

INTERSTATE 80 PLANNING STUDY (PEL)

Modal Options

Office of Location and Environment | June 2017



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1. EXECUTIVE SUMMARY

The Iowa DOT is conducting a long-range planning study of the rural portions of I-80 in Iowa. This study is being conducted using the federally adopted Planning and Environmental Linkage (PEL) Study process. As such, the study's findings can be referenced by subsequent environmental and engineering studies for the implementation of the recommended improvements. The goal of the PEL Study is to identify the best long-term vision for improving the I-80 Corridor, extending from Council Bluffs to the Quad Cities. This will enable near-term improvements to be planned, designed and constructed in accordance with the long-term plan, as funding allows.

As travel within the Corridor is currently impacted by a combination of transportation systems, including highways, rail, waterways and other modes of travel, in addition to improving I-80, an assessment of non-Interstate improvement strategies is needed. A system-wide assessment can identify the interactions between the various modal systems and opportunities for coordination with the planned I-80 improvements. The purpose of this technical memorandum is to evaluate the various alternative modal strategies that could affect the I-80 improvements and to identify what additional coordination should be included in the I-80 planning process.

The intent of the modal study is not to assess how investments in alternative modal strategies could be made in lieu of improvements to I-80, but rather how these modes could complement each other, improve the total system's performance, and be integrated with the future vision of the I-80 improvements. The study approach, therefore, entailed identifying the existing and planned system for each alternative mode; evaluating the potential impacts to the I-80 infrastructure; and providing recommendations for further coordination with I-80. The purpose of this study is not to assess the relative merits of any future investments in these alternative strategies.

Table 1, on the following page, presents a summary of the recommendations from the I-80 modal analysis.



The vast majority of the travellers across central Iowa, either freight or passengers, utilize the I-80 corridor.

Table 1: MODAL EVALUATION SUMMARY

Existing & Planned Systems	Potential Impact on I-80	I-80 Recommendations
Intercity Passenger Rail/High Speed Rail		
<p>A Tier I Environmental Impact Statement was completed, executed and released in May 2013, entitled <u>Chicago to Council Bluffs – Omaha Regional Passenger Rail System Planning Study – Tier I Draft EIS</u>. The Iowa DOT has been planning for new intercity passenger rail service between Chicago and Council Bluffs/Omaha. AMTRAK currently provides long passenger rail service in Iowa via the California Zephyr. No HSR service is currently planned in Iowa.</p>	<p>The proposed Chicago-Quad Cities-Iowa City-Des Moines-Council Bluffs/Omaha intercity passenger rail project would not measurably affect the need to improve I-80. The Chicago to Council Bluffs/Omaha alignment, using existing freight rail lines, would cross I-80 in several locations.</p>	<p>Evaluate the proposed intercity passenger rail service for project crossings of I-80 for potential opportunities to jointly develop and coordinate the rail and I-80 improvements at the crossing locations.</p> <p>Based on the fiscal constraints and limitations of other HSR technologies, such as Maglev, utilizing existing rail lines and associated higher speed trains would best meet the needs and potentially available funding for the project.</p>
Commuter Rail		
<p>A future potential passenger rail network in Iowa has been identified in the <u>Iowa Railroad System Plan</u>. A planning study, entitled <u>Iowa City-Cedar Rapids Passenger Rail Conceptual Feasibility Study</u>, investigated new commuter rail service between Iowa City and Cedar Rapids. Commuter rail service is currently not in operation in Iowa.</p>	<p>New commuter rail service within the future potential rail network would not affect rural I-80.</p>	<p>None.</p>
Over-the-Road Bus		
<p>Burlington Trailways currently provides regional bus service in Iowa.</p>	<p>Existing and future potential expansion of regional bus service would not affect I-80.</p>	<p>None.</p>
River Freight		
<p>The Mississippi and Missouri Rivers, as identified in the Iowa State Freight Plan, currently serve river freight in Iowa.</p>	<p>Potential future investments in Iowa's waterways would not affect the need for improvements along I-80.</p>	<p>None.</p>

<i>Air Freight</i>		
The <i>Iowa State Freight Plan</i> identifies existing air freight services in Iowa.	Potential future expansion of freight aviation services would not affect the need for improvements along I-80.	None.
<i>Existing & Planned Systems</i>	<i>Potential Impact on I-80</i>	<i>I-80 Recommendations</i>
<i>Rail Freight</i>		
The <i>Iowa State Freight Plan</i> identifies the existing freight rail network in Iowa.	Potential future expansion of the privately owned rail facilities would complement improvements to I-80.	None.
<i>Park and Ride</i>		
<i>Iowa Park and Ride System Plan</i> identifies existing and future potential park and ride facilities in Iowa.	Several future potential park and ride facilities are located along rural I-80.	Evaluate new park and ride facility opportunities, as included in the statewide plan, as part of the rural I-80 improvement planning.
<i>Paratransit</i>		
Paratransit services for disabled and elderly Iowa residents are currently provided, as indicated in the <i>Iowa Statewide Passenger Transportation Funding Study</i> .	Existing and future potential expansion of paratransit services would not impact I-80.	None
<i>Trails</i>		
The existing and planned trail network in Iowa is defined in the <i>Iowa Trails 2000 Study</i> and is currently being updated.	Improved and expanded trails in Iowa would not affect the need to improve I-80. Several existing or planned trails cross rural I-80.	Future improvements to rural I-80 need to be coordinated with local planning partners for impacts to existing and planned trail improvements at crossing locations.
<i>Special Generator Services</i>		
A statewide plan for special generator transit services was not identified. Special events were considered as part of the evaluation in the Transportation Systems Management and Operations (TSMO) Program Plan.	Special transit services for major employers or events would not impact I-80.	None.
<i>Passenger Air Service</i>		
The <i>Iowa Air Service Plan</i> identifies	Potential future expansion of	None.

existing commercial service airports and potential air service enhancements.	air passenger services would complement improvements to I-80.	
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2. INTRODUCTION

The Iowa DOT is studying the rural portions of the Interstate 80 Corridor statewide to evaluate and identify a long-term improvement strategy and vision for the Corridor. This study is being conducted as a Planning and Environmental Linkage (PEL) Study. As a system-level planning assessment, the PEL Study will enable Iowa DOT to plan and program improvements to the Corridor according to the long-term vision, while meeting its more immediate and pressing short-term needs. These improvements will be implemented as funding allows and based on more detailed engineering and environmental studies, as appropriate, in accordance with the overall long-term improvement strategy.

The PEL process entails identifying and assessing various possible system-level improvement strategies to meet the goals and objectives of the Corridor’s improvements. These strategies are evaluated on how well each accomplishes and meets the needs of the Corridor, including transportation impacts, such as safety, capacity and infrastructure maintenance; potential social and environmental impacts; and the ability for Iowa DOT to fund and implement the improvements from readily available funding sources. The outcomes of the study will include an overall implementation plan for the selected overall Corridor vision, including follow-up actions and the need for more detailed study. As a PEL Study, pursuant to Federal planning regulations, the findings of the study can be referenced by subsequent National Environmental Policy Act (NEPA) engineering and environmental studies to further advance the improvements to the Corridor.

