in this transportation corridor are centered upon congestion in the Chicago airport and highway systems, the high cost of adding transportation capacity to those systems, and at the same time maintaining the connectivity, travel times, and travel efficiency upon which users of this transportation corridor and intersecting corridors depend. This Program leverages existing capacity of rail infrastructure, and the ability to inexpensively add capacity to the existing infrastructure, in comparison to more costly highway and airport infrastructure, to reduce pressure on air and highway transportation systems and maintain capacity in those systems for users who cannot readily or economically substitute rail transportation.

1.4 Population and Geography of the Service Area

The service area of the proposed Iowa City service includes the major population areas of Chicago, the Quad Cities, and Iowa City. Between these major urban areas are numerous small communities. The geography of this region is open and of low relief, and does not restrict or channel travel routes with the exception of a limited number of bridges across the Mississippi River. Highway connectivity in the service area is extremely high, but is seriously affected by significant traffic congestion on highways approaching and within the Chicago metropolitan area.

Chicago, the largest city in the Midwest with a Metropolitan Statistical Area (MSA) population of 9,569,684 (2008 estimate), provides comprehensive national and international transportation connections. Chicago is the third largest MSA in the U.S., and one of the largest commercial, educational, entertainment, and industrial centers in the U.S.

The Quad Cities area has an MSA population of nearly 377,291 (2008), and is a major manufacturing and commercial location supplying agricultural implements and earthmoving machinery worldwide. Augustana College at Rock Island, Illinois (student population approximately 2,500) draws students nationwide and internationally. Other universities in the Quad Cities include St. Ambrose University and Western Illinois University, Quad Cities Campus. The Quad Cities are also a major visitor draw from both Illinois and Iowa, with attractions including its scenic Mississippi River frontage, river boating and riverboat casinos, the Rock Island Arsenal, and several museums and convention centers. Approximately 60 percent of the visitors to the Quad Cities are from the Chicago area.

The Iowa City area has an MSA population of 128,094 (2008), and is nationally recognized for its medical centers and the University of Iowa. Over 5,000 of the university's student population of nearly 30,000 are from the Chicago metropolitan area. Iowa City is a major commercial and

manufacturing location, with a highly developed agricultural processing and heavy capital goods manufacturing sector. Adjacent to the proposed route is Cedar Rapids, with a metropolitan statistical area population of 255,000. Downtown Cedar Rapids is 27 miles north of the proposed rail station in Iowa City.

Many of the communities between Chicago and Iowa City have experienced rapid growth since 2000 and are experiencing increased congestion on urban roadways. The population of the service area of this proposed rail passenger service increased 15 percent between 1970 and 2008, according to the U.S. Census Bureau, as of August 5, 2009.

1.5 Existing Corridor Transportation Options and Corridor Intermodal Connections

This proposed rail passenger service will lie in an established, regular travel corridor with high vehicle travel rates on Interstate Highways 80 and 88 within and through the corridor (the latter highway is tolled from the Chicago metropolitan area west to Sterling, Illinois), and regional airline service offered between Chicago, the Quad Cities, and Iowa City/Cedar Rapids. The service corridor has well-developed highway connections between proposed station stops and communities within and to each side of the corridor. Accordingly, highway connections do not limit the access of riders to the proposed rail passenger service within the corridor, except in Chicago where highway connectivity is congested. However, Chicago offers highly developed intermodal connectivity to the stations that would be served by the proposed service. This includes the CTA, an integrated rail rapid transit and bus system, and Metra, a commuter rail passenger system. Iowa City and Moline each have local bus systems.

Intercity bus service to Chicago is offered daily by three bus transportation companies. Greyhound and Burlington Trailways offer travel times between Iowa City and Chicago of nominally 4.5 to 6 hours. Greyhound and Trailways travel times between Iowa City and the Quad Cities are nominally 1 hour, 35 minutes to 2 hours, and between the Quad Cities and Chicago are nominally 3 hours to 3 hours, 20 minutes. MegaBus operates on a 3 hour, 50 minute schedule between Iowa City and Chicago with no intermediate stops. Additionally, weekend-only bus service is offered between the University of Iowa campus and Chicago suburbs and the two Chicago airports, operating on a 3 hour, 45 minute to 4 hour schedule with no intermediate stops and specifically designed to serve the needs of students.

Air service to Iowa City is offered at the Eastern Iowa Airport (CID) near Cedar Rapids, 24.7 miles north of the city center of Iowa City. As of September 2009, 16 weekday roundtrips to Chicago O'Hare International Airport were provided by three carriers, United Airlines, American Airlines, and U.S. Airways, with 55 to 56 minute actual flight times, not including taxi times and airport security clearances. Air service to the Quad Cities is offered at the Quad City International Airport (MLI), 7.2 miles south of the city center of Moline. As of September 2009, 13 weekday roundtrips to Chicago O'Hare International Airport were offered by three carriers, United Airlines, American Airlines, and U.S. Airways, with 45 to 50 minute actual flight times, not including taxi time and airport security clearance. Intermediate cities in the corridor do not have scheduled air service to Chicago. No non-stop service is presently offered from Eastern Iowa Airport and Quad City International Airport to Chicago Midway Airport. Regional air services

constrain capacity for and contribute to delays to long-distance and international flights arriving or departing at Chicago's two airports.

Amtrak corridors radiating westward from Chicago depart from the proposed service area in north-central Illinois. Only one existing Amtrak corridor passes near to the western end of the proposed service area, but it passes through southern Iowa (the California Zephyr route). The short-line distance between the two principal urban areas on the proposed route, and the nearest existing Amtrak stations, ranges from 50 miles (Iowa City) to 40 miles (Moline). Compared to the time, distance, convenience, and cost of direct bus or private-automobile service between Iowa City, Moline, and Chicago, the twice-daily California Zephyr service plus the associated travel time and inconvenience to the nearest station makes this passenger-rail service not useful for the majority of persons seeking travel services in the proposed service area.

1.6 Transportation Demand Analysis

Transportation demand and transportation use by mode in the proposed service area has been studied by the MWRRI and by Amtrak. The MWRRI studies are focused on the general demand for the Midwest, whereas the Amtrak studies were focused on the proposed service that is addressed in this Service Development Plan. Table 1.6-1 shows the total trips in the Chicago-Des Moines-Omaha corridor by mode, for the year 2000.

Table 1.6-1: Total Trips in the Chicago-Des Moines-Omaha Corridor, for the Year 2000 (Rounded to nearest 1000)

Mode of Travel	Total	Percent of Total	Reason for Travel	
			Business	Non-Business
Air	722,000	1.4%	270,000	452,000
Bus	123,000	0.2%	5,000	118,000
Auto	51,062,000	98.0%	12,324,000	38,738,000
Rail	181,000	0.3%	32,000	149,000
Total	52,088,000		12,631,000	39,457,000

Source: MWRRI Project Notebook, Exhibit 4-10, as modified to remove Quincy travel demand

Iowa DOT developed a statewide travel-demand forecasting model (iTRAM) which shows the travel demand for 2010 and 2035 for various city pairs in the Iowa region. This model includes travel demand estimates between Iowa City and Chicago, between the Quad Cities and Chicago, and between Iowa City and the Quad Cities, all of which would be served by the proposed Chicago – Iowa City passenger rail service. Table 1.6-2 below illustrates that the total travel demand – as quantified by passenger trips between Chicago, the Quad Cities, and Iowa City – shows that travel between these city pairs will increase by about 42 percent between 2010 and 2035.

Table 1.6-2: Travel Demand between City Pairs:
Chicago, the Quad Cities, and Iowa City (2010 and 2035)

2010

City Pair Origin	Destination	Distance (miles)	2010 Daily Person Trips
Chicago	Quad Cities	174	11,200
Chicago	Iowa City/Cedar Rapids[3]	221	7,200
Quad Cities	Iowa City/Cedar Rapids	47	3,200
Total Travel Demand			21,600

2035

City Pair Origin	Destination	Distance (miles)	2035 Daily Person Trips
Chicago	Quad Cities	174	12,800
Chicago	Iowa City/Cedar Rapids	221	10,100
Quad Cities	Iowa City/Cedar Rapids	47	7,200
Total Travel Demand			30,100

Source: Iowa DOT (iTRAM)

The most recent ridership estimates for the proposed Chicago – Iowa City service were conducted as part of feasibility studies prepared by Amtrak in 2007 and 2008. The 2015 ridership for new rail service between Chicago and the Quad Cities, and Chicago and Iowa City, based on a two round-trip daily, maximum speed 79 mph service, was estimated in August 2010 by Amtrak at 246,800 via the Wyanet route.

As illustrated in Amtrak data in Table 1.6-3 below, more than two-thirds of the Chicago – Iowa City passenger rail service's estimated annual ridership from 2015 would be diversion from private auto, and scheduled bus and airline service. The majority of these diverted trips, 60 percent, are from auto, an additional 24 percent are diverted from air service, and 9 percent from bus. The Program would also generate induced demand, new trips that would otherwise not occur because the air, bus, or private auto modes do not offer sufficient convenience, cost, or public perception of value, in combination, compared to passenger rail service. The amount of induced demand has been estimated by Amtrak and MWRRI, respectively, to range between 5 and 10 percent.

[3] The distance between Iowa City and Cedar Rapids is approximately 30 miles and they share the use of the Eastern Iowa Airport for passenger service. Iowa DOT's statewide travel-demand model estimates travel demand for Iowa City and Cedar Rapids separately. In the table the estimated travel demands for the two communities have been combined because of the proximity of the two communities and a passenger rail station at Iowa City will support some of the travel demand from Cedar Rapids.

Table 1.6-3: Total Ridership and Estimated Diversions, Chicago-Quad Cities-Iowa City, by Mode

(Rail is based on two round-trip trains per day, rounded to nearest 1000)

Mode	Estimated diversion, Chicago – Iowa City Service
Scheduled Air	59,200
Auto	148,000
Scheduled Bus	22,200
Induced demand	17,200
Total ridership	246,800

Source: Amtrak Chicago – Quad Cities – Iowa City – Scenario A-6 (BNSF-IAIS) – 4 Hours and 58 Minutes Estimated Revenue and Expense Performance (figures updated August 2, 2010)

2 Qualifications of the States of Iowa and Illinois to Implement and Maintain the Service

2.1 Eligibility

The Iowa DOT is submitting the Grant Application on behalf of both the states of Iowa and Illinois. Iowa is an eligible Applicant in accordance with Section 3.1 of the Notice of Funding Availability for Service Development Programs. Attached to the Grant Application are letters from the Governors of both states supporting the Service Development Program and the Grant Application. In addition, the state legislatures from both states support the expansion of passenger rail within the states. Legislation from both Iowa and Illinois that enables the states to sponsor the Service Development Program is attached to the Grant Application. The Grant Application also defines in detail the states' commitment to the new service. Iowa and Illinois have formed a strong partnership to jointly pursue this new service. Iowa DOT and the Illinois DOT in 2009, signed a Memorandum of Understanding (MOU) (copy attached to the Grant Application) defining the roles and responsibilities of each state in advancing the Service Development Program. The states have also signed an Agreement in Principle (AIP) that spells out how the Program will be developed and managed.

2.2 Agreements between the States and Enabling Legislation

The States have put into place agreements and enabling legislation that fully contemplate the long-term commitment to rail passenger transportation service. The agreements and enabling legislation contemplate the commitment of capital, operating and maintenance funding, organization and leadership, and management resources that the Program explicitly and implicitly requires of the States. Agreements and enabling legislation that have been created to date, and the status of the States process toward final agreements and enabling legislation, are described in this section.

The States began to create the agreements and processes with their commitment to the Midwest Regional Rail Initiative (MWRRI) in 1996. This process has enabled the States to develop a sophisticated understanding of the organizational and operational implications of undertaking a passenger-train implementation program. In addition, the lengthy involvement of Illinois with state-supported trains has provided Illinois with a deep body of experience and expertise that makes Illinois particularly adept with passenger-rail implementation and operation.

Once the States determined that they wished to pursue a Chicago-Iowa City high-speed intercity passenger rail program, the States began to create the necessary agreements, interim funding mechanisms, and organizational structures necessary to commence and carry forward to completion the Program that is the subject of this Grant Application.

The States executed a Memorandum of Understanding (MOU) on July 27th, 2009. The MOU detailed the general approach to establishing new passenger rail service from Chicago Union Station to Iowa City, and established the basis for cost sharing between the States for capital and subsidy costs.

An Agreement in Principle (AIP) between the State DOTs was executed subsequently that further detailed the roles and responsibilities of each State in implementing the Project. The AIP identified how the project level environmental studies and design will be administered and completed. Per the AIP, Iowa DOT became the responsible agency for receiving and disbursing High-Speed Intercity Passenger Rail (HSIPR) program funds that may become available through this Grant Application. Iowa DOT will also be responsible for providing to the Federal Railroad Administration (FRA) records of payments and other reporting requirements. The AIP clearly notes the full commitment of both States to implement all aspects of the Program, and notes that Project risks and benefits will be shared between the States.

Copies of the MOU and AIP between the States are attached to the Grant Application.

Both States also have enabling legislation in place to accommodate passenger rail service, as inserted herein.

2.2.1 Iowa Enabling Legislation -

CHAPTER 327J
PASSENGER RAIL SERVICE

327J.1 Definitions.
327J.2 Passenger rail service revolving fund.
327J.3 Administration.

327J.1 Definitions
As used in this chapter, unless the context otherwise requires:

1. "AMTRAK" means the national railroad passenger corporation created under 45 U.S.C. § 541.
2. "Department" means the state department of transportation.
3. "Director" means the director of transportation.
4. "Fund" means the passenger rail service revolving fund created under section 327J.2.
5. "Midwest regional rail system" means the passenger rail system identified through a multistate planning effort in cooperation with AMTRAK.
6. "Passenger rail service" means long-distance, intercity, and commuter passenger transportation, including the Midwest regional rail system, which is provided on railroad tracks.

92 Acts, ch 1210, §2; 2000 Acts, ch 1168, §1; 2009 Acts, ch 97, §16 NEW subsection 6

327j.2 Passenger Rail Service Revolving Fund

1. Fund created. The passenger rail service revolving fund is established as a separate fund in the state treasury under the control of the department. Moneys deposited in the fund shall be administered by the director and shall be used to pay the costs associated with the initiation, operation, and maintenance of passenger rail service.
2. Funding. To achieve the purposes of this chapter, moneys shall be credited to the passenger rail service revolving fund by the treasurer of state from the following sources:

a. Appropriations made by the general assembly.
b. Private grants and gifts intended for these purposes.
c. Federal, state, and local grants and loans intended for these purposes.

3. No reversion. Notwithstanding section 8.33, any balance in the fund on June 30 of any fiscal year shall not revert to the general fund of the state.

92 Acts, ch 1210, §3; 2009 Acts, ch 97, §17
Legislative intent that moneys directed to be deposited in road use tax fund under §312.1 not be used for loans, grants, or other financial assistance for passenger rail service; 2000 Acts, ch 1168, §4 Subsections 1 and 2 amended

327J.3 Administration

1. The director may expend moneys from the fund to pay the costs associated with the initiation, operation, and maintenance of passenger rail service. The director shall report by February 1 of each year to the legislative services agency concerning the status of the fund including anticipated expenditures for the following fiscal year.
2. The director may enter into agreements with AMTRAK, other rail operators, local jurisdictions, and other states for the purpose of developing passenger rail service serving Iowa. The agreements may include any of the following:
    a. Cost-sharing agreements associated with initiating service, capital costs, operating subsidies, and other costs necessary to develop and maintain service.
    b. Joint powers agreements and other institutional arrangements associated with the administration, management, and operation of passenger rail service.
3. The director shall enter into discussions with members of Iowa's congressional delegation to foster passenger rail service in this state and the Midwest and to maximize the level of federal funding for the service.
4. The director may provide assistance and enter into agreements with local jurisdictions along the proposed route of the Midwest regional rail system or other passenger rail service operations serving Iowa to ensure that rail stations and terminals are designed and developed in accordance with the following objectives:
    a. To meet safety and efficiency requirements outlined by AMTRAK and the federal railroad administration.
    b. To aid intermodal transportation.
    c. To encourage economic development.
5. The director shall report annually to the general assembly concerning the development and operation of the Midwest regional rail system and the state's passenger rail service.

92 Acts, ch 1210, §4; 2000 Acts, ch 1168, §2; 2003 Acts, ch 35, §45, 49; 2009 Acts, ch 97, §18
Section amended

2.2.2 Illinois Enabling Legislation

(20 ILCS 2705/2705 440) (was 20 ILCS 2705/49.25h) Sec. 2705 440. Intercity Rail Service.

(a) For the purposes of providing intercity railroad passenger service within this State (or as part of service to cities in adjacent states), the Department is authorized to enter into

agreements with units of local government, the Commuter Rail Division of the Regional Transportation Authority (or a public corporation on behalf of that Division), architecture or engineering firms, the National Railroad Passenger Corporation, any carrier, any adjacent state (or political subdivision, corporation, or agency of an adjacent state), or any individual, corporation, partnership, or public or private entity. The cost related to such services shall be borne in such proportion as, by agreement or contract the parties may desire.

(b) In providing any intercity railroad passenger service as provided in this Section, the Department shall have the following additional powers:
  (1) to enter into trackage use agreements with rail carriers;
  (2) to enter into haulage agreements with rail carriers;
  (3) to lease or otherwise contract for use, maintenance, servicing, and repair of any needed locomotives, rolling stock, stations, or other facilities, the lease or contract having a term not to exceed 50 years (but any multi year contract shall recite that the contract is subject to termination and cancellation, without any penalty, acceleration payment, or other recoupment mechanism, in any fiscal year for which the General Assembly fails to make an adequate appropriation to cover the contract obligation);
  (4) to enter into management agreements;
  (5) to include in any contract indemnification of carriers or other parties for any liability with regard to intercity railroad passenger service;
  (6) to obtain insurance for any losses or claims with respect to the service;
  (7) to promote the use of the service;
  (8) to make grants to any body politic and corporate, any unit of local government, or the Commuter Rail Division of the Regional Transportation Authority to cover all or any part of any capital or operating costs of the service and to enter into agreements with respect to those grants;
  (9) to set any fares or make other regulations with respect to the service, consistent with any contracts for the service; and
  (10) to otherwise enter into any contracts necessary or convenient to provide the service.

(c) All service provided under this Section shall be exempt from all regulations by the Illinois Commerce Commission (other than for safety matters). To the extent the service is provided by the Commuter Rail Division of the Regional Transportation Authority (or a public corporation on behalf of that Division), it shall be exempt from safety regulations of the Illinois Commerce Commission to the extent the Commuter Rail Division adopts its own safety regulations.

(d) In connection with any powers exercised under this Section, the Department
  (1) shall not have the power of eminent domain; and
  (2) shall not directly operate any railroad service with its own employees.

(e) Any contract with the Commuter Rail Division of the Regional Transportation Authority (or a public corporation on behalf of the Division) under this Section shall provide that all costs in excess of revenue received by the Division generated from intercity rail service provided by the Division shall be fully borne by the Department, and no funds for

operation of commuter rail service shall be used, directly or indirectly, or for any period of time, to subsidize the intercity rail operation. If at any time the Division does not have sufficient funds available to satisfy the requirements of this Section, the Division shall forthwith terminate the operation of intercity rail service. The payments made by the Department to the Division for the intercity rail passenger service shall not be made in excess of those costs or as a subsidy for costs of commuter rail operations. This shall not prevent the contract from providing for efficient coordination of service and facilities to promote cost effective operations of both intercity rail passenger service and commuter rail services with cost allocations as provided in this paragraph.

(Source: P.A. 94 807, eff. 5 26 06.)

2.3 Financial Responsibility

Iowa and Illinois both support the Program financially. The states have agreed to fully fund the required 20 percent match on the capitol costs. In addition, the states have developed Agreements in Principle with Amtrak that describes how the states will provide the required operating subsidy. Copies of the cost sharing AIP between the states and the Amtrak AIP are attached to the Grant Application.

2.4 Cost Sharing and Matching Funds Agreements

As described in the States' AIP that is attached to the application, the States will share the capital costs and operating subsidies for the Project based on the mileage percentage of the Program in each state. This percentage is calculated by the total route miles between center of platform at Chicago Union Station and center of platform at the former Chicago, Rock Island & Pacific station at Iowa City, Iowa, via the proposed new connection at Wyanet, Illinois, and divided at the boundary between the States at the Mississippi River where the route crosses the river on the Government Bridge. In nominal terms, this is calculated as 73 percent in Illinois and 27 percent in Iowa. Capital costs for fixed infrastructure will be allocated according to the state in which the infrastructure is physically located, with the exception of single-point control systems, such as communications and signal-system central office equipment, the costs of which will be allocated according to the percentage of the system that is located in each state. Capital costs for mobile equipment, such as rolling stock, will be allocated on the mileage percentage described above.

Illinois DOT has AIPs with the cities of Moline and Geneseo that detail that matching funds related to the passenger station improvements will be handled by the cities by providing funds or in-kind services. Iowa DOT has a similar AIP with Iowa City that details the matching funds related to the passenger station improvements will be handled by the city.

2.5 Prior Experience with Rail and with Large Projects

Both Iowa DOT and Illinois DOT have vast experience in administering similar size transportation project and programs. These projects include both highway and rail projects. Illinois DOT in particular has been a sponsor of passenger rail service within the state since 1971. Projects of comparable size and scope to the Program completed by the Iowa DOT include:

- Evaluation of Interstate 80 (ongoing) from Quad Cities to Omaha, which covers much of the same corridor;
- Assessment of flood damages to Iowa's railroads (2009), resulting in $9.6 million in federal grants through FRA's Disaster Assistance Grants;
- Completion of the Environmental Impact Statement for the Interstate 74 Corridor Project (2009), with construction costs of nearly $1 billion; and,
- Completion of the Council Bluffs Interstate project (2008), a tiered environmental process with construction costs over $1 billion, including development of a management plan and a financial plan for submittal to FHWA.

Iowa is one of the few states to use American Recovery and Reinvestment Act of 2009 (ARRA) highway funding for eligible rail projects. Iowa selected four rail projects for ARRA funding totaling $5 million, including:

- Improvements at the IAIS Intermodal Facility in Council Bluffs;
- Construction of a new rail access to an industrial park in Clinton;
- Upgrades to the electrical systems on a rail bridge in Keokuk over the Mississippi; and
- Rehabilitation of nine bridges to upgrade weight capacity on the D&W Railroad Inc. (operated by Iowa Northern Railway Company).

Through these rail projects, Iowa DOT staff demonstrated the ability to develop diverse rail projects from concept, through engineering, letting, and construction in a timely manner. This unique funding source provided many opportunities for Iowa DOT staff and rail project sponsors to work together to implement rail projects that satisfy all federal funding requirements.

Projects of comparable size and scope to the Program completed by the Illinois DOT include:

- Implementation of Illinois DOT's $14.3 billion highway improvement program (2009), including an annual program of $2.4 billion;
- Implementation of the Chicago Regional Environmental and Transportation Efficiency Program (CREATE) .The CREATE partners completed the $4.5 million railroad modernization project in 2008; it improved the 40 year-old signal system and helped mitigate conflicting use of tracks among freight trains, Metra, and Amtrak along the Indiana Harbor Belt Corridor; and,
- Administration of five state-supported Amtrak routes (2009) operating throughout the state and managing the Chicago to St. Louis high speed rail corridor.

In addition, all Illinois state-sponsored trains continue to post record levels of ridership.

2.6 Understanding of the Commitment

The Project Partners, which includes the States, the Cities of Geneseo, Moline and Iowa City, host railroads BNSF and IAIS, and Amtrak, have a deep understanding of the commitment required for successful implementation of the Program. The States have worked closely with the host railroads to evaluate in detail freight operations and identify potential infrastructure improvements to mitigate the passenger rail impacts of the Program. The States have also

worked with both Amtrak and the communities served by the Program to identify the minimum requirements for passenger station maintenance needs, platform length, parking, and other station-related infrastructure (as noted in the City AIPs attached to the application). Additionally, an Iowa DOT/Illinois DOT AIP was developed to detail the specific responsibilities of the States, including the sharing of risks and benefits. All Project Partners have indicated their commitment to a successful Program implementation through Agreements in Principle or Letters of Support, and will continue to work closely together to successfully implement this service.

The evidence of the States' and their partners understanding that the commitment includes both commitment of State resources and the establishment of processes that require commitment of resources from host railroads, Amtrak, the cities, and other public bodies, is listed below:

- The States have selected consultants for project level environmental studies and design, and can get efforts started immediately after project award;
- The States have obligated management resources and planning funds to progress planning for the Program through the NEPA Tier 1, conceptual engineering, and service plan development phases;
- The States, cities, local agencies, and railroads have actively participated and promoted public outreach processes such as Iowa's Passenger Rail Advisory Committee;
- Host railroads, Amtrak, and the cities have actively participated in the planning process and service definitions that have shaped the Program;
- Legislative energy and the States' funds have been committed to the Program during a period of economic exigency.

2.7 Public Support and Public Involvement Obtained

The new Chicago to Iowa City Service Development Program has a broad base of public support in both the Quad Cities and in Iowa City, as demonstrated by the letters of support that are attached to the Grant Application. Iowa DOT and Illinois DOT have an active program to share information with the public and obtain public comments on the Program. Both states maintain active websites with the latest information on the status of the Program and the states have participated in a number of public information meetings to help the public better understand the Program.

3 Environmental Compliance

3.1 Introduction

This section summarizes the status of environmental compliance and public involvement activities of the Program to date. Environmental compliance informs the Service Design by establishing legal compliance requirements that affect the range of options that the Service Design can reasonably consider. Public involvement informs the Service Design by clarifying public values, concerns, and requirements that in many cases may awaken the Service Design to needs that previously were unknown. In turn, this helps the Service Design provide a better match to the overall values of the population it proposes to serve.

3.2 NEPA Compliance Summary

The National Environmental Policy Act (NEPA) procedures insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA. Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail.

The Program is compliant with NEPA and will be compliant with future Project Level NEPA and permitting requirements. The history of how the Program attained compliance follows herein.

In 2009, Illinois and Iowa DOTs prepared a Tier 1 Service Level EA which addressed the service level issues that would be part of the initial operations, assessed as two round-trip passenger trains per day under the Program. The EA is included as an attachment to the Grant Application to which this Service Development Plan is attached. As discussed in Chapter 1 of this Service Development Plan, the Route A Alternative (Preferred Alternative) is the environmentally preferable alternative. It requires fewer miles of track improvements, is a shorter and faster route, provides better ridership, and would provide more environmental benefits than the Route B Alternative. (A comparison of the alternatives is found in Chapter 1 of this document.) The Route A Alternative would reduce air pollutants and energy use to a greater extent, and have fewer noise impacts than the Route B alternative. The 2009 Service Level EA identified that impacts on natural resources are very similar between the two alternatives, with some key exceptions. The Wyanet Connection (a new connection between the BNSF and IAIS rail lines) is only needed for the Route A Alternative and would include work outside of the existing right-of-way. The Route B Alternative is adjacent to critical habitat of the threatened Indiana bat, and due in part to its longer length, crosses eight more waterways and has 119 more National Wetland Inventory-listed (NWI) wetlands within 100 feet of the right-of-way than the Route A Alternative. Minority and low income populations would not be disproportionately impacted by severe noise impacts; it is expected that the Program would provide greater mobility and employment opportunities, benefiting all residents, including minority and low income populations. The 2009 Service Level EA was published in September 2009.

As part of the Illinois DOT and Iowa DOTs 2010 High-Speed Intercity Passenger Rail (HSIPR) Grant Application for the Chicago to Iowa City service, the Federal Railroad Administration (FRA) requested additional analysis of the potential impacts associated with the construction and operation of the Eola Main Line Improvements (near Aurora, Illinois) and the Wyanet Connection as a supplemental information document in support of the September 2009 Service Level EA. The 2010 Supplemental Information Document is attached to this Grant Application. The noise and vibration assessment that was completed in the September 2009 EA was updated to include the Eola Main Line Improvements in the supplement (August 2009). Similar to the conclusion reached in the EA, the supplemental information found no additional severe noise impacts and an incremental increase in ground-borne vibration. An archaeological and historic property field reconnaissance investigation was performed at the Eola Main Line segment and a Phase I archaeological reconnaissance survey was performed at the Wyanet Connection. No resources were identified at either site. Wetlands and waterways were identified at both the Eola Main Line Improvements and the Wyanet Connection sites. Along with wetland impacts and the placement of fill in streams at both sites, the supplemental information identified a conceptual mitigation plan to compensate for the waterway and wetland impacts at both Eola Main Line Improvements and the Wyanet Connection. Based on the 2009 Service Level EA and the supplemental information, Illinois and Iowa DOTs determined that Route A was the environmentally preferred route, compared to Route B.

As documented in the 2009 Service Level EA and 2010 supplemental information, Illinois and Iowa DOTs have concluded that this Program will not have a significant environmental impact. The Grant Application contains a Draft Finding of No Significant Impact (FONSI). Illinois and Iowa DOTs expect FRA to finalize and approve a FONSI prior to award of a construction grant and commencement of any construction activities related to the Program.

Future Tier 2 Project Level analyses would be prepared for specific project level activities required to implement the Chicago to Iowa City passenger rail service. These project level activities include the evaluation and selection of specific station locations and designs at Geneseo, Moline and Iowa City, identification and evaluation of specific track improvements such as sidings and new connecting track (for example, Eola Main Line Improvements and Wyanet Connection). Specific environmental permits and approvals necessary to construct each project will be determined during Tier 2. The following Project specific studies may be required under Tier 2:

- Wetland delineations (Clean Water Act)
- Cultural resources surveys and Section 106 consultation
- Threatened and endangered species surveys (Endangered Species Act)
- Engineering surveys
- Noise analysis
- Section 4(f) resource evaluation
- Phase I Environmental Site Assessments
- Air emissions analysis in non-attainment areas
- Hydraulic modeling for surface waters and floodplains (Clean Water Act)
- Stream relocation studies (Clean Water Act)

3.3 Public Involvement Summary

NEPA requires that agencies make diligent efforts to involve the public in preparing and implementing their NEPA procedures. Subsequent to the publication of the September 2009 Service Level EA, a public meeting was held in Moline on September 29, 2009. Copies of the EA and the preliminary engineering drawings were available to the public. During the meeting 15 attendees provided written comments that expressed support for the Program, selection of the Route A Alternative, and rapid progression to operation of the two round-trips per day. One individual who was not in full support of the Program was not convinced that ridership would meet projections and felt the cost was not worth the projected benefits.

