

FINAL

# Eight-County Freight Plan

## Working Paper 4: Recommendations

Prepared for:

East Central Intergovernmental Association  
Blackhawk Hills Regional Council

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### Eight-County Freight Plan

The objective of the Eight-County Freight Plan is to develop a better understanding of the multimodal freight system in the bi-state region and to use that information to better inform policy and programming decisions.

### Working Paper

This Working Paper is the fourth in a series of four that together inform the Plan. This Working Paper provides recommendations for projects, programs, policies, and partnerships intended to improve the movement of freight in the bi-state region.

### Acknowledgments

The CPCS Team acknowledges and is thankful for the input of those consulted in the development of this Working Paper, as well as the guidance and input of representatives from ECIA, BHRC and their study partners.

### Opinions

Unless otherwise indicated, the opinions herein are those of the authors and do not necessarily reflect the views of ECIA or BHRC.

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# Acronyms / Abbreviations

BCA	Benefit-Cost Analysis
BHRC	Blackhawk Hills Regional Council
CFP	Illinois Competitive Freight Program
CMAQ	Congestion Mitigation and Air Quality
CRFC	Critical Rural Freight Corridors
CUFC	Critical Urban Freight Corridors
DOT	Department of Transportation
ECIA	East Central Intergovernmental Association
FAF	Freight Analysis Framework
FAST Act	Fixing America’s Surface Transportation Act
GCPF	Grade Crossing Protection Fund
HTF	Highway Trust Fund
IA	Iowa
ICAAP	Iowa Clean Air Attainment Program
IL	Illinois
INFRA	Infrastructure for Rebuilding America
LIFTS	Linking Iowa’s Freight Transportation System
NHFN	National Highway Freight Network
NHFP	National Highway Freight Program
NHS	National Highway System
PHFS	Primary Highway Freight System
Plan	Eight-County Freight Plan
Region	Eight-County Region
RRIF	Railroad Rehabilitation and Improvement Financing
TIFIA	Transportation Infrastructure Finance and Innovation Act
TIGER	Transportation Investment Generating Economic Recovery
US	United States
USACE	United States Army Corps of Engineers

# Project Sponsors



# Executive Summary

## 1.1 Eight-County Freight Vision, Goals and Objectives

The Eight-County Freight Plan recommendations were formed by considering the vision for the Region’s freight system, and how strategic actions by East Central Intergovernmental Association (ECIA), Blackhawk Hills Regional Council (BHRC) and other study partners could advance that vision. The Eight-County Freight System Vision is an aspirational future point for the transportation system and was formed through a collaborative process with the Freight Study Steering Committee.

**Eight-County Freight System Vision:** The Eight-County Multimodal Freight System supports quality of life, growth and enables business retention and attraction, by providing safe, efficient, and reliable connections to regional, national, and global markets today and in the future.

## 1.2 Freight Plan Recommendations

The Eight-County Freight Study recommends that ten (10) strategic actions be taken as result of the thorough quantitative and qualitative analysis conducted. These recommendations support and advance the Vision established for the freight system, and directly address the freight system needs, issues and challenges identified during Plan development. These recommendations have been grouped within the categories of projects, programs, policies and partnerships.

### 1.2.1 Project Recommendations

Infrastructure investments that could benefit freight system users were identified through data analysis, review of established state and local planning documents, and then validated through stakeholder consultations. The majority of infrastructure investments identified relate to simply ensuring that the existing system is well maintained and that spot improvements are made to improve safety. There is the potential need in the future for major new investments along two key east-west corridors that connect the Region to centers of transload and consolidation activity, including existing centers of Rockford, Rochelle, and Greater Chicago, and the burgeoning development in Cedar Rapids (i.e., Cedar Rapids Logistics Park). Three key project-related recommendations have been identified that ensure strategic infrastructure investments are made and to ensure that funding is available to advance those investments.