I-80 Corridor Travel

Extending from Council Bluffs to the Quad Cities across the State of Iowa, existing travel within the Corridor is predominantly served by I-80. Originally built as part of the National Interstate Highway System, I-80 connects the metropolitan areas of Council Bluffs, Des Moines, Iowa City and the Quad Cities with the rest of the country, including Omaha, Nebraska to the west and Chicago, Illinois to the east, and beyond. While a considerable extent of the travel within the Corridor is in state, a portion of travel is destined to or originating from out of state locations. Travel within the Corridor includes both passenger travel and the movement of freight. While to some extent existing travel demand within the Corridor is served by other modes of transportation, such as aviation, rail or waterways, a high majority of travel is currently and projected to be served by I-80.

I-80 Corridor Modal Options

Given the Corridor's travel characteristics, and given the critical role I-80 plays in the State's and Nation's surface transportation system, the focus of the PEL Study is on the long-term needs of the existing I-80 infrastructure. While alternative modes of travel could conceivably reduce the need for capacity improvements by shifting travel demands, certain needs of the existing I-80 infrastructure would be unaffected, such as safety, modernization and preservation (i.e., maintenance). To the extent that alternative improvement strategies can shift travel to other modes, the need or timing of roadway widening could be affected. However, just as is the case today, effectively serving future travel within the Corridor will entail a system of transportation facilities and modes working in combination, including I-80.

Considering overall system operations, in addition to investments in the existing I-80 infrastructure and possible general roadway widening strategies, Iowa DOT is evaluating alternative modal improvement strategies within the PEL Study. The purpose of this technical memorandum is to evaluate the viability of non-Interstate improvement strategies. The intent of this evaluation is to assess the feasibility of alternative modal strategies to offset the need for improvements to I-80 and/or be integrated into the full future vision of the Corridor's improvements.

Modal Options Considered

Iowa DOT's approach to the PEL Study entails a series of technical memoranda, each encompassing a different topic or issue related to I-80 at a system level. This particular technical memorandum addresses the feasibility of non-interstate highway transportation modes (e.g., rail, bus, etc.) and their ability to solve, or at least improve, mobility across the rural portions of I-80. In addition, Iowa DOT is evaluating various roadway improvement strategies in separate memoranda. These roadway improvement strategies include general widening and reconstruction of the existing I-80 infrastructure, truck-only lanes widening and reconstruction, and improvements to alternative roadway routes to I-80. In addition, a separate analysis is being performed regarding the consideration of emerging automated vehicle technologies. Combined, these memoranda, including this memorandum, will provide a complete and comprehensive assessment of the full range of possible improvement strategies and issues for the Corridor. A final PEL Study report will provide an overall summary and assessment of these improvement strategies and a comprehensive impact evaluation of the system of improvements. The final report will provide a recommendation of the improvement vision for the Corridor.

Non-highway mobility options evaluated in this technical memorandum include:

- Intercity Passenger Rail/High Speed Rail
- Commuter Rail
- Over-the-Road Bus
- River Freight
- Air Freight

- Rail Freight
- Park-and-Ride
- Paratransit
- Trails
- Special Generator Services
- Passenger Air Service

Evaluation Methodology

The evaluation of the potential viability of various modal improvement strategies entails establishing the planning context for the strategy, as documented in readily available planning studies and documents, and assessing the potential implications of the strategy on the need for improvements to the I-80 infrastructure and Corridor vision. The intent of this evaluation is not to assess how additional investments in these alternative modal strategies could be made in lieu of improvements to I-80, but rather how the total system's performance and enhancements could complement each other and be integrated with the future vision of the Corridor. The evaluation methodology therefore entails, for each modal option:

- Identifying current system operational plans (i.e., planning context) based on available planning studies and documents;
- Identifying if and how the I-80 infrastructure relates to these plans;
- Assessing if possible expansion of the I-80 infrastructure would affect the future plans of the alternative mode and could be jointly developed;
- Qualitatively assessing the benefits of combined system expansion on the mobility needs of the I-80 infrastructure; and
- Providing recommendations for further consideration and integration of the alternative modal strategy within the PEL Study process.

These recommendations are not intended to reflect the independent merits of future investments in these alternative strategies, in terms of meeting their unique needs, but rather how they might be combined with the I-80 infrastructure improvements to improve the overall performance of the Corridor's future transportation system, including further considerations and evaluations within the PEL Study process.

3. INTERCITY PASSENGER RAIL/HIGH SPEED RAIL

Typically utilizing existing freight rail lines, regional intercity passenger rail provides longer-distance travel service for daily and longer duration travel with amenities designed for shorter duration routes. This type of service is typically most appealing to business and leisure travel-

ers. Benefits of intercity passenger rail include the versatility to tie into other modes of travel for connections to broader destinations. Other benefits include energy efficiency, increased quality of travel experience, higher weather reliability and reduction of roadway system congestion. The challenge of passenger rail services lies in the costs of system operations, relative to the fares; the higher costs to develop the rail infrastructure, whether on separate alignment or on an existing freight rail line; and the overall availability of funding.

A High Speed Rail (HSR) system differs from traditional passenger rail in that high-speed trains are a key component, in addition to special high performance dedicated track and advanced signaling systems. There are a number of advanced high-speed technologies offering passenger service, including Maglev and Hyperloop. Magnetic levitation (Maglev) trains, powered by electromagnetic propulsion, integrate speed and efficiency and can reach speeds up to 268 mph. Maglev systems require a large initial capital investment for new infrastructure. Hyperloops, currently in the development phase, are transportation capsules that travel through low pressure tubes at low and high speeds. Capsules are lifted by pressurized air and accelerated by magnetic linear accelerators lining the tube at various locations. No Hyperloop systems are currently in operation. Just as there is a variety of technologies, there are varieties of definitions of operational speeds that qualify as “high speed.” HSR is currently in operation in more than 20 countries and under construction or development in more than 20 additional countries, including the United States. HSR has been in operation in Japan since 1964, carrying over 9 billion passengers. HSR has been advertised for its reduction in oil consumption and emissions, congestion relief on highways, increased safety, mobility and modal choice, and quality of life benefits. There are no plans for HSR in Iowa.

Existing and Planned Systems

Today, Amtrak provides intercity passenger rail service in Iowa. For longer distance service, Amtrak currently operates the California Zephyr, connecting Chicago and San Francisco, and the Southwest Chief, with service between Chicago and Los Angeles. These services are located across Southern Iowa with stations in Burlington, Creston, Fort Madison, Mt. Pleasant, Osceola and Ottumwa. Amtrak ridership was up 6.5% through September 2016, as compared to the same period in 2015, despite declining gas prices. Iowa DOT’s latest *IOWA STATE RAIL PLAN*, completed in 2017, identified the importance of sustaining current passenger rail service on Amtrak for long distance service. Poor on-time performance issues, low frequencies and lack of connections to Iowa’s major population centers affect the viability and convenience of Amtrak for travelers. While the opportunity and need to improve service have been recognized, no current plans or funding have been identified.