Comments were received from the public and agencies via the Project website, mail, public meeting comment forms, a telephone information line, and email, with the majority received by the website or by mail. The Illinois DOT and Iowa DOT reviewed and addressed all comments. Attachment 2 of the supplemental information to the EA contains a complete list of all comments, the issues raised, and the responses to the comments. If the comment identified a concern or issue that requires additional analysis, clarification, or correction, the supplement addressed these.

The supplemental information will be made available to the public when it is published on the Project website, www.chicagotoiowacity.com. This website also contains the EA, comments on the EA, press releases, the September 29, 2009 meeting materials, and participant links.

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4 Transportation Delivery Plan

This chapter describes the technical basis for establishing the passenger-rail transportation service of the Program. This chapter translates the purpose and need for the Program, established in Section 1 of this Service Delivery Plan into the technical parameters of a passenger-rail service that will fulfill the Program's requirement in a cost-effective and feasible manner. Elements of this process included development of:

- An understanding of the present-day function, geometry, multimodal connectivity, and operating and engineering feasibility for high-speed passenger rail of the several alternative route choices that could connect the endpoints of the corridor;
- An understanding of the present-day freight and passenger rail uses of the alternative routes, in order to best-fit the needs of the Program with the needs of other users of the routes;
- A final corridor, in conjunction with the Tier 1 NEPA process;
- Optimized the combination of infrastructure investment and operating requirements;
- Rail Traffic Controller (RTC) models of the corridor to validate conceptual infrastructure planning, proposed schedules, and proposed operating plans (two separate RTC models were conducted, one each for the BNSF and IAIS portions);
- A final operating plan, which involved detailed validation discussions with the host railroads and Amtrak;
- Equipment, station, and equipment maintenance facility requirements to meet the proposed schedule and operating plan; and
- Infrastructure, equipment, operating, and maintenance cost estimates.

4.1 Route Selection

Selection of the route was conducted during the Tier 1 NEPA process using input from rail operations and engineering experts, the host railroads and Amtrak, the cities that could be served by the Program, and the public. This route selection process is described in full in the Tier 1 NEPA attachment to this Grant Application. The process was informed by initial conceptual-level passenger-train schedules, assessments of existing infrastructure, discussions with freight and passenger rail users to determine existing and likely future uses of the proposed routes, and initial cost estimates. The route selection process concluded with the selection of a combined BNSF Railway/Iowa Interstate Railroad route originating at Chicago Union Station, following the existing BNSF primary commuter route to Chicago's western suburbs, transitioning from BNSF to IAIS at a new connection to be built at Wyanet, Illinois, and continuing on IAIS to the Quad Cities and Iowa City. The existing conditions of this route, the current-day operating environment and infrastructure, and the effects of these conditions and uses on the Program's operating plan are described in the following sections.

4.2 BNSF Railway Portion of the Route

4.2.1 Background

The Chicago and Mendota Subdivisions of the BNSF Railway, which will be used by the passenger trains of the Program, formerly comprised a portion of the principal east/west corridor

of the Chicago, Burlington and Quincy Railroad, a precursor to today's BNSF. The Chicago Subdivision extends from Chicago Union Station to Montgomery, Illinois, 41 miles, and the Mendota Subdivision extends from Montgomery to Galesburg, Illinois, continuing past Wyanet, 71 miles west of Montgomery. Similar to the history of the Rock Island Railroad, described below, the "Q" as it was known colloquially, operated a fleet of fast passenger trains mixed with overhead and locally generated freight. Most of the freight traffic was classified at their yard in Cicero, Illinois. The thread of the "Burlington" names lives on through a series of significant mergers that meshed the CB&Q with Northern Pacific, Great Northern, and Spokane, Portland & Seattle in 1970, and finally with the Atchison, Topeka & Santa Fe Railway in 1995. It was this last merger that changed the operational complexion of the corridor from Chicago through Wyanet to Galesburg, as the primary Santa Fe corridor tapped directly into the Pacific Southwest trade corridor offering significant time saving and strategic advantages over the CB&Q corridor. With the development of logistics centers and intermodal yards along the former Santa Fe alignment in Illinois at Willow Springs and at Logistics Park near Joliet, and with few capacity constraints, much of BNSF's time-critical traffic from Southern California, Arizona, and Texas, is now moved on the Santa Fe corridor through Illinois to Chicago as opposed to the CB&Q corridor.

4.2.2 Present Day

The Chicago and Mendota Subdivisions transport Pacific Northwest intermodal goods, manifest freight, and grain, as well as a large portion of BNSF's total Powder River Basin coal traffic including virtually all of its coal traffic to the Great Lakes states. As of early 2010, approximately 20 to 25 freight trains operate daily on the Mendota Subdivision, with an additional 20 to 25 freight trains daily entering or leaving at Aurora, MP 38.4, just east of Montgomery, for a total of 40 to 50 freight trains daily on the Chicago Subdivision. These trains average 6,000 to 7,000 feet in length with 8,800 to 13,200 hp on each train, with both conventional power placement as well as distributed power. At Montgomery, the single-track Aurora Subdivision joins with the double-track Mendota Subdivision to form the double-tracked, then triple-tracked Chicago Subdivision. Two each-way daily long-distance Amtrak trains, the Southwest Chief and California Zephyr, as well as two round-trip daily state-supported Chicago to Quincy, Illinois, trains, the Carl Sandburg and Illinois Zephyr, also operate on this corridor. From Aurora (entering BNSF's corridor at West Eola on the Chicago Subdivision) and Naperville to Chicago's Union Station, more than 120 Metra local and express trains operate Monday through Friday with a lesser number operating through the weekend.

BNSF's Barstow Subdivision crosses the IAIS at a level crossing at Colona, with a current maximum authorized speed of 30 MPH. Approximately 16- to 18 BNSF trains cross the Program's route each day at Colona, with trains that average approximately 6,000 feet in length. This crossing is an automatic interlocking where each train is advanced across the crossing "diamond" on a first come, first serve basis. In the Moline/Rock Island area, BNSF operates an average of two through trains and two locals a day between Silvis and Rock Island with an occasional grain train (loaded and empty) also operating through this corridor once a week. The two locals occupy the BNSF/IAIS joint track between Moline and Rock Island four to five hours each day. BNSF holds loaded coal trains west of Aurora on the double-tracked Mendota Subdivision until the shipper or connecting railroad at Chicago can accommodate these trains.

Typically these trains are held on one of the two main tracks between the Earlville and Somonauk control points. During the time these trains are staged, only one main track is available for service for this 15-mile stretch between the Earlville and Somonauk crossovers.

BNSF maintains the Chicago and Mendota Subdivision to FRA Class 4 standards, which allows 80 mph for passenger and 60 mph for freight. Current maximum operated speeds on the BNSF portion are 79 mph passenger and 60 mph freight, with permanent speed restrictions reducing these speeds at locations such as curves, stations, and terminal areas. Train movements on the Chicago and Mendota Subdivisions are governed by Centralized Traffic Control (CTC). The Mendota Subdivision typically is equipped with universal No. 20 crossovers (BNSF typically allows 35 mph through the diverging side of the turnout) at control points located as indicated in Table 4.2-1. Operations and maintenance activities on the Chicago Subdivision are handled in a similar fashion on this primarily three and four- track main line, although crossovers are more likely to be No. 24's through which BNSF allows 50 mph through the diverging side of the turnout. Maximum track speed is 70 MPH with track maintained to FRA Class 4 standards. BNSF is in the process of installing PTC on this corridor (from Chicago to Galesburg).

Table 4.2-1: BNSF Interlocking Locations, Chicago and Mendota Subdivisions

Location	MP	Type of Operation	Turnout Size	Speed through Turnout (MPH)	Comments
Chicago Subdivision Maximum Speed MP 0.0 to 38.4 = 70 MPH; MP 38.4 to 41.0 = 79 MPH					
Halsted St./Union Ave	1.8	4 main tracks CTC	No. 20	35	
Western Ave	3.7		No. 15	10	
Cicero	7.0		No. 20	35	
La Vergne	9.0	3 main tracks CTC	No. 15 & 20	30	
Berwyn	9.6		No. 24	50	
Brookfield/Congress Park	12.3		No. 24	40	
Highlands	16.3		No. 20	35	
West Hinsdale	17.8		No. 20	35	
Fairview/Downers Grove	21.1		No. 20	35	
Lisle	24.4		No. 24	50	
Naperville	28.4		No. 20	35	
Eola	33.4		No. 15	30	
West Eola	35.3		No. 15	30	
Aurora	38.4	2 main tracks CTC	No. 20	35	
Mendota Subdivision Maximum Speed MP 41.0 to MP 112.0 (Wyanet) = 79 MPH					
Bristol	45.5	2 main tracks CTC	No. 20	35	RH Crossover only
Somonauk	59.2		No. 20	35	
Earlville	72.1		No. 20	35	

Location	MP	Type of Operation	Turnout Size	Speed through Turnout (MPH)	Comments
Electrics	80.5		No. 20	35	
Zearing	95.3		No. 20	35	
Wyanet (proposed)	112.0		No. 24	50	To be constructed

Passenger platforms for the current slate of passenger trains (and commuter trains on the Chicago Subdivision) are located on both sides of the BNSF corridor except at Mendota, where the platform is only located on the north side of the double-track main line.

4.3 Iowa Interstate Railroad

4.3.1 Background

Iowa Interstate Railroad (IAIS) between Wyanet and Iowa City was once an Automatic Block signaled, double-track main line of the Chicago, Rock Island & Pacific Railroad (Rock Island Railroad) reaching from Chicago to Tucumcari, New Mexico and Denver, Colorado (double-track ended at Iowa City). The route hosted a slate of streamlined intercity passenger trains connecting Chicago with LaSalle, the Quad Cities, Des Moines, Omaha, and Denver well into the 1960s. The Rock Island did not join Amtrak in 1971, and instead ran its own passenger trains from Chicago to Rock Island and Peoria with financial assistance from the state of Illinois until discontinuance of the Quad Cities train in 1978.

The Rock Island also funneled a large volume of overhead freight traffic to and from its yard in Blue Island in Chicago, on their east/west main route (which includes the segment between Wyanet and Iowa City) to western origins and destinations. The Rock Island Railroad ultimately became a victim of railroad regulation when it was forced to declare bankruptcy and was ordered for liquidation by a Federal judge after several reorganization efforts failed. A trustee oversaw the railroad's dismemberment and sold its assets piecemeal to other carriers through 1984. The Chicago-Blue Island portion was sold to Metra for commuter rail; Blue Island to Bureau was sold to CSX for freight movement, and Bureau to Council Bluffs ultimately became the IAIS.

Iowa Interstate Railroad (IAIS) emerged in 1984 as the operator of the Chicago-Council Bluffs corridor to provide rail service between Bureau, Illinois, where it connected with CSX, and Council Bluffs, Iowa, where it connected with several railroads, including Union Pacific. This re-established rail service to many of the corridors' on-line shippers for the first time since 1980. In order to interchange with Class I carriers in Chicago, the IAIS obtained trackage rights from Bureau to Joliet over CSX and from Joliet to Blue Island over Metra, which assumed operation of the former Rock Island commuter service in the Chicago metropolitan area.

By this time, much of the Chicago-Omaha route was fraught with crumbling infrastructure and slower operating speeds, as a result of deferred maintenance and insufficient capital investment by the Rock Island during its final decades. Wayside signals were removed from service and the main line was single-tracked west of Joliet. This now requires IAIS to switch most of its on-line customers directly from the main track rather than clearing the main track to switch customers.

Because the volume of through rail traffic had plummeted, only a limited number of sidings, fashioned from the former second main track, were still required. Rock Island's major yards in Blue Island and Silvis, Illinois, and Des Moines, Iowa, were abandoned or taken over by other carriers, leaving IAIS to switch trains from smaller secondary yards in Rock Island, Illinois, and Iowa City, Newton, and Council Bluffs, Iowa. Because few – if any – through trains and no passenger trains continued to operate over the corridor, the main track cost-effectively became the switching lead for these yards, a practice that continues to the present day.

4.3.2 Present Day

IAIS is managed from its corporate headquarters located in Cedar Rapids, Iowa, and is broken into several subdivisions: Subdivision 1 from LaSalle to Iowa City; Subdivision 2 from Bureau to Peoria, Illinois; Subdivision 3 from Iowa City to Des Moines, Iowa; and Subdivision 4 from Des Moines to Council Bluffs, Iowa. IAIS has developed a diverse on-line traffic base, whereas the Rock Island once handled that plus a substantial overhead traffic from Western connections. In turn, shippers along this corridor have come to rely on timely, consistent, and highly efficient (i.e., low-cost) rail service provided by the IAIS to transport their goods to market. The railroad continues to grow and diversify its online traffic base, and it had a record-breaking year in 2008 by originating over 75,000 cars. Both CSX and Metra provide daily time "slots" on their congested main tracks that IAIS trains must meet in order to move the final miles to and from Chicago. These specified times must be met in order to minimize disruption on Metra's fleet of commuter trains that operate daily. These slot times, in turn, set the schedule for train operations throughout the rest of the IAIS system.

IAIS serves customers and conducts interchange with connecting railroads over the length of its main line daily. The daily each way combination through-train/roadswitchers with train symbols BICB and CBBI provide the backbone of IAIS operations between Blue Island and Council Bluffs and carry a mixture of general manifest, intermodal, grain, and ethanol traffic. These trains pick up and set out cars for other IAIS trains at Rock Island, Illinois, and Iowa City and Newton, Iowa, and can be dispatched to handle any customer switching en route. The BICB and CBBI average 7,000 feet in length and are typically pulled with two 4,400 horsepower locomotives totaling 8,800 horsepower.

Two pairs of roadswitchers, trains CRIC and ICCR between Cedar Rapids and Iowa City, and trains ICRI and RIIC between Iowa City and Rock Island, work together to shuttle a large volume of interchange traffic between the Cedar Rapids and Iowa City Railway (CIC) interchange in Cedar Rapids (IAIS has trackage rights over CIC between Yocum Connection and Cedar Rapids) and Rock Island where it is added to or subtracted from trains BICB/CBBI or interchanged to BNSF or Canadian Pacific Railway (CPR). Frequent commodities handled by these trains from Cedar Rapids include construction materials, corn syrup, animal feed, and ethanol. The trains frequently shuttle grain from western and central Iowa origins (set out at Iowa City by train CBBI) to the ADM grain-processing complex in Cedar Rapids, and will also handle online customer switching between Durant and Davenport, Iowa, as needed. The trains average 8,000 feet in length and employ total locomotive horsepower of between 8,800 and 13,000.

Another pair of daily locals, trains RIBU and BURI, shuttle interchange traffic to BNSF at Silvis, Illinois; handle online customers between Silvis and Bureau, Illinois; and swap cars with train BUSW at Bureau (the Bureau Switcher, which operates to Peoria and LaSalle, Illinois). Trains average 3,000 feet in length and 4,000 total locomotive horsepower.

The recent ethanol boom created additional rail-served business with large-scale facilities located along IAIS at Annawan, Illinois, and Menlo, Iowa. These facilities generate unit trains averaging 5,200 feet in length several times weekly, as well as loose carload traffic on a daily basis. Unit trains have 8,800 total locomotive horsepower.

IAIS also handles occasional unit coal trains between Peoria, Illinois, and Cedar Rapids, Iowa, averaging 7,200 to 7,500 feet in length and total locomotive horsepower of 11,000. These trains are often held on the IAIS awaiting acceptance by the shipper or connecting railroad.

Switchers based in Rock Island and Iowa City build trains, stage cars for pick up by through trains, and serve concentrated clusters of online customers. The Iowa City Switcher serves customers between Oxford (west of Iowa City) and Durant (east of Iowa City), Iowa, six days a week. Daily, around-the-clock service to customers and interchange partners in the Quad Cities is facilitated by a trio of Rock Island-based switchers. CPR also interchanges daily with IAIS and with BNSF using the BNSF bridge to access Rock Island and Moline/Silvis Yards – a CPR local typically passes through Moline and Rock Island once daily, occupying the same main track as IAIS through trains and switch engines, and BNSF's each-way daily through trains and locals, a total of five trains daily in addition to the IAIS trains. The BNSF locals frequently require 3 to 4 hours to move between the BNSF connection at 7th Street, and Rock Island Yard, due to train congestion and switching and interchange activity. As a result, this corridor is occupied by at least one, and frequently three to four, trains and switch engines from one to three different railroads virtually around the clock.

IAIS track between Wyanet and Coralville is generally single track maintained to FRA Class 3 standards, allowing a maximum operating speed of 40 mph for freight, with segments of former double-track main line left in place for sidings. Sidings are used more as locations for car staging for connecting railroads and for industries, and for industry switching support, than for meets and passes. Track speeds are 10 mph on these sidings, through the yard at Rock Island and over the interlocking at Colona. These siding lengths, locations, turnout size, siding speed, and primary function (of the siding) are shown in Table 4.3-1. Trains enter these sidings by hand-throwing the entering switch and, once clear of the main track, leave the main line switch in the open position. Train movements over the IAIS are governed by a series of Track Warrant Control and Yard Limit segments, except where IAIS trains pass through the automatic interlocking at Colona and through the manual interlocking that governs train movement over the Government Bridge over the Mississippi River. At these locations, IAIS trains are governed by signal indication.

Table 4.3-1: IAIS Siding Locations and Current Characteristics, Wyanet to Iowa City

Location (listed east to west)	West MP	East MP	Siding Length (feet)	Turnout Size	Siding Speed (MPH)	Notes
Atkinson	152.0	150.0	9,500	No.10	10	
Silvis	174.4	171.9	12,000	No.10	10	Yard
Moline	178.5	177.3	6,000	No.10	10	Storage
Rock Island	181.3	180.5	Yard	No.10	10	Classification Yard
Walcott	194.2	193.0	6,520	No.10	10	Meets and Passes/Storage
Twin States	204.5	203.5	4,980	No.10	10	Industry
Wilton/North Star	210.9	208.5	12,272	No.10	10	Meets/Passes and Industry
West Liberty	222.2	221.3	4,200	No.10	10	
Iowa City	236.8	235.1	8,676	No.10	10	Classification Yard

4.4 Rail Traffic Controller Analysis

Both BNSF and the States have completed Rail Traffic Controller analyses between Chicago and Iowa City. BNSF performed RTC modeling extending from Chicago Union Station to Wyanet (and beyond to Galesburg), and the States performed RTC modeling on the IAIS between Wyanet and Iowa City. The IAIS RTC model extended beyond Wyanet to Bureau and beyond Iowa City to Yocum Connection in order to capture freight train operational patterns that will influence the Program's service design. Several simulations were performed that took into account (1) the base case, (2) the base case *plus* proposed Amtrak service (using the 2008 Amtrak feasibility study schedule and the Program's proposed accelerated train schedule) and (3) the base case *plus* proposed passenger service *plus* proposed track and signal improvements. This would translate to a total car count of cars being originated by IAIS in 2030 of 110,000 (calculated from a 2010 base number of 75,000). The results of these scenarios are displayed in various formats including Time/Distance Diagrams, Train Performance Calculations (TPCs), Animations (of the scenarios), and Delay Ratios. Freight growth calculated at 2.0 percent for the 2030 year planning horizon was also added to the second and third scenarios. Freight train growth can be accommodated in several ways, including (1) adding more freight train frequency, (2) operating longer trains, and/or (3) operating heavier rail cars. Each approach affects the overall capacity of the system.

BNSF's RTC model was developed to better understand the interaction between the addition of the four passenger trains between Chicago Union Station and Wyanet (where these trains would diverge onto the Iowa Interstate) and BNSF's existing freight, Amtrak's passenger and Metra's commuter trains. HDR reviewed BNSF's RTC output (time/distance diagrams, known as stringlines, which are Included in Appendix A) for accuracy and noted that several existing and proposed passenger train schedules required adjustment. Figure 4-1 through Figure 4-3 show these modified stringlines. According to schedules developed for a 79 MPH operation between Chicago and Iowa City, the opposing passenger trains would meet each other between

Naperville and Earlville each day. Complicating these meets would be the possibility that one of the BNSF Mendota Subdivision main tracks could be blocked with a staged coal train awaiting disposition. BNSF's RTC runs focused-in on this possibility and recommended a series of track and signal improvements at Eola that are discussed below and in more depth in Appendix A.

BNSF's RTC analysis modeled the 20-23 freight trains and 8 existing passenger trains that operate daily on the Mendota Subdivision. To this volume, BNSF's Aurora Subdivision (which connects at Aurora to form the Chicago Subdivision) adds approximately 25-27 BNSF freight trains. Many of these freight trains continue east on the Chicago Subdivision towards Cicero and many trains divert at Eola onto the CN/EJ&E corridor. The time/distance diagrams also show a tremendous number of green lines. These green lines represent the nearly 100 Metra commuter trains that enter the BNSF Chicago Subdivision every Monday through Friday. The horizontal yellow lines represent trains "held" on one of the main tracks between Earlville and Somonauk. Figure 4-2 shows the results of adding passenger trains onto this congested operational and infrastructure picture. It appears that several opposing passenger trains, existing and proposed, meet on the double-track either just east or just west of the Earlville/Somonauk segment. The Program's proposed Amtrak Trains A384 and A385 incur delay waiting at Somonauk for each other. It may be possible to adjust one of these two train's start times to permanently shift this meeting location.

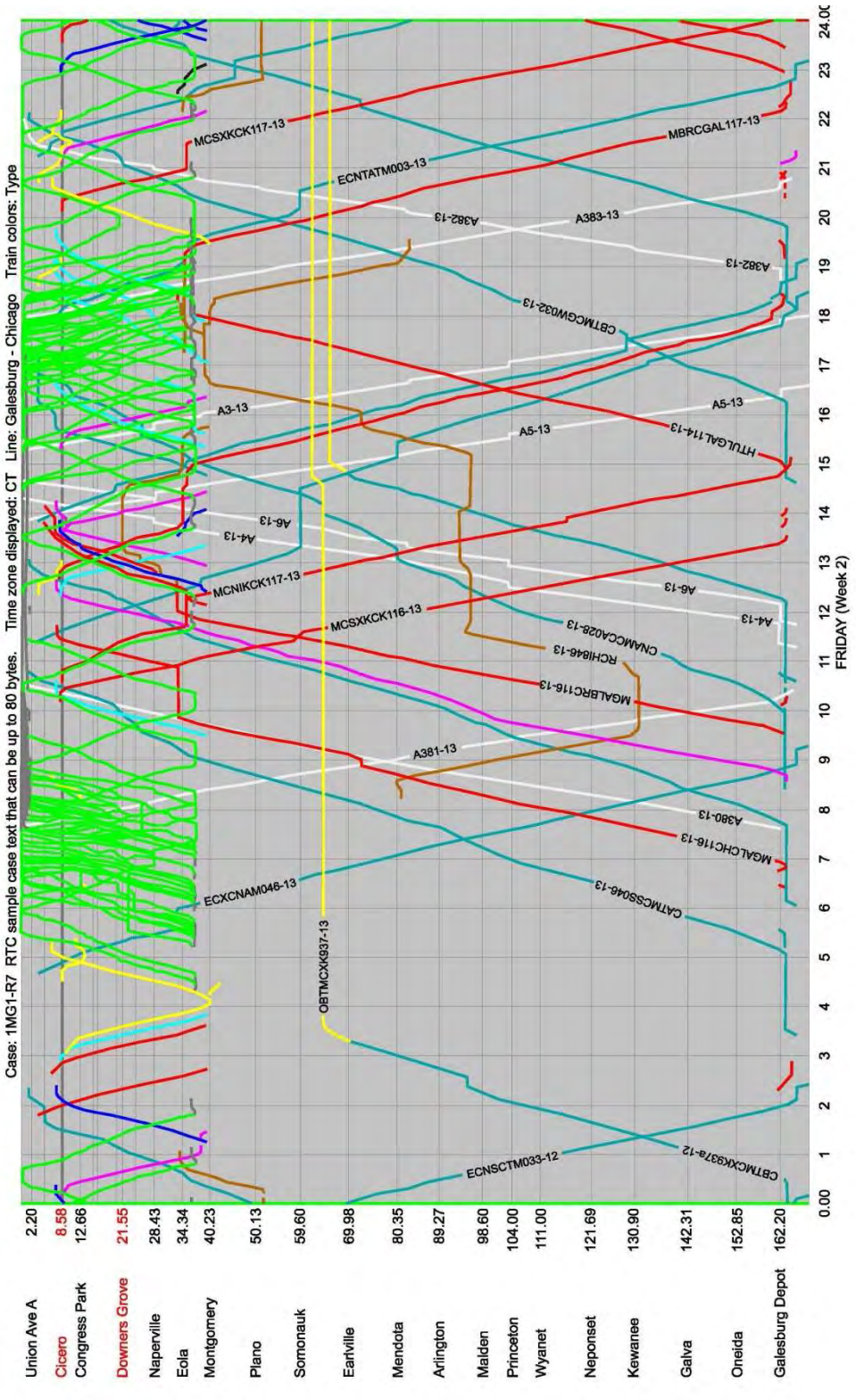
However, RTC outputs are only a snapshot of what might be considered an idealized world of train operations. It is rare for these perfect-world conditions to be replicated in the day-to-day operations experienced by BNSF, Metra, and Amtrak. Some of the opposing passenger trains (existing and proposed) shown in Figure 4-2 meet each other near to the Earlville/Somonauk segment. Even a slight delay to any or all of these passenger trains would put their ideal meeting place at the very location where one of the main tracks is blocked with the "held" train (shown in yellow on Figure 4-1 and Figure 4-2). BNSF's suggested solution is to provide sufficient trackage in the Eola area so this trains could be advanced to its ultimate destination whenever the shipper desires. One of the advantages of the RTC modeling effort is that it allows a quantitative comparison between the various scenarios. Using the data derived from the un-adjusted modeling runs, BNSF has calculated the following delay ratios that result from the proposed infrastructure modification. Table 4.4-1 shows these ratios.

Table 4.4-1: Delay Ratios Generated by BNSF's RTC Modeling, Chicago to Wyanet

Scenario	Scenario #1 - Base Case	Scenario #2 - Base Case Plus Wyanet Trains Added	Scenario #3 - Base Case Plus Wyanet Trains Added plus Eola Improvements
Passenger Trains	0.0205	0.0335	0.0178
Freight Trains	0.1320	0.1444	0.1207

Scenario #2 shows that both Amtrak as well as BNSF trains incur delay once the additional passenger trains to Wyanet are placed in service. Additional graphs showing the amount of passenger and freight train delay hours per week are included in Appendix A. According to BNSF, Amtrak would receive on average 7.38 hours of delay each week if this segment of main track remains blocked.

Figure 4-1: BNSF RTC Base Case – Chicago to Wyanet, No Chicago-Iowa City Trains[4]



[4] Passenger train schedules in Figures 4-1 through 4-3 have been modified to current proposed schedules from schedules proposed at time of BNSF modeling.