**Recommendation 1: Advance roadway projects that provide benefits to freight users.**



**Recommendation 2: Advocate for multimodal improvements to the Eight-County freight transportation system.**

**Recommendation 3: Advocate for adequate funding and investment to maintain and improve the freight transportation system.**

### 1.2.2 Program Recommendations

Neither ECIA nor BHRC construct, own, operate or maintain any part of the freight transportation system, therefore it is important that these agencies advance transparent processes that include outside freight perspectives in their daily activities that influence the system. This will not only produce a more comprehensive assessment and understanding of the freight system and what is needed, but also helps ensure that the solutions that are ultimately advanced are ones that work in the “real world” for freight users. An inclusive approach to freight planning where both public and private sector voices are heard will help minimize opposition to projects and form a foundation of trust for expanded public and private sector partnerships in the future. Three key program-related recommendations have been identified to continue with the collaborative process established during the development of this Eight-County Freight Plan. These recommendations provide an opportunity for long-term engagement within key areas including freight planning, safety, and design. While it is recommended that each ECIA and BHRC take these steps independently, they should also continue to coordinate with each other, across planning boundaries.

**Recommendation 4: Formalize a freight planning program as part of activities to identify and address freight system needs, and to ensure freight system stakeholders are an ongoing and integral part of regional transportation planning processes.**

**Recommendation 5: Ensure that highway and railway safety is considered as part of all freight planning activities.**

**Recommendation 6: Establish and incorporate freight guidelines to ensure infrastructure improvements consider all users of the transportation system.**

### 1.2.3 Policy Recommendations

Truck regulation harmonization between Iowa and Illinois is important to this freight study, as when the system is “harmonized” trucks are allowed unencumbered operations within and beyond the Region, to the benefit of the local economy. While a variety of regulatory barriers exist between Iowa and Illinois, the Eight-County stakeholders have identified inconsistent truck weight limits as the biggest issue and one that keeps companies in Iowa and Illinois on an uneven playing field.

Each of the policy recommendations made go beyond the jurisdiction of ECIA and BHRC and will require close partnership with the states of Iowa and Illinois to advance, as well as advocacy groups such as American Association of State Highway and Transportation Officials (AASHTO) and others.

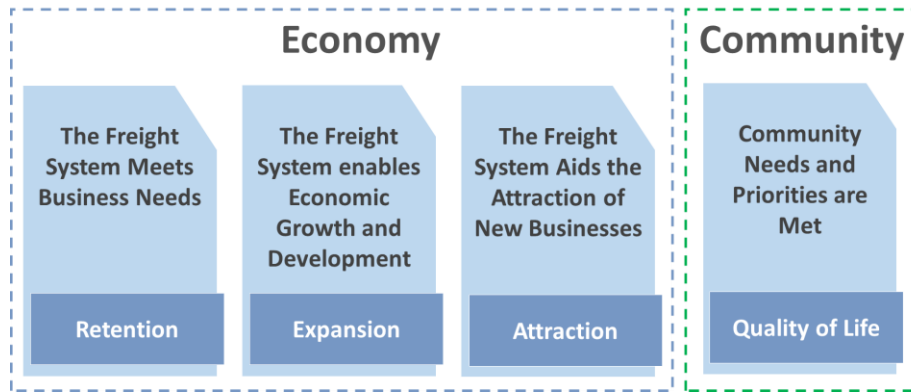
**Recommendation 7: Harmonize overall trucking regulations between Iowa and Illinois for seamless freight operations between the states.**

**Recommendation 8: Harmonize truck weight limits between Iowa and Illinois.**

**1.2.4 Partnership Recommendations**

The Eight-County Freight Plan was sponsored by a consortium of public and private stakeholders that each has an interest in improving the Region. Four goals, shown in Figure ES-1, were established that underpin the Vision for the Eight-County freight system, and align with what is most important to those stakeholders. While the Eight-County Freight Plan is focused on making improvements to the transportation system, these goals underscore that the movement of freight should support and enable the economy while not having adverse impacts on the communities in the Region. As such, not only do the transportation planners of the Region (ECIA and BHRC) have a role in advancing the recommendations of this Plan, but so too does each project sponsor, as well as other public and private stakeholders at the local, regional and state level. Only through working together will the full benefits of Eight-County Freight Plan recommendations be realized.

