9.0 Current Rail Practices in Iowa for Crude by Rail and Ethanol Transportation by Rail

This section describes in general the practice of transporting bulk crude oil by rail and the characteristics of the rail routes over which bulk ethanol is currently or potentially transported in Iowa. Information presented in this section was provided by the state's railroads during interviews conducted for this Study or compiled from public sources such as the Iowa State Rail Plan.

9.1 Crude by Rail Transportation in Iowa

This section describes in general the practice of transporting bulk crude by rail and the characteristics of the rail networks over which crude oil is currently transported in unit-train quantities in Iowa. Information presented in this section was provided by the state's railroads during interviews conducted for this Study or compiled from public sources such as the Iowa State Rail Plan.

9.1.1 Equipment and Transportation

Crude by rail transportation requires the use of a railroad tank car. Rail equipment used for the transportation of crude oil is typically owned by the producer/shipper or by a railcar leasing company, and not the railroad that is providing the transportation service. The typical characteristics of railcars used for crude oil transportation and applicable tank car construction and maintenance and railroad operations regulations are also described within Section 4.0, Section 5.0, and Appendix A.

Crude by rail can be transported as loaded single cars, blocks of cars, or as a unit train. Railroads will often collect single cars or blocks of cars from the facility of one or more crude oil producers and stage them in a railroad yard for assembly into a unit train. General operating practice is for railroads to transport crude oil separately in bulk shipments via unit trains. At present, crude oil unit trains are not assembled or switched in Iowa, and no crude oil is destined for receivers in Iowa. Crude oil is transported through Iowa only. Additional information about the rail haulage of crude oil by rail can be found within Section 3.0 and Appendix A.

In order to detect potential safety and operational hazards of transporting crude oil by rail, the mechanical components of railroad tank cars used for shipping crude oil are inspected at several intervals during the typical transportation cycle, as generally described below:

- Empty tank cars are inspected by the producer/shipper after delivery to a production facility by the railroad and before cars are loaded with crude oil. Potential mechanical issues or loading/unloading device defects are noted, and repaired as required.
- The producer/shipper formally releases loaded tank cars for movement by the railroad, and railroad train crews inspect the tank cars before pulling them from a producer/shipper's facility. Any potential mechanical defects or other issues, including leaky valves, cracked wheel, safety appliance defects, or improperly or insufficiently displayed hazardous materials placards, are immediately reported to the producer/shipper for response, repair, or reconciliation, as appropriate.

- Railroad mechanical forces inspect loaded tank cars received in interchange and accepted from other railroads. In some instances, a tank car may be inspected later and at a point other than where it was received in interchange from another railroad. Any potential mechanical defects are reported to the delivering and receiving railroads- the producer/shipper, and the owner of the tank car. One of these parties will be responsible for payment for repairing the car, depending upon the nature of the defect, agreements between the parties, and other considerations. However, repairs, if they are safety-related, are made before the tank car departs the yard where the defect was discovered.
- Depending upon the length of the rail route between the producer/shipper (origin) and the receiver (destination) and the number of railroads involved in providing the transportation, tank cars are required to be additionally inspected at routine intervals en route. Inspections may occur where train crews change, when a certain mileage between inspections has occurred, or in cases when locomotives and/or other railcars are added to or switched out of the train carrying the crude oil. These inspections may occur on the Iowa railroad network.
- The receiver inspects the loaded tank cars upon delivery from the railroad.
- The receiver empties the tank cars and releases them to the railroad for pick up.
- Railroad train crews or mechanical forces inspect empty tank cars before a train pulls them from a receiver's facility.
- Empty tank cars are assembled and reverse routed to a crude oil producer (shipper) for reloading.

9.2 Crude by Rail Routes in Iowa

The Iowa rail network supports transportation of crude oil by rail that is produced in North Dakota and other states and is transported through Iowa. At present, two of the six Class I railroads that serve Iowa transport crude oil, BNSF and CP. [50] The characteristics of each are described below.

9.2.1 Class I Railroads

BNSF Railway (BNSF)

BNSF Railway (BNSF) is a Fort Worth, Texas-based Class I railroad with a network of approximately 32,500 miles in the U.S. and Canada, of which approximately 700 miles are in Iowa. BNSF serves the U.S. Midwest, West, and South; Gulf Coast and West Coast ports; and Canada.

The BNSF network hosts crude by rail shipments from several fields. While the principal field shipping oil on BNSF is the Bakken of North Dakota, other fields that have loaded trains on BNSF that may travel through Iowa include the Niobrara (northeast Colorado), Uinta (northeast Utah), and Canadian oil sands. Trains may be originated by BNSF or interchanged to BNSF

[50] The six Class I railroads serving Iowa are BNSF Railway, Canadian National Railway, Canadian Pacific Railway, Kansas City Southern Railway (haulage rights only), Norfolk Southern Railway, and Union Pacific Railroad.

from other carriers, and in order to reach markets and receivers in the southern and eastern U.S. located both on and off the BNSF network, may travel through Iowa. For receivers located off its network, BNSF interchanges crude by rail trains at various gateways such as Chicago, St. Louis, and Kansas City.

At present, much of the crude by rail on the BNSF network that passes through Iowa originates in the Bakken Field of North Dakota, and flows generally on the following two north-south routes:

- South from Fargo, North Dakota, to Willmar, Minnesota; Sioux City, Iowa; Ashland and Lincoln, Nebraska; Kansas City, Missouri; and points in the southern U.S. This route travels through northwestern Iowa between Lester and Sioux City, Iowa.
- South from Fargo, North Dakota, to Minneapolis, Minnesota; La Crosse, Wisconsin; Savanna and Galesburg, Illinois; and points south including St. Louis, Missouri, and the southern U.S. and points east including Chicago, Illinois. This route is not located in Iowa, but it is immediately opposite and generally within 1-3 miles of Iowa's eastern border with Wisconsin or Illinois, between New Albin and Sabula, Iowa.

BNSF also carries crude by rail over two east-west routes that are used to provide additional capacity and connectivity between the two north-south routes identified above. These east-west routes are described below:

- East from Ashland, Nebraska, to Creston, Ottumwa, and Burlington, Iowa; Galesburg, Illinois; and points south including St. Louis, Missouri and the southern U.S. and points east including Chicago, Illinois. This route travels through southern Iowa between Pacific Junction and Burlington, Iowa.
- West from Galesburg, Illinois, to Fort Madison, Iowa; Kansas City, Missouri; and points in the southern U.S. This route travels through southeastern Iowa between Fort Madison and Argyle, Iowa.

The characteristics of BNSF's potential crude by rail routes in Iowa are identified later in this section.

The general operating practice is for BNSF to transport bulk crude by rail in unit trains, but it can also be transported as blocks of cars in manifest trains. Crude by rail unit trains in the U.S. are typically at least 75 cars in length and up to 120 cars in length. The frequency of crude by rail shipments on BNSF through Iowa ranges from 0 to 2 trains daily on each route.

Canadian Pacific Railway (CP)

Canadian Pacific Railway (CP) is a Calgary, Alberta (Canada) based Class I railroad with a network of approximately 13,700 miles in the U.S. and Canada, of which approximately 650 miles are 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 & Eastern Railroad.

The CP network hosts bulk crude by rail shipments, with originating points from the oil fields of North Dakota and Alberta and Saskatchewan in Canada, and traveling to markets in the southern and eastern U.S. CP projected that in 2015 it transported approximately 12,000 crude oil

carloads, some of which traveled over the Iowa rail network. No crude oil shipments originate or terminate on CP in Iowa, but shipments from Canadian oil fields to markets in Texas presently travel through Iowa. CP has one north/south crude by rail route in Iowa, as described below:

- South from Canada to Minot, North Dakota; Minneapolis, St. Paul, and Winona, Minnesota; New Albin, Lansing, Marquette, Dubuque, Clinton, Davenport, Muscatine, Washington, Ottumwa, and Moravia, Iowa; and Kansas City, Missouri, for forwarding to destinations in the southern U.S. (including Texas) not located on the CP network.

The characteristics of CP's crude by rail route in Iowa are identified and described later in this section.

The general operating practice is for CP to transport bulk crude by rail in unit trains. In 2015, approximately 95 percent of bulk crude oil on CP was moved in this manner. Some crude oil is transported as blocks of cars in CP manifest trains, depending upon customer and service requirements. In 2015, approximately 5 percent of bulk crude oil on CP was moved in this manner. CP crude by rail unit trains in the U.S. are typically at least 75 cars in length and up to 120 cars in length, and many unit trains traveling through Iowa presently average 115 cars. Loaded unit trains from oil fields in Canada operate south from Minneapolis to Kansas City via Iowa and empty unit trains returning to the Canadian oil fields to be reloaded travel north from Kansas City to Minneapolis via Iowa. Frequency of crude by rail shipments on CP in Iowa ranges from 0 to 2 trains daily.

9.2.2 Other Railroads

Other railroads in Iowa may potentially handle empty railcars used in crude oil transportation that are returning to an oil field for reloading, traveling to or from storage, traveling to or from a car repair facility, or repositioning between oil fields. Empty tank cars may contain a small amount of residue or crude oil.

9.2.3 Detailed Characteristics of Rail Routes Currently Carrying Bulk Crude in Iowa

This section describes the physical and operating characteristics of each current railroad route and railroad operating subdivision over which crude oil is transported in Iowa. The following physical characteristics are accounted for in the inventory, as described below:

- Railroad and Operating Subdivision within Iowa – identifies the owner and operator of the railroad and limits of each operating subdivision in Iowa carrying crude by rail. Segments on which the identified railroad has trackage rights over a segment owned by another railroad are described.
- Segment in Iowa and Approximate Mileage – identifies the segment of the operating subdivision that is within Iowa and the approximate length of the segment in miles.
- Track Configuration – identifies the number of main tracks and the presence of sidings used for meet-pass events between trains.

- Method of Operation – identifies generally the railroad operating system or practice employed on each segment, to the extent known, including the presence of:

  - Centralized Traffic Control (CTC) – A train control system whereby a train dispatcher provides operational authority to trains remotely via a wayside signal system and radio communication.
  - Automatic Block Signals (ABS) – A wayside signal system that indicates block occupancy and minimizes the likelihood of collisions between trains. ABS is not controlled by a train dispatcher, but a train's entry to into a segment of ABS may be controlled by a train dispatcher. Typically requires that operational authority be provided as an overlay through a track warrant or track authority issued by a train dispatcher via radio communication.
  - Track Warrant Control (TWC) or Track Authority (TA) – System of operational authority issued to trains remotely by a train dispatcher via radio communication.
  - Restricted Limits (RL) or Restricted Speed (RS) and Yard Limits (YL) – Slow speed operations (not greater than 20 mph) within and at the approach to railroad yards and on industrial leads and other trackage that does not require operational authority from a train dispatcher. Trains operating within these limits typically coordinate operations with the train dispatcher and other trains operating within the limits via radio communication.