Figure 4-2: BNSF RTC Base Case, Chicago to Wyanet, With Chicago-Iowa City Trains

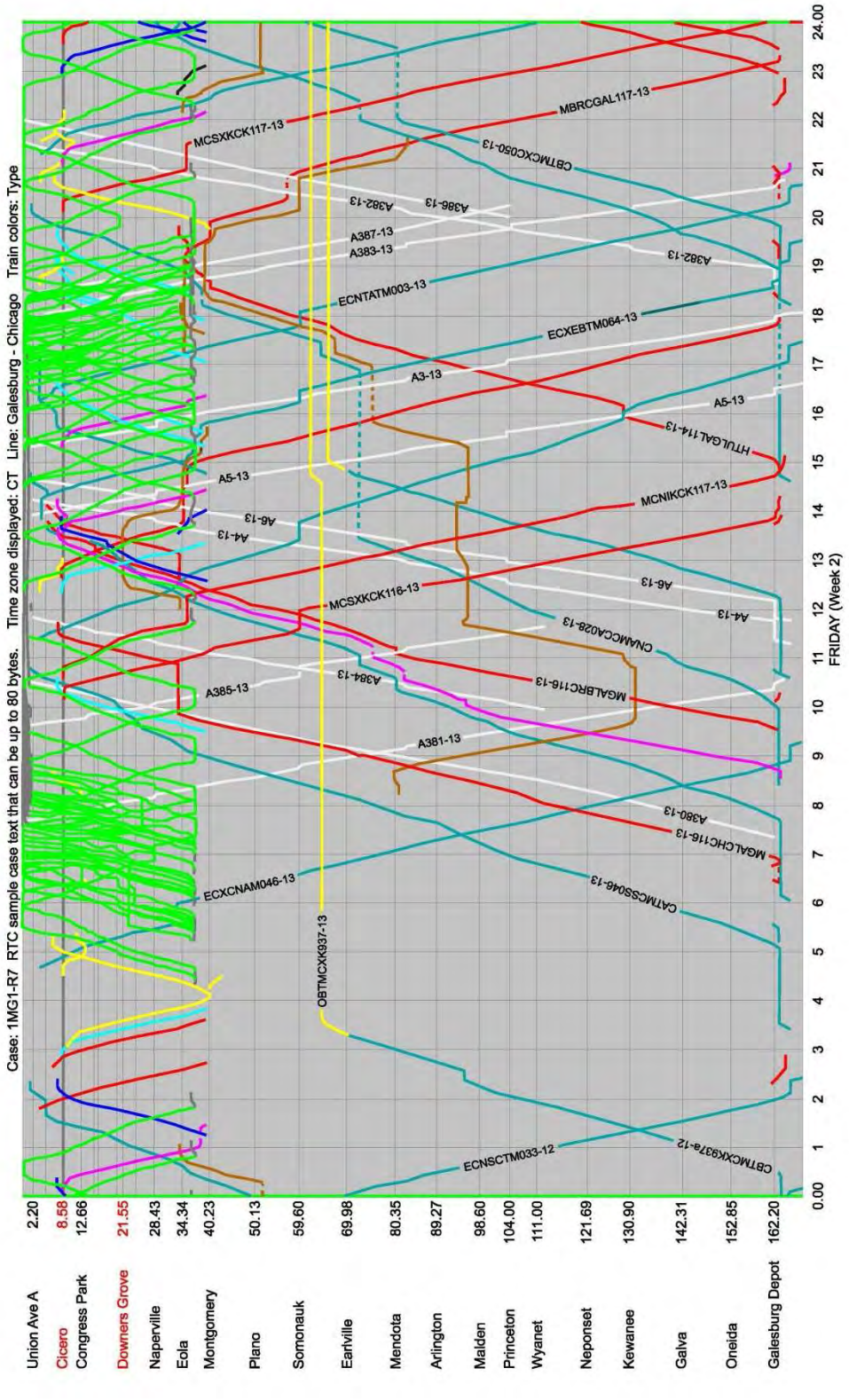
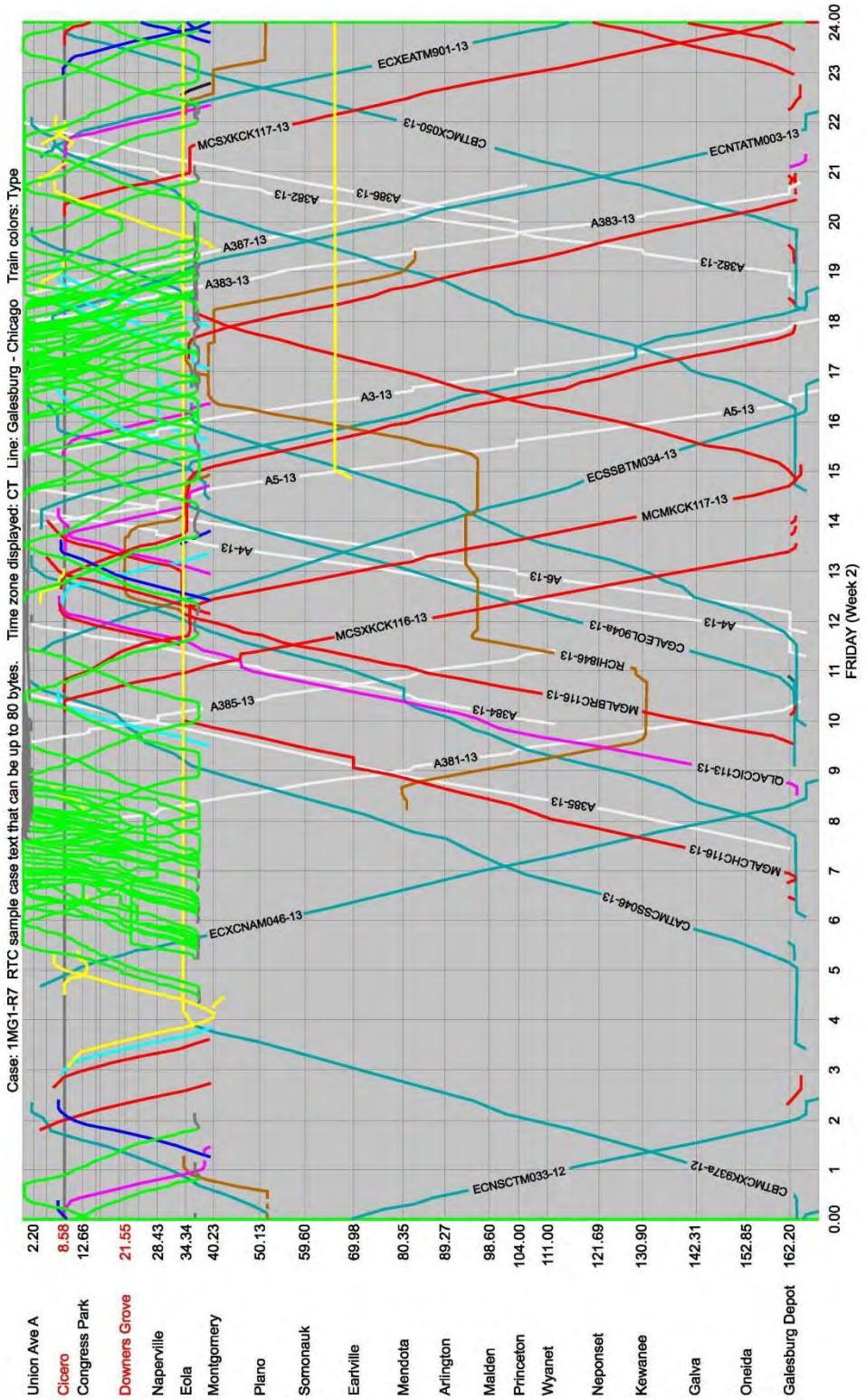


Figure 4-3: BNSF RTC Proposed Case, With Chicago-Iowa City Trains and Eola Main Track Improvements



This added delay to passenger trains is the result of opposing passenger trains delaying each other as well as passenger trains delaying freight trains. In turn, the blocked tracks cause additional delay as freight trains entering the system cannot get out of the way and inadvertently cause more delays to passenger trains. This is not a disregard for dispatching priority issue in that RTC "dispatches" the higher priority trains first then finds slots for all the lower priority trains. Amtrak trains receive top dispatching priority. The issue is that, at the very location where they trains could or should meet, 13 miles of flexibility has been "removed" from use. BNSF would move the staged train if there were sufficient room to hold this train. Typically, this train is a 135-car coal train which averages 7,500 feet in length. Most of the yard trains in Eola average 4,000- to 4,500 feet long. Consequently, BNSF has developed three alternatives to creating a long enough track in which to hold the Earlville/Somonauk train and thereby freeing up critical main track capacity. These alternatives are discussed in depth in the Supplemental information provided in support of the 2009 System-Level EA.

For the proposed Amtrak passenger service, TPC runs based on one locomotive plus four coaches with a cab/coach on the east end were derived. These graphs are included in Figure 4-4 and Figure 4-5. These graphs indicate the topography, the proposed station stops, the maximum authorized operating speeds, throttle, and dynamic brake and air brake settings, and resulting train speeds. These time/distance diagrams were used to establish cumulative run times for the passenger train runs, which in turn were used to determine a schedule time. Because the arrival and departure times were not changed at Chicago Union Station, these TPC schedule times were used on an iterative basis to derive the balance of the schedule. The proposed passenger train schedule indicates that the opposing passenger trains meet on BNSF trackage – on the double-track Mendota Subdivision.

Train operations on the IAIS were modeled by the States using the RTC software tool. Freight train data based on IAIS's year 2010 operations was obtained from IAIS personnel. IAIS freight train growth, which is assumed to include originating 110,000 cars by the year 2030, could be managed by IAIS by operating additional through-type trains. In review of the time/distance diagrams, these trains could be handled between 10 am and 7 pm daily. However, additional frequencies are at this time hypothetical and would ultimately be based on negotiations with CSX and with Metra as freight operations on IAIS are dictated on slot time capabilities on these railroads.

Figure 4-6 to Figure 4-9 display the four scenarios: Figure 4-6 illustrates the Base Case – existing IAIS freight trains only under current operating patterns; Figure 4-7 illustrates the Base Case with passenger trains added to the existing IAIS freight train scenario, main track speeds increased to 79 mph, but *no* siding, or second main track infrastructure improvements added, and passenger trains having no dispatching priority; Figure 4-8 illustrates the same case as Figure 4-6, but with passenger trains receiving dispatching priority; and Figure 4-9 illustrates the proposed case with passenger trains, with passenger trains receiving dispatching priority, with probable freight train traffic growth, and *including* proposed infrastructure improvements.. However, several existing IAIS freight schedules operate during the time-of-day that Amtrak proposes to run. Accordingly, these schedules were simulated using RTC to develop the attached time/distance graphs.

Figure 4-4: 79 mph Eastbound Passenger Train TPC (proposed main track upgrades included)

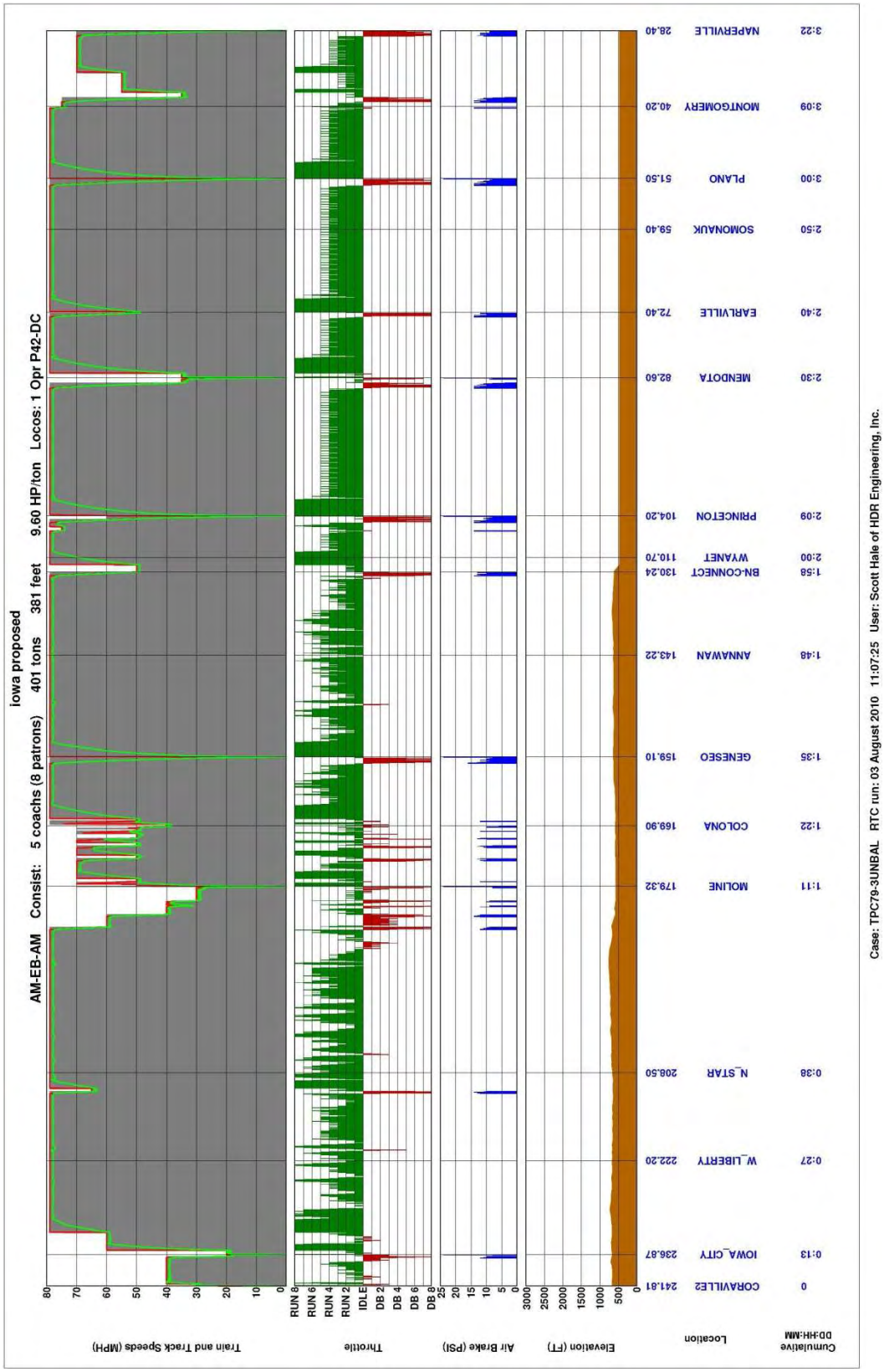


Figure 4-5: 79 mph Westbound Passenger Train TPC (proposed main track upgrades included)

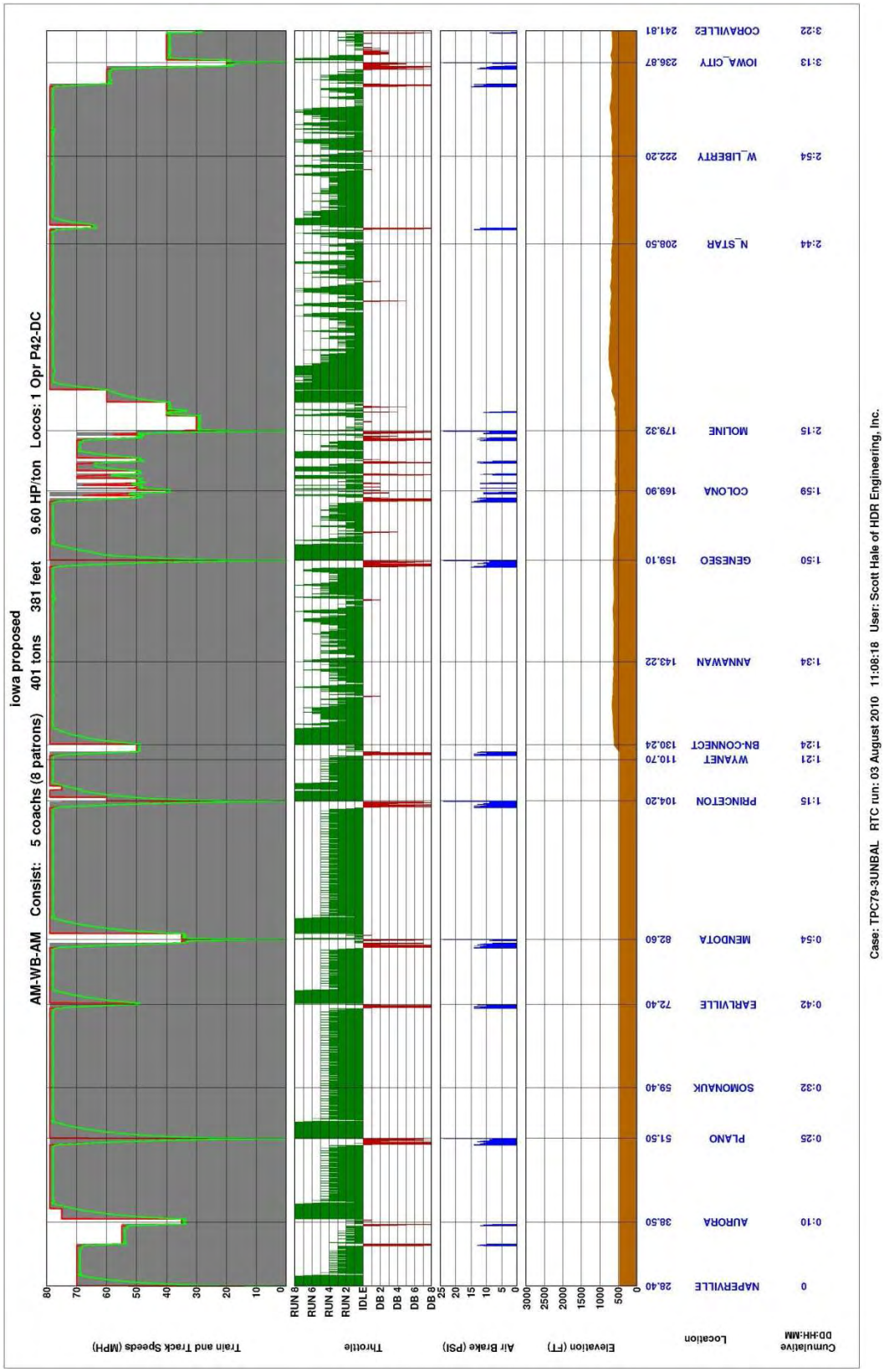


Figure 4-6: IAIS Wyanet-Iowa City RTC Base Case (Freight Only)

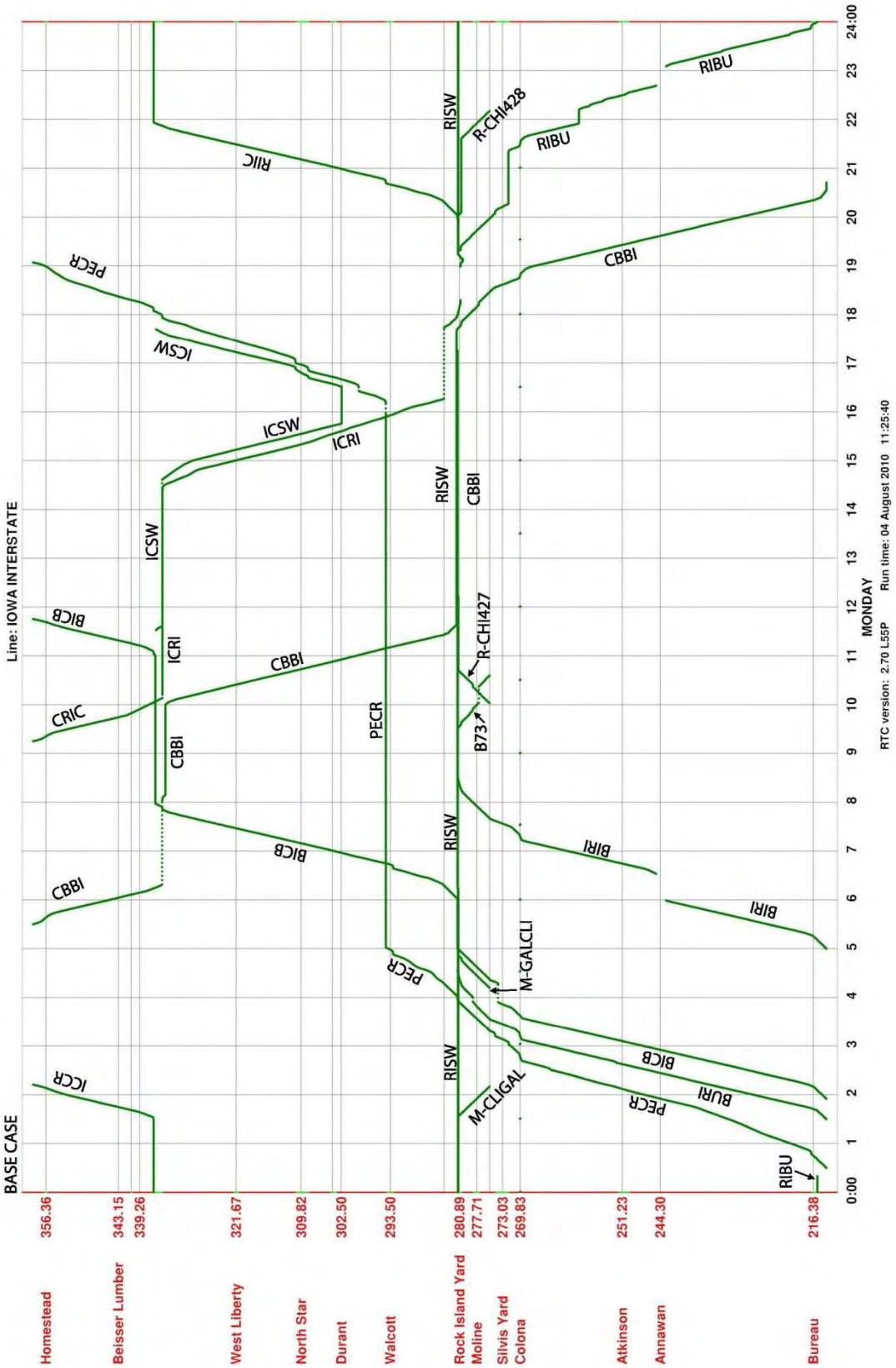


Figure 4-7: IAIS Wyanet-Iowa City RTC Base Case, with Passenger Trains (Passenger has No Priority)

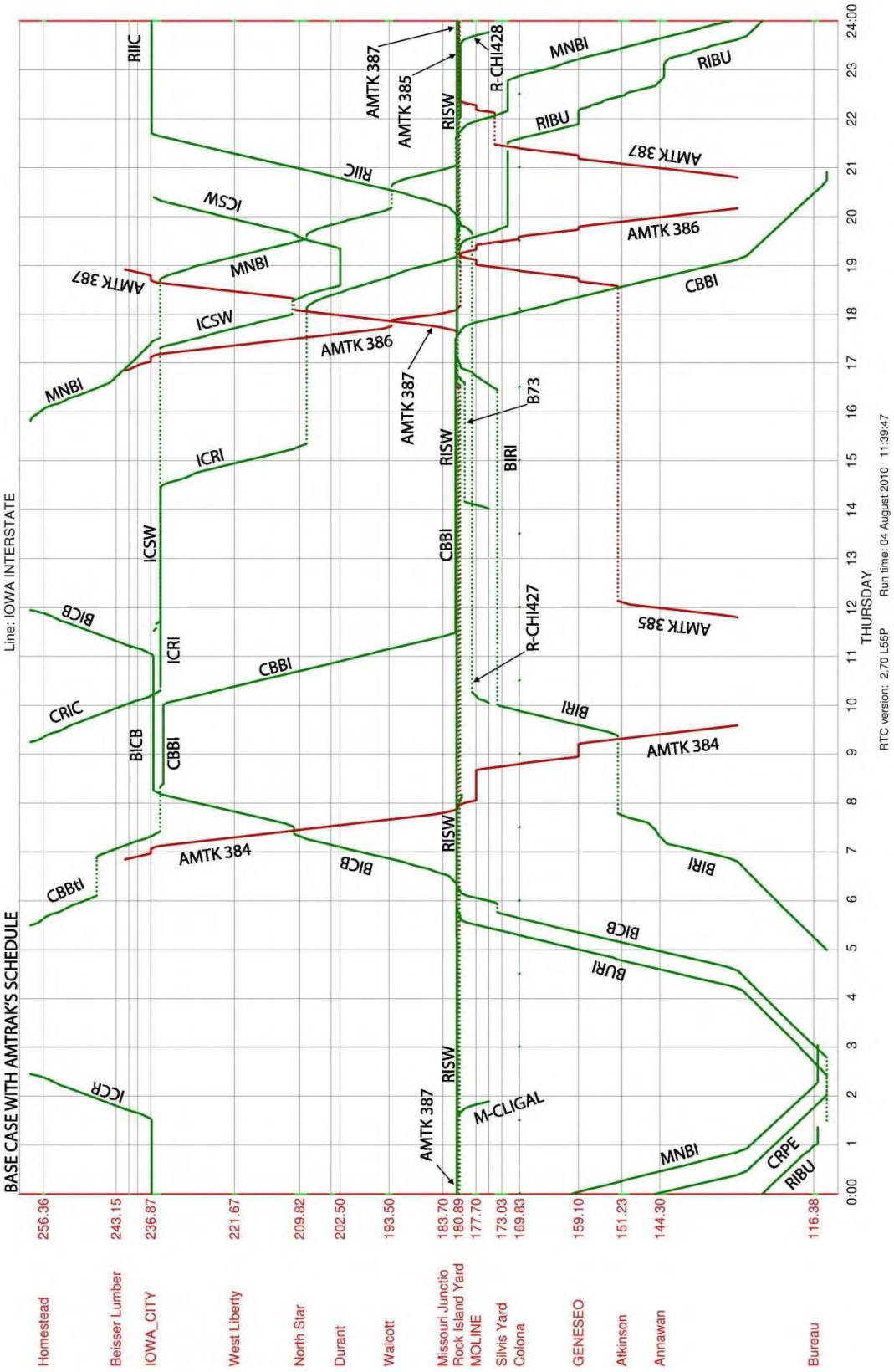


Figure 4-8: IAIS Wyanet-Iowa City Base Case, with Passenger Trains (Passenger has Priority)

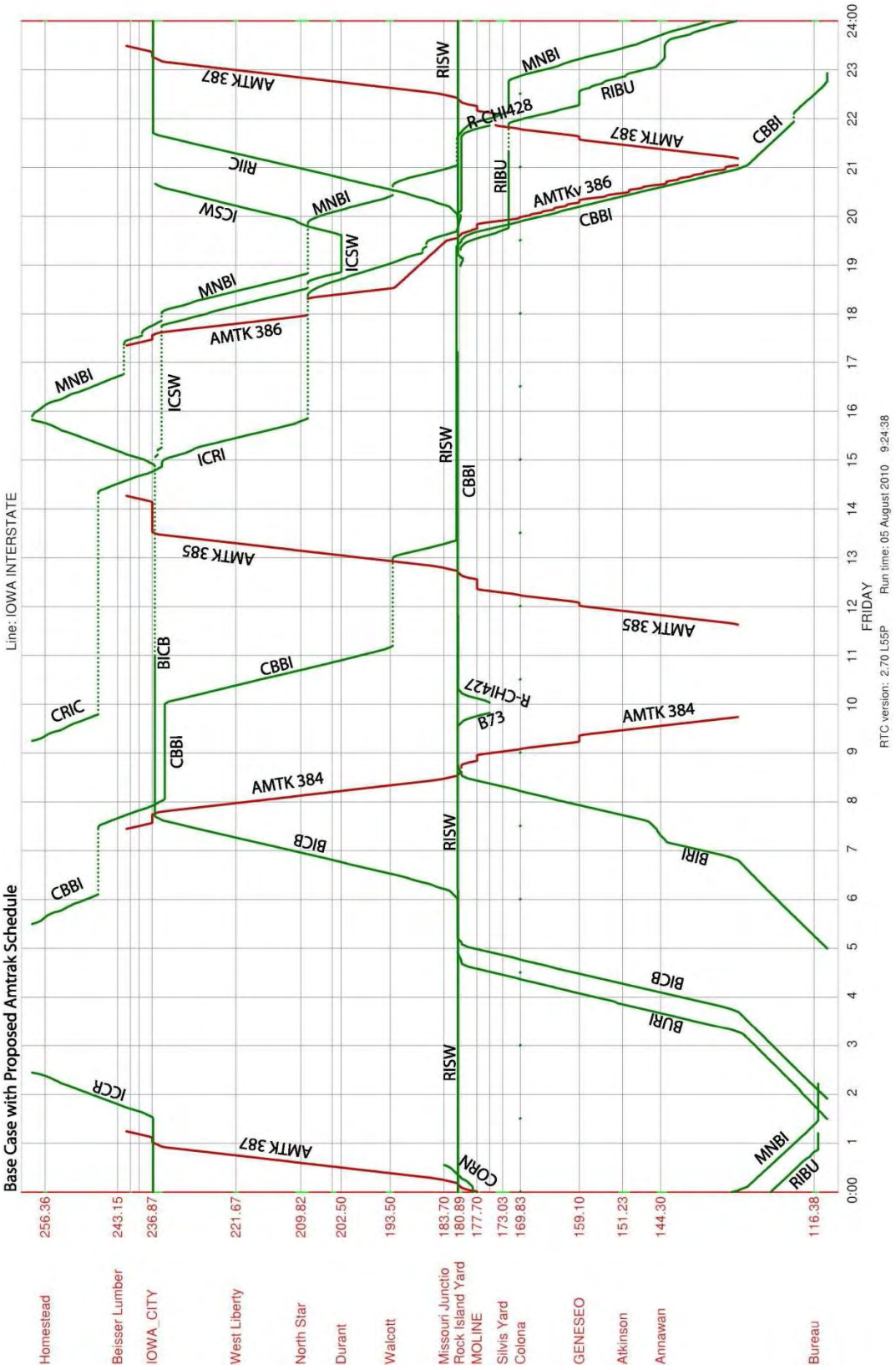
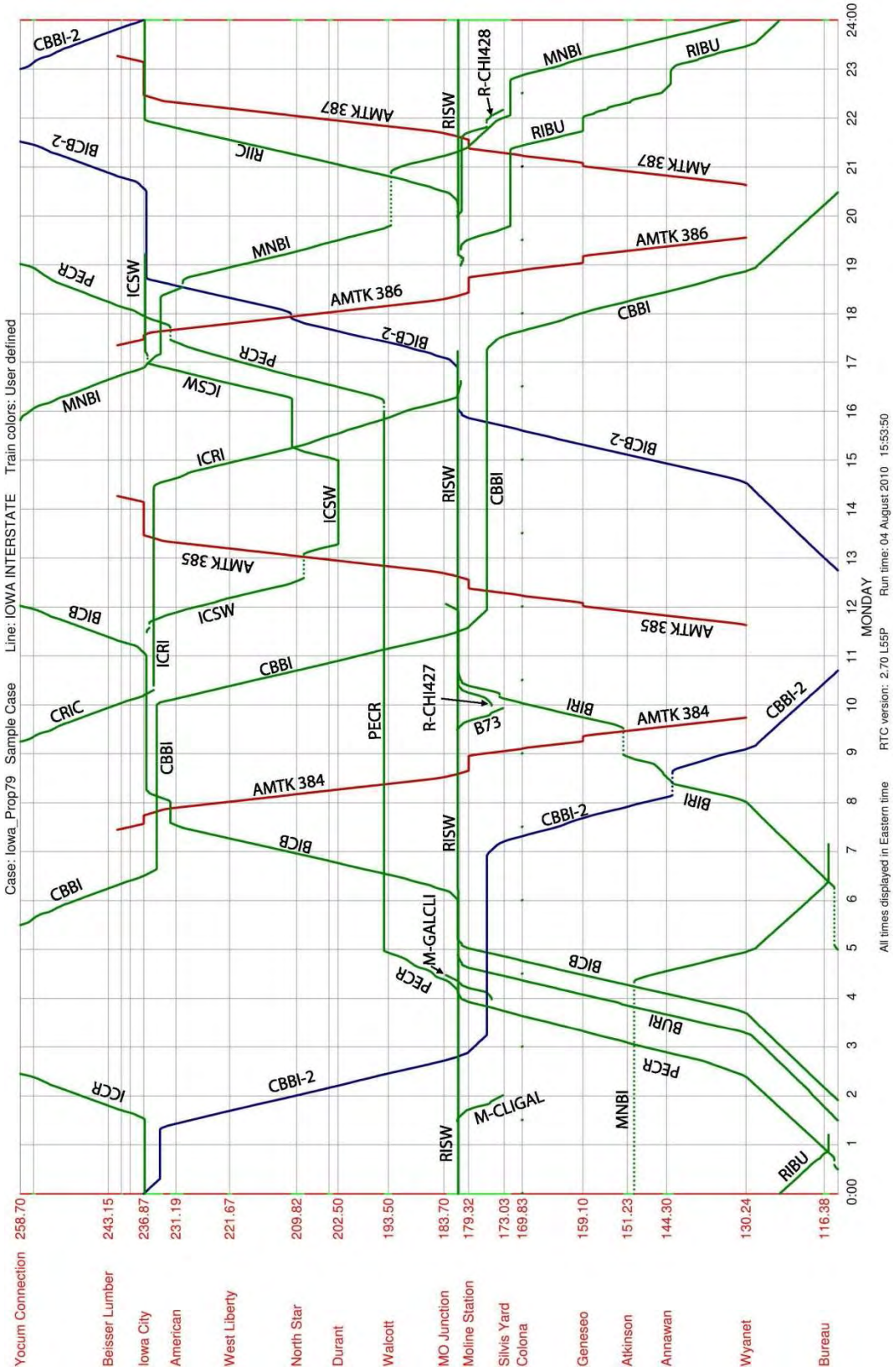


Figure 4-9: IAIS Wyanet-Iowa City RTC Proposed Case, with Passenger Trains, Proposed Infrastructure, and Freight Train Growth



4.4.1 Delay Ratios:

One of the more useful outputs produced by the RTC software is the delay ratio. This output enables a quantitative comparison between the various scenarios. The Base Case establishes what level of delay (to the freight trains currently operating) might be considered "normal," which is then used to validate the track and signal improvements to be implemented in order to reach these same delay ratio numbers once the passenger trains have been added to the schedule (Table 4.4-2).