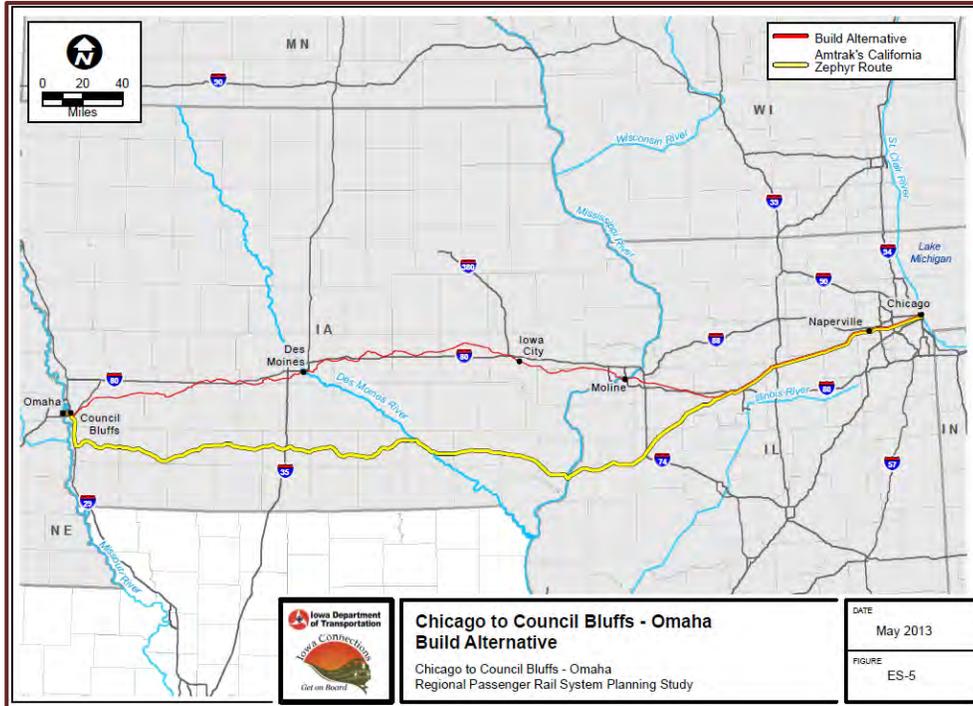
The Midwest Regional Rail Initiative (MWRRI) was established in 1991 as part of a national effort to support high speed rail throughout the region. As a result of this initiative, numerous corridors were identified with Chicago as the hub. An overall transportation plan was developed that included nine passenger rail corridors within the Midwest Regional Rail System (MWRRS). The Chicago to Omaha, Nebraska corridor is the only route located in Iowa potentially serving

the I-80 Corridor. This overall system plan was identified to enhance and/or replace services currently provided by Amtrak with improved passenger rail services.

In 2009 and 2010, Iowa DOT and Illinois DOT, working with the Federal Railroad Administration (FRA), evaluated alternatives for a passenger rail corridor from Chicago to Omaha, Nebraska. A Tier I Environmental Impact Statement was completed, executed and released in May 2013, entitled Chicago to Council Bluffs – Omaha Regional Passenger Rail System Planning Study – Tier I Draft EIS. The Tier I study evaluated alternative rail technologies, routes, operational plans and funding plans for the new passenger rail service. Based on high-level advance planning considerations and infeasibility of modern HSR improvements on new alignment, the Tier I study focused on expanded service and operational speed improvements along existing rail lines between these service destinations. This study identified a Preferred Alternative, consisting of improvements to existing rail lines that would ultimately accommodate up to seven round-trip passenger trains per day between Chicago and Omaha, at maximum speeds of up to 110 mph. These improvements will be constructed and operated in phases, as funding allows.

For the full distance of the improved passenger rail service between Chicago and Omaha, the approximately 475 mile long improvements would consist of tracks currently owned and operated by four rail carriers, with the BNSF Railroad and the Iowa Interstate Railroad owning and operating the vast majority of the existing trackage. Amtrak and the Union Pacific Railroad own and operate relatively short distances of the required trackage within the metropolitan areas of Chicago, Des Moines, and Omaha/Council Bluffs. **Figure 1**, from the Tier I EIS, shows the route of the California Zephyr and the Preferred Alternative for the new passenger rail service. The Tier I EIS noted that current Amtrak service is expected to continue regardless of whether the new service between Chicago and Omaha is constructed. As shown, this new passenger rail service would utilize existing freight rail lines in relative close proximity to I-80 across Iowa.

Figure 1: CHICAGO TO COUNCIL BLUFFS – OMAHA BUILD ALTERNATIVE



Source: U.S. Department of Transportation, Federal Railroad Administration, Record of Decision, Tier 1: Environmental Impact Statement Chicago to Council Bluffs-Omaha Regional Passenger Rail System Planning Study, August 2013

In the Service Development Plan, completed in November 2013 concurrently with the Tier I EIS, Iowa DOT and Illinois DOT propose a phased implementation plan for the expanded passenger rail service that would incrementally increase train frequency and extend the service westward geographically, as funding allows. The overall funding plan is based on an 80% Federal participation level. The proposed implementation plan would provide improved 79-mph service as follows:

- Phase 1 – Implement improved service between Chicago and Moline, Illinois (this service is already funded and is in the process of being implemented by Illinois DOT).



Existing Amtrak service exists along the US 34 corridor in southern Iowa.

- Phase 2 – Extend improved service from Moline to Iowa City, Iowa (this service is currently being evaluated on a Tier 2 Environmental Effort).
- Phase 3 – Extend improved service from Iowa City to Des Moines, Iowa.
- Phase 4 – Increase service frequency from Chicago to Omaha.
- Phase 5 – Extend increased service from Des Moines to Omaha.

Ultimately, the speed and the frequency of round-trips would increase with subsequent implementation phases up to a maximum of 110 mph and up to seven round-trips per day from Chicago to Des Moines, with five of the round-trips extending from Chicago to Omaha. Full implementation would be realized over many years of phased implementation as Federal and state funds are allocated to the proposed project.

In 2010, the FRA awarded Iowa DOT and Illinois DOT a grant of \$230 million to move forward with Tier 2 studies and construction activities on the Chicago to Iowa City improvements (i.e., Phase 2). End of 2017 is the estimated completion date for the Chicago to Iowa City passenger rail studies, including expanded intercity passenger rail service from the Quad Cities (Moline, IL) to Iowa City. This service would include two daily round trips with an initial maximum speed of 79 mph. The Quad Cities to Iowa City portion of the service plan is expected to carry 76,100 riders each year, taking around 38,000 cars off the road system annually. A feeder bus service is proposed to connect the rail passengers to Des Moines and Ames and potentially Cedar Rapids to Des Moines and Iowa City.

There is not currently a HSR network in place or planned in Iowa. The proposed Chicago to Omaha passenger rail improvements, utilizing existing freight lines without dedicated track, would not provide speeds typically considered as high speed. However, these improvements would provide “higher-speed rail”, as it would allow operating speeds faster than conventional passenger rail systems currently in operation.

The idea of high speed rail within the interstate median is a concept that has been considered for many corridors. The idea of operating HSR within the median is attractive because the right of way is available and the impacts may be lessened by this configuration. The challenges of operating a HSR system within the median include having to raise the overpass bridges to meet minimum bridge clearances and highway grades that are too steep for high speed trains. Both of which would add to the overall cost of the project. Another issue is the lack of access to the population centers where there are enough riders needed to make the project feasible.