- FRA Track Class – identifies the applicable Federal Railroad Administration (FRA) Class of Track designation on the main track(s) for each line segment. Note that a railroad may maintain a line segment one level higher than the assigned FRA Track Class and what is shown in this inventory.

- Maximum Authorized Speed for Freight Trains – identifies the maximum speed freight trains can travel over each segment; note that speeds may be further restricted owing to track geometry, bridge restrictions, limited sight distances, challenges of rail operations in urban and rail terminal areas, and other safety and operating considerations.

- Maximum Authorized Speed for Passenger Trains – identifies the maximum speed passenger trains can travel over each segment; note that speeds may be further restricted owing to track geometry, limited sight distances, challenges of rail operations in urban and rail terminal areas, and other safety and operating considerations. Speeds are identified only for railroad subdivisions presently hosting Amtrak intercity and long-distance passenger trains in Iowa.

- Maximum Allowable Gross Weight per Car – identifies the heaviest railcar gross weight that can be accommodated over the main tracks of the segment.

- Existing Wayside Asset Protection Devices and Spacing – identifies the locations of existing wayside asset protection devices, which is infrastructure that identifies mechanical defects and failures and shifted loads on railcars, and other potentially hazardous conditions that could affect the safety of railroad operations. These include Hot Box Detectors (HBD), Dragging Equipment Detectors (DED),

High/Wide/ Shifted Load Detectors (SLD), Hot Wheel Detectors (HWD), Wheel Impact Load Detectors (WILD), and other devices.

- Proposed Wayside Asset Protection Devices – identifies proposed wayside asset protection devices, as described by Iowa's freight railroads during railroad coordination conducted during the Study.
- Likely Average Number of Crude Oil Trains Daily by Segment – identifies the likely average number of trains daily by segment over each railroad operating subdivision potentially carrying crude oil in Iowa. The average number of crude oil trains and crude oil volumes transported by segment may change, based upon market changes, available railroad capacity, and other considerations. In general, the aggregate frequency of crude oil unit trains per day, combined all railroads, at any location in Iowa, typically does not exceed three (3).

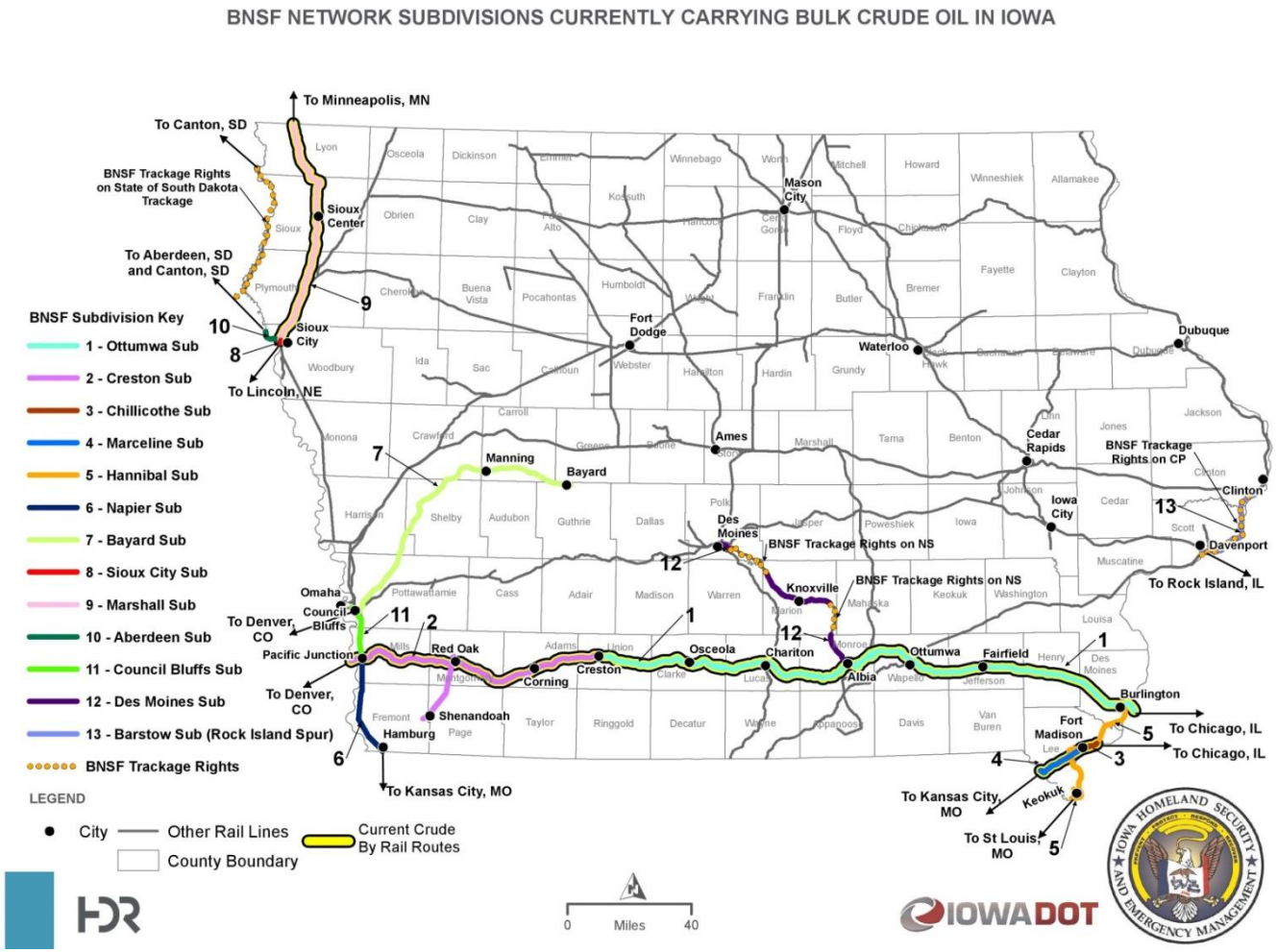
The Study recognizes that there are many active and passive warning devices at road/rail at-grade crossings on segments of the Iowa rail network over which crude oil is potentially transported. Specific inventories for the number and types of grade crossing warning devices by rail segment are not included in this Study due to the level of detail and field investigation that would be required. Section 9.5.3 includes summary information about the total number of and types of all grade crossings on the Iowa rail network. Note that a relatively small percentage of the Iowa rail network currently hosts movements of crude oil unit trains.

During interviews conducted for this Study, the state's railroads identified some routes and operating subdivisions hosting bulk crude oil transportation by rail in Iowa. These subdivisions and others that are likely to host crude by rail transportation are included in the descriptions below.

BNSF Railway (BNSF)

The characteristics of BNSF railroad operating subdivisions currently carrying unit trains of crude oil in Iowa, to the extent known, are identified in Appendix C. Railroad operating subdivisions of BNSF currently carrying bulk crude oil in Iowa are identified in Figure 8 below.

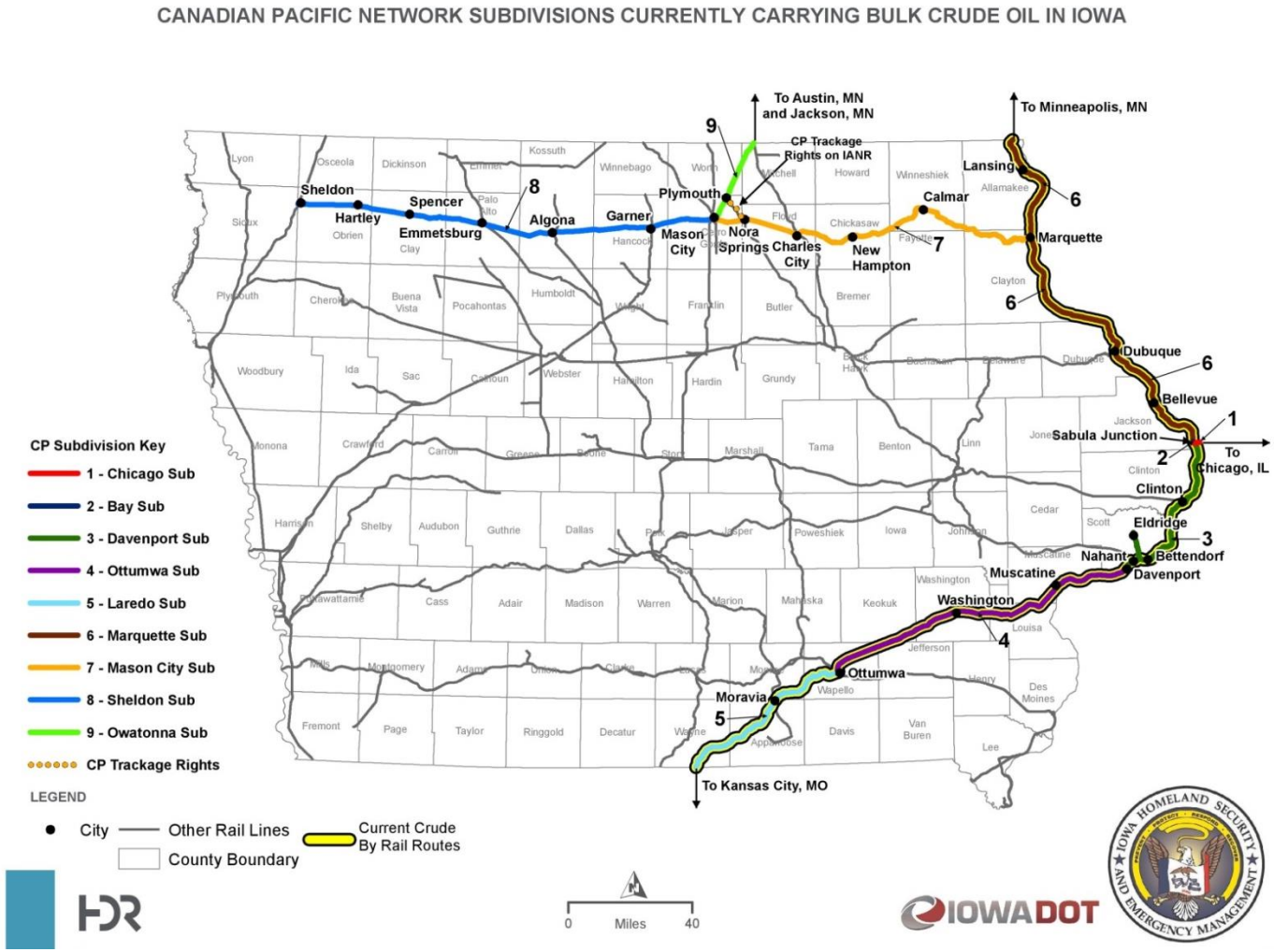
Figure 8. BNSF Network Subdivisions Currently Carrying Bulk Crude Oil in Iowa



Canadian Pacific Railway (CP)

The characteristics of CP railroad operating subdivisions currently carrying crude unit trains of crude oil in Iowa, to the extent known, are identified in Appendix C. Railroad operating subdivisions of CP currently carrying bulk crude oil in Iowa are identified in Figure 9 below.