Figure ES-1: Eight-County Freight Plan Goals



**Recommendation 9: Coordinate with local public sector and industry partners to advocate for and improve the transportation system in the Eight-County Region.**

**Recommendation 10: Support workforce development programs to ensure local businesses have access to skilled employees.**

**1.3 Conclusions and Next Steps**

The Eight-County Freight Plan recommends that ten (10) strategic actions be taken as result of the thorough quantitative and qualitative analysis conducted during the study period. The first of these, Recommendation 1: Advance roadway projects that provide benefits to freight users, is highlighted below as it generally relates to the advancement of key infrastructure projects identified in the Plan, and is specifically focused on taking next steps toward improvements to US 20, US 30 and improvements to Dubuque/East Dubuque area barge terminal operations.

The benefit-cost analysis conducted for these three key project showed that there is “something there” to be explored further. Each project demonstrated benefits that could be commensurate with varying levels of cost. The US 20 and US 30 projects have high benefits, and could support high costs.

The barge terminal improvements have modest benefits, but would have positive benefits if they can be implemented at modest cost.

Securing funding to advance these projects and other projects in the Region is important but could pose challenges. There is a continuous need for transportation funding for the essentials, such as the ongoing maintenance of bridges and pavement in the Eight-County Region. These projects will benefit the freight users of the system, but lack the cachet of major new capital programs leaving little room in tight budgets for system expansion or innovation. New, freight-specific funding sources may provide opportunities to address freight system needs, however many of the current federal grant programs that could be used to supplement local resources (e.g., TIGER or INFRA) are highly competitive.

In the Eight-County Region there are funding opportunities for the three key projects that underwent benefit-cost analysis:

- **US 20 Safety Performance Corridor.** In January 2018, ECIA and BHRC met with the Illinois DOT Secretary and District 2 staff to present the findings of the Eight-County Freight Plan US 20 safety analysis, and stress the need for increased attention to, and investment in, the corridor. Following that meeting, Illinois DOT noted that in the coming year they would fund a Road Safety Audit of the US 20 corridor to better understand where key safety issues exist, as well as identify and advance appropriate countermeasures. While this project was identified to benefit trucks and goods movement, the next steps taken by Illinois DOT will provide benefits to all users of the corridor.
- **US 30 Multimodal Access Corridor.** As part of this study a roundtable was held in Clinton, IA, to better understand key issues and needs in the US 30 corridor. With major development occurring along the corridor to the west of the Eight-County Region (i.e., Cedar Rapids Logistics Park), preserving and enhancing mobility in the corridor was noted as a concern. In January 2018, ECIA discussed next step options for the corridor, and the Iowa DOT agreed to advance a US 30 Corridor Planning and Environmental Linkages (PEL) study to ensure that needs/issues arising due to the development are proactively addressed.
- **Dubuque/East Dubuque Area Marine Terminal Enhancement.** The enhancement of barge terminal capacity at multiple locations in Dubuque and East Dubuque (and as far south as Savanna, IL) has been contemplated. As the Eight-County Freight Plan was being completed, Illinois DOT announced the new, Illinois Competitive Freight Program. The program solicits applications from public sector entities, and aims to fund studies and projects focused on reducing bottlenecks, improving freight safety, improving intermodal access and the deployment of technology. ECIA is in the process of submitting an application for future funding for next steps (a planning study) related to further study of this opportunity, in collaboration with Iowa partners.

While the Eight-County Region has considerable momentum related to key Plan recommendations, it will be important for other planning and policy related recommendations to not sit idle. From a transportation perspective, the major roles of ECIA and BHRC relate to the coordination of long range transportation system planning, forming regional transportation policy, and making programming decisions to best apply federal, state and local transportation dollars to regional needs. In these roles

both ECIA and BHRC have a history of coordinating with local stakeholders. To advance the Eight-County Freight Plan recommendations, their natural facilitator role should be expanded to include key public and private sector stakeholders that have an interest in advancing these recommendations to the benefit of the Region's economy and community quality of life.