Based on the fiscal constraints and limitations of other HSR technologies, such as Maglev, it has been determined that utilizing existing rail lines and associated higher speed trains would best meet the needs and potentially available funding for the project.

Impacts on I-80

The implications of the proposed MWRRI service between Chicago and Omaha on the I-80 Corridor include complementary travel service, thereby reducing travel along I-80, and possible joint development opportunities at the rail line crossings of I-80.

- **Travel Demand** – As the new passenger rail service will provide service to travel between Chicago and Omaha, and destinations in between at intermediate stations, these travel markets are also served by I-80. As complementary services, the MWRRI and Amtrak passenger rail services will function as a system with I-80, providing travelers more options for travel depending on their needs and circumstances. As a result, it is reasonable to expect some reduction of traffic along I-80 in the future as MWRRI becomes operational and fully developed. The Tier I EIS identifies this as one of the benefits of the rail project.

In support of the analysis of passenger rail service in the Tier I EIS, ridership forecasts for the improved service were developed. These estimates were developed for 2020 based on projected travel demands between Chicago and Omaha and within the service route. There are a number of factors affecting traveler choice, including the points of origination and destination for the travel, connectivity of the modal choice, travel times by mode, costs of travel and overall convenience and traveler preferences. Annual ridership estimates in the Tier I EIS project 605,000 passengers in 2020, including both the MWRRI improvements and the existing Amtrak service. This projection is based on the initial service plan at 79 mph. Expansion of the service frequency and higher speeds, planned for the future, would further increase the ridership. New riders would account for 571,000 of these trips. Of these new riders, roughly 379,500 passengers, or 66%, would be diverted from auto trips, some of which would likely come from I-80. Other sources of the new riders would include diversions from air travel and over the road buses, and new induced travel.

Depending on a number of factors, including vehicle occupancies, the originations and destinations of these diverted auto trips, and annual travel days, it is reasonable to expect a maximum potential reduction of around 800 to 1,000 vehicles per day along I-80 in 2020. Depending on the location along I-80, this reduction would account for around 2% of the projected traffic on the Interstate. The Tier I EIS estimated that automobiles account for 98 percent of the travel in the study area.

While the MWRRI passenger rail project would be expected to reduce travel along I-80, it is not expected that this reduction would impact the need for improvements to I-80. Improved mobility and safety along I-80 realized by roadway widening and modernization would complement the planned future passenger rail service improvements. These combined improvements would operate as a system and provide travelers more choices for reliable transportation service.

- **MWRRS Crossings of I-80** – The proposed route for the MWRRS rail service, utilizing existing freight rail lines, crosses I-80 in several rural locations in Iowa. To the extent that improvements at these crossings are needed to support the new MWRRS infrastructure, these improved crossings could be jointly developed to coordinate and share the costs of the necessary construction as I-80 is improved across Iowa.

4. COMMUTER RAIL

Commuter rail is a form of passenger rail service that typically operates in a metropolitan area or between city centers, primarily providing daily service to commuters. This type of service typically connects suburban areas with business and employment centers. Trains typically operate on fixed daily schedules, inbound in the morning and outbound in the evening. Commuter rail trains, designed for heavy rail crash and safety compliance, typically operate on existing freight rail lines to reduce the cost of track construction. However, as necessary to avoid delays caused by shared use with freight train traffic and/or to provide connections to employment centers, commuter rail can use dedicated right-of-way. For commuter rail service to be effective, it needs to operate at a frequency and level of reliability that is appealing to daily travelers for commuting to and from work.

Existing and Planned Systems

There are no commuter rail services currently in operation in Iowa today. However, the IRSP identified a future potential regional passenger rail network for the State of Iowa, including the consideration of potential intercity commuter rail services. Expansion of intercity commuter rail service to serve Iowa's population centers was identified as a key issue in the IRSP. The proposed future passenger rail system in Iowa would consist of a 1,230-mile intercity network (*Figure 2*). Funding for these new services has not been identified.

Figure 2: EXISTING and POTENTIAL FUTURE PASSENGER RAIL ROUTES IN IOWA



Source: Iowa DOT, Iowa Railroad System Plan, 2017.

In 2015, the Iowa City-Cedar Rapids Passenger Rail Conceptual Feasibility Study was completed. This study looked at commuter rail service operating between Iowa City and Cedar Rapids along the existing 20.5 mile long Cedar Rapids & Iowa City Railway (CRANDIC) corridor. In addition to daily service between the cities, this new service could potentially network with the MWRRI services between Chicago and Omaha, connecting passengers to and from Cedar Rapids at the Iowa City passenger rail station. While funding for this service has not been identified, this service could be provided if funding becomes available. Studies continue for this corridor with support of the Iowa DOT, CRANDIC and both Iowa City and Cedar Rapids Stakeholders.

Impacts on I-80

Today, there are no commuter rail services in operation in Iowa. While a future passenger rail network has been identified for Iowa, including the consideration of possible commuter rail services, due to funding constraints, there are no commuter rail projects currently in the development stage. Given that commuter rail primarily serves metropolitan travel, while commuter rail services could be developed in the future, it is not envisioned that any future new services would impact the rural portions of I-80. Should the Cedar Rapids to Iowa City passenger rail service be developed in the future, this new service could divert traffic from I-380, similar to the

MWRRI project. However, given the travel market of this new service, it is not likely it would divert measurable traffic from the rural portions of I-80.

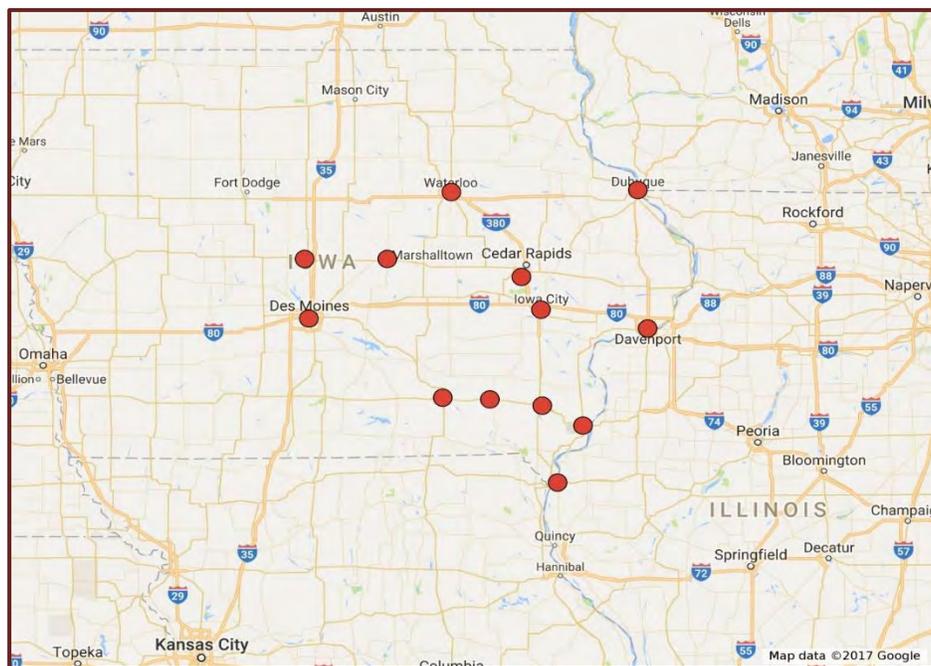
5. OVER-THE-ROAD BUS

Over-the-road buses (OTRBs) provide a variety of services, including: fixed-route; regular-route service links to communities; charter and tour services for group travel; and commuter, airport and other services. OTRB service provides regional and intercity mobility for travelers, often on a fixed schedule, and utilizes the highway network including the Interstate to connect communities.

