



Iowa State Rail Plan Final

Chapter 2

Iowa's Existing Rail System



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2.1 Existing Iowa Rail System: Description and Inventory

This chapter provides an overview and inventory of Iowa's existing rail system as a baseline for planning and decision making in the state. Discussed below are three major aspects of the state's existing freight rail and passenger rail systems: a description of the services and physical characteristics of the state's railroad network as they are today; rail service trends and forecasts; and needs and opportunities.

2.1.1 Iowa's Existing Rail Network

Railroads have served Iowa continuously since 1855. In 1914, when main line railroad mileage in Iowa peaked at 10,018 miles, it was widely held that no community in any of the state's 99 counties was more than 13 miles from a railroad¹. Railroads spurred development, most noticeably in Iowa's largest cities, some of which became principal regional and national rail hubs. Railroad development in Iowa continued into the 1910s, but the system has decreased since then, as the state's railroads faced increasing competition to both their freight and passenger businesses from improved roadways, new air routes, and the development of interstate highways. Today, Iowa is served by 18 freight railroads, two Amtrak intercity passenger routes, and two tourist or heritage railroads. There are presently no commuter rail services in Iowa.

Iowa's operating freight railroads are divided into three categories, including Class I railroads which are large, primarily long-haul national rail systems; Class II railroads which are medium sized railroads that operate regional rail systems; and Class III railroads which are commonly referred to as short line and switching or terminal railroads, which operate at the local level. Iowa also has non-operating railroad owners, which own short segments of the Iowa rail network and have agreements with Class II and Class III railroads to provide rail service.

The passenger rail system is comprised of Amtrak National Network, or long-distance intercity services, and privately owned tourist railroads.

Rail lines which have been abandoned or rail banked since 2004 are discussed later in this chapter.

Iowa's rail system consists of 3,851 railroad route miles owned by 18 railroads and two non-operating railroad owners.

Table 2.1 below identifies by railroad entity — railroad class (if applicable), standard alpha carrier code (an industry standard two- to four-letter abbreviation), total miles of freight railroad owned and operated in Iowa (including lines leased, operated under contract, trackage rights, and haulage rights, as applicable), and the percentage of the total Iowa rail network that each railroad owns. Note that miles leased and/or operated under contract, miles operated under trackage rights, and miles operated under haulage rights are included in the total miles operated figures, allowing total miles operated to exceed total miles owned.

Industrial railroads and private track ownership provide transportation service at industrial installations in Iowa, but, due to their classification, the mileage of privately owned industrial track is not included in calculations of the state's rail network. Similarly, the industrial track (including designated industrial leads and spurs) of Class I, II, and III rail carriers is also not included in the route-mile calculations. Iowa has two tourist railroads, but entities of this classification are also not included in route-mile calculations. The tourist railroads are discussed in Section 2.1.1.3.

¹ Grant, H. Roger and Hofsommer, Donovan L.: *Iowa's Railroads: An Album*, Indiana University Press, 2009

Table 2.1: Iowa Route Mileage by Railroad and Non-Operating Railroad Owner

RAILROAD	STANDARD CARRIER ALPHA CODE	RAILROAD CLASS	TOTAL MILES OWNED	PERCENT OF TOTAL IOWA RAIL NETWORK OWNED	MILES LEASED/ OPERATED UNDER CONTRACT	MILES OPERATED UNDER TRACKAGE RIGHTS	MILES OPERATED UNDER HAULAGE RIGHTS	TOTAL MILES OPERATED
BNSF Railway	BNSF	Class I	631	16.39%	33	42	0	706
Canadian National Railway (operates in Iowa via subsidiaries Chicago Central & Pacific [CCP] and Cedar River Railroad [CEDR])	CN	Class I	605	15.71%	0	3	0	608
Canadian Pacific Railway (operates in Iowa via subsidiary Dakota, Minnesota & Eastern Railroad [DME])	CP	Class I	654	16.98%	0	12	0	666
Kansas City Southern Railway	KCS	Class I	0	0.00%	0	0	55	55
Norfolk Southern Railway	NS	Class I	44	1.14%	4	0	386	395 See Note (a) below
Union Pacific Railroad	UP	Class I	1,291	33.52%	0	95	126	1,512
SUBTOTAL (CLASS I)			3,225	83.74%				
Iowa Interstate Railroad	IAIS	Class II	298	7.73%	6 See Note (b) below	21	0	325
SUBTOTAL (CLASS II)			298	7.73%				
Appanoose County Community Railroad	APNC	Class III	35	0.90%	0	0	0	35
Boone & Scenic Valley Railroad	BSV	Class III	2	0.05%	0	0	0	2
Burlington Junction Railway	BJRY	Class III	6	0.16%	0	0	0	6
CBEC Railway (CBEC operated by IAIS)	CBEC	Class III	6	0.16%	0	0	0	6
Cedar Rapids & Iowa City Railway	CIC	Class III	57	1.48%	0	0	0	57
D&I Railroad	DAIR	Class III	0	0.00%	35 See Note (c) below	7	0	42
D&W Railroad (DWRV operated by IANR)	DWRV	Class III	22	0.57%	0	6	0	28
Iowa Northern Railway	IANR	Class III	117	3.04%	50	60	0	227
Iowa River Railroad	IARR	Class III	9	0.24%	0	0	0	9
Iowa Traction Railway	IATR	Class III	10	0.26%	0	0	0	10
Keokuk Junction Railway	KJRY	Class III	1	0.03%	0	3	0	4
SUBTOTAL (CLASS III)			265	6.89%				
North Central Iowa Rail Corridor (NCIRC trackage operated by IANR)	N/A	Non-Operating Railroad Owner	28	0.73%	0	0	0	28
State of South Dakota (SD trackage operated by DAIR)	N/A	Non-Operating Railroad Owner	35	0.91%	0	0	0	35
SUBTOTAL (NON-OPERATING RAILROAD OWNERS)			63	1.64%				
Iowa Rail Network Total			3,851	100.0%	128	249	567	4,756

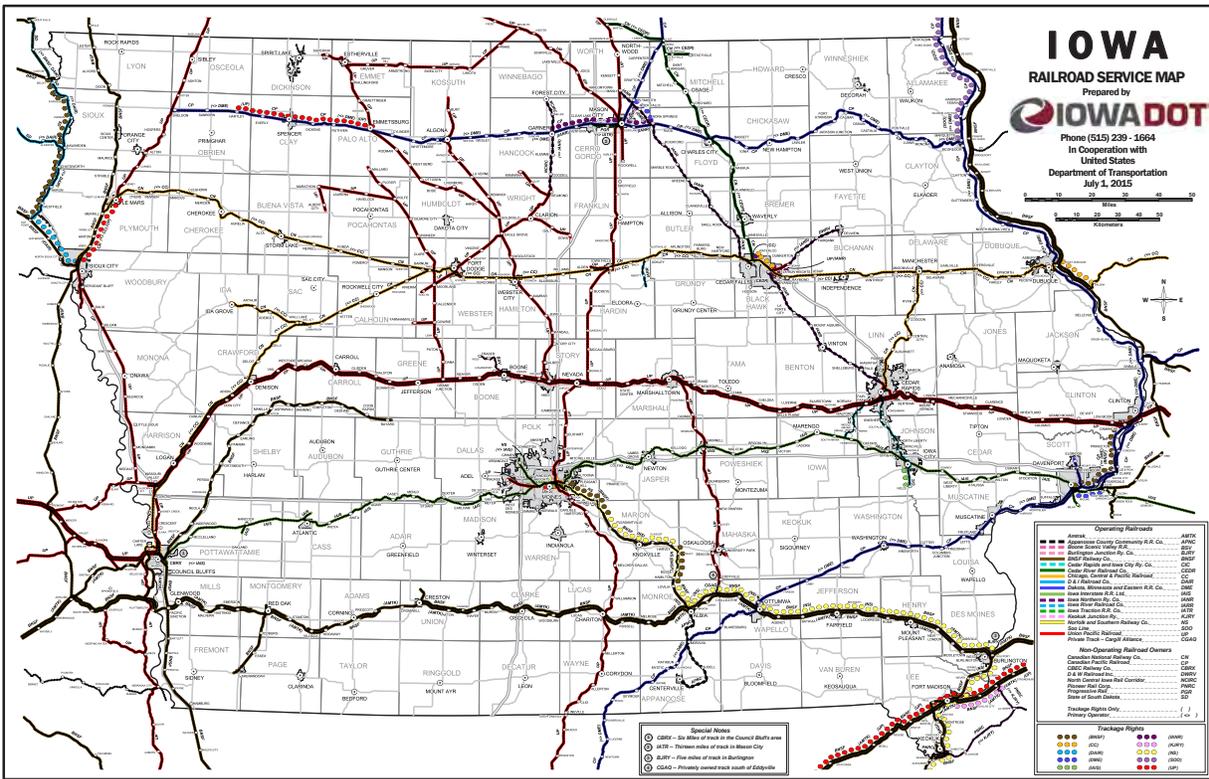
Source: Iowa DOT; Class I Railroad Annual Reports R-1 (2014); Iowa Class I, II, and III railroads

Notes:

- a. NS presently operates on 9 miles in Iowa – 5 miles of NS trackage at Des Moines and 4 miles of BNSF trackage at Des Moines operated under contract. The remainder of the NS-owned trackage in Iowa has been leased to BNSF and IAIS for operations. Total Miles Operated figure represents miles in Iowa over which NS operates through ownership, under contract, and via haulage rights only.
- b. IAIS also leases or operates under contract the 6-mile CBEC Railway at Council Bluffs, a 12-mile segment from NS between Des Moines and Grimes, and an 8-mile segment from CIC between Iowa City and Hills, totaling 24 miles. These miles are not included in IAIS route-mile calculations in the table above, as IAIS designates these segments as industrial leads, which are not included in route-mile calculations. IAIS operates over the 18 miles of CIC between Yocum Connection (near South Amana), Iowa, and Cedar Rapids, Iowa, via a marketing agreement with CIC.
- c. State of South Dakota owned trackage in Iowa is leased to the Sioux Valley Regional Railroad Authority (SVRRA); DAIR provides service for SVRRA via an operating contract.

Figure 2.1 below identifies the routes of Iowa's railroads in the context of the state's rail network.

Figure 2.1: Iowa Railroad Service Map, 2015



Source: Iowa DOT

2.1.1.1 FREIGHT RAIL NETWORK

2.1.1.1.1 Class I Railroads

Class I railroads are defined as those national railroads that typically operate over thousands of route miles, employ thousands of people, and have revenues and capital budgets in the billions of dollars collectively². There are seven Class I railroads in the United States and Canada; some have transportation linkages to Mexico.

² See Federal Register, Volume 79, No. 111, June 10, 2014, p. 33257. The STB defines class of railroad based on revenue thresholds adjusted for inflation. For 2013, the most recent available, Class I carriers had revenues of \$467.0 million or more. Class II carriers have revenues ranging from \$37.4 million to under \$467.0 million. Class III carriers have revenues under \$37.4 million. All switching and terminal carriers regardless of revenues are Class III carriers. (See 49 CFR 1201.1-1)

Iowa is served directly by five Class I railroads: BNSF Railway (BNSF), Canadian National Railway (CN), Canadian Pacific Railway (CP), Norfolk Southern Railway (NS), and Union Pacific Railroad (UP). A sixth Class I railroad — Kansas City Southern Railway (KCS) — has access to Council Bluffs, Iowa, via haulage rights over BNSF and UP from Kansas City, Missouri. A brief description of each railroad appears in the following sections. Details of the railroads' physical plant and operations appear in Appendix A.

BNSF Railway (BNSF)

BNSF Railway (BNSF), a wholly owned subsidiary of Berkshire Hathaway, is a Fort Worth, Texas-based Class I railroad with a network of approximately 32,500 miles in the U.S. and Canada. BNSF owns approximately 631 miles in Iowa. BNSF serves the U.S. Midwest, West, and South; Gulf Coast and West Coast ports; and Canada. Interchanges are locations where railroads intersect and exchange railcars. BNSF has the ability to interchange freight rail traffic with four Class I carriers (CN, CP, NS, UP), one Class II carrier (IAIS), and four Class III carriers (APNC, BJRY, DAIR, KJRY) in Iowa.

Canadian National Railway (CN)

Canadian National Railway (CN) is a publicly traded Montreal, Quebec (Canada) based Class I railroad with a network of approximately 20,500 miles in the U.S. and Canada, of which approximately 605 miles is in Iowa. CN serves the U.S. Midwest and South; Gulf, West Coast, and East Coast ports; and Canada. CN operates in Iowa through its subsidiaries Chicago Central and Pacific Railroad (CC&P) and Cedar River Railroad (CEDR). CN has the ability to interchange freight rail traffic with three Class I carriers (BNSF, CP, UP), one Class II carrier (IAIS), and four Class III carriers (CIC, DAIR, IANR, IARR) in Iowa.

Canadian Pacific Railway (CP)

Canadian Pacific Railway (CP) is a publicly traded Calgary, Alberta (Canada) based Class I railroad with a network of approximately 13,700 miles in the U.S. and Canada. CP owns approximately 654 miles in Iowa. CP serves the U.S. Midwest and East Coast, West Coast and East Coast ports, and Canada. CP operates in Iowa through its subsidiary Dakota, Minnesota and Eastern Railroad (DM&E). CP has the ability to interchange freight rail traffic with three Class I carriers (BNSF, CN, UP), one Class II carrier (IAIS), and three Class III carriers (APNC, IANR, IATR) in Iowa.

Kansas City Southern Railway (KCS)

Kansas City Southern Railway (KCS), a wholly owned subsidiary of Kansas City Southern Industries, is a Kansas City, Missouri-based Class I railroad with a network of approximately 3,500 miles in 10 U.S. states. KCS has approximately 55 miles of haulage rights over BNSF and UP in Iowa, but does not own any trackage in Iowa. KCS serves the U.S. Midwest and South; Gulf Coast ports; and has connections to Mexico.

Norfolk Southern Railway (NS)

Norfolk Southern Railway (NS), owned by Norfolk Southern Corporation, is a publicly traded Norfolk, Virginia-based Class I railroad with a network of approximately 20,000 miles in 22 U.S. states. NS owns approximately 44 miles in Iowa. NS operations are centered on Des Moines and much of the NS trackage in Iowa is leased to other railroads. NS also has haulage rights over BNSF between Des Moines, Iowa, and St Louis, Missouri, and haulage rights over IAIS between Des Moines, Iowa, and Peoria, Illinois, to connect with the rest of the NS network; most of these rights are within Iowa. NS serves the U.S. Midwest, East, and South, and Gulf and East Coast ports. NS has the ability to interchange freight rail traffic with two Class I carriers (BNSF, UP), one Class II carrier (IAIS), and one Class III carrier (APNC) in Iowa.

Union Pacific Railroad (UP)

Union Pacific Railroad (UP), a wholly owned subsidiary of the Union Pacific Corporation, is a publicly traded Omaha, Nebraska-based Class I railroad with a network of approximately 32,000 miles in 23 U.S. states. UP owns approximately 1,291 miles in Iowa, which represents one-third of the total Iowa rail network and the largest single ownership of railroad lines in Iowa. UP serves the U.S. Midwest, West, and South; Gulf and West Coast ports; and maintains direct connections within the rail network of Mexico. UP has the ability to interchange freight rail traffic with five Class I carriers (BNSF, CN, CP, KCS, NS), one Class II carrier (IAIS), and six Class III carriers (BSV, CIC, DAIR, IANR, IATR, KJRY) in Iowa.

2.1.1.1.2 Class II Railroads

Freight railroads are generally divided into three categories. In addition to the Class I railroads discussed above, smaller railroads include Class II or regional railroads, and Class III or short line railroads³.

One Class II or regional railroad currently operates in Iowa: the Iowa Interstate Railroad (IAIS). A brief summary of the railroad appears below. Details on its physical plant and operations appear in Appendix A.

Iowa Interstate Railroad (IAIS)

Iowa Interstate Railroad (IAIS) is a Class II railroad based in Cedar Rapids, Iowa, and is owned by Railroad Development Corporation (RDC) of Pittsburgh, Pennsylvania. IAIS was established in 1984 to preserve rail service over a former principal route of the Chicago, Rock Island & Pacific Railroad line between Bureau, Illinois (west of Chicago) and Council Bluffs, Iowa. The initial network included trackage rights from Bureau to Joliet, Illinois, on CSX Transportation and from Joliet to Blue Island (near Chicago), Illinois, on Metra, for access to Chicago. The initial network also included branch lines extending from Altoona to Pella, Iowa (this segment was cut back from Pella in stages in 1998, 2000, and 2014 and now ends at South Mitchellville, Iowa); Hancock Junction to Hancock and Oakland, Iowa (this segment was largely abandoned between Hancock Junction and Oakland in 2014); Atlantic to Audubon, Iowa (this segment was largely abandoned in 1995); and Rock Island to Milan, Illinois.

Subsequent network expansions included operation of NS-owned trackage between Des Moines and Grimes, Iowa; acquisition of the former CRI&P line between Henry (south of Bureau) and Peoria, Illinois (previously leased from Lincoln & Southern Railroad since 1987) and Class III railroad Great Western Railway of Iowa (CBGR) at Council Bluffs, Iowa, in 2006; operation by agreement over CIC trackage between Yocum Connection (South Amana) and Cedar Rapids, Iowa, and between Iowa City and Hills, Iowa; and lease of former CRI&P trackage from CSX Transportation between Henry, Bureau, and Utica, Illinois, in 2006⁴.

IAIS also operates and maintains the CBEC Railway in Council Bluffs, Iowa. Today, IAIS operates a regional network of approximately 550 miles, reaching from Chicago and Peoria, Illinois, to Davenport, Iowa City, Des Moines, and Council Bluffs, Iowa. IAIS operates over approximately 325 miles in Iowa. IAIS connects with all U.S. Class I railroads, either in Iowa or Illinois.

2.1.1.1.3 Class III Railroads

There are 11 Class III or short line railroads in Iowa. Short line railroads are local railroads that primarily engage in freight haulage or line haul services or terminal switching services.

In recent years there has been a trend toward consolidation of railroads within the short line and regional railroad industry with many lines coming under the control of railroad holding companies. In Iowa, the state's one regional railroad and two of the state's 11 short line railroads are operated by railroad holding companies, including Railroad Development Corporation (owner of IAIS), Pioneer Railcorp (owner of KJRY), and Progressive Rail (owner of IATR). Iowa's other Class III railroads are generally independently owned.

A brief description of each operating Class III operating railroad in Iowa is included below. Details on the railroads physical plant and operations appear in Appendix A of the Iowa State Rail Plan.

Appanoose County Community Railroad (APNC)

The Appanoose County Community Railroad (APNC) is a Class III railroad headquartered in Centerville, Iowa. The APNC was established by the town of Centerville, Iowa, in 1983 to preserve rail service in Appanoose County. Today, APNC owns and operates segments of former Chicago, Burlington & Quincy Railroad; Chicago, Rock Island & Pacific Railroad; and Wabash Railroad trackage that form a continuous, J-shaped route from Centerville to Moravia and Albia, Iowa. APNC operates 35 miles of railroad.

³ See *Federal Register*, Volume 79, No. 111, June 10, 2014, p. 33257. The STB defines class of railroad based on revenue thresholds adjusted for inflation. For 2013, the most recent available, Class I carriers had revenues of \$467.0 million or more. Class II carriers have revenues ranging from \$37.4 million to under \$467.0 million. Class III carriers have revenues under \$37.4 million. All switching and terminal carriers regardless of revenues are Class III carriers. (See 49 CFR 1201.1-1)

⁴ Iowa Interstate Railroad, Ltd. — *Growing and Glowing at Age 25*; Iowa Interstate Railroad, 2009

Boone & Scenic Valley Railroad (BSV)

The Boone & Scenic Valley Railroad (BSV) is a Class III railroad based in Boone, Iowa. B&SV passenger rail operations began in 1983 when it acquired 12 miles of former Fort Dodge, Des Moines & Southern Railroad (FDDM&S) trackage between Boone and Wolf, Iowa, from the Chicago & North Western Railway (C&NW). In 2001, B&SV acquired an additional 2 miles of former FDDM&S and C&NW trackage in Boone, Iowa, from UP, and began offering freight service only on that segment to serve an industrial park. Today, the Boone-Wolf segment is for passenger service of the Boone & Scenic Valley Railroad and Museum only.

Burlington Junction Railway (BJRY)

The Burlington Junction Railway (BJRY) is a Class III railroad headquartered in Burlington, Iowa. The BJRY was established in 1985 to provide rail service over former Chicago, Rock Island & Pacific Railroad trackage in Burlington, Iowa, and commodity transloading services. BJRY subsequently expanded its rail switching and commodity transloading services to additional locations in Mount Pleasant, Ottumwa, and Le Mars, Iowa, as well as at other locations in Illinois and Missouri. BJRY operates approximately 6 miles of railroad in Iowa.

CBEC Railway (CBEC)

The CBEC Railway (CBEC) was established in 1992 as a wholly owned subsidiary of MidAmerican Energy in Council Bluffs, Iowa. The CBEC network was built in 1997 and consists of 6 miles of trackage in the Council Bluffs area and is used primarily to provide coal to a utility plant at the Council Bluffs Energy Center. IAIS operates and maintains the CBEC and BNSF and UP have operating rights over CBEC. Today, CBEC is owned by Corn Belt Power Cooperative and the Central Iowa Power Cooperative⁵. Details about the operating and physical characteristics of the CBEC network in Iowa can be found in the IAIS section presented in Appendix A.

Cedar Rapids & Iowa City Railway (CIC)

The Cedar Rapids & Iowa City Railway (CIC) — more commonly referred to as the CRANDIC — is a Class III railroad owned by Alliant Energy and is based in Cedar Rapids, Iowa. The CIC was established as an electric railroad and began providing service between Cedar Rapids and Iowa City, Iowa, in 1904. The railroad subsequently dieselized its operations in the 1950s and later expanded its freight railroad network in the area considerably, mostly via the acquisitions of former Chicago, Rock Island & Pacific Railroad trackage between Iowa City and Hills, Iowa, and former Chicago, Milwaukee, St. Paul & Pacific Railroad trackage between Cedar Rapids and near Yocum Connection (South Amana), Iowa, during 1980-1982. CIC owns 57 miles of railroad in Iowa.

D&I Railroad (DAIR)

The D&I Railroad (DAIR) is a Class III railroad based in Sioux Falls, South Dakota, and is owned by aggregate producer L.G. Everist. DAIR was established in 1981, and its principal route is from Sioux City, Iowa, to Hawarden, Iowa, and Sioux Falls and Dell Rapids, South Dakota. The segments of DAIR's network in Iowa consist almost entirely of operating or trackage rights over former lines of the Chicago, Milwaukee, St. Paul & Pacific Railroad (CMStP&P), which retrenched from much of Iowa and South Dakota in 1980, and was acquired by other entities as a means of preserving rail service to the region.

D&W Railroad (DWRV)

The D&W Railroad (DWRV) was established by TRANSCO Railway Products in 2002 to acquire from UP 19 miles of former Chicago Great Western Railway trackage between Dewar and Oelwein, Iowa, in order to preserve rail service in three Iowa counties. DWRV is based in Chicago, Illinois. DWRV later added 3 miles to its network at Oelwein. TRANSCO remains the parent company of DWRV. IANR operates the 22-mile railroad through an agreement with DWRV and the line between Dewar and Oelwein is designated the IANR Oelwein Subdivision. Details about the operating and physical characteristics of the DWRV network in Iowa can be found in the IANR section presented below.

Iowa Northern Railway (IANR)

Iowa Northern Railway (IANR), based in Cedar Rapids and Manly, Iowa, is the state's largest Class III railroad and

⁵ <http://www.cbpower.coop/asp/News.aspx?NewsID=1945>

it operates a regional network consisting of approximately 167 miles of railroad it owns, leases, and operates under contract, all in Iowa. IANR was established in 1984 to provide operations over former Chicago, Rock Island & Pacific Railroad trackage and to preserve rail service in seven Iowa counties. That included a principal route of the former CRI&P from Manly, Iowa, to Waterloo and Cedar Rapids, Iowa, and a branch line from Vinton to Dysart, Iowa (this segment was mostly abandoned in 1994). The present IANR management team assumed control of the railroad in 1994. Today, in addition to the principal line segment between Manly and Cedar Rapids (consisting of the Manly and Cedar Rapids subdivisions), IANR has trackage rights over CP and UP to access isolated lines between Belmond and Forest City, Iowa (owned by the North Central Iowa Rail Corridor and operated by IANR as its Garner Subdivision), and between Dewar (Waterloo) and Oelwein, Iowa (owned by DWRV and operated by IANR as its Oelwein Subdivision), respectively.

Iowa River Railroad (IARR)

The Iowa River Railroad (IARR) is a Class III railroad based in Steamboat Rock, Iowa. IARR was established in 2006 to operate former Minneapolis & St. Louis Railway trackage acquired from UP between Marshalltown and Steamboat Rock, Iowa, and from the North Central Railway Association (NCRA) between Steamboat Rock and Ackley, Iowa. IARR abandoned the Marshalltown-Steamboat Rock segment in 2012. Today, IARR operates over the 9-mile segment between Steamboat Rock and Ackley and is used primarily to serve an ethanol plant near Steamboat Rock.

Iowa Traction Railway (IATR)

The Iowa Traction Railway (IATR) is a Class III railroad based in Mason City, Iowa, and one of seven railroads owned and operated by short line railroad conglomerate Progressive Rail of Lakeville, Minnesota. IATR traces its history back to the founding of the Mason City & Clear Lake Railway (MC&CL) in 1896, was acquired by Progressive Rail in 2012, and is the only remaining electrified common carrier freight railroad in Iowa. IATR operates over approximately 10.4 miles of mostly former MC&CL trackage between Mason City and Clear Lake, Iowa.

Keokuk Junction Railway (KJRY)

The Keokuk Junction Railway (KJRY) is a Class III railroad based in Peoria, Illinois, and one of several railroads owned and operated by short line conglomerate Pioneer Railcorp. of Peoria, Illinois. KJRY was established in 1981 to operate former Chicago, Rock Island & Pacific Railroad trackage at Keokuk, Iowa, and later expanded with the 1986 acquisition from the Atchison, Topeka & Santa Fe Railway of the former Toledo, Peoria & Western Railroad between Keokuk, Iowa, and La Harpe, Illinois (east of Keokuk, Iowa). Subsequent expansions included trackage acquisition from La Harpe to Peoria and Lomax, Illinois, and trackage rights over the BNSF Railway Chillicothe Subdivision between Lomax, Illinois, and Fort Madison, Iowa. KJRY operates 1 mile in Iowa (a segment of the KJRY Iowa Subdivision at Keokuk) and has 3 miles of trackage rights in Iowa.

2.1.1.1.4 Non-Operating Railroad Owners

A non-operating railroad owner is typically an entity that owns a railroad, but has an agreement with an operating railroad to provide service. There are two non-operating railroad owners in Iowa. These are identified, along with the operator of each, in Table 2.2 below.

The state of Iowa does not presently own any rail lines. There is one instance of public ownership of non-operating railroad lines in Iowa. This is identified, along with the designated operator of the lines, in the table.

A principal privately owned rail line exists in Iowa to preserve rail service over a short corridor. This is identified, along with the designated operator, in the table.

Table 2.2: Non-Operating Railroad Owners

RAILROAD OR OWNER OF RAIL LINE	STANDARD CARRIER ALPHA CODE	RAILROAD TYPE
North Central Iowa Rail Corridor	Not applicable (abbreviated as NCIRC in the State Rail Plan)	Principal privately owned railroad corridor (operated by Class III railroad IANR)

State of South Dakota	Not applicable (abbreviated as SD in the State Rail Plan)	Publicly owned railroad (operated by Class III railroad DAIR)
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Source: Iowa Class III railroads; Iowa DOT Annual Reports 2014

A brief description of each non-operating railroad owner and associated rail line segments in the Iowa rail network is included in Appendix A of the Iowa State Rail Plan. The descriptions include such details as ownership; miles owned; designated operator; physical characteristics of rail lines; improvement needs identified by each entity, if known; and more.

2.1.1.1.5 Industrial Railroads

Industrial railroads exist in Iowa and typically provide intraplant and interplant rail switching service to industrial and manufacturing customers and to coordinate and facilitate carload interchange with operating Class I, II, or III railroads. These small privately owned switching railroads operate over private track on private property, and exist at many grain elevators and ethanol plants in Iowa. These operations can be owned and operated by the company they serve or can be operated under a contract agreement with an outside party. The mileage of privately owned industrial track is not included in route-mile calculations of the Iowa rail network. Specific industrial railroad applications in Iowa are not identified in the State Rail Plan.

2.1.1.2 PASSENGER RAIL NETWORK

This section summarizes the history of Iowa passenger rail service and also provides an overview of the current service provided by the National Railroad Passenger Corporation, which is otherwise known as Amtrak.

2.1.1.2.1 Historical Rail Intercity Passenger Perspective

Iowa has hosted passenger trains for 160 years and the state was once served by a comprehensive array of local, intercity, and long-distance trains operated by the main line railroads. Through the 1950s, Iowa was still well served by intercity and long-distance passenger trains. Some of the named trains of the main line railroads at that time, and their routings in Iowa, included the following:

- Chicago & North Western Railway (C&NW) via Clinton, Cedar Rapids, Marshalltown, Ames, Boone, Carroll, and Council Bluffs, Iowa, and later the Chicago, Milwaukee, St. Paul and Pacific Railroad (CMStP&P)⁶ via Marion (Cedar Rapids), Perry, and Council Bluffs, Iowa:
 - *City of Los Angeles* (Chicago — Los Angeles)⁷
 - *City of San Francisco* (Chicago — San Francisco Bay Area)
 - *City of Portland* (Chicago — Portland)
 - *City of Denver* (Chicago — Denver)
 - *Challenger* (Chicago — Los Angeles)
- Chicago, Burlington and Quincy Railroad (CB&Q) via Burlington, Mount Pleasant, Fairfield, Ottumwa, Albia, Chariton, Osceola, and Creston, Iowa:
 - *California Zephyr* (Chicago — Oakland)
 - *Nebraska Zephyr* (Chicago — Lincoln)
 - *Denver Zephyr* (Chicago — Denver)
- Chicago, Rock Island and Pacific Railroad (CRI&P) via Davenport, West Liberty, Iowa City, Grinnell, Newton, Des Moines, Atlantic, and Council Bluffs, Iowa:
 - *Rocky Mountain Rocket* (Chicago — Denver and Colorado Springs)
 - *Corn Belt Rocket* (Chicago — Omaha)
- Chicago, Rock Island and Pacific Railroad (CRI&P) via Davenport, Muscatine, and Fairfield, Iowa:
 - *Golden State* (Chicago — Kansas City — Los Angeles)
- Chicago, Rock Island and Pacific Railroad (CRI&P) via Manly, Mason City, Iowa Falls, Nevada, Des Moines, and Chariton, Iowa:

⁶ In 1955, Union Pacific Railroad shifted its streamliners from the C&NW route to the CMStP&P route east of Council Bluffs.

⁷ In 1960, this train was combined with the City of San Francisco east of Ogden, Utah.

- *Twin Star Rocket* (Minneapolis — Kansas City — Houston)
- Chicago, Rock Island and Pacific Railroad (CRI&P) via Manly, Cedar Falls, Waterloo, Cedar Rapids, West Liberty, and Burlington, Iowa:
 - *Zephyr Rocket* (Joint with CB&Q⁸) (Minneapolis — St. Louis)
- Illinois Central Railroad (IC) via Dubuque, Manchester, Waterloo, Iowa Falls, Fort Dodge, Storm Lake, and Cherokee, Iowa:
 - *Hawkeye* (Chicago — Sioux City)
 - *Land O'Corn* (Chicago — Waterloo only)
- Atchison, Topeka and Santa Fe (AT&SF)⁹ via Fort Madison, Iowa:
 - *Chief* (Chicago — Los Angeles)
 - *Super Chief* (Chicago — Los Angeles)
 - *Texas Chief* (Chicago — Houston)
 - *San Francisco Chief* (Chicago — San Francisco Bay Area)
 - *El Capitan* (Chicago — Los Angeles)

Since that time, passenger train service gradually declined as the interstate highway system expanded and jet air travel became more common. Loss of ridership resulted in declining revenues and eventually mounting financial losses. To save costs, railroads began combining or eliminating train services. For example, of the joint UP and CMStP&P passenger services operating across Iowa, the *City of Los Angeles* and the *Challenger* were combined in 1956, and the *City of San Francisco* and the *City of Los Angeles* were combined in 1960. On the CRI&P, the last run of the *Twin Star Rocket* was in 1969 and passenger service across Iowa from Council Bluffs, Des Moines, Iowa City, and Davenport to Chicago — a remnant of the *Corn Belt Rocket* and *Rocky Mountain Rocket* services — was truncated to a Rock Island-Chicago operation within Illinois only in 1970. On the CB&Q, the *California Zephyr* ceased operations in 1970.

In 1970 Congress created Amtrak to relieve freight railroads of their intercity passenger train operations. Amtrak assumed operation of most intercity trains in 1971¹⁰. By 1972, there were only five long-distance Amtrak trains serving Iowa, plus two other intercity trains operated by the CRI&P, which did not join Amtrak.

- Amtrak trains:
 - *Denver Zephyr* (Chicago — Denver)
 - *Super Chief* (Chicago — Los Angeles)
 - *El Capitan* (Chicago — Los Angeles)
 - *Texas Chief* (Chicago — Houston)
 - *City of San Francisco* (Chicago — San Francisco Bay Area)
- Chicago, Rock Island & Pacific Railroad (CRI&P)
 - *Quad City Rocket* (Chicago — Rock Island)
 - *Peoria Rocket* (Chicago — Peoria)

While the latter two trains did not reach Iowa, they were accessible to residents in the eastern part of the state. Both CRI&P trains were discontinued altogether in 1978.

Starting in 1974, another Amtrak intercity train, the *Black Hawk*, operated between Chicago and Dubuque over the Illinois Central Gulf Railroad (ICG). That Amtrak train was dropped in 1981. The *Denver Zephyr* was combined with the *City of San Francisco*, which eventually became the *San Francisco Zephyr* and later the *California Zephyr*. The *Texas Chief* also had a name change to the *Lone Star*, which was eliminated due to budget cuts in 1979. The Chicago — Los Angeles service was combined into what ultimately became the *Southwest Chief*.

⁸ Transitioned to the CB&Q at Burlington.