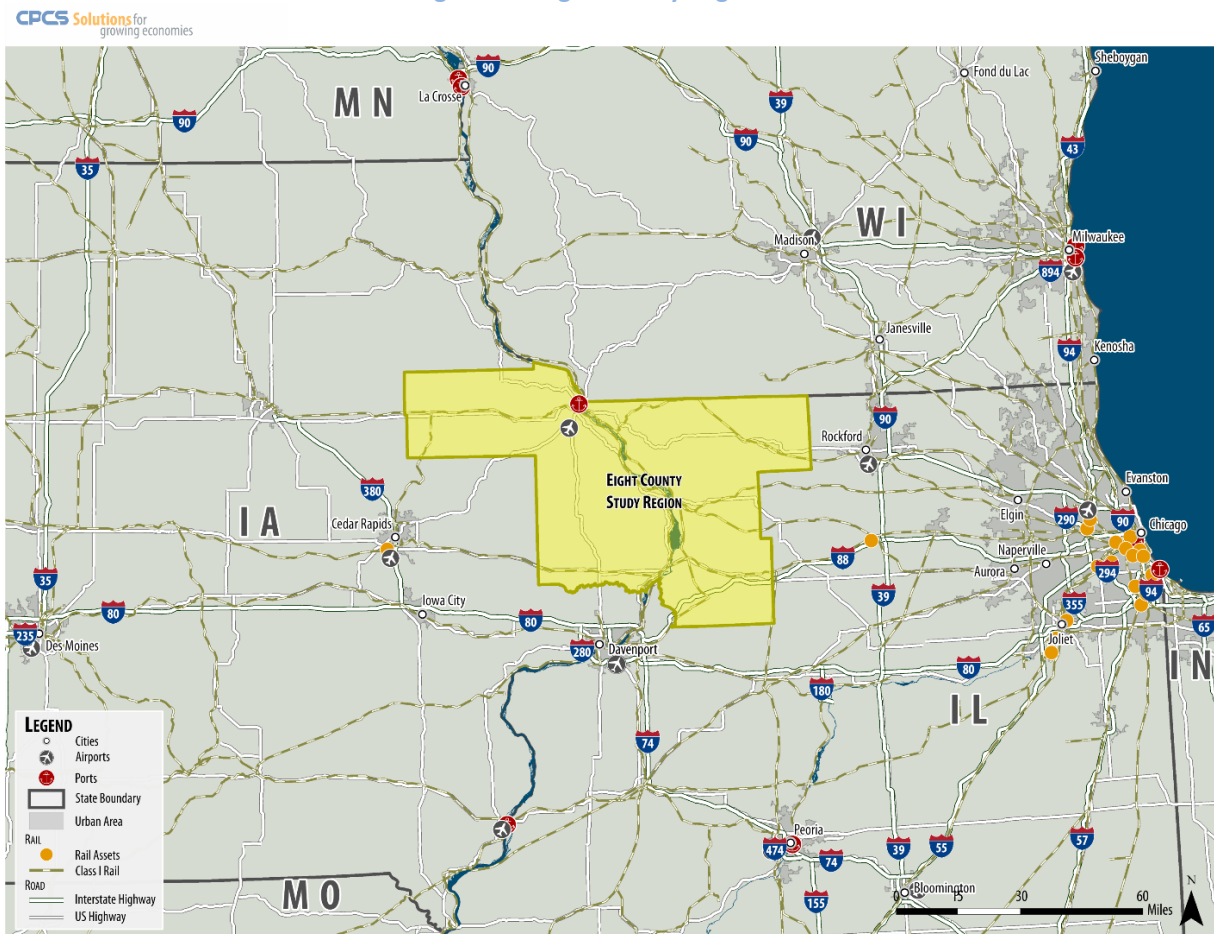
# 1 Introduction

## 1.1 Background

The Eight-County Region, shown in Figure 1-1, is at the heart of major US manufacturing and agricultural activity. The Counties of Carroll, Clinton, Delaware, Dubuque, Jackson, Jo Daviess, Stephenson, and Whiteside rely on the multimodal transportation system of roads, rails, air, and water ports to both supply the inputs needed for production and to transport goods to consumers inside and outside of the Region – driving their local economies.