Existing Networks

Regional bus service in Iowa is currently provided by Burlington Trailways, Dodger Area Rapid Transit and Jefferson Lines. This service connects a majority of mid-to-large sized cities in Iowa, particularly in the eastern side of the State. Burlington Trailways took over Greyhound routes in 2012, including the route from Omaha to Chicago, which features stops in Des Moines, Iowa City, Davenport and Moline (Figure 3). It takes approximately 6 hours to travel from Davenport, Iowa to Omaha, Nebraska at a cost of around \$80. Windstar Lines also operates a Megabus' Chicago and Omaha route, with stops in Coralville and Des Moines. Additional service may be added as needed on weekends and holidays.

Figure 3: BURLINGTON TRAILWAYS LOCATIONS IN IOWA



Source: Burlington Trailways Website, burlingtontrailways.com/locations/iowa/ February 1, 2017.

Impact on I-80

Current and future services by Burlington Trailways and Megabus would not impact the need for improvements to I-80. While this service provides the residents of Iowa a travel option other than travelling by auto, existing and future bus ridership would not measurably impact the traffic volumes along the rural portions of I-80.

6. RIVER FREIGHT

The transport of freight involves an integrated system of transportation facilities including waterways, trucks and freight rail systems. These systems work together to transport commodities and products to the marketplace using intermodal facilities and distribution centers. The Interstate and National Highway Systems play an important role in this multi-modal system. Alternatives to hauling freight via truck could help reduce future travel demands on the Nation's highway network, thereby potentially reducing congestion and maintenance and providing improved safety.

According to the *Iowa State Freight Plan* (2016), water transport fills an important role in Iowa with its ability to carry the most weight while offering the lowest shipping cost per commodity. The disadvantages of using waterways for transporting freight include longer times, an aging lock and dam system on the Mississippi River, water level unpredictability on the Missouri River and weather limitations.

Existing and Planned Systems

The two waterways with the ability to carry freight in Iowa are the Mississippi River and the Missouri River. The majority of freight moving by water is on the Mississippi River. A network of federally owned locks and dams operated by the United States Army Corps of Engineers (USACE) facilitate the movement of freight on the Mississippi. The Upper Mississippi River System (UMRS) has 29 locks and 858 miles of commercially navigable waterway. The Missouri River, which is also part of the UMRS, has no locks along the 735 miles of navigable water between Sioux City, Iowa and St. Louis, Missouri. Both rivers are part of America's Marine



An aging lock and dam system creates uncertainties about the future of river barge traffic.

Highway Program. The goal of this program is to expand the use of the nation's navigable waterways to relieve landside congestion, reduce air emissions and generate other public benefits by increasing the efficiency of the surface transportation system.

Located along the two navigable rivers are 60 barge terminals (55 on the Mississippi, five on the Missouri), all of which are privately owned. The barge terminals transfer freight between barge, rail and truck. Traffic through Iowa's locks increases from north to south with most of the movements being exports out of the state and down the Mississippi River to the Gulf of Mexico. Most of the exports are agricultural products.

Panama Canal Widening

The Panama Canal has served as a vital connection between the Pacific Ocean and the Gulf of Mexico since it opened, and in 2016, the Canal expanded its annual capacity by 75 percent, allowing accommodation for much larger ships. Larger cargo ships are typically more cost efficient for transporting commodities.

According to the *Development of Iowa Statewide Freight Transportation Network Optimization Strategy* (September 2016), if the new Panama Canal standard results in an estimated 10 percent reduction in ocean freight rates, routing freight through the Canal would be more competitive than routing through the Pacific Northwest ports for a larger number of companies located near the Mississippi or Missouri Rivers, thereby potentially increasing freight tonnage along these rivers. The impact of shipments shifting from over land freight to river freight, because of the expansion project, could potentially reduce the number of trucks traveling along I-80.

Based on the findings in the *U.S. Inland Waterway Modernization: A Reconnaissance Study* (April 2013), trade volume for marine ports is expected to double from 2011 levels by 2021, and double again after 2030. Long-term trends suggest a need for major investments in U.S. ports. Railroads and waterways carry significant volumes over long distances. By 2025, freight tonnage on inland waterways is expected to increase by 23 percent from 2011; rail is expected to grow by 18 percent and truck freight tonnage by 22 percent. By 2040, this increase is expected to be over 50 percent for trucks, 40 percent for water, and 38 percent for rail.

Impacts on I-80

Potential investments in and expansion of the lock and dam system along the Mississippi River would not affect the need for improvements along I-80. As is the case today, as part of the Nation's Interstate System, I-80 will continue to play a vital role in the transportation of freight and connecting waterway ports with the Nation's freight distribution system. As indicated by the *Iowa State Freight Plan*, waterway transport plays an important role in the movement of freight in Iowa. However, given the nature of the freight transported by water and the noted limitations of river barge operations, the movement of freight by truck along I-80 does not significantly compete directly with waterway services, but rather complements it by connecting it to distribution centers and the ultimate marketplace.

Future expansion of waterway freight tonnage, as predicted by the USACE, will further highlight the importance of I-80 in Iowa's surface transportation system.

7. RAIL FREIGHT

The Nation's network of privately-owned railroads provides an important role in transporting freight across the country and Iowa. Railroads are an integral part of the Nation's surface transportation system, working and competing with the Nation's highway and waterway systems. According to the *Iowa State Freight Plan*, the rail network in Iowa consists of less mileage than it once did but the total amount of tonnage handled annually has slowly increased. Growing demands and changes in the rail industry have increased railcar capacities and train lengths.

Although rail competes with the other modes of freight transportation, it often cooperates with the other modes to provide intermodal services. The railroad network is important to moving bulk commodities produced and consumed in the state to local processors, livestock feeders and river terminals for foreign export.

Existing and Planned Systems

Iowa currently has 3,825 miles of railroads (*Figure 4*). There are 18 railroad companies, which includes, six Class I, one Class II, and 11 Class III railroads. About 80 percent of Iowa's rail miles are able to carry the industry-standard 286,000-pound cars. The other 20 percent would need improvements to accommodate this standard.

Of the six Class I carriers in Iowa, the Union Pacific Railroad and the BNSF carry the largest volume in the state. The Class II and III railroads often provide a feeder service to the Class I railroads. The railroad companies have been steadily increasing expenditures on maintenance and improvements of rail infrastructure in the state.

In the *Development of Iowa Statewide Freight Transportation Network Optimization Strategy*, one of the key findings is that there are opportunities to leverage railroad transportation in Iowa to reduce freight costs. However, in 2040, the analysis forecasts that there will be railroad capacity constraints in 29 Iowa counties without additional capacity. As a result, some of the cost savings opportunity by using rail instead of trucks would be lost. Additionally, shippers in many places in Iowa are over 100 miles from existing intermodal yards, which may increase the cost to transport commodities.