⁹ Only made one stop in Iowa, at Fort Madison.

¹⁰ Amtrak was created pursuant to the National Passenger Service Act of 1970; Amtrak's first day of operations was May 1, 1971.

2.1.1.2.2 Current Amtrak Routes

Today, Iowa is directly served by two long-distance Amtrak trains. There currently is no intercity corridor or commuter service provided in the state, either by Amtrak or by other operators. Amtrak operates entirely over the trackage of BNSF Railway in Iowa. The state of Iowa is also served by Amtrak Thruway Bus Connections to the two intercity trains.

The *California Zephyr* and the *Southwest Chief* operate with bi-level train car equipment. Each train is equipped with coaches, sleeping cars, a diner, and a lounge car. Current Amtrak services in the U.S. Midwest and West appear in Figure 2.2 below, and their routes through Iowa appear in Figure 2.3 below.

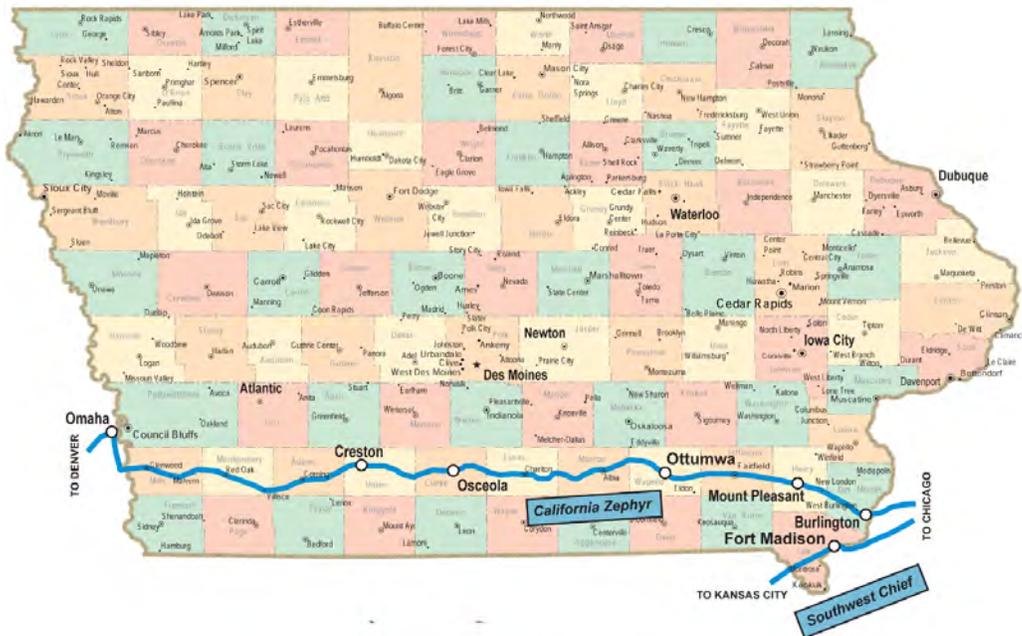
Figure 2.2: Amtrak Western Routes, Including the *California Zephyr* and *Southwest Chief*



Source: Amtrak

California Zephyr – The *California Zephyr* operates between Chicago and Emeryville, which is in the San Francisco Bay Area (route shown in Figure 2.2 above). The service consists of one daily round-trip, stopping at Burlington, Mount Pleasant, Ottumwa, Osceola and Creston. Intermediate stops outside Iowa include Omaha, Denver, Salt Lake City, and Reno. In the westbound direction Amtrak Train 5 leaves Chicago at 2:00 PM (CT) and arrives in Emeryville at 4:10 PM (PT) two days later. Eastbound Train 6 leaves Emeryville at 9:10 AM (PT) and reaches Chicago at 2:50 PM (CT) two days later. In the westbound direction the *California Zephyr* stops at Iowa stations between 5:25 PM and 8:41 PM while eastbound the train stops at Iowa stations between 7:04 AM and 10:36 AM. The *California Zephyr's* schedule offers early to mid-morning service through the southern tier of the state eastbound, while westbound service through Iowa is in the early evening. The *California Zephyr's* route on BNSF through Iowa is 274 miles long.

Figure 2.3: Existing Amtrak Routes in Iowa



Source: Amtrak

Southwest Chief – The *Southwest Chief* operates between Chicago and Los Angeles (route shown in Figure 2.3 above). The service consists of one daily round-trip, stopping at Fort Madison. Intermediate stops outside Iowa include Kansas City, Albuquerque, and Flagstaff. In the westbound direction Amtrak Train 3 leaves Chicago at 3:00 PM (CT) and arrives in Los Angeles at 8:15 PM (PT) two days later. Eastbound Train 4 leaves Los Angeles at 6:15 PM (PT) and reaches Chicago at 3:15 PM (CT) two days later. In the westbound direction the *Southwest Chief* stops at Fort Madison at 6:42 PM, while eastbound the train stops at Ft. Madison at 11:09 AM. The *Southwest Chief's* route on BNSF through Iowa is 20 miles long.

Thruway Bus Connections – Amtrak offers its Thruway bus service to and from Davenport connecting with the *California Zephyr* and the *Southwest Chief* at Galesburg, Illinois. The most convenient connections are from Davenport to westbound Train 3 and to Davenport from westbound Train 5. Davenport is the only Iowa stop for the Thruway buses.

2.1.1.3 TOURIST TRAIN NETWORK

2.1.1.3.1 Tourist Train Overview

Iowa's tourist railways and museums offer tourists and visitors several hour-long trips that showcase scenic or historic areas of the state with bucolic rides between small towns. These rail trips offer a glimpse of an activity that was once part of daily life. The railroads also serve to preserve equipment, buildings, artifacts, and industrial skills from earlier eras.

In addition to preserving railroad history, heritage railways, museums, and other venues also attract visitors, generating income not only for these businesses but also for restaurants, hotels and other visitor service establishments. Heritage railways can also provide an opportunity to introduce the general public to the contemporary rail industry and its key role in the state's economy.

The following summaries provide an overview of the tourist railroads and some railroad museums in Iowa.

2.1.1.3.2 Boone and Scenic Valley Railroad and Museum

This tourist railroad offers various rides on a 15-mile, 1-hour 45-minute round trip between the Boone depot (13 miles west of Ames) and Fraser on a former interurban line of the Fort Dodge, Des Moines & Southern Railway. Trains run between Memorial Day and the end of October. The route follows the Des Moines River west of Boone for five miles to Frasier. There are two large bridges on the route: heading north, trains cross a ravine east of the Des Moines River and then cross the Des Moines River just east of Fraser.

Offered to the public are four trips:

- 1-hour and 45-minute excursion trains (daily)
- 2-hour and 15-minute dinner train trips (Fridays and Saturday)
- 2-hour and 45-minute desert trains (Sundays)
- 2-hour and 45-minute picnic trains (Sundays)

Holiday themed and special excursions are also available.

Trains are pulled by diesel electric locomotives daily and steam locomotives on Saturday. Locomotives pull a mix of passenger equipment, including vintage coaches, open air cars, cabooses, and vintage Union Pacific Railroad streamliner equipment from the historic *City of San Francisco* and *City of Los Angeles* trains. A *City of San Francisco* car has an open-air rear observation deck.

Also offered is a 30-minute ride in a restored 1920's era electric trolley running between the depot and downtown Boone, making it one of the few tourist railroads offering rides on all three basic historic technologies – steam, diesel ,and electric locomotives

Located at the Boone depot is the James H. Andrew Railroad Museum and History Center, a new 9,000-square-foot facility that includes displays and memorabilia about railroading in Iowa. The museum is open Monday through Sunday.

A weekday departure from Boone is seen in Figure 2.4 below.

Figure 2.4: Boone and Scenic Valley Tourist Train Preparing to Depart Boone



Source: CDM Smith

The railroad hauls about 49,000 to 55,000 passengers a year, of which 60 to 65 percent are from out of state. Volunteers operate the trains.

2.1.1.3.3 Midwest Central Railroad and Midwest Electric Railway

Located in Mount Pleasant, the Midwest Central Railroad has six narrow gauge steam locomotives (not all operating), a diesel electric switcher, a Model T motor car, and six open-air passenger cars, among other rolling stock. There is also standard gauge electric trolley equipment at the site.

Rides on steam trains and trolleys are offered to the public at four events:

- Independence Day Celebration (July 4)
- Old Threshers Reunion (five days ending on Labor Day)
- Haunted Rails (in October)
- North Pole Express (late November through mid-December)

The station facility, which is a restored CB&Q depot, is shown in Figure 2.5 below.

Figure 2.5: Midwest Central Railroad Station Facility



Source: CDM Smith

Steam trains operate clockwise on a loop track through McMillan Park. The train crews are all volunteers.

The trains carry about 14,000 passengers a year, most during the Old Threshers Reunion. About 50 percent come from out of state.

On a loop track around a campground just to the south of McMillan Park, antique standard gauge trolleys run counter-clockwise. The trolley operation, dubbed the Midwest Electric Railway, brings people staying in the campground to the Old Threshers Reunion at McMillan Park. The trolleys are also active for the Haunted Rails event in October and during Christmas. Special event runs and school tours are also available.

The trolleys haul about 25,000 riders a year, with the largest concentration during the Old Threshers Reunion. About half of the riders are from out of state.

The trolleys are operated by volunteers. The operation is owned by the Midwest Old Settlers and Threshers Association, which sponsors the Old Threshers Reunion event.

2.1.1.3.4 Union Pacific Railroad Museum

The Union Pacific Railroad Museum is located in downtown Council Bluffs in a Beaux Arts style building that formerly housed the Council Bluffs Carnegie Free Public Library. Its mission is to educate the public about the past, present, and future of the UP specifically and the railroad industry in general. To this end, the museum maintains a large collection of photographs, archives, and artifacts relating to UP and to the railroad industry. The museum is open Thursdays through Saturdays from 10 AM to 4 PM, and is closed on some holidays. The museum building is seen in Figure 2.6 below.

Figure 2.6: Union Pacific Railroad Museum at Council Bluffs



Source: HDR

The museum sees about 28,000 visitors a year. In 2015, 27 percent came Iowa, 29 percent came from Nebraska and Iowa, 43 percent came from outside the two-state area, and the remainder came from outside the United States.

The museum is operated by the Union Pacific Museum Association.

2.1.1.4 RAILROAD ABANDONMENTS AND RAILBANKED LINES

2.1.1.4.1 Background

This section summarizes a general background of rail line abandonments in Iowa and the identification of actual rail service discontinuances and abandonments in the state over the last decade. Railroad abandonment occurs when a rail line is no longer used for rail service. Abandonment and discontinuance of common carrier rail service on a given rail line is allowed by federal law. A railroad may abandon a rail line

with the permission of the Surface Transportation Board (STB) as generally described in this section. Iowa DOT has minimal regulatory jurisdiction in matters regarding railroad operations or service in Iowa, but it does participate in the STB abandonment process when required. More information about the railroad abandonment process and Iowa DOT's roles can be found in Railroad Abandonment issued by the Iowa DOT at: <http://www.iowadot.gov/iowarail/railroads/regulatory/regulatoryhome.htm>.

The following events had a profound and lasting effect on the Iowa railroad network, and launched an extended period of railroad consolidation, divestiture, and abandonment in Iowa, starting in the 1970s:

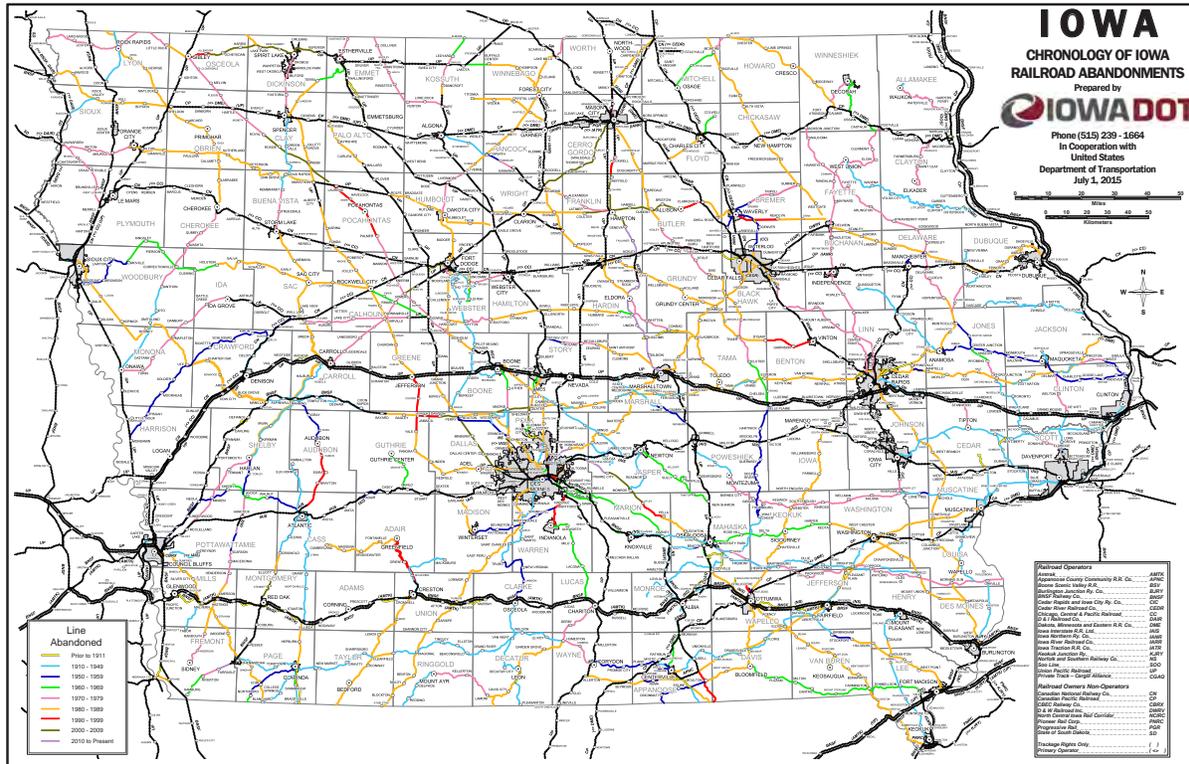
- Merger of Iowa railroads that resulted generally in excess route capacity and numerous parallel rail routes in Iowa for a single carrier. Notable was the mergers of the Minneapolis & St. Louis Railway and the Chicago Great Western Railway with the Chicago & North Western Railway during the 1960s.
- Bankruptcy of the Chicago, Rock Island & Pacific Railroad in 1980.
- Major retrenchment of the Chicago, Milwaukee, St. Paul & Pacific Railroad in Iowa (and neighboring Midwest states) during 1980.
- Passage of the 1980 Staggers Act, which deregulated railroads and was a catalyst for additional railroad mergers, and accelerated Class I railroad route abandonments and spinoffs to regional (Class II), short line (Class III) railroads, and various non-operating railroad owners in Iowa. Notable was Illinois Central Gulf Railroad's spinoff of much of its Iowa network to Class II railroad Chicago Central & Pacific Railroad in 1985; CC&P was reacquired by Class I Illinois Central Railroad (successor to ICG) in 1996, and is today a part of the CN network. Also notable was the creation of the Class II Iowa Interstate from principal lines of the CRI&P in Iowa.

Several hundred miles of railroad lines in Iowa owned historically by Class I railroads were abandoned or sold or leased to regional and short line railroads between 1980 and 2010. None of the abandoned rail lines was acquired by Iowa DOT. Some rail lines owned by the state of South Dakota include segments located in Iowa.

Rail banking is a process established under federal law that allows public entities to preserve established railroad rights-of-way for future reactivation of rail service, to protect rail transportation corridors, and to provide for recreational uses such as hiking and bicycling. Many abandoned or rail banked lines have been repurposed for interim recreational trail use in Iowa; principal rail trails in Iowa will be identified later in this section.

The map in Figure 2.7 below provides a chronology of railroad abandonments in Iowa.

Figure 2.7: Chronology of Iowa Railroad Abandonments



Source: Iowa DOT

2.1.1.4.2 Rail Abandonments and Discontinuances Since 2004

49 U.S.C. § 10903 governs the filing and procedure for common carrier application to abandon or discontinue rail operations over any part of its railroad lines as detailed in 49 CFR Part 1152. Abandonment or discontinuation requires a Surface Transportation Board (STB) finding “that the present or future public convenience and necessity require or permit the abandonment or discontinuance.” 49 CFR 1152.50 provides for exemption from the requirements for abandonment and discontinuance when the STB has found approval is unnecessary to carry out rail transportation policy of 49 U.S.C. § 10101, and the actions are of limited scope not requiring shippers be protected from abuse of market power.

The principal requirements for an exempted abandonment is that the railroad certify that no local traffic has moved over the line for two years, that any overhead traffic can be routed over other lines, and that no formal complaint is filed by a rail service user. Table 2.3 below identifies Iowa railroad discontinuances and abandonments approved by the STB since 2004, as well as such cases that are still pending, as of September 2015.

Table 2.3: Iowa Railroad Abandonments: 2004-2015

OPEN/ CLOSED	RAILROAD	LINE SEGMENT & APPLICABLE COUNTIES	MILES IN IOWA	DATE OF DECISION	DATE FINAL DECISION OR ACTION	INITIAL EFFECTIVE DATE	ACQUIRED FOR RAIL USE	ACQUIRED FOR RAIL BANKING/ TRAILS USE	COMMENTS
Open	BNSF	Shenandoah to Farragut MP 20.05 to MP 26.00 Page, Fremont	5.95			7/9/2012			Trail use neg. for MP 20.05 - 21.9; Green Plains Shenandoah will purchase MP 21.9-26.0
Closed	IARR	North of Steamboat Rock to Marshalltown Hardin, Marshall	34.35		2/5/2014	1/30/2013		CITU	
Open	UP	Royal Industrial Lead near Laurens MP 475.15 to MP 477.00 Pochahontas	1.95			9/22/2012			
Open	UP	Ankeny Industrial Lead - near Des Moines S of I-80 & Broadway NW to 1st St. at end of line at Ankeny MP 4.70 to MP 10.50 Polk	5.70		3/5/2014	9/25/2012		CITU	
Open	UP	Thornton Industrial Lead near Belmond (northeast from 4th Ave. NE) MP 30.02 to MP 29.52 Wright	0.50			7/4/2013			
Closed	NCRA	Ackley to Geneva MP 201.46 to MP 191.00 Franklin, Hardin	10.46			7/5/2013			
Open	DME	Blackhawk Spur in Davenport (near Rockingham Rd. NW to Wedge of Davenport) MP 0.33 to MP 0.99 Scott	0.66			1/23/2014			
Closed	CN	Cedar Rapids - near Rockwell Dr. to near Council St. NE MP 229.75 to MP 230.24 Linn	0.49		1/30/2014	11/29/2013	no	no	
Open	UP	Bristow Sbudivision near Hampton, IA (Olive Avenue just N of 10th St. NW) MP 318.07 to 318.66 Hampton, Franklin	0.59			12/11/2013			
Open	NS	In the City of Des Moines, SE 26th Ct. 0.3 miles to Scott Avenue (eastern segment) & approx. 0.3 mi. from E 6th St. to near E. 1st St. & the Des Moines River (western segment). MP 336.80 to MP 337.10 (.30 mi.) & MP 339.30 to MP 339.60 (.30 mi.) Polk	0.60			10/19/2013			
Open	CN	Council Bluffs Across Missouri River into Omaha, NE MP 510.62 to 514.80 (MP equations where 511.35 = 513.41) Pottawattamie	2.12	2/11/2015					
Open	IAIS	Near Hancock Junction, IA to end of track near Oakland, IA MP 467.77 to 469.59 Pottawattamie	1.82			4/26/2014			
Open	IAIS	South of Mitchellville, IA to end of Track southeast of Prairie City, IA MP 145.75 to MP 135.00 Polk, Jasper	10.75			9/17/2014			

Source: Iowa DOT

Notes:

1. CITU = Certificate Of Interim Trails Use
2. The Surface Transportation Board assumed responsibility for abandonments from the Interstate Commerce Commission in 1995. Dockets dated 1996 or later are available at <http://stb.dot.gov>
3. Initial decision date may be extended. Final abandonment or acquisition for rail or trails use may be significantly later. Refer to docket at www.stb.dot.gov

2.1.1.4.3 Railbanked Lines and Interim Trail Use

Recognizing that abandoned rail lines are typically lost for future transportation uses, rail right-of-way has been proactively railbanked in Iowa. When a line is railbanked, the purchaser must maintain ownership of the corridor for future rail use. Some of these segments may potentially hold strategic value as future transportation corridors in the state. Iowa DOT reviews all potential rail abandonments in the state for suitability as recreational corridors under the Federal Rails to Trails legislation, though Iowa DOT does not always have a way to intercede.

Over 22,000 miles of open rails-to-trails corridors exist nationwide, with approximately 806 miles of those miles in Iowa. The state has 76 multi-use rail trails of varying lengths¹¹. Several abandoned rail line segments have been converted to rail trails for interim recreational use in the state since the 1980s. Some principal rail trails in Iowa include the following facilities¹²:

- **Cedar Valley Nature Trail:** Approximately 51 miles of the former Waterloo, Cedar Falls & Northern Railroad between Evansdale and Hiawatha (Cedar Rapids), Iowa.
- **Chichaqua Valley Trail:** Approximately 28 miles of the former Chicago Great Western Railway between Bondurant and Baxter, Iowa.
- **Heart of Iowa Nature Trail:** Approximately 27 total miles of segments of the former Chicago, Milwaukee, St. Paul & Pacific Railroad between Slater and Rhodes, Iowa.
- **Heritage Trail:** Approximately 29 miles of the former Chicago Great Western Railway between Dubuque and Dyersville, Iowa.
- **High Trestle Trail:** Approximately 25 total miles of segments of the former Chicago & North Western Railway between Ankeny and Slater, Iowa, and the former Chicago, Milwaukee, St. Paul & Pacific Railroad between Slater and Woodward, Iowa.
- **Hoover Nature Trail:** Approximately 24 total miles of segments of the former Chicago, Rock Island & Pacific Railroad between Cedar Rapids and Burlington, Iowa.
- **Raccoon River Valley Trail:** Approximately 90 total miles, including the former Chicago, Milwaukee, St. Paul & Pacific Railroad between Jefferson and Waukee, Iowa, and between Herndon and Perry, Iowa; and the former Minneapolis & St. Louis Railway between Perry and Waukee, Iowa.
- **Rolling Prairie Trail:** Approximately 34 miles of the former Chicago Great Western Railway between Allison and Shell Rock, Iowa, and between Waverly and Readlyn, Iowa.
- **Sauk Rail Trail:** Approximately 35 miles of the former Chicago & North Western Railway between Carroll and Lake View, Iowa.
- **T-Bone Trail:** Approximately 21 miles of the former Chicago, Rock Island & Pacific Railroad between Atlantic and Audubon, Iowa.
- **Wabash Trace Nature Trail:** Approximately 64 miles of the former Wabash Railroad between Council Bluffs and Blanchard, Iowa.

Additional rail trails are currently under development in Iowa.

2.1.2 Major Freight and Passenger Terminals

2.1.2.1 FREIGHT RAIL YARDS AND FACILITIES IN IOWA

Iowa's operating freight railroads have multiple facilities to support railroad operations and maintenance and interface with freight shippers and receivers in the state. Major freight rail yards, terminals, and facilities of the Class I, Class II, and Class III railroads in Iowa are identified and described in Appendix A. The following freight rail facilities presently exist in Iowa:

¹¹ *Rails to Trails Conservancy web site; October 19, 2015*

¹² <http://www.iowadot.gov/iowabikes/multiusetrails.html>

- Switching yards and terminal
- Intermodal container transfer facility
- Transload facilities
- Freight car repair facilities
- Locomotive repair and servicing facilities

2.1.2.2 PASSENGER RAIL STATIONS IN IOWA

There are presently six Amtrak passenger rail stations in Iowa. Five are served by the *California Zephyr* and one by the *Southwest Chief*, as seen in Table 2.4 below. Each station sees two stops per day. Osceola generated the most passenger boardings and alightings (on's and off's) in Amtrak's fiscal year 2014 (FY2014)¹³.

Table 2.4: Boardings and Alightings of Amtrak Stations in Iowa

CITY	SERVICE	DAILY TRAINS	BOARDINGS AND ALIGHTINGS IN 2014
Burlington	<i>California Zephyr</i>	2	8,813
Creston	<i>California Zephyr</i>	2	4,314
Fort Madison	<i>Southwest Chief</i>	2	6,986
Mount Pleasant	<i>California Zephyr</i>	2	12,030
Osceola	<i>California Zephyr</i>	2	13,986
Ottumwa	<i>California Zephyr</i>	2	11,109
Total Iowa Station Usage			57,238

Source: Amtrak

Each passenger rail station in Iowa is identified below, along with a brief description of each station depot (structure) and its general location.

2.1.2.2.1 Burlington

Erected in 1944 by the former Chicago, Burlington and Quincy Railroad, the two-story Burlington depot replaced an earlier depot that was destroyed by fire in January 1943. The depot was also used as local offices for the railroad. Seen in Figure 2-8 below, the depot has a sleek streamlined design that became popular in the 1930s. Listed in the National Register of Historic Places, the depot is just south of downtown and just west of BNSF's rail yard and the Mississippi River.

Figure 2.8: Burlington Station



Source: CDM Smith

¹³ Amtrak reports its annual data by its fiscal year which runs from October 1 through September 30.

2.1.2.2.2 Creston

Seen in Figure 2.9 below, the Creston depot is a one-story utilitarian structure built by the former CB&Q in 1968. It is shared today with the BNSF Railway, the CB&Q's successor railroad. It is just east of the historic three-story, brick Burlington depot and railroad division offices built in 1899. The station is on the north side of the BNSF's yard facility in Creston and on the south side of downtown.

Figure 2.9: Creston Station



Source: CDM Smith

2.1.2.2.3 Fort Madison

The former Atchison, Topeka and Santa Fe Railway built the current Fort Madison station in 1968. The depot itself is a one-story utilitarian structure. The west side is used by BNSF operations personnel. The east side, shown in Figure 2.10 below, is the Amtrak station. The station is located at the east end BNSF's rail yard in Fort Madison, about 1.5 miles west of downtown, where the city's historic downtown AT&SF station complex is found. That structure is occupied by the North Lee County Historical Society and features a museum focused on regional and railroad history.

Figure 2.10: Fort Madison Station



Source: CDM Smith

2.1.2.2.4 Mount Pleasant

The former CB&Q built the station in 1912 at a location less than a half mile north of the historic downtown. The one-story Prairie style depot itself is made of pressed brick. The depot is seen in Figure 2.11 below.

Figure 2.11: Mount Pleasant Station



Source: CDM Smith

2.1.2.2.5 Osceola

The former CB&Q built the one-story, reddish brown brick Prairie Style depot in 1907. The station is located on the north edge of downtown. The Osceola depot was placed on the National Register of Historic Places in 2009. The depot is seen in Figure 2.12 below.

Figure 2.12: Osceola Station



Source: CDM Smith

2.1.2.2.6 Ottumwa

The former CB&Q built the modernistic two-story, stone depot in 1951, which was also used as local offices for the railroad. Amtrak shares the depot with the Wapello County Historical Museum. The station facility is just west of downtown and 600 feet east of the Des Moines River. The depot was placed on the National Register of Historic Places in 2008. The depot is seen in Figure 2.13 below.

Figure 2.13: Ottumwa Station



Source: CDM Smith

2.1.2.2.7 Iowa Passenger Rail Station Characteristics

Detail on the physical characteristics of the six Iowa station facilities served by Amtrak and identified in this section appears in Table 2.5 below.

Table 2.5: Characteristics of Iowa Amtrak Stations

CHARACTERISTICS	BURLINGTON	CRESTON	FORT MADISON
Ownership	City of Burlington owns the facility and parking lot; BNSF owns the platform and track	BNSF owns the facility, parking lot, platform and track	BNSF owns the facility, parking lot, platform and track
Address	300 South Main Street, Burlington	Pine and Adams Avenue, Creston	1601 20th Street, Fort Madison
Served By	<i>California Zephyr</i>	<i>California Zephyr</i>	<i>Southwest Chief</i>
Platform Type	Double	Double	Double
Platform Length	697 ft. 697 ft.	192 ft. 372 ft.	1,447 ft. 1,560 ft.
Platform Construction	Asphalt	Concrete	Concrete
Shelter	Enclosed waiting area	Enclosed waiting area; station eaves extend over platform	Enclosed waiting area; station eaves extend over platform
Lighting	Fully lit	Lighting under eaves	Fully lit
Platform Amenities	Canopy and benches	Benches under eaves	Benches under eaves

Passenger Safety	No safety stripe	Yellow safety stripe	Yellow safety stripe
ADA	Station wheelchair accessible; not all station facilities accessible	Station wheelchair accessible; not all station facilities accessible	Station wheelchair accessible; not all station facilities accessible
Depot Hours	8:00 AM to 6:00 PM daily	No station hours	10:00 AM - 1:00 PM and 5:00 PM - 6:30 PM M-F; closed weekends and holidays; lobby open daily
Wi-Fi Available	No	No	No
Inside Seating Capacity	Seating space for 14; storage lockers	Seating space for 19	Seating space for 23
Water Fountain	No	No	Yes
Restrooms	Yes	Yes	Yes
ATM	No	No	No
Ticketing	Unstaffed station; a caretaker opens and closes the station	Unstaffed station	Staffed counter with checked baggage; help with baggage
Payphone	No	No	No
Parking	40 spaces total	19 spaces total	49 paved spaces and 20 unpaved spaces total
ADA Parking Facilities	2 spaces reserved	2 spaces reserved	2 spaces reserved
Shared Use	No	BNSF facility	BNSF facility
Intermodal	SEIBUS local fixed route bus service and SEIRPC dial-a-ride service	Southern Iowa Trolley dial-a-ride service	SEIRPC dial-a-ride service
CHARACTERISTICS	MOUNT PLEASANT	OSCEOLA	OTTUMWA
Ownership	BNSF owns the facility, parking lot, platform and track	City of Osceola owns the facility and parking lot; BNSF owns the platform and track	Wapello County owns the facility and the parking lot; BNSF owns the platform and track
Address	418 North Adams Street, Mount Pleasant	Main and East Clay Streets, Osceola	210 West Main Street, Ottumwa
Served By	<i>California Zephyr</i>	<i>California Zephyr</i>	<i>California Zephyr</i>
Platform Type	Double	Double; north platform not used presently	Double
Platform Length	600 ft.	500 ft.	1,033 ft.
	730 ft.	727 ft.	1,104 ft.
Platform Construction	Concrete / brick / asphalt	Concrete	Asphalt
Shelter	Enclosed waiting area	Enclosed waiting area	Enclosed waiting area
Lighting	Fully lit	Fully lit	Fully lit
Platform Amenities	Benches under eaves	Benches on north side in glass shelter	Topless canopy
Passenger Safety	Yellow safety stripe; yellow safety bumpy pads on concrete ADA boarding area	Yellow safety stripe; red safety bumpy pads	Yellow safety strip
ADA	Station wheelchair accessible; not all station facilities accessible	Station wheelchair accessible; not all station facilities accessible	Station wheelchair accessible; not all station facilities accessible

Depot Hours	9:30 AM - 1:30 PM and 2:30 PM - 6:15 PM MTuWF; 9:30 AM - 3:45 PM and 4:45 PM - 6:15 PM Th; closed weekends and holidays	7:00 AM - 10:00 AM and 7:00 PM - 9:00 PM daily	8:30 AM - 11:30 AM and 5:30 PM - 8:00 PM
Wi-Fi Available	No	No	No
Inside Seating Capacity	Seating space for 34	Seating space for 25-30	Seating space for 40
Water Fountain	Yes	No	Yes
Restrooms	Yes	Yes	Yes
ATM	No	No	No
Ticketing	Staffed counter with checked baggage; help with baggage; checked baggage service available on weekends	Unstaffed station; Quik-Trak self-service ticketing kiosk	Staffed counter; help with baggage
Payphone	Yes	No	No
Parking	100 long term spaces; 100 short term spaces	63 spaces total	30 long term spaces and 18 short term spaces total
ADA Parking Facilities	Yes	3 spaces reserved	3 spaces reserved
Shared Use	No	No	Wapello County Historical Museum
Intermodal	SEIRPC dial-a-ride service	Southern Iowa Trolley dial-a-ride service, Greyhound and Trailways 600 feet from station	Ottumwa transit fixed route local service, Greyhound and Trailways intercity

Source: Source: Amtrak and site visits conducted for the Iowa State Rail Plan

2.1.3 Passenger Rail Service Objectives

Current intercity passenger rail services are long-distance trains operated by Amtrak on rail lines owned by BNSF, therefore limiting Iowa's ability to directly impact specific service levels. At this point, there are no plans for changes in the frequency or routes of Amtrak services in Iowa. That noted, Iowa DOT is working on various fronts on potential new passenger rail corridor services and facilities supported at least in part by federal funding sources. These plans are discussed in Chapter 3 of the Iowa State Rail Plan — Proposed Passenger Rail Improvements.

Iowa DOT's 2009 Iowa Railroad System Plan identified the following objectives that guide the agency as it continues its rail corridor planning efforts with Amtrak and other states. They are:

- **Connect major cities in Iowa to each other, as well as to regional trade centers outside of Iowa.** The present Amtrak system provides for daytime/early evening travel in the southern tier of the state, linking Iowans with West Coast and Chicago and intermediate markets. However, most of the state is without convenient rail service and rail linkages to major markets outside of Iowa. As Amtrak has no current plans to add new services, development of new rail services in new corridors will require Iowa's leadership to partner with other states and the freight railroads that will host such services. To this end, Iowa is engaged with the Midwest Regional Rail Initiative (MWRRI), involving nine Midwest states and the Federal Railroad Administration, which envisions implementing multiple multi-state corridors centered on Chicago. Iowa is investigating other new services with other states apart from the MWRRI.
- **Maintain national long-distance routes served by Amtrak.** The state is served by two Amtrak long distance trains accessed through six stations. These stations have improvement needs with regard to being compliant with the Americans with Disabilities Act of 1990 (ADA) as well as for maintaining a state of good repair. Amtrak services are striving to meet on-time performance goals and service quality goals. In the near term, Iowa will continue its role preserving services, monitoring service quality, and being an advocate for the improvement and expansion of its existing intercity rail passenger trains and stations.