The efficiency of the transportation system affects the competitiveness and growth potential of the Region. In order to enable the competitiveness of existing, as well as attract new business, the Region must understand how the freight transportation system is linked to the local economy, identify needs on the transportation system and define opportunities to improve freight transportation in local planning and policy decisions.

Figure 1-1: Eight-County Region



Source: National Transportation Atlas Database. Bureau of Transportation Statistics. 2015

## 1.2 Objectives

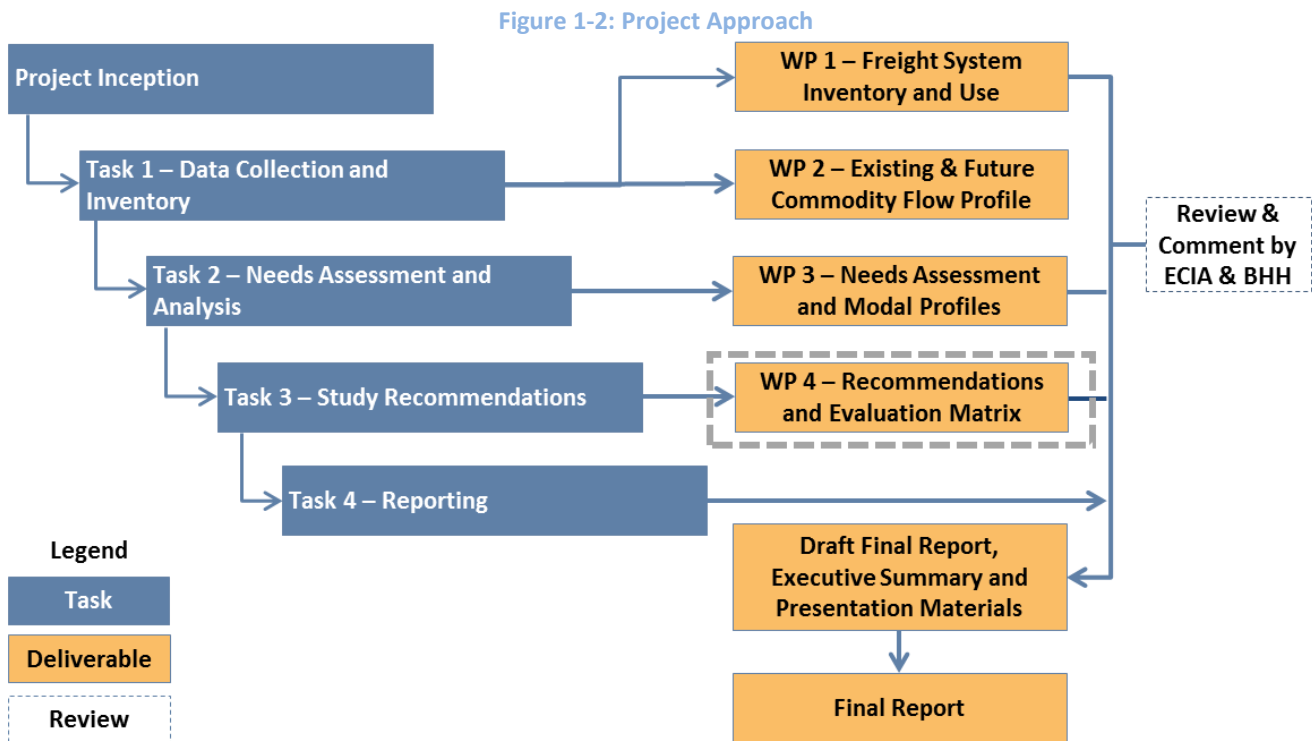
The primary objective of the Eight-County Freight Plan is

to develop a better understanding of the multimodal freight system in the Eight-County Region and to use this information to better inform policy and programming decisions.