Table 4.4-2: Base Case Delay Ratios

		Base Original Speeds	
See Figure 4-6	Train Count	Delay Percentage	Delay Min. Per 100 Train Miles
IAIS Freight	88	10.08	29.033

Delay ratios shown in Table 4.4-2 were derived to allow a comparison in terms of overall delay likely to be incurred on a daily basis by either the freight trains or passenger trains based on the three scenarios tested. The delay ratios in Table 4.4-2 represent the delays incurred under the current IAIS operating plan, with the current level of traffic (in 2010).

Table 4.4-3 lists these ratios based on the operation of all trains modeled between Wyanet and Iowa City. Included in this total are the BNSF trains that cross the IAIS on BNSF's Barstow Subdivision at Colona. These are shown as "expedited" trains in the table below. The results shown in Table 4.4-3 were based on five days of RTC Modeling of aggregate operations, Monday through Friday with a one day "warm-up" and one day "cool-down" period. Scenario #1 simply places the proposed Amtrak schedule onto the IAIS railroad without any improvements and with no changes to IAIS freight train operations. Scenario #2 uses an improved operating schedule with the main line upgrade to 79 mph with an attempt to have IAIS freight operations accommodate the anticipated passenger train schedule but with no infrastructure improvements added. Scenario #3 was modeled using an improved main track with critical sidings upgraded and additional trackage installed (such as between Silvis and Rock Island and at Iowa City) to enable the IAIS freight trains to conduct their switching assignments while simultaneously operating the Program's proposed passenger service.

Table 4.4-3: Delay Ratios

Scenarios:		Scenario #1 Base79 Original PSGR (Amtrak) Schedule (see Figure 4-7)		Scenario #2 Base79 New PSGR Schedule (see Figure 4-8)		Scenario #3 Prop79 New PSGR Schedule with Improvements + Freight Growth (see Figure 4-9)	
Train Type	**Train Count**	**Delay %**	**Delay Min. Per 100 Train Miles**	**Delay %**	**Delay Min. Per 100 Train Miles**	**Delay %**	**Delay Min. Per 100 Train Miles**
Passenger	20	302.21	369.693	54.79	60.854	0	0
Expedited	81	2.66	7.572	1.76	5.013	0	0
Freight	88	109.86	346.424	43.58	138.254	7.61	21.104
All	188	135.41	344.987	43.9	110.883	10.765	6.59

The results indicate that the suggested infrastructure improvements make the Program's proposed passenger train operations feasible, for both passenger and freight on the Wyanet to Iowa City corridor. While Scenario #2 is a vast improvement over Scenario #1, both passenger and freight trains continue to incur unacceptable delay. In particular, the minutes of delay for passenger trains per 100 passenger train miles is strikingly high, and represents an unacceptable service outcome. Scenario #3 allows both systems to operate smoothly, enabling the passenger trains to meet the proposed 90% or better on-time-performance criteria, and allowing IAIS, BNSF, and CPR to continue to meet their shipper obligations. Scenario #3 was modeled with two future IAIS freight trains operating to illustrate likely growth in IAIS's traffic, based on information provided by IAIS.

4.5 Infrastructure Needs

Improvements to the physical plant along the BNSF-IAIS route between Chicago and Iowa City (including the proposed layover facility east of Iowa City, at Coralville) are concentrated on the following projects with the exception of the Eola Main Track Capacity Improvement Project and the BNSF-IAIS Wyanet Connection Project. The BNSF segment already supports a total of eight passenger trains daily at a maximum speed of 79 mph. Accordingly, most of the work described herein is focused on upgrading the IAIS segment between Wyanet and Iowa City, which is currently FRA Class 3 track (with a maximum passenger train speed of 60 mph), to accommodate 79 mph operation (FRA Class 4 track), and to create capacity in the IAIS portion for the new proposed passenger trains operating on the proposed schedule with high reliability and on-time performance. Currently there is no regular scheduled passenger service on the IAIS. However, this corridor formerly handled the Rock Island Rocket and other very fast passenger trains. These trains operated on this double-track corridor up until 1978. Given that much of the double-track has been removed, the remaining railroad may or may not support the high speed spirals necessary for the proposed 79 mph maximum track speed. During the track improvement phase when the track is surfaced and raised, the alignment will be surveyed to ensure that the appropriate spirals are in place.

Proposed track improvements to this segment will be constructed on wood ties. Rail improvements are detailed in the Conceptual Engineering section of the Grant Application but will ultimately result in a railroad composed of Continuous Welded Rail (CWR) throughout the IAIS main track plus key sidings as described below. The existing ballast on the segment from Wyanet to Iowa City is washed and screened, crushed rock main line ballast. The proposed track improvement projects will be constructed utilizing washed and screened main line ballast.

Existing turnouts on the segment from Chicago to Wyanet (primarily on BNSF) are #24, #20, and #15 power-operated for main line crossovers and main line-to-sidings, with #11 hand-throw for yard and industry tracks. Existing turnouts on the segment from Wyanet to Iowa City (primarily on IAIS) are #10 and #11 hand-throw. Proposed turnouts for the segment from Wyanet to Iowa City are #20, #15, and #11 power-operated for main-line crossover and main-line-to-sidings and other speed-critical areas, and #11 hand-throw for yard and industry tracks. Turnouts on controlled passing sidings from Wyanet to Iowa City will be upgraded from the existing #10 and #11 hand-throw turnouts to #15 power-operated turnouts. Passenger trains will operate at 30 mph and IAIS freight trains will be able operate at 25 mph over the diverging side of the #15 turnouts.

Proposed project upgrades to support 79 mph passenger service between Wyanet and Iowa City include installation of CTC including power-operated, remote-control switches at sidings and junctions with frequent meet-pass events or where trains need to enter and exit the main track quickly in order to maintain main-track capacity and flexibility.

Due to the proposed significant increase in passenger train speed (compared to the existing freight train speeds) on the IAIS and the anticipated large variance in speed between passenger and freight, all public at-grade crossings with active warning devices will receive constant-time warning devices and bells, flashers, and two-arm gates. Selected high-risk private crossings will also be upgraded. Recommendations for improvements to structures to allow higher passenger train speeds were provided by the IAIS based on recent bridge and culvert inspections.

In addition to track, grade crossing, and structures rehabilitation projects to improve general maximum speed limits to 79 mph, several projects were identified through RTC modeling and interviews of IAIS officials, to create necessary capacity and operational reliability of passenger trains. Generally, track and signal improvements validated by the RTC model focus on those locations where IAIS trains occupy the same trackage during the same time of day that Amtrak is proposed to operate. RTC Figure 4-6 to Figure 4-9 indicate where these conflict locations occur. These additional projects are listed below:

- Colona Junction Improvements – the existing junction between BNSF and IAIS at Colona will be reconfigured with #20 power-operated turnouts and less severe curvature to increase passenger speed from 10 mph to 40 mph
- East Moline to Rock Island 2nd Main Track – a second main track with crossovers at selected locations will be established between the point where IAIS, BNSF, and CPR tracks converge at East Moline, to the west end of Rock Island Yard, enabling passenger trains to have a clear path through Moline without interference from freight trains and switch engines, to reduce delays to freight trains and switch engines in this

congested area, and to increase passenger train speeds from 10 mph on the existing main track to 79 mph east of Moline station and 30 mph west of Moline station.

- Walcott Siding Extension – the existing Walcott siding will be extended by 1,800 feet, and the existing #10 hand-throw turnouts replaced with #15 power-operated turnouts to allow freight operations to better clear the main track for passenger trains, and to hold out of congestion at the Quad Cities area.
- American Siding Construction – a new siding will be constructed east of Iowa City with #15 power-operated turnouts to allow freight operations to better clear the main track for passenger trains, and to hold out of congestion at the Iowa City area.
- Iowa City Runner Track – a runner will be constructed from the Iowa City Station to the east side of Iowa City utilizing a combination of new track construction and rehabilitation of the existing south siding and existing industrial lead trackage, to enable better flow of passenger and freight operations within the Iowa City vicinity, and to better enable passenger trains to make moves to and from the layover facility without interfering with freight trains.
- Existing Siding Turnout Replacement and Siding Track Improvements – existing #10 and #11 hand-throw turnouts at the Atkinson, Silvis, and North Star sidings, as well as at Walcott, will be replaced with #15 power-operated turnouts. The existing #11 hand-throw turnouts at the Annawan siding will be powered. Sidings will be surfaced and lined, and existing jointed rail cropped and welded, to enable 30 mph siding speeds at Atkinson, Silvis, Walcott, North Star, and American. This will enable freight operations to better clear the main track for passenger trains, to better hold alignment under heavy freight loading, and to improve passenger-train recovery in the event of late-running passenger trains and freight-train schedule irregularity.

Table 4.5-1: Reference Table of Infrastructure Improvements to IAIS Freight Train Operational Patterns and Conflicts with Proposed Passenger Schedule

Location	West MP	East MP	Length (feet)	Speed into Siding (MPH)	Controlled?	Comments
Annawan	144.97	143.29	8,870	10	Yes	Retains #11 turnouts
Atkinson	151.88	150.05	9,662	30	Yes	
Silvis to Rock Island	174.14	171.88	11,993	30	Yes	Single Main Track between Silvis and Rock Island is occupied virtually 20 to 24 hours day by the following trains including a 24/7 switch engine. IAIS: RISW; BIRI; CBBI; RIBU; RIIC BNSF: B73; R-CHI427; R-CHI428 Retains Hand throw Crossover at MP 172.6

Location	West MP	East MP	Length (feet)	Speed into Siding (MPH)	Controlled?	Comments
Walcott	194.30	192.72	8,342	30	Yes	Extend siding to the east by approximately 2000 feet. This siding is often used to stage a loaded coal train (PECR) awaiting shipper disposition.
Twin States	204.5	203.5	4,980	10	No	
Wilton/North Star	210.9	208.5	13,464	30	Yes	Extend pocket track to the east to MP 208.00
West Liberty	222.20	221.30	4,200	10	No	
American	232.23	230.05	11,510	30	Yes	This requirement for this siding is indicated by the congestion that occurs at Iowa City yard in order to give IAIS a location of stage a train should the yard at Iowa City be "over-subscribed" when Amtrak's train arrive.
Iowa City	236.4	233.64	17,424	20	Yes	According to IAIS and verified by RTC model runs, at least five and sometimes six trains meet and/or pass at the yard located just east of the Iowa City station. IAIS: CBBI; BICB; CRIC; ICRI; ICSW; PECR, plus CIC interchange trains.

4.6 Communications and Signaling

To obtain 79 mph operation on IAIS for passenger trains, a block system of operation is required. While in some cases manual block operation has enabled such speeds, in general practice only automatic block systems are employed. The industry-standard system consists of a Centralized Traffic Control (CTC) overlay on an Absolute-Permissive Block (APB) system. The APB system provides the detection and automatic separation of trains, and protects turnouts. The CTC overlay enables a train dispatcher to choose priority of trains and route selection, and issue requests to the APB-CTC system that it translates as signal instructions to trains, and grants if conditions are safe.

Additionally, a PTC overlay has been specified for the IAIS route portion that is compatible with PTC expected to be installed on the BNSF route portion.

A preliminary train-control system and wayside signal design was developed with input from IAIS based on the operational requirements of the existing freight service and proposed passenger service. This preliminary design incorporates appropriate braking curves for the

maximum authorized train speeds, train tonnage, and vertical profile of the IAIS, and includes locations of absolute and intermediate signals, ancillary signal and communication equipment, insulated joints, cabling, and other features. Signal spacing for future 90-mph and 110-mph maximum speeds was considered in this conceptual design.

4.7 Eola Main Track Capacity Improvement Project

The Eola project creates capacity for the Program's eastbound and westbound passenger trains to meet and pass on BNSF's double-track Mendota Subdivision between Montgomery and Wyanet. Absent the construction of the Eola project, a persistent train delay of between 5 and 15 minutes, of one or both of the two morning Chicago-Iowa City trains, would occur almost every day. The project also creates capacity for schedule recovery for the Chicago-Iowa City trains, should one or both trains run behind schedule.

Chicago-Iowa City trains are placed into the situation where the Eola project is required in order for the trains to use schedule slots at Chicago Union Station. The Chicago-Iowa City trains fit into limited time slots that are dictated by the platform and track capacity consumed by the 271 Metra and 50 Amtrak trains that also use Chicago Union Station. In addition, the Chicago-Iowa City trains also must operate at convenient hours for passengers departing both Chicago and Iowa City in order to serve passenger needs. These restrictions on when the Chicago-Iowa City trains can arrive at, or depart from, Chicago Union Station create a regular meet-and-pass event each day, consisting of morning westbound train #385 and the morning eastbound train #384, meeting at or near Earlville, Illinois, at about 10:30 am. Were there no other trains on the Mendota Subdivision at this time, trains #384 and #385 would pass by each other, each moving at 79 mph, and each unaffected by the other on the double-track. However, BNSF at most times has an eastward unit coal train staged stationary on the double track between the crossovers at Earlville and Somonauk. BNSF stages coal trains at this location when connecting railroads at Chicago are unable to accept coal trains as they arrive from Wyoming's Powder River Basin, and staging room at Eola Yard in Chicago is consumed by other trains awaiting acceptance by connecting railroads in Chicago. At this time, BNSF's train schedule and Amtrak schedules for the four long-distance trains and four Quincy trains that use the Mendota Subdivision make the slot between Earlville and Somonauk the only logical place for staging in order to not have the staged coal train interfere with other freight, passenger, or freight-passenger meet-pass events on the Mendota Subdivision, and remain clear of public and private roadway crossings. When a coal train is staged between Earlville and Somonauk, the double-track Mendota Subdivision is in effect reduced to one track for the 10.4-mile distance between these crossover locations. When two trains seek to enter this section at or nearly at the same time, when a coal train is occupying one of the tracks, one of the trains must wait at either Earlville or Somonauk for the other train to exit the section. Including braking, acceleration, and signal spacing requirements, a 5 to 15 minute delay is created for one of the two trains.

The Eola project creates a new staging location at Eola Yard for eastward trains. Eola Yard is a BNSF yard immediately west of the BNSF connection to Canadian National's former Elgin, Joliet & Eastern belt line around the perimeter of Chicago. Many of BNSF's eastward coal trains move through Chicago on the CN-EJ&E. The Eola project is the best possible location for staging coal trains because it places the coal train immediately at hand when a connecting

railroad can accept it. Eola is a crew-change location and locomotive terminal with management, mechanical support, and transportation support personnel that is staffed around the clock. Staging coal trains east of Eola places them onto the triple-track Metra commuter territory where all tracks are needed to attain schedule-keeping and provide movement capacity for the 120 Metra, 12 Amtrak and 50 BNSF freight trains that use BNSF's Chicago Subdivision.

BNSF's RTC modeling of the Chicago-Iowa City trains identified the train-delay problem that would occur without the project, and validates the capability of the Eola project. BNSF's RTC model outputs are shown in Figure 4-1, Figure 4-2, and Figure 4-3, and in Appendix A:

- Figure 4-1 illustrates the Base Case – the present-day train operating situation, showing Metra trains in green, Amtrak trains in white, loaded or empty unit coal trains in blue, manifest freight trains in red, and local trains in brown. Coal trains that stage on the Mendota Subdivision are shown in yellow after the staging event commences.
- Figure 4-2 illustrates the addition of the Chicago-Iowa City trains. Note the delay that occurs to Chicago-Iowa City trains #384 and #385 at Somonauk at 10:40 am, with a coal train staged between Somonauk and Earlville on a main track that one of the Chicago-Iowa City trains would otherwise use to proceed unimpeded.
- Figure 4-3 illustrates the relocation of the coal train that is staged between Somonauk and Earlville to Eola (note the change in placement of the yellow line from Figure 4-2 indicating a staged coal train identified as OBTMCXK9317-13, from Somonauk to Eola).

BNSF's modeling identified that the project would eliminate 3.51 hours per week of delay to Amtrak trains, or a total of 15.04 minutes of delay for each of the two affected trains per day, that would otherwise occur every day.

The States have discussed the potential for a cost allocation strategy. Definitional agreements would occur once NEPA Tier 2 studies, final engineering, final RTC modeling and operational planning, and final agreements between BNSF, Amtrak, and other stakeholders are completed and costs understood. At that time, freight-train benefits could be calculated and a cost apportionment formula could be derived.

The Eola Main Track Capacity Project in general terms consists of a new main track at Eola between the East and West Eola Yard interlockings. This track, of sufficient length to contain a coal train, would be constructed and signaled as main track to enable BNSF to flexibly stage a coal train on this new track or any of three other main tracks between East and West Eola, retaining the existing flexibility and capacity for the 80-plus Metra trains that operate each day between Metra's Aurora Transportation Center just west of Eola, freight trains, and Amtrak long-distance and Quincy trains.

In detail, the project includes power-operated #24 crossovers capable of 50 mph diverging-route speeds, associated revisions to yard lead and ladder tracks, and revisions and additions to the wayside signaling system, to attain the same flexibility and capacity that the main tracks at Eola have at present. No roadway grade-crossings are affected by the project. BNSF has prepared three alternative designs for the project that would be analyzed during the Tier 2 NEPA process, and a final alternative would be selected at that time.

4.8 Passenger Stations

Field reconnaissance was performed for the three proposed Amtrak stations located at Geneseo, Moline, and Iowa City. Based on the site review proposed improvements were identified for each of the station locations. A detailed explanation of the proposed work at each location is included in the section on Stations.

4.9 Iowa City Layover Facility

A layover facility for Amtrak trains is required at the end of the service in Iowa City for light maintenance, cleaning, and layover requirements

- Typical layover facility requirements were provided by Amtrak
- A concept level cost for a typical layover facility has been developed including the following elements:
  - Track (with access pad) to accommodate the standard trainset of one locomotive and five cars, plus headroom for peak-service trains of two locomotives and eight cars
  - The track is double-ended to enable switching and set-out of equipment.
  - Small building (less than 2000 square feet) for crews to go on/off duty
  - Employee parking and access to public road network
  - Track access pad
  - Potable water and general utility services
  - 480V electrical service for standby power
  - Perimeter security fencing
  - Site lighting

The facility is proposed to be located at Coralville, at a location that offers future potential as a passenger station with thruway bus connections to Cedar Rapids and Des Moines.

Track speeds through Colona were also improved from 10 mph to 40 mph (30 mph for freights) by re-arranging the turnouts connecting the IAIS with BNSF's Barstow Subdivision. These improvements help all trains moving through Colona including those BNSF freights that might otherwise need to wait at the interlocking for the IAIS freights to move through at 10 mph if the improvements are not implemented.

4.10 Passenger Train Schedule Development

4.10.1 Background

The proposed Chicago to Iowa City passenger rail service was encouraged by the success of the Illinois- sponsored Chicago to Quincy trains and by the continued population growth of the Quad Cities. Amtrak was conducted a feasibility study for Chicago-Quad Cities service, which was released in December, 2007. While this study was underway, the State of Iowa requested that Amtrak extend the study area west to include Iowa City. This report was submitted as an addendum to the Quad Cities report in February, 2008. Two routes were analyzed. Alignment A followed the BNSF corridor from Chicago Union Station west to Wyanet where a connection track to allow access to the IAIS would be constructed. From that point west, Alignment A would follow the IAIS to the western terminus at Iowa City. Alignment B followed the original Rock

Island corridor from La Salle Street Station in Chicago to Iowa City. The studies recommended Alignment A, because of its shorter route (by 18.9 miles), less infrastructure required to implement the service, and improved connectivity to other corridor and long-distance trains at Chicago.

4.10.2 Operating Plan

The Program's proposed train consists are based on considerations of ridership, maximum speeds, infrastructure requirements to support the proposed train length and curve-speed capability, technical maturity of equipment designs, and costs. Train consists were iterated to arrive at a proposed consist. The proposed consist is comprised of one 4,250 hp locomotive (3,650 hp available for traction), three coaches, one food service car, and a coach/cab-car on the opposite end of the train. Each trainset (two are required to meet the schedule) would be initially made-up at Amtrak's 14th Street Yard located immediately south of Chicago Union Station, and cycled through one round-trip daily, with the consists remaining unbroken except for programmed heavy maintenance events or unplanned maintenance events that cannot be performed during layover periods.

Each train is 495 feet in length, weighs roughly 522 tons and would accommodate three inches of cant deficiency (or unbalance). The one locomotive per train would likely be a P42-DC type or equivalent, capable of generating 4,250 hp with 3,650 hp available for tractive effort after subtraction for head-end power (HEP) to the passenger cars for heating, cooling, ventilation, and lighting, resulting in a 7.0 horsepower/trailing ton ratio. This train would be spotted by Amtrak's hostlers just prior to the proposed schedule departures each day with train #385 departing at 9:30 am (trainset #1) and train #387 departing at 6:30pm (trainset #2). The intent is that Amtrak would service locomotives and equipment at Chicago, while at Iowa City trains would be serviced by Amtrak, or potentially an Amtrak sub-contractor. Train crews would report for duty approximately one hour prior to departure to allow for the proper review of the necessary paperwork by the train crew. Train Crew #1 would protect Trainset #1, and Train Crew #2 would protect Trainset #2. These train departures (and arrivals) have been suggested by Amtrak to coordinate with its platform and station trackage use at Chicago Union Station, and with BNSF, the host railroad, for the initial 112 mile segment between Halsted Street and Wyanet over which this service will operate (the first 0.9 miles is operated on Amtrak's trackage from Chicago Union Station to Halsted Street).

The overall passenger train schedule was determined using the RTC-generated TPC runs based on one locomotive plus four coaches with a cab/coach on the east end. These graphs are included in Figure 4-4 and Figure 4-5 which show the departure times at each intermediate station. Because the arrival and departure times were not changed at Chicago Union Station, these TPC schedule times were used on an iterative basis to derive the balance of the schedule. In turn, RTC dispatching modeling indicates that the proposed passenger train schedule indicates that the opposing passenger trains meet on BNSF trackage.

Operating at a maximum speed of 70 MPH, the two daily departures stop momentarily at LaGrange Road and at Naperville (each with a two minute dwell) to receive passengers. Just west of Aurora, the service enters the double track Mendota Subdivision increasing its speed to

79 mph, and stopping to receive and discharge passengers each with a three minute dwell at Plano, Mendota, and Princeton, Illinois. Over a connecting track constructed for the proposed service at Wyanet, the two passenger trains would operate over the single track IAIS stopping to receive and discharge passengers at Geneseo (with a three minute dwell) and at Moline (with a five minute dwell) before crossing over the Mississippi River on the Department of the Army-owned Government Bridge into Iowa. Amtrak has recommended that ten minutes be added to the timetable schedule for both eastbound and westbound passenger trains between Geneseo and Princeton to allow for the interchange coordination between the two host railroads at Wyanet. Whether this "lag" time would be added to the schedule will be determined during agreement negotiations with both host railroads. Amtrak has also recommended that fifteen minute of non-scheduled lag time be included in the run-time between Moline and Iowa City should the bridge be in the open position for river traffic movement when the passenger train arrives. The proposed schedule included herein has included the additional 15 minutes of lag that could be incurred at the Mississippi River crossing. After proceeding through the urbanized Davenport area, the train passes through Iowa farmland before entering its terminus station at Iowa City with Train #385 arriving at 1:53 pm and Train #387 at 10:53 pm daily. Recovery time totaling 18 minutes (based on 8 percent of the RTC-derived run-time between Chicago and Iowa City as determined by Train Performance Calculations (TPC) outputs as discussed below) has been added to the Moline to Iowa City run-time (this time is in addition to the 15 minutes bridge open time). Following a five minute station stop, these trains proceed to a layover facility to be constructed approximately four miles beyond the Iowa City station near Coralville. Once the train has been tied up by the train crew a few minutes after arrival (marking off-duty at roughly 2:30 pm and 11:30 pm daily), the train crew would be transported to lodging for their rest. These crews would have been on duty six hours respectively and would be available for service eight hours later (Train Crew #1 would be rested at 10:30 pm and Train Crew #2 would be rested at 7:30 am).

The eastbound service would depart the Coralville layover facility daily with Train #384 departing at approximately 7:26 am and Train #386 at 5:26 pm each day. The early departure would use Trainset #2 (which had arrived in Coralville approximately eight hours earlier at 11:04 pm) and Train Crew #3. The later departure would use Trainset #1 (which had arrived in Coralville approximately three hours earlier at 2:04 pm) and Train Crew #4. Because these crews will be starting their service on the second day at the west end of the proposed operation, it will be necessary to establish Train Crew #3 and #4 to protect the first day's service. Depending on the start-up schedule required to initiate service, it may be necessary to "borrow" a third trainset to protect the proposed schedule out of Chicago.

The return schedule includes 15 minutes of added run-time at the Government Bridge and 18 minutes of recovery time added to the run-time between La Grange Road and Chicago Union Station, with Train #384 arriving at 12 noon and Train #386 at 10:00 pm. Each train would then be hostled (or moved by a train crew member) to Amtrak's train yard for servicing.

The schedule pad of 8 percent is higher than the 7 percent recommended by FRA in its "Railroad Corridor Transportation Plans" revised in July, 2005. Based on the RTC time/distance diagrams, nearly all of the meets and passes with freight trains for the proposed operation occur

at either the Silvis/Moline/Rock Island area or the Iowa City Yard area. Working through the formula provided by FRA suggests that the 8 percent recovery time should accommodate FRA's 7 percent pad plus the additional elements that FRA states should be factored into the pad calculation. This understanding is based on the fact that (1) the opposing passenger trains will meet on the BNSF double track east of Wyanet, (2) IAIS and BNSF freight trains will be working on segments of double track (to be constructed) at the Quad Cities and Iowa City, that (3) the passing sidings are located roughly 11 miles apart, (4) that the maximum operating speed will be 79 mph (or 1.3 miles per minute).

In addition to the 8 percent recovery time (which amounts to 18 minutes of additional time added to the 79 mph between Chicago to Iowa City), Amtrak has suggested that an additional 15 minutes be added to the run-time between Moline and Iowa City for a potential bridge lift for river traffic on the Mississippi. According to the Department of the Army, operator of the bridge, approximately 15 vessels navigate up and down the river each day when the river is open for navigation. The river is frozen over from mid-December to mid-February, for a total of 3,000-4,000 vessels annually. Each bridge lift averages 13 minutes in duration from a typical minimum of 8 minutes to a typical maximum of 30 minutes of bridge-open time. If the 15 minutes is added to the 18 minutes of calculated recovery time, a total of 14.6 percent of additional time has been added to the RTC-generated run-times.

4.11 Passenger Train Schedules Discussion

Amtrak developed conceptual passenger-train schedules in its December 5, 2007, feasibility study for implementation of passenger-train service between Chicago and the Quad Cities. Amtrak modified these schedules in its January 7, 2008, addendum to the Quad Cities study that considered extension of the Chicago-Quad Cities service to Iowa City. The Amtrak schedule that best fits the route selection in the Tier 1 NEPA study of the service, and the proposed infrastructure improvements, is "Scenario A6 – 79 mph via BNSF-IAIS." This schedule has an overall longer running time, and thus slower average speed, than the schedule represented by the RTC simulations performed for this Grant Application. This schedule is reproduced below in Table 4.11-1:

Table 4.11-1: Amtrak 2008 Initial 4-Hour, 58-Minute Schedule

Route: BNSF - IAIS
Origin/Destination: Chicago/Iowa City

A6 - 79mph via BNSF-IAIS
Chicago…Plano…Mendota...Princeton…Geneseo…Moline...Iowa City

385 Daily	387 Daily					384 Daily	386 Daily
9:30 AM	6:30 PM	Dp	Chicago, IL CT	Ar	↑	12:00 PM	10:00 PM
R 9:47 AM	R 6:47 PM	Dp	La Grange Road, IL	Dp	↑	D 11:32 AM	D 9:32 PM
R 10:04 AM	R 7:04 PM	Dp	Naperville, IL	Dp	↑	D 11:17 AM	D 9:17 PM
10:29 AM	7:29 PM	Dp	Plano, IL	Dp	↑	10:53 AM	8:53 PM
10:57 AM	7:57 PM	Dp	Mendota, IL	Dp	↑	10:25 AM	8:25 PM
11:19 AM	8:19 PM	Dp	Princeton, IL	Dp	↑	10:05 AM	8:05 PM
12:14 PM	9:14 PM	Dp	Geneseo, IL	Dp	↑	9:12 AM	7:12 PM
12:52 PM	9:52 PM	Dp	Moline, IL	Dp	↑	8:40 AM	6:40 PM
2:28 PM	11:28 PM	Ar	Iowa City, IA	Dp	↑	7:02 AM	5:02 PM

R – LaGrange Road and Naperville Westbound – Stops only to receive passengers
D – Naperville and LaGrange Road Eastbound – Stops only to discharge passengers

Source: Amtrak Chicago to Iowa City Feasibility Study, February 25, 2008

Amtrak has used Scenario A6 to generate ridership, revenue, and operating and maintenance cost estimates **which, together with capital cost estimates prepared by the States, form the basis of the financial projections of this Grant Application**, as well as the benefit-cost analysis.

Subsequent to Amtrak's feasibility studies, the States performed detailed field investigations, discussions and coordination with Amtrak and the host railroads (BNSF and IAIS), and, as noted above, RTC modeling to validate the shorter running times. In addition, the regulatory and economic environment evolved with the institution of the Railroad Safety Improvement Act (RSIA) of 2008 (which required installation of Positive Train Control by December 31, 2015 on most routes carrying intercity passenger trains), and the appearance of new freight shippers on BNSF and IAIS such as ethanol plants. The funding and regulatory environment also evolved with the institution of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) and the American Recovery and Reinvestment Act (ARRA) of 2009. These acts established new guidelines and requirements for federal funding of new-start passenger service that

emphasized, among other features, a desire for higher speeds and improved on-time performance accountability.