- **Link Iowa to other passenger rail corridors.** While Amtrak provides linkages for Iowans via its long-distance intercity services, there are no short to medium distance passenger rail corridor services in the state. However, Iowa DOT has identified such services. These include east-west routes between Chicago and both the Quad Cities of Illinois and Iowa and Dubuque. These intercity corridor services could potentially be extended westward to Iowa City, Des Moines, Council Bluffs/Omaha, and Waterloo, Fort Dodge, and Sioux City, respectively. Additional development could potentially include two north-south routes between the Twin Cities of Minneapolis/St. Paul and Kansas City — one via Mason City and Des Moines and the other via Sioux City and Council Bluffs/Omaha.
- **Provide transportation options to driving or flying for passengers in Iowa.** New corridor trains could restore much of the north-south and east-west services that crossed the state through the 1950s, significantly enhancing the mobility of Iowans. Key for new passenger train development is ensuring that it is recognized as being competitive with automobile and air travel in terms of cost and journey time and thus attractive to users. The new services envisioned will all be on freight railroads. A prerequisite for gaining access to freight railroads' main lines for state-sponsored passenger trains will be public investments for capacity sufficient to ensure fluid and reliable operations for both passenger and freight trains.
- **Serve major metropolitan areas.** New rail corridor services will focus on Des Moines as the nexus of east-west and north-south trains. But they should also serve major markets that have been without rail service for decades, including Iowa City, Dubuque, Waterloo, and Sioux City. The envisioned passenger rail system will establish a network of trains serving intrastate markets and providing access to major metropolitan areas outside the state, including Chicago, Omaha, the Twin Cities, and Kansas City.
- **Serve diverse constituency groups and their needs (universities, elderly, business travel, recreational travel).** These constituencies are markets that can be well served by new passenger rail services in Iowa. Iowa will continue its outreach to these groups so that their transportation needs are understood so as to inform Iowa's development of attractive passenger rail services. The needs of each constituency vary. For example, the student market is more cost-sensitive than time-sensitive, while business travel is just the opposite. Corridor services in other regions of the country have crafted transportation products that meet these varying needs, including the California Corridor Services and the Cascades in the Pacific Northwest. Iowa is considering the lessons learned and best practices by such operations as it continues planning for its corridor services.
- **Provide intermodal connections to transit, airports, bicycling, and walking.** The average age of Americans is increasing, and young people are waiting longer to get their driver's licenses or are deciding not to purchase automobiles. Both trends speak to the need for people finding their ways to stations with less reliance on the automobile. Amtrak stations in Iowa have some transit connection, but most are on-demand type services rather than scheduled services that provide frequent and reliable connections to trains. Stations are in exurban environments not served by commercial airlines, with the exception of Burlington. Most stations are near downtown areas and provide relatively convenient access by cyclists and pedestrians. However, for the location of stations to serve new corridor trains, connections for scheduled transit, and to airports in larger cities, is a fundamental consideration for Iowa's rail planners, as is convenient access for bicyclists and pedestrians.
- **Provide an opportunity for commuter rail service in Iowa's major metro areas.** Commuter rail concepts have been researched for Des Moines and the Cedar Rapids — Iowa City area. Commuter rail service is typified by peak period, peak direction oriented trains. The service concepts were both explored in studies completed in 2000. The Cedar Rapids — Iowa City concept was revisited in 2006, and additional commuter analysis for the conceptual feasibility of passenger rail service in that corridor was completed in 2015. Both concepts envisioned operating commuter trains on existing freight railroad corridors. The proposed projects envision providing a good alternative to auto travel that promotes potential environmental benefits, including reduced air pollutants emissions, less land use, and fewer habitats and water resource impacts compared to expanding highways. Both projects envision enhanced mobility for Iowans and interconnectivity between transportation modes. These concepts are also discussed in Chapter 3.

2.1.4 Amtrak Performance Evaluation

This section provides an overview of the metrics associated with intercity rail passenger operations in Iowa. Where available it describes the ridership, operating, and financial results for these services. This section constitutes the extent of Iowa DOT's monitoring of Amtrak performance.

As noted earlier, Amtrak operates two long-distance intercity trains through Iowa. The performance characteristics for these trains are outlined below.

2.1.4.1 RIDERSHIP AND UTILIZATION

Passenger boardings and alightings at Iowa stations for both the *California Zephyr* and the *Southwest Chief* have declined in recent years, as seen in Table 2.6 below. In FY2014, the total number of passengers utilizing all six stations was 57,238. The *California Zephyr*, passing through southern tier of the state, stops at five stations and generates the majority of the ridership activity in the state. The *Southwest Chief* stops at just one station, Fort Madison.

Table 2.6: Annual Boardings and Alightings at Amtrak Stations in Iowa 2008 - 2014

CITY	2008	2009	2010	2011	2012	2013	2014
Burlington	7,283	7,487	8,744	7,285	7,646	8,811	8,813
Creston	4,444	4,831	4,803	4,229	4,531	4,621	4,314
Fort Madison	9,307	7,813	7,656	7,944	7,003	7,246	6,986
Mount Pleasant	14,422	15,176	16,063	13,034	13,634	12,613	12,030
Osceola	17,811	19,423	19,095	14,891	14,681	14,799	13,986
Ottumwa	10,993	11,556	12,383	10,497	11,674	11,735	11,109
Total Iowa Station Usage	64,260	66,286	68,744	57,880	59,169	59,825	57,238
Change Year over Year	3.1%	3.2%	3.7%	-15.8%	2.2%	1.1%	-4.3%
Total for California Zephyr	54,953	58,473	61,088	49,936	52,166	52,579	50,252
Change Year over Year	6.6%	6.4%	4.5%	-18.3%	4.5%	0.8%	-4.4%
Total for Southwest Chief	9,307	7,813	7,656	7,944	7,003	7,246	6,986
Change Year over Year	-13.8%	-16.1%	-2.0%	3.8%	-11.8%	3.5%	-3.6%

Source: Amtrak Fact Sheet, State of Iowa, Fiscal Years 2007 - 2014

Over its 2,438-mile route between Chicago and the San Francisco Bay Area, the *California Zephyr* carried 366,564 riders in FY2014, a 2.8 percent decrease over the previous year, as seen in Table 2.7 below¹⁴. Despite the inconsistency of annual ridership levels, the train's total ridership has risen 4 percent over the seven-year period from FY 2008. The largest single passenger rail market of the *California Zephyr* is between Denver and Chicago, accounting for 9.1 percent of total trips. Nearly three-quarters of the passengers are spread among dozens of smaller markets, each with less than 3 percent of the total ridership¹⁵.

Over its 2,265-mile route between Chicago and Los Angeles, the *Southwest Chief* carried 352,162 riders in FY2014, a 1 percent decrease from the previous year. Again, despite the annual inconsistencies in ridership, the train's total ridership is up 6.3 percent over the seven-year period. The largest ridership markets for the *Southwest Chief* are Chicago — Los Angeles, Chicago — Kansas City and Albuquerque — Los Angeles, each accounting for 8 percent of total trips in FY2011¹⁶.

By way of comparison, the respective 4 percent and 6.3 percent ridership increases in the above long distance

¹⁴ Ridership per train on average is 502 for the *California Zephyr* and 482 for the *Southwest Chief*.

¹⁵ Per PRIIA Section 210 FY12 Performance Improvements Plan, *California Zephyr*, Amtrak, September 2010.

¹⁶ Per PRIIA Section 210 FY12 Performance Improvements Plan, *Auto Train, City of New Orleans, Coast Starlight, Empire Builder, Southwest Chief*, Amtrak, September 2012.

services are lower than the 8.9 percent increase in Amtrak ridership for all of its long-distance trains over the period.

Table 2.7: Ridership for Amtrak Trains Serving Iowa and All Long Distance Trains 2008 - 2014

SERVICE	2008	2009	2010	2011	2012	2013	2014
<i>California Zephyr</i>	352,563	345,558	377,876	355,324	376,459	376,932	366,564
Change Year over Year	6.9%	-2.0%	9.4%	-6.0%	5.9%	0.1%	-2.8%
<i>Southwest Chief</i>	331,143	318,025	342,403	354,912	355,316	355,815	352,162
Change Year over Year	4.4%	-4.0%	7.7%	3.7%	0.1%	0.1%	-1.0%
Long Distance Trains	4,170,359	4,198,750	4,474,844	4,521,833	4,736,187	4,757,358	4,543,199
Change Year over Year	9.2%	0.7%	6.6%	1.1%	4.7%	0.4%	-4.5%

Source: Amtrak Monthly Performance Reports for September 2008 - 2014

Passenger-miles per train-mile is a measure of utilization generated by dividing service passenger-miles (moving one passenger one mile is one passenger-mile¹⁷) by route train-miles (moving a train one mile is one train-mile¹⁸). The measures for each service have changed only slightly over the periods studied, as seen in Table 2.8 below. Interestingly, the *Southwest Chief* has a greater utilization rate even though the *California Zephyr* carries more riders. This result is due to *Southwest Chief* riders taking slightly longer trips on average¹⁹.

Table 2.8: Rolling Average, Passenger-Mile per Train-Mile for Amtrak Trains Serving Iowa

ROUTE	JULY 2011 - JUNE 2013	JULY 2012 - JUNE 2014
<i>California Zephyr</i>	173	172
<i>Southwest Chief</i>	188	187

Source: Amtrak Quarterly Report on the Performance and Service Quality of Intercity Passenger Train Operations, 2014

2.1.4.2 FINANCIAL PERFORMANCE

Revenue and cost information by route is shown in Table 2.9 below. The revenue-to-cost or cost recovery ratio is calculated as follows: total ticket revenue, including ticket revenue and revenues from meals, on-board services, and other operating sources, divided by fully allocated operating costs. The ratio is a metric of the amount, by percentage, of each service's costs that are covered by revenues. Between 2009 and 2014, the cost recovery ratios for the *California Zephyr* and the *Southwest Chief* have been stable, varying in a range of from 42.5 percent to 48.2 percent. These performances, however, are noticeably lower than that of Amtrak's long distance trains overall, which generated a cost recovery in the range of 47.5 percent to 52.6 percent over the past six years.

Table 2.9: Financial Performance of Amtrak Trains Serving Iowa and All Long Distance Trains 2008 - 2014

SERVICE	2008	2009	2010	2011	2012	2013	2014
<i>California Zephyr</i>							
Revenue	\$43.3	\$43.1	\$48.3	\$49.8	\$53.2	\$55.7	\$55.8
Operating Cost	n/a	\$94.4	\$100.8	\$109.7	\$121.9	\$125.9	\$115.8
Cost Recovery	n/a	45.7%	47.9%	45.4%	43.6%	44.2%	48.2%
<i>Southwest Chief</i>							
Revenue	\$44.7	\$41.2	\$44.8	\$48.0	\$48.2	\$49.1	\$49.4
Operating Cost	n/a	\$93.4	\$103.2	\$111.8	\$113.3	\$115.6	\$108.9
Cost Recovery	n/a	44.1%	43.4%	42.9%	42.5%	42.5%	45.4%

¹⁷ Estimated passenger miles per trip are 418,992 for the *California Zephyr* and 425,820 for the *Southwest Chief*.

¹⁸ Train-miles per trip are the length of the routes, viz., 2,436 for the *California Zephyr* and 2,265 for the *Southwest Chief*.

¹⁹ *Southwest Chief* riders' average trip length calculates to 883 miles, whereas *California Zephyr* riders' average trip length calculates to 834 miles.

Long Distance Trains							
Revenue	\$448.0	\$443.0	\$485.8	\$518.5	\$557.1	\$568.8	\$564.2
Operating Cost	n/a	\$927.2	\$1,019.2	\$1,090.7	\$1,132.2	\$1,163.0	\$1,071.7
Cost Recovery	n/a	47.8%	47.7%	47.5%	49.2%	48.9%	52.6%

Source: Amtrak Monthly Performance Reports for September 2008 - 2014

Note: Operating costs in 2008 were calculated differently from costs after 2008; cost and cost recover, therefore, are not shown for 2008.

2.1.4.3 ON-TIME PERFORMANCE AND CUSTOMER SATISFACTION

Amtrak defines on-time performance (OTP) as the total number of trains arriving on-time at a station divided by the total number of trains operated on that route. A train is considered on-time if it arrives at the final destination within an allowed number of minutes, or tolerance, of its scheduled arrival time. Tolerances vary based on how far trains travel.

OTP Annual Trend – The on-time performance of the two Amtrak services in Iowa since 2008 is shown in Table 2.10 below, along with the OTP of all Amtrak long distance trains over the seven-year period.

Table 2.10: On-Time Performance of Amtrak Trains Serving Iowa and of All Long Distance Trains 2008 - 2014

SERVICE	2008	2009	2010	2011	2012	2013	2014
<i>California Zephyr</i>	30.1%	59.7%	52.6%	41.5%	51.6%	57.5%	33.6%
Change Year over Year	19.9%	29.6%	-7.1%	-11.1%	10.1%	5.9%	-23.9%
<i>Southwest Chief</i>	65.4%	85.2%	79.1%	73.3%	75.3%	60.5%	44.8%
Change Year over Year	5.3%	19.8%	-6.1%	-5.8%	2.0%	-14.8%	-15.7%
Long Distance	54.2%	75.1%	74.6%	63.7%	70.7%	54.6%	40.0%
Change Year over Year	12.6%	20.9%	-0.5%	-10.9%	7.0%	-16.1%	-14.6%

Source: Amtrak Monthly Performance Reports for September 2008 - 2014

The on-time performance standard for long distance trains established by the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) is 80 percent. For the entire period, the *California Zephyr's* OTP performance has been significantly lower than the standard. After achieving an OTP exceeding the standard in 2009, the *Southwest Chief* has experienced a steady decline in OTP.

Cause of OTP Delays – Causes for Amtrak train delays can be attributed to a number of reasons. Table 2.11 below shows the leading causes of delay, by percentage of delay minutes, for the Iowa-serving routes as well as for all Amtrak long distance trains in September 2014. The single largest cause for delay for *California Zephyr* was train interference, as it was for all long-distance trains taken together. For the *Southwest Chief* no single cause stands out.

Table 2.11: Causes of Delay to Amtrak Trains Serving Iowa in September 2014

CAUSES OF DELAYS	ROUTES		
	CALIFORNIA ZEPHYR	SOUTHWEST CHIEF	LONG DISTANCE TRAINS
Train Interference	32.2%	20.5%	32.6%
Passenger Operations Related Delays	21.2%	25.7%	22.0%
Slow Orders	17.7%	26.0%	13.4%
All Other Freight Railroad Operational Delays	18.1%	18.5%	22.0%
All Other Delays	10.8%	9.4%	10.0%
Total Delays	100.0%	100.0%	100.0%

Source: Amtrak Monthly Performance Reports for September 2014

The following provides definitions of each type of causes of delay, as listed in the table above.

- **Train Interference Delays** are related to other train movements in the service area. These can be delays from freight trains as well as other Amtrak trains.
- **Passenger Operating Delays** are related to equipment turning and servicing, engine failures, passenger train holds for connecting trains and buses, crewing, and detours.
- **Slow Orders** are delays from reduced speeds to allow safe operation, generally due to track or bridge issues on routes over which the passenger trains operate.
- **All other Freight Railroad Operational Delays** are miscellaneous freight railroad delays and delays related to the railroad infrastructure and/or maintenance work being done on the tracks, bridges, or signaling systems.
- **All Other Delays** could include delays caused by the weather and non-railroad third-party factors such as customs and immigration, a bridge opening for waterway traffic, police activity, grade crossing accidents, or loss of power due to a utility company failure.

Customer Satisfaction Indicator — Amtrak's Customer Service Indicator (CSI) scores measure the satisfaction by passengers, on an 11-point scale, on particular aspects of their trip. For example, a CSI score of 80 means 80 percent of respondents rated the aspect of their trip in the top three of the 11 steps of the scale.

- **Overall Service** is the measure for the respondents rating for their overall trip experience.
- **Amtrak Personnel** is the measure for the respondents rating Amtrak reservations personnel, station personnel, train crew, and on-board service crew.
- **Information Given** is the measure for the respondents rating all information they received pertaining to their trip.
- **On-Board Comfort** is the measure for the respondents rating seat or sleeping compartment comfort, air temperature, and ride quality.
- **On-Board Cleanliness** is the measure for the respondents rating the cleanliness of the train and on-board restroom facilities.
- **On-Board Food Service** is the measure for the respondents rating the quality of the food and snacks purchased on-board the train.

Table 2.12 below shows the CSI averaged scores for the two services in Iowa for the first three quarters of FY2014 compared to Amtrak's standard. The Overall Service, Amtrak Personnel, and On-Board Comfort scores for the two services either exceeded or were close to the standard, but their remaining scores were noticeably substandard. The figures in red indicate CSI scores below standard.

Table 2.12: CSI Scores for Amtrak Trains for Three Quarters in 2014

FISCAL YEAR 2013	STANDARD	CALIFORNIA ZEPHYR	SOUTHWEST CHIEF
Overall Service	82	77	80
Amtrak Personnel	80	82	82
Information Given	80	70	72
On-Board Comfort	80	78	75
On-Board Cleanliness	80	61	61
On-Board Food Service	80	68	70

Source: Quarterly Report on the Performance and Service Quality of Intercity Passenger Train Operations, 2014

2.1.4.4 POSSIBLE IMPROVEMENTS FOR AMTRAK SERVICES

This section identifies and describes potential improvements for Amtrak services in Iowa.

2.1.4.4.1 California Zephyr

Amtrak's September 2010 report, *PRIIA Section 210 FY12 Performance Improvements Plan, California Zephyr*, pointed to implementation of Amtrak's Customer Service Excellence Program as a means to drive improvements to CSI scores. The program has four focus areas: personnel, equipment, food service, and stations. The program was to be implemented system wide to all routes. One key element to the program

was the completion of the Customer Experience Research Program, which highlighted numerous areas for improvement, two of which were directly relevant for the *California Zephyr* improvements:

- **Elevate customer comfort on-board the trains** — Personal comfort is a prime reason travelers choose train travel.
- **Develop a culture of customer service** — Amtrak only performs as well as its employees. Customers want to be treated as though they are important.

Beyond the Customer Service Excellence Program, the 2010 report cited no service-specific improvements or initiatives.

However, In January 2010, the Federal Railroad Administration announced that the Iowa DOT was awarded a \$17 million grant under the American Recovery and Reinvestment Act of 2009 (ARRA) for improvements to the BNSF's line that hosts the *California Zephyr*. The track improvements included installation of four high-speed crossovers in Iowa that have significantly reduced freight and passenger rail operating conflicts, congestion, and delays. Indeed, for FY 2015, the train's on-time performance at all stations increased to 42.8 percent versus 33.6 percent for the previous year.

2.1.4.4.2 Southwest Chief

Amtrak's September 2012 report, *PRIIA Section 210 FY12 Performance Improvements Plan, Auto Train, City of New Orleans, Coast Starlight, Empire Builder, Southwest Chief*, identified numerous possible improvements for the *Southwest Chief*. These potential improvements could improve connectivity and service to Iowa, and included:

- **Newton-Wichita-Oklahoma City Thruway Bus** — This concept would provide a link between the *Southwest Chief* in Newton, Kansas, and the *Heartland Flyer* in Oklahoma City, Oklahoma. The *Heartland Flyer* provides daily service between Oklahoma City and Fort Worth, Texas. Due to the performance reliability of the *Southwest Chief* and *Heartland Flyer*, the Thruway service is estimated to work smoothly and successfully in connecting both trains.
- **Premium Express Contracted Pallet Service between Chicago and Los Angeles** — This concept would provide for a small-scale shipment of six pallets per trip loaded into the train's existing baggage car between Los Angeles and Chicago. No incremental labor or capital costs are anticipated. Incremental revenue would amount to an estimated \$284,000 per year.
- **Southwest Chief Food Service Adjustments** — Given that trains often arrive in Los Angeles an hour earlier than scheduled (8:15 AM), passengers' time for breakfast is compressed, as it is for dining car crews preparing, serving, and clearing meals. The concept of the adjustments was to switch from a conventional sit-down breakfast to a continental breakfast, which would minimize food preparation as well as free up seating, as passengers will not have to wait for their meals to be cooked and brought to them and thus remain in their table seats for longer periods.
- **Schedule Improvements** — Minor schedule adjustments were contemplated to help improve all stations' and overall on-time performance.

Other initiatives, common to all of the services reviewed, were:

- **Modify the Seat Pitch on Superliner Coaches** — The concept is to reduce seat pitch from 50-52 inches to 46-48 inches, allowing for 4 or 6 additional seats, and thus generating more revenue.
- **Modify the Current Superliner Transition Sleeping Car** — This concept is to add 11 additional sleeping rooms for sale. Most will be on the lower level where a largely unused lounge space will be converted into four roomettes, one Family Room, and one ADA Accessible room. Also five rooms for sale will be added on the upper level: four from the Business Travel group and one from the conversion of the Conductor Room. The Conductor's Room will be relocated to the former Chief's Room, thereby maintaining and Amtrak crew work area.
- **Customer Service Performance Metrics Integrator Program** — This program is a business intelligence system that tracks information on an individual crew and train level, with monthly reports that compare a route's performance by crew and crew member. The goal is to encourage positive competition between

crew couplets, build teamwork, and identify crew couplets needing additional management coaching. The ultimate goal is an improvement in the personnel-related CSI scores.

2.1.4.5 RECENT-YEAR IMPROVEMENTS AT AMTRAK STATIONS

Amtrak's 2009 *A Report on Accessibility and Compliance with the Americans with Disabilities Act of 1990* identified station ADA compliant and State-of-Good-Repair improvement needs amounting to \$11.2 million for the six Iowa Amtrak stations. Of this amount, \$2.3 million was for structures, \$5.7 million for platforms, and \$3.2 million for pathways.

Since that time, Amtrak has made some improvements, according to the annual Amtrak Fact Sheet for Iowa. In 2009 Amtrak installed a new information kiosk, providing train schedules, ticketing, safety and security information, and an enhanced level of Amtrak brand visibility at the Osceola station. Further, exterior stabilization and rehabilitation work began at the station, which was completed in 2010.

According to the Great American Station project²⁰, the Friends of the Depot, a volunteer group committed to restoring the Burlington station, organized work days in 2011 and 2012, during which volunteers painted the depot's exterior trim and caulked windows using funding donated by Amtrak. Local businesses either donated supplies or offered deep discounts to support the renovation effort. In addition, with monies that Amtrak received under the American Recovery and Reinvestment Act of 2009, the depot received a new wheelchair lift and enclosure in 2010. Platform signage was updated in 2011.

Furthermore, the Great American Station project reported that the Creston depot received a new wheelchair lift, enclosure, and pad in 2010. In addition, a new sidewalk and curb cut were installed from the parking area to the platform.

Using funds received under the American Recovery and Reinvestment Act of 2009, Amtrak installed a new wheelchair lift and enclosure at the Mount Pleasant station in 2010.

2.1.5 Public Financing for Rail Projects and Services

Iowa DOT, as well as a number of local public agencies in the state, has utilized federal and state transportation funding programs for rail infrastructure improvements where they were eligible. The following is a short summary of state and federal rail funding resources utilized for railroad improvements in Iowa in the recent past.

2.1.5.1 STATE-SPONSORED RAIL INVESTMENT PROGRAMS

State-sponsored rail investment in Iowa has been provided through the Iowa DOT since the mid-1970s. DOT's Office of Rail Transportation oversees the rail assistance programs described below.

2.1.5.1.1 Railroad Revolving Loan and Grant Program

The Railroad Revolving Loan and Grant (RRLG) Program provides financial assistance to improve rail facilities that will create jobs, spur economic activity, and improve the rail transportation system in Iowa. Assistance is available in the following three categories:

- **Targeted job creation.** These rail projects are those that provide immediate, direct job opportunities. Loans and grants are available. Grant funding is contingent on job creation and retention commitments by the applicant and loans can supplement grants if the project cost exceeds that available in grant funding. A local match is required for both grants and loans.
- **Rail network improvement.** These rail projects are those that support existing rail lines and service or improve industrial access when no direct job creation is involved. Only loans are available in this category. Loans will be offered at 0 percent for a ten-year term. Loan requests require a 20 percent matching contribution.

²⁰ <http://www.greatamericanstations.com/Stations/BRL>

- **Rail Port Planning and Development.** Grants of up to \$100,000 are available for planning studies that enable a community, county or region to make fact based decisions concerning the location, design or funding requirements for a rail port facility. The end result of a planning study should help decision makers evaluate rail development options that support industrial and business progress and economic growth in the community and region. Grant requests require a 20 percent matching contribution.

The RRLG program is funded from loan repayments and state appropriations. The amount of funding availability varies.

Projects are approved by the Iowa Transportation Commission (ITC).

In 2015, the ITC approved almost \$1.3 million for five rail infrastructure and related rail development projects under RRLG. The projects are:

- Phase I of the Boone and Scenic Valley Industrial Park Line (\$316,050 loan, \$240,000 grant);
- The Iowa Traction Transload project (\$35,792 loan, \$59,653 grant);
- A to Z Rail Enhancement (\$200,000 loan);
- The ADM "S" Curve project (\$165,600 loan); and,
- The KJRY Yard Enhancements II project (\$280,285 loan).

2.1.5.1.2 Highway-Railroad Grade Crossing Safety Program

Administered by the state, this federally funded program provides financial assistance to improve highway-railroad crossings. Approved projects are 90 percent federally funded with 10 percent provided by the railroad and/or highway authority. Funds are used to install new crossing signal devices, upgrade existing signals, improve crossing surfaces, and provide low-cost improvements such as increased sight distance, medians, widened crossings, increased signal lens sizes, or to close crossings.

Project approval and funding is determined by a cost-benefit analysis that considers costs, estimated benefits, and the severity of crash risk at the selected location. Projects must be approved by Iowa DOT and the Iowa Transportation Commission (ITC) before being placed in the Statewide Transportation Improvement Program (STIP). Annual funding is approximately \$5.7 million. Projects identified for the short-range are noted in Chapter 5 of the State Rail Plan, the Rail Service and Investment Program.

2.1.5.1.3 Highway-Railroad Grade Crossing Surface Repair Program

This state-funded program assists rail operators and governmental jurisdictions in maintaining a safe and smooth crossing surface at highway-railroad grade crossings. Applications for funding must be initiated by the highway jurisdiction and approved by the railroad. The fund will support 60 percent of project costs with the remainder coming from the railroad (20 percent) and public road jurisdiction (20 percent). Projects are approved by Iowa DOT and the ITC. The annual funding level is \$900,000, appropriated from the Road Use Tax Fund.

2.1.5.1.4 Primary Road Highway-Railroad Grade Crossing Repair Program

This state-funded program assists with surface improvements at highway-rail crossings on the Primary Road System. This program is unique in that railroads and Iowa DOT partner in cost, labor, and equipment to rehabilitate crossings on these higher volume highways. The program is administered by the Iowa DOT's Office of Rail Transportation.

2.1.5.1.5 Iowa Highway Grade Crossing Safety Fund

This state fund has covered a portion of maintenance costs for traffic control devices, activated by the approach or presence of a train (such as flashing light signals, flashing light signals with cantilever assemblies, and flashing light signals with automatic gate arms), installed under the Highway-Railroad Crossing Safety Program since 1973. The annual funding level is \$700,000. The fund is administered by Iowa DOT.

2.1.5.1.6 LIFTS Program

The Linking Iowa's Freight Transportation System Program (LIFTS) seeks to address gaps in multimodal funding to assist in bolstering the freight transportation system. LIFTS grant funding is not limited to a particular mode of transportation, but is designed to assist projects that contribute to effective and efficient freight transportation. Examples of projects could include transload facilities, port-rail improvements and other projects that increase capacity, efficiency or connections between modes. Project applications were solicited in 2015 for available funding of \$2.6 million, which expended available funding. A legislative appropriation will be needed for future funding rounds.

In 2016 the Iowa Transportation Commission approved more than \$2.6 million in grant funding for six transportation infrastructure-related development projects under the LIFTS program. The following is a list of LIFTS projects approved by the ITC:

- Port of Muscatine (\$80,000)
- Standard Distribution Company (\$584,000)
- Hall Towing Inc. (\$479,000)
- Iowa Traction Railway Propane Terminal (\$544,000)
- Council Bluffs Transload Facility (\$500,000)
- Eastern Iowa Logistics Park (\$500,000)

2.1.5.2 FEDERAL RAIL-RELATED PROGRAMS AND FUNDING

This section identifies and describes federal rail-related programs and funding. Federal transportation funding to states is periodically authorized through Federal Surface Transportation Acts. Transportation funding is provided to states through apportionment by formula or discretionary funding for various programs.

The recently approved Federal Surface Transportation Act, the Fixing America's Surface Transportation (FAST) Act, is a five-year program to improve the nation's transportation infrastructure, including roads, bridges, transit systems, and rail transportation network. The bill provides for a total of \$305 billion in funding over the period.

The FAST Act places major emphasis on freight investments to be supported by the Highway Trust Fund by creating a new National Freight Program funded at an average of \$1.2 billion per year to be distributed to states by formula. Non-highway projects eligible to receive these funds include rail-highway grade separation and intermodal transfer and access projects.

Title XI of the FAST Act, also known as the Passenger Rail Reform and Investment Act of 2015 (PRRIA), provides for \$5.5 billion to be spent on the national intercity rail network outside the Northeast Corridor. Funding for this program, as well as another \$2.2 billion for FRA grant programs, however, are dependent on annual Congressional budget appropriations. No passenger appropriations were passed for the first year of the program. The following is a brief description of rail-eligible programs available through PRRIA, as well as past and current Federal Surface Transportation Acts, and Iowa's participation where applicable.

2.1.5.2.1 PRRIA Capital Assistance Programs

In 2008, the Passenger Rail Investment and Improvement Act (PRRIA) and related appropriation bills provided funds directly to states for intercity rail passenger investments. In early 2009, the American Recovery and Reinvestment Act (ARRA) also provided flexible transportation funding to states for rail capital projects as well as funding for passenger rail development.

The following section provides a brief history of these programs and federal budget appropriations which were specifically available for rail assistance as well as other programs that have been utilized or may be eligible for future rail-related applications

Passenger Rail Investment and Improvement Act (PRRIA)

This legislation authorized over \$13 billion between 2009 and 2013 for Amtrak and promoted the

development of new and improved intercity rail passenger services. The act also established an intercity passenger rail capital grant program, the High Speed Intercity Passenger Rail Program (HSIPR) for states. States were required to identify passenger rail corridor improvement projects in their state rail plans.

Federal funding authorized under PRIIA or other authorization programs were required to be appropriated in annual budget or other legislative bills. USDOT's last budget appropriation for the high-speed rail state grant programs was for Federal Fiscal Year (FFY) 2010 (October 1, 2009 through September 30, 2010) and provided \$2.5 billion of funds authorized under PRIIA. These funds were provided to states, on a competitive basis, for up to 50 percent of the capital cost of improving intercity rail passenger service.

Previous USDOT appropriation acts also provided funding that could be utilized for intercity rail passenger improvements under similar terms. The FFY 2008 USDOT Appropriations Act provided \$30 million to states. The FFY 2009 USDOT Appropriations Act provided \$90 million to states. No appropriations for high-speed rail grants were included in subsequent federal budgets, and PRIIA authorizations expired on September 30, 2013.

HSIPR funding received by Iowa includes:

- A grant of \$1.0 million for planning, engineering, and environmental analysis to support new intercity passenger service between Chicago and Council Bluffs/Omaha via the Quad Cities of Illinois and Iowa, Iowa City, and Des Moines.
- A grant of \$400,000 to develop new transportation forecasting and analysis software to support the Statewide Travel Demand Model-Rail Component of Iowa's State Rail Plan

American Recovery and Reinvestment Act (ARRA)

As a result of the economic recession of 2008, the federal government approved the ARRA (Public Law 111-5) in February 2009 to stimulate the economy partly through the funding of infrastructure projects that could be initiated in the short term.

Grants awarded to Iowa DOT through ARRA include a grant of \$17.3 million under the HSIPR for the construction of four new track crossovers on the BNSF Ottumwa Subdivision necessary to significantly reduce delays on Amtrak's long-distance *California Zephyr* service. In addition, ARRA regulations allowed Iowa to "flex" \$5 million of highway funding received from ARRA for rail-related improvements.

Transportation Investment Generating Economic Recovery Program (TIGER)

A popular program established under ARRA is the Transportation Investment Generating Economic Recovery (TIGER) program, which provides grants for capital investment in rail, highway, bridge, public transportation, and port projects and is awarded by USDOT on a competitive basis. USDOT has held or scheduled eight rounds of TIGER applications since 2010. Following the sunset of ARRA in 2013, subsequent TIGER programs were funded through annual appropriation acts.

Iowa DOT has received a number of TIGER grants for projects in Iowa. These include:

- A grant of \$10.0 million to construct the second phase of the Des Moines Multi-Modal Hub. This facility in downtown Des Moines functions as a central location for public transportation service, including potential future passenger rail services.
- A grant of \$1.0 million to fund planning and design work for a viaduct that will span several railroad tracks and intersecting roadways in Sioux City. The project will improve safety for residents by replacing at least two at-grade crossings as well as improving rail switching

2.1.5.2.2 Federal Surface Transportation Rail-Related Programs

Highway Safety Improvement Program (HSIP)

This program is a core federal-aid funding program with the goal of achieving a significant reduction in traffic fatalities and serious injuries on all public roads. Funding from this program can be set aside for the purpose of reducing the number of fatalities and serious injuries at public highway-railway crossings through the

elimination of hazards and/or the installation/upgrade of protective devices at crossings (Section 130 funding). The federal funding share for this program is 90 percent. Iowa receives approximately \$5.0 million annually through this program which is described under the state-sponsored Railway-Highway Crossing Safety Fund.

Rail Line Relocation Program

This program provided grants to be awarded for construction projects that improve the route or structure of a rail line for either the purpose of mitigating the adverse effects of rail traffic on safety, motor vehicle traffic flow, community quality of life, or economic development or for the lateral or vertical relocation of any portion of the rail line. Funding for this program was last appropriated in FFY 2011.

Iowa localities have received the following grants through this program:

- A grant of \$237,500 for Southeast 44th Avenue railroad crossing improvements in Des Moines.
- A grant of \$2.0 million to construct the new Southbridge Rail Yard in Sioux City to alleviate traffic congestion and trains blocking grade crossings, as well as to enhance the efficiency of railroad switching operations.