This study recommended exploring the opportunity for a new rail intermodal facility in Eastern Iowa and potentially in other areas. These facilities would offer the benefits of lower cost service by rail for longer distances and the door-to-door flexibility of trucking, which provides for overall transportation cost savings.

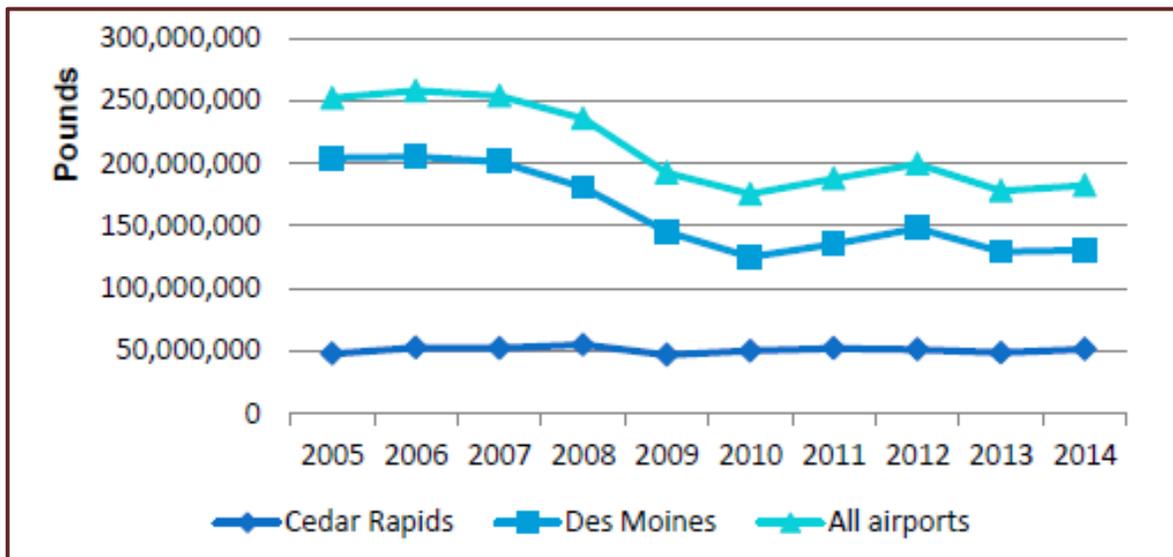
the rail system will be needed to meet future freight demands, improvements to I-80 will similarly be needed to fulfill its role in meeting the freight demands of tomorrow.

8. AIR FRIEGHT

Historically, aviation services have played an important role in the expedient delivery of freight. However, transporting freight by air has its limitations. Today, air cargo represents a relatively small portion of the Nation’s freight distribution system. Similar to other modes of freight transport, the transport of freight by air requires transfers to trucks for distribution. Recent declines in air freight have occurred due to mostly logistics of private air freight companies and the relative cost to operate aircraft.

The primary air cargo users in Iowa are FedEx and UPS, who have both reduced their air freight operations and now rely more on distribution by trucks. The *Iowa State Freight Plan* reflects this decline showing that air freight moving through airports in Iowa has decreased from 259,370,000 to 181,588,000 pounds in the last 10 years (*Figure 5*). Difficulties in expanding air freight service include Iowa’s excellent surface transportation infrastructure, large cargo airports in bordering states, the price of aircraft fuel, pilot shortages, and the use of regional jets with less room for cargo.

Figure 5: TOTAL AIR CARGO, 2005-2014



Source: Iowa DOT, Iowa in Motion – State Freight Plan, 2016

Existing and Planned Systems

More than 99 percent of the reported tonnage moves through the Des Moines International Airport (DSM) and the Eastern Iowa Airport (CID) in Cedar Rapids. The remaining one percent is shared by Burlington, Dubuque, Fort Dodge, Mason City, Sioux City, and Waterloo. Both, UPS and FedEx maintain operations at DSM and CID. Air freight services are used primarily for timely transportation of cargo into and out of Iowa. No bottlenecks have been identified for air freight and significant capacity exists to accommodate future growth.

Impacts on I-80

Based on the status of air freight operations in Iowa, additional investment in air freight operations would not measurably affect the need for improvements to I-80.

9. PASSENGER AIR SERVICE

Passenger air service provides needed connectivity to get people and goods to their destination quickly and efficiently. Iowa generates nearly 3 million passenger enplanements each year, mostly related to traveling distances that exceed 300 miles from the point of departure. Logistics and feasibility play significant roles in decisions on whether or not to use passenger air service.

Both Iowa DOT and Federal Aviation Administration forecasts project continued growth in passenger air service. According to the *Iowa Air Service Plan* completed in 2014, 59 percent of the passengers using commercial airports in Iowa are visitors, and 51 percent are traveling for business.

Existing and Planned Systems

Today, there are five commercial service airports near the I-80 Corridor that could impact travel along I-80 in Iowa. These airports include Eppley Airfield (Omaha), Des Moines International (Des Moines), the Eastern Iowa Airport (Cedar Rapids), Quad City International (Moline), and O'Hare International (Chicago). Other Iowa cities with commercial service airports include Sioux City, Fort Dodge, Mason City, Waterloo, Dubuque, and Burlington (*Figure 6*).

More than 95% of passenger air service originating from airports in Iowa is being serviced by the Des Moines International Airport and The Eastern Iowa Airport in Cedar Rapids. Improvements to infrastructure at both airports is ongoing, and major enhancements involving passenger terminals at both airports are planned or underway.

Figure 6: AIRPORTS PRIMARILY SERVING IOWA PASSENGER BOARDINGS



Source: Commercial Air Service Retention and Expansion Committee, Air Service Overview and Plan for Air Service Improvement, December 2014.

Impact on I-80

Improvements to I-80 allowing faster, safer and more reliable travel could conceivably shift some travel away from air travel, depending on the circumstances of the travel choice. The same could be said for the addition of high speed rail service along the corridor.

To the extent that travelers choose to travel by air today, thereby reducing some of the travel demand along I-80, it is reasonable to expect this trend would continue similarly in the future. Given the range of factors affecting traveler choices, it is not likely that shifts in air passenger travel would measurably change travel demands along I-80 in the future. Passenger air service should not be expected to significantly reduce traffic along I-80, and could be considered as a complementary improvement to any direct improvement to I-80.

10. PARK AND RIDE

Park and ride facilities are publically-owned parking lots, typically located adjacent to the highway system, to enable travelers with common trip destinations to rideshare. These facilities can play an important role in achieving broader transportation efficiency goals by reducing single-occupant vehicle travel through ridesharing activities such as carpooling, vanpooling and public transit. Park and ride facilities are often one of the primary pieces of an effective commuter-oriented transportation system. Facilities can vary depending on the commuting system that they are intended to serve. These facilities can range from surface lots to complex structures for multiple modes, such as bike and bus transit.



Source: Iowa Park and Ride System Plan, 2014.

As would be expected, the current park and ride facilities in Iowa are concentrated near the more urbanized areas within the state. While population in these areas is increasing, population in the more rural portions of the state is declining. Employment industries are also changing from farming and manufacturing to the health care and services sectors, which are typically located in the urban areas. According to the *Iowa Park and Ride System Plan (PRSP)* completed in 2014, “urban service and management-oriented jobs are more supportive of transit; whereas construction, manufacturing, or agricultural jobs are more supportive of single-occupant vehicle travel and to a lesser degree, carpooling.”