Figure 9. CP Network Subdivisions Currently Carrying Bulk Crude Oil in Iowa



9.3 Ethanol by Rail Transportation in Iowa

This section describes in general the practice of transporting ethanol by rail and the characteristics of the rail networks over which ethanol is currently or potentially transported in Iowa. Information presented in this section was provided by the state's railroads during interviews conducted for this Study or compiled from public sources such as the Iowa State Rail Plan.

9.3.1 Equipment and Transportation

Ethanol transportation by rail requires the use of a railroad tank car. Rail equipment used for the transportation of crude oil typically owned by the producer/shipper or by a railcar leasing company, and not the railroad that is providing the transportation service. The typical characteristics of railcars used for ethanol transportation and applicable tank car construction and maintenance and railroad operations regulations are described later in this report.

Ethanol can be transported as loaded single cars, blocks of cars, or as a unit train. Railroads will often collect single cars or blocks of cars from the facility of one or more ethanol producers and stage them in a railroad yard for assembly into a unit train of typically 75 or more cars. Because ethanol is often shipped from refineries that do not have large-scale storage, and often is shipped to receivers that may not require large quantities, ethanol unit trains have a greater variability of length than crude oil unit trains. While crude oil unit trains are typically 110-120 cars long, ethanol unit trains often vary from as few as 60 cars to as many as 120 cars. Additional information about the rail haulage of ethanol by rail can be found later in this report.

In order to detect potential safety and operational hazards of transporting ethanol by rail, the mechanical components of railroad tank cars used for shipping ethanol are inspected at several intervals during the typical transportation cycle, as generally described below:

- Empty tank cars are inspected by the producer/shipper after delivery to a production facility by the railroad and before cars are loaded with ethanol. Potential mechanical issues or loading/unloading device defects are noted, and repaired as required.
- The producer/shipper formally releases loaded tank cars for movement by the railroad, and railroad train crews and/or mechanical forces inspect the tank cars before pulling them from a producer/shipper's facility. Any potential mechanical defects or other issues, including leaky bottom outlet valves, cracked wheel, safety appliance defects, or improperly or insufficiently displayed hazardous materials placards, are immediately reported to the producer/shipper for response, repair, or reconciliation, as appropriate.
- Railroad mechanical forces inspect loaded tank cars received in interchange and accepted from other railroads. In some instances, a tank car may be inspected later and at a point other than where it was received in interchange from another railroad. Any potential mechanical defects are reported to the delivering and receiving railroads- the producer/shipper, and the owner of the tank car. One of these parties will be responsible for payment for repairing the car, depending upon the nature of the defect, agreements between the parties, and other

considerations. However, repairs, if they are safety-related, are made before the tank car departs the yard where the defect was discovered.

- Depending upon the length of the rail route between the producer/shipper (origin) and the receiver (destination) and the number of railroads involved in providing the transportation, tank cars are required to be inspected at routine intervals en route. Inspections may occur where train crews change, when a certain mileage between inspections has occurred, or in cases when locomotives and/or other railcars are added to or switched out of the train carrying the ethanol.
- The receiver inspects the loaded ethanol tank cars upon delivery from the railroad.
- The receiver empties the tank cars and releases them to the railroad for pick up.
- Railroad train crews and/or mechanical forces inspect empty tank cars before a train pulls them from a receiver's facility.
- Empty tank cars are assembled and reverse routed to an ethanol producer (shipper) for reloading.

9.4 Ethanol Rail Networks in Iowa

The Iowa rail network supports transportation of ethanol that is produced in Iowa and ethanol that is produced in neighboring states and is transported through Iowa. The networks of nine Iowa railroads – including four Class I railroads and five Class II and Class III railroads (regional and short line railroads) – transport ethanol in Iowa and are identified in this section. The characteristics of each are described below.

9.4.1 Class I Railroads

BNSF Railway (BNSF)

BNSF Railway (BNSF) is a Fort Worth, Texas-based Class I railroad with a network of approximately 32,500 miles in the U.S. and Canada, of which approximately 700 miles are in Iowa. BNSF serves the U.S. Midwest, West, and South; Gulf Coast and West Coast ports; and Canada. Ethanol plants are located on the BNSF network in Iowa, in which BNSF also receives ethanol through interchange with other railroads in Iowa and in adjacent states and from producers in other states. Frequency of ethanol shipments on BNSF in Iowa is typically daily, and it can be transported as single cars, blocks of cars, or as a unit train.

Canadian National Railway (CN)

Canadian National Railway (CN) is a Montreal, Quebec (Canada) based Class I railroad with a network of approximately 20,600 miles in the U.S. and Canada, of which approximately 600 miles are 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 and Cedar River Railroad. Ethanol plants are located on the CN network in Iowa and CN can also receive ethanol through interchange with its connections in the state. Frequency of ethanol shipments on CN in Iowa is typically daily, and it can be transported as single cars, blocks of cars, or as a unit train.

Canadian Pacific Railway (CP)

Canadian Pacific Railway (CP) is a Calgary, Alberta (Canada) based Class I railroad with a network of approximately 13,700 miles in the U.S. and Canada, of which approximately 650 miles are in Iowa. CP serves the U.S. Midwest and East Coast, Canada, and West Coast and East Coast ports. CP operates in Iowa through its subsidiary Dakota, Minnesota & Eastern Railroad. Ethanol plants are located on the CP network in northern and eastern Iowa and CP can also receive ethanol through interchange with other railroads in Iowa and adjacent states and from producers in other states. Frequency of ethanol shipments on CP in Iowa is typically daily, and it can be transported as single cars, blocks of cars, or as a unit train.

Union Pacific Railroad (UP)

Union Pacific Railroad (UP) is an Omaha, Nebraska-based Class I railroad with a network of approximately 32,000 miles in the U.S., of which approximately 1,300 miles are located 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. Ethanol plants are located on the UP network throughout Iowa and UP can also receive ethanol through interchange with other railroads in Iowa and adjacent states and from producers in other states. Frequency of ethanol shipments on UP in Iowa is typically daily, and it can be transported as single cars, blocks of cars, or as a unit train.

9.4.2 Class II and Class III Railroads

Cedar Rapids & Iowa City Railway (CIC)

The Cedar Rapids & Iowa City Railway (CIC) is a Class III railroad owned by Alliant Energy and based in Cedar Rapids, Iowa. CIC operates a network consisting of approximately 57 miles of lines in the Cedar Rapids and Iowa City area. Large volumes of ethanol originate at the ADM and Ingredion plants on the CIC at Cedar Rapids, Iowa. Iowa Northern Railway (IANR) also delivers ethanol in unit and manifest trains to CIC at Cedar Rapids, Iowa. Frequency of ethanol shipments on CIC in Iowa is typically daily, and it can be transported as single cars, blocks of cars, or as a unit train.

D&I Railroad (DAIR)

The D&I Railroad (DAIR) is a Class III railroad owned by aggregate producer L.G. Everist and is based in Sioux Falls, South Dakota. Its network includes a principal line from Dell Rapids and Sioux Falls, South Dakota, to Sioux City, Iowa. DAIR operates in Iowa entirely on trackage owned by the State of South Dakota between Canton and Elk Point, South Dakota, via Hawarden, Iowa, and over trackage rights on the BNSF Aberdeen Subdivision between Elk Point, South Dakota, and Sioux City, Iowa, for approximately 42 rail miles within Iowa. DAIR transports ethanol through Iowa from the Siouxland Energy Transload and POET Biorefining on the State of South Dakota-owned line at Hudson, South Dakota, south to Sioux City, Iowa. Frequency of ethanol shipments on DAIR is typically several times weekly. Ethanol can be transported as single cars, blocks of cars, or as a unit train.

Iowa Interstate Railroad (IAIS)

Iowa Interstate Railroad (IAIS) is a Class II railroad based in Cedar Rapids, Iowa, and 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 also operates over a line of the CIC from Yocum Connection (South Amana), Iowa, to Cedar Rapids, Iowa.

IAIS is a conduit for a large volume of ethanol rail traffic that originates in Cedar Rapids and northern Iowa, which flows to markets in the U.S. Midwest, East, and South via the rail gateways of Chicago, the Quad Cities, and Peoria, Illinois. IAIS ethanol traffic traveling through Iowa originates at the ADM and Ingredion plant in Cedar Rapids on the CIC, from unit and manifest ethanol trains from northern Iowa that are transported by the Iowa Northern Railway (IANR) to Cedar Rapids for interchange to CIC, and via an ethanol plant located on the IAIS network at Menlo, Iowa. Frequency of ethanol shipments on IAIS in Iowa is typically daily, and it can be transported as single cars, blocks of cars, or as a unit train.

Iowa Northern Railway (IANR)

Iowa Northern Railway (IANR) is a Class III railroad based in Cedar Rapids, Iowa, and operates a regional network consisting of approximately 165 miles of railroad that it owns or operates under agreement. IANR's principal route reaches from Manly to Waterloo and Cedar Rapids, Iowa. IANR has trackage rights over CP and UP in Iowa to access isolated IANR lines between Belmond and Forest City, Iowa, and between Dewar (Waterloo) and Oelwein, Iowa, respectively. As part of a trackage rights agreement with UP to access UP's North Yard in Cedar Rapids and an interchange agreement with CIC, IANR also operates over the CIC in Cedar Rapids to interchange traffic with the CIC at its 950 Yard in southwest Cedar Rapids.