Rail Rehabilitation and Improvement Financing (RRIF)

This program provides loans and credit assistance to both public and private sponsors of rail and intermodal projects. Eligible projects include acquisition, development, improvement, or rehabilitation of intermodal or rail equipment and facilities. Direct loans can fund up to 100 percent of a capital project with repayment terms of up to 25 years and interest rates equal to the cost of borrowing to the government.

Eligible borrowers include railroads, state and local governments, government sponsored authorities, corporations, and joint ventures that include at least one railroad.

Railroads operating in Iowa which have received RRIF funding include the Dakota, Minnesota & Eastern Railroad (DM&E), a subsidiary of the Canadian Pacific Railway (CP); Iowa Interstate Railroad (IAIS); and Iowa Northern Railway (IANR).

Railroad Rehabilitation and Repair (Disaster Assistance) Program

This program provided the US Secretary of Transportation funding for necessary expenses to make grants to repair and rehabilitate Class II and Class III railroad infrastructure damaged by hurricanes, floods, and other natural disasters. These funds covered up to 80 percent of the project costs. Due to flood damage in Iowa, the following grants were awarded in 2009:

- \$6.965 million for restoration of a bridge and signals on the Cedar Rapids and Iowa City Railway in the Cedar Rapids Area;
- \$459,200 for restoration of the Keokuk Junction Railway Yard in Keokuk; and,
- \$2.175 million for replacement of the Iowa Northern Railway's bridge over the Cedar River in Waterloo.

Additional funding was awarded in 2011 and 2014 to repair rail infrastructure damaged by floods and to address flood mitigation, as follows:

- \$2.236 million to Iowa Northern Railway (2011)
- \$566,400 to Iowa Interstate Railroad (2011)
- \$44,771 to Burlington Junction Railway (2011)
- \$760,926 to Cedar Rapids and Iowa City Railway (2014)
- \$407,024 to Iowa Northern Railway (2014)
- \$76,623 to Iowa Interstate Railroad (2014)
- \$47,857 to Keokuk Junction Railway (2014)

Railroad Safety Grants for the Safe Transportation of Energy Products by Rail Program

This program provides \$10 million in discretionary funding for public and private railroad grade crossing

projects that improve safety on rail routes that transport flammable energy product. Iowa DOT has applied for funding under this program but has not received a grant.

2.1.5.2.3 Federal Surface Transportation Programs with Selected Rail Applications

In addition to the above programs, a number of additional programs, although primarily intended for highway use, are eligible for rail projects at the discretion of states and with the approval of the administering federal agency. These programs include:

National Highway System Program

This program can be utilized to improve designated highway intermodal connectors between the National Highway System (NHS) and intermodal facilities, such as truck-rail transfer facilities. The federal share of NHS funding is 80 percent.

Congestion Mitigation and Air Quality Improvement Program

This program funds transportation projects and programs that improve air quality by reducing transportation-related emissions in non-attainment and maintenance areas for ozone, carbon monoxide, and particulate matter. Examples of Congestion Mitigation and Air Quality (CMAQ)-funded rail projects include the construction of intermodal facilities, rail track rehabilitation, diesel engine retrofits and idle-reduction projects in rail yards, and new rail sidings.

CMAQ funds are disbursed to and within a state based on levels of pollution within an area, with the state or the region utilizing the funds to implement projects that reduce congestion or improve air quality. Projects must be included in MPO transportation plans and transportation improvement programs (TIPs) or the current state transportation improvement program (STIP) in areas without an MPO. The federal matching share for these funds is 80 percent.

Surface Transportation Program

The Surface Transportation Program (STP) is a general grant program available for improvements on any Federal-Aid highway, bridge, or transit capital project. Eligible rail improvements include lengthening or increasing vertical clearance of bridges, crossing eliminations, and improving intermodal connectors, which are roads that provide access between major intermodal facilities. Project funding decisions are made by states with approval from the FHWA. The federal share for these funds is 80 percent.

Transportation Infrastructure Finance and Innovation Act (TIFIA)

This program provides credit assistance to large-scale projects (over \$50 million or one-third of a state's annual federal-aid funds) of regional or national significance that might otherwise be delayed or not constructed because of risk, complexity, or cost. A wide variety of intermodal and rail infrastructure projects are eligible and can include equipment, facilities, track, bridges, yards, buildings, and shops. Eligible recipients for TIFIA funds include state and local governments, transit agencies, railroad companies, special authorities or districts, and private entities. The interest rate for TIFIA loans is the U.S. Treasury rate, and the debt must be repaid within 35 years.

Transportation Alternatives Program

This program, which replaced the SAFETEA-LU Transportation Enhancement Program, offers funding opportunities to expand transportation choices and enhance the transportation experience through 12 eligible activities related to surface transportation. Eligible rail-related activities include the rehabilitation of historic transportation buildings or facilities, the preservation of abandoned rail corridors, and the establishment of transportation museums. The federal share of project costs is 80 percent.

2.1.5.2.4 Other Federal Programs and Mechanisms Available for Rail-Related Funding

In addition to transportation programs available under the Transportation Authorization bill, other programs are administered by federal agencies for which rail-related capital projects are eligible. These programs include:

U.S. Department of Commerce Economic Development Administration

The U.S. Department of Commerce provides Economic Development Administration (EDA) grants for projects in economically distressed industrial sites that promote job creation. Eligible projects must be located within EDA-designated redevelopment areas or economic development centers. Eligible rail projects include railroad spurs and sidings. EDA also provides disaster recovery grants. Grant assistance is available for up to 50 percent of the project, although EDA could provide up to 80 percent for projects in severely depressed areas.

Recent EDA rail-related grants provided to Iowa localities include:

- A \$7.1 million grant to the city of Coralville to help make rail corridor improvements, including developing higher surface elevations and flood-proof construction to protect area businesses from future flood events.
- A \$5.5 million grant to help build the Northern Cedar Falls Industrial Park. The project includes extension of required utilities, road upgrades, rail spur design and construction, and an access roadway.
- A \$6.7 million grant to the city of Davenport and the Greater Davenport Redevelopment Commission to help build a transload facility to handle the movement of goods between rail and truck for businesses utilizing the I-80 Airport Industrial Park.
- A \$551,459 grant to Sioux City to provide flood-protected access for the Sioux Southbridge Business Park.

U.S. Department of Agriculture Programs

The U.S. Department of Agriculture (USDA) Community Facility Program and Rural Development Program provide grant or loan funding mechanisms to fund construction, enlargement, extension, or improvement of community facilities providing essential services in rural areas and towns. Grant assistance is available for up to 75 percent of the project cost. Eligible rail-related community facilities include transportation infrastructure for industrial parks and municipal docks.

The 45G Short Line Railroad Tax Credit

Originally enacted in 2004, the Railroad Track Maintenance Tax Credit, also known as the Section 45G Tax Credit, was a federal income tax credit for track maintenance performed by short lines and regional railroads (Class II and III railroads) in the U.S. Tax Code Section 45G leveraged private sector investment in rail infrastructure by providing a tax credit of 50 cents for every dollar spent on qualified track maintenance expenditures or other qualifying railroad infrastructure projects. The credit was capped based on a mileage-based formula; the maximum amount allowable was \$3,500 per mile of track.

The credit created a strong incentive for short line and regional railroads to invest private sector dollars on freight railroad track rehabilitation. Recent legislation extended Section 45G for tax years 2015 and 2016.

Per Section 45G, qualifying railroad structures improvements include: grading; other right-of-way expenditures; tunnels and subways; bridges, trestles, and culverts; elevated structures; ties; rails and other track material; ballast; fences, snow sheds, and signs; signals and interlockers; public improvements and construction. Qualified railroad track maintenance expenditures are expenditures for maintaining the aforementioned qualifying railroad structures owned by short line and regional railroads.

2.1.6 Ongoing Projects for Safety and Security Improvements

Rail safety is an important issue for both railroads and state departments of transportation. Rail safety affects the well-being of railway workers and the general public. It also has a major impact on the efficiency of railroad operations. Increased attention has also focused on the safe movement of hazardous materials by rail, especially the movement of crude oil.

Rail security has seen increased attention due to the potential for disruption of the transportation system or acts which could place large numbers of citizens at risk.

This section describes rail safety and security efforts in Iowa.

2.1.6.1 RAIL SAFETY PROGRAMS IN IOWA

Rail safety requirements are provided through a combination of federal and state laws. Most safety-related rules and regulations fall under the jurisdiction of the Federal Railroad Administration (FRA), as outlined in the Rail Safety Act of 1970 and other legislation, such as the most recent Rail Safety Improvement Act of 2008. FRA's rail safety regulations can generally be found in Title 49 Code of Federal Regulations Parts 100-299.

Iowa DOT's involvement in rail safety is located within the Office of Rail Transportation which is responsible for railroad coordination activities, track safety inspection, and the grade crossing safety program.

This office oversees the federally funded Highway-Railroad Grade Crossing Safety Programs by identifying and funding safety enhancement projects at public highway-rail grade crossings. The state funded Highway-Railroad Grade Crossing Surface Repair Program and Primary Grade Crossing Repair Program provides funding for safe and smooth grade crossings. Projects receive final approval by the Iowa Transportation Commission.

Iowa Operation Lifesaver, established in 1972, is a non-profit educational organization for highway-rail crossing safety and rail trespass prevention. Operation Lifesaver promotes safety through education of both drivers and pedestrians to make safe decisions at crossings and around tracks, promoting enforcement of traffic laws related to crossing signals and trespass, and by encouraging continued engineering research and innovation to improve the safety of railroad crossings. The Iowa DOT has a liaison that works with the state-wide Operation Lifesaver coordinator.

Rail inspection activities fall under the jurisdiction of FRA's Office of Railroad Safety which promotes and regulates safety throughout the nation's railroad industry. The office executes its regulatory and inspection responsibilities through a diverse staff of railroad safety experts. Safety inspections are carried out to ensure compliance in five safety disciplines: Hazardous Materials; Motive Power and Equipment; Operating Practices; Signal and Train Control; and Track.

Iowa DOT provides two federally certified track inspectors to supplement and coordinate with FRA inspectors.

In 2012, Iowa DOT published its Highway-Rail Grade Crossing Action Safety Plan for a five-year period 2012-2016. Because Iowa's collision experience ranked in the top 10 states for the years 2006 through 2008, the state was mandated by 49 CFR Part 23, "State Highway-Rail Grade Crossing Action Plans" to submit an action plan to the FRA promote safety at highway-rail grade crossings. The resulting plan included specific solutions for improving safety through new or expanded educational, enforcement, and engineering programs, as well as new incentives for crossing closures; it also included a focus on crossings that have experienced multiple accidents.

In April 2016, Iowa DOT released a study about crude oil and biofuels railroad transportation incident response preparedness within Iowa. The Iowa Crude Oil and Biofuels Rail Transportation Study was developed to serve as a tool to assist Iowa's state, local, and tribal governments to determine the status of risks and vulnerabilities; prevention methods and programs; and preparedness, response, and recovery capabilities for crude oil and biofuels railroad transportation incidents in Iowa. The geographic, administrative, and operational areas identified in the report were assessed for risks, vulnerabilities, programs, and capabilities. Results of the assessments were used to identify challenges and to form recommendations to reduce risk and vulnerability through policy change, planning, training and education, communication, and other actions.

The Study examined the commodities of crude oil and biofuels that are being transported by railroads in bulk volumes in and through Iowa. The Study used desktop research, interviews and surveys, a Stakeholder Steering Committee (SSC), and workshops to gather and assess information, develop findings, form recommendations, and design an action plan. Desktop research used public sources to assess current practices, regulations, risks, and vulnerabilities. Interviews and surveys were used to focus on the capabilities, practices, and programs of railroads, ethanol shippers, first responders, and federal, state, and local agencies. In addition, a SSC was assembled and was comprised of Iowa railroads, ethanol shippers/producers, government agencies, and emergency response personnel/first responders. Together these groups

participated in workshops that were used to present findings, discuss gaps, develop strategies to close gaps, to refine recommendations, and to develop implementable action plans.

Additionally, a Risk and Vulnerability Assessment (RVA) conducted for the Study considered current bulk crude oil and ethanol transportation routes and volumes, recorded previous incidents including main track derailments, spills, and fires, likelihood of future incidents, key public safety and environmental risk factors, and potential impacts from those incidents. These quantities were used to derive an aggregate value for risk. The RVA was constructed as a building block process on a county-by-county basis, using various factors, such as length of railroad segments carrying crude oil or ethanol within a county, volume of rail traffic, and populations, critical facilities, and environmentally important segments within an identified hazard area. The individual factors were analyzed to determine and overall risk for a given county. In addition, all risk assessment results are based on methodology designed specifically for the State of Iowa using Iowa-specific data, statistics, and conditions.

The Study then combined all of the results from research, interviews, SSC meetings, and the RVA to create a summary of findings, recommendations, and improvement actions. These recommendations were developed using feedback from stakeholders, Iowa DOT, and Iowa Homeland Security and Emergency Management (HSEMD). Improvement actions were guided by several principles:

- Cooperation and voluntary action by stakeholders would be the preferred methods, instead of new regulation requiring legislative action at the state or federal level.
- Proposed improvements would be implementable within the near term, and would be practical and meaningful.
- Proposed improvements would work within existing commercial, economic, regulatory, and technological parameters.
- Proposed improvements would be amenable to tracking to enable measurement of improvement and the efficacy of actions.
- Where feasible, improvements would extend to other hazardous commodities transported by rail in or through Iowa.

Detailed findings, recommendations, and improvement actions are presented in Iowa Crude Oil and Biofuels Rail Transportation Study Executive Summary included in Appendix B of the Iowa State Rail Plan.

2.1.6.2 IOWA RAIL ACCIDENT STATISTICS

The following is a statistical review of rail safety in Iowa over the past decade. It addresses the rail accident and incident trends and provides details as to the type of rail accidents, those affected, and causes.

Table 2.13 below shows statistics for the total number of rail accidents and incidents in Iowa over the past 10 calendar years. These totals include Train Accidents, Highway-Rail Incidents, and Other Incidents. These categories will be defined and discussed in greater detail below.

Table 2.13: Total Accidents and Incidents in Iowa (2005-2014)

RAIL INJURY TYPE	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Incidents	275	252	283	267	187	208	195	167	163	164
Deaths	10	8	12	7	10	5	11	7	13	9
Injuries	166	125	153	160	101	119	122	88	96	98

Source: FRA Office of Safety Analysis.

The trend in total rail accidents and incidents in Iowa has decreased over the past decade. The first half of the decade saw an average of 253 total incidents, 9.4 fatalities, and 179 injuries, while the most recent five-year period saw averages of 179 total incidents, 9.0 fatalities, and 105 injuries.

The following sections discuss the various types of Iowa rail accidents and incidents in more detail.

2.1.6.2.1 Train Accidents in Iowa

Train accidents include train derailments, collisions, and other events involving on-track rail equipment that result in fatalities, injuries, or monetary damage above a threshold set by FRA²¹. Train accident statistics in Iowa over the past decade are provided in Table 2.14 below.

Table 2.14: Total Train Accidents in Iowa (2005-2014)

TRAIN ACCIDENTS	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Accidents	76	82	73	68	51	55	59	51	40	34
Deaths	0	0	0	0	2	0	2	0	0	0
Injuries	7	2	2	7	1	0	6	1	3	0

Source: FRA Office of Safety Analysis.

Figure 2.14 below provides more detailed information regarding the type, location, and causes of the train accidents over the past decade.

Figure 2.14: Train Accident Type/Locations/Causes in Iowa (2005-2014)



Source: FRA and CDM Smith

In the above illustration, rail derailments are shown to have been the dominant type of rail accidents in the state over of the past 10 years. Also, most rail accidents occurred on yard tracks as opposed to main line tracks. Lastly, track defects and human error were the leading causes of train accidents over the past decade, while equipment defects and miscellaneous causes comprised lesser shares of rail accidents in the state.

2.1.6.2.2 Other Rail Incidents

Other rail incidents include events other than train accidents or crossing incidents that caused a death or injury to any person. Most fatalities in this category are due to rail trespassers. Other events which generally lead to injuries in this category include such railroad-related activities as getting on or off equipment, doing maintenance work, throwing switches, setting handbrakes on railcars, falling, and so on. Rail passenger-related casualties can include boarding or alighting from standing trains or platforms. Statistics for this category of rail incidents are shown in Table 2.15 below.

Table 2.15: Other Rail Incidents 2005-2014

OTHER RAIL INCIDENTS	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Incidents	122	101	128	127	84	98	95	73	74	79
Deaths	4	2	5	2	4	1	7	2	8	2
Injuries	127	103	124	128	81	99	92	71	68	81

Source: FRA Office of Safety Analysis.

In recent years the trend has shown a decrease in the number of total incidents and injuries for this category

²¹ In 2014, the monetary threshold was \$10,500. The threshold is adjusted yearly to ensure the threshold accurately reflects cost increases that have occurred within the railroad industry.

of rail incidents.

2.1.6.3 HIGHWAY-RAIL AT-GRADE CROSSING SAFETY IN IOWA

2.1.6.3.1 Crossing Protection in Iowa

According to FRA's inventory of at-grade crossings, there are a total of 4,331 public at-grade highway-rail crossings in Iowa. In addition, there are also 745 crossings that are grade separated. Public at-grade crossings in the state have various levels of grade crossing warning devices. Table 2.16 below shows the type of warning equipment and the number of crossings equipped with each. The warning devices are shown in a decreasing order of warning effectiveness.

Table 2.16: Types of Warning Devices at Iowa Public At-Grade Crossings

WARNING DEVICE TYPE	GATES	FLASHING LIGHTS	BELLS	SPECIAL WARNING	STOP SIGNS	CROSS BUCKS	OTHER	NONE
Number of Crossings	1,010	794	19	19	423	2,042	2	20

Source: FRA Office of Safety Analysis.

These figures show that slightly less than half of all public at-grade crossings in the state have active warning devices such as gates, flashing lights, and bells or special warning arrangements (e.g., flagmen), while more than half of crossings have passive warning devices (e.g., cross bucks and / or stop signs) or no warning systems. Many of the crossings with passive warning systems have low volumes of roadway traffic and are rural in nature.

In addition to public at-grade crossings, there about 2,500 private crossings in the state. Private crossings are outside the jurisdiction of Iowa DOT.

2.1.6.3.2 At-Grade Crossing Incidents in Iowa

Table 2.17 below shows the number of highway-rail grade crossing incidents, fatalities, and injuries which have occurred at all public at-grade crossings over the past decade.

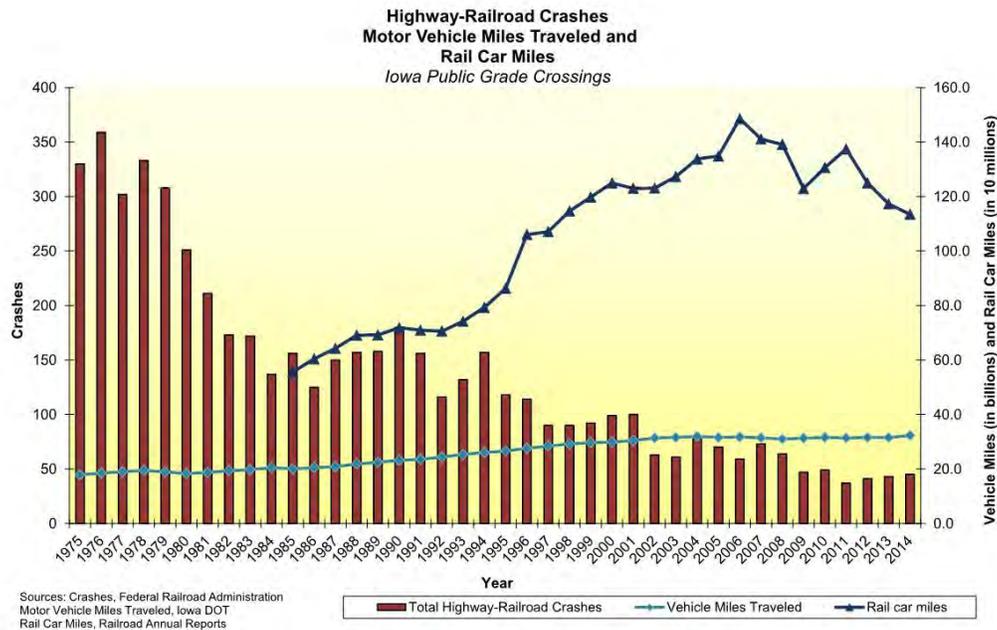
Table 2.17: Highway-Rail Incidents in Iowa (2005-2014)

HIGHWAY-RAIL INCIDENTS	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Incidents	77	69	82	72	110	52	41	43	49	51
Deaths	6	6	7	5	4	4	2	5	5	7
Injuries	32	20	27	25	19	20	24	16	25	17

Source: FRA Office of Safety Analysis.

These figures show a significant decrease in the average number of total incidents and injuries comparing the initial and later five-year segments, with the average number of total incidents decreasing 42 percent and the number of injuries decreasing 33 percent. Over the successive five-year periods the number of deaths decreased by an average of one per year. The decrease in total incidents is noteworthy in that the decrease has occurred during a period where motor vehicle and train traffic has been increasing, as seen in Figure 2.15 below.

Figure 2.15: Crossing Incidents Decreasing while Motor Vehicle and Train Traffic Increasing



In 2012, Iowa DOT developed a *State Highway-Rail Grade Crossing Action Plan*²² to focus on road user safety at highway-rail at-grade crossings. The objective of the plan was to identify specific solutions to reduce collisions between railroad trains and equipment, and pedestrians or vehicles at crossings. The plan focused on crossings with a history of multiple crashes or which were determined to have other risk factors associated with multiple crash crossings. The plan identified specific solutions to reduce grade crossing collisions with action items associated with increased education, engineering, enforcement, and funding.

2.1.6.4 HAZARDOUS MATERIAL INCIDENTS IN IOWA

2.1.6.4.1 Hazardous Materials Safety Programs

The Federal Railroad Administration (FRA) and the Pipeline and Hazardous Materials Safety Administration (PHMSA) regulate the transport of hazardous materials.

Hazardous Materials Safety Programs are generally composed of four main components:

- Inspection of railroad and shipping facilities and inspection of employee training records, security procedures, and quality assurance programs to ensure safety standards are met;
- Technical assistance, education, and outreach activities to shippers/consignees, rail carriers, emergency responders, and the general public are carried out by the FRA, PHMSA, railroads, Iowa's Homeland Security and Emergency Management Department, Iowa DOT, and TRANSCAER (a training and outreach organization supported by the railroad and chemical industries);
- Inspection and transport of nuclear materials (the Iowa Department of Health permits certain nuclear materials shipped by rail); and,
- Planning, preparation, and recovery plans, exercises, and training in the event of an incident. Hazardous materials are just one hazard encompassed in "all hazards" planning (Section 2.1.6.6 describing security includes more details on Iowa's emergency management organization).

Outside of public emergency response to a hazardous materials rail incident, the larger Class I railroads have

²² <https://www.iowadot.gov/lowarail/pdfs/Action%20Plan%20-%20FRA%20rewrite%20submittal>.

additional resources and personnel that can be rapidly dispatched to the scene of an incident to advise and supplement the local response.

2.1.6.4.2 Rail Accidents Involving Hazardous Materials in Iowa

Table 2.18 below shows the history of accidents involving rail cars carrying hazardous materials in Iowa over the past decade.

Table 2.18: Rail Accidents Involving Hazardous Materials in Iowa (2005-2014)

RAIL INCIDENTS	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Cars Carrying Hazmat	158	120	203	109	332	316	245	190	352	97
Hazmat Cars Damaged or Derailed	15	7	48	7	67	28	34	17	24	28
Cars Releasing Hazmat	0	0	0	0	2	0	0	1	3	0

Source: FRA Office of Safety Analysis.

Rail accidents involving hazardous materials in Iowa have not generally followed the overall trend of decreases in rail-related accidents and incidents. In recent years the number of cars carrying hazardous materials involved in rail accidents has increased. The average number of hazardous material cars damaged or derailed in accidents, however, has decreased slightly in the most recent five-year period.

2.1.6.5 POSITIVE TRAIN CONTROL

Positive Train Control (PTC) refers to technologies designed to automatically stop or slow a train before certain accidents can occur. PTC is designed to prevent collisions between trains, derailments caused by excessive speed, trains operating beyond their limits of authority, incursions by trains on tracks under repair, and by trains moving over switches left in the wrong position. PTC systems are designed to determine the location and speed of trains, warn train operators of potential problems, and take action if operators do not respond to a warning.

The Rail Safety Improvement Act of 2008 originally required railroads to place PTC systems in service by December 31, 2015, under the following circumstances:

- On all rail main lines over which regularly-scheduled commuter or intercity passenger trains operate; and
- On all Class I railroad main lines with over 5 million gross ton-miles per mile annually over which any amount of toxic/poison-by-inhalation hazardous materials is handled.

The mandate for PTC excludes all Class II (regional) and III (short line) railroads regardless of tonnage or number of toxic/poison cars handled as long as no passenger trains travel over the lines.

Under these conditions, all rail operators over the Amtrak corridors within Iowa as well as any Class I railroad main line routes would likely need to be equipped with PTC. Class I railroads are currently developing PTC systems for their networks, which would include implementation of the technology on principal lines in Iowa.

Congress has considered several bills that would extend the 2015 deadline of the Act. In October 2015, Congress passed H.R. 3819 — Surface Transportation Extension Act of 2015, providing a three-year extension of the original PTC deadline. Under the new law, U.S. freight railroads will have until December 31, 2018, to fully implement PTC²³.

2.1.6.6 RAIL SECURITY

In response to the increased focus on the security of the transportation system, new federal and state agencies have been established to oversee and provide assistance to ensure the security of transportation modes. The following addresses specific rail security issues and Iowa's involvement in rail security procedures.

23 Association of American Railroads - Positive Train Control: <https://www.aar.org/policy/positive-train-control>

The primary agencies responsible for security related to transportation modes in Iowa are the U.S. Department of Homeland Security, Iowa's Homeland Security and Emergency Management Department, Iowa Department of Public Safety, Iowa Emergency Response Commission (IERC), and county emergency management coordinators. These agencies, in coordination with federal and state transportation agencies, have addressed transportation security largely through identifying critical infrastructure assets, developing protection strategies for these assets, and developing emergency management plans.

The U.S. Department of Homeland Security addresses rail system security through the following means:

- Training and deploying manpower and assets for high risk areas;
- Developing and testing new security technologies;
- Performing security assessments of systems across the country; and,
- Providing funding to state and local partners.

Iowa's Homeland Security and Emergency Management Department (Iowa HSEMD) works to ensure the state is adequately prepared for disasters through administration, preparation, and execution of emergency management and homeland security programs. Iowa HSEMD supports local entities as they plan and implement mitigation, preparedness, response, and recovery strategies. Iowa HSEMD provides technical assistance, training, exercise facilitation, communications, and other support necessary for establishing and maintaining local capabilities. Iowa HSEMD is the coordinating entity that ensures consistency and compliance with numerous federal and state requirements and regulations.

IERC's mission is to assist in improving communities' preparedness for handling chemical accidents, promoting cooperation among state and local government and industry, increasing public awareness of chemicals in the community, and building information databases. The IERC appoints members to Local Emergency Planning Committees (LEPC).

LEPCs develop an emergency response plan, review the plan at least annually, and provide information about chemicals in the community to citizens. LEPCs have broad-based representation, including state and local officials, law enforcement, emergency management, emergency medical services, firefighting, health, local environment, hospital, transportation, broadcast and print media, community groups, and owners and operators of facilities subject to the state's Emergency Planning and Community Right-to-Know Act of 1986 requirements. The IERC supervises the activities of the LEPC and reviews emergency response plans.

County emergency management coordinators and agencies facilitate the local government and volunteer response to and recovery from a disaster, whether man-made or natural. When a communities' ability to respond exceeds its capabilities, there is a process in place to obtain mutual aid from other local entities, HSMED, other states, and the federal government.

Iowa's larger Class I railroads also have additional resources and personnel that respond to a security threat or incident, including railroad police officers.

Additionally, the Iowa Department of Public Safety's Intelligence Fusion Center plays a role in security through support to law enforcement and homeland security partners in Iowa.

The Association of American Railroads (AAR), working with the U.S. Department of Homeland Security and other federal agencies, has organized the Rail Security Task Force. This task force developed a comprehensive risk analysis and security plan for the rail system that includes:

- A database of critical railroad assets;
- Assessments of railroad vulnerabilities;
- Analysis of the terrorism threat; and,
- Calculation of risks and identification of countermeasures.

The railroad sector maintains communications with the U.S. Department of Defense, the U.S. Department of Homeland Security, the USDOT, the Federal Bureau of Investigation, and state and local law enforcement agencies on all aspects of rail security.

2.1.7 Economic Impacts

Rail economic impacts to Iowa are derived from the IMPLAN® economic model with input data and assumptions from freight movement data (via the STB Waybill Sample, which is described in Section 2.2.2 of the Iowa State Rail Plan) and passenger rail operations and visitor characteristics. Impacts of rail activities in Iowa emanate from firms providing freight and passenger transport services, industries using such services to trade goods (shippers/receivers), and tourism-related visitors to Iowa via rail. Of these activities, freight-users generate the most significant impacts.

Impacts are calculated and presented by activity (service provision and rail users), type (direct, indirect, induced, and total), and measure (employment, income, value added, output, and tax revenue) for year 2013 to provide a comprehensive perspective on how rail in Iowa impacts the economy, and are shown in Table 2.19 below:

- **Employment** – Economic impacts of rail extend beyond the 3,520 directly employed in the provision of rail transport (both passenger and freight). When the freight and visitor user impact activities and multiplier impacts are included, rail-related employment in Iowa totals 219,380 jobs, which represent 10.8 percent of the 2.0 million jobs statewide.
- **Income** – \$13.8 billion earned by these total employees represent 13.6 percent of Iowa's total labor income.
- **Value-Added** – And, the combined value-added impact, \$24.2 billion, associated with the rail services and users represent 14.7 percent of the state's Gross State Product (GSP).

Table 2.19: Rail Economic Impacts in Iowa

MEASURE AND TYPE	TRANSPORT SERVICES			TRANSPORT USERS			TOTAL		
	PASS.	FREIGHT	SERVICES	PASS.	FREIGHT	USERS	PASS.	FREIGHT	TOTAL
EMPLOYMENT*									
Direct	20	3,500	3,520	230	66,450	66,680	250	69,960	70,200
Total	40	8,830	8,860	300	210,220	210,510	330	219,040	219,380
Income**									
Direct	\$1.1	\$365.9	\$367.0	\$4.8	\$6,411.3	\$6,416.1	\$5.9	\$6,777.2	\$6,783.1
Total	\$1.7	\$600.6	\$602.4	\$7.6	\$13,214.2	\$13,221.8	\$9.4	\$13,814.8	\$13,824.2
VALUE ADDED**									
Direct	\$1.9	\$1,075.5	\$1,077.4	\$7.1	\$11,196.9	\$11,204.0	\$9.0	\$12,272.4	\$12,281.4
Total	\$3.0	\$1,448.0	\$1,451.0	\$12.0	\$22,705.5	\$22,717.6	\$15.0	\$24,153.6	\$24,168.6
OUTPUT**									
Direct	\$3.6	\$1,725.8	\$1,729.4	\$13.4	\$43,029.3	\$43,042.6	\$17.0	\$44,755.0	\$44,772.0
Total	\$5.6	\$2,428.0	\$2,433.6	\$22.3	\$66,970.4	\$66,992.7	\$27.9	\$69,398.4	\$69,426.3
TAX REVENUE**									
Direct	\$0.05	\$18.3	\$18.4	\$1.2	\$475.0	\$476.2	\$1.3	\$493.3	\$494.6
Total	\$0.14	\$49.5	\$49.6	\$1.6	\$1,325.5	\$1,327.1	\$1.8	\$1,375.0	\$1,376.7

Source: CDM Smith, Amtrak, WAYBILL, and IMPLAN

* Employment rounded to nearest ten job-years; totals may not sum due to rounding

** in millions of 2013 dollars

The full description of economic impacts can be found in Appendix C of the Iowa State Rail Plan.

2.2 Trends and Forecasts

The purpose of this section is to describe trends that will affect rail needs for the state of Iowa in the future. Trends which impact both passenger and freight rail include factors such as demographic and economic growth, freight and passenger transportation changes, congestion to all transportation modes, and the future land use outlook. These factors all contribute to the projected demand and growth for both passenger and freight, although many of these factors are difficult to incorporate into demand forecasting. The following discussion provides a base for determining future rail service needs in Iowa and identifies areas of the state's future economy that will be transportation dependent.

2.2.1 Demographic and Economic Growth Factors

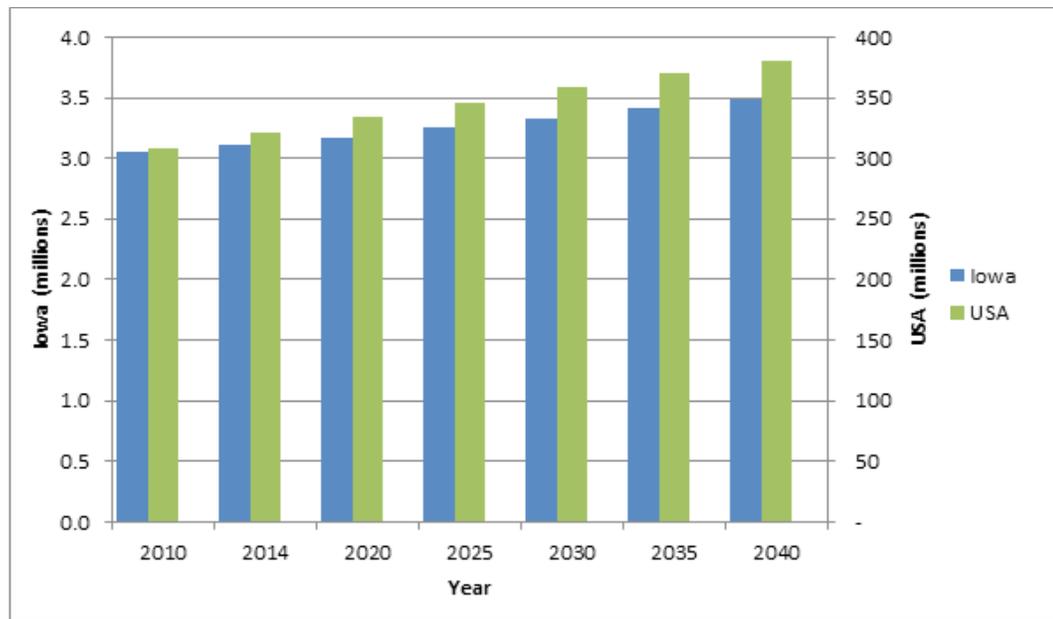
2.2.1.1 POPULATION

The estimated population for Iowa in 2014 was 3,107,126, which ranked 30th among the U.S. states. Over the past four years Iowa's population increased by 2.0 percent, compared with a 3.3 percent population growth rate for the U.S. as a whole. From 2000 to 2014, Iowa only grew at the 38th fastest rate in the country, reflecting the slower growth of the region when compared with other portions of the country.