Existing and Planned System

In 2014, 26 state-owned and 12 county-owned park and ride locations were present within the state. Many of these were developed in the 1980s. Four of the park and ride locations are located along I-80. As shown in *Figure 7*, these I-80 facilities are located in the rural areas west of Des Moines. Four new park and ride facility candidates along I-80 were identified by the *PRSP*, including Des Moines, Newton, Coralville and Tipton.

To encourage ridesharing, a statewide ridesharing database was developed by Iowa DOT that uses mapping to pair potential commuters and carpoolers. The goal of this program was to connect commuters who are looking to carpool or vanpool. This new database, as carpooling grows across the state, could increase the need for park and ride facility locations in the future.

In 2010, about 11% of Iowans either carpooled or used public transportation. However, travel by single occupant vehicles in Iowa grew from 62% in 1980 to around 79% percent in 2010. One

11. RIDEMATCHING SERVICES

The Iowa Commuter Transportation Study recommended a package of commuter improvements that could be implemented as a comprehensive program. In a separate effort, Iowa DOT initiated a review of potential public transit service and modal enhancement strategies to mitigate congestion ahead of and in collaboration with reconstruction of the I-80/I-380 system interchange, as part of the I-380 Coralville to Cedar Rapids Corridor, Multi-Modal and Operations Study. Several multimodal transportation strategies were identified in both efforts that could reduce commuter traffic near metro areas along the I-80 corridor. This package of improvements includes:

- **Express Bus Service:** An express bus service is a limited stop fixed route bus transit service designed to serve commuters in and near major metro areas.
- **Public Carpool Matching Program:** An informal or formal sharing of rides using one of the participant's private automobiles. Carpooling typically has two to six participants with similar origins and destinations. Iowa Rideshare is a statewide online commute-matching system that lets registrants quickly and securely find viable commute options including carpools, vanpools, and transit routes. Less than six months from launch, the Iowa Rideshare commute matching system is utilized most in urban areas that are connected by I-80, including the Des Moines, Iowa City, and the Quad City metro areas. An effective locally sponsored commuter transportation outreach effort can reduce commuter related traffic on I-80 near these metro areas. Over 30,000 find match requests have been processed through the system to date. All public carpool parking lots identified in the Iowa Park and Ride System Plan are included in Iowa Rideshare, and commuters are able to post trips and find ride matches with these locations identified as convenient origins and destinations.
- **Public Vanpool Program:** This service uses passenger vans supplied by a public agency or agencies driven by one of the vanpool participants. Vanpools typically have seven to fifteen participants with similar origins and destinations.

Existing and Planned System

Today, there are three existing public sponsors for commuter transportation programs near the I-80 Corridor that could have an impact on travel along I-80 in Iowa. These sponsors include the Metropolitan Area Planning Agency (Council Bluffs/Omaha), the Des Moines Area Regional Transit Authority (Polk County), and the East Central Iowa Council of Governments (Benton, Iowa, Johnson, Jones, Linn and Washington counties).

Impact on I-80

Locally sponsored commuter transportation programs could remove individual vehicles from I-80 and assist with reducing congestion and improving traffic management specifically during peak hour commute times. These services are cost effective ways to reduce traffic in Iowa's

metro areas, and should be considered as a complementary service to improving traffic along the I-80 corridor.

12. PARATRANSIT

Paratransit provides services for persons with disabilities and seniors who are unable to use regular bus services. Many of these programs require an application process to determine eligibility for the curb-to-curb, ADA accessible services. Paratransit and demand-response transit services are provided at the user's request, meaning that the trip must be pre-arranged between a unique origin and destination and back again. According to the *Iowa Statewide Passenger Transportation Funding Study*, completed in December 2009, mobility services for persons with disabilities and seniors allow them to live at home versus in care facilities and provide a significant healthcare benefit.

The *Passenger Transportation Funding Study* compiled ridership information for the State of Iowa in 2008. The total annual ridership in 2008 for all transit trips was 25.5 million. Of the total ridership, a little over 1.7 million were trips taken by Iowa's elderly population. Persons with disabilities accounted for approximately 3.2 million of the total trips taken that year. Of the 31.1 million passenger vehicle miles traveled, 8.8 million were elderly/disabled paratransit (*Table 2*).

Table 2: IOWA PASSENGER TRANSPORTATION STATISTICS (2008)

Service Type	2008 Ridership			Vehicle Miles Traveled	Passenger/Contract Revenue	Operating Cost Per Trip
	Total	Elderly Trips	Persons w/ Disability			
Unrestricted Paratransit	2,940,000	595,000	1,349,000	11,784,300	\$11,734,000	\$5.32
Elderly/Disabled Paratransit	2,399,000	337,300	948,600	8,837,400	\$9,929,400	\$2.60
Fixed Route Service	20,207,000	807,500	927,800	10,523,300	\$10,839,200	\$2.08
Statewide Summary	25,546,000	1,739,800	3,225,400	31,145,000	\$32,502,600	\$2.50

Source: Iowa DOT, Iowa Statewide Passenger Transportation Funding Study, 2009

Existing and Planned System

In Iowa, paratransit services are provided by all seven small urban transit systems (servicing populations less than 50,000) and 12 large urban transit systems (servicing populations of 50,000 or more). The ridership mix for fixed route versus demand-response services varies across the small urban areas.

In the rural (non-urbanized) areas, the state is divided into 16 paratransit service regions, comprised of adjoining counties. Each county's Board of Supervisors determines the level of service within their respective county and how the service is funded. Because of this, a multiple-county region could offer widely divergent levels of service depending on local support. Service within these 16 rural regions is demand-response service based, where users make a reservation for each trip they take.

Impact on I-80

Existing paratransit services for Iowa's elderly and disabled populations provide an important mobility service to those populations. However, given the nature and specific purpose of these services, and while the merits and justification for paratransit services are independent of the need to improve I-80, its benefits to rural I-80 are limited for the following reasons:

- Many of the individuals utilizing paratransit services do not have access to vehicles and would not otherwise be adding to congestion.
- Paratransit services cater to unique origin and destinations, which are most likely local trips rather than long distance travel.