The States' investigation, coordination, and RTC modeling, review of the new requirements and guidelines of the RSIA, PRIIA, ARRA, and compliance with FRA guidelines for grant funding for the Program, identified requirements for freight-train capacity and for safety improvements, and for practical methods to improve passenger-train speed, on-time performance, and reliability. Accordingly, the States' performed combined rail operations, engineering, and environmental analysis studies that identified cost-effective methods to deliver faster passenger train speeds and reduced trip times, while simultaneously addressing the changed requirements for freight-train capacity, safety, passenger train on-time performance, and other requirements of the Acts. Several potential infrastructure scenarios were modeled using the RTC tool, generating TPC outputs and RTC stringlines (these are graphs that plot the geographic location versus time for freight and passenger trains) that were assessed for cost-effectiveness against the infrastructure that would be required under each scenario. The RTC tool identified a cost-effective passenger-train performance that provided the higher speeds encouraged by PRIIA and by FRA grant funding guidelines. In turn, this TPC output was used to develop a proposed new schedule that promises significantly better running times than Amtrak Scenario A6. This schedule is show below as Table 4.11-2 as the "Proposed Improved Schedule."

Table 4.11-2: 79 MPH Chicago-Iowa City via BNSF and IAIS – Proposed Improved Schedule

Read Down						Read Up	
#385	#387					#384	#386
Trainset #1	Trainset #2		Equipment	Dwell		Trainset #2	Trainset #1
CrewStart #1	CrewStart #2		Crew				
9:00 am	6:00 pm	Ar	Chicago, IL (to & From 14th Street Yard)	30.0	Dp	12:30 pm	10:30 pm
9:30 am	6:30 pm	Dp			Ar	12 noon	10:00 pm
NA	NA	8%	Recovery Time EB	18.0		+18 minutes	+18 minutes
9:45 am	6:45 pm	Ar	La Grange Road, IL	2.0	Dp	D 11:25 am	D 9:25 pm
R 9:47 am	R 6:47 pm	Dp			Ar	11:23 am	9:23 pm
10:02 am	7:02 pm	Ar	Naperville, IL	2.0	Dp	D 11:08 am	D 9:08 pm
R 10:04 am	R 7:04 pm	Dp			Ar	11:06 pm	9:06 pm
10:26 am	7:26 pm	Ar	Plano, IL	3.0	Dp	10:45 am	8:45 pm
10:29 am	7:29 pm	Dp			Ar	10:42 am	8:42 pm
10:55 am	7:55 pm	Ar	Mendota, IL	3.0	Dp	10:16 am	8:16 pm
10:58 am	7:58 pm	Dp			Ar	10:13 am	8:13 pm
11:16 am	8:16 pm	Ar	Princeton, IL	3.0	Dp	9:55 am	7:55 pm
11:19 am	8:19 pm	Dp			Ar	9:52 am	7:52 pm
11:25 am	8:25 pm	By	Wyanet		By	9:43 am	7:43 pm
11:51 am	8:51 pm	Ar	Geneseo, IL	3.0	Dp	9:21 am	7:21 pm
11:54 am	8:54 pm	Dp			Ar	9:18 am	7:18 pm
12:14 pm	9:14 pm	Ar	Moline, IL	5.0	Dp	8:57 am	6:57 pm

Read Down						Read Up	
#385	#387					#384	#386
Trainset #1	Trainset #2		Equipment	Dwell		Trainset #2	Trainset #1
CrewStart #1	CrewStart #2		Crew				
12:19 pm	9:19 pm	Dp			Ar	8:52 am	6:52 pm
12:24 pm	9:24 pm	Ar	Arsenal Bridge (No Stop)	15.0	Dp	8:47 am	6:47 pm
12:39 pm	9:39 pm	Dp			Ar	8:32 am	6:32 pm
+18 minutes	+18 minutes	8%	Recovery Time WB	18.0		NA	NA
1:50 pm	10:50 pm	Ar	Iowa City	5.0	Dp	7:44 am	5:44 pm
1:55 pm	10:55 pm	Dp			Ar	7:39 am	5:39 pm
2:04 pm	11:04 pm	Ar	Coralville To & From Layover Facility	5.0	Dp	7:26 am	5:26 pm
Trainset #1	Trainset #2		Equipment			Trainset #2	Trainset #1
			Crew			CrewStart #3	CrewStart #4

Notes:

- Non-Revenue moves between layover facility in Chicago and Coralville. Home terminal for Crew Starts to be determined.
- A run-time of 34 minutes was assumed between Chicago Union Station and Naperville which was then added to the RTC-generated overall run-time for a WB time of 3h 47min (see below). EB time calculated in a similar fashion.
- Overall run-time WB = 3 hr 47 min = 3.78 hours x 8 percent = 18 minutes of recovery time = 4h 05 m overall. Overall run-time EB = 3 hr 43 min = 3.72 hours x 8 percent = 18.0 minutes = 4h 01m overall
- 15 minutes added to the run-time between Iowa City and Moline to accommodate bridge lifts at the Arsenal Bridge over the Mississippi River.

The proposed new schedule has been submitted to Amtrak, BNSF, and IAIS for review and judgment of its feasibility as a basis for future on-time performance guarantees and final agreements. In the interim, ridership, revenue, and operating and maintenance cost estimates developed by Amtrak for its Scenario A6 have been retained as the basis of financial projections of this Grant Application. It is the expectation of the States that adoption of the Proposed Improved Schedule will result in an increase in ridership, an increase in revenue, and an increase in operating and maintenance costs; however, the States expect that ridership and revenue increases will exceed the increase in operating and maintenance costs. Therefore, this Grant Application is likely to understate the cost-effectiveness and benefit-cost ratio of the Program.

It is important to note that while the proposed infrastructure that underlies the RTC model that varies from the infrastructure proposed in Amtrak's 2007 and 2008 feasibility studies has the capability to deliver faster passenger-train speeds, it is infrastructure that is also necessary to meet the freight capacity, safety, and passenger-train reliability requirements that have appeared since the Amtrak feasibility studies were conducted. In other words, regardless of whether the passenger schedule that is ultimately adopted is Amtrak's Scenario A6 or the Proposed Improved Schedule, the additional infrastructure that underlies the RTC model, which was not described in Amtrak's feasibility studies, is still required. The faster running times that

were estimated by the RTC model, and captured in the Proposed Improved Schedule, are in effect a bonus.

The Proposed Improved Schedule maintains consistency with Amtrak slot times at Chicago Union Station and to commuter-territory slot times between Chicago and Naperville that are embedded into Amtrak Scenario A6 Schedule. These slot times are difficult to revise or move to different times of the day without creating extensive impacts onto Amtrak and Metra train schedules, crew and equipment scheduling and utilization, and track maintenance windows. Accordingly, the Proposed Improved Schedule is hinged at Naperville, with all improvements in running times and speeds, and all changes in recovery time, restrained entirely to the route between Naperville and Iowa City.

Subsequent to this Grant Application, the intent of the States is to further refine schedules in cooperation with BNSF, IAIS, and Amtrak. The goal of the States is to develop schedules that deliver the best trip times possible, while also attaining the on-time performance and cost-effectiveness required by PRIIA and FRA guidance, and being practical to deliver. Final schedules will be used to develop updated ridership and revenue predictions, final operating and maintenance costs, and to develop a final pro forma and financial plan. In turn these documents will form the basis of final agreements between the States, Amtrak, and BNSF and IAIS.

4.12 Future Increased Passenger Train Frequency and Higher Operating Velocities

BNSF-predecessor railroads began in the West Chicago area in 1848 and the competing Rock Island corridor was chartered in 1851 with construction beginning in 1854, with the railroad constructing the first bridge over the Mississippi River in 1856. Because these railroads were constructed relatively early in terms of overall regional settlement, both alignments were not heavily influenced by existing settlement patterns. Accordingly, both could be located with fairly long sections of tangent (straight) track connected by a series of gentle one to two degree curves. This enabled very fast running times for passenger trains as track quality was improved. On the Rock Island, for instance, running times in 1948 between Chicago La Salle Street Station (near Chicago Union Station) and Iowa City were as fast as 3 hours and 55 minutes westbound and 4 hours 15 minutes eastbound. These very fast run-times were accomplished using the longer all-Rock Island route (18.9 miles longer than the BNSF-IAIS route) that passes through Joliet and LaSalle, Illinois. These historic run-times are slightly better than the 79 mph RTC-generated schedule used in this analysis even though the routing used the BNSF to Wyanet thence west on the IAIS (former Rock Island). These run-times could only be generated by a 90 to 110 mph maximum operating speed on tangent track. What these historic run-times indicate is that both the BNSF and the IAIS alignments are highly suited to operate higher speed trains. Using a 4.5 inch super-elevation and 3 inch unbalance, passenger trains operating on the BNSF-IAIS alignment would need to slow below either 90 or 110 mph based on the following speed table (Table 4.12-1):

Table 4.12-1: Maximum Passenger-Train Velocity Obtainable on Curves of Varying Degree

Degrees	0.5	0.85	1.0	1.25	1.5	2.0	2.5	3.0	3.5	4.0
Velocity (mph)	144	110	103	90	84	73	65	59	54	51

In others words, if 90 mph is the maximum velocity desired, any curve exceeding 1.25 degrees will either need to be reduced (or softened) or the speed must be reduced. If 110 mph is desired, then any curve over 0.85 must be reduced or the speed reduced. Increasing the operating velocity around curves can be improved by operating tilt-body equipment. Indeed modern equipment is capable of achieving twice the unbalance as older conventional equipment. For instance, if 6 inch unbalance-capable equipment was used, then all curves 1.55 degrees or less could be safely negotiated at 90 mph and curve 1.05 degrees or less for trains operating at 110 mph, again with 6-inch unbalance.

4.12.1 90 mph

BNSF has indicated it would consider 90 mph operation on its portion of the corridor west of Montgomery, where allowed by current maximum track speeds with respect to curves, terminal trackage, and local conditions. Historically, 90 to 110 mph operation was practiced on the former Rock Island. Both railroads have long stretches of tangent track connected by gentle curves. Indeed, once a passenger train entered the IAIS corridor at Wyanet, there are no curve-caused speed restrictions for 90 mph until the interlocking at Colona is reached and only one short curve that may be "reducible" for 110 mph operation using 3-inch unbalance equipment. The following Table 4.12-2 indicates where existing curves would limit the train's ability to reach 90 mph between Aurora and Iowa City.

Table 4.12-2: Curves that Affect a 90 mph Maximum Operating Speed

Location	East MP	West MP	Curvature	Speed (mph)	Comments
BNSF					
Mendota	82.18	82.83	2°-00'	75	Station Stop, should not affect run-time
Mendota	82.88	83.00	3°-15'	55	Station Stop, should not affect run-time
Mendota	83.05	83.20	4°-45'	45	Station Stop, should not affect run-time
Princeton	104.10	104.33	2°-20'	65	Station Stop, should not affect run-time
Princeton	104.40	104.68	2°-10'	65	Station Stop, should not affect run-time
Wyanet	112.0	112.10	No. 24 TO	50	Connection to IAIS
IAIS					
Colona	169.90	170.20	Colona	40	Interlocking
Silvis	172.60	172.98	2°-00'	75	
Moline	178.20	178.58	2°-00'	75	Station Stop, should not affect run-time
Moline	179.40	179.58	2°-00'	75	Station Stop, should not affect run-time
Rock Island	180.65	180.72	2°-00'	75	Permanent Slow Order at Bridge will dictate speed
Rock Island	180.79	180.87	2°-00'	75	Permanent Slow Order at Bridge will dictate speed
Arsenal Br.	181.18	181.56	4°-45'	40	Permanent Slow Order at Bridge will dictate speed
Arsenal Br.	182.27	182.30	3°-58'	40	Permanent Slow Order at Bridge will dictate speed
Arsenal Br.	182.35	182.41	7°-15'	40	Permanent Slow Order at Bridge will dictate speed
Arsenal Br.	182.66	182.74	6°-12'	40	Permanent Slow Order at Bridge will dictate speed
Davenport	184.02	184.92	2°-20'	70	

Location	East MP	West MP	Curvature	Speed (mph)	Comments
Davenport	185.17	185.67	2°-30'	65	
Moscow	211.02	211.36	2°-30'	65	

This table indicates that the entire corridor between Aurora (BNSF MP 38.4) and Iowa City (IAIS MP 236.85) is suitable for 90 mph except for these 19 curves totaling 5.2 miles long (for a percentage of less than 3 percent) that cannot accommodate 90 mph today. Of this total, several curves are located at station stops and at the restricted bridge over the Mississippi River. If these curves are deleted from this list, then only the 2 degree curve at Silvis, the two curves (2 degree 20 min and 2 degree 30 min) on the west side of Davenport and the 2 degree 30 minute curve at Moscow would impact the 90 mph velocity. The curves at the station stops are listed should express service ever be considered on this corridor.

4.12.2 110 mph

While BNSF's has indicated that BNSF will consider 90 mph operation, if train velocities in excess of 90 mph are desired, then a stand-alone alignment will become necessary due to freight congestion, overtake issues, maintenance requirements, and so forth. Given the lower volume of freight activity on IAIS, IAIS might consider 110 mph operating velocities on its track provided that capacity was created for freight train overtakes, work events, and meet-pass events. If so, the FRA Class of Track would need to be upgraded from the Program's proposed Class 4 (80 mph passenger) to FRA Class 6 (110-mph passenger). Each railroad may also have sufficient right-of-way to accommodate a stand-alone passenger-only main track as both railroad's rights-of-way are approximately 100 feet in width, at least through rural areas. Locations that will require closer scrutiny include the community centers along the corridor including Aurora, Plano, Sandwich, Somonauk, Leland, Earlville, Mendota, Arlington, Princeton and Wyanet along the BNSF alignment, and Sheffield, Mineral, Annawan, Atkinson, Geneseo, Colona, Silvis, and Moline in Illinois, and Davenport, Walcott, Stockton, Durant, Wilton, Atalissa, West Liberty and the Greater Iowa City area, along the IAIS alignment. Critical structures along the alignment would include the Fox River (two bridges at 200' and 240') at Aurora, the Rock River (three bridges totaling 1945') between Colona and Silvis, the Sylvan Slough (1500') & Mississippi River (1700') between Rock Island and Davenport, the Cedar River (870') at Moscow and the Iowa River (345') just west of the station stop at Iowa City.

4.12.3 Results of RTC Modeling for 90 and 110-mph Speeds

Several RTC time/distance diagrams (Figure 4-10 and Figure 4-11) were generated that indicate the overall run-time between Chicago Union Station and Iowa City for 90 and 110 mph speeds, using the same trainset as proposed for the Program's 79-mph schedule. The table below (Table 4.12-3) summarizes the differences between the run-times based on the maximum operating velocities of 79, 90 and 110 mph which are all based on a maximum of 4.5 inches of super-elevation installed in the track with the equipment capable of handling 3 inch unbalance. It is likely that if higher speeds are desired, then the equipment may be capable of accommodating 6 inches or more unbalance which would greatly improve the running-times shown below.

Figure 4-10: Hypothetical 90 MPH TPC Run Naperville to Iowa City

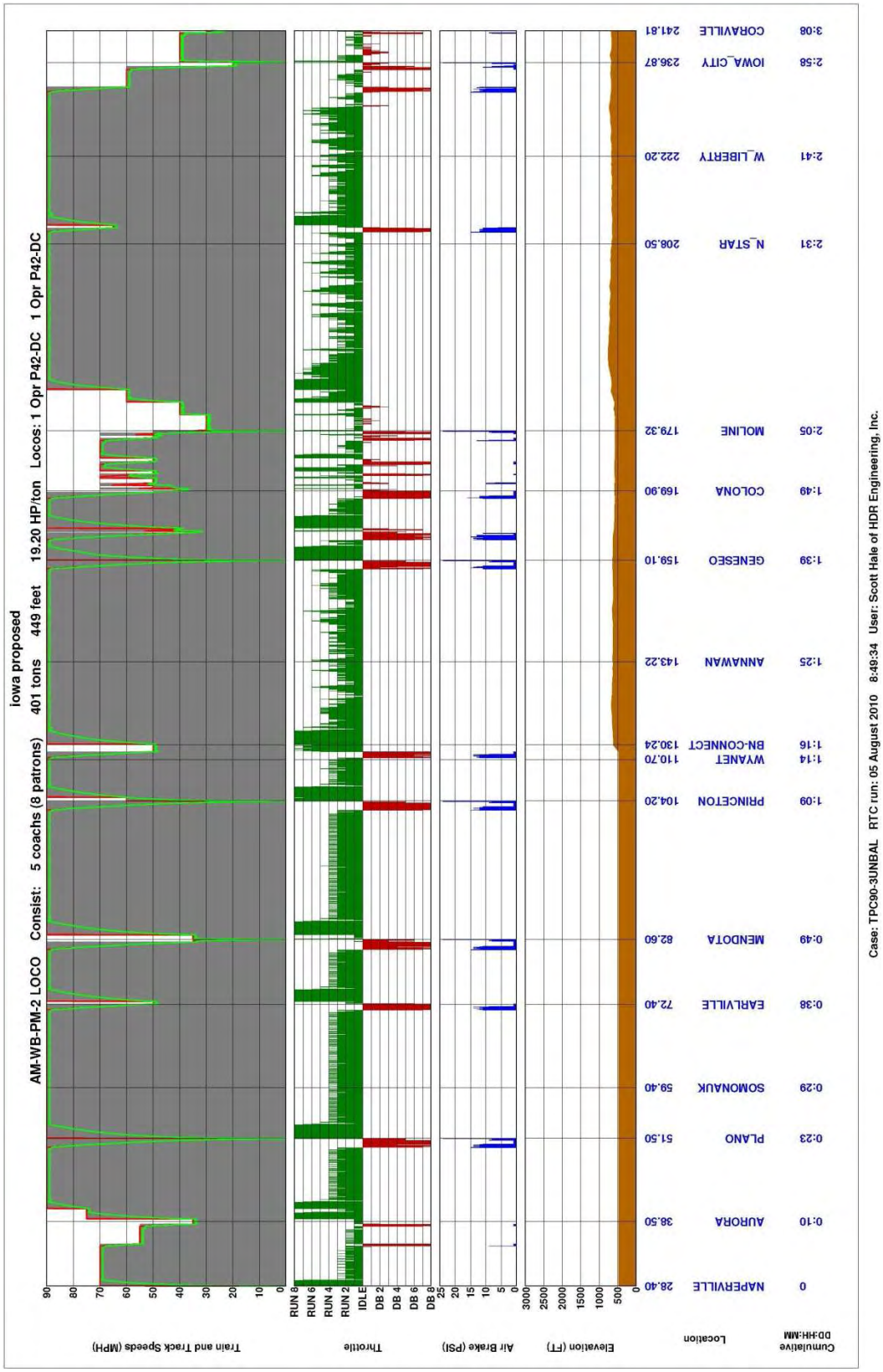


Figure 4-11: Hypothetical 110 MPH TPC Run Naperville to Iowa City

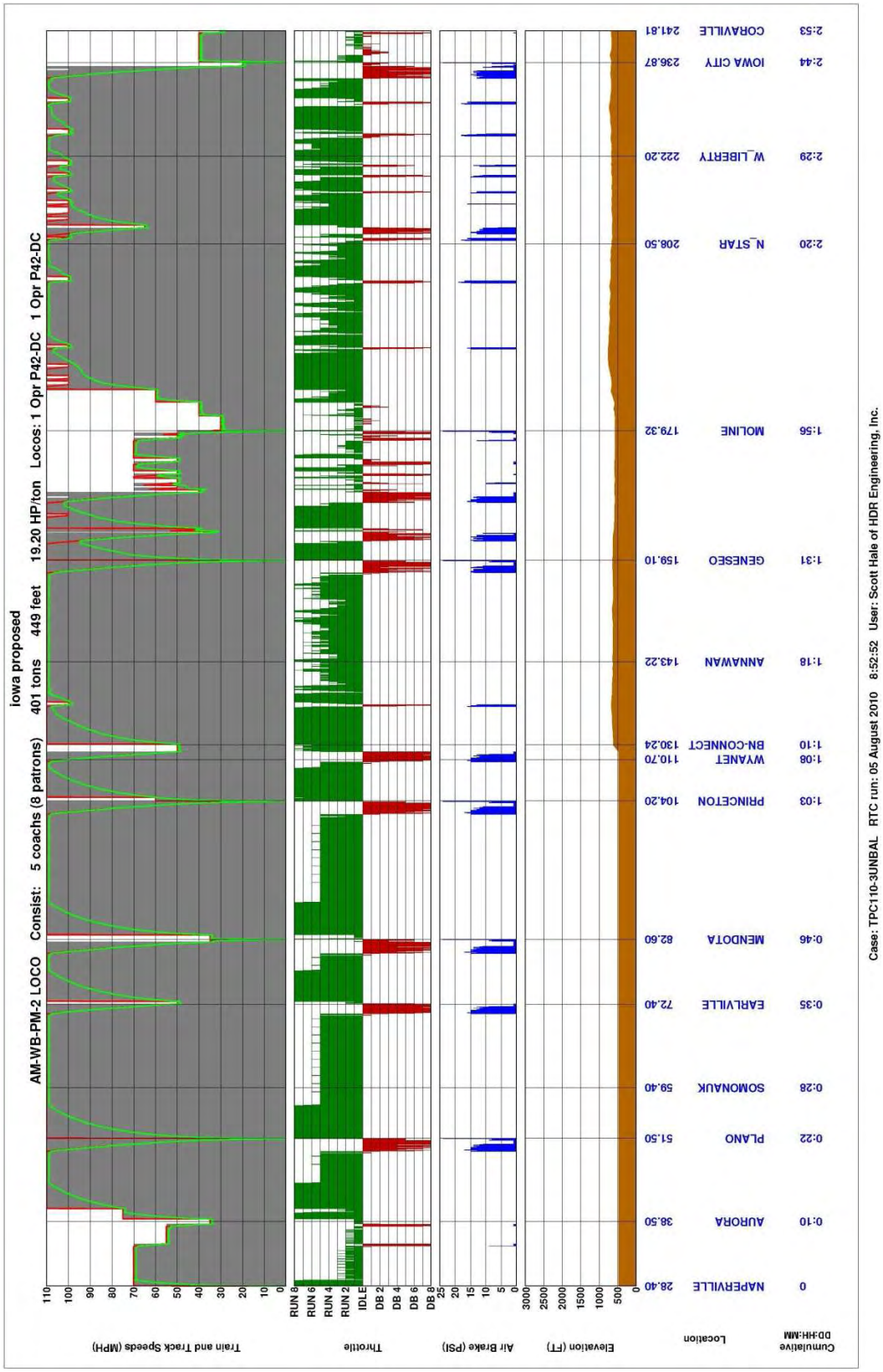


Table 4.12-3: Overall Trip Times Assuming Two Terminal Stations (Chicago and Iowa City) and Seven Intermediate Stations (La Grange Road, Naperville, Plano, Mendota, Princeton, Geneseo, Moline)

Velocity (mph)	Direction	RTC Run-Time	8% Recovery	Overall Time	Avg. speed
79	WB	3h 47m	18 min	4h 05m	53.7 mph
79	EB	3h 43m	18 min	4h 01m	54.5 mph
90	WB	3h 37m	17 min	3h 54m	56.3 mph
90	EB	3h 33m	17 min	3h 50m	57.3 mph
110	WB	3h 29m	16 min	3h 45m	58.5 mph
110	EB	3h 24m	16 min	3h 40m	60.0 mph

This data indicates that the 79 mph schedule is only slightly slower than the 90 or 110 mph schedules. Extraction of value from the higher speeds will require either extensive improvements in track speeds in the Chicago commuter corridor and in terminal areas, reduction in number of stops, or increase in train horsepower/trailing ton ratio. The single-locomotive consist exhibits substantial loss of acceleration capability above 80 mph.

4.12.4 Increased Frequency

The MWRRI schedule (page 12 in the MWRRI Program) indicates a five-train round trip schedule between Chicago and Iowa City. This schedule is based on a fairly aggressive schedule with three of the trains operating “express-like” in that these trains skip all the stations along the BNSF (except for Naperville) and the remaining two trains stop at all six intermediate stations (a scheduled stop at Geneseo is not included in the MWRRI Program). These five trains continue on to Des Moines and to Omaha in subsequent years. According to Amtrak and BNSF, the schedules used to describe these five trains are not verified as feasible at this time by either Amtrak or by BNSF. If additional frequencies are desired, then it is likely that the states of Illinois and Iowa would build on the ridership, schedule, and experience of the two trains discussed in this report. The schedules of the resultant three trains would be:

(1) Verified by Amtrak to ascertain if there is sufficient room at the 14th Street Yard for the equipment and at Chicago Union Station in terms of platform time and space, or to determine if it is cost-effective to add capacity;
(2) Verified by BNSF to determine if there is sufficient capacity on the Chicago and Mendota Subdivisions, or to determine if it is cost-effective to add capacity;
(3) Verified by IAIS to determine if its single-track railroad can support the additional service, especially if the five train-a-day round trip service is extended to Des Moines, or to determine if it is cost-effective to add capacity.

Once the results of these three efforts are combined, it is likely that additional infrastructure improvements may be required.

4.13 Infrastructure Improvements Required to Support the Schedule

4.13.1 Overview

Physical characteristics of the host routes were examined for their influence on train schedules, train service benchmarks, costs, and suitability for a passenger-rail corridor that must also continue to host freight and passenger trains of other railroads without significant negative effects on their capacity, speed, reliability, costs of operation, or operational flexibility. These characteristics were used to develop Conceptual Engineering documents that describe, illustrate, and quantify new track, train-control, and communications infrastructure that will be required to deliver the proposed service reliably, at reasonable cost, and for the 30-year time horizon required by the FRA. These engineering documents are attached separately to the Grant Application and consist of track plans, signal straightlines, and station plans and narrative description. Stakeholders involved in the development of these documents include Iowa DOT, Illinois DOT, Amtrak, BNSF, and IAIS.

4.13.2 Existing Conditions

The existing route and track mileage for the host railroads and Amtrak as well as current volume and speed information of the proposed route from Chicago to Iowa City is as follows:

- Amtrak
  - 112.0 route miles
  - 0.9 track miles
  - 8 trains per day, Chicago to Wyanet
  - 79 mph maximum speed
  - Passenger railroad

- BNSF (BNSF is the operator of Metra services on the BNSF corridor)
  - 117.1 route miles
  - 116.2 track miles
  - 94 Metra trains per day, Chicago to Naperville and Aurora; 40-50 freight trains per day, Chicago to Montgomery, and 20-25 freight trains per day, Montgomery to Wyanet, and 4-6 freight trains per day, 7th Street (East Moline) to Rock Island
  - 60 mph freight, 79 mph passenger maximum speed
  - Class I freight railroad per Surface Transportation Board rules
  - 286,000 lbs. maximum gross weight

- IAIS
  - 107.5 route miles
  - 102.4 track miles
  - 10-20 trains per day (Wyanet to Iowa City)
  - 40 mph maximum speed
  - Class II freight railroad per Surface Transportation Board rules`
  - 286,000 lbs. maximum gross weight

The existing FRA track classification for the segment between Chicago and Wyanet (primarily on BNSF) is Class 4. The segment between Wyanet and Iowa City (primarily on IAIS) is

currently FRA Class 2 and 3 (mostly 3), virtually all laid with welded rail of 115 lb weight. Rail weight for sidings and yard track along the segment from Wyanet to Iowa City varies, but is predominantly jointed rail with a weight of 119 lb or less. The existing ballast on the segment from Wyanet to Iowa City is washed and screened crushed rock mainline ballast. This segment is constructed on 7"x 9" hardwood ties.

The approximate amount of curvature along the segment from Wyanet to Iowa City is as follows:

- Tangent – 95.0 miles
- < 2 degrees – 10.2 miles
- 2 – 4 degrees – 2.0 miles
- 4 – 6 degrees – 0.3 miles
- > 6 degrees – 0.0 miles

Existing turnouts are described in the operations sections above. Public and private grade crossings are tabulated in the Preliminary System Safety Plan, attached separately to the Grant Application.

The existing corridor from Wyanet to Iowa City has limited right-of-way fencing located primarily in urban areas to protect against trespassers. The location requirements of any proposed right-of-way fencing will be determined as part of final design and in consultation with the System Safety Plan.

There is no ownership of air-rights along the corridor from Wyanet to Iowa City and utility rights-of-way will be verified during final design.

BNSF and IAIS own parallel, adjoining rights-of-way in the corridor between 7th Street in East Moline to Rock Island Yard. BNSF refers to its track segment is called the BNSF Industrial Track while the IAIS track is removed between 7th Street and Rock Island Yard. IAIS and CPR exercise trackage rights on BNSF on this segment. This segment is restricted to a maximum speed of 10 mph due to track conditions, and is constructed with jointed rail.

4.13.2.1 IAIS Infrastructure Requirements

Infrastructure on the IAIS between Wyanet and Iowa City (including the BNSF portion through the Quad Cities) is not sufficient to host the proposed service without substantial additions of track and improvement in track structure. The IAIS infrastructure at present is matched to its role as a regional railroad with some overhead freight traffic and no passenger traffic. It has little spare capacity for additional trains, or trains of higher speeds than the freight traffic, and very little capability for recovery of schedule should unforeseen events delay train meet-and-pass events, or reduce track speeds. IAIS local freight trains at present switch most of these industries "off the main track," i.e., the train occupies the main track continuously while it switches the industry. Industrial switching operations can consume one or more hours per industrial spur location, during which time no through trains can operate past that location because the local train is occupying the main track. IAIS freight trains have a nominal schedule but as is common in North American freight-train operation, schedules can regularly vary by

eight hours or more, as a result of variations in when shippers load or unload freight cars, variations in freight traffic released for rail movement daily and seasonally, and variations in weather, maintenance activities, and congestion on other connecting railroads.

Accordingly, in order to operate a mixed passenger-freight rail system with a high degree of reliability for the passenger trains, sufficient infrastructure must be provided for the freight trains to clear the main track for the passenger trains. This infrastructure must incorporate allowance for a high degree of variability in freight operations (e.g., freight-passenger meet-pass events will be unlikely to occur in the same location every day), or freight operations must have temporal separation for the passenger trains, or freight operations must accept lower efficiency of operation. IAIS freight shipper needs, and IAIS efficiency needs, are incompatible with either a temporal separation or a lower efficiency of freight-train operation, thus infrastructure must be provided to accommodate the proposed passenger trains without creating undo delays for freight trains, or undo restrictions on when freight trains can switch customers. This infrastructure consists of installing additional tracks where trains can meet and pass, improvements to track structure to improve speeds and ride conditions, and installation of high-capacity train-control systems.