Overall, Iowa's population increased by 6.2 percent from year 2000 to 2014, which is substantially lower than the country's overall 13.3 percent growth in population during the same time period. This indicates that Iowa, while still growing, is not adding as much population as most other states in the country²⁴.

The State Library of Iowa's Data Center Program and the U.S. Census Bureau provide future population projections for public use. Iowa's information is provided to year 2040, while the U.S. Census projects to the year 2060. Population projections in five-year increments were used for both the state and country. Based on this information, between 2010 and 2040 the state's population is projected to increase by more than 14 percent, reaching a total of nearly 3.5 million people. Compared to the estimated 23.1 percent growth for the country, Iowa's projected growth indicates that the state will continue to lag behind most of the country in terms of attracting more people and grow slower than the U.S. as a whole. Figure 2.16 below shows the projected population estimates for both Iowa and the United States²⁵.

Figure 2.16: Iowa and USA Future Population Estimates



Source: U.S. Census Bureau

²⁴ Population data from U.S. Census Bureau.

²⁵ Population forecast based on U.S. Census Bureau population estimates.

Based on information from the Census Bureau's American FactFinder, which is sourced from information gathered for the American Community Survey (ACS), the median age for the state is 38.1 years, which is slightly older than the national median age of 37.2 years. Among the state's population over 25 years of age, 90.9 percent graduated from high school and 25.7 percent received a bachelor's degree or higher degree; the high school graduation rate is much higher than the national average of 85.7 percent, but the college graduation rate is below the 28.5 percent national average²⁶. Iowa's working age population (aged 18 to 65 years) was about 61.2 percent of the overall population, which is below the country's 62.9 percent of the population. This suggests that the state skews slightly older than the rest of the country in general, which is also reflected in the median age.

2.2.1.2 EMPLOYMENT

The most current wage and salary employment (i.e., base employment) figures indicate that around 1.93 million people were employed in the state as of 2014, based on information from the Bureau of Economic Analysis (BEA). This data excludes farm and nonfarm proprietors' employment information.

Using Iowa Workforce Information Network employment growth projections, by 2020 base employment will increase to about 2.05 million, an 11.2 percent increase when compared to 2012 base employment projections²⁷. Using this information and applying actual employment information from the BEA, the state's base employment is projected to increase by around 24 percent to nearly 2.48 million jobs in year 2040²⁸. As previously mentioned, this excludes proprietor's employment as defined by the BEA.

Iowa's unemployment rate over the past few years has changed substantially as a result of shifting regional and national economic conditions. In the past decade unemployment rates ranged from as low as 3.6 percent in June 2006 prior to the recent economic recession to as high as 6.6 percent in August 2009. Since 2009, rates have gradually dropped from 6.0 percent in May 2010 to 5.5 percent in June 2011, 5.0 percent in August 2012, 4.7 percent in August 2013, and 4.3 percent in August 2014. As of July 2015, the seasonally adjusted unemployment rate for the state was 3.8 percent. This rate is significantly lower than the national average rate of 5.3 percent, which itself has dropped substantially from its recent high of 10.0 percent in October 2009²⁹.

As of 2014, Iowa is the headquarters for two Fortune 500 companies: Principal Financial Group, an insurance and investment management company, and Casey's General Stores, a convenience store chain. According to the Iowa Economic Development Authority (IEDA), Iowa's gross domestic product (GDP) has increased by 10.2 percent since 2010, which is the 8th highest rate in the country. Companies in Iowa have continued to increase economic development in the state. For example, Google recently chose to increase their investment in their Council Bluffs data center by over \$1 billion³⁰. This investment reflects the strong economic performance of the state and indicates that overall economic development will continue to increase as the economy expands and improves.

Figure 2.17 below displays the employment change from 2000 and 2013 against the Iowa's Gross State Product (GSP) by employment sector in 2014. The graph highlights sectors with the largest impact on the Iowa economy and the changes in those sectors recently in terms of available jobs. The size of the bubble for each employment sector represents the number of jobs in that sector compared against all other sectors. According to the BEA, education and healthcare and public administration rank as the top employment sectors for the state, with retail trade and manufacturing closely behind. Education and healthcare employment has shown a growing trend since 2000, while public administration employment has slowly grown. The manufacturing sector has decreased by more than 13 percent, while the information sector

26 U.S. Census Bureau, 2010 Demographic Profile Data.

27 Iowa Workforce Information Network. Part of the Labor Market and Workforce Information Division of Iowa Workforce Development. July 2014.

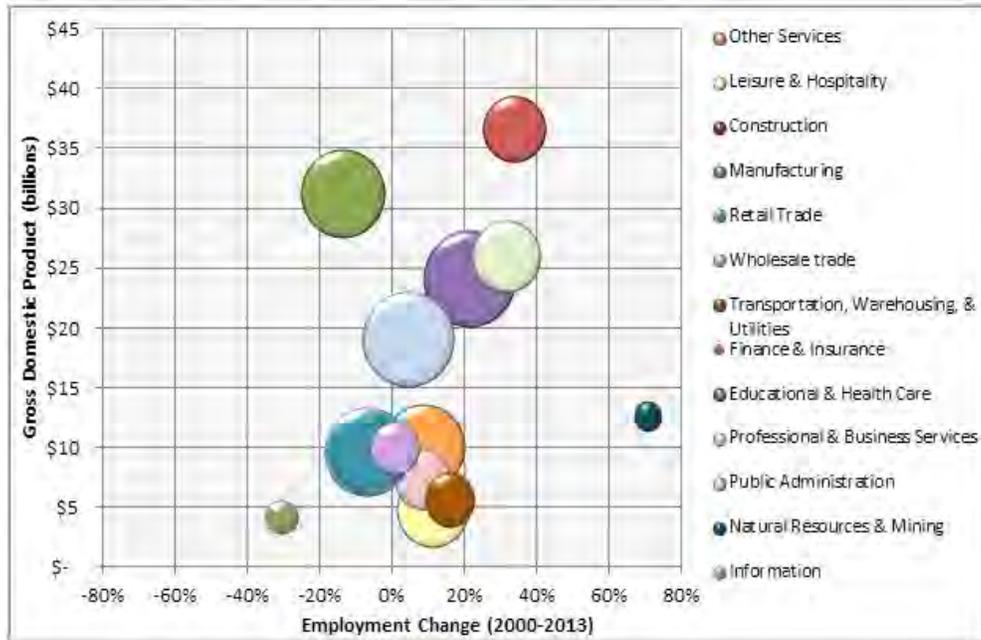
28 Percentage increase determined from projections provided by IWIN and then applied to actual BEA data. Thus it varies from IWIN projection data.

29 Unemployment statistics provided by the U.S. Department of Labor and the Bureau of Labor Statistics.

30 Link found via <http://www.desmoinesregister.com/story/tech/2015/04/16/google-invests-billion-council-bluffs-data-center/25894229/>. Accessed on September 21, 2015.

(which includes industries like publishing and telecommunications) has decreased by around 30 percent³¹. Other notable sectors include the natural resources and mining sector which has grown by over 70 percent in the past 15 years. In terms of GSP, four sectors generate nearly 59 percent of the overall GSP and have the most economic impact for the state. These four sectors are: the finance and insurance sector, educational and healthcare industry, manufacturing, and professional and business services.

Figure 2.17: Employment Growth and GSP by Size of Employment Sector (2014)



Source: U.S. Census Bureau and the Bureau of Economic Analysis

2.2.1.3 PERSONAL INCOME

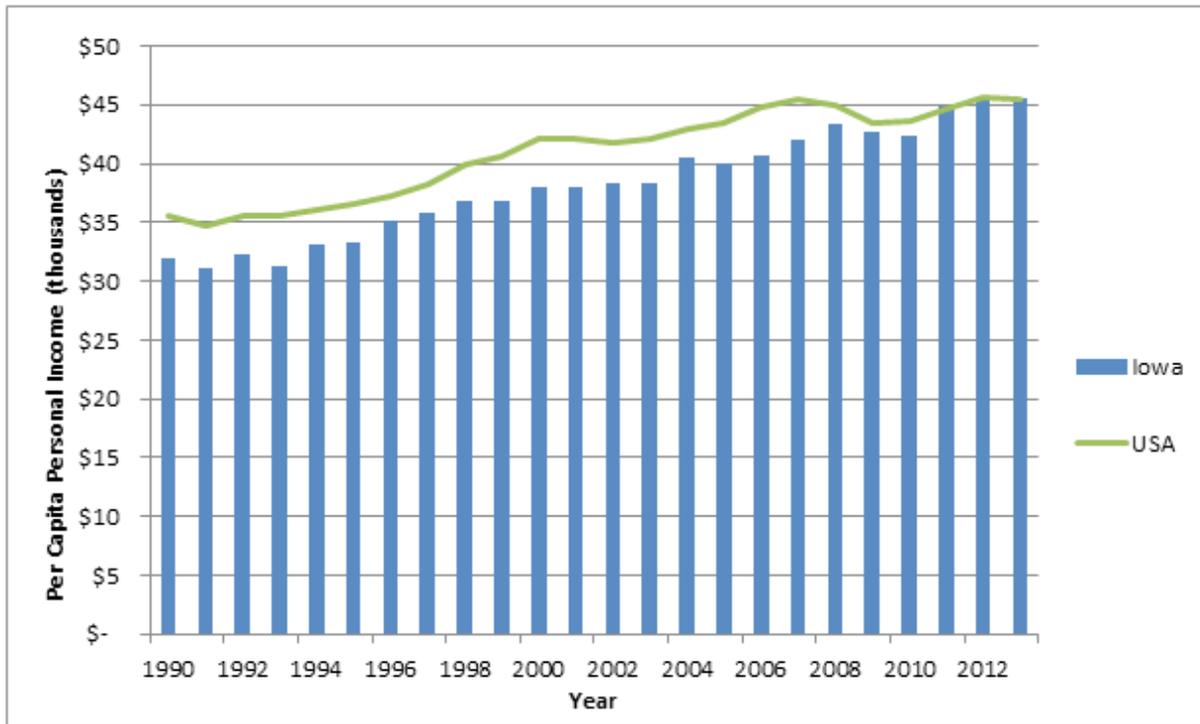
Iowa's per capita personal income in 2014 was \$45,115, which ranked 26th within the United States and was 98 percent of the national average (\$46,129)³². In continuous 2013 dollars (adjusted for inflation using the Consumer Price Index) the per capita personal income since 1990 has grown by 41.3 percent, substantially above the national income growth of 30.0 percent. Since 2000, Iowa's per capita personal income has continued to increase at a pace well above the national average, with a growth of 19.0 percent, while nationally incomes have grown by about 9.7 percent. The income growth in the past decade in Iowa can be attributed to the strong economy, as shown by the recent GSP gains and low unemployment rate. Iowa's per capita personal income is currently at or around the U.S. personal income average, which is a substantial improvement when compared to historical data, where it was consistently below the national average. Historical per capita personal income from 1990 to the present day is shown in Figure 2.18 below³³.

³¹ U.S. Census Bureau and the Bureau of Economic Analysis.

³² Bureau of Economic Analysis, accessed at http://www.bea.gov/iTable/index_regional.cfm.

³³ Bureau of Economic Analysis, adjusted by the national CPI into 2014 U.S. dollars.

Figure 2.18: Historical Per Capita Personal Income (2014 U.S. \$)



Source: Bureau of Economic Analysis

2.2.1.4 INDUSTRIAL OUTLOOK BY SECTOR

Inbound agricultural shipments will have the highest growth rate at 4.6 percent per year over the period 2013-2040. However, by 2040, outbound agricultural products will comprise by far the single largest tonnage shipped (30.8 million tons). The outlook of rail shipments by industrial sector is discussed in the following section.

2.2.2 Freight Demand and Growth

2.2.2.1 INTRODUCTION AND APPROACH

Various freight traverses Iowa's rail infrastructure annually. Such freight includes finished goods, materials, and supplies. Principal freight rail issues concern the identification of movements most important to Iowa, and the options to facilitate/support such movements. Identifying the importance of, and solutions for, freight rail comprises several perspectives, including: volumes (especially compared to capacity), units (carloads), and directional movements.

In this report, current freight rail volumes for year 2013, as reported in the U.S. Surface Transportation Board (STB) Railroad Waybill Sample database, are tabulated by major commodity types to understand freight movements. Additionally, directional rail tonnage forecasts are provided as derived from the Federal Highway Administration (FHWA) Freight Analysis Framework (FAF) data.

- **Commodity Classification** — The Standard Transportation Commodity Code (STCC) is a seven-digit numeric code, categorized by 40 commodity groupings, based on physical product information used on shipping documents and published/maintained by the Association of American Railroads (AAR). A hierarchical STCC structure allows for data collapsibility, enabling summarization of commodity information³⁴. Although freight movements are tallied at the seven-digit STCC detail, the information summarized herein is at the aggregated two-digit level.

³⁴ For example, '01' represents 'Farm Products', '011' identifies 'Field Crops', '0112' indicates 'Raw Cotton', etc., narrowing in specificity to a seven-digit level

- **Waybill Sample** — Based on STCC codes³⁵, the Waybill provides detailed most-recently available year 2013 movement data by commodity. It uses a 2 percent stratified sample by the STB Carload Waybill Sample of carload waybills for all rail traffic submitted by rail carriers that terminate 4,500 or more revenue carloads annually.
- **Freight Analysis Framework (FAF)** — Integrates year 2012 U.S. Census Bureau Commodity Flow Survey (CFS) and additional sources to provide freight movement metrics in terms of tonnage, value, and domestic ton-miles by region of origin and destination, commodity type, and mode for most current year (e.g., 2013 via FAFv3.6) and forecasts through 2040 (via FAFv3.5). While FAF is not as exhaustive (excludes railcar unit metrics or through state movements) as the Waybill Sample, FAF does provide a means by which to assess future tonnage growth. Note that FAF presents rail ton movement data by two-digit Standard Classification of Transportable Goods (SCTG) code classification, which differs notably from the STCC classification used in the Waybill Sample³⁶.

2.2.2.2 CURRENT FREIGHT RAIL

Year 2013 Iowa rail movements by direction (outbound, inbound, intrastate, and through) and term (defined as tons and carload units) are derived from the STB Waybill database. Each subsection summarizes rail movements by direction and term, and each identifies the top two-digit STCC commodity movements. Summary data are shown graphically for ease of visually identifying important commodity movements and related observations, with the supporting comprehensive data located in tables in Appendix D of the Iowa State Rail Plan.

2.2.2.2.1 Summary

Iowa rail movements in 2013 totaled 290.3 million tons, carried within almost 4.5 million carload units, as seen in Table 2.20 below. As depicted in Figure 2.19 below, rail movements through Iowa are the dominant directional movement, comprising almost three-quarters (73.2 percent) of all directions, by tonnage, and over four-fifths (80.9 percent) by units. Outbound and inbound movements are proportionally similar in total magnitude and compositional percentage (12.2 percent of tons and 8.1 percent to 8.9 percent of carload units), while intrastate movements are relatively small (around 2 percent) by comparison.

Table 2.20: Rail Movements by Direction, 2013

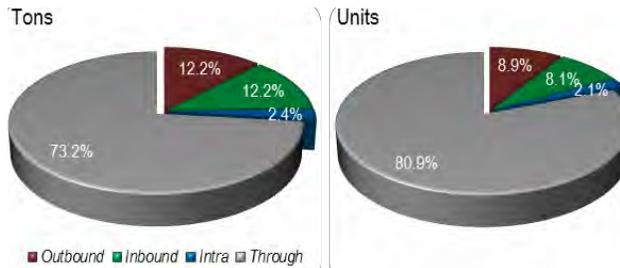
DIRECTION	TONS		UNITS (CARLOADS)		TONS/UNIT UTILIZATION
	AMOUNT	PERCENT	AMOUNT	PERCENT	
Outbound	35,428,698	12.2%	400,835	8.9%	88.4
Inbound	35,402,440	12.2%	360,760	8.1%	98.1
Intra	6,894,726	2.4%	93,910	2.1%	73.4
Through	212,549,767	73.2%	3,624,093	80.9%	58.6
Total	290,275,631	100.0%	4,479,598	100.0%	64.8

Source: prepared by CDM Smith, based on the STB Waybill Sample data for 2013

³⁵ STB WAYBILL designates freight rail movements via two STCC conventions: one includes the 49xxxxx (HAZMAT-related) and 50xxxxx (bulk movements) STCC designations; the alternative translates those HAZMAT- and bulk-related movements into actual product STCC. Summary data herein pertains to the non-HAZMAT/non-bulk STCC convention.

³⁶ STCC is a detailed 7-digit numeric code with about 750 product classifications, published/maintained by the Association of American Railroads (AAR), that are generally collapsed for analysis purposes into 4-digit or 2-digit summaries. Conversely, STCG is based on the Harmonized Commodity Description and Coding System product classifications tailored for transportation modes. The 5-digit SCTG comprises over 1,100 product classifications; however, FAF only provides information at the 2-digit summary level. Unfortunately, collapsibility between the two conventions differs due to the overarching needs of the organizations that developed them. While STCC is railroad-based commodity classification system, STCG is a broader-based multimodal classification system for all modes. So, developed for different purposes and modal use, STCC and STCG are different tools used for different purposes, which happened to overlap on quantification of rail movements. Most notably for Iowa products is the difference in classification of ethanol between STCC (Chemical and Allied Products) and STCG (Alcoholic Beverages).

Figure 2.19: Rail Movement Share by Direction, 2013



Source: prepared by CDM Smith, based on the STB Waybill Sample data for 2013

Major Commodity Movements – A table in Appendix D summarizes rail commodities in Iowa (all directions), which total 290.3 million tons, via 4.5 million carload units. The top five commodities by tonnage and by units (i.e., by terms) include:

By Tonnage:

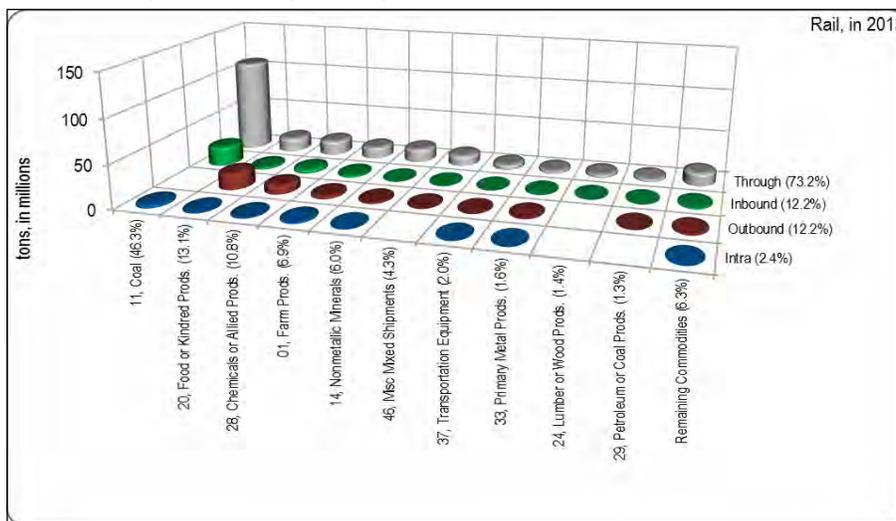
1. Coal (134.4 million tons, 46.3 percent of rail total);
2. Food or Kindred Products (38.0 million, 13.1 percent);
3. Chemicals or Allied Products (31.2 million, 10.8 percent);
4. Farm Products (20.0 million, 6.9 percent); and
5. Nonmetallic Minerals (17.4 million, 6.0 percent).

By Units:

1. Coal (1,215,557 units, 27.1 percent of rail total);
2. Miscellaneous Mixed Shipments (837,920, 18.7 percent);
3. Food or Kindred Products (526,973, 11.8 percent);
4. Chemicals or Allied Products (402,477, 9.0 percent); and
5. Transportation Equipment (317,018, 7.1 percent).

Figure 2.20 and 2.21 below depict two-digit STCC commodities³⁷ by direction for Iowa freight rail, in terms of tonnage and units, respectively. Supporting data are presented by direction in Appendix D and are further detailed in the following subsections.

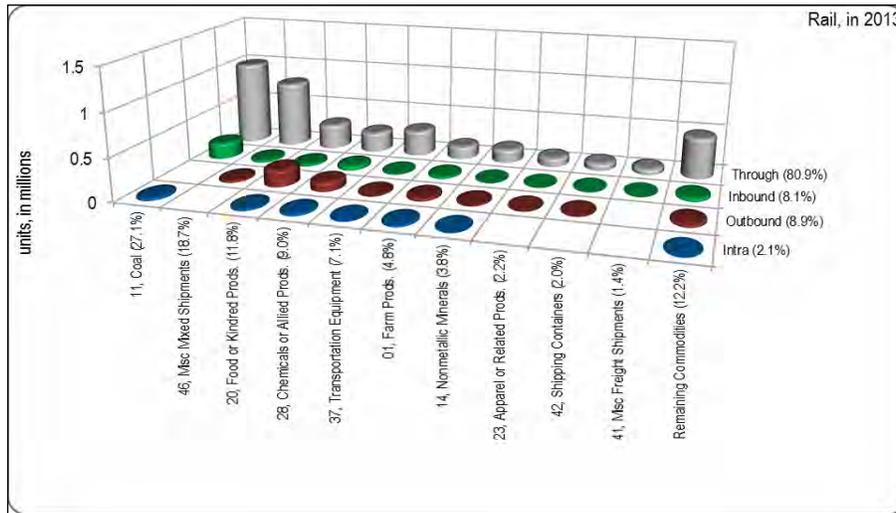
Figure 2.20: Rail Commodity Direction by Tonnage, 2013



Source: Prepared by CDM Smith, based on the STB Waybill Sample data for 2013

³⁷ Note the numbers preceding the commodity names in the figures pertain to the two-digit STCC codes for such commodities

Figure 2.21: Rail Commodity Direction by Unit, 2013



Source: Prepared by CDM Smith, based on the STB Waybill Sample data for 2013

2.2.2.2.2 Rail Outbound

A table in Appendix D presents outbound rail commodities from Iowa, in 2013, which total 35.4 million tons, via 400,835 carload units; top five commodities include:

By Tonnage:

1. Food or Kindred Products (18.5 million tons, 52.2 percent of outbound total);
2. Chemicals or Allied Products (9.6 million, 27.2 percent);
3. Farm Products (3.1 million, 8.6 percent);
4. Nonmetallic Minerals (1.3 million, 3.7 percent); and
5. Primary Metal Products (0.9 million, 2.6 percent).

By Units:

1. Food or Kindred Products (193,089 units, 48.2 percent of outbound total);
2. Chemicals or Allied Products (102,799, 25.6 percent);
3. Farm Products (29,378, 7.3 percent);
4. Miscellaneous Mixed Shipments (22,040, 5.5 percent); and
5. Nonmetallic Minerals (11,876, 3.0 percent).

Outbound Tonnage Origin — Major outbound rail tonnages in 2013 are charted by county of origin in Figure 2.22 and mapped in Figure 2.24 below (support data are presented in Appendix D). Rail movements destined out-of-state are primarily transported from Pottawattamie County (4.7 million, 13.2 percent), Wapello County (2.9 million, 8.2 percent), and Clinton County (2.7 million, 7.5 percent).

Pottawattamie County:

1. Food or Kindred Products (2.6 million tons, 55.1 percent of outbound county total);
2. Farm Products (1.2 million, 25.9 percent);
3. Miscellaneous Mixed Shipments (0.4 million, 8.6 percent);
4. Chemicals or Allied Products (0.2 million, 4.2 percent); and
5. Nonmetallic Minerals (0.2 million, 3.3 percent).

Wapello County:

1. Food or Kindred Products (2.8 million tons, 97.4 percent of outbound county total);
2. Chemicals or Allied Products (0.1 million, 1.9 percent);
3. Clay, Concrete, Glass, or Stone (11,320, 0.4 percent);

4. Nonmetallic Minerals (4,640, 0.2 percent); and
5. Waste or Scrap Materials (3,320, 0.1 percent).

Clinton County:

1. Food or Kindred Products (1.4 million tons, 52.8 percent of outbound county total);
2. Chemicals or Allied Products (0.9 million, 34.2 percent);
3. Primary Metal Products (0.2 million, 7.2 percent);
4. Farm Products (0.1 million, 3.5 percent); and
5. Petroleum or Coal Products (38,120, 1.4 percent).

Outbound Tonnage Destination – Major outbound rail tonnages in 2013 are charted by state destination in Figure 2.23 and mapped in Figure 2.25 below (support data is also presented in a table in Appendix D). Rail movements destined out-of-state are transported to the following top three states: Illinois (10.9 million, 30.8 percent), Texas (6.8 million, 19.1 percent), and California (3.5 million, 9.8 percent).

Illinois:

1. Food or Kindred Products (5.6 million tons, 51.7 percent of outbound state total);
2. Chemicals or Allied Products (4.5 million, 41.2 percent);
3. Farm Products (0.2 million, 2.2 percent);
4. Waste or Scrap Materials (0.2 million, 1.7 percent); and,
5. Miscellaneous Mixed Shipments (0.1 million, 1.3 percent)

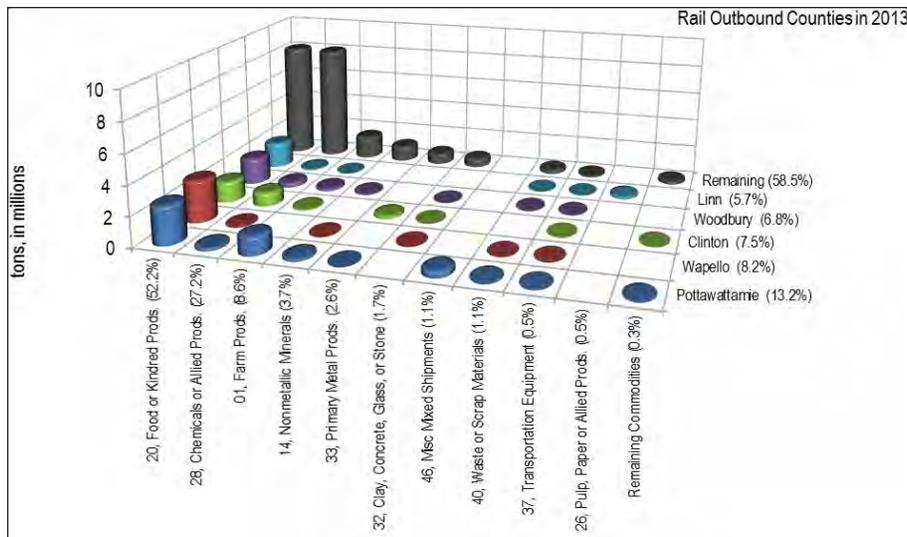
Texas:

1. Food or Kindred Products (4.2 million tons, 61.3 percent of outbound state total);
2. Chemicals or Allied Products (1.5 million, 22.3 percent);
3. Nonmetallic Minerals (0.7 million, 10.9 percent);
4. Farm Products (0.1 million, 1.9 percent); and,
5. Primary Metal Products (0.1 million, 1.5 percent)

California:

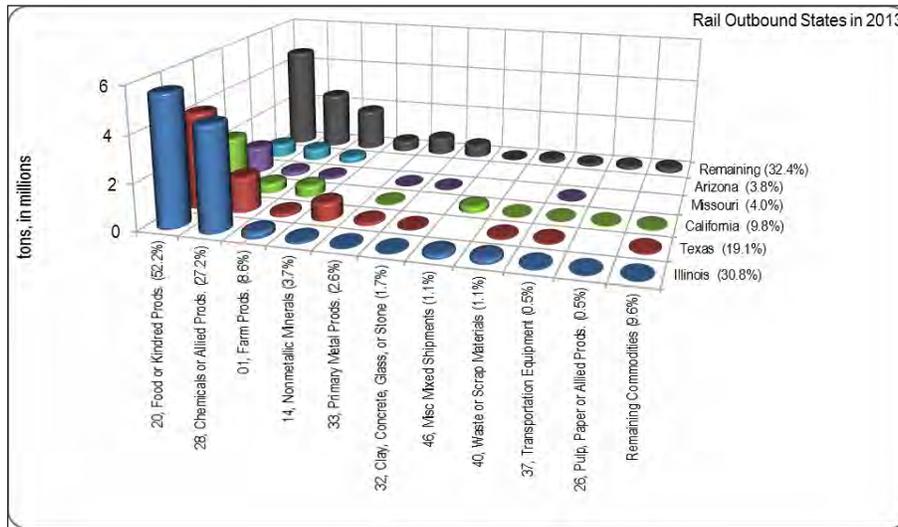
1. Food or Kindred Products (2.3 million tons, 66.0 percent of outbound state total);
2. Farm Products (0.5 million, 13.4 percent);
3. Chemicals or Allied Products (0.4 million, 11.6 percent);
4. Miscellaneous Mixed Shipments (0.2 million, 6.9 percent); and,
5. Primary Metal Products (0.0 million, 0.8 percent)

Figure 2.22: Rail Outbound Commodity Tonnage by Iowa County Origin, 2013



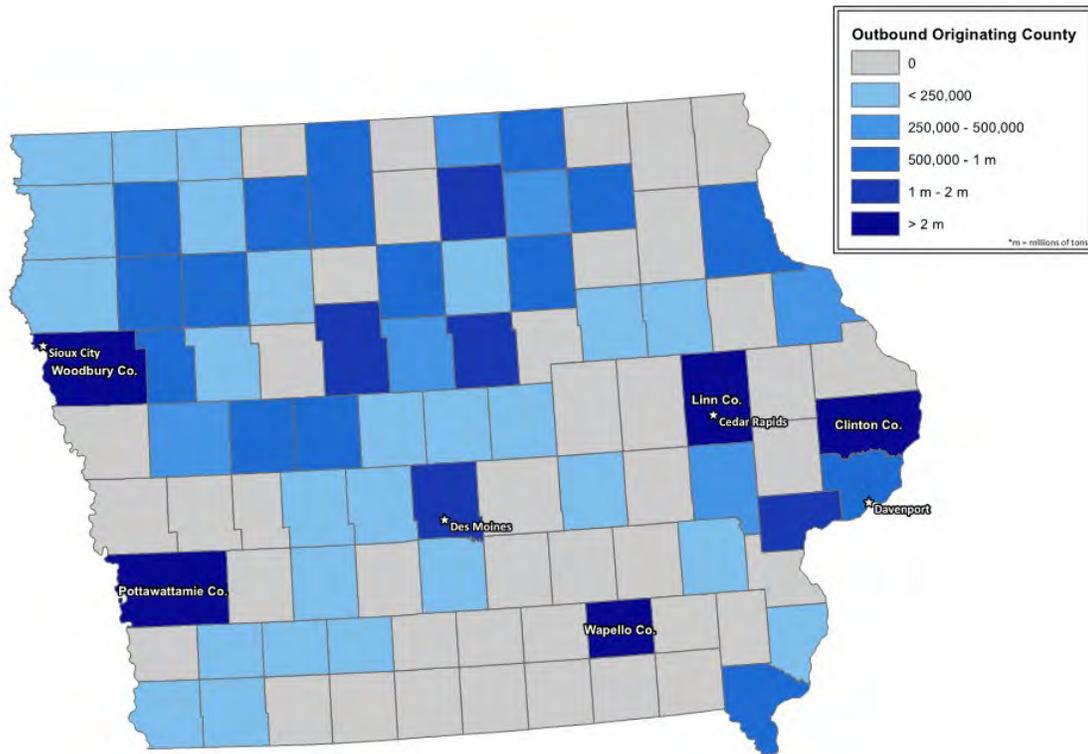
Source: Prepared by CDM Smith, based on the STB Waybill Sample data for 2013

Figure 2.23: Rail Outbound Commodity Tonnage by Destination State, 2013



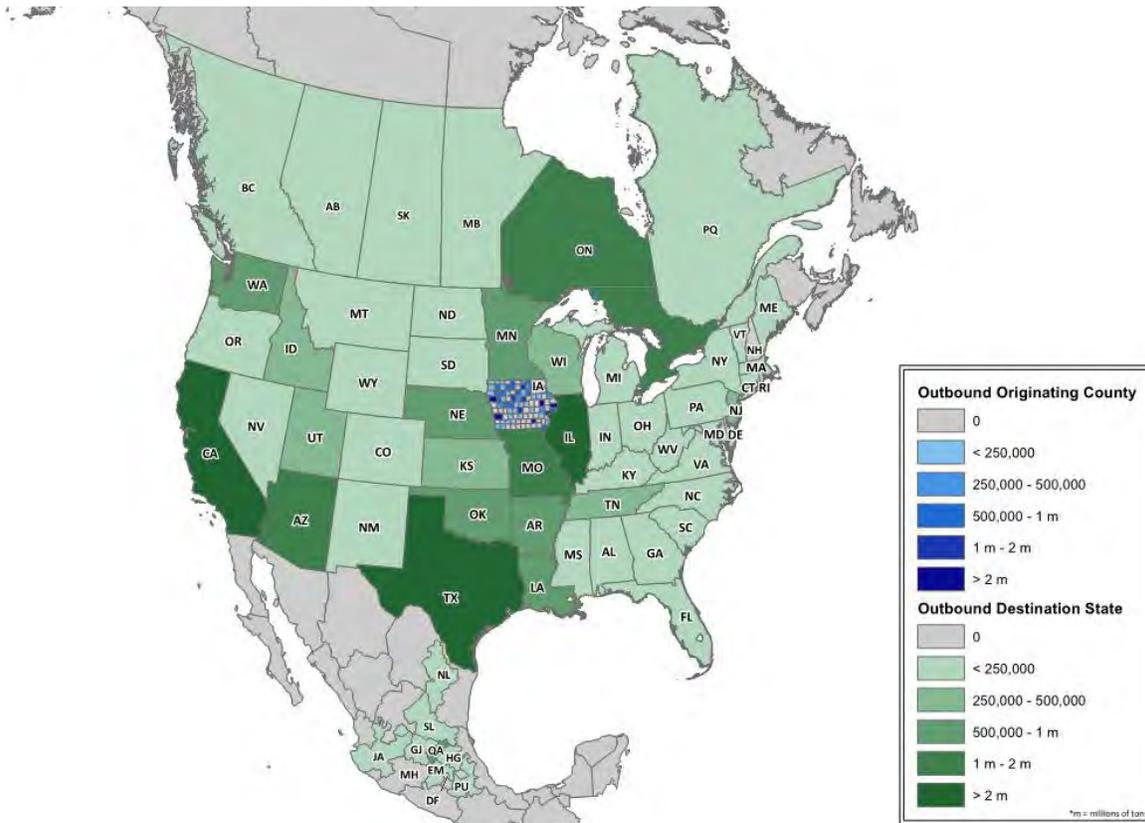
Source: Prepared by CDM Smith, based on the STB Waybill Sample data for 2013

Figure 2.24: Rail Outbound Total Tonnage by Iowa County Origin, 2013



Source: Prepared by CDM Smith, based on the STB Waybill Sample data for 2013

Figure 2.25: Rail Outbound Total Tonnage by Destination State, 2013



Source: Prepared by CDM Smith, based on the STB Waybill Sample data for 2013

2.2.2.2.3 Rail Inbound

A table in Appendix D presents inbound rail commodities to Iowa, in 2013, which total 35.4 million tons, via 360,760 carload units; top five commodities include:

By Tonnage:

1. Coal (22.4 million tons, 63.2 percent of inbound total);
2. Chemicals or Allied Products (4.2 million, 11.9 percent);
3. Food or Kindred Products (2.5 million, 7.1 percent);
4. Farm Products (2.3 million, 6.4 percent); and
5. Clay, Concrete, Glass, or Stone (0.8 million, 2.2 percent).