IANR ethanol traffic originates at plants on its network at Shell Rock and Fairbank, Iowa. Blocks of ethanol from each plant are typically combined into a unit train at Waterloo, Iowa, which is interchanged to CIC and bridged to IAIS in Cedar Rapids. Frequency of ethanol shipments on IANR in Iowa is at least once weekly, and it can be transported as single cars, blocks of cars, or as a unit train.

Iowa River Railroad (IARR)

Iowa River Railroad (IARR) is a Class III railroad based in Steamboat Rock, Iowa, and operates a single line from an ethanol plant near Steamboat Rock, Iowa, approximately 9 miles to the interchange with CN at Ackley, Iowa. Frequency of ethanol shipments and method of shipment on IARR is not confirmed.

9.4.3 Characteristics of Rail Networks Potentially Carrying Bulk Ethanol in Iowa

Ethanol has many origins and many destinations with both short-term and long-term contracts for its movement by rail. This results in a high variability of routing as different consumers of ethanol source from many different ethanol refineries, and as large producers of ethanol with multiple refineries may choose to fulfill a contract with shipments from multiple refineries. This section describes the physical and operating characteristics of each potential railroad network or railroad operating subdivision over which bulk ethanol is transported in Iowa. The following physical characteristics are accounted for in the inventory, as described below:

- Railroad and Operating Subdivision within Iowa – identifies the owner and operator of the railroad and limits of each operating subdivision in Iowa carrying ethanol. Segments on which the identified railroad has trackage rights over a segment owned by another railroad are described.
- Segment in Iowa and Approximate Mileage – identifies the segment of the operating subdivision that is within Iowa and the approximate length of the segment in miles.
- Track Configuration – identifies the number of main tracks and the presence of sidings used for meet-pass events between trains.
- Method of Operation – identifies generally the railroad operating system or practice employed on each segment, to the extent known, including the presence of:

  - Centralized Traffic Control (CTC) – A train control system whereby a train dispatcher provides operational authority to trains remotely via a wayside signal system and radio communication.
  - Automatic Block Signals (ABS) – A wayside signal system that indicates block occupancy and minimizes the likelihood of collisions between trains. ABS is not controlled by a train dispatcher, but a train's entry to into a segment of ABS may be controlled by a train dispatcher. Typically requires that operational authority be provided as an overlay through a track warrant or track authority issued by a train dispatcher via radio communication.
  - Track Warrant Control (TWC) or Track Authority (TA) – System of operational authority issued to trains remotely by a train dispatcher via radio communication.
  - Restricted Limits (RL) or Restricted Speed (RS) and Yard Limits (YL) – Typically slow speed operations within and at the approach to railroad yards, on industrial leads, and other trackage that does not require operational authority from a train dispatcher. Trains operating within these limits typically coordinate operations with the train dispatcher and other trains operating within the limits via radio communication.

- FRA Track Class – identifies the applicable Federal Railroad Administration (FRA) Class of Track designation on the main track(s) for each line segment. Note that a railroad may maintain a line segment one level higher than the assigned FRA Track Class and what is shown in this inventory.
- Maximum Authorized Speed for Freight Trains – identifies the maximum speed freight trains can travel over each segment; note that speeds may be further restricted owing to track geometry, bridge restrictions, limited sight distances, challenges of rail operations in urban and rail terminal areas, and other safety and operating considerations.
- Maximum Authorized Speed for Passenger Trains – identifies the maximum speed passenger trains can travel over each segment; note that speeds may be further restricted owing to track geometry, limited sight distances, challenges of rail operations in urban and rail terminal areas, and other safety and operating

considerations. Speeds are identified only for railroad subdivisions presently hosting Amtrak intercity and long-distance passenger trains in Iowa.

- Maximum Allowable Gross Weight per Car – identifies the heaviest railcar gross weight that can be accommodated over the main tracks of the segment.
- Existing Wayside Asset Protection Devices and Spacing – identifies the locations of existing wayside asset protection devices, which is infrastructure that identifies mechanical defects and failures and shifted loads on railcars, and other potentially hazardous conditions that could affect the safety of railroad operations. These include Hot Box Detectors (HBD), Dragging Equipment Detectors (DED), High/Wide/ Shifted Load Detectors (SLD), Hot Wheel Detectors (HWD), Wheel Impact Load Detectors (WILD), and other devices.
- Proposed Wayside Asset Protection Devices – identifies proposed wayside asset protection devices, as described by Iowa's freight railroads during railroad coordination conducted during the Study.
- Likely Average Number of Ethanol Trains Daily by Segment – identifies the likely average number of trains daily by segment over each railroad operating subdivision potentially carrying ethanol in Iowa. The average number of ethanol trains and ethanol volumes transported by segment may change, based upon market changes, available railroad capacity, and other considerations. In general, the aggregate frequency of ethanol unit trains per day, combined all railroads, at any location in Iowa, typically do not exceed three (3).

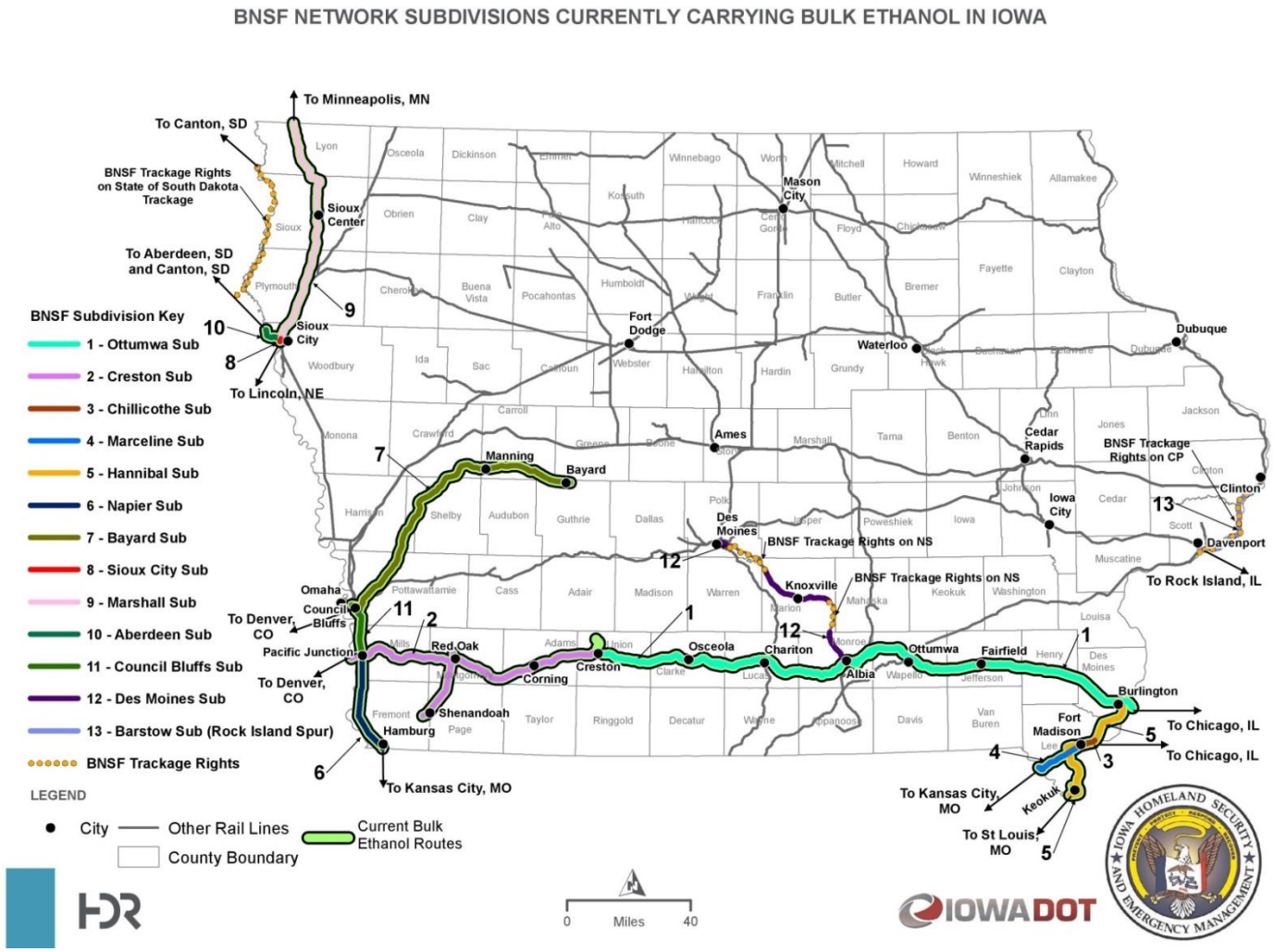
The Study recognizes that there are many active and passive warning devices at road/rail at-grade crossings on segments of the Iowa rail network over which ethanol is potentially transported. Specific inventories for the number and types of grade crossing warning devices by rail segment are not included in this Study due to the level of detail and field investigation that would be required. Section 9.5.3 includes summary information about the total number of and types of all grade crossings on the Iowa rail network. Note that most of the Iowa rail network currently hosts regular ethanol shipments in quantities varying from individual carloads to unit trains, but only routes known to currently handle bulk shipments are detailed below.

During interviews conducted for this Study, the state's railroads identified some routes and operating subdivisions hosting bulk ethanol transportation by rail. These subdivisions and others that are likely to host ethanol transportation are included in the descriptions below.

BNSF Railway (BNSF)

The characteristics of the BNSF rail network currently carrying bulk ethanol in Iowa, to the extent known, are identified in Appendix D. Railroad operating subdivisions of BNSF currently carrying ethanol in Iowa are identified in Figure 10 below.