Infrastructure needs on the IAIS that are deemed necessary through conservative RTC modeling and in view of on-time performance goals to support the proposed passenger-train service are as follows:

- Installation of sidings, crossovers, and second main track to enable passenger trains and freight trains to make meet-pass events and operate without creating either delays for passenger trains or loss of efficiency for freight trains.
- Improvement of track structure to increase nominal maximum non-urban track speed from 40 mph to 79 mph, and urban track speed through the Quad Cities and Iowa City from 10 to 20 mph, to 30 to 40 mph, or greater.
- Installation of CTC to enable passenger trains to operate at speeds of up to 79 mph, and to enable a high degree of train dispatcher control, flexibility, and to increase the capability of the train dispatcher to issue more frequent control decisions.
- Installation of PTC to enable the entire route to be in compliance with the Railroad Safety Improvement Act of 2008.

4.13.2.2 BNSF

The BNSF portion of the proposed route includes the portion between Chicago Union Station and Montgomery (Aurora), and the Rock Island Spur in the Quad Cities. This latter portion is operationally controlled by IAIS so is discussed under that railroad's portion. BNSF has unusually high traffic densities between Chicago and Aurora, Illinois, and high traffic densities between Aurora and Wyanet. The Chicago to Aurora segment hosts 94 commuter passenger trains on weekdays (not all continue as far as Aurora), eight Amtrak long-distance or corridor passenger trains daily, plus 40 to 50 freight trains daily. From Aurora to Wyanet, the route hosts the eight Amtrak trains plus 20 to 25 freight trains daily. Maximum passenger train speeds on the BNSF portion are 70 mph from Chicago to Aurora, and 79 mph from Aurora to Wyanet.

Power-operated, remote-control crossovers at regular intervals enable train dispatchers to maintain traffic flow and flexibility, including during track maintenance outages.

Infrastructure on the BNSF was deemed sufficient by BNSF to accommodate the proposed passenger rail service, with the following key exceptions:

- At Eola Yard, a major BNSF freight-car classification facility, BNSF has requested that a bypass track be constructed around the yard to reduce congestion of passenger and freight trains it would otherwise occur (Eola Main Line Improvements).
- At Wyanet, a new connection with IAIS will be made with a right-hand facing crossover between the two BNSF main tracks. The new connection will join the northernmost main track (Main Track #1). Typically trains on the Mendota Subdivision run right-hand, with westward trains on Main #1 and eastward trains on Main #2. Westward trains would thus be able to enter the Wyanet Connection track directly, but eastward trains would have to run "wrong-way" on Main #1 15 miles to the first existing crossover at Zearing, then crossover to Main #2. The right-hand crossover at Wyanet will eliminate this counterflow operation and reduce congestion for freight and other passenger trains on the Mendota Subdivision.
- The installation of PTC and required re-equipping of CTC and communications infrastructure on the Mendota and Chicago Subdivisions that is necessary to support PTC implementation. PTC is required to be implemented by December 31, 2015, on all U.S. Class 1 railroads hosting intercity or commuter passenger trains, or carrying Toxic Inhalation Hazard (TIH) commodities, under the Railroad Safety Improvement Act of 2008 (RSIA 2008). BNSF is currently progressing toward a PTC implementation between Chicago and Wyanet independent of this Program.

The BNSF portion of the route between Chicago and Wyanet is mostly double and triple track with some four-main-track. Its Method of Operation is CTC, and currently supports passenger service at speeds up to 79 mph. The IAIS portion of the route between Wyanet and Iowa City is single track. Its Method of Operation is Track Warrant Control and it is non-block territory without signals except at the Colona interlocking with BNSF. It supports freight service at speeds up to 40 mph. Currently there is no regular scheduled passenger service on the IAIS.

4.13.3 Proposed Infrastructure Improvements

Infrastructure on the joint BNSF-IAIS route requires some improvements on the BNSF portion, and significant improvements on the IAIS portion, in order to support the proposed passenger-train schedule and to obtain sufficient track capacity on each railroad to enable its freight trains and hosted passenger trains to continue to operate efficiently. The proposed improvements to the physical plant of the route will allow both BNSF and IAIS the ability to operate their freight service in a timely manner, providing cost-efficient and satisfactory freight service to their on-line and through-traffic customers. Absent these improvements, rail-served shippers will possibly incur higher transportation costs due to slower transit times, higher inventory volumes, and unreliable shipping schedules. The goal is to construct a rail network that provides for on-time performance for both the proposed passenger service as well as the existing freight service.

As part of this Program, proposed improvements, the segment between Wyanet and the Iowa City (primarily on IAIS) will be upgraded to FRA Class 4 from its current FRA Class 2 or 3. The proposed track improvement projects will be constructed utilizing washed and screened mainline ballast. Surfacing, ballast dressing, tamping, and aligning, to improve track geometry and reduce track maintenance frequency needs will also be addressed as part of the proposed improvements.

In addition, existing turnouts will be upgraded from Wyanet to Iowa City. The existing turnouts will be replaced with #20, #15, and #11 power-operated for main-line crossover and main-line to sidings and other speed-critical areas, and #11 hand-throw for yard and industry tracks. Turnouts on existing passing sidings from Wyanet to Iowa City will be upgraded from the existing #10 and #11 hand-throw to #15 power operated.

Due to the proposed significant increase in speed on the IAIS and the anticipated large variance in speed between passenger and freight, all at-grade crossings with active warning devices on IAIS will be upgraded with constant-time warning devices and be equipped with bells, flashers, and gates.

Along with these general improvements, several key track infrastructure projects were identified along the route and are described in the following sections.

4.13.3.1 Illinois Track Improvements

On IAIS between Wyanet and the Illinois and Iowa State Border, a total of 5.1 miles of existing jointed rail of varying weight will be replaced by 115 lb minimum CWR as part of the proposed improvements. Rail weights and proposed improvements for this segment are:

- Wyanet to Colona – predominantly 132 lb CWR with some 119 lb CWR
- Colona to East Moline – 115 lb, 119 lb, and 132 lb jointed rail to be replaced by 115 lb minimum CWR
- East Moline to Rock Island (on BNSF trackage) – CWR of various weights with miscellaneous joints that will be welded

There are several sidings between Wyanet and the state line that will require turnout replacement, surface-and-line improvements and addition of ballast as required, and crop-and-weld of jointed rail. These include replacing the existing #10 and #11 hand-throw turnouts at Atkinson, Silvis, and Wilton with #15 power-operated turnouts. The existing #11 hand-throw turnouts at the Annawan siding will be powered to allow freight operations to better clear the main track for passenger trains and to better hold alignment under heavy freight loading.

A second main line track is proposed from 7th Street in East Moline to Rock Island Yard, including a bypass along the north side of Rock Island Yard, to create capacity for the Program's passenger trains and remove adverse impacts the additional passenger trains would have on freight trains on the existing single track. This resulted in the existing Moline Siding being changed from a siding track to a second main line track. The existing Moline siding will be surfaced with 50 percent tie renewal. Universal crossovers with #15 power-operated turnouts at 7th Street and just west of the Moline station will enable freight trains to clear the main track

expeditiously, and passenger trains to crossover at Moline to reach the Rock Island Yard bypass. Main track speeds will increase from 10 mph to 79 mph from 7th Street to Moline station, and from 10 mph to 30 mph from Moline station to the Government Bridge.

With the addition of the second main line track, the east BNSF Yard Lead Connection will be adjusted to allow freight and switch operations within the Rock Island Yard to occur simultaneously with the passenger trains that will be using the Rock Island Yard bypass. This eliminates yard operations between Rock Island Yard and Moline Station from conflicting with passenger operations.

4.13.3.2 Iowa Track Improvements

Between the Illinois and Iowa State border and Iowa City, there are several rail improvements required. Rail weights and proposed improvements are:

- Davenport – 112 lb jointed rail to be replaced by 115 lb minimum CWR
- Davenport to Iowa City – predominantly 115 lb CWR with some 119 lb CWR.
- Iowa City – 115 lb jointed rail to be replaced by 115 lb minimum CWR
- A total of 3.7 miles of existing jointed rail of varying weight will be replaced by 115 lb minimum CWR.
- A total of 1.36 miles of existing 115 lb CWR will be replaced by 115 lb minimum CWR due to rail wear through curvature on an extended grade.

In addition to rail improvements, a runner track/south siding is proposed to be constructed from the Iowa City Station to the east side of Iowa City, utilizing a combination of new track construction and rehabilitation of the existing south siding and existing industrial lead trackage. This will allow for better flow of passenger and freight operations within the Iowa City vicinity, and to better enable passenger trains to make moves to and from the layover facility without interfering with freight trains.

A new freight siding called the American Siding is proposed east of Iowa City with #15 power-operated turnouts to allow freight operations to better clear the main track for passenger trains, and to hold out of congestion at the Iowa City area. Walcott siding will be extended from 6.250 feet to 8.342 feet to enable freight trains to hold out of congestion at the Quad Cities, and Walcott and North Star sidings will both receive #15 power-operated turnouts, surface-and-line improvements, and crop-and-weld of jointed rail to enable 30 mph operating speeds.

4.13.3.3 Iowa City Layover Facility

A layover facility for Amtrak trains is required at the end of the service in Iowa City for light maintenance and cleaning to be completed. Typical layover facility requirements were provided by Amtrak. The layover facility will provide a secure place for passenger trains to “park” between runs, clear of the main track and a location for train crews to go on-duty and prepare the paperwork associated with train operations. It will also provide a place to store spare equipment, if desired, at the Iowa City end of the corridor.

A concept level cost for a typical layover facility has been developed including the following elements:

- Track (with access pad) to accommodate the proposed train set plus peaking cars, double-ended to enable bad-order setouts and consist adjustments
- Small building (approximately 2,000 square feet) for crews to go on/off duty
- Employee parking and access to public road network
- Track access pad
- Potable water and general utility services
- 480V electrical service for standby power
- Perimeter security fencing
- Site lighting

Costs for the Iowa City Layover facility were developed in conjunction with Amtrak and utilizing industry standard unit costs.

4.13.3.4 Colona, Illinois Improvements

As part of the Program's proposed improvements, the existing junction between BNSF and IAIS at Colona will be reconfigured with #20 power-operated turnouts and less severe curvature to increase passenger speed from 10 mph to 40 mph.

4.13.3.5 Rock Island, Illinois Yard Bypass

Current operations in the Rock Island Yard are restrictive for providing efficient freight and passenger operations with the addition of the proposed passenger service through this area. Thus, it is proposed that an existing BNSF yard track be reconstructed as a passenger train bypass track and a new BNSF yard track constructed with reconfigured connections to the remainder of the BNSF trackage to increase passenger speed from 10 mph to 30 mph. This project is described above.

4.13.3.6 Wyanet Connection

To enable passenger trains to travel from the BNSF to the IAIS at Wyanet, a connection is required. IA connection was designed by Design Nine, Inc. in 2001 and is shown in the Conceptual Engineering Plans on G.16-18. However, this design exceeds the desired super-elevation for the design speed for this connection. These plans have been incorporated into the Conceptual Engineering Plans on E.01-02 with a reduced super-elevation, meeting a 4" max with 3" unbalance while maintaining the same design speed (50 mph). This decreased super-elevation reduces the long term maintenance costs for the curve and is more in with the desired maximum super-elevation used by freight railroads.

4.13.3.7 Eola Main Line Improvements

The purpose and need for the Eola Main Line Improvements are discussed in section 4.7.

The cost estimate for the Eola Main Line Improvements along the BNSF is based on the conceptual engineering design provided by BNSF, "Hill Yard Lead Expansion, Alignment #1, Sheets 1 – 9, June 21, 2010." Out of three alignments, Alignment #1 is BNSF's preferred alternative; however, there are significant permitting issues from approximately 2800 lineal feet of stream impacts. If during the preliminary design development phase it is determined the

stream impacts cannot be successfully mitigated then other track improvement alternatives will need to be considered. These alternatives could include:

- Eola Yard Alternative - BNSF Hill Yard Lead Expansion, Alignment #3 – Does not have significant stream impact but would require mitigation of about 4700 lineal feet of yard track impacts and thus would be a net project cost increase over Alignment #1.
- Farnsworth Avenue Alternative - Construct an additional track south of Main #2 from Farnsworth Avenue and westerly to stage BNSF coal trains. Based on aerial imagery review, approximately 9,000' to 9,500' may be available for staging coal trains. This would likely be less expensive than Alignment #1.
- West of Aurora - Construct a siding on the Mendota Subdivision west of Aurora to stage BNSF coal trains. This would likely be less expensive than Alignment #1.

4.13.4 Right-of-Way

The existing right-of-way was determined based on IAIS track charts and BNSF valuation maps. Based on those sources, no right-of-way needs were identified for track work other than the 7 acres for the Wyanet Connection identified in the 2001 Chicago to Quad Cities Amtrak Passenger Service study developed by Design Nine. The acquisition costs identified in the Design Nine Study were escalated for purposes of the Conceptual Engineering cost estimate.

Right-of-way/property acquisition needs for the passenger stations at Iowa City and Geneseo were identified during the site review. Costs for acquisition of the Iowa City station property were developed in conjunction with the city and costs for Geneseo were developed in a similar manner. Right-of-way/property acquisition needs and costs for the Moline passenger station were developed as part of the 2009 Quad Cities TOD + Intermodal study and those values were utilized.

4.13.5 Cost Estimate

All design and construction costs for the Program were developed utilizing a base year of 2010. Due to the scope of the Program, final design is anticipated to take several years, concluding at the end of 2013. Construction is anticipated to begin in 2013 and conclude in 2014 with operations beginning in July 2015 after six months of operations and equipment testing. In order to more accurately capture the design and construction costs for the Program, the costs associated with individual activities were escalated by 4.5 percent per year to account for inflation between the base year (2010) and the year when the costs are anticipated to be incurred (year of expenditure).

Infrastructure needs were identified based on reviews of previous studies, discussions with the host railroads, and field visits and incorporated in the Conceptual Engineering Plans. The previous studies reviewed included:

- Chicago to Quad Cities Amtrak Passenger Service, 7/27/2001, developed by Design Nine
- Midwest Regional Rail System, 09/2004 (updated 11/2006), developed by TEMS

- Feasibility Report on Proposed Amtrak Service, Chicago – Quad Cities, 12/5/2007, developed by Amtrak
- Feasibility Report on Proposed Amtrak Service from Chicago to Iowa City via Quad Cities, 4/18/2008 (an Addendum to the above noted 12/5/2007 report), developed by Amtrak
- Quad Cities TOD + Intermodal Plan, 08/2009, developed by S.B. Friedman & Company

Recommendations for improvements between Wyanet and Iowa City to structures were provided by the IAIS based on recent bridge and culvert inspections.

All estimated costs were assembled and categorized into FRA Standard Cost Categories for Capital Projects. Contingency factors commensurate with the level of project development were applied to each major cost category. Unit Costs were provided in most part by the IAIS or developed based on typical industry unit costs and prior experience. Documentation of unit costs and detailed cost breakdowns are included in this Grant Application.

4.14 Signaling, Train Control, and Positive Train Control

The proposed route, BNSF-IAIS, consists of two types of train-control systems. The BNSF portion is equipped with Centralized Traffic Control (CTC) from Chicago Union Station to Wyanet. Track Warrant Control (TWC) is used as the Method of Operation on IAIS from Wyanet to Iowa City. (A “Method of Operation” is a term of art for a body of practice, operating rules, and regulations that encapsulate a specific method for operating trains on a railroad track.)

CTC enables 79 mph maximum speed operation for passenger trains, whereas TWC is limited to 59 mph for passenger trains. No changes are anticipated to be required in the train-control, wayside signaling, and grade-crossing signal systems on the BNSF portion. BNSF is at this time installing PTC on its portion of the route to support its existing freight and passenger-train traffic. In contrast, implementation of a CTC system on the IAIS between Wyanet and Iowa City (continuing to the proposed passenger-train layover facility at Coralville), in conjunction with a Positive Train Control overlay and grade-crossing signal system upgrades and new installations, is proposed as a major project of the Program. This physical location of this system and its wayside signal elements are illustrated on the conceptual signal engineering drawing attached to this Application.

4.14.1 Background

Track Warrant Control (TWC) is a common Method of Operation for line-haul railroads of moderate train traffic density and moderate speeds, as it has a low cost of implementation and execution. While TWC is often sufficient for moderate-speed passenger trains, it is limited by regulation to a maximum passenger-train speed of 59 mph. TWC is also inefficient for high-density or complex rail operations because of the high “time per instruction” workload it requires of the train dispatcher, and long latency time for the passage of instructions from the train dispatcher to the train, and acknowledgement of compliance with instructions from the train to the dispatcher. Execution of a single instruction typically requires 3 to 5 minutes in normal practice, and in some cases requires the train that is receiving the instruction to stop and stay

stopped during the instruction process. During the time an instruction is being issued or acknowledged, the train dispatcher cannot engage in other tasks.

Centralized Traffic Control (CTC), by comparison, when used as the Method of Operation, is allowed speeds of 79 mph by the FRA for both passenger and freight trains. CTC enables a much higher degree of train dispatcher capacity and flexibility compared to TWC. CTC commands can be issued by the dispatcher in as little as 1 to 2 seconds in normal practice, and many CTC commands can be pre-selected by a dispatcher and "stacked" for transmission to trains as trains execute planned operational events. Accordingly for the Program, CTC is necessary (1) to permit the 79 mph track speeds required to meet the Program's ridership goals and public service goals; (2) to reduce train dispatcher workload and avoid overloading the train dispatcher; (3) to enable rapid train dispatcher reaction times necessary to insure high reliability for passenger trains when unanticipated train performance events occur; and (4) to enable IAIS and BNSF to continue to efficiently meet the needs of their existing and future shippers.

Positive Train Control (PTC) will be implemented on the IAIS portion of the route as a major project of the Program. PTC is currently being implemented by BNSF on its portion of the route between Chicago and Wyanet, independently of the Program described in this Grant Application. PTC is required on Class 1 railroad main tracks that host intercity passenger trains by the Railroad Safety Improvement Act of 2008, as codified in 49 CFR 236 Subpart I. The IAIS, as a Class 2 railroad as classified by its revenue by the U.S. Surface Transportation Board, could potentially be exempt from the requirement to install PTC on its portion of the route. The means by which the IAIS could apply for an exemption is described in the exemption methodology prescribed in 49 CFR 236.1019, "Main Line Track Exemptions." The relevant exemption is if the IAIS carries less than 15 million gross tons per year on the main track on which the Program's passenger trains operate. This tonnage quantity is either now exceeded or will soon be exceeded on the IAIS between Wyanet and Silvis, and when added to BNSF tonnage between 7th Street in East Moline and Rock Island, is likely in excess of 15 million gross tons per year. Accordingly, the States do not believe that IAIS is eligible for an exemption under 49 CFR 236.1019 on the basis of tonnage, or under other pathways described in this rule.

PTC infrastructure on the IAIS portion of the route is, under this Program, intended to emulate BNSF standards and practices to reduce operational handoff complications at Wyanet and Colona, and to reduce cost of implementation, operation, maintenance and administration, and training and familiarization. BNSF proposes to use a system on its Chicago to Wyanet portion (and throughout its U.S. rail system) it has called "Electronic Train Management System" (ETMS), a non-vital overlay of PTC onto vital CTC systems. This Program will seek to emulate to the greatest possible degree BNSF's software architecture, communications protocols and frequencies, hardware, and implementation strategy. This will enable the IAIS portion to emulate BNSF's Product Safety Plan (PSP), Railroad Product Safety Plan (RPSP), and enable locomotives operating on the route to have full interoperability with BNSF as well as Metra, Amtrak lines serving Chicago, and other Class 1 rail lines serving the Chicago rail network. In turn, this will improve the capability for the Program's locomotives to pool with the MWRRS system.

Work required to implement PTC on the IAIS portion includes:

- Development of the system requirements, systems management strategy and implementation strategy, PSP, and RPSP;
- Construction of sufficient communications bandwidth of high reliability to assure system robustness and minimization of train delay or dispatching delay;
- Construction of wayside interface units to tie the wayside signal system to the PTC system;
- Installation of PTC equipment on passenger-train and IAIS locomotives;
- Installation of a PTC-compatible CTC dispatching desk and PTC backoffice server in the IAIS dispatching center at Cedar Rapids, Iowa; and
- Testing, commissioning, and implementation of a management and configuration method for long-term operation.

The wayside signal and PTC infrastructure intended by the Program will be designed to support incremental maximum passenger-train speed increases to 90 and 110 mph, and to support additional increase in passenger train frequency as well as anticipated future growth in freight train frequency.

4.14.2 Station Locations and Improvements

The proposed passenger rail service would use existing stations at Chicago (Union Station), La Grange Road, Naperville, Plano, Mendota, and Princeton, Illinois. New stations are proposed at Geneseo, Moline, and Iowa City. These stations, selected in the Amtrak feasibility study, were reviewed in this Service Development Plan for criteria that include convenience to users, cost of any required infrastructure, location in relationship to existing high-use transportation patterns, parking space for personal vehicles, connectivity to other transportation modes, population concentrations, and number of stations. Number of stations influences both total transit times and accessibility of the passenger rail system to users. Each station is discussed individually or in groups in this section. More information regarding stations is available in the Conceptual Engineering Stations Report. More detailed information regarding the constraints of the station sites, as well as proposed scopes of work and initial cost estimates, is available in the Conceptual Engineering attachment to this Grant Application.

Chicago Union Station (CUS) is the principal long-distance passenger rail station in Chicago and the proposed hub station for the MWRRS. Other Metra downtown Chicago stations include Ogilvie Transportation Center (Northwestern Station), LaSalle Street Station, and Van Buren Street Station. While these three stations are generally configured for commuter rail service, while none are well configured to handle long-distance or corridor service trains. Furthermore, none of these stations offers a transportation connectivity or convenience advantage over CUS, but each would require significant transportation infrastructure improvement or provide deficient connectivity and convenience, or both. Accordingly, CUS was selected as the Chicago station. Operations at CUS are discussed at the end of this section.

Other than Chicago Union Station, all stations on the route are unstaffed facilities, though at the new stops in Geneseo, Moline, and Iowa City there is sufficient space in the station building that

other tenants may co-locate in the stations, thereby providing an increased presence and level of activity. If future traffic levels warrant, there would also be sufficient room in these stations for a ticket agent.

La Grange Road and Naperville are high-use Chicago suburban stations on the existing BNSF-Metra commuter rail corridor that will be used by this proposed passenger service. Both stations offer high connectivity to the Metra network and the Chicago street and highway transportation network, and do not require infrastructure investment to support the proposed service.

Plano, Mendota, and Princeton are existing rural community stations served by Amtrak's California Zephyr, Southwest Chief, and Illinois Service, a total of four long-distance and four corridor trains daily. These three stations offer connectivity to these trains, to local road networks and these communities, and do not require infrastructure investment to support the proposed service.

The three proposed new stations are located at Geneseo, Moline, and Iowa City. All three are presented in greater detail in the Conceptual Engineering Stations Report, attached to this Grant Application. Geneseo serves a rural community. Together with Plano, Mendota, Princeton, and Moline, these stations are spaced at approximately 25 to 35 mile intervals, providing a balance between convenience and impact on train travel times. Geneseo has a population (2000) of 6,480. The proposed station site is at the city center. New infrastructure would include acquisition of the existing historic railroad depot that dates to the late 1800s and either rehabilitation of the station or construction of a suitable substitute structure. In both cases construction would include relocation of the station building further from the tracks in order to provide a 600' platform, construction of approximately 20 parking spaces, and other site improvements.

Moline and Iowa City serve the two principal population centers outside of Chicago, with 2008 Metropolitan Statistical Area (MSA) populations of 377,291 and 128,094, respectively. Both stations are city-center and convenient to the downtown commercial districts of each city, and in the case of Iowa City, within 1 mile of the center of the University of Iowa campus. Moline station is co-located with an existing intermodal transportation center and parking garage. These station locations were determined to be readily accessible to where people live and work, will cater to both business and leisure travel, are within the central business district, and have direct access to local bus and taxi transportation systems.

Infrastructure improvements at Moline station would include modifications to the existing Centre Station intermodal transportation center to accommodate rail passenger service, a new 600' platform, and site improvements. An existing historic structure, the O'Rourke Building, would be renovated to provide a station facility. An ongoing study proposes expansion of the intermodal transit center and transit-oriented development that would generate commercial, entertainment, and business uses that would enhance and reinforce the passenger-rail service proposed in this Service Development Plan.

The proposed Iowa City station would be adjacent to the downtown core of Iowa City. Establishing a station here would involve acquisition and possibly rehabilitation of the existing

historic railroad depot, a brick structure constructed in 1898. Minimum infrastructure would include construction of a 600 foot platform, closure of one of the grade crossing, construction of either a warming shelter or renovation of the existing station building, construction of a platform canopy, and other site improvements. The depot currently has approximately 20 parking spaces, though the project budget provides for acquisition of an adjacent property for additional parking. Parking structures are located at several locations within the immediate vicinity, including a county-owned structure one block distant with 300 spaces, and a city-owned parking garage three blocks distant with 300 spaces, as well as on-street parking. The depot is two blocks from Iowa City's Court Street Transportation Center, which provides local and regional bus service.

Existing stations from Chicago to Princeton inclusive are active stations. The proposed service is expected to have minimal impact on these stations with regard to the local road network and parking demand. Impacts if any of the proposed rail passenger service on local road networks and parking availability will be discussed in the Tier 2 Project Level NEPA documents. Mitigation for any permanent impacts will be identified in the Tier 2 Project Level NEPA review.

Amtrak owns and operates Chicago Union Station (CUS). This downtown station is the largest of four train stations serving the Chicago Loop. Each weekday, 50 Amtrak Intercity passenger trains and 271 Metra trains arrive and depart. The majority of the Metra trains arrive during the morning and evening peak periods, while the Amtrak trains are more dispersed. CUS meets current ADA standards and has full service ticket agents on-duty the greater part of each day. Ticketing kiosks are available at all hours.

Operational capacity and flexibility at CUS is crucial to the Chicago-Iowa City Program, as well as the MWRRS, which intends to hub at CUS. CUS was analyzed in terms of passenger and train capacity in a 2002 report that is discussed below. The study, sponsored by Amtrak and Metra, was prompted by two critical factors: (1) continued population growth in the Greater Chicagoland Region, and (2) the initiation of the MWRRI, which seeks to use CUS as a hub for its new high-speed trains. While the recommendations highlighted in this reported indicated that station capacity would be nearly reached in 2010 and exceeded by 2015, changes have subsequently occurred that enable the introduction of the four proposed Chicago to Iowa City trains without incurring or triggering major infrastructure modifications to CUS, as follows:

(1) In 2002, capacity was constrained by the handling of Amtrak Mail and Express at the south end of CUS by Amtrak. This practice was discontinued subsequently, and consequently, Amtrak trains arrive and depart with greater ease than when the recommendations were made, thus freeing up greater capacity for additional traffic.
(2) Metra added cars to many of their commuter trains, thus accommodating some of the growth anticipated in the 2002 report without increasing train counts.

The two Chicago to Iowa City trains arrive at 12 noon and 10:00 pm daily, and the two departures daily occur at 9:30 am and 6:30 pm. With the exception of the evening departure at 6:30 pm (with the equipment being spotted at CUS from Amtrak's coach yard by 6:00 pm each day), these times fall outside the peak period for CUS caused by Metra's commuter trains, or are counterflow to Metra's morning-inbound, evening-outbound primary flows. The configuration

for the two Chicago-Iowa City trains would include a diesel-electric locomotive placed on the west end of the consist to avoid to the greatest extent possible the introduction of diesel emissions within the CUS trainshed area, and a coach/cab-car on the east end inside the trainshed. Overall length for the one locomotive, five-car Chicago-Iowa City consist is estimated at 495 feet. This length of train can fit at any of the CUS platforms on the south end and if necessary could double-spot with other intercity passenger trains.

4.15 Trainsets and Equipment Plan

4.15.1 Equipment Plan – Locomotives and Passenger Cars

The Chicago–Iowa City High Speed Intercity Passenger Rail Program proposes to purchase two trainsets each consisting of one 4,200-hp diesel-electric locomotive, 3 coaches, 1 cab-control/coach, and 1 food-service car. The equipment will be of conventional type, i.e., non-tilting, using Head-End Power (HEP). One spare of each type will be purchased at the same time, along with an inventory of spare parts. Purchases for the Program will be consistent with the new specifications under development by the Next Generation Corridor Equipment Committee (NGEC), created by section 305 of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) to establish a fleet of standardized rail corridor equipment. The equipment will be capable of 125 mph, and is intended to be fully capable of pooling with the MWRRS through the Chicago hub.

The NGEC will develop new specifications for both single and bi-level passenger coaches by the end of 2010 and locomotives in 2011. Illinois and Iowa DOT serve on the Executive Committee for the NGEC with a focus on the Technical Subcommittee. The NGEC provides a forum for exploring potential new technologies that are compatible with the “GreenLine” vision of the Program. Iowa is participating on the Locomotive group of the Technical Subcommittee in order to pursue the development of fuel efficient, environmentally responsible locomotives that will be help to achieve the “GreenLine” vision. Another benefit that Illinois and Iowa have by serving on the NGEC Executive Committee is their participation in the development of equipment procurement strategies that will ultimately provide benefits in the purchase and operation of a new pool of equipment for MWRRS.

Equipment for the Program must also meet the goals of the capacity, comfort, convenience, and amenities required by this SDP. The Program will use industry-review processes to author equipment specifications. These specifications will require equipment that meets or exceeds Environmental Protection Agency (EPA) emissions regulations, and emphasize superior fuel economy, noise reduction, and domestic sourcing. The Program will seek opportunities to innovate and employ sustainable practices such as diesel/battery hybrid locomotives, bio-fueled locomotives, and reduced energy consumption passenger-car heating and cooling.

Standardization with the train sets of the full MWRRS has been established as a desirable goal by Illinois DOT, Iowa DOT, and Amtrak, to enable pooling of equipment for maintenance or overhaul outages, and to provide flexibility of equipment at the Chicago Terminal to avoid congestion while train sets unique to different lines of the MWRRS are shuttled between Chicago Union Station and the Amtrak maintenance facility near the station. Pooled equipment would enable, for example, an arriving Iowa train to be immediately redispatched as a St. Louis

train, while an inbound Milwaukee train in turn becomes the next Iowa City train. This will greatly increase the platform and track capacity at Chicago Union Station as opposed to dedicated equipment sets for each rail line.

4.15.2 Standard Consist

The Program requires two train sets to support the proposed two-roundtrip-daily schedule between Chicago and Iowa City, each train set performing one round trip every 24 hours. Each standard train set will have 230 standard revenue seats, weigh 522 tons, and measure 495 feet in length.