By Units:

1. Coal (187,395 units, 51.9 percent of inbound total);
2. Chemicals or Allied Products (45,730, 12.7 percent);
3. Miscellaneous Mixed Shipments (27,000, 7.5 percent);
4. Food or Kindred Products (25,140, 7.0 percent); and
5. Farm Products (23,563, 6.5 percent).

Inbound Tonnage Origin — Major inbound rail tonnages in 2013 are shown by state origin in Figure 2.26 and Figure 2.28 below (support data are presented in a table in Appendix D). Rail movements originating out-of-state are transported from the following top three states: Wyoming (22.4 million, 63.3 percent), Illinois (1.6 million, 4.6 percent), and Minnesota (1.5 million, 4.2 percent).

Wyoming:

1. Coal (22.1 million tons, 98.7 percent of inbound state total);

2. Chemicals or Allied Products (0.3 million, 1.1 percent);
3. Clay, Concrete, Glass, or Stone (38,000, 0.2 percent);
4. Nonmetallic Minerals (4,000, 0.0 percent); and
5. Petroleum or Coal Products (3,400, 0.0 percent).

Illinois:

1. Chemicals or Allied Products (0.4 million tons, 24.1 percent of inbound state total);
2. Food or Kindred Products (0.3 million, 18.2 percent);
3. Coal (0.3 million, 16.4 percent);
4. Farm Products (0.2 million, 12.5 percent); and
5. Waste or Scrap Materials (0.1 million, 6.4 percent).

Minnesota:

1. Farm Products (0.9 million tons, 59.0 percent of inbound state total);
2. Food or Kindred Products (0.2 million, 16.6 percent);
3. Waste or Scrap Materials (0.2 million, 11.1 percent);
4. Chemicals or Allied Products (0.1 million, 9.7 percent); and
5. Petroleum or Coal Products (36,792, 2.5 percent).

Inbound Tonnage Destination — Major inbound rail tonnages in 2013 are shown by county destination in Figures 2.27 and 2.29 below. Rail movements originating out-of-state are transported to the following top three counties: Pottawattamie County (8.0 million, 22.6 percent), Wapello County (5.9 million, 16.6 percent), and Woodbury County (5.8 million, 16.4 percent).

Pottawattamie County:

1. Coal (5.7 million tons, 71.7 percent of inbound county total);
2. Food or Kindred Products (1.0 million, 12.7 percent);
3. Miscellaneous Mixed Shipments (0.4 million, 4.5 percent);
4. Chemicals or Allied Products (0.2 million, 2.5 percent); and
5. Nonmetallic Minerals (0.2 million, 2.2 percent).

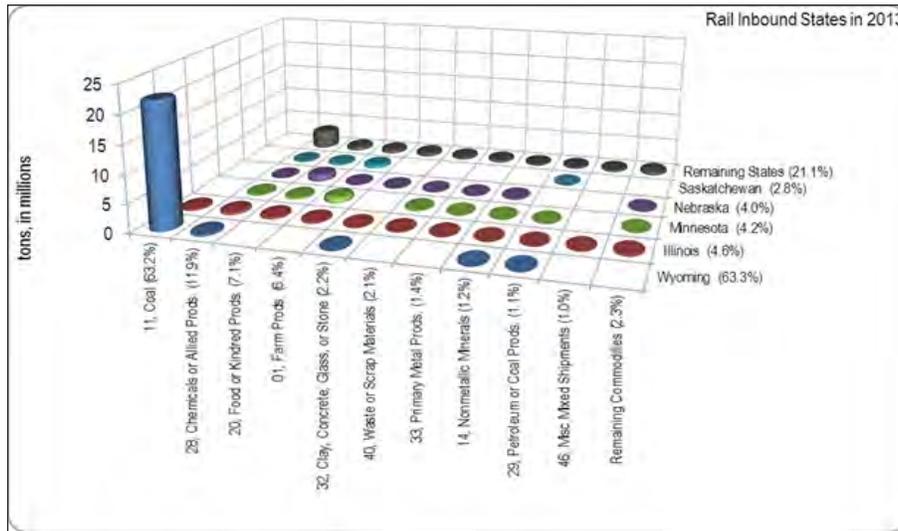
Wapello County:

1. Coal (5.5 million tons, 94.1 percent of inbound county total);
2. Chemicals or Allied Products (0.2 million, 3.4 percent);
3. Food or Kindred Products (0.1 million, 1.9 percent);
4. Nonmetallic Minerals (20,400, 0.3 percent); and
5. Transportation Equipment (6,520, 0.1 percent).

Woodbury County:

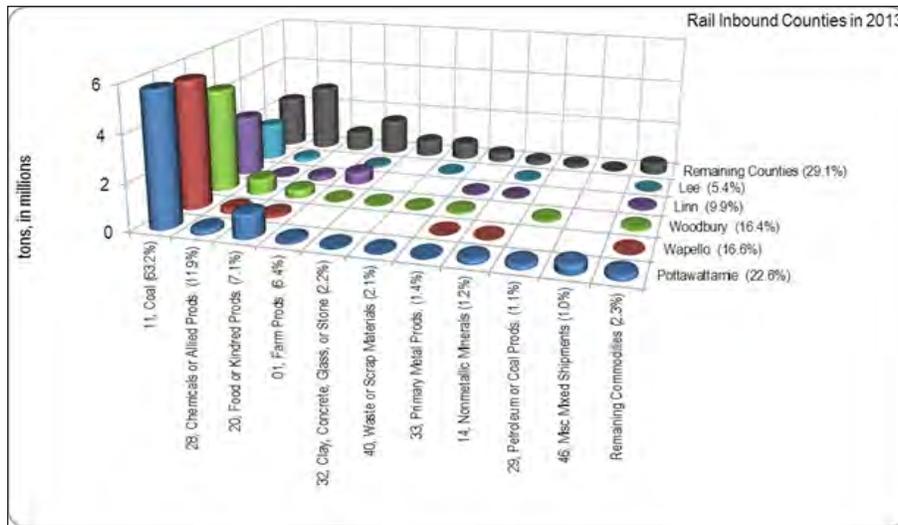
1. Coal (4.5 million tons, 78.0% of inbound county total);
2. Chemicals or Allied Products (0.7 million, 11.5 percent);
3. Food or Kindred Products (0.3 million, 5.9 percent);
4. Petroleum or Coal Products (0.1 million, 1.2 percent); and
5. Primary Metal Products (0.1 million, 1.1 percent).

Figure 2.26: Rail Inbound Commodity Tonnage by Origin State, 2013



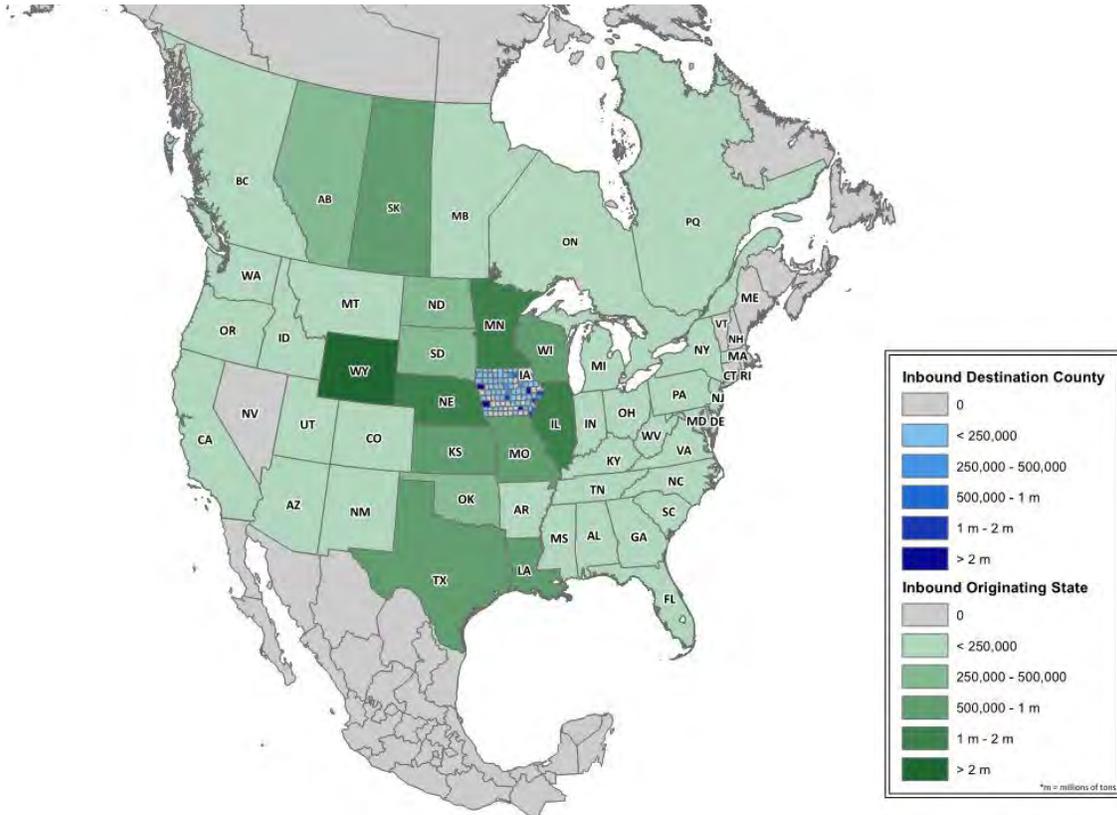
Source: Prepared by CDM Smith, based on the STB Waybill Sample data for 2013

Figure 2.27: Rail Inbound Commodity Tonnage by Iowa County Destination, 2013



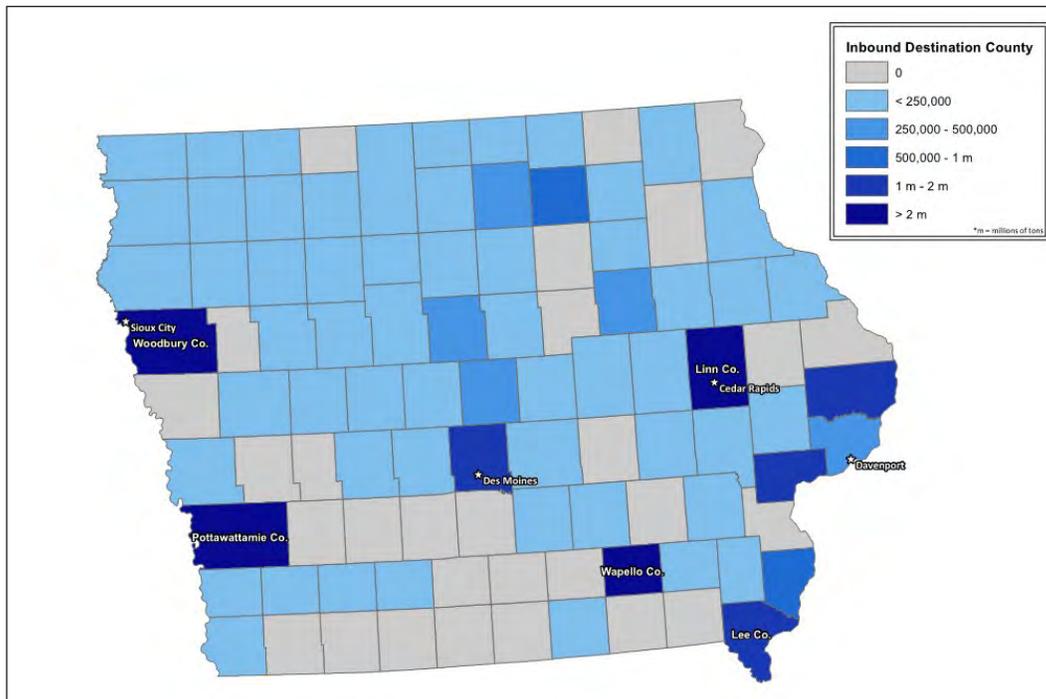
Source: Prepared by CDM Smith, based on the STB Waybill Sample data for 2013

Figure 2.28: Rail Inbound Total Tonnage by Origin State, 2013



Source: Prepared by CDM Smith, based on the STB Waybill Sample data for 2013

Figure 2.29: Rail Inbound Total Tonnage by Iowa County Destination, 2013



Source: Prepared by CDM Smith, based on the STB Waybill Sample data for 2013

2.2.2.2.4 Rail Intrastate

A table in Appendix D presents intrastate rail commodities within Iowa, in 2013, which total 6.9 million tons, via 93,910 carload units; top five commodities include:

By Tonnage:

1. Coal (3.1 million tons, 45.2 percent of intra total)³⁸;
2. Farm Products (1.4 million, 19.7 percent);
3. Food or Kindred Products (0.9 million, 13.4 percent);
4. Chemicals or Allied Products (0.6 million, 9.4 percent); and
5. Waste or Scrap Materials (0.4 million, 6.0 percent).

By Units:

1. Coal (26,180 units, 27.9 percent of intra total);
2. Chemicals or Allied Products (19,776, 21.1 percent);
3. Food or Kindred Products (19,252, 20.5 percent);
4. Farm Products (17,390, 18.5 percent); and
5. Waste or Scrap Materials (4,932, 5.3 percent).

2.2.2.1.5 Rail Through

As previously noted, through traffic is the largest rail directional rail movement in Iowa representing 73.2 percent of total tonnage movements and 80.9 percent of carloads. A table in Appendix D presents through rail commodities moving across Iowa, in 2013, which total 212.5 million tons, via 3.6 million carload units; top five commodities include:

By Tonnage:

1. Coal (108.9 million tons, 51.2 percent of through total);
2. Chemicals or Allied Products (16.7 million, 7.9 percent);
3. Food or Kindred Products (16.1 million, 7.6 percent);
4. Nonmetallic Minerals (15.5 million, 7.3 percent); and
5. Farm Products (13.4 million, 6.3 percent).

By Units:

1. Coal (1,001,982 units, 27.6 percent of through total);
2. Miscellaneous Mixed Shipments (788,880, 21.8 percent);
3. Transportation Equipment (299,721, 8.3 percent);
4. Food or Kindred Products (289,492, 8.0 percent); and
5. Chemicals or Allied Products (234,172, 6.5 percent).

2.2.2.3 FREIGHT FORECASTS

Rail freight tonnage forecasts for year 2040 were derived using data from the Freight Analysis Framework (FAF): 2013 provisional data (FAFv3.6) and 2040 forecasts (FAFv3.5). While rail freight data in the FAF is not as exhaustive as the Waybill, FAF does provide a means by which to assess future tonnage growth. Specifically, total annual growth forecasts by direction (outbound, inbound, intrastate, and through) are derived by comparing FAF tonnage volumes for year 2013 to year 2040³⁹. FHWA FAF data are presented in SCTG commodity terms, and is thus not directly comparable to the Waybill by commodity⁴⁰. However, the directional totals are relatively comparable, as shown below.

³⁸ Coal moved by rail could be originating by water, and it could also be coal that is being repositioned. Coal is not actively mined in Iowa.

³⁹ Since FAF does not provide specific through-state movement data, total US tonnage growth was used as a proxy to estimate through-state tonnage.

⁴⁰ While useful for aggregate directional comparisons, commodity code variance between the two sources (STCC-Transearch versus STCG-FAF) can present complications when/if broken down by commodity groups due to variances between sub-group composite commodities.

FHWA FAF makes available directional rail tonnage for 2013 via the FAFv3.6 provisional data; however, the directional coverage excludes through movements because routing of freight movements is not specified. As such, only outbound, inbound, and intra movements are comparable with the Waybill data for 2013. Subtotaling the available three directions, the FHWA FAF indicates that 68.8 million tons moved via the Iowa rail system, about 11.5 percent below that subtotal reported by Waybill. Because of the reporting differences (shown in Table 2.21 below), the forecast growth rates, by direction, from the FAF were applied to the Waybill directional totals to estimate 2040 rail freight.

Table 2.21: Rail Tonnage Comparison by Source, 2013

DIRECTION	STB WAYBILL		FHWA FAFV3.6		FAF/STB
	AMOUNT	PERCENT	AMOUNT	PERCENT	
Outbound	35,428,698	45.6%	28,267,709	41.1%	79.8%
Inbound	35,402,440	45.5%	34,061,534	49.5%	96.2%
Intra	6,894,726	8.9%	6,425,712	9.3%	93.2%
Through*	NA	NA	NA	NA	NA
Subtotal	77,725,864	100.0%	68,754,954	100.0%	88.5%

Source: STB WAYBILL 2013 and FHWA FAF v3.6

*Note FAF does not provide Through-State movement data

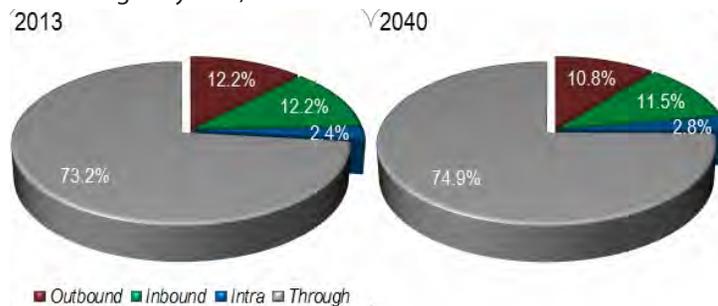
Summary Forecasts — FAF growth rate forecasts for Iowa rail movements between 2013 and 2040 indicate that outbound rail freight tonnage will grow 34.7 percent (1.1% CAGR)⁴¹ and inbound by 44.0 percent (1.4% CAGR). Further, FAF data are used to estimate a 79.7 percent (2.2% CAGR) growth⁴² in intrastate movements, and a 55.7 percent (1.7% CAGR) growth in through-state movement (based on national growth trends). These directional CAGRs were applied to the total directional volumes reported by the Waybill Sample for year 2013, to generate year 2040 rail freight ton forecasts as summarized in Table 3 below and contrasted in Figure 12 below.

Table 2.22: Rail Tonnage Forecast Summary, 2013-2040

DIRECTION	2013		2040		CHANGE		
	AMOUNT	PERCENT	AMOUNT	PERCENT	AMOUNT	PERCENT	CAGR
Outbound	35,428,698	12.2%	47,718,838	10.8%	12,290,140	34.7%	1.1%
Inbound	35,402,440	12.2%	50,987,470	11.5%	15,585,030	44.0%	1.4%
Intra	6,894,726	2.4%	12,392,520	2.8%	5,497,794	79.7%	2.2%
Through	212,549,767	73.2%	330,989,061	74.9%	118,439,294	55.7%	1.7%
Total	290,275,631	100.0%	442,087,889	100.0%	151,812,258	52.3%	1.6%

Source: CDM Smith use of STB WAYBILL 2013 and FHWA FAF v3.5/v3.6 growth

Figure 2.30: Rail Tonnage Percentages by Year, 2013 and 2040



Source: Prepared by CDM Smith, based on the STB Waybill Sample data for 2013

41 CAGR: Compound annual growth rate.

42 Almost half of the growth in interstate tonnage is attributed to cereal grains.

Including all directional movements, total rail freight in Iowa is forecast to grow 52.3 percent (1.6% CAGR) from 290.3 million tons in 2013 to 442.1 million tons in 2040. Given similar changes in growth by direction, the directional composition is not projected to alter appreciably, with through traffic still constituting the large majority of all freight on the Iowa rail network.

Commodity Growth — As noted, the SCTG commodity types reported in the FAF differ from the STCC reported in the Waybill Sample, which makes direct comparison difficult. Nonetheless, the change in 2-digit level SCTG commodity movements for the available outbound, inbound, and intra directions for both years (2013 to 2040) are presented in a table in Appendix D. The most notable changes concern Cereal Grains, which are forecast to increase for inbound and intra movements (4.9% and 2.6% CAGR, respectively), while outbound is forecast to decline (1.0% CAGR). Additionally, Alcoholic Beverages (this category led by the ethanol, a primary rail-borne commodity in Iowa) are also forecasted to change freight patterns more notably than the other SCTG commodity groups, with outbound increasing 4.2% CAGR through 2040, for an almost tripling of outbound commodity movements.

Top SCTG commodities in 2040, according the FHWA FAFv3.5 include:

Outbound Tonnage (2040)

1. Animal Feed (8.4 million tons, 22.1 percent of outbound total);
2. Other Foodstuffs (8.3 million, 21.9 percent);
3. Alcoholic Beverages (6.6 million, 17.4 percent);
4. Cereal Grains (4.9 million, 12.7 percent); and
5. Nonmetal Mineral Products (2.0 million, 5.2 percent).

Inbound Tonnage (2040)

1. Coal (20.2 million tons, 41.2 percent of inbound total);
2. Cereal Grains (8.0 million, 16.4 percent);
3. Fertilizers (5.0 million, 10.2 percent);
4. Basic Chemicals (3.0 million, 6.0 percent); and
5. Chemical Products. (1.9 million, 3.9 percent).

Intra Tonnage (2040)

1. Cereal Grains (5.1 million tons, 43.8 percent of intra total);
2. Gravel (2.0 million, 17.1 percent);
3. Waste/Scrap (1.2 million, 10.0 percent);
4. Other Agricultural Products. (1.0 million, 8.6 percent); and
5. Animal Feed (0.9 million, 7.4 percent).

Industrial Outlook by Sector — FHWA FAF-derived commodity movements by direction are presented by SCTG code in Appendix D, where the SCTG codes are also summarized within four overarching industrial categories: *Agricultural, Mining and Extraction, Manufacturing, and Other*. Note that Alcoholic Beverages, a category that includes ethanol, is included in the Agricultural SCTG code. A condensed table of the industrial categories is provided below in below. It presents the FHWA FAF 2013 provisional data (v3.6) and 2040 forecasts (v3.5) by outbound, inbound, and intrastate directions, with corresponding compound annual growth rates in rail freight and percentages of total directional/year movements.

FAF data suggests the largest outbound industrial-category movement by rail pertains to Agricultural products, constituting 81.8 percent and 80.8 percent of all outbound industrial products in 2013 and 2040, respectively. Such outbound *Agricultural* products are forecast to increase from 23.1 million to 30.8 million tons between 2013 and 2040, for a 1.1% CAGR.

Inbound industrial-category movements are dominated by *Mining and Extraction* products, which are not slated to effectively increase between 2013 and 2040, with 23.2 million and 23.4 million tons, respectively. As such, the proportional composition of inbound *Mining and Extraction* products declines over time, from

68.1 percent in 2013 to 47.6 percent in 2040. In contrast, *Agricultural and Manufacturing* inbound products are forecasts to increase by 4.6 percent and 2.6 percent respectively, and thus increasing proportional share of inbound industrial goods by 2040.

As with outbound industrial movements, the dominant intrastate movement pertains to *Agricultural* products, constituting 57.4 percent and 64.5 percent of all intrastate industrial products in 2013 and 2040, respectively. Such intrastate *Agricultural* products are forecast to increase 2.6% CAGR, from 3.7 million to 7.4 million in 2013 and 2040, respectively. See Table 2.23 below.

Table 2.23: FHWA FAF Rail Tons by Industrial Sector, 2013 and 2040

INDUSTRIAL SECTOR	OUTBOUND			INBOUND			INTRA		
	2013	2040	CAGR	2013	2040	CAGR	2013	2040	CAGR
Agricultural	23,133,781	30,770,081	1.1%	3,103,540	10,500,764	4.6%	3,685,994	7,449,741	2.6%
Mining/ Extraction	437,799	353,866	-0.8%	23,211,400	23,359,672	0.0%	1,340,938	1,976,559	1.4%
Manufacturing	4,395,184	6,463,458	1.4%	7,217,659	14,468,100	2.6%	840,765	964,198	0.5%
Other	300,945	486,311	1.8%	528,934	727,727	1.2%	558,015	1,159,021	2.7%
Total	28,267,709	38,073,716	1.1%	34,061,534	49,056,264	1.4%	6,425,712	11,549,518	2.2%
PERCENT OF TOTAL									
Agricultural	81.8%	80.8%	N/A	9.1%	21.4%	#N/A	57.4%	64.5%	N/A
Mining/ Extraction	1.5%	0.9%	N/A	68.1%	47.6%	#N/A	20.9%	17.1%	N/A
Manufacturing	15.5%	17.0%	N/A	21.2%	29.5%	#N/A	13.1%	8.3%	N/A
Other	1.1%	1.3%	N/A	1.6%	1.5%	#N/A	8.7%	10.0%	N/A
Total	100.0%	100.0%	N/A	100.0%	100.0%	#N/A	100.0%	100.0%	N/A

Source: Prepared by CDM Smith, based on the FHWA FAFv3.5 and v3.6

2.2.2.4 CONCLUSIONS

Freight rail movements pertaining to Iowa comprise a range of commodities moving in different directions (outbound, inbound, intrastate, and through), measured in different terms (tons and carload units), and with varying geographic origins and destinations. These various directional movements, terms, and geographies complicate simple summarization. Nonetheless, the following summary highlights major commodity movements by direction.

Total Movements – A combined total 290.3 million tons of freight moved across Iowa rail lines in 2013, transported in almost 4.5 million railcar units, for an average 64.8 tons/carload.

Directional Overview – Commodity movement, and composite terms (tons and carload units), vary by direction.

- **Through** – Significantly dominates directional movements in terms of both tonnage and carload units. In terms of tonnage, the 212.5 million tons constitutes almost three-quarters of all directional freight rail movement via Iowa (73.2 percent). In terms of carload units, the directional proportion attributable to through traffic is even higher, with the 3.6 million carload units representing 80.9 percent of total directional units. About half (108.9 million tons, or 51.2 percent of through tonnage) of such through freight comprises Coal (from Wyoming, predominately to Illinois, Wisconsin, and Missouri).
- **Inbound** – At 35.4 million tons, it represents 12.2 percent of all directional tonnage, and at 360,760 units, 8.1 percent of directional carloads. As with through movements, the dominant commodity is Coal, representing 63.2 percent of all inbound tonnage (22.4 million).
- **Outbound** – Almost the same tonnage volumes as inbound rail flows in 2013, at 35.5 million, representing 12.2 percent of directional movements; however, the units are slightly greater than inbound, at 400,835,

representing 8.9 percent of directional carloads. More than half (18.5 million, or 52.2 percent of outbound) tonnage is Food and Kindred Products.

- **Intrastate** – Comparatively insignificant, mostly repositioning of Coal.

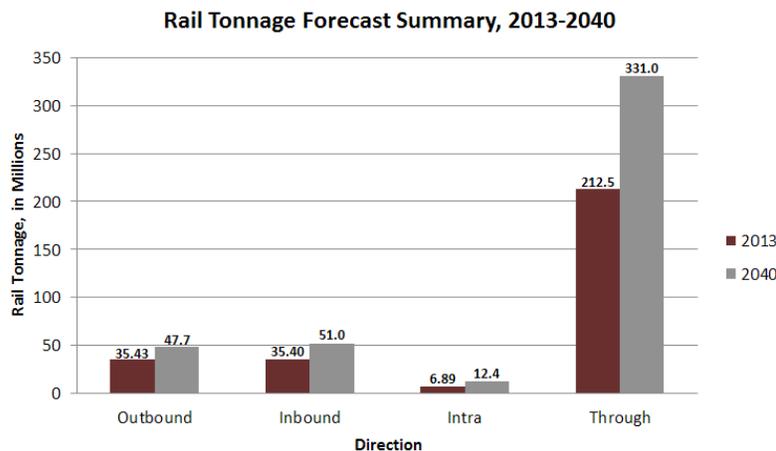
Notable Commodity Movements – Commodity movements are compared and contrasted by their associated tonnage and carload units, as well as direction.

- **Coal (STCC 11)** – The major single-commodity movement via Iowa in 2013, accounting for 46.3 percent of all freight rail tonnage (134.4 million tons); and, accounting for 27.1 percent of carload units (1.2 million). A majority of such coal freight pertains to through movements (108.9 million tons), predominately from Wyoming to Illinois, Wisconsin, and Missouri (among a few other origins/destinations); with the remaining pertaining to inbound (22.4 million tons) and intrastate repositioning (3.1 million). There is presently no outbound coal.
- **Food or Kindred Products (STCC 20)** – Almost 38.0 million tons traversed the rail network in Iowa in 2013, the second largest commodity movement, with almost half (48.7 percent, 18.5 million tons) pertaining to outbound movements; 42.3 percent, 16.7 million tons pertain to through movements, and the remaining 9.0 percent pertain to both inbound and intrastate. Given that Iowa is an agriculture-producing state, the outbound-related movements are intuitive. In terms of specific outbound Food or Kindred Products, about a third of the exported commodity (6.9 million tons) pertains to Soybean Oil or Byproducts (STCC 2092), and other significant detailed commodity exports pertain to Wet Corn Milling or Milo (STCC 2046) at 4.3 million tons, Prepared or Canned Foods (STCC 2042) at 2.5 million, and Distilled or Blended Liquors (STCC 2085) at 2.4 million tons.
- **Chemicals or Allied Products (STCC 28)** – The third largest commodity movement by tonnage, at 31.2 million tons, representing 10.8 percent of all commodities. A majority of such movements are through movements (16.7 million tons, 53.6 percent of directional commodity movements), with 30.8 percent (9.6 million) as outbound; the remainder are mostly inbound. Ethanol is included in this STCC category.

Forecasted Movements – Total rail traffic inbound, outbound, and within the state (intra) will grow 34.7 percent (1.1 % CAGR), 44.0 percent (1.4 % CAGR), and 79.7 percent (2.2% CAGR) per year respectively from 2013 through 2040. Inbound agricultural shipments will have the highest growth rate at 4.6 percent per year over the period. However, by 2040, outbound agricultural products will comprise by far the single largest tonnage shipped (30.8 million tons).

Total growth for freight rail traffic for all directional categories from 2013 to 2040 is estimated at 151.8 million tons, representing a 52.3 percent change. Growth is anticipated at 1.6 percent CAGR overall. The forecasted growth in freight rail tonnage from 2013 to 2040 is portrayed in Figure 2.31 below.

Figure 2.31: Rail Tonnage Forecast Summary, 2013-2040



Source: Prepared by HDR

2.2.3 Passenger Travel Demand and Growth

2.2.3.1 TRAVEL DEMAND – HIGHWAYS

Projections for travel demand within and to/from Iowa will continue to grow in the future. The estimated growth in vehicular travel demand for Iowa, exhibited in Vehicles Miles Traveled (VMT), is shown in Table 2.24 below. VMT describes the level of travel demand on a roadway system, and growth in VMT is a strong indicator of growth in travel demand. VMT is a weighted measure of travel, and it is calculated by multiplying the number of vehicles on a roadway segment by its length. Thus, an increase could be correlated to either increases in vehicles or trip lengths, both of which are growth-related.

In the table, VMT is shown for years 2010 and 2040 by National Highway Functional Classification (NHFC). These classifications are used to define roadway types and their primary uses for roadway users.

Table 2.24: Estimated VMT on IDOT Roadways by Classification, 2010 and 2040

FUNCTIONAL CLASS	EXISTING MILES OF ROADWAY	AVERAGE ANNUAL DAILY VMT (IN THOUSANDS)		GROWTH IN VMT	% GROWTH
		2010	2040		
Interstate/ Freeway	1,569	19,725	26,017	6,292	24.2%
Principal Arterial	5,353	30,034	35,257	5,222	14.8%
Minor Arterial	3,854	8,981	9,497	516	5.4%
Collector	94	132	153	21	13.6%
Local	18	66	90	24	27.1%
Total	10,888	58,938	71,014	12,076	17.0%

This information was extracted from the state's travel demand forecasting model and represents an estimate of the changes in regional travel conditions between 2010 and 2040, specifically for Iowa DOT-controlled roadways (where data is available to study). Overall vehicle travel is forecasted to grow by around 17 percent from around 59 million daily VMT to around 71 million daily VMT in the state, with the large majority of growth occurring along interstate freeways and principal arterial roadways controlled by Iowa DOT (around 95 percent of the VMT growth would occur in these two functional classes). In terms of a general trend, it can be expected that travel, particularly on state and federal highways, will increase as the population grows and overall economy expands.

2.2.3.2 TRAVEL DEMAND – AIR TRAVEL

The Iowa DOT's *Aviation System Plan 2010-2030* projected 2015 passenger enplanements at 2.1 million, which is relatively close to the 1.8 million enplanements reported by Iowa DOT for 2014. The plan anticipated a total of 3.2 million enplanements in 2030. Furthermore, the plan projected that based aircraft at the state's eight commercial airports would rise from 614 in 2010 to 787 in 2030. With more activity measured in enplanements and based aircraft expected at Iowa airports, airport planners need to ensure sufficient capacity to serve airport users and thus avoid congested conditions. More detail on air travel is included in Section 2.2.6.2 of the Iowa State Rail Plan.