13. TRAILS

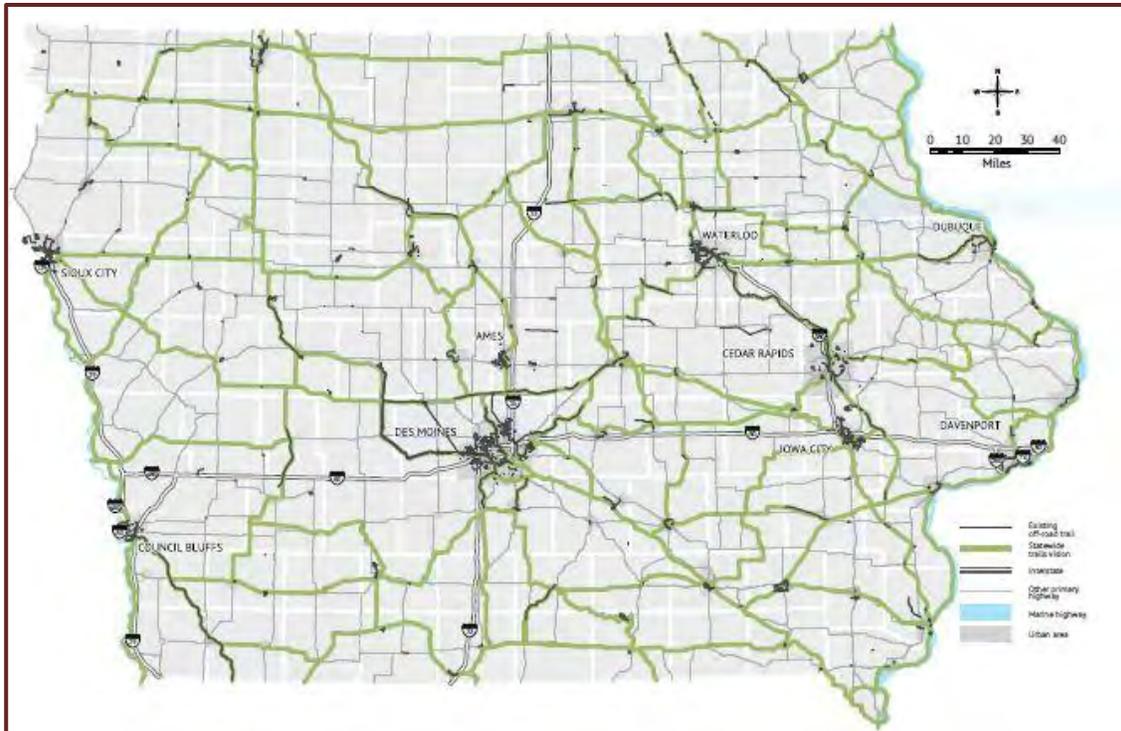
There is currently a desire by Iowa communities to better accommodate pedestrians and bicyclists in recognition of the recreational and alternative transportation opportunities offered by these modes. *Iowa in Motion 2045*, takes a look at the needs of non-drivers. One section of the study highlights the economic impacts and potential opportunities to connect local trail and pedestrian facilities with adjacent communities and state and regional trails. An update to *Iowa Trails 2000* is currently underway to look at these issues in more detail.

Continuity and safety are important considerations if bicycles are to be a means of regular and daily transportation, in addition to recreational opportunities. Accommodations for bicyclists are provided in two ways -- independent multi-use trails and roadway-based facilities. Similar to motorists, pedestrians and bicyclists have a dispersed and varying range of destinations which cannot be fully served by even the most extensive trail system. Service to bicyclists and pedestrians typically entails a connected system of off-road dedicated trails and on-road facilities. Bicycle and pedestrian travel along roadways can be enhanced by adjacent accommodations, such as bike lanes and sidewalks.

Existing and Planned System

There are currently more than 3,300 miles of trails, paved shoulders and other bike and pedestrian facilities in Iowa. Of these miles, around 1,866 are off-road and multi-use trails. The vision for Iowa's statewide trail system is an emphasis on a network of separated multiuse trails connecting rural communities, metropolitan areas, state and county parks and natural amenities. **(Figure 8)** This plan does not envision new trail facilities along rural I-80. However, existing and improved trails do cross I-80 in various locations particularly near the major metropolitan areas.

Figure 8: IOWA'S STATEWIDE TRAIL VISION



Impact on I-80

As an Interstate corridor, it is not recommended that trail facilities be considered along the rural portions of I-80. However, there are opportunities to jointly develop improvements to existing and planned trail facilities that cross I-80. Subsequent environmental and engineering studies will need to evaluate and mitigate, as appropriate, any impacts to existing and planned trails. Further coordination with local planning agencies will be required. In addition, in coordination with local planning agencies, as interchange areas are potentially reconstructed, pedestrian facilities will need to be evaluated and considered further as part of the I-80 improvements.

14. SPECIAL GENERATOR SERVICES

A subscription public bus service can be tailored to the needs of a specific locale, event type or single employer. The concept is similar to a vanpool except that the vehicle is larger, usually a small to medium size bus, and uses a professional driver rather than one of the commuters. The design and operation of this type of service is very flexible. The route can be designed to access the largest number of employees or event attendees, with park and ride lots typically used as a collection point.

There is a potential for these types of services to be used for large employers like Brownells, Kinze, JELD-WEN, Whirlpool, etc. These companies are located in areas that are more rural and draw employees from a large geographic area. Special generator services could also be used to reduce traffic congestion along I-80 by removing individuals driving to football games in Iowa City or Ames, the Iowa State Fair, RAGBRAI (route dependent) and races in Newton as examples.

Event centers were considered as part of the TSMO Program Plan, completed in 2016. A buffer was created for events, like those listed above, in order to be factored into the Interstate Condition Evaluation for Operations tool that was developed. This evaluation was part of identifying interstate corridors that should be considered priorities for infrastructure renewal.

Existing and Planned Systems

Special Generator Services along I-80 include the Iowa State Fair's transportation service provided by Des Moines Area Regional Transit Authority and the Iowa Speedway shuttle services provided by the Heart of Iowa Regional Transit Authority in Newton.

Impact on I-80

Providing subscription services for an event or employer basis could remove individual vehicles from I-80 and assist with reducing congestion and improving traffic management. These services should be considered as a complementary service to resolving issues along I-80 and should be considered independent of improving I-80.

15. RECOMMENDATIONS

Based on the review of existing and planned modal options and high-level system analysis, it is not feasible or viable for any one or all of these modes to fully address the goals and objectives of improving mobility across the rural portions of I-80. Effectively serving the diverse needs of passenger and freight travel within the Corridor requires a system of transportation services, including I-80.

While none of these alternative modal strategies would directly affect the need to improve I-80, several have unique needs and opportunities for improved service, that when combined with an improved I-80, can improve the overall transportation system. Improvements to these alternative modes are generally independent of I-80. Consequently, further evaluation and consideration of other modal improvements, including the possible participation by the Iowa DOT, as appropriate, can proceed on its own merits independent of improving rural I-80 in Iowa.

In the evaluation of alternative modal strategies, several coordination opportunities were identified for further evaluation in the PEL Study and subsequent environmental and engineering studies. These coordination and joint development opportunities include the following:

- **Intercity Passenger Rail/High Speed Rail** – It is recommended that the planned MWRRRI project crossings of I-80 be further evaluated for possible opportunities to jointly develop and coordinate the rail and I-80 improvements at these crossing locations.
- **Park-and-Ride** – As part of an overall travel demand management program for I-80, it is recommended that elements relating to rural I-80 included in Iowa DOT's Statewide Park and Ride Plan be further evaluated and considered in the development of the improvement plans for rural I-80, as priorities and funding allow.
- **Trails** – Future environmental and engineering studies need to evaluate and consider further any potential impacts to existing and planned trails impacted by I-80. Further coordination with local planning agencies will be required, including the coordination of impacts to trail operations during construction and the possible joint improvement of planned trails that cross I-80. In addition, in coordination with local planning agencies, as interchange areas are potentially reconstructed, pedestrian facilities will need to be evaluated and considered further as part of the I-80 improvements.

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