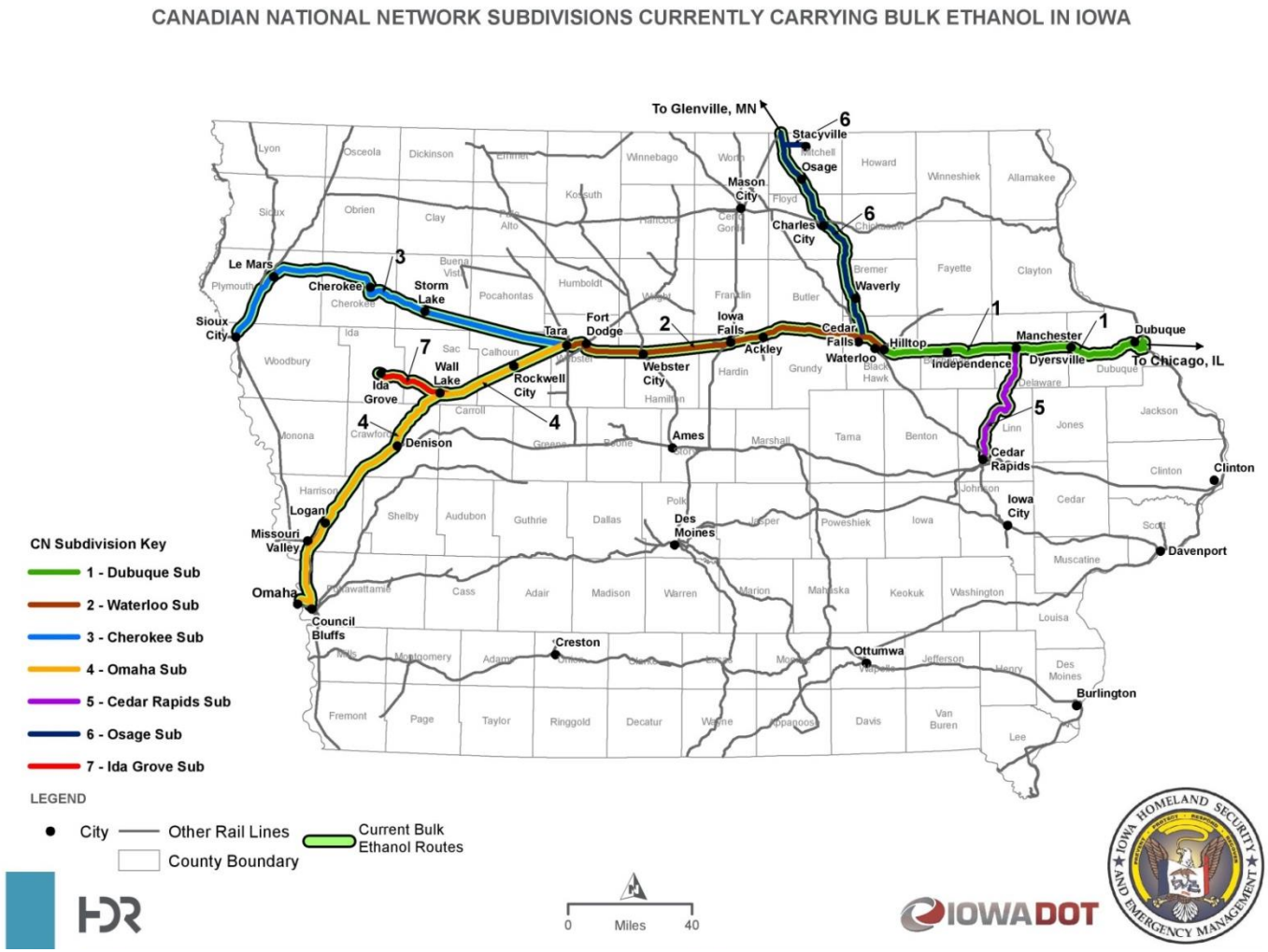
Figure 10. BNSF Railroad Network Subdivisions Currently Carrying Bulk Ethanol in Iowa



Canadian National Railway (CN)

The characteristics of the CN rail network currently carrying bulk ethanol in Iowa, to the extent known, are identified in Appendix D. Railroad operating subdivisions of CN currently carrying bulk ethanol in Iowa are identified in Figure 11 below.

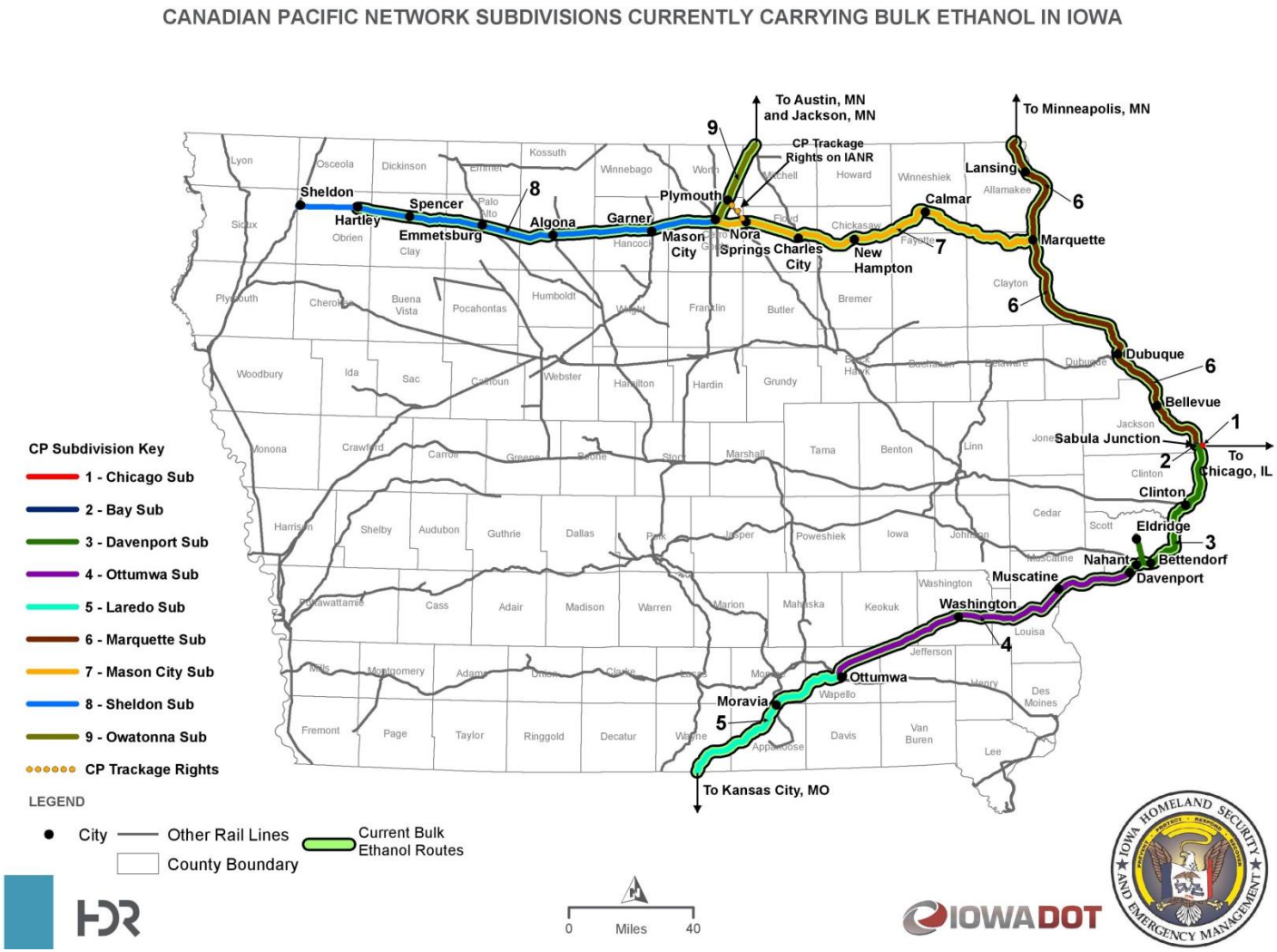
Figure 11. CN Network Subdivisions Currently Carrying Bulk Ethanol in Iowa



Canadian Pacific Railway (CP)

The characteristics of the CP rail network currently carrying bulk ethanol in Iowa, to the extent known, are identified in Appendix D. Railroad operating subdivisions of CP currently carrying bulk ethanol in Iowa are identified in Figure 12 below.

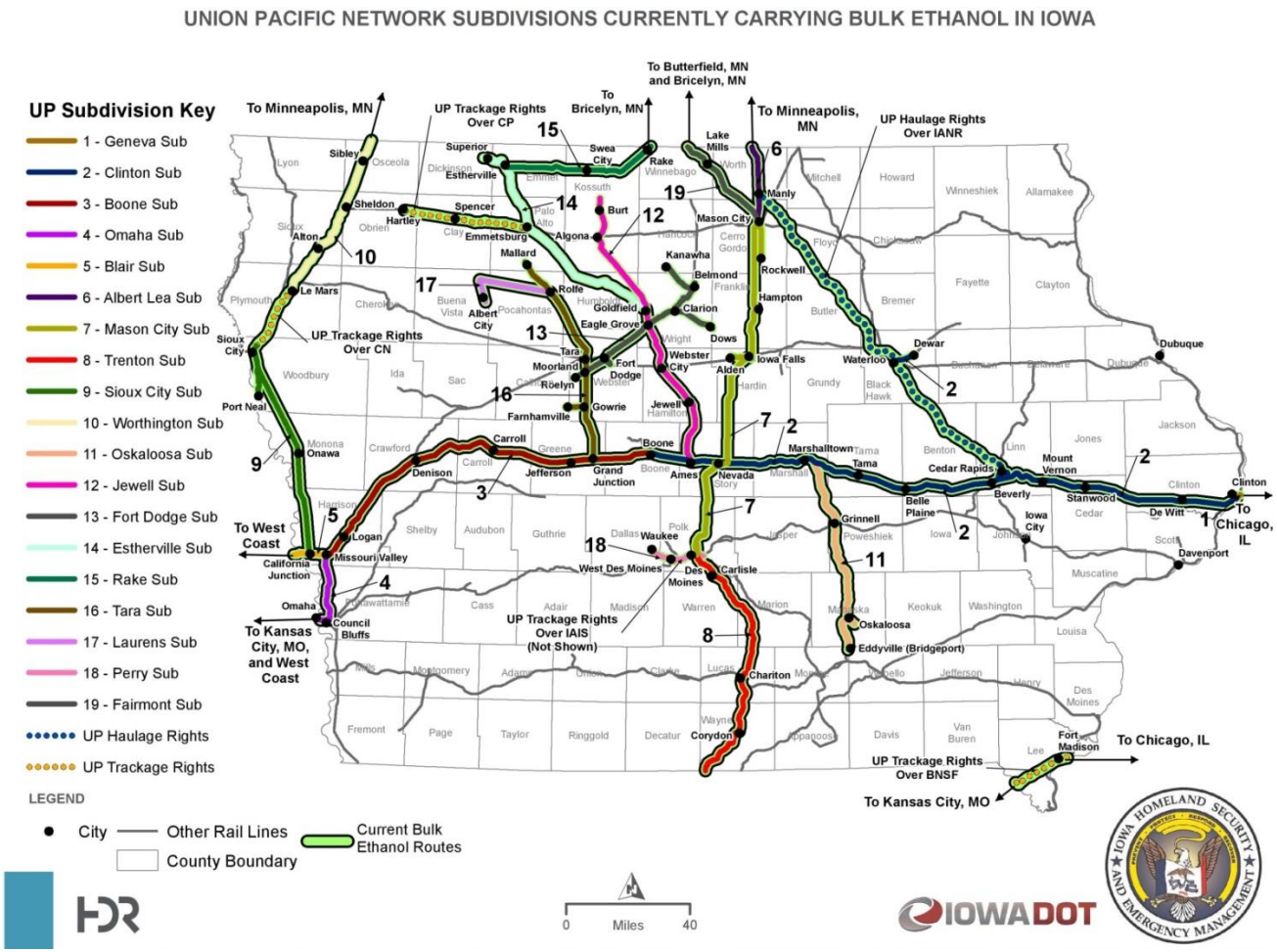
Figure 12. CP Network Subdivisions Currently Carrying Bulk Ethanol in Iowa



Union Pacific Railroad (UP)

The characteristics of the UP rail network currently carrying bulk ethanol in Iowa, to the extent known, are identified in Appendix D. Railroad operating subdivisions of UP currently carrying bulk ethanol in Iowa are identified in Figure 13 below.