The standard consist will be arranged as follows:

- 1 locomotive (west end)
- 2 coaches
- 1 food service car
- 1 coach
- 1 coach / cab-car (east end)

Locomotives for the proposed service are similar to those powering existing intercity and corridor-service Amtrak trains nationwide. Planning assumed that locomotive specifications would be similar to P42-type diesel-electrics of 4,250 net horsepower after deduction for parasitic loads, with 3,650 or greater flywheel horsepower after deduction for Head-End Power supplied to the train set. P42-type locomotives currently manufactured weigh 121 tons and are 70 feet in length. Train Performance Calculations with this consist on the route demonstrated that a P42-type locomotive could adequately accelerate from station stops and permanent speed restrictions to the 79 mph maximum track speed proposed by the infrastructure, with the proposed trainset, on the corridor's exiting vertical alignment.

Locomotive reliability may decrease as mileage increases. New-design locomotives may require robust warranty protection potentially including on-site manufacturer support and/or manufacturer-provided spares to ensure the necessary passenger-train on-time performance during the warranty period and initial operating experience. After five years of service, locomotive reliability and power output may degrade to the degree that two locomotives per train are required to maintain schedule reliability, particularly during winter weather. Two locomotives per train may also be required when train lengths temporarily increase for special events or holiday travel peaks.

Each coach is proposed to be configured to seat 60 passengers. Planning assumed specifications similar to Amtrak Horizon-type cars, with each weighing 58 tons and 85 feet in length. Each coach will be equipped with reclining seats, handicap-accessible lavatories, and accommodation for baggage. Wheelchair lifts will be required at stations.

Food-service cars are proposed to be configured with space for a food-preparation area, and café/lounge seating for 24. Planning assumed specifications similar to Amtrak Horizon-type cars, with each weighing 55 tons and 85 feet in length. Food-service cars will include reclining dining furnishings, lounge seating, and lavatories.

The coach/cab-car will enable push-pull operation without infrastructure requirement (e.g., a wye, balloon track, or turntable) for turning train sets at Chicago and Iowa City. Each coach/cab-car is proposed to seat 50 passengers and would include reclining seats, lavatories, and accommodation for baggage as well as bicycles. T Planning assumed specifications similar to Amtrak Horizon-type cars, with each weighing 65 tons and 85 feet in length.

The original Amtrak feasibility study proposed non-powered control units (NPCUs) built from retired Amtrak F40 locomotives. Availability of NPCUs is uncertain and use of a coach/cab-car can reduce tare weight and maintenance expense. The coach/cab-bars will be configured for mid-train capability and thus one coach/cab-car spare will provide the spare for both coach/cab-cars and plain coaches.

Spare equipment to support maintenance will consist of one locomotive, one food-service car, and one coach/cab-car.

4.15.3 Performance of the Standard Consist on the Chicago – Iowa City Corridor

Train Performance Calculation runs (TPC runs) were conducted to compare the performance of the design train set against the schedule requirements and proposed infrastructure, with all station stops included. TPC runs (see Figure 4-4 and Figure) showed that the proposed infrastructure and train sets could meet or exceed the proposed schedule, using appropriate station dwell times.

4.16 Capital Cost Estimates

In order to develop a cost for the acquisition of new motive power and passenger coaches for the Chicago-Iowa City service, order of magnitude estimates were made after review of recent orders (including purchases by Metrolink, Amtrak California service, MTA Metro-North, and MBTA), discussions with manufacturers, and cost escalations that are likely.

The review took the following equipment into consideration:

- **Locomotive**
  The most recent similar U.S. locomotive purchase was made by Boston's MBCR in July 2010. This 20-unit order was for HSP46 units from Wabtec MotivePower for $5,750,000 each. The HSP46 develops 4,650 horsepower. The States estimate that the locomotives purchased for this service will be approximately $5,000,000 each, based on a higher degree of standardization for locomotives for the MWRRS.
- **Coaches**
  The most recent single-level passenger coach purchased for U.S. service was Alstom's Comet V car by New Jersey Transit and MTA Metro-North Railroad in 2002. In this purchase, straight trailer-type coaches were $897,000 and coach/cab-cars were $1,050,000 apiece. Allowing for escalation to 2010 of 21 percent, the estimated current cost of the coaches would be $1,085,370 for a trailer and $1,270,500 for a coach. In its High Speed Passenger Rail Safety Strategy released in 2009, the FRA anticipated the continued use of cab-cars as controlling units. The potentially small size of this order,

compared to the large size of the NJT/MTA order, will likely escalate costs to the $2,000,000 range per car.

- **Food Service Car**
  There is no recent purchase of a food-service car in the U.S. Discussions with manufacturers indicated that it will cost about $1,000,000 additional per car to design and construct a standard coach to a food-service car configuration, or a total of $3,000,000 per car.

The equipment cost data above, in conjunction with the TPC runs was used as a basis for determining the makeup of and the estimated cost of the standard consist designated for the Chicago-Iowa City service, including spare equipment. These figures are explained in Table 4.16-1 below.

Table 4.16-1: Chicago-Iowa City Passenger Service Equipment Cost (Generated August 2, 2010)

Type	Estimated cost in millions (FRA Tier 1, speeds up to 125 mph)
Locomotive	$5.0 (x 3 = $15.0)
Coach/Cab-Car	$2.5 (x 3 = $7.5)
Coach	$2.0 (x 6 = $12.0)
Food Service	$3.0 (x 3 = $9.0)
Subtotal	$43.5
Project Management	$0.9 (2 percent)
Spares @ 10 percent	$4.4 (10 percent)
Total	**$50.9**

4.16.1 Capital Spares for Rolling Stock

The Program estimates an allowance of 10% critical spare parts to be obtained with equipment acquisition. These costs have been incorporated into operating and maintenance cost estimates, but are listed here for illustration.

Capital Spare Parts

Locomotive Bogie Complete with Traction Motor Combos:	$500,000
Locomotive Spare PTC Hardware Package:	$80,000
Locomotive Spare Brake Valves:	$50,000
Locomotive Spare Event Recorder	$80,000
Coach/Cab-Car Bogie Complete:	$250,000
Cab-Car Spare PTC Unit:	$80,000
Coach Spare Air Conditioning Unit (2):	$50,000
Cab-Car Spare Event Recorder:	$80,000
Coach/Cab-Car Spare Brake Valves:	$35,000
Coach Seats (Repair Pool) (50 x $450)	$22,500

Locomotives Capital Renewal

During the 30-year event horizon of this Plan, it is not anticipated that the locomotives will require a mid-life rebuild program. However, they will require three, eight-year overhauls of all rotating components that will be Unit Exchanged (UTEX) by sending the in-service units back to the supplier for rebuilding of electric components and trucks.

Locomotive Truck Complete (2):	$ 100,000
Main Power Plant (UTEX):	$ 300,000
Main Alternator (UTEX):	$ 200,000
Locomotive Traction Motor (UTEX):	$ 100,000
($ 25,000 each – 4 required)	
Locomotive Air Compressor (UTEX):	$ 25,000
Locomotive Equipment Blowers (UTEX):	$ 35,000
Locomotive Rebuild PTC air brake interface:	$ 5,000
Locomotive rebuild Brake Valve Set:	$ 2,000
Locomotive rebuild Event Recorder:	$ 1,000
Total Cost of Overhaul:	$758,000

The maximum total projected cost of one Locomotive Overhaul Program (will vary by the number of locomotives actually purchased), to be completed in ownership-year eight, is $3,790,000.

Coaches Capital Renewal

During the 30-year planning horizon of this program, the coaches will not require a mid-life rebuild program; they will however require thee, eight-year overhauls of rotating equipment and critical electronic components. The windows will only reach eight years of useful life if the operational direction of each car is reversed every year.

Trailer Coach/Cab-Car Truck Complete (2):	$ 5,000
Cab-Car/NPCU rebuild PTC Unit:	$ 5,000
Coach Air Conditioning Unit (2)(UTEX):	$ 10,000
Cab-Car/ NPCU rebuild Event Recorder:	$ 1,000
Coach / Cab-Car rebuild Brake Valves:	$ 2,000
Replace all Exterior Windows (20 x $250):	5,000
Replace All Seat Bottoms (80 x $200):	$ 16,000
Total Cost of One Single Car Overhaul:	$ 44,000

The maximum total projected cost of one Car Overhaul Program (will vary by the number of coaches actually purchased), to be completed in ownership-year eight, is $484,000. Food-service car overhaul will increase over standard coach overhaul by approximately $150,000 each.

4.17 Train Operations and Maintenance Provisions and Cost Estimates

Amtrak prepared operating and maintenance cost estimates for the states based on synergies that Amtrak has with its Midwest operations and projections of Amtrak future costs. These cost estimates were submitted in the Project Financial Plan. The States independently assessed

probable costs, which in some cases differ from Amtrak's estimates. These independent assessments are described below. Amtrak's projected expenses for first-year 2015 are listed below.

Table 4.17-1: Independently Assessed Probable Costs

EXPENSES				
Host Railroad	$1.3	$2.0	$1.9	4.86%
Fuel	1.3	2.2	1.7	3.41%
T & E Labor	1.7	2.7	2.3	3.85%
Onboard Services (4)	0.6	0.7	0.9	5.20%
Mechanical	2.5	3.6	3.3	3.53%
Stations	0.8	0.9	1.2	5.20%
Remaining Direct Costs (Incl. Yard Ops & MT)	2.6	3.6	4.6	7.39%
Total Direct Costs	**$10.8**	**$15.7**	**$15.9**	**4.95%**

Train Service and Operations

Crew requirements for the Chicago–Iowa City service are subject to agreements with Amtrak and the host railroads, BNSF and IAIS. It is anticipated that each of the four train crews will have four people, and will include an engineer, conductor, assistant conductor, and food-service car attendant. Chicago-based Amtrak train crews would take a train west to the Iowa City depot and later the Coralville layover facility, take their Federally mandated rest, and take a train east to Chicago the following day. Outlined below is the estimated annual expense for train and engine personnel.

Estimated Train and Engine Personnel Operating Expense

Each crew:

Engineer	$85,000 per year
Conductor:	$80,000 per year
Assistant Conductor:	$75,000 per year
On Board Service:	$60,000 per year
Total wages:	$300,000 per year
Burden rate of 1.8:	$540,000 per crew, per year
For four crews:	**$2,160,000 per year**
One crew turns at Iowa City and returns to Chicago (Arbitraries of 3 percent):	$16,200 per year
One crew overnights at Iowa City (Lodging, meals, transportation – arbitraries of 25 percent):	$135,000 per year
Total T&E Labor:	**$1,231,200 per year**
One RFE/TM (Non-Agreement):	$200,000
Total operations department labor:	**$3,742,400 per year**

Estimated Fuel Expense

Amtrak uses a fuel consumption model to estimate the gallons of fuel necessary to operate service. The model takes into account the weight of each car, the proposed schedule, and the physical characteristics of the track. The States used the TPC runs from the RTC model to extract probable fuel consumption. These indicate that each locomotive on the Chicago–Iowa City service would consume 635 gallons eastbound and 643 gallons westbound. Taking into account the two daily roundtrips, the service would require:

Gallons per day for eastbound operations between Iowa City and Chicago: 1,270

Gallons per day for westbound operations between Chicago and Iowa City: 1,286

Gallons per day for layover fuel usage at Coralville:..... 384

(12 gallons per hour x 16 hours per locomotive x 2 locomotives)

Subtotal (Gallons per day): 2,940

10 percent HEP factor (204 KW load for 5 cars) (Gallons per day):..... 294

Total (Gallons per day): 3,234

Multiplying the figure of 3,234 gallons by 365 days yields a figure of 1,213,260 gallons of fuel consumed per year.

4.18 Equipment Maintenance and Provisioning

A layover facility is proposed at Coralville, as the proposed schedule incorporates an overnight stay for the westbound evening train, and a lengthy daytime dwell for the morning westbound train. The schedule allows for two train sets to cover the service. Spare equipment can be provided at Chicago or the Coralville layover facility. Minor servicing such as coach cleaning, refueling, and restocking of the food-service car can occur at the Coralville facility. Major repairs, inspections, and overhauls would be performed at Amtrak's Chicago maintenance facility in the short term, and at proposed MWRRS maintenance facilities at Pontiac, Michigan; St. Louis and Kansas City, Missouri; Madison, Wisconsin; and St. Paul; Minnesota, in the long term.

4.18.1 Car and locomotive maintenance costs:

Amtrak bases car and locomotive maintenance costs on the proposed change in unit miles. Operations and maintenance figures here include a maintenance cost-per-car mile calculation. This cost is made up of two elements: Direct costs-per-mile and indirect costs-per-mile. The cost-per-mile or locomotive miles break down as follows:

	Coaches	**Locomotives**
Direct Costs:	$0.129	$0.782
Indirect Costs:	$0.137	$0.222
Total Costs:	**$0.266**	**$1.004**

The equipment maintenance elements included in the direct cost-per- mile figures for coaches and locomotives include:

- Wheel True
- Locomotive and Coach Axle Combo Change
- Locomotive and Coach Truck Change
- Locomotive or Cab-Car PTC and 92-Day Air Brake
- Locomotive or Cab-Car Annual Inspection (365 Day)
- Locomotive or Cab-Car 736-Day Inspections
- Locomotive or Cab-Car Three Year Inspection (Allow 5 Days)
- Coach Periodic Inspections (Allow 3 days)
- Locomotive Running Repairs
- Coach, in all configurations, running repair

The equipment maintenance elements included in the indirect cost-per-mile figures for coaches and locomotives include:

- External Car Wash
- Locomotive and Coach Disc Brake Pit Inspection (Brake Shoes, Disc Pads, etc.)
- Class One Daily Air Brake, and Equipment Mechanical Inspections (Brake Shoes, Disc Pads, Light Bulbs, etc.)
- Locomotive Six-Year Air Brake Valve Rebuild
- Coach Six-Year Air Brake Valve Rebuild
- All Consumables not otherwise specified, Lube Oil, Window Washing Fluids, etc.

4.18.2 Station Operating and Maintenance Cost Breakdown

For all three stations (Iowa City, Geneseo, and Moline) and layover facility (Coralville)

Servicing and Cleaning (annually)
At Stations Only

Servicing/cleaning once weekly (performed by mechanical contractor):..... $ 0

Trash pick-up and straightening daily, 1 hour per station per day: $16,425
($10 per hour, 1.5 burden rate)

E-clean once a quarter, 8 hours per station: ..... $ 1,440
($10 per hour, 1.5 burden rate)

All electronics for stations – On contract basis: ..... $ 39,000
($1500 per day for 26 days per year)

Includes:

- Cameras
- Full service-intrusion alarms
- Fiber optic or Cat 5
- Train Arrival and departure display both visual and audio, as required by ADA)

Contract snow removal as needed for parking lots, walkways,
and station platforms ($1,000 per day all in, contingency contract): $12,000

Walking vacuum machine for parking lots:
($200 per month per station) ..... $ 7,200
Potential to lease out parking concession to a third party
Landscaping ($100 per station, per week 36 weeks):..... $10,800

Ticket Vending Machine Servicing
At Layover Facility Only

Trash pick-up and straightening bi-weekly, 1 hour per visit:
($10 per hour, 1.5 burden rate) ..... $ 1,560

Total..... $ 88,425

Mechanical
At Layover Facility Only

Assumption: Two employees on day shift, two employees on night shift, seven days per week (28 shifts per week).

Two options

- Five employees and cover three open shifts by overtime
- Six employees and use sixth person to perform station maintenance two days per week

Elected Option 1 with six employees and the use of the relief employee to perform weekly station cleaning on two “overlap” days.

Assumptions:

- Working foreman or lead mechanic
- Mechanical contractor
- Rate of pay of $22 per hour
- 1.5 for burden rate

Totals: $33 per hour ($1,320 per week per employee): ..... $7,920 per week
Overtime (20 percent of straight time):..... $1,584 per week
Total wages..... $494,208 annually
Expenses (5 percent of straight time): ..... $ 20,592 annually
Subtotal:..... $514,800 annually
2 pick-up trucks ($800/month each)..... $ 19,200 annually
Locker rooms/facilities- part of Iowa City Station $0

Total:..... $1,058,304 annually

Tools and Supplies (annually)
At Layover Facility Only

Small Tools: ..... $ 2,000
Supplies for coach cleaning: ..... $ 2,000

Total:..... $ 4,000

Projected inspection and maintenance costs
At Layover Facility Only

$0.266 per car mile: ..... $340,980 annually
$1.004 per loco mile:..... $652,129 annually

Total:..... $993,109
Station Operating and Maintenance Cost Total..... $ 2,143,838 annually

4.19 Ridership and Revenue Projections

Ridership and revenue projections were updated by Amtrak in August 2010, for the Program for year 2015, based on a 4-hour, 58-minute schedule between Chicago and Iowa City. Table 4.19-1 below displays these projections and compares them to prior projections by Amtrak. Scenario A6, one of six scenarios for the Chicago-Iowa City corridor that was studied in Amtrak's Chicago-Iowa City feasibility study of April, 2008, is the best fit to the Program's route, operating plan, and proposed infrastructure.

Table 4.19-1: Amtrak Ridership and Revenue Projections for the Chicago-Iowa City Service, Compared to Prior Estimates

National Railroad Passenger Corporation (Amtrak) Chicago - Quad Cities - Iowa City - Scenario A-6 Via BNSF-IAIS - 4 Hrs 58 Mins Estimated Revenue & Expense Performance - (1)				
	Quad Cities Report & Iowa Addendum Pro Forma 2007 Operation (2)	ARRA 2009 Grant Application Pro Forma 2013 Operation (3)	2010 ARRA Grant Application Pro Forma 2015 Operation (3)	Compounded Annual Growth Rate FY07 - FY15 (3)
				(In Millions of Dollars)
REVENUE				
Passenger Revenue	$4.4	$5.3	$6.0	3.95%
Food & Beverage Revenue	0.4	0.4	0.4	0.00%
Total Revenue	**$4.8**	**$5.7**	**$6.4**	**4.91%**
EXPENSES				
Host Railroad	$1.3	$2.0	$1.9	4.86%
Fuel	1.3	2.2	1.7	3.41%
T & E Labor	1.7	2.7	2.3	3.85%
Onboard Services (4)	0.6	0.7	0.9	5.20%
Mechanical	2.5	3.6	3.3	3.53%
Stations	0.8	0.9	1.2	5.20%
Remaining Direct Costs (Incl. Yard Ops & MT)	2.6	3.6	4.6	7.39%
Total Direct Costs	**$10.8**	**$15.7**	**$15.9**	**4.95%**
OPERATING CONTRIBUTION/(LOSS)	**($6.0)**	**($10.0)**	**($9.5)**	**5.91%**
Fare Box Recovery	**44.4%**	**36.1%**	**40.3%**	**-1.23%**
Total Projected Ridership	**186,900**	**213,500**	**246,800**	**3.54%**
Passenger Miles	**21,780,000**	**33,940,000**	**36,060,000**	**8.77%**
Average Ticket Revenue per Rider - Chicago - Iowa City	**$23.54**	**$ 24.70**	**$24.31**	**0.54%**

Notes:

(1) Projected pro forma annual financial performance for each of the years 2007, 2013 and 2015 based upon the hypothetical start-up and 12-month operation of proposed service between Chicago-Quad Cities-Iowa

City as contemplated in the Amtrak Route Feasibility Study of February 2008. All amounts presented herein are for illustrative purposes only and are subject to change due to variation in service level, service attributes, route, economic conditions, and numerous other factors that may have a material effect on actual financial performance.

(2) FY09 results per Bill Sheridan as developed for Iowa City addendum of February 25, 2008

(3) Updated results contemplating commencement of proposed operations in 2013 or 2015 prepared by Bill Sheridan per Financial Analysis (email) dated August 2,, 2010.

(4) Includes the projected cost of both onboard labor & support and the allocated cost of food & beverage items sold.

Amtrak projects that the Program's ridership will experience a 2.0 percent compound annual ridership growth rate during the 30-year time horizon requested by the FRA. This growth rate is based upon Amtrak's experience and calibrated ridership estimate methodology. Table 4.19-2 displays the ridership and revenue statistics for 2015 and 2045, applying a 2.0% consumer-price index-based inflation rate.

Table 4.19-2: Ridership and Revenue Projections

Ridership	**2015**	**2045**
Projected Ridership (Yearly)	246,800	447,000
Revenue (FY11 $ in Thousands)*	**2015**	**2045**
Passenger Revenue	5,031	9,113
Food and Beverage Revenue	335	607
Total Revenue	5,366	9,720

*Revenue projections discounted from FY15 $ to FY11 $ using a 4.5 percent inflation rate.

Amtrak's August 2010 ridership and revenue projections do not reflect the faster Proposed Improved Schedule that was developed in this Service Development Plan (this Service Development Plan projects a feasible 4-hour, 5-minute schedule between Chicago and Iowa City). Therefore, ridership and revenue projections in Table 4.19-1 are likely to be conservative and may significantly understate actual ridership and revenue results of the Program during the 30-year horizon requested by the FRA. The Program's financial projections and economic analysis incorporate the Amtrak revenue projections only, and do not reflect potential additional revenue that is likely to accrue if the Proposed Improved Schedule is adopted.

4.19.1 Ridership and Revenue Estimate Methodology

As developer of the ridership and revenue estimate, Amtrak has provided the following description of its methodology to the States:

> "Ridership forecasts for proposed rail passenger corridor services are prepared using a "National Corridor Model" developed by AECOM for Amtrak and various states for corridor passenger rail forecasting throughout the U.S., including corridors in the Midwest. This "best practices" model was derived from several detailed models, surveys, and data, including:
>
> - Northeast Corridor Model (Amtrak – NEC area)

- Amtrak/Caltrans Model (Amtrak and Caltrans)
- Chicago-Milwaukee Corridor Model (Wisconsin and Illinois)
- Southeast Corridor Model (North Carolina, Virginia, South Carolina, Georgia, and Florida)

For purposes of ridership projections, the model evaluates proposed new passenger rail services based upon a number of variables including the following key inputs:

- Total Market Size – Population, employment and income of each market served
- Station Locations – Size of potential local/regional market(s) to be served
- Mode Share – Modal distribution of the existing transportation market
- Service characteristics of competing modes – auto, air, and bus
- Passenger Rail Timetable, providing departure/arrival times by train and station and thus defining:
  - Travel Time (duration of proposed trip)
  - Frequency (proposed number of daily round trips, i.e., travel options available to a potential traveler)
  - Schedule/Scheduling Attractiveness – Proposed scheduled departure and arrival times and time-of-day slots
- Average Fares, based on observed average yields per mile in existing Amtrak markets within the Midwest

When applicable, pertinent state and/or regional information may also be supplemented by national sources such as Moody's Economy in order to permit consideration of anticipated national trends in population, employment, and income.

4.19.2 Ridership Estimate Validation

During 2010, the States conducted a high-level passenger-rail ridership estimate for passenger rail routes in the Midwest that are described in Iowa's State Rail Plan. This includes the Program's Chicago-Iowa City corridor, as a component of the Chicago-Omaha corridor. These ridership estimates are described in the Iowa DOT 10-Year Strategic Passenger Rail Plan, which is attached to this Grant Application. The estimate process resulted in planning-level ridership and revenue forecasts for the Chicago-Iowa City corridor, with upper and lower probable boundaries for rail ridership.

The methodology used in the Iowa DOT 10-Year Strategic Passenger Rail Plan utilized a two-step approach. In the first step, a total number of person-trips between each origin and destination metropolitan city pair that had a proposed station stop was compiled from data supplied by Iowa DOT's statewide travel-demand forecasting model, which is called iTRAM. In order to account for the person-trips to and from the non-metropolitan station stops, a generalized number of person-trips were applied for each city-pair combination that included one or two non-metropolitan station stops.

In the second step, a rail mode share was applied to the person-trips to determine the potential rail demand. In order to determine the appropriate rail mode shares for a typical Midwestern state such as Iowa, two studies were consulted. The first was conducted by Cambridge Systematics, entitled "Minnesota Comprehensive Statewide Freight and Passenger Rail Plan," and dated July 2009. The second was conducted by Burk-Kleinpeter, Inc. and AECOM, entitled "Lake Charles to Meridian Corridor Development Plan," and dated June 2007. In the AECOM study, the rail mode shares were based on an intercity mode choice model that was calibrated to observed Amtrak data in the New Orleans-Atlanta and Mobile-New Orleans-Houston corridors. The Cambridge Systematics study used a more simplified method using the boarding and alighting data from Amtrak and apportioning those trips to Minnesota's Twin Cities by applying a range of factors that depended on trip distance.

The person-trips from the first step in the States' ridership study were multiplied by the lower- and upper-bound percent rail mode share to obtain estimated rail ridership between each city pair. The estimated city pair rail ridership volumes were then aggregated for each route to develop daily rail ridership volumes for each route. Using the above steps, a lower and upper bound daily ridership for each route was developed. These volumes were then converted to yearly ridership.

This same methodology was used to develop a high-level approach to forecast the upper and lower probable boundaries for this Program. Table 4.19-3 displays the planning upper and lower bound probable ridership for Year 2015 for Chicago-Iowa City.

Table 4.19-3: Year 2015 Planning Level Ridership Projections

Ridership	2015
Project Ridership – Lower Bound (Yearly)	135,400
Projected Ridership – Upper Bound (Yearly)	315,900

For comparison, the projected opening year ridership of 246,800 provided by Amtrak is contained within the bounds of the planning level ridership methodology used to develop ridership for the Iowa DOT 10-Year Strategic Passenger Rail Plan.

4.19.3 Revenue Methodology and Validation

Forecasted ticket revenues for 2015 were provided by the Amtrak Market Research Department. The average fares were based on observed average yields per mile in existing Amtrak markets within the Midwest. Food and Beverage Revenue were forecasted for food and beverage revenue based on the per rider average Food and Beverage revenue based on a comparable route. Amtrak recommended advancing revenues by 2.0 percent to match the

5 Public Benefits of the Service

5.1 Introduction

This section describes the public benefits that the Program is expected to deliver. These benefits include:

- economic impacts of construction projects necessary to construct, operate, and maintain the passenger service including jobs creation, spending of employee wages and salaries, and related economic-development benefits;
- creation of economic value from services provided to the traveling public, such as time spent in travel, reliability of travel, and cost of purchasing travel;
- creation of economic value from changes in externalized cost of transportation such as highway congestion, highway safety, highway maintenance, and air emissions;
- improvements in community livability through the establishment of transit-oriented development, reductions in transportation congestion, and improved access to transportation, particularly for the elderly, disabled, and people who cannot afford personal autos or airline transportation;
- improvements in sustainability through reductions in motor fuel consumption, air emissions including greenhouse gases, and reductions in capacity increases that would otherwise be required for airports and highways. This goal is more fully addressed in the "GreenLine" concept below.

The States' position is that public benefits are not an effect of the Program as much as they are the rationale for the Program. The Program's goal is ultimately to create a passenger-rail transportation system that is a tool that addresses the public needs identified in Section 1 of the Service Development Plan, is coherent with the public values and goals identified in Section 1, and enables the States to comprehensively improve transportation, sustainability, community livability, and economic development over the long term.

5.2 The "GreenLine" Concept and its Role in the Future of Iowa and Illinois

In 2009, the states of Illinois and Iowa committed to implementing green and sustainable principles into the Program and developed a vision statement. This application expands that vision into an approach to implement green and sustainable principles into the Program, including commitments from both communities and host railroads, BNSF and IAIS. Illinois DOT and Iowa DOT have termed this concept the "GreenLine."

There are multiple definitions of green and sustainable principles. Sustainability is the act of balancing the environmental, community, and economic needs of the built and natural environments for present and future generations.

Sustainability is inherent in the Program. Consistent with the Midwest Regional Rail Initiative (MWRRI), the Program connects Chicago's Union Station with other major population centers in the Midwest, in this case, the Quad Cities (Moline, Illinois) and Iowa City, using existing railroad right-of-way. These stations act as regional transportation hubs, that integrate commuter rail, light rail, bus rapid transit, bicycle and pedestrian trails as mobility options. The Program

adopted an incremental development approach (with Chicago to Iowa City as the first increment), pooling equipment and working with Amtrak as the service provider. This includes developing the corridors and service levels on a phased and incremental approach as the opportunities, ridership demands, and funding become available.

Illinois and Iowa are committed to implementing passenger rail service between Chicago and Iowa City that expands the green and sustainable principles to foster livable communities. Both states envision "GreenLine" principles relating to stations, such as: built in city centers; implementation of transit-oriented design (TOD) surrounding stations; connections to public transit, bicycle and pedestrian networks; connections to intercity bus "feeder" service; parking for bicycles; and solar charging stations/plug-ins for hybrid/electric vehicles (see "GreenLine" Approach). The stations at Moline and Iowa City are excellent examples of how local leaders are focused on making their communities more people-friendly. Specifically, Moline and Iowa City have committed to construction of the stations to LEED standards, connection to multi-modal transportation, sustainable construction practices, waste recycling, stormwater management, water conservation, and an integrated team design practice that incorporates public input. In addition, as final design proceeds, these communities will consider sustainable practices such as permeable paving, solar panels, wind turbines, and green roofs.

The States will seek to incorporate into equipment design and operation to the greatest degree possible their goals for sustainability and reduction of environmental impacts per their "GreenLine" approach. Integration of equipment has been established by Agreements in Principle (AIPs) between the members of the MWRRS. Illinois and Iowa DOT are members of the Next Generation Equipment Committee (NGEC) as established by Section 305 of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA). Rolling stock purchased for this Program will be compatible with NGEC committee recommendations and the MWRRS, and like all MWRRS equipment, will be capable of 125-mph operation. Illinois and Iowa DOT serve on the Executive Committee for the NGEC with a focus on the Technical Subcommittee. The NGEC provides a forum for exploring potential new technologies that are compatible with the "GreenLine" approach of the Program. Iowa is participating on the Locomotive group of the Technical Subcommittee in order to pursue the development of fuel efficient, environmentally responsible locomotives that will be helpful in achieving the "GreenLine" vision. Another benefit that Illinois and Iowa have by serving on the NGEC Executive Committee is their participation in the development of equipment procurement strategies that will ultimately provide benefits in the purchase and operation of a pool of equipment for the MWRRS.

5.3 Return on Public Investment of the Program

The Program creates broad-based public benefits such as reductions in greenhouse gases, highway congestion, and highway maintenance costs; improvements in highway safety, and user benefits such as improved access to transportation, improved reliability of transportation, and lower transportation costs. These benefits were calculated and monetized through a formal benefit-cost analysis process that is described in Appendix B, "Benefit-Cost Analysis of the Chicago-Iowa City High-Speed Intercity Passenger Rail Program." This analysis adheres to guidance issued by USDOT and FRA, and calculates the net present value of the benefits using a seven percent discount rate over a 30-year period after initial service implementation.