2.2.3.3 TRAVEL DEMAND – INTERCITY RAIL

The basis for forecasting Amtrak riders at Iowa stations was to project population growth in Iowa and Illinois for counties within an approximate 30-mile radius of Iowa stations⁴³. Station ridership changes were calculated based upon the growth rate of each county served by the station.

It is important to note that actual future ridership performance will be based not only on population growth,

⁴³ County population projections obtained from the State Data Center of Iowa website and from the Illinois Department of Commerce and Economic Opportunity website.

but also by changes in income growth, changes in the number of train frequencies and train schedule times at the station (day vs. night), changes in Amtrak fares vs. other modes, and changes in the quality of Amtrak service (i.e., on-time performance).

Population around Iowa's Amtrak stations shows growth overall at 8.34 percent over the period, with the strongest growth around Ottumwa and Osceola. As a result, forecasted passenger boardings and alightings at those stations are highest. A slight decline in usage is predicted for Mount Pleasant.

Table 2.25 below shows FY2014 boardings and alightings at Iowa's six intercity rail stations as well as the forecasts for 2040.

Table 2.25: Amtrak Iowa Boardings and Alightings Forecast for 2040

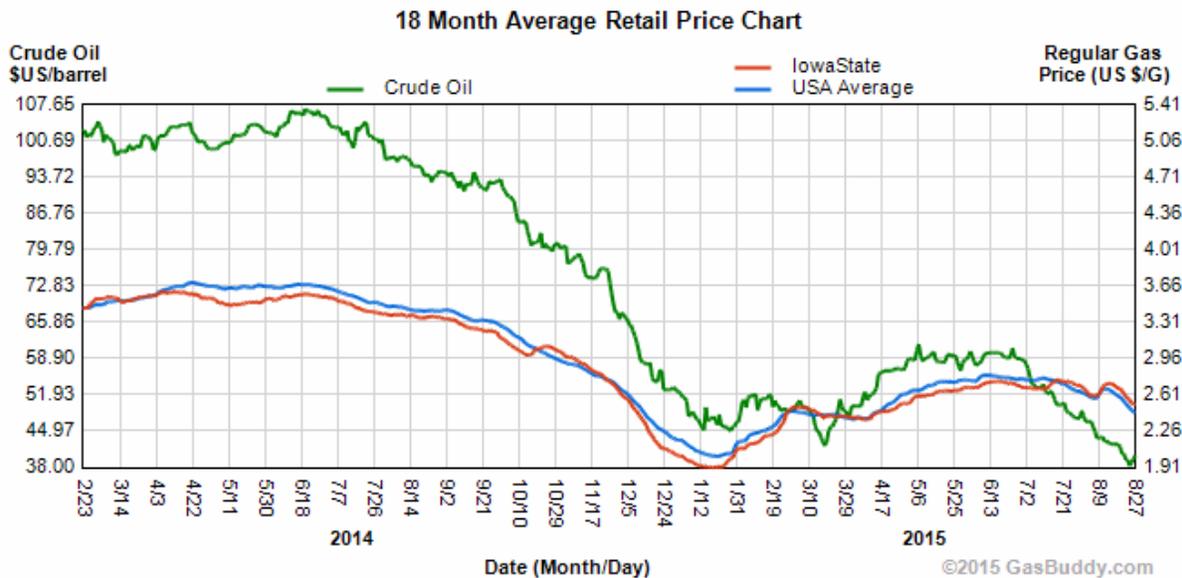
CITY	2014	2040	CHANGE OVER PERIOD	ANNUAL CHANGE
Burlington	8,813	9,011	2.25%	0.09%
Creston	4,314	4,486	3.98%	0.15%
Fort Madison	6,986	7,091	1.50%	0.06%
Mount Pleasant	12,030	11,915	-0.96%	-0.04%
Osceola	13,986	16,373	17.07%	0.61%
Ottumwa	11,109	13,137	18.25%	0.65%
Total Iowa Station Usage	57,238	62,012	8.34%	0.31%

Source: Amtrak

2.2.4 Fuel Cost Trends

Trends in fuel costs (crude oil and regular gasoline) over the last 10 years are shown in Figure 2.32 below. The average retail gas price trends in the state of Iowa and the U.S. track closely to each other.

Figure 2.32: Fuel Price Trends from 2005 to 2015



Source: GasBuddy.com

Ultra-low diesel fuel costs over the past 7 years for Midwest region have also not varied substantially from the nationwide average, according to the U.S. Energy Information Administration (EIA). The price of diesel fuel in February 2007 in the Midwest was \$2.46, climbing to \$4.64 per gallon in July 2008. With the onset of the Great Recession diesel began to drop, bottoming out at \$2.04 per gallon in March 2009. Diesel prices recovered to almost pre-recessionary highs between 2011 and 2014, but have since dropped. The cost of diesel averaged

\$2.69 per gallon from March through August 2015 in the Midwest region.

2.2.5 Rail Congestion Trends

In order to assess the potential level of congestion on major Class I main lines, or main lines having the higher rail traffic volumes, a planning level evaluation was conducted for selected major rail lines in Iowa, i.e., the Class I main lines have the highest volume of trains. The evaluation compared estimated volumes of trains per day to the practical capacity of the line (the maximum trains per day that can be accommodated), as determined by the existing Method of Operations and associated control systems (e.g., Centralized Traffic Control [CTC]⁴⁴; Automatic Train Control [ATC]⁴⁵; Automatic Block Signals [ABS]⁴⁶; and Track Warrant Control [TWC]⁴⁷) on the line and the existing track configurations (single track [1]; two main tracks [2]; and three main tracks [3]). The practical capacity limits for the respective control systems and track configurations were taken from the *National Rail Freight Infrastructure Capacity and Investment Study*, 2007, prepared for the Association of American Railroads.

The practical capacity of a line segment is stated in a range; for example, for a single-track segment with a CTC control system, the range is between 30 and 48 trains per day. The lower end of the range reflects use by multiple train types, such as traditional carload (merchandise), intermodal (trailers and containers on railcars), and passenger trains; and the higher end reflects use by single train types, such as coal unit trains. For subdivisions having two control systems on separate segments of the line (e.g., ABS and TWC), the practical capacity of the lesser efficient control system (in this example, the TWC) is generally shown.

Figure 2.33 below identifies the select major rail routes of UP and BNSF in Iowa, along with the corresponding railroad operating subdivisions comprising each, that were evaluated during the practical capacity analysis exercise conducted for the Iowa State Rail Plan. Note that this practical capacity exercise is only a high-level conceptual analysis and was not conducted through coordination with or data inputs from UP and BNSF.

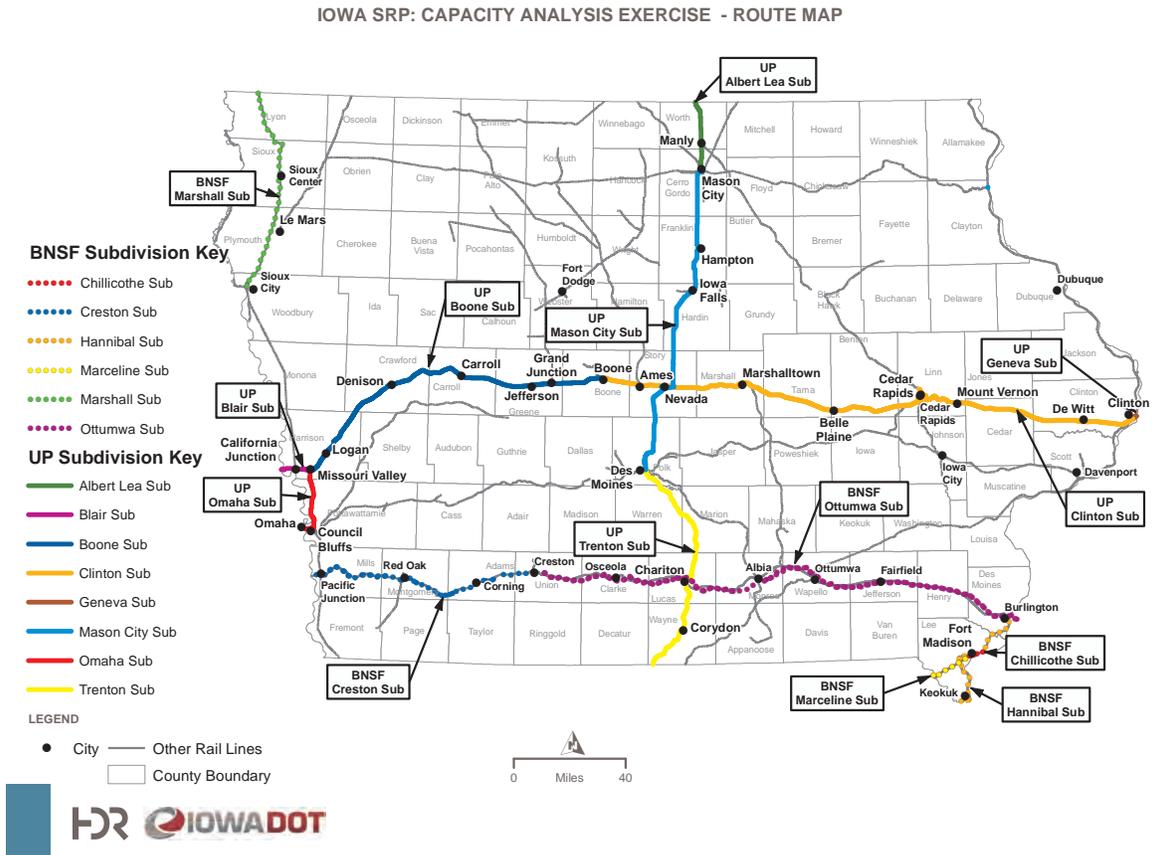
⁴⁴ CTC is a train control system whereby a dispatcher in a remote location moves trains across sections of track using a wayside signal system and radio communication.

⁴⁵ ATC is a train control system that automatically stops a train if the engineer does not do so in instances when the train exceeds the maximum authorized speed for a specific track segment. If the train exceeds the maximum authorized speed, an alarm sounds in the locomotive cab to warn the engineer. On the UP, ATC is deployed with CTC on some main lines in Iowa. CTC is the arbiter of practical capacity of these lines, rather than ATC.

⁴⁶ ABS is a train control system that controls when a train can advance into the next block via wayside signal indications. ABS operation is generally designed to allow trains operating in the same direction to follow each other in a safe manner by minimizing the risk of rear end collisions. ABS is governed by block occupancy and cannot be controlled remotely by a dispatcher. Movement of trains over ABS-equipped segments would generally require a track warrant or other special manual overlay protection from a dispatcher to provide main track authority.

⁴⁷ TWC is a verbal authorization system defined by the General Code of Operation Rules (GCOR), using track warrants authorizing trains to occupy main tracks. Track warrants are generally provided by the dispatcher remotely via radio communication.

Figure 2.33: Major Iowa Rail Line Capacity Evaluation – Routes Studied



Source: HDR

For the UP, the two major lines evaluated in Iowa are:

- **“The Overland Route”** – oriented from west to east from the Iowa/Nebraska state line, across the central tier of the state to Clinton and onto the Iowa/Illinois state line. The UP subdivisions making up the Overland Route through Iowa include the Omaha, Blair, Boone, Clinton, and Geneva subdivisions.
- **“The Spine Line”** - oriented from north to south from the Iowa/Minnesota state line through Des Moines to the Iowa/Missouri state line. The UP subdivisions making up the Spine Line through Iowa include the Albert Lea, Mason City, and Trenton subdivisions.

For BNSF, the four major lines evaluated in Iowa are:

- **“The Southern Tier Route”** between the Iowa/Nebraska state line, Creston, Osceola, Ottumwa, Mount Pleasant, Burlington, and the Iowa/Illinois state line. The BNSF subdivisions making up this route in Iowa include the Creston and Ottumwa subdivisions. The route handles one daily Amtrak round-trip, i.e., the *California Zephyr*.
- **“The TransCon Route”** via Fort Madison in the southeastern quadrant of the state. The BNSF subdivisions making up the TransCon through Iowa include the Marceline and Chillicothe subdivisions.
- **The Hannibal Subdivision** between Burlington and the Iowa/Missouri state line near Keokuk in the southeastern quadrant of the state.
- **The Marshall Subdivision** between Sioux City and the Iowa/Minnesota state line north of Lester, Iowa, in the northwest quadrant of the state.

2.2.5.1 RESULTS OF THE EVALUATION

The results of the evaluation of these major lines appear in Table 2.26 below.

Table 2.26: Major Iowa Rail Line Capacity Evaluation

RAILROADS EVALUATED							
UNION PACIFIC RAILROAD							
UP Rail Line Segments		UP Operating Subdivision	Control System	No. of Main Tracks	Est. Trains per Day*	Practical Capacity in Trains per Day**	Capacity Constraint
IA/NE State Line	N Council Bluffs	Omaha	CTC	2 & 3	35-45	75-163	No
N Council Bluffs	Missouri Valley	Omaha	CTC/ATC	1	35-45	30-48	Potential
IA/NE State Line	California Jct	Blair	CTC	1	35-45	30-48	Potential
California Jct	Missouri Valley	Blair	CTC	2	35-45	75-100	No
Missouri Valley	E Missouri Valley	Blair	CTC/ATC	2	65-75	75-100	No
Missouri Valley	Boone	Boone	CTC/ATC	2	65-75	75-100	No
Boone	Clinton	Clinton	CTC/ATC	2	65-75	75-100	No
Clinton	IA/IL State Line	Geneva	CTC/ATC	2	65-75	75-100	No
IA/MN State Line	Mason City	Albert Lea	CTC	1	10-14	30-48	No
Mason City	Flint	Mason City	ABS/Yard Limits	1	10-12	18-25	No
Flint	Nevada	Mason City	ABS/TWC	1	10-12	16-20	No
Nevada	Des Moines	Mason City	CTC	1	10-12	30-48	No
Des Moines	Beech	Trenton	CTC	1	10-14	30-48	No
Beech	Williamson	Trenton	ABS/TWC	1	10-14	16-20	No
Williamson	IA/MO State Line	Trenton	CTC	1	10-14	30-48	No
BNSF RAILWAY							
BNSF Rail Line Segments		BNSF Operating Subdivision	Control System	No. of Main Tracks	Est. Trains per Day*	Practical Capacity in Trains per Day**	Capacity Constraint
IA/NE State Line	Creston	Creston	CTC	1	40-45	30-48	No
Creston	IA/IL State Line	Ottumwa	CTC and ABS/TWC	2	40-45	53-80	No
Sioux City	IA/MN State Line	Marshall	TWC	1	10-14	16-20	No
IA/MO State Line	Burlington	Hannibal	TWC	1	12-16	16-20	No
IA/MO State Line	Fort Madison	Marceline	CTC/ATC	2	70-75	75-100	No
Fort Madison	IA/IL State Line	Chillicothe	CTC/ATC	2	60-65	75-100	No

Source: HDR and CDM Smith

* Trains per day estimates provided by BNSF and HDR

** Per National Rail Freight Infrastructure Capacity and Investment Study, Association of American Railroads, September 2007

The sole potential capacity constraint for UP in Iowa appears to exist on the westernmost segment of the corridor – west and south of Missouri Valley. The UP Overland Route traffic generally runs directionally:

westbound from Missouri Valley to Blair, Nebraska, and thence to Fremont, Nebraska, on the Blair Subdivision; eastbound traffic from Fremont to Omaha, thence to Council Bluffs and Missouri Valley on the Omaha Subdivision. Single-track segments between California Junction and Missouri Valley (Blair Subdivision) and between North Council Bluffs and Missouri Valley (Omaha Subdivision) constrict volume to the point where current volumes appear to be consuming the practical capacity of the lines.

The practical capacity of the UP Spine Line appears to be sufficient to handle estimated present train volumes.

The practical capacity of the BNSF subdivisions evaluated during the exercise appear to be sufficient to handle estimated present train volumes.

2.2.6 Highway and Airport Trends

2.2.6.1 HIGHWAY CONGESTION

Iowa contains 99 counties and is home to three cities with populations greater than 100,000, including the state capital and largest city, Des Moines. Linking these cities and counties within the state are various types of highways and roadways. According to Iowa DOT, as of 2013, the state has approximately 114,400 miles of public roadway. Of these, around 8 percent are state or federal highways (comprising interstate highways, US highways, and Iowa state highways), 79 percent are county roads, and 13 percent are city, institution, or locally maintained streets. There are approximately 782 miles of federal interstate highways in Iowa. Primary interstate roadways in the state include Interstate 29, Interstate 35, Interstate 80, and Interstate 380. Other interstate highways in Iowa include Interstate 74, Interstate 129, Interstate 235, Interstate 280, Interstate 480, and Interstate 680.

Every highway within the state is classified as one of six state traffic data definitions, as shown in Table 2.27 below. Rural locations refer to unincorporated places within the state, while municipal areas are located within city or town limits. Secondary roads and streets refer to nonfederal or state highways that range from local streets to larger multilane roadways. Primary roads are federal and state highways that usually provide high speed travel over middle-to-long distances. The interstate highway class of road is the highest classification of arterial roadway and is designed and constructed with mobility and long-distance travel in mind, primarily providing limited-access intercity travel connections.

Most traffic counts are reported in terms of annual average daily traffic (AADT) and represent an estimate of the number of vehicles traveling along a given point on a highway on an average day in the year. Vehicle-miles-traveled (VMT) estimates, while based on AADT estimates, include the distance traveled element and thus provide a measure of highway vehicle travel usage over a geographic area, such as a county, state, or highway system.

The table below provides a breakdown of the lane-mileage and VMT of each type of roadway type and location (i.e. rural vs. city). The data indicate that for year 2014 the Iowa state roadway network carried about 32.3 million vehicle-miles a day, for an estimated 11.8 billion vehicle-miles a year.

Table 2.27: Iowa 2014 Lane-Mileage and VMT by Facility Type (in thousands)

FUNCTIONAL CLASS	LANE-MILES	% OF TOTAL MILES	VMT (IN 1000S)	% OF TOTAL VMT
Rural Interstate	773	0.7%	5,335	16.5%
Rural Primary	7,092	6.2%	8,580	26.5%
Rural Secondary	89,818	78.6%	5,366	16.6%
Municipal Interstate	286	0.3%	2,737	8.5%
Municipal Primary	1,253	1.1%	3,641	11.3%
Municipal Streets	15,037	13.2%	6,673	20.6%
Total	114,257	100.0%	32,332	100.0%

Source: Iowa DOT Miles of Public roads in Iowa by Surface Type

While interstate/freeway roadways account for only 1 percent of the state's roadway lane-mileage, they carry the highest percentage (27 percent) of the recorded vehicle-miles traveled. Rural secondary roads, which inherently connect low-traveled and populated areas, comprise around 79 percent of the state's roadway system, but only carry around 17 percent of the state's traveled vehicle mileage.

Based on data provided by Iowa DOT, Table 2.28 below shows the lane-miles and percentage of Iowa DOT-controlled roadways and their respective level of service (LOS) operations, sorted by functional class. Iowa DOT is generally responsible for regional and longer-distance roadways such as the interstate and state/US highway systems. LOS ranges from A to F, with LOS A describing free-flow conditions and LOS F describing highly congested and delayed traffic. LOS D through F conditions describe traffic conditions approaching or exceeding available capacity.

Table 2.28: IDOT Existing LOS Mileage and Operations by Functional Class

FUNCTIONAL CLASS	TOTAL MILES	LOS OPERATIONS – NUMBER OF MILES											
		A	%	B	%	C	%	D	%	E	%	F	%
Interstate/ Freeway	1,566	687	43.8%	549	35.0%	253	16.1%	58	3.7%	14	0.9%	4	0.3%
Principal Arterial	5,340	5,122	95.7%	161	3.0%	35	0.7%	13	0.2%	5	0.1%	3	0.1%
Minor Arterial	3,854	3,794	98.4%	49	1.3%	3	0.1%	3	0.1%	1	0.0%	4	0.1%
Collector	93	92	98.3%	0	0.3%	0	0.3%	1	0.7%	0	0.0%	0	0.0%
Local	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	10,853	9,695	89.0%	759	7.0%	292	2.7%	75	0.7%	20	0.2%	11	0.1%

Source: Iowa DOT 2010 Travel Demand Model output

The vast majority of non-interstates currently perform very well according to Iowa DOT, with only 30 miles of roadway operating at LOS D or worse and with most roadways operating at LOS A. At the interstate level of roadway, around 76 of the 1,566 interstate miles in the state operate at LOS D or worse, comprising around 5 percent of the existing interstate mileage. Overall a total of 89 percent of Iowa DOT-maintained roadways operate at LOS A, while a total of 1 percent of roadways operate at LOS D or worse.

Iowa DOT projected highway volumes and level of service to year 2040 for their roadways. A comparison between current and future 2040 conditions is presented below in Table 2.29 below, specifically the number of miles in the future expected to worsen compared to existing conditions. According to Iowa DOT data, the 2040 roadway network is largely expected to remain the same, with only a limited amount of new roadway construction, for a network mileage total of 10,881 miles. Conditions in year 2040 are projected to worsen slightly, as an estimated 425 additional miles of Iowa highways and interstates would experience LOS D through F conditions. In sum, around 5 percent of total roadway mileage would experience traffic conditions approaching or exceeding available capacity in 2040. In particular, an estimated 94 additional miles of roadways are expected to operate at LOS F. Overall, around 84 percent of the Iowa DOT mileage in the future would still operate at LOS A; however, only 30 percent of the interstate mileage would perform at LOS A, indicating that there is an expectation that some roadways would experience increased congestion.

Table 2.29: IDOT 2040 LOS Mileage and Operations by Functional Class and Comparison to Existing Conditions

FUNCTIONAL CLASS	TOTAL MILES	LOS OPERATIONS – NUMBER OF MILES											
		A	%	B	%	C	%	D	%	E	%	F	%
Interstate/ Freeway	1,566	476	30.3%	518	33.0%	148	9.5%	266	16.9%	83	5.3%	76	4.8%
Principal Arterial	5,367	4,946	91.0%	236	4.3%	100	1.8%	47	0.9%	21	0.4%	17	0.3%
Minor Arterial	3,854	3,745	97.1%	70	1.8%	18	0.5%	4	0.1%	5	0.1%	12	0.3%

Collector	94	93	91.9%	0	0.2%	0	0.3%	1	0.6%	0	0.0%	0	0.0%
Local	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	10,881	9,259	84.3%	823	7.5%	267	2.4%	318	2.9%	108	1.0%	105	1.0%
Existing Total	10,853	9,695	89.0%	759	7.0%	292	2.7%	75	0.7%	20	0.2%	11	0.1%
2040 – Existing Difference	28	(435)	(4.7%)	64	0.5%	(25)	(0.3%)	243	2.2%	88	0.8%	94	0.9%

Source: Iowa DOT 2010 Travel Demand Model output

2.2.6.2 AIRPORT CONGESTION

There are eight commercial service airports in Iowa. According to the Aviation System Plan, "These airports support some level of scheduled commercial airline service and have the infrastructure and service available to support a full range of general aviation activity. These facilities meet most needs of the aviation system and serve as essential transportation and economic centers of the state."

Iowa's eight commercial airports appear in Table 2.30 below, along with their passengers and pounds of cargo enplaned and deplaned. As can be seen, Cedar Rapids and Des Moines dominate the air traffic profile in the state.

Table 2.30: Iowa Commercial Airport Activity

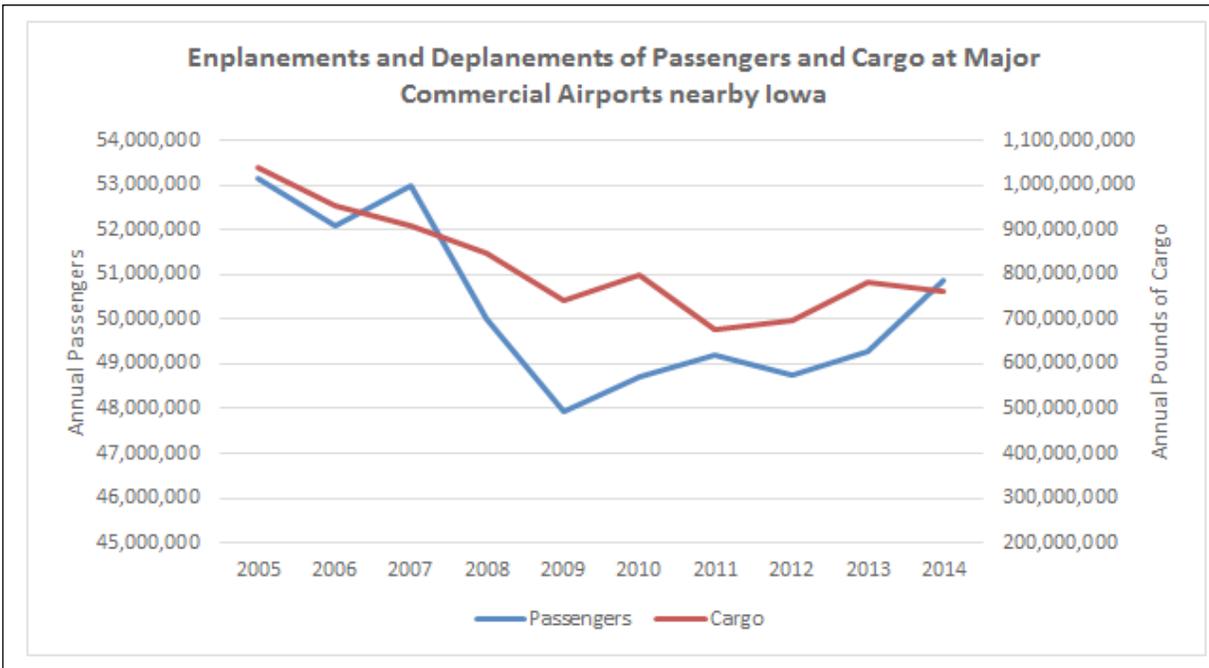
AIRPORT	2014	
	PASSENGERS	CARGO (POUNDS)
Burlington	12,905	0
Cedar Rapids	1,138,148	51,698,793
Des Moines	2,324,289	130,790,339
Dubuque	68,401	2,712
Fort Dodge	232	0
Mason City	1,475	32
Sioux City	55,899	1,596
Waterloo	47,980	850
Total	3,649,329	182,494,322

Source: Iowa DOT

Of the 3.6 million passengers, almost exactly half (1.8 million) were enplaned and half deplaned. Of the 182.5 million pounds of cargo, 97.5 million, or about 53 percent, were enplaned and 85 million, or 47 percent, were deplaned.

A 10-year summary of the passenger and freight activity at these airports is seen in Figure 2.34 below. Both passenger and freight activity declined with the onset of the Great Recession in 2008. However, passenger traffic has recovered since that time and exceeded the pre-recessionary high of 2007. Freight traffic; however, has tended to remain flat since 2009.

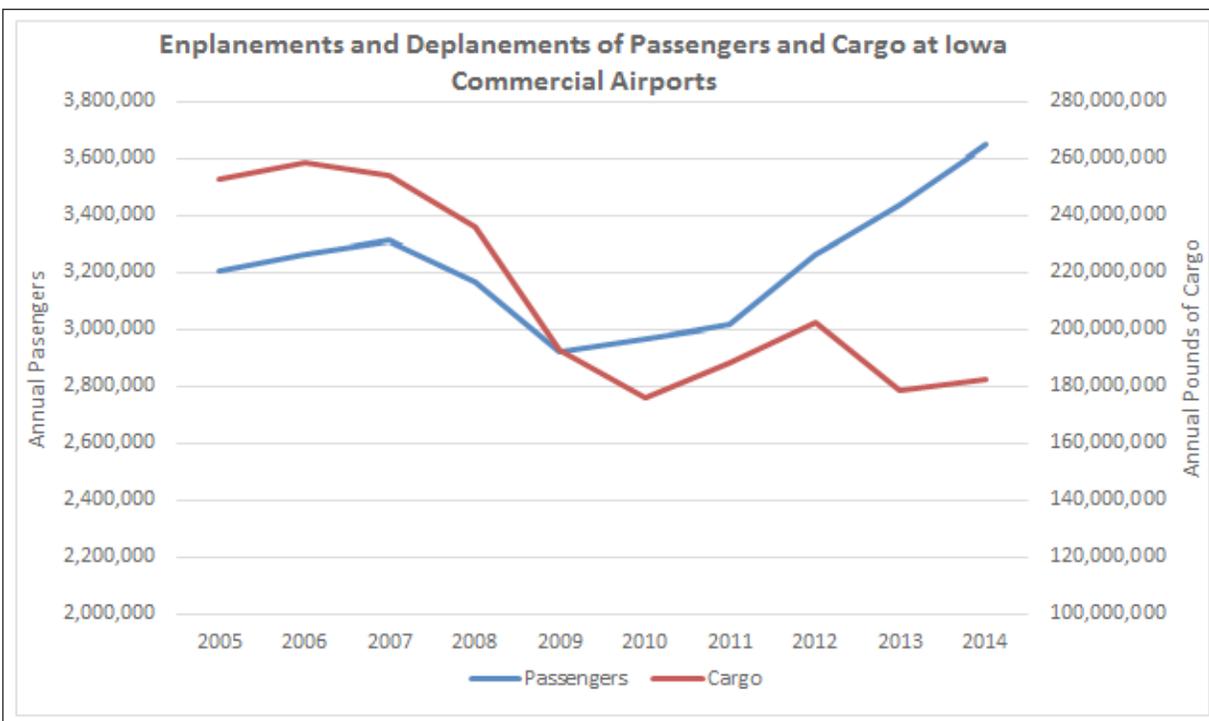
Figure 2.34: Iowa Airport Activity 10-Year Summary



Sources: Figures from Iowa DOT

Iowans also make use of commercial airports in nearby states. These airports include Kansas City, Missouri; Minneapolis, Minnesota; Moline, Illinois; Omaha, Nebraska; and Sioux Falls, South Dakota. The passenger and freight activity at these airports over the last 10 years is summarized in Figure 2.35. While passenger activity is recovering, the long-term trend in cargo activity has been more or less flat since 2009.

Figure 2.34: Activity at Airports near Iowa 10-Year Summary



Source: Figures from Iowa DOT

2.2.7 Land Use Trends

A large portion of the state's land is rural with the majority of land in the state used for cropland and pastureland. Agriculture continues to be a large land use in the state as Iowa remains a leader in producing corn, soybeans, and other products.

In all, 33.4 million acres of Iowa's total land acreage of 36.1 million, or 92.5 percent, is rural farm land, while 1.9 million acres, or 5.2 percent, are developed. Of farm uses, cropland accounts for 25.7 million acres, or 77.4 percent, and pastureland 3.3 million acres, or 9.9 percent⁴⁸.

2.3 Rail Service Needs and Opportunities

This section identifies the needs and opportunities for freight and passenger rail in Iowa. Specific projects relative to these needs and opportunities are summarized in subsequent chapters.

2.3.1 Freight Rail Needs and Opportunities

2.3.1.1 RAIL CORRIDOR DEVELOPMENT

As owners and operators of large transportation networks, BNSF, CN, CP, NS, and UP manage their businesses across state lines, considering the entire market potential and competition they face in their Midwestern and western U.S. operating territory. The portions of the railroads' networks connecting key regional markets are considered rail freight corridors, most all of which span multiple states. In Iowa, BNSF and CP name these corridors for business planning, investment, and marketing reasons. Iowa's location in the Midwest and its close proximity to major rail hubs in neighboring states — including Chicago, Illinois; Kansas City, Missouri; and Minneapolis, Minnesota — means that many of the rail corridors in the regional and national rail network connect through Iowa.

Class I freight railroads typically provide the capital necessary for their own network corridor infrastructure improvements. Yet in recent years, some Class I railroads have made corridor improvement investments that have involved public financial assistance, typically justified on the basis of the public benefits from reducing truck traffic and truck emissions on parallel portions of the highway network. A primary interest of the state of Iowa is in the impacts on the connecting short line railroads, enhanced access to the state's rail network, and potential connections to river ports.

The remainder of this section discusses Class I freight railroad corridors in Iowa and elsewhere in the Midwestern United States that affect Iowa in some way. While the focus is on freight rail corridors, some or portions of these routes may have potential to expand existing or add new passenger rail service in coordination with the ongoing operations of the freight railroads in Iowa.

2.3.1.1.1 BNSF Corridors of Commerce

BNSF has designated Corridors of Commerce within its network of routes in the U.S. and Canada to create jobs; deliver rail transportation, safety, and environmental benefits; and promote U.S. economic growth and competitiveness.

Two of the three BNSF Corridors of Commerce intersect with Iowa — the MidCon Corridor and the Transcon Corridor.

BNSF MidCon Corridor

The BNSF MidCon Corridor extends from Canada and Duluth, Minnesota, through the U.S. Heartland to southern ports in Texas and to connections with other railroads at the Mexican border. Of the 3,216 miles comprising the MidCon Corridor reaching 10 U.S. states and the Canadian province of Manitoba, 114 of those miles include BNSF lines in Iowa. Principal BNSF terminals in Iowa, including Sioux City and Council Bluffs are located on the MidCon Corridor⁴⁹.

⁴⁸ <http://www.extension.iastate.edu/soils/crop-and-land-use-statewide-data>. Based on USDA Natural Resources Inventory (NRI) 2010 data.

⁴⁹ BNSF MidCon Corridor Fact Sheet, 2015

The MidCon Corridor is a primary conduit for the U.S. energy supply, including coal movements to utilities for power generation and unrefined petroleum products from the Bakken in North Dakota and refined petroleum products from the U.S. South. The MidCon also handles substantial volumes of agricultural products for export. In 2009, BNSF transported 192 million tons of freight, removing 7.6 million trucks from U.S. highways⁵⁰. BNSF has invested over \$220 million in the MidCon Corridor to increase capacity by double tracking key segments, siding extensions, and yard improvements. BNSF has spent over \$1.4 billion in the last decade to maintain its infrastructure and to ensure the safe movement of goods.

The MidCon Corridor is identified in Figure 2.35 below and connects with BNSF's other two Corridors of Commerce as identified below:

- Great Northern Corridor between Chicago, Illinois and Seattle, Washington/Portland, Oregon — at Fargo, North Dakota
- TransCon Corridor between Chicago, Illinois/St. Louis, Missouri/Atlanta, Georgia/Fort Worth, Texas and Los Angeles/San Diego/Oakland, California — at Kansas City, Missouri, and Ellinor, Kansas.