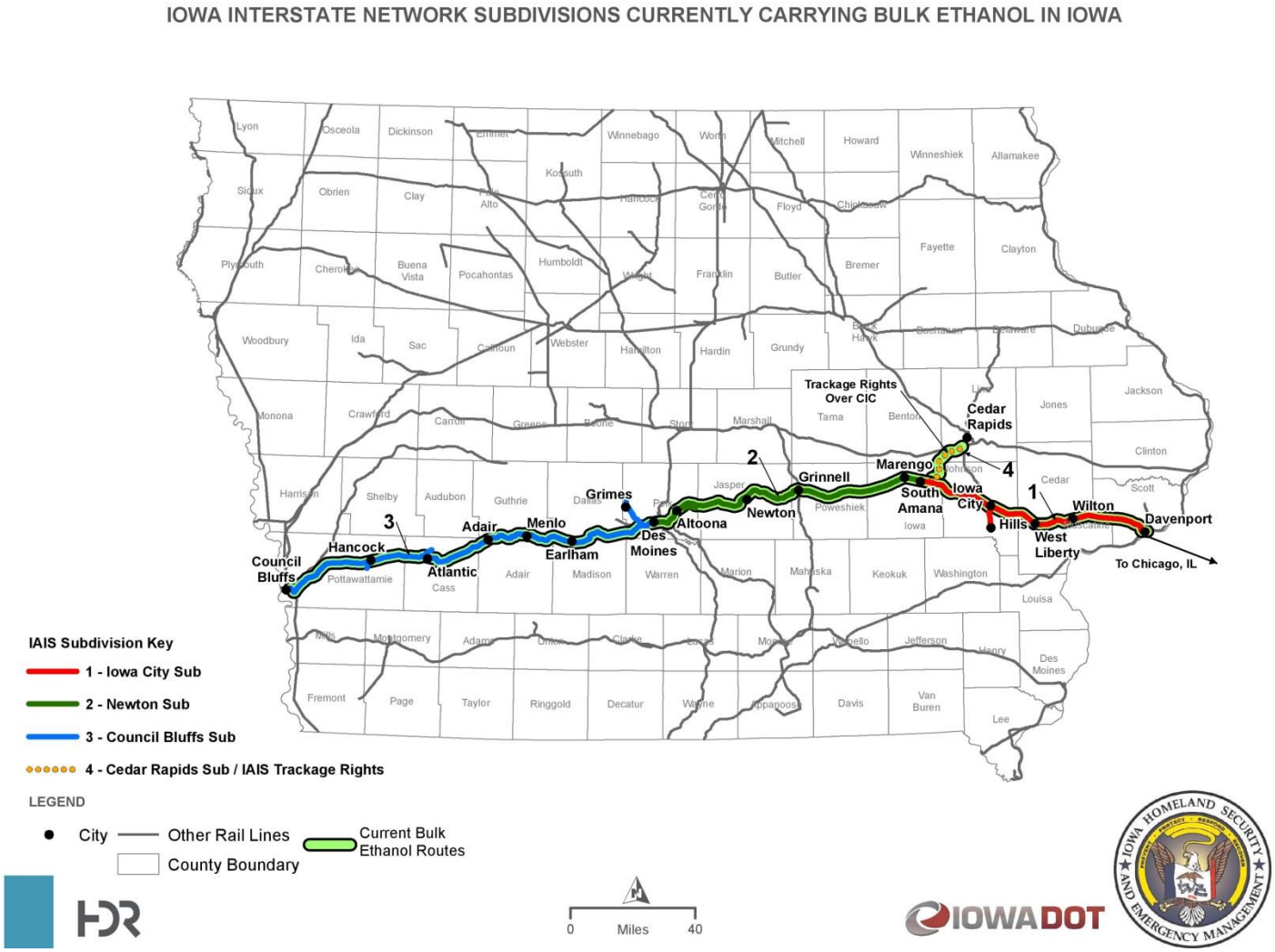
Figure 13. UP Network Subdivisions Currently Carrying Bulk Ethanol in Iowa



Iowa Interstate Railroad (IAIS)

The characteristics of the IAIS rail network currently carrying bulk ethanol in Iowa, to the extent known, are identified in Appendix D. Railroad operating subdivisions of IAIS currently carrying bulk ethanol in Iowa are identified in Figure 14 below.

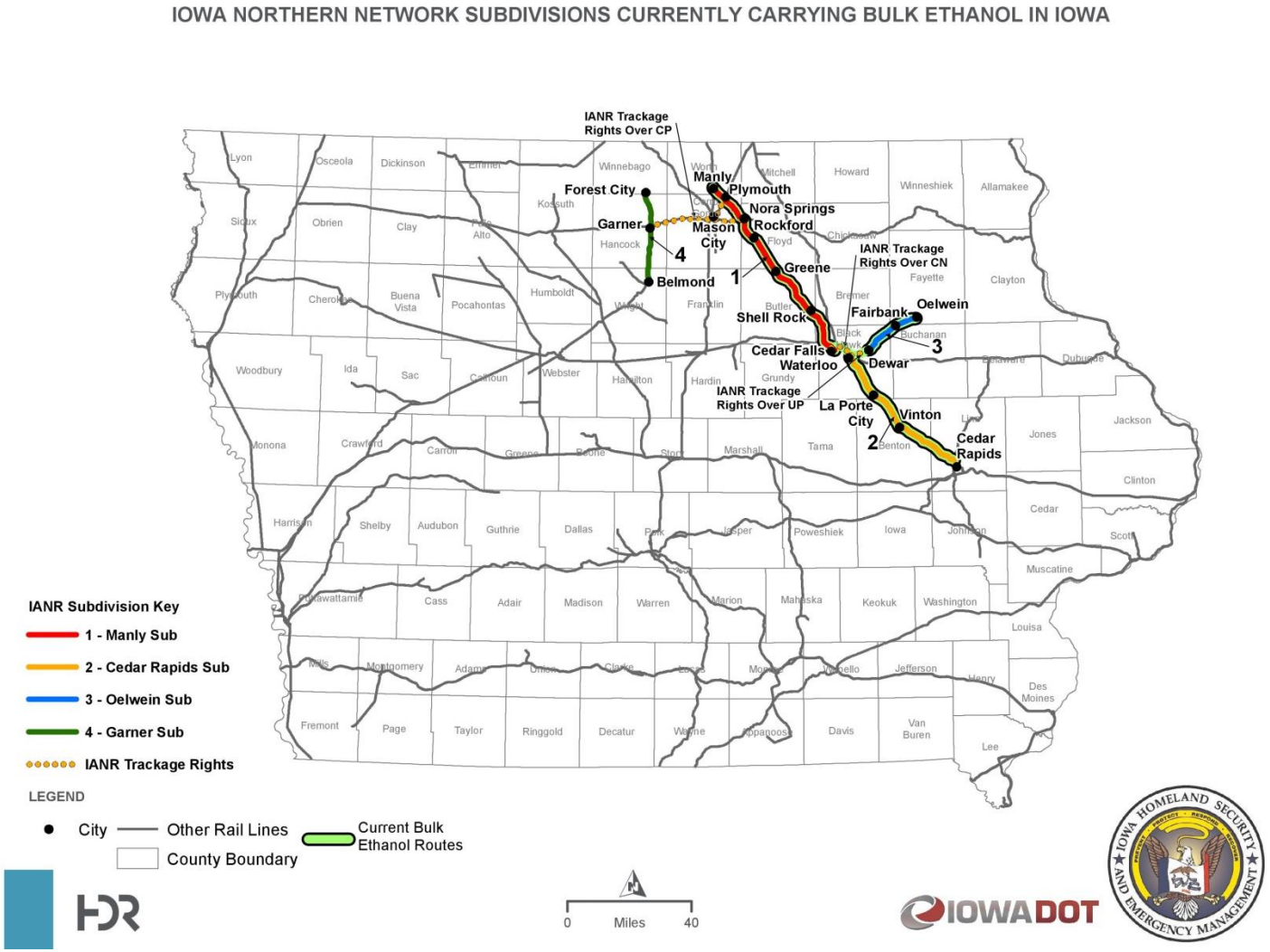
Figure 14. IAIS Network Subdivisions Currently Carrying Bulk Ethanol in Iowa



Iowa Northern Railway (IANR)

The characteristics of the IANR rail network currently carrying bulk ethanol in Iowa, to the extent known, are identified in Appendix D. Railroad operating subdivisions of IANR currently carrying bulk ethanol in Iowa are identified in Figure 15 below.