The Program will contribute to passenger diversions from personal vehicles and highway miles, reduction in greenhouse gases, and improvement in cross-modal transportation within communities. Projected cross-modal impacts of the Program include, for the 30-year time horizon calculated:

1. 25.6 million annual passenger-miles removed from the Iowa and Illinois highway systems;
2. 10.8 million gallons less petroleum fuel consumed; and,
3. 89,943 tons reduction in greenhouse gas emissions (CO2).

Net public benefits are estimated at $263.2 million over the 30-year time horizon at a 7 percent discount rate, or a benefit-cost ratio of 1.70 percent.

The Program would divert travelers that would otherwise use personal automobile, scheduled airline service, or scheduled intercity bus service, as well as provide transportation growth capacity and capability for passengers that otherwise would have no viable transportation choice. The projected diversion rates are 67 percent from personal vehicle, 24 percent from air, and 9 percent from bus.

Current schedule airline options primarily consist of 50- or 70-passenger regional jets or turboprops. Each planeload diverted to rail enables reallocation of a newly required or existing landing/takeoff slot at Chicago O'Hare International Airport or Chicago Midway Airport to a long-haul air route or a regional airport not served by high-speed rail. Expansion of airport capacity and improvement of air services reliability is a goal of the City of Chicago, and the Chicago metropolitan area counties. In 2009, in terms of delays in the U.S., O'Hare was the 12th worst airport.

Personal vehicle and bus diversion enables avoidance of highway congestion in Chicago, and enables reduction in future highway transportation demand that would increase congestion. The Program is estimated to generate a highway congestion benefit of $16.3 million dollars, based solely on reduction in travel time for passengers who choose rail instead of highway. The capital costs of any congestion-capacity relief projects that the Program helps forestall are in addition to this benefit. The Program will provide increased safety benefits by diverting passengers from highways to rail. The Program is estimated to generate a safety benefit of $7.4 million dollars based on a 7 percent discount over 30 years.

At a local level, the Program generates cross-modal benefits at Moline and Iowa City. The Moline station is adjacent to the existing Moline Centre Station. This facility is the hub of the Quad Cities bus system and long-distance buses serving the Quad Cities, and will provide connectivity to proposed future commuter rail and ferry operations. At Iowa City, the station is located in the heart of downtown within easy walking distance to the University of Iowa and the local bus system. Amtrak Thruway bus service may be instituted from Iowa City station to Des Moines, to downtown Cedar Rapids, and to the Eastern Iowa Airport.

5.4 Jobs Creation and Economic Impact of the Service

The Program creates economic impacts through the construction of the infrastructure projects necessary to implement the service and acquisition of the equipment necessary to operate the service, and continuing through the operation and maintenance of the trains, stations, and maintenance facilities, along with additional infrastructure maintenance for tracks, signals, and communications systems. These benefits were calculated and monetized through a formal economic-impact analysis process that is described in Appendix C, "Economic-Impact Analysis of the Iowa Portion of the Chicago-Iowa City High-Speed Intercity Passenger Rail Program", and Appendix D, "Economic-Impact Analysis of the Illinois Portion of the Chicago-Iowa City High-Speed Intercity Passenger Rail Program." These analyses adhere to guidance issued by USDOT and FRA, and calculate jobs creation, and direct, indirect, and induced economic impacts using the IMPLAN economic impact software model.

Economic impacts of the Iowa portion are estimated as follows:

- 860.0 job-years (one job lasting one-year during the construction period
- 31.3 job-years during each year of operation of the passenger service
- $125.8 million in additional business output during construction, and $6.8 million annually during operation
- $57.9 million in value added to the economy during construction, and $3.2 million annually during operation
- $42.2 million in employment income during construction, and $1.8 million annually during operation (all values in 2010 dollars).

Economic impacts of the Illinois portion are estimated as follows:

- 1,517.4 job-years (one job lasting one-year during the construction period
- 84.7 job-years during each year of operation of the passenger service
- $215.3 million in additional business output during construction, and $18.3 million annually during operation
- $97.9 million in value added to the economy during construction, and $8.7 million annually during operation
- $72.2 million in employment income during construction, and $4.9 million annually during operation (all values in 2010 dollars).

These outputs of the Program compare to the estimated Iowa operating and maintenance subsidy of $3.44 million in 2010 dollars, and the Illinois subsidy of $9.31 million in 2010 dollars.

5.5 Contribution of the Service to Livable Communities

Inherently, this Program contributes to livable communities by connecting high speed rail, intercity rail, commuter rail, light rail, bus rapid transit, pedestrian and bicycle trails, and even water taxi. The communities of Moline and Iowa City plan to employ an integrated team (including civil engineers, urban design architects, landscape architects, urban planners, and environmental staff) to design the station facilities and surrounding integrated mobility options. Public input could be collected during design charettes. The ultimate goal is to create a zone

that favors pedestrians and bicyclists; respects the neighborhood fabric; creates a walkable, lively mix of uses and activities near transit; and increases density closer to the station.

In Moline, the Amtrak station would be located within the Green Enterprise Zone (GEZ), an innovative concept focused on achieving energy efficiency and deploying advanced renewable energy systems in an area targeted for sustainable economic development. Through partnerships between local government, non-profits, academic institutions, and the private sector, the GEZ is a model for how to link energy innovation to economic development and provide companies with opportunities to differentiate themselves by locating in a setting powered by on-site green energy systems. The Rock Island County Metropolitan Mass Transit District (MetroLINK), along with the City of Moline, is planning to construct an Amtrak station as an expansion of the existing Centre Station bus terminal in downtown Moline. Centre Station is the hub for eight local bus routes; paratransit routes; routes to Davenport and Bettendorf, Iowa; the Channel Cat Water Taxi; and intercity bus. Bicycle trails are also identified on 7th Street, 11th Street, 14th Street. Two regional express bus services are planned for the metropolitan area, which would also stop at Centre Station. Centre Station is located in the central business district of Moline and near entertainment venues, office complexes, and tourist attractions. In anticipation of the arrival of Amtrak service, MetroLINK and the City of Moline developed The Quad Cities TOD + Intermodal Plan, completed in 2009. The Plan features transit-oriented development that facilitates development of additional rail transit and linkages to other transportation modes. It also anchors the development of the immediate station area, the TOD area, and the downtown area. The goals of the TOD Plan include creating the GEZ that favors pedestrians and bicyclists; respecting the neighborhood fabric (that is, personal mobility, reuse of historic buildings); creating a walkable, lively mix of uses and activities near transit; and increasing density closer to the station. The TOD Plan includes an implementation strategy with specific action items in order to realize this vision.

Iowa City is planning a smart growth approach for the Riverfront Crossings District. The City envisions transforming Riverfront Crossings into a walkable, transit-friendly neighborhood that features a mix of housing, storefront retail and office space, entertainment and recreational facilities, and public open space and trails. The Riverfront Crossings area is currently the focus of significant community interest, not only because of its close proximity to downtown Iowa City and the University of Iowa campus, but also because of the potential introduction of Amtrak passenger rail service linking Iowa City and Chicago; possible future light rail service from the area through the heart of the University of Iowa campus and downtown Iowa City to Coralville, and eventually North Liberty and Cedar Rapids; discussions about relocating the Hancher / Voxman / Clapp performing arts facilities to this area; as well as a desire to reclaim the riverfront in response to recent flooding. The Amtrak station in the Riverfront Crossings District is proposed to be located at the Old Rock Island Depot and located on the south side of the Iowa City's Downtown District and the University of Iowa campus. This station site is four blocks from the Court Street Transportation Center, which provides local and regional bus service. As previously discussed, Amtrak Thruway buses could be instituted from Iowa City station to Des Moines, to downtown Cedar Rapids and to the Eastern Iowa Airport.

5.6 Environmental Sustainability of the Service

As discussed in the sections above, Iowa DOT and Illinois DOT, in partnership with the communities to be serviced, are committed to a sustainable transportation service. The re-introduction of passenger rail service between Chicago and Iowa City is the product of an extensive multi-state planning effort, that includes Illinois and Iowa state rail plans, Iowa's 10-Year Strategic Passenger Rail Plan, and the regional planning for the Chicago Hub Network high-speed rail by the MWRRI. The planning for this service includes the capability to expand the service to include new communities, increase the frequency of the service from 2 round trips per day to five round trips per day, and increase the speed from 79 mph to 90 mph and potentially even 110 mph.

The new passenger rail service takes full advantage of the inherent efficiency of rail service and will reduce average annual vehicle miles traveled by approximately 25.6 million miles, and will reduce average annual fuel use by approximately 10.8 million gallons. The new service will deploy state-of-the-art equipment identified by the Next Generation Equipment Committee. In addition, as described in the "GreenLine" discussion attached to the Grant Application, Iowa and Illinois DOT are evaluating the use of sustainable fuels, such as bio-diesel, which has already undergone substantial field testing on the IAIS system, as well as many other sustainable concepts. The communities that will be served have incorporated the new service into their plans to enhance the livability of their communities. Moline is connecting the new station to the City's Centre Station transportation hub and is making it part of their Green Enterprise Zone, Iowa City has integrated the rehabilitated station into their long term smart growth Riverfront Crossings District.

As demonstrated by Illinois DOT's 39 year history of providing passenger rail subsides and in the Iowa DOT 10 Year Strategic Passenger Rail Plan the states are committed to realizing and sustaining the environmental benefits of the new service. The new passenger rail service will provide environmental, economic, and transportation benefits for generations to come.

6 Program Delivery Plan

The states of Iowa and Illinois have partnered to develop and deliver the Chicago to Iowa City High Speed Intercity Passenger Rail Program under the guidelines established by the High Speed Intercity Passenger Rail Act. The route traverses three host railroads (Amtrak, BNSF Railway, and Iowa Interstate Railroad), spans two states (Illinois and Iowa), and establishes new stations at two cities in Illinois and one in Iowa. The combination of multiple government jurisdictions with multiple private partners places a premium on coordination and integration of the overall program during design, construction, commissioning, and operation.

With support from their respective state legislatures and governors, the project co-sponsors are the Iowa Department of Transportation (DOT) Office of Rail Transportation and the Illinois Department of Transportation Bureau of Railroads. The two states have agreed that the Iowa Department of Transportation (DOT) will be the lead agency for Program implementation. The two states, together, comprise the Program Management Team (PMT), which is described in more detail in the Program Management Plan in the Grant Application.

6.1 General Approach of the States of Iowa and Illinois

The complexity of the project and the multiple partners involved requires an integrated approach toward project delivery. Contracts for design and construction will be structured in a logical manner to ensure coordination of not only the design and performance of related elements of work, but also coordination of the construction schedules, a critical consideration for a Program of his magnitude with many interrelated elements of work let under separate contracts.

Certain portions of the infrastructure are wholly within a given state, and the respective state DOT will be responsible for those improvements. However, Iowa DOT will be responsible for overall Program implementation and for portions of the Program which span jurisdictional boundaries. For example, Iowa DOT (working closely with Illinois DOT) will be responsible for equipment acquisition, negotiation of final agreements with the Iowa Interstate Railroad, and integration of Positive Train Control across the entire system; in each of these examples there are few physical improvements in any single state, while economies of scale, in addition to systems integration considerations, favor a unified approach under a single contract.

6.2 Project Schedule and Phasing

The Program has been divided into six major elements, including:

- Agreements
- Tier 2 NEPA/Preliminary Engineering
- Final Design
- Construction
- Acquisition of Rolling Stock and Testing
- Operations

The overall Program implementation schedule is illustrated below (Table 6.2-1). It is based on a Notice of Selection in September 2010 and an Award being issued in first quarter of 2011. Details of the elements of work (individual projects) listed in the schedule are explained elsewhere in the Grant Application.

While many aspects of the Program are self-explanatory, note that the equipment acquisition process commences almost immediately, since rolling stock is likely to be a long lead-time item. Also, note that there is an extensive testing phase that begins when rolling stock is delivered and the complete system is available for testing (e.g., rolling stock, track and signal upgrades, positive train control system), which is anticipated in the first quarter of 2015. This testing phase is intended to not only test the recently delivered equipment, but also to test the overall operating system, to train crews and dispatching staff, establish operating patterns in conjunction with the freight railroad hosts, and to identify any issues early-on, while there is still time to resolve such issues.

Depending upon funding availability and the progress of agreements with the host railroads and Amtrak, there is the potential to start some of the railroad rehabilitation activities (e.g., tie renewal on the Iowa Interstate Railroad or upgrade of the less complex grade crossing warning devices) earlier in the overall project timeline. If agreements are in place, some of the rehabilitation contracts could be accelerated, with potential start dates in early- to mid- 2012.

To allow such early-start activities, both DOTs have procured professional consulting services to allow environmental documentation, design, and contract document development to commence immediately. Since such a modification to the Program schedule would result in significant construction activity (and expenditures), impacts of such changes on the overall Program, and especially the cash flow, would have to be addressed. However, if environmental, contractual, and cash flow considerations allow these projects to commence earlier, the reduction in cost inflation for such projects would help to reduce the overall cost of the program (in today's dollars).

Table 6.2-1: Program Implementation Schedule

	2011				2012				2013				2014				2015			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Section 1: Agreements																				
Host Railroad Agreements																				
Operator Agreements																				
Agreements with Cities																				
Section 2: Tier 2 NEPA/PE																				
Illinois Track Improvements																				
Iowa Track Improvements																				
Illinois Train Control & Comms																				
Iowa Train Control & Comms																				
Geneseo, Illinois, Station																				
Iowa City, Iowa, Station																				
Moline, Illinois, Station																				
Iowa City, Iowa, Layover Facility																				
Colona, Illinois, Improvements																				
Rock Island, Illinois, Yard Bypass																				
Wyanet Connection																				
Eola Yard Improvements																				
Section 3: Final Design																				
Illinois Track Improvements																				
Iowa Track Improvements																				
Illinois Train Control & Comms																				
Iowa Train Control & Comms																				
Geneseo, Illinois, Station																				
Iowa City, Iowa, Station																				
Moline, Illinois, Station																				
Iowa City, Iowa, Layover Facility																				

	2011				2012				2013				2014				2015			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Colona, Illinois, Improvements																				
Rock Island, Illinois, Yard Bypass																				
Wyanet Connection																				
Eola Yard Improvements																				
Section 4: Construction																				
Illinois Track Improvements																				
Iowa Track Improvements																				
Illinois Train Control & Comms																				
Iowa Train Control & Comms																				
Geneseo, Illinois, Station																				
Iowa City, Iowa, Station																				
Moline, Illinois, Station																				
Iowa City, Iowa, Layover Facility																				
Colona, Illinois, Improvements																				
Rock Island, Illinois, Yard Bypass																				
Wyanet Connection																				
Eola Yard Improvements																				
Section 5: Rolling Stock																				
Develop Specifications/Order																				
Testing																				
Section 6: Operations																				
Operations																				

6.3 Program Management Plan and Project Financial Plan

A Project Management Plan (PMP) and a Financial Plan (FP) were developed for this Program and are attached separately to this Grant Application. The PMP serves as an overview of Iowa DOT and Illinois DOTs approach to planning, monitoring, and implementation of the projects. The PMP addresses the following topics:

- Staff organization including relationships, responsibilities, job descriptions, and job qualifications
- Budget covering project management, consultants, property acquisitions, utility relocations, audits, and miscellaneous payments the recipient may be prepared to justify
- Document control procedures and recordkeeping system
- Change order procedure that includes a documented, systematic approach to handling the construction change orders
- Construction phase organization structures
- Quality control and quality assurance functions, procedures, and responsibilities for construction, system installation, and integration of system components.
- Material testing policies and procedures
- Internal plan implementation and reporting requirements
- Testing and operational system criteria and procedures
- Periodic plan update procedures

The FP is a document that addresses the Iowa DOT and Illinois DOT's approach toward managing the financial resources necessary to deliver the program. The FP addresses the following topics:

- General Components
  - Legal and Necessary Authority to Accept and Spend Federal and Non-Federal Funds
  - Financial Stability of Project Sponsors and Key Contributors
  - Program Funding Commitments and Budgets
  - Financial Plan Standards

- Capital Financial Plan
  - Cost Estimate
  - Implementation Plan
  - Financing and Revenues
  - Cash Flow
  - Risk Identification and Mitigation

- Operating Financial Plan
  - Operating Forecast
  - Capital Replacement Forecast
  - Financing and Revenues
  - Cash Flows
  - Risk Identification and Mitigation

6.4 Approach to Fulfilling Specific FRA Requirements

The Notice of Funding Availability includes several specific procurement requirements.

6.4.1 DBE Requirement

The Iowa and Illinois DOTs may set DBE goals for individual contracts let under the Program in compliance with the FRA funding grant requirements and with requirements associated with the state matches. Where work is being administered by an outside agency (such as a municipality) or railroad (such as Iowa Interstate Railroad), the outside agency or railroad is responsible for ensuring the contracted Commitment is met. Contingent to execution of a design or construction contract, the Program Management Team will assure that commitments made to DBE participants are fulfilled. As work progresses, DBE performance will be measured as a ratio of total dollars paid to all DBEs and the total contract value (including any subsequent contract modifications). The DBE performance data will be submitted to the respective DOT Civil Rights Divisions for compliance assurance by each individual contract and subsequently cumulated by the divisions to FRA for compliance review.

In some cases, the States have developed streamlined reporting methods for submittal of general Federal reports. For example, the Illinois DOT has created an online portal to facilitate direct entry of DBE performance figures. The PMT will perform audits to assure compliance with each respective State's DBE programs and the DBE programs run by outside agencies and railroads.

Iowa DOT's policy is that Disadvantaged Business Enterprises (DBE) and Targeted Small Business (TSB) as defined in 49 CFR Part 26 shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with federal funds. For the individual work projects the DBE goal will be determined based on the actual dollar amount and the availability of DBE firms to conduct the work. A list of certified DBE firms may be found at http://www.dot.state.ia.us/contracts/contracts_eeoaa.htm. A list of TSB firms may be found at https://dia.iowa.gov/tsb/.

6.4.2 Davis-Bacon Requirement

The Davis-Bacon Act is a federal mandate assuring that payments for trades performed on federally funded construction projects shall meet or exceed prevailing wages for a given locality. These prevailing wage determinations are categorized by construction type, e.g. civil / heavy highway, and further defined per county. The PMT will administer construction contracts in accordance with Davis-Bacon provisions. Prevailing wage payment compliance will be part of the PMT's regular review of certified payroll reports submitted by prime and sub-contractors. For verification purposes, these reports will contain employee information and appropriate prevailing wage rate.

Prevailing wage determinations are updated by the Department of Labor with varying frequency, and as such, the terms of the Act require these wages are honored as payable minimum rates throughout the duration of the contract. If prevailing wages are not attained through previously contracted work due to an update to the regional determination, the PMT will facilitate a Change

Order payable by the respective state to assure the difference in contract values is properly compensated in accordance with the Act.

6.4.3 Buy America Requirements

In general, it is anticipated that very few items will require Buy America waivers and that the overall value of those items is comparatively low. A major exception is rolling stock; while several manufacturers have expressed interest in establishing rolling stock manufacturing capabilities, no new passenger cars have been recently manufactured in the USA.

The Interim Guidance on HSIPR projects filed in the Federal Register by the FRA asserts that projects must comply with the Buy America requirements as determined in 49. U.S.C. §24405(a) and ARRA Section 1607. In general, these requirements apply to "all iron, steel and manufactured goods used" for projects in excess of $100,000, and certification would be provided by the prime contractor for each work performed.

Where materials or equipment are either unavailable for purchase within the United States and/or demand a significant price premium, Buy America Waivers may be submitted to and subsequently determined by the Secretary or FRA Administrator if one of the following conditions apply:

- The low domestic bid/proposal for the end product is 25 percent more than the low foreign bid/offer;
- The item(s) being procured are not available in the U.S.;
- There is a public interest in waiving the national policy embodied in the Buy America provisions.

Because the waiver solicitation process may be lengthy, if Buy America waivers are needed, the PMT will work with prime contractors to facilitate such waiver applications to the FRA to mitigate delay.

6.5 Agreements with Responsible Stakeholders

To establish and maintain the service, there will be multiple agreements with stakeholders. There are three categories of these agreements, the first are the agreements between public agencies, such as the two DOTs and the Federal Railroad Administration (FRA) for funding, implementation, and provision of service, the second are the construction agreements with the public stakeholders, and the third are the operating agreements with the railroads.

6.5.1 Agreements between Public Agencies

The Illinois DOT and the Iowa DOT have an established Memorandum of Understanding and Agreement in Principle for corridor development activities. This MOU and AIP will be strengthened by a formal Project Sponsor Agreement between the two DOTs for implementation of the Program and ongoing operations. The Iowa DOT will be the recipient of funds, will be responsible for disbursing funds among the other agencies, and will be responsible for fulfilling reporting requirements.

The Notice of Funding Availability (NOFA) outlines the requirements the FRA has established for the service; the detailed provisions therein will not be repeated here. However, it is important to note that the FRA will be an active stakeholder in the service and has the obligation to ensure that the Program Management Team (PMT) is a suitable steward for the federal funds invested in the service.

The PMT has reviewed and understands the obligations accepted by recipients of the federal funds as described in the NOFA.

A primary consideration for the agreements with the FRA is the match to the federal funding and issue of independent funding of ongoing operating costs. The Program Management Team recognizes that there is a 20% match required for the funds provided by the FRA. The requirement for a 20% match will be included in the flow-down provisions to any outside agencies that contract for services under the Program, the primary example of which will be the stations. For each station, the respective Cities have signed agreements in principle (attached) to fund the 20% match and to fund ongoing station operations and maintenance costs. The PMT also understands that cost overruns must be funded by the PMT itself. As a demonstration of their financial commitment to the Program, the state legislatures of both Iowa and Illinois have already established funding mechanisms for the 20% match.

6.5.2 Construction Agreements

The agreements for construction between the PMT and outside entities (such as host railroads or cities) will define the scope, schedule, and budget of the proposed improvements, and define the ownership of the resulting assets. In situations where construction results in assets owned by an outside entity, such as a city or a railroad, the relevant agreement will provide for ongoing use and access of the improvements for the benefit of the Program.

6.5.3 Operating Agreements

The agreements between Amtrak and the host railroads for operation of Amtrak trains are known as “Operating Agreements.” These agreements are in fact contracts for provision of railroad operation and, in some cases maintenance services, by one railroad (the “host” railroad) for the benefit of another railroad.

To the extent that new language is required, the PMT would be involved with the operating contracts between Amtrak and the host railroads. The content of these agreements has the potential to affect the quality and cost of the service, and the PMT will be involved to ensure that the desired outcomes for the service will be achieved, costs will be controlled, and the relevant contractual provisions between the PMT and Amtrak flow-down to the host railroads. A new operating agreement will have to be established between Amtrak and Iowa Interstate Railroad, and the existing agreement between Amtrak and BNSF modified to include this service. Note that Amtrak is also considered a host railroad for the trackage, maintenance facility, and passenger facilities at Chicago Union Station (CUS), and the PMT will contract directly with Amtrak for services at CUS.

The operating agreements will also include contracts between the DOT(s) and a railroad. For example, as lead agency, Iowa DOT will negotiate a contract for operations with Amtrak. This

contract would include an agreed-upon level of service, schedule of trains, maintenance of equipment and the establishment of operating agreements with the host railroads.

The contract between Iowa DOT and Amtrak will ensure that the assets (such as railcars and locomotives) acquired under the Program are properly maintained, and that the PMT can provide continuing oversight to ensure contractual requirements are met. The equipment purchased by this Program may be pooled with other equipment purchased for the Midwest Regional Rail System (MWRRS). The contract between Iowa DOT and Amtrak will provide for control of the passenger equipment acquired and owned by the Program to ensure that the equipment is used to provide services only for the Program or for other MWRRS corridors, and that the equipment does not become "lost" in the larger nationwide pool of equipment. If the Program equipment is used for other MWRRS corridors, a procedure will be established to track maintenance and inspection of the equipment and to protect the Program's investment.

The PMT already has experience establishing agreements for rail service and infrastructure improvements. For example, both Iowa and Illinois have existing rail programs within their respective DOTs, and the Illinois DOT has already participated in funding several Amtrak services. In addition, to help ensure the desired outcomes, the PMT has already familiarized itself with arrangements between other agencies and Amtrak for the provision of service, including such considerations as control and maintenance of equipment; provision of ticketing services for passengers and revenue management; liability; costs of provision of service; reporting requirements; and oversight of service. These other agreements will serve as useful examples for establishing the Program. In addition, the FRA's documentation and guidance for establishing railroad operating agreements will be incorporated in the operating agreements for the Program.

The operation and maintenance contracts would also include agreements between the PMT and recipients of construction funds under the Program to ensure that the level of utility contracted for is actually maintained. Examples of such arrangements include the agreement between the PMT and the Iowa Interstate Railroad for maintenance of the track rehabilitated under the Program to ensure that the level of utility established by the Program is maintained.

The agreements that are expected to be part of this Program include:

- **FRA/Illinois DOT/Iowa DOT** – These agreements will cover the terms of the grant of funds from FRA to the DOTs, including the 20 percent match requirements and the requirement that the FRA grant not be used for operating expenses.
- **Illinois DOT/Iowa DOT** – Illinois DOT and Iowa DOT entered into a Memorandum of Understanding (MOU) in 2009 for the implementation of rail passenger service in their respective states. The states agree to share costs and to support funding applications per the Iowa/Illinois Cost Sharing MOU included in the application. In addition, a subsequent Agreement in Principle has been established between Iowa and Illinois DOTs, included in this application. This will be used as the basis for the Project Sponsor Agreement, which establishes the single grantee for funds from the FRA.
- **Iowa DOT/Illinois DOT/IAIS** – IAIS, Iowa DOT, and Illinois DOT have entered into an AIP in support of this application. Both the Iowa DOT and Illinois DOT will enter into

agreements with Iowa Interstate Railroad for provision of two round-trips daily between Chicago and Iowa City. IAIS will act as a host railroad for portions of the corridor. This agreement, or a separate agreement between the parties, would provide for improvements on the IAIS Railroad necessary for the implementation of service.

- **Iowa DOT/Illinois DOT/BNSF** – BNSF has signed an Agreement in Principle. BNSF is aware that the Program consists of two round-trips daily between Chicago and Iowa City and that BNSF would act as a host railroad for portions of the corridor. An agreement, or a separate agreement between the parties, would provide for improvements on the BNSF Railway necessary for the implementation of service.
- **Amtrak/Iowa DOT Agreement in Principle** – Amtrak and the Iowa DOT have entered into an AIP in support of this application. Amtrak agrees to provide two new passenger rail round-trips per day between Chicago Union station and Iowa City.
- **Amtrak/IAIS Operating Agreement** – This agreement is not required for this application. An Operating Agreement will be negotiated after Chicago to Iowa City is identified for funding.
- **Amtrak/BNSF Operating Agreement** – A new agreement between Amtrak and BNSF is not required for this application. The existing Operating Agreement will be updated after Chicago to Iowa City is identified for funding.
- **Amtrak/ILDOT Operating Agreement** – A new agreement between Amtrak and Illinois DOT is not required for this application. The existing Operating Agreement will be updated after Chicago to Iowa City is identified for funding.
- **Iowa DOT/City of Iowa City Agreement in Principle** – The Iowa DOT has entered into an AIP with the City of Iowa City. The City will be required to fund its portion of the match for the construction or rehabilitation of a station, along with all ongoing station maintenance and operations costs.
- **Illinois DOT/Moline Agreement in Principle** – The Iowa DOT has entered into an AIP with the City of Moline. The City will be required to fund its portion of the match for the construction or rehabilitation of a station, along with all ongoing station maintenance and operations costs.
- **Illinois DOT/City of Geneseo Agreement in Principle** – The Illinois DOT has entered into an AIP with the City of Geneseo. The City will fund its portion of match for construction of a new station, and all of the ongoing station maintenance and operations costs.
- **City of Geneseo Resolution** – The City of Geneseo passed a resolution supporting passenger rail service between the Quad Cities and Chicago. Geneseo is a possible station location and the City offers full support for the effort to restore passenger rail service between Quad Cities and Chicago.

6.6 Contracting Methods and Means

The Program Management Team will employ contracting means and methods that are compliant with applicable laws and regulations. In general, there are two broad categories of contracts involved with this Program. The first category includes construction and acquisition contracts let by public agencies, while the second category includes construction contracts let by a railroad.

6.6.1 Contracts Let by Public Agencies

There are two categories of construction and acquisition contracts. The first category includes the contracts let directly by a public agency on the team (e.g., Iowa DOT, Illinois DOT, or a municipality) for goods or services. Examples of such contracts include acquisition of passenger cars and locomotives (by Iowa DOT), station rehabilitation (by the respective cities), or construction of the layover facility at Iowa City/Coralville (by Iowa DOT). The public procurement contracting methods for these projects are generally well known, and each of these agencies is experienced in letting such contracts. The Program Management Team will work with stakeholder agencies (particularly the cities responsible for the station contracts) to ensure procurement requirements are followed and flow-down provisions are addressed. The PMT will also oversee reporting and will be responsible for ensuring the reporting requirements of Section 6.4 of the Notice of Funding Availability are met.

In addition, for construction projects carried out by an agency on or immediately adjacent to a railroad, the safety and engineering requirements of the affected railroad (if any) would also have to be included in the contractual language between the agency and the construction contractor.

6.6.2 Contracts Let by a Railroad

The second category of construction contracts is those let by a railroad for work benefitting a public agency. An example of such a contract would be the contract for work at Eola Yard on the BNSF Railway. Historically, BNSF lets its own contracts for design and construction for work on its property. This pattern will likely continue for the Program. In this example, the DOT would contract with BNSF for the complete project and establish scope of work, schedule milestones, budget, and outcomes. BNSF would, in turn, contract with design and construction firms under a procurement strategy that complies with the applicable laws and regulations that “flow-down” from the FRA, through the PMT, and on to BNSF.

However, for contracts let by a railroad, the PMT will provide oversight and assistance to ensure that applicable federal requirements are met, including the requirements from the Federal Railroad Administration and the funding legislation, including, as applicable, PRIIA, and the FY2010 Appropriations Act. The PMT will also provide independent inspection to verify that the contracted services are performed in a quality manner and that the desired outcomes of an individual project are achieved. The PMT will also ensure that the appropriate documentation is made by the railroads and consolidate such documentation to comply with the reporting requirements identified in Section 6.4 of the Notice of Funding Availability.