Figure 2.35: BNSF MidCon Corridor



Source: BNSF

BNSF TransCon Corridor

The BNSF TransCon Corridor extends from Chicago, Illinois; St. Louis, Missouri; and Atlanta, Georgia, through the U.S. Heartland and U.S. South to West Coast ports and major metropolitan areas in the U.S. Southwest and West including Fort Worth and El Paso, Texas; Albuquerque, New Mexico; Phoenix, Arizona; San Diego, Los Angeles, Stockton, Sacramento, and Oakland, California. Of the over 4,647 miles comprising the MidCon Corridor reaching 13 U.S. states, 20 of those miles include a BNSF line in Iowa⁵¹. The principal BNSF terminal at Fort Madison, Iowa, is located on the TransCon Corridor.

The TransCon Corridor is a major import and export gateway for U.S. businesses and consumers and is a

⁵⁰ *Ibid.*

⁵¹ BNSF TransCon Corridor Fact Sheet, 2015

primary conduit for high volumes of consumer goods. The TransCon also handles substantial volumes of agricultural products and other bulk products. BNSF has invested over \$1.8 billion in the TransCon Corridor in the last decade to ensure the safe movement of goods, increase capacity by double and triple tracking key segments; expanding and rebuilding an intermodal facility at Memphis, Tennessee; and undertaking several maintenance projects⁵².

The TransCon Corridor is identified in Figure 2.36 below and connects with BNSF's other two Corridors of Commerce as identified below:

- MidCon Corridor identified earlier in this section — at Kansas City, Missouri, and Ellinor, Kansas.
- Great Northern Corridor between Chicago, Illinois and Seattle, Washington/Portland, Oregon — at Chicago, Illinois.

Figure 2.36: BNSF TransCon Corridor



Source: BNSF

2.3.1.1.2 CP Corridors

CP has one designated corridor serving Iowa: the Central Corridor, which reaches to six U.S. states and one Canadian province. This route connects with CP's east-west transcontinental route at Moose Jaw, Saskatchewan (Canada), and is oriented south to Minneapolis, Minnesota; Milwaukee, Wisconsin; Chicago, Illinois; and Kansas City, Missouri. Over the Central Corridor, CP provides a direct, single-carrier route between West Coast ports in Canada, Western Canada, and the U.S. Midwest, with access to Great Lakes and Mississippi River ports⁵³.

Approximately 360 miles of the Central Corridor include the CP network in Iowa. The Central Corridor serves the Iowa cities of Dubuque, Clinton, Davenport, Muscatine, and Ottumwa, and provides an efficient route for traffic destined for southern U.S. and Mexican markets via connections with other railroads at Kansas City. The principal CP terminal at Davenport (Nahant), Iowa, is located on the Central Corridor. The Central Corridor segment to Kansas City also connects with a line at Sabula Junction, Iowa, that has a direct connection into Chicago and points east on the CP network, including Toronto, Ontario, and the Montreal, Quebec, in Canada⁵⁴.

The Central Corridor is identified in Figure 2.37 below and connects with CP's other two designated corridors as identified below⁵⁵:

- Western Corridor from Vancouver, British Columbia, to Calgary and Edmonton, Alberta; Saskatoon, Moose Jaw, and Regina, Saskatchewan; Winnipeg, Manitoba; and Thunder Bay, Ontario — at Moose Jaw, Saskatchewan.

⁵² *Ibid*

⁵³ *CP Investor Fact Book, 2014*

⁵⁴ *Ibid*

⁵⁵ *Ibid.*

- Eastern Corridor from Chicago, Illinois, and Thunder Bay, Ontario, to Detroit, Michigan; Toronto, Ontario; and Montreal, Quebec — at Chicago, Illinois.

Figure 2.37: CP Central Corridor



Source: CP

2.3.1.1.3 UP Corridor Development

The two main UP corridors serving Iowa are the east-west Overland Route through the central tier of the state, and the north-south Spine Line via Des Moines. The corridors cross in Nevada, Iowa.

The Overland Route connects Chicago and the San Francisco Bay Area. At one time, the route consisted of segments of three separate railroads:

- Chicago & North Western Railway (C&NW) between Chicago, Illinois, and Omaha and Fremont, Nebraska (via Iowa);
- Union Pacific Railroad between Omaha and Fremont, Nebraska, and Ogden, Utah; and,
- Southern Pacific Railroad (SP) between Ogden, Utah, and Sacramento and Oakland, California.

The UP acquired C&NW in 1995 and the SP in 1996, thereby providing common ownership and management of the Overland Route, a primary east-west corridor for national and international rail-borne traffic. Branches off the Overland Route in Wyoming and Utah allow UP to reach Denver and the Pacific Northwest, and Southern California, respectively.

Part of the former Chicago Rock Island & Pacific Railroad, the Spine Line connects the Twin Cities of Minneapolis and St. Paul, Minnesota with Des Moines, Iowa, and Kansas City, Missouri; thence by other UP lines to several urban centers in Texas: Dallas/Fort Worth, Houston, San Antonio, and Laredo, the major rail gateway to Mexico.

These two corridors are strategically important to UP. Besides handling Powder River Basin coal trains from Wyoming bound for the Midwestern, eastern, and southern power plants, the Overland Route serves as a land

bridge for domestic and international container traffic between West Coast cities (Seattle, Tacoma, Portland, Oakland, and Los Angeles/Long Beach) and Chicago. The Spine Line is part of UP's north-south network linking rapidly growing southwestern markets and Mexico with the Midwest.

2.3.1.1.4 DRIVING FACTORS IN RAIL CORRIDOR DEVELOPMENT

Many external factors are generally affecting the demand for use of rail corridors as well as influencing Class I railroads' business and network investment strategies. Some of the key factors influencing rail corridor development generally are identified in this section.

Expansion of the Panama Canal

The Panama Canal was opened in 1914 as a major international trade artery that cuts through the Isthmus of Panama and connects Pacific Ocean and Atlantic Ocean trade routes. The Panama Canal Authority is currently expanding the Panama Canal with a larger, third set of locks. This project, anticipated for 2016 completion, will significantly increase the throughput capacity of the canal. It will allow for much larger vessels to transit the locks, potentially providing savings from greater economies of scale for shippers on Panama Canal trade routes. The canal capacity for container vessels, now limited to 4,500 Twenty-foot Equivalent Units (TEU) ships, will increase to container vessels of 12,500 TEU capacity. The greater capacity of the locks will permit larger dry bulk and tanker vessels to also use the canal.

This expansion project creates an opportunity for the ports in the eastern and southern U.S. to capture additional ocean trade with Asian and West Coast of South American countries — traffic that, until now, has bypassed Atlantic ports and traveled instead to ports on the West Coast before traveling to or from the eastern and southern U.S. by rail or truck. Additional international trade could be carried to and from Atlantic ports by rail, if port market shares increase. International trade commodities traveling cross-country by rail through Iowa to or from Atlantic and Pacific Coast ports may see a decrease in share.

Increases in Domestic Intermodal Transportation

The Class I railroads are increasingly focused on growing their intermodal container business and facilities. The intermodal business has been part of the railroads' services since the 1960s, and it grew substantially between 1980 and 2000. Intermodal transportation may include a truck trailer on a flat car (TOFC) or a shipping container stacked one or two high on specialized container well railcars or other flatcar (COFC). COFC was first initiated to serve international ocean container traffic at container ports, but within the last decade, railroads have grown their domestic intermodal container businesses nationwide. The railroads have accomplished this generally by offering speed and pricing of service and intermodal container yards located where they are useful to truckers, thus replacing the need for truck drivers to drive long-haul distances far from home and to better address the present and surging shortage of truck drivers in the U.S. The domestic intermodal service uses larger size containers than used in ocean shipping, matched instead to standard highway trailer sizes that are 53 feet long and taller and wider than a standard 40-foot long international ocean container. In 2015, Iowa had one active rail intermodal facility, at Council Bluffs, and was located in proximity to other intermodal facilities in the Chicago area, Omaha, Minneapolis / St. Paul, and Kansas City. Iowa's central location in the Midwest could potentially make it a hub for the development of an additional facility on various domestic intermodal rail corridor services extending to the southern, eastern, and western U.S. and various international ports, thus enhancing access to the rail network in Iowa and the reach of Iowa's shippers and receivers in the national and global marketplace.

Changes in Energy Production: Oil, Gas, and Coal

There has been growth in U.S. domestic production of oil and gas through the application of hydraulic fracking and directional drilling in the last five years. Rail has played a significant part in supplying drilling equipment and materials such as frac sand to these operations. Rail service has made production possible in areas without or with inadequate pipeline capacity.

Iowa does not have oil or gas fields or oil refineries affected by the growth, but crude-by-rail trains transit the state between producers in the Bakken oil fields of North Dakota and markets in the southern and eastern U.S. Frac sand shipped by rail is also transported through Iowa. This increased traffic may have impacts that are

significant to the national and Iowa railroad networks.

Combined with the cost of complying with emissions regulations, coal-fired electric generating plants are increasingly becoming uncompetitive with natural gas fired plants. Retirements of coal-fired plants nationwide are increasing and accelerating — a trend which has implications for coal transport by rail and would be traditionally significant for Iowa, as large volumes of coal produced in the Powder River Basin of Wyoming travels over the state's rail network en route to markets in the U.S. Midwest, East, and South or terminate in Iowa. Less direct effects on Iowa's economy and rail network may be relatively greater manufacturing and related shipping activity, as lower electricity prices may make Iowa even more competitive as a manufacturing location, including products for export.

2.3.1.2 OTHER NEEDS AND OPPORTUNITIES FOR IOWA'S FREIGHT RAILROADS

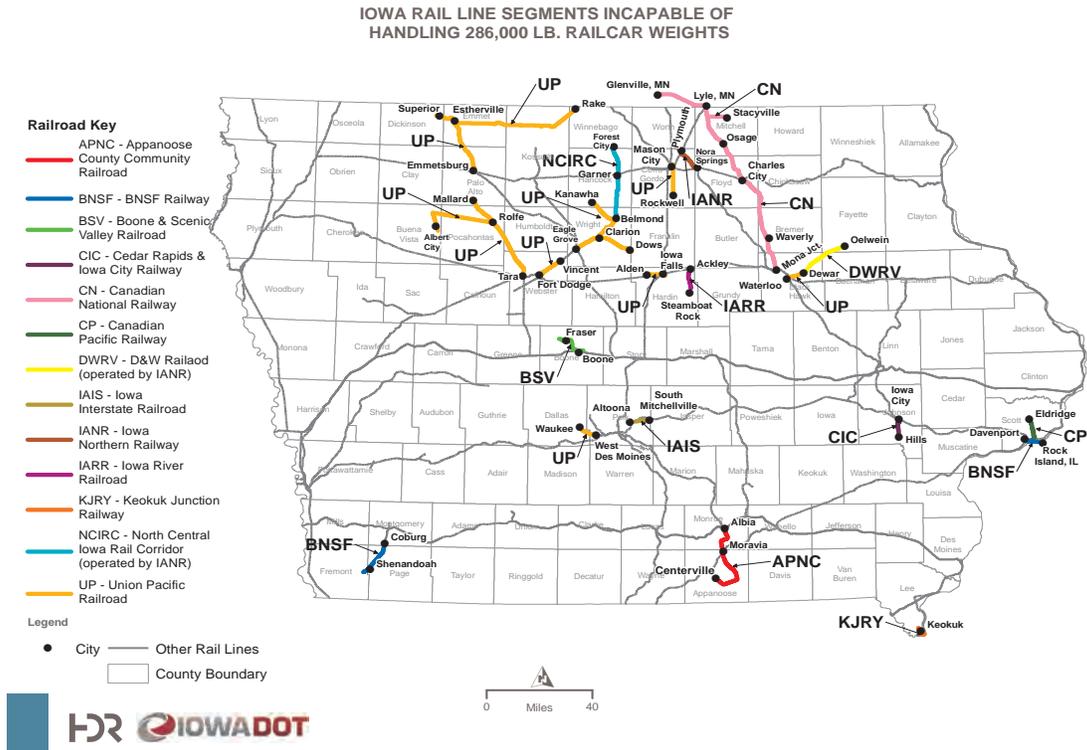
This section identifies and describes generally some needs and opportunities for Iowa's freight railroads. Proposed freight rail improvements and potential investments aimed at targeting freight rail needs and opportunities and a recommended approach for finding potential solutions will be discussed in Chapters 4 and 5 of the Iowa State Rail Plan.

2.3.1.2.1 Upgrades to Accommodate Heavier Railcars

Iowa's railroads have made considerable progress in the last two decades to upgrade track and bridges to accommodate heavier railcars with maximum allowable gross weights of 286,000 lbs. Railcars with a maximum gross weight of 286,000 lbs. are becoming an industry standard for railroad transportation. During the coordination for the State Rail Plan, some of Iowa's Class III railroads identified the need to upgrade track and bridges to increase capacity and, in some instances, also to accommodate 286,000 pound railcar loadings on some or all segments of their Iowa networks. The ability to handle maximum carloads of 286,000 lbs. is of importance to railroads to increase operational efficiencies and to railroad shippers to maintain local rail access and the ability to compete in the marketplace. Railroad shippers on short lines that can only accommodate railcars with a maximum allowable gross weight of 263,000 lbs. or 268,000 lbs. must compete with firms served by Class I and Class II railroads whose lines have the capacity for 286,000 lb. cars. These railroad-served shippers can load more cargo per car and thus realize a transportation cost savings relative to short line railroad shippers whose serving railroad cannot handle the heavier car weights. Some segments of the Class I and Class II networks in Iowa with lighter traffic densities are also unable to accommodate 286,000 lb. cars at present.

Figure 2.38 below identifies rail line segments in Iowa that are incapable of handling maximum loaded car weights of 286,000 pounds. This includes route segments and designated industrial leads of the state's Class I, II, and III railroads.

Figure 2.38: Iowa Rail Line Segments Incapable of Handling 286,000 Lb. Railcar Weights



Source: Iowa's Class I, II, and III railroads and Iowa DOT

Note: The line segment between Plymouth and Nora Springs, Iowa, can accommodate 286,000 lb. car weights with special approval from IANR.

2.3.2.1.2 Enhanced Railroad Access

One potential solution for Iowa's shippers to remain competitive in the global marketplace and to spur economic development, employment, and income in the state, is enhanced access to the Iowa railroad network. Enhanced railroad access could be provided through:

- Rehabilitation of existing railroad branch lines;
- Development of improved or new industrial spurs;
- Optimization of existing access to transload and intermodal facilities in Iowa and construction of additional such facilities to meet demand for multimodal transportation and to address numerous transportation challenges; and,
- Development of coordination and communication strategies for locating and securing available rail equipment and shipping containers in Iowa.

2.3.2.1.3 Reduction of Bottlenecks

Bottlenecks exist throughout Iowa's railroad network, which constrain railroad operating capacity, efficiency, velocity, and safety, as well as freight mobility. Typical bottlenecks in the state include:

- Insufficient capacity on main tracks and in terminals and rail yards to accommodate present and future train volumes, interchange of traffic between railroads, and provision of rail switching;
- Operating delays at railroad junctions and at movable bridge spans over principal navigable waterways;
- Bridges that constrain vertical and horizontal clearances and restrict the types of rail car equipment that can be accommodated; and,
- Potential effects on infrastructure and service for rail lines located in a major floodplain.

Table 2.31 below presents 36 Iowa rail network bottlenecks, as identified by Iowa DOT in 2014 through a

freight mobility survey it sent to the state's railroads, Metropolitan Planning Organizations, Regional Planning Affiliations, and Iowa DOT District transportation planners for inputs. The bottlenecks identified through the survey are numbered in the table below and shown by location on the map in Figure 2.39 below. This list differs from the main line analysis in Section 2.2.5 which focused on Class I rail line congestion as a function of trains per day and the existing track and control system infrastructure on certain line segments.

Additional bottlenecks identified by the state's Class III railroads during the 2015 railroad coordination conducted for the State Rail Plan are identified in Table 2.32 as well as in Appendix A of the Iowa State Rail Plan.

Table 2.31: Iowa Rail Network Bottlenecks Inventory, 2014

ID	RAILROAD	LOCATION	FREIGHT MOBILITY ISSUE
1	CN (CC&P) and UP	Mainline between Sioux City and Le Mars, Iowa	Track congestion from multiple rail companies operating over the same line.
2	DAIR, UP, CN (CC&P), and BNSF	Interchange at Sioux City, Iowa	Limited size and capacity. The alignment of interchanges between all four railroads causes each railroad to access a busy BNSF main line to allow for certain interchange movements from one railroad to another. The alignment requires a very unsafe "back-up and see-saw" movement which causes delays to trains and vehicular traffic.
3	BNSF	Gordon Drive Viaduct; Sioux City, Iowa	The Gordon Drive viaduct has a vertical clearance of 17' 6" Above Top of Rail which does not allow for the passage of double stack container trains.
4	UP	West of Missouri Valley, Iowa, and South of Omaha, Nebraska	Flood prone area; Missouri River flooding in 2011 did not cause a shutdown, but traffic was reduced for a period of 10 days to raise the track in multiple locations above predicted crest elevations. The process was a costly undertaking.
5	CN (CC&P)	UP Bridge over Missouri River in Council Bluffs, Iowa	CN uses a UP bridge at Council Bluffs, Iowa, to reach a customer in Omaha, Nebraska, which causes some delay waiting for UP trains. CN traffic between Council Bluffs and Omaha is limited.
6	BSV	Industrial Park at Boone, Iowa	Need to improve infrastructure with additional siding and storage.
7	IAIS	Bridge 380.4 (near De Soto, Iowa)	This bridge restricts the movement of high-wide loads due to the truss construction. This affects movements between Des Moines and Council Bluffs, Iowa, and restricts movements from wind tower producers.
8	IAIS	Bridge 378.1 (near Van Meter, Iowa)	This bridge restricts the movement of high-wide loads due to the truss construction. This affects movements between Des Moines and Council Bluffs, Iowa, and restricts movements from wind tower producers.
9	IAIS	Bridge 373.0 (near Booneville, Iowa)	This bridge restricts the movement of high-wide loads due to the truss construction. This affects movements between Des Moines and Council Bluffs, Iowa, and restricts movements from wind tower producers.
10	IAIS	Bridge 360.9 (near West Des Moines, Iowa)	This bridge restricts the movement of high-wide loads due to the truss construction. This affects movements between Des Moines and Council Bluffs, Iowa, and restricts movements from wind tower producers.

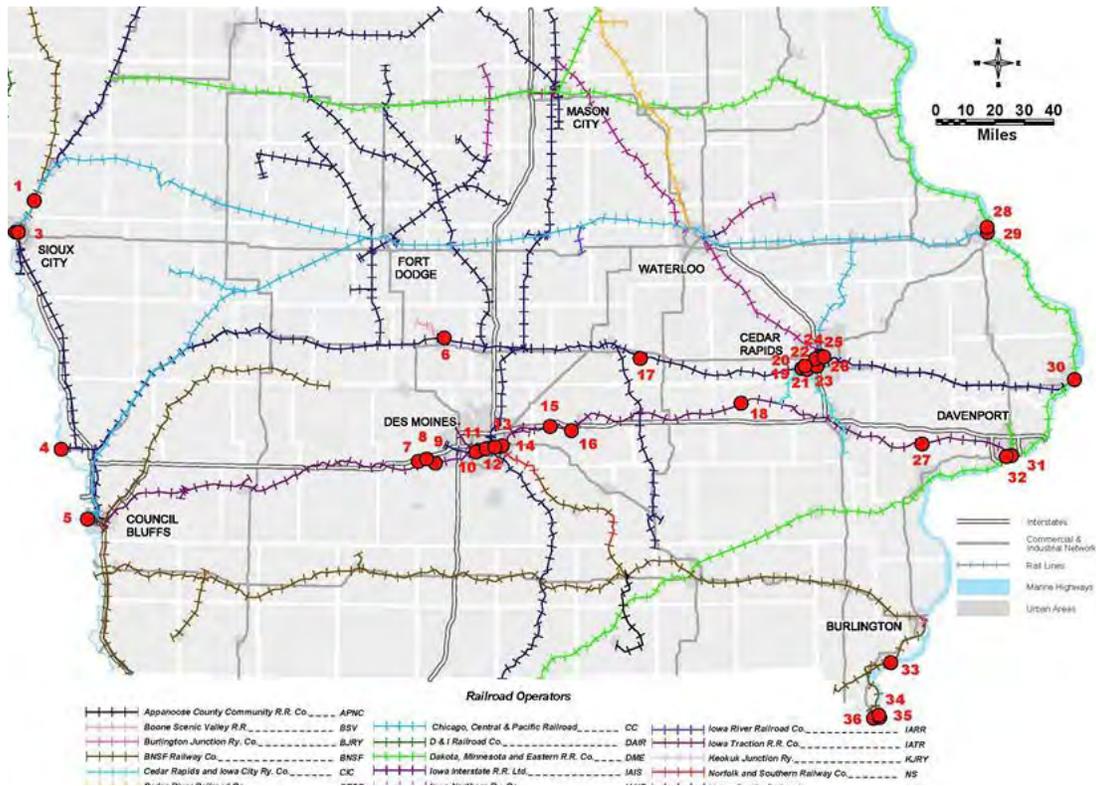
11	IAIS	Des Moines, Iowa, Track Conditions	Rail, crossings, and bridge conditions limit main track to FRA Class 1 and operations not exceeding 10 mph. Need improvements to meet FRA Class 2 track standards and an operating speed increase to 25 mph.
12	IAIS	Des Moines, Iowa	Flood prone area; Track from MP359.04 to MP362.25 near Edwards Avenue is at risk of flooding from the Raccoon River anytime the Fluer Flood Gates close.
13	IAIS	UP Short Line Yard in Des Moines, Iowa	UP-owned trackage and yard, no dedicated through route for IAIS. Need a dedicated separate track to allow through IAIS movements to pass without restriction.
14	IAIS	Pleasant Hill, Iowa	Flood prone area; MP352.25 to MP353 near Fairview Drive is at risk of flooding from Four Mile Creek.
15	IAIS	Colfax, Iowa	Flood prone area; MP334.25 to MP336 near Walnut Street is at risk of flooding from the Skunk River.
16	IAIS	Bridge 329.1 (near Colfax, Iowa)	This bridge restricts the ability to carry high-wide movements associated with wind towers. Need to replace structure with through plate girder bridge.
17	UP	Montour, Iowa	Flood prone area; Closed the line in 2014 due to a large rain event.
18	IAIS	Bridge 268.6 (near Marengo, Iowa)	This bridge restricts the movement of high-wide loads due to the truss construction. This affects movements between Newton and Davenport, Iowa, and restricts movements from wind tower producers.
19	CIC and UP	Fairfax 3 in Cedar Rapids, Iowa	UP can only deliver one train at a time at this location. Additional interchange track would alleviate the capacity issue.
20	UP	Cedar Rapids, Iowa	Flood prone area; Closed the mainline in 2014 due to a Prairie Creek watershed rain event that backed up drainage ditches. Water backup created flooding in UP Beverly Yard as well as the main line for multiple days.
21	CIC	IAIS Interchange near Cedar Rapids, Iowa	There are only two tracks existing for the interchange . Additional track to accommodate ADM traffic growth via IAIS is warranted.
22	CIC	Edgewood Road - 26th Street Reconfiguration in Cedar Rapids, Iowa	The single line limits train traffic between the UP and IAIS interchanges and ADM. It also doesn't allow for car inspections. A second track, removing the S curves, and adding an access road from ADM to the interchange yards would solve the issue.
23	CIC	Cedar Rapids Bypass; Cedar Rapids, Iowa	Rail traffic currently moves through the ADM plant greatly affecting services. A new single line that bypasses ADM would allow trains to travel around the plant more efficiently and minimize potential operating conflicts between CIC trains.
24	CIC	OR Bypass in Cedar Rapids, Iowa	Insufficient capacity to accommodate the interchange space for IANR and CN corn traffic while facilitating other yard switching activities. Bypass would provide additional capacity and efficiency of railroad operations.

25	CIC	8th Avenue Curve in Cedar Rapids, Iowa	The current 18-degree curve limits train size and motive power options for train operations , increasing the number of trains and causing congestion (motor and rail) in downtown Cedar Rapids, Iowa.
26	UP	Cedar Rapids, Iowa	Flood prone area; Cedar River caused an entire industrial lead to be closed for the duration of a flood in 2008.
27	IAIS	Moscow, Iowa	Flood prone area; MP211.75 to MP 212.75 near Noble Avenue on the Cedar River.
28	CP (DM&E)	Garfield Avenue; Dubuque, Iowa	Lack of rail yard capacity
29	CN (CC&P)	South Port; Dubuque, Iowa	Lack of rail yard capacity
30	UP*	Swing-span bridge over Mississippi River at Clinton, Iowa	The bridge closes for rail traffic to accommodate barge passage on the river during navigation season . The time typically required to stop trains, open the bridge for river traffic, return the bridge to its original position, and restore normal railroad operations cause major delays to UP.
31	IAIS, CP (DM&E), and BNSF*	Government Bridge over Mississippi River at Davenport, Iowa	Existing bridge restricts all rail traffic to 10 mph, rail traffic is restricted by barge movements during navigation season, and railcar capacity of structure is marginal for railcars with a maximum allowable gross weight of 286,000 lbs. Need to replace structure.
32	BNSF	Crescent Bridge over Mississippi River at Davenport, Iowa	Railroad bridge functionally obsolete; should be replaced.
33	BNSF*	Swing-Span Railroad Bridge over the Mississippi River at Ft. Madison, Iowa	The bridge closes for rail traffic to accommodate barge passage on the river during navigation season . The time typically required to stop trains, open the bridge for river traffic, return the bridge to its original position, and restore normal railroad operations cause delays to BNSF and vehicular traffic that shares the bridge.
34	KJRY	Between Keokuk, Iowa, and Hamilton, Illinois	Flood prone area along the Mississippi River; Flooding sometimes requires tracks to be shut down for periods of time (a 2008 flood event had the largest impact).
35	KJRY*	Swing-Span Bridge over Mississippi River at Keokuk, Iowa	The bridge closes for rail traffic to accommodate barge passage on the river during navigation season . The time required to stop trains, open the bridge for river traffic, return the bridge to its original position, and restore normal railroad operations cause delays to KJRY.
36	KJRY	Twin Rivers Yard at Keokuk, Iowa	Insufficient storage and switching capacity, as well as the inability to block rail traffic properly exists at this location. In order to alleviate the bottleneck, an increase in yard capacity is necessary.

Source: Iowa DOT

Note: Locations denoted with an asterisk (*) above indicate multimodal bottlenecks in Iowa that have a rail transportation and a waterway (river) transportation component.

Figure 2.39: Iowa Rail Network Bottlenecks Map



Source: Iowa DOT

Note: Canadian National Railway (CN) operates in Iowa through its subsidiaries Chicago Central & Pacific Railroad (CC&P) and Cedar River Railroad (CEDR) and Canadian Pacific Railway (CP) operates in Iowa through its subsidiary Dakota, Minnesota & Eastern Railroad (DM&E). Bottlenecks listed in the tables above for CN and CP are shown on the figure above on routes of CC&P and DM&E, respectively.

Table 2.32: Capacity Constraints and Operational Bottlenecks Identified by Class III Railroads, 2015

RAILROAD	LOCATION	DESCRIPTION
Cedar Rapids and Iowa City Railway	26th Street to Edgewood Road – Cedar Rapids	Double track main to ease congestion
Cedar Rapids and Iowa City Railway	Interchange Track 953 – Cedar Rapids	Additional interchange track with IAIS
Cedar Rapids and Iowa City Railway	OR Bypass Interchange Track – Cedar Rapids	Unit train receiving track for CN, IANR Rapids
D & I Railroad	Sioux City Terminal Area – Sioux City	Operations bottleneck exists where the four railroads in Sioux City (BNSF, CN, DAIR, and UP) intersect at a major at-grade crossing of rail lines and where trains operate at slow speeds in a terminal environment. Carload interchange between the carriers can be a challenge, as there are presently no designated interchange locations, and many of the carriers must operate in each other's yards to interchange cars
Iowa Northern Railway	Bryant Yard – Waterloo	Convergence of traffic from three subdivisions results in insufficient classification space

Iowa Northern Railway	Nora Springs – CP Interchange Traffic	Increased volumes of IANR/CP interchange traffic results in insufficient track capacity.
Keokuk Junction Railway	Keokuk	Limited yard space for storage of primary shippers' private railcars

Source: Iowa DOT

2.3.1.3 PORT-RAIL NEEDS AND OPPORTUNITIES

Iowa does not have any seaports, but several of its 55 river barge ports on the Missouri and Mississippi rivers have a physical connection to the Iowa rail network. The opportunity for enhanced multimodal transportation opportunities could potentially be met through investments targeted to promote interconnectivity and capacity. Such investment could include the construction or rehabilitation of existing rail connections between principal railroad lines and river port properties and additional sidings, spurs, or yard tracks for switching, staging, and storing railcars at or near port facilities.

2.3.2 Passenger Rail Needs and Opportunities

This section identifies and describes potential passenger rail needs and opportunities in Iowa. Proposed passenger rail improvements and potential investments aimed at targeting passenger rail needs and opportunities will be discussed in Chapter 3 of the Iowa State Rail Plan.

2.3.2.1 PASSENGER RAIL OPPORTUNITIES

2.3.2.1.1 Population and Economic Growth

With population, employment and personal income all forecast to increase through year 2040, it appears that the basic economic conditions in Iowa will be supportive of new passenger rail service. More people and more workers with more disposable income are likely to seek out transportation options that enhance their mobility in convenient and affordable ways. The last 25 years have seen the development of new intercity passenger corridor services (e.g., in California; Oregon and Washington; Texas and Oklahoma; Virginia; Massachusetts, New Hampshire; Maine; and elsewhere) and commuter rail services (e.g., in South and Central Florida; Dallas-Fort Worth; Washington DC; Salt Lake City; Los Angeles; and elsewhere) in response to people's needs for getting around without reliance on auto travel. The intercity and commuter rail concepts summarized below have the potential to meet Iowans' future mobility needs.

2.3.2.1.2 Potential for Intercity Passenger Rail

Responding to the likely increase in regional travel, Iowa continues to investigate new potential services on new routes which will link the state with Chicago, Omaha, the Twin Cities, and Kansas City as well as link cities within Iowa (e.g. Des Moines with Council Bluffs to the west and Iowa City and Davenport to the east). These services would restore passenger rail services that vanished decades ago. It is important to note that intercity bus companies such as Greyhound Lines, Megabus, and Jefferson Lines serve several of these interstate and intrastate markets today. However, intercity bus services typically cater to the price sensitive and transit dependent riders. The opportunity for intercity rail service rests with offering higher quality, albeit more expensive, options appealing to riders. Successful examples of state-sponsored trains started in the not too distant past are the Saluki (between Chicago and Carbondale, Illinois, initiated in 2006) and the Heartland Flyer (Oklahoma City to Fort Worth, initiated in 1999).

The Federal Railroad Administration anticipates the need for a regional approach to new intercity passenger rail service development. The FRA intends to initiate a Midwest Regional Rail Plan effort sometime in 2016 or 2017, which will look at updating and expanding previous work done for the Midwest Regional Rail Initiative. This effort will evaluate the potential for new service in the states of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

2.3.2.1.3 Potential for Commuter Rail

Commuter rail options have been explored for both the Des Moines and the Iowa City – Cedar Rapids areas. Commuter rail assumes a predominance of peak-period and peak-direction travel at costs ranging from 15 to 20 cents per mile per rider. Commuter rail has been deployed most successfully along corridors that have congested highways and high parking fees at central city stations having relatively high job densities. Absent these conditions, successful implementation becomes more challenging. Still commuter rail provides mobility options for busy people, who would prefer to take a comfortable train than remain behind the driver's wheel of their automobiles stuck in traffic. Therefore, studies of potential commuter rail options should continue to determine where and when the key success factors may arise. Examples of medium market commuter rail successes include Nashville's *Music City Star*, Albuquerque's *Rail Runner*, and Salt Lake City's *FrontRunner*.

Another option would be for Iowa to consider schedules for any new regional intercity passenger trains that could attract commuters to the trains. Examples of such dual market trains include two California Corridor trains: the *Capitol Corridor* (between San Jose, Oakland, Sacramento, and Auburn) and the *Pacific Surfliner* (between Santa Barbara, Ventura, Los Angeles, Anaheim, and San Diego). Both trains carry short distance commuters as well as longer distance intercity travelers. Conceivably, the proposed Chicago-Council Bluffs/Omaha intercity service could serve commuters bound for Des Moines, as that service develops. Such a scenario would require commuter stops closer to Des Moines than the either Grinnell to the east and Atlantic to the west, where intercity stations have been proposed⁵⁶.

2.3.2.2 PASSENGER RAIL NEEDS

2.3.2.2.1 Improvements to Current Amtrak Performance

The *California Zephyr* and the *Southwest Chief* today are earning substandard scores per Amtrak's Customer Service Indicator, particularly with regard to information given, on-board cleanliness and on-board food service. Furthermore, the trains are well below the Amtrak standard with regard to on-time performance. Several stations still have unmet needs in terms of ADA compliance and achieving a state of good repair. The good news is that ridership has grown noticeably for both trains since 2008. Also, the cost recovery for the trains is not that far behind the financial performance for Amtrak long-distance trains overall. It is reasonable to conclude that with improvements in customer satisfaction, on-time performance and station conditions, more riders will be attracted to the trains, thus spurring improvements to the trains' performance metrics.

2.3.2.2.2 Capacity

Iowa, among other Midwestern states, envisions intercity passenger rail expansions, which will occur on existing freight railroad corridors. The potential of commuter rail in the Des Moines and the Cedar Rapids – Iowa City areas would also require access to freight railroad corridors. Given the freight railroads' existing and projected traffic volumes, rail line capacity likely will loom large as an issue for new passenger rail service implementation. Passenger rail sponsors will need to engage the freight railroads in analysis of the infrastructure improvements required to assure fluid and reliable freight and passenger operations in shared-use corridors. Often such collaboration will require operations simulation modeling, which can pinpoint potential bottlenecks and robustly test for infrastructure solutions (e.g., additional passing sidings or lengthening sidings), given specific assumptions about train volumes and schedules.

⁵⁶ Chicago to Council Bluffs-Omaha Regional Passenger Rail System Planning Study, Draft Service Development Plan, November 2013.



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