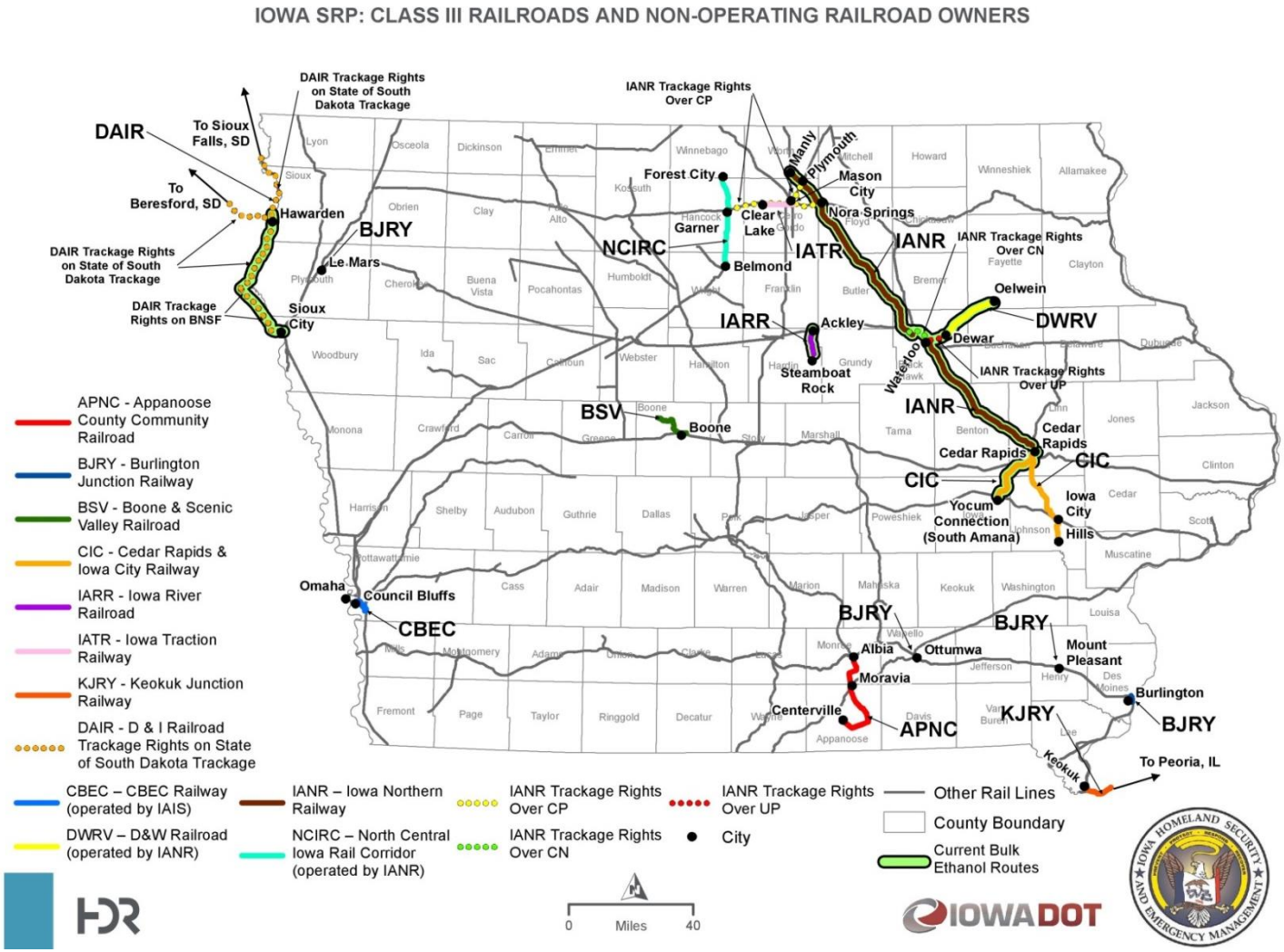
Figure 15. IANR Network Subdivisions Currently Carrying Bulk Ethanol in Iowa



Other Short Line Railroads

The characteristics of the rail network of other short line railroads currently carrying ethanol in Iowa, to the extent known, are identified in Appendix D. Other short line railroads currently carrying ethanol in Iowa are identified in Figure 16 below.

Figure 16. Other Short Line Railroads Currently Carrying Ethanol by Rail in Iowa



9.5 Risk Reduction Programs Identified by Iowa Railroads

Iowa's railroads utilize programs and practices to identify and improve safety, operations, and other risks on their networks in the state. During interviews conducted for this Study, the state's railroads identified some of these routine risk reduction programs and practices. These and others that are likely to be utilized by the state's railroads transporting crude oil and ethanol by rail are included in the descriptions below.

9.5.1 Derailment Prevention via Track Inspection and Improvements

Iowa's railroads routinely inspect infrastructure for defects that could potentially cause a train derailment or other incidents.

Routine track inspections, as mandated by federal regulations enumerated in 49 CFR 213.233, are conducted by a designated track inspector and are used to identify potential defects to track structure and the best means of correction. A track inspector is designated by the Federal Railroad Administration (FRA) as one who "inspects and monitors functions of railroad track and structures to assure compliance with Federal safety and health regulations among railroads, railroad employees, and contractors to railroads within an assigned geographical territory[51]." Iowa railroads have one or more designated track inspectors that inspect main tracks and sidings on a schedule and at an interval associated with the designated FRA Class of Track on each rail line segment in Iowa, as generally described in Table 1 below. Some of Iowa's railroads interviewed for the Study indicated that additional track inspections might be performed in the case of inclement weather, flooding, or a train derailment, or immediately preceding a unit train carrying ethanol.

Table 1. Main Track Inspection Requirements by FRA Class of Track

FRA Class of Track	Maximum Authorized Train Speeds	Number of Times Track Inspected per Week and Inspection Intervals
1	10 mph freight / 15 mph passenger	Weekly with at least three calendar days interval between inspections, or before use, if the track is used less than once a week, or twice weekly with at least one calendar day interval between inspections, if the track carries passenger trains or more than 10 million gross tons of traffic during the preceding calendar year.
2	25 mph freight / 30 mph passenger	Weekly with at least three calendar days interval between inspections, or before use, if the track is used less than once a week, or twice weekly with at least one calendar day interval between inspections, if the track carries passenger trains or more than 10 million gross tons of

[51] USDOT – FRA, *Track Inspector*, https://www.fra.dot.gov/Page/P0374

FRA Class of Track	Maximum Authorized Train Speeds	Number of Times Track Inspected per Week and Inspection Intervals
		traffic during the preceding calendar year.
3	40 mph freight / 60 mph passenger	Weekly with at least three calendar days interval between inspections, or before use, if the track is used less than once a week, or twice weekly with at least one calendar day interval between inspections, if the track carries passenger trains or more than 10 million gross tons of traffic during the preceding calendar year.
4	60 mph freight / 80 mph passenger	Twice weekly with at least one calendar day interval between inspections.
5	80 mph freight / 90 mph passenger	Twice weekly with at least one calendar day interval between inspections.

In addition to the designated track inspectors of the railroads, the FRA has track inspectors, as described earlier in this report. Generally, FRA inspects segments of the Iowa railroad network at regular intervals. The track inspections and evaluations are prioritized based on tonnage traveling over a segment and whether or not a segment carries hazardous materials. A special emphasis for FRA track inspections is given to routes carrying crude oil and to routes that have had the most defects in past inspections. FRA Region 6 has jurisdiction over Iowa's railroad network. Region 6 is based in Kansas City, Missouri, and has additional offices in Council Bluffs, Iowa, and St. Louis, Missouri. Region 6 has approximately 55 inspectors that cover a multi-state area that includes Iowa. FRA track inspectors regularly coordinate with Iowa's railroads and Iowa DOT, as described below.

In addition to the railroads and the FRA, Iowa DOT has two track inspectors that inspect the Iowa railroad network, independently and in coordination with the state's railroads and the FRA. Iowa Code requires that Iowa DOT track inspectors inspect all main tracks in the state's general rail system once annually. During an interview conducted for the Study, Iowa DOT track inspectors indicated that DOT prioritizes track inspections based upon past history of derailments and other incidents, past history of defects, existing freight railroad tonnage over a given segment, and whether or not a route hosts passenger trains. Iowa DOT track inspectors indicated that they inspect the BNSF Creston and Ottumwa subdivisions – over which Amtrak operates a pair of passenger trains daily – twice a year, and that the goal was to inspect routes carrying crude by rail twice a year.

The routine track inspections made by designated railroad and state track inspectors described above are visual, and may not reveal the existence of potential issues concerning internal track defects and a number of track geometry considerations. Many of Iowa's railroads interviewed during the Study employ rail detection vehicles at longer intervals to identify these rail defects and failures. Federal law "requires that internal rail inspections on Class 4 and 5 track, and Class 3 track hosting regularly scheduled passenger trains or that is a hazardous materials route, not exceed a time interval of 370 days between inspections or a tonnage interval of 30 million gross

tons, whichever is shorter[52]." Some of Iowa's railroads, at their discretion, may use a rail detection and track geometry vehicle more frequently than required by federal law, as part of a risk management, track maintenance, or general safety program.

Some of Iowa's railroads interviewed for the Study own their own rail detection vehicles, while others use vehicles owned by other railroads or use the services of a contractor with a vehicle. The FRA also has a rail detection and track geometry vehicle that operates over the national rail network, including segments in Iowa, year-round to identify potential rail defects and failures. The Iowa DOT has coordinated with Iowa's railroads and the FRA on past track inspection programs for the state's rail network, including a two-week program (CORTEx, Crude Oil Route Track Examination) in spring 2015, in which FRA and DOT inspected routes in Iowa that carry crude by rail and other high energy commodities.

Iowa railroads interviewed during the Study identified the following general track improvements that have been made, or could potentially be made in the future, to reduce the risk of train derailments and other safety and operating risks on routes carrying crude by rail and ethanol:

- Replacement of lighter rail sections (i.e. 75-100 lbs. / yd.) with heavier rail sections (i.e. 110-136 lbs. / yd.) on main tracks and sidings
- Replacement of jointed rail sections on main tracks and sidings – which are typically 39 feet in length, connected by bolted joint bars at the end of each rail section, and prone to cracking and other rail flaws and defects at the ends – with continuous welded rail that is free of joints. Continuous welded rail is either new rail or secondhand rail that was checked for internal rail flaws and defects before installation
- Cascade main track rail into yard tracks during replacement programs
- Replacement of rail in road/rail grade crossing surfaces, which can be prone to corrosion and breaks caused by road salt used to melt ice and snow on roadways in winter
- Elimination of bridge joints, which are rail joints typically within 500 feet of a bridge approach, or on the bridge itself, which can fail under stress created by non-uniform loading on an approach to a bridge or on the bridge itself
- Replacement of ties in main tracks and sidings, including hardwood ties on main tracks, sidings, and yard tracks, and some application of steel ties in railroad yards
- General improvements to track surface
- Replacement of main track turnouts
- Installation of switch point protectors on main track turnouts
- Installation of switch point indicators on select main track turnouts on lines that do not have a wayside signal system
- Installation of a fixed derail device on industry trackage at a location with a turnout to a railroad main track or siding to avoid the unnecessary movement of

[52] 49 CFR Part 213 (Final Rule); January 24, 2014

standing cars from an industry track and onto a main track or siding used for trains to meet and pass

- Installation of additional wayside asset protection devices to mitigate against potential rail equipment defects and failures and associated rail damage, including Wheel Impact Load Detectors (WILD)
- Upgrade of active warning devices at public grade crossings to include flashing light signals and gates, closure of public grade crossings, or grade separation of public grade crossings

9.5.2 Derailment Prevention via Bridge and Structures Inspection and Improvements

Iowa's railroads typically make a general visual inspection of railroad bridges and other structures during the routine track inspections made by a designated track inspector as noted in earlier in this section. Additional bridge inspections may be conducted in the case of inclement weather, flooding, or a train derailment. Iowa railroads must also adhere to federal law concerning railroad bridge safety and assurance, qualifications and designation of responsible bridge engineers and inspectors, capacity of bridges, bridge inspections, repair and modification of bridges, and bridge management programs as outlined in 49 CFR Part 237. More comprehensive inspections of bridges and other structures are facilitated at longer intervals and typically include an emphasis on structural condition, identification of short- and long-term maintenance needs, and bridge ratings. Iowa railroads interviewed during the Study conduct the comprehensive inspection of bridges independently and/or through a qualified contract railroad bridge inspector.

Iowa railroads interviewed during the Study identified the following general bridge and structures improvements that have been made, or may be made in the future, to reduce the risk of train derailments and other safety and operating risks on routes carrying crude by rail and ethanol:

- Acquire updated load rating data for bridges and other structures
- Upgrade bridges and other structures to accommodate railcars with heavier maximum allowable gross weights of 286,000 lbs., which has become an industry standard capacity for railroad equipment (268,000 lbs. was the previous industry standard capacity; Iowa's railroads have been in the process of upgrading bridges to handle 286,000 lb. gross weight cars since the 1990s).
- Convert open deck bridges to ballast deck bridges to improve train ride quality and general track geometry.
- Replace wooden-pile bridge structures with corrugated metal pipes, pre-stressed concrete structures, and steel bridges.

9.5.3 Grade Crossing Inventory, Risks and Incident Trends, and Programs

Inventory

According to the FRA's inventory of at-grade crossings, there are a total of 4,331 public at-grade road/rail crossings and an additional 745 public crossings that are grade separated in Iowa. The number of private at-grade road/rail crossings in Iowa is not confirmed. The type of warning devices at Iowa's public at-grade crossings is identified in Table 2 below.

Table 2. Types of Warning Devices at Iowa Public At-Grade Crossings

Warning Device Type	Gates	Flashing Lights	Bells	Special Warning	Stop Signs	Crossbucks	Other	None
Number of Crossings	1,010	794	19	19	423	2,042	2	20

Source: FRA Office of Safety Analysis

The Table 2 above shows that slightly less than half of all public at-grade crossings in Iowa have active warning devices such as gates, flashing lights, and bells, while more than half of crossings have passive warning devices such as crossbucks and/or stop signs or no warning systems. An inventory of the specific number and classification of grade crossings over railroads lines potentially carrying crude by rail and ethanol in Iowa was not assembled for this Study.

Risks and Incident Trends

Iowa's at-grade crossings provide an intersection between active railroad operations and vehicular and pedestrian traffic on roadways. The most common risk at grade crossings is a collision between a moving train and a vehicle. Depending upon a train's length and tonnage, the speed at which it is operating, and other considerations including sight distances and weather conditions, it may take a train a mile or more to come to a complete stop to avoid a potential collision with a vehicle. Collisions can result in an incident (including a derailment and release of a hazardous material such as crude oil or ethanol), and fatalities and injuries to railroad employees, motorists, and pedestrians.

Table 3 below shows the number of road/rail grade crossing incidents, fatalities, and injuries, which have occurred at public at-grade crossings in Iowa over the last decade (2005-2014). These figures represent the entire Iowa railroad network and not just routes potentially carrying crude oil and networks carrying ethanol in Iowa. Incidents that involve trains carrying ethanol and crude oil have not been separately reported.

Table 3. Road/Rail Incidents in Iowa (2005-2014)

Road/Rail Incidents	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Incidents	77	69	82	72	52	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 that a significant decrease in the average number of total incidents and injuries, comparing the initial and latter 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.

Programs

General improvements to public road/rail grade crossings in Iowa are typically made with assistance from federal, state, and local funding sources.

Iowa DOT administers several loan and grant programs and state-sponsored rail investment programs to railroads in Iowa, as identified below:

- Railroad Revolving Loan and Grant Program: Provides, among other things, assistance for the restoration, conservation, improvement, and construction of railroad main lines, branch lines, switching yards, sidings, rail connections, intermodal yards, highway grade separations, and other rail-related improvements.
- Highway-Railroad Grade Crossing Safety Program: This federally funded program provides financial assistance to states for improvement of rail crossings over roadways.
- Highway-Railroad Grade Crossing Surface Repair Program: This state-funded program is similar to the federally funded crossing safety fund.
- Primary Road Highway-Railroad Grade Crossing Repair Program: This state-funded program is designed to assist with surface improvements at road/rail crossings on the primary road system.

Iowa railroads interviewed during the Study identified the following general programs and improvements that have been made, or may be made in the future, to reduce the risk of train derailments and other safety and operating risks at grade crossings on routes carrying crude by rail and ethanol:

- Continue to identify strategies and local, state, and federal sources to assist with the funding necessary to upgrade signage, active warning devices, and crossing surfaces and roadway approaches at grade crossings, and to potentially grade separate or close high-risk or high-traffic road/rail grade crossings. Emphasis was made on taking advantage of the funding programs administered by Iowa DOT that are described earlier in this section.
- Continue to maintain railroad emergency contact information signage and a federal DOT grade crossing number for unique identification at each grade crossing in Iowa.
- Continue to promote public safety and grade crossing awareness in the communities served by the railroads, which may involve coordination with Operation Lifesaver in Iowa.

9.5.4 Mechanical Defects

Iowa's railroads inspect railroad tank cars used in the transportation of crude oil and ethanol at regular intervals as prescribed by federal regulations, railroad operating rules, and other practices used by railroads to identify potential mechanical defects and/or loading/unloading device defects. Iowa's ethanol producers and receivers provide additional inspections before loading or unloading a railcar. While there are no crude oil shippers or receivers in Iowa at present, crude oil shippers and receivers outside of the state would provide inspections similar to those performed by ethanol shippers and receivers in Iowa.

Mechanical defects on a railcar used to transport crude oil or ethanol by rail are typically identified by a railroad or a shipper. This may include a cracked wheel, safety appliance defects (such as bent handholds used by train crews to ride on cars during switching events), structural defects (such as damaged rail car frame), loading and unloading device defects (such as leaky valves), and insufficiently or improperly displayed hazardous materials placards.

Additional mechanical inspections may be conducted in the case of a railroad incident or accident (such as a train derailment) or when there is suspicion of a potential defect at any other time in the transportation cycle not outlined above.

Iowa railroads interviewed during the Study identified the following general improvements that have been made, or could potentially be made in the future, to reduce the risk of train derailments and other safety and operating risks due to mechanical defects on railcars traveling over routes carrying crude oil and ethanol in Iowa:

- Continued use of a Qualified Mechanical Inspector (QMI) to assist train crews with a Class I brake test and initial terminal inspection of railcars loaded with ethanol, as identified by FRA Emergency Order 30 and FRA Safety Advisory 2015-01.
- Development of strategies for assuring that ethanol producers/shippers are equally responsive to maintenance issues related to railroad tank cars.
- Increased monitoring of potential leaks on bottom outlet valves on railroad tank cars used in ethanol transportation. Defective bottom outlet valves can develop leaks about 24 hours after the railcar has been loaded with ethanol, and after the railroad has received the car from the producer.
- Increased monitoring of potential cracking in side bearing cages on railroad tank cars.
- Continued focus on identification and repair of empty tank cars with condemnable wheels.
- Assure that producers/shippers and railroads are sufficiently or properly displaying hazardous materials placards on railroad tank cars carrying ethanol.
- Greater vigilance in identifying potential mechanical defects and human factor issues as a means of minimizing train derailments and other accidents.
- Continued maintenance of detailed railcar inspection documentation.

Iowa ethanol producers/shippers interviewed during the Study identified the following general improvements that have been made, or could potentially be made in the future, to reduce the risk of train derailments and other safety and operating risks due to mechanical defects on railcars traveling over routes carrying ethanol in Iowa:

- Increased monitoring of potential mechanical issues or loading/unloading device defects.
- Greater vigilance in identifying potential mechanical defects and human factor issues as a means of minimizing train derailments and other accidents.
- Continued maintenance of detailed railcar inspection documentation. Many rail producers/shippers in Iowa use an inspection checklist as the basis for inspection of empty railcars before loading. Inspection checklists typically vary from shipper to shipper.
- Reduce the number of bad order empty cars that are received from a railroad for use in loading at an ethanol producing facility.

9.6 Other Risk Reduction Programs

This section identifies other regulations and practices to improve safety, operations, and other risks on railroads in the state. During interviews conducted for this Study, the Federal Railroad Administration (FRA) and other agencies identified some of these routine risk reduction regulations and practices. Those that are likely to be utilized by the state's railroads transporting crude oil and ethanol by rail are included in the descriptions below.

9.6.1 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 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 for operation over the lines.

Class I railroads are currently developing PTC systems for their networks, which would include implementation of the technology on principal lines in Iowa. As an example, a route that hosts bulk crude oil and ethanol shipments in Iowa was targeted for the first implementation of a PTC system on the CP network. CP selected its Ottumwa Subdivision for a pilot program and anticipated that it would receive FRA approval to begin revenue service test runs of the system before the end of 2015. CP anticipates that it will next implement a PTC system on its connecting Davenport and Laredo subdivisions in Iowa.

Congress has considered several bills that would extend the 2015 deadline of the Act. In October 2015, Congress passed H.R.38 19 - 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 PTC. [53]

[53] Association of American Railroads- Positive Train Control: https://www.aar.org/policy/positive-train-control