Thus, the central output of the study will be the identification of baseline freight movements across modes, the identification of the major freight transportation challenges including truck bottlenecks and how they may impact the performance of key economic sectors, as well as the formulation of recommendations on freight policy and projects that will provide the greatest benefit to the Region. This study will also provide the Region with a means of leveraging freight transportation data to help make better, more informed investment decisions.

## 1.3 Project Structure

The project is to be developed through four broad tasks, as set out in Figure 1-2. The present Working Paper is the output of Task 3 – Study Recommendations.



## 1.4 Purpose of this Working Paper

The purpose of this Working Paper is to provide recommendations for the maintenance and improvement of the Study Area’s freight system. Specifically, it addresses the following key questions:

- Considering how the future freight system may be used, what are the Study Area’s greatest infrastructure investment needs?
- How do the Study Area’s needs align with established short and long-range plans?
- What are the benefits and costs of priority projects?
- What are the Study Area’s other needs (including partnerships, policies, and programs)?

This Working Paper is also intended to provide an overview of progress to date and to solicit comments and other feedback on the structure and content of this component part of what will become the Final Report. Revisions to this Working Paper will be reflected in the Draft Final Report.

## 1.5 Methodology

The recommendations outlined in this Working Paper were derived through comparing overall system needs identified in Working Paper 3 – Needs Assessment with projects and plans previously identified by Iowa and Illinois DOTs and the study partners. These recommendations were presented for vetting to the Freight Study Steering Committee during two separate meetings, and ECIA and BHRC also consulted with county engineering offices to ensure recommendations were in sync with projects and plans they were advancing.

## 1.6 Limitations

Some of the findings in this report are based on the analysis of third party data. While CPCS makes efforts to validate data, CPCS cannot warrant the accuracy of third party data.

# 2 Freight Plan Recommendations

## Key Chapter Takeaway

The Eight-County Freight Plan recommends that ten (10) strategic actions be taken as result of the thorough quantitative and qualitative analysis conducted. These recommendations support and advance the Vision established for the freight system, and directly address the freight system needs, issues and challenges identified during Plan development. These recommendations are:

1. Advance roadway projects that provide benefits to freight users.
2. Advocate for multimodal improvements to the Eight-County freight transportation system.
3. Advocate for adequate funding and investment to maintain and improve the freight transportation system.
4. Formalize a freight planning program as part of activities to identify and address freight system needs, and to ensure freight system stakeholders are an ongoing and integral part of regional transportation planning processes.
5. Ensure that highway and railway safety is considered as part of all freight planning activities.
6. Establish and incorporate freight guidelines to ensure infrastructure improvements consider all users of the transportation system.
7. Harmonize overall trucking regulations between Iowa and Illinois for seamless freight operations between the states.
8. Harmonize truck weight limits between Iowa and Illinois.
9. Coordinate with local public sector and industry partners to advocate for and improve the transportation system in the Eight-County Region.
10. Support workforce development programs to ensure local businesses have access to skilled employees.

## 2.1 Summary of Recommendations

Using the combination of data analysis and stakeholder consultations, a slate of freight plan recommendations was developed. These recommendations, shown in Figure 2-1, are generally grouped within the categories of projects, programs, policies and partnerships (the “4 P’s”).

- **Projects.** Projects represent infrastructure-related recommendations.
- **Programs.** Programs represent recommendations where infrastructure projects have not been identified, but where a thoughtful, methodical approach should be considered in making investments.



- **Policies.** Policies support both project and program recommendations, as often the full benefits of those may not be achieved absent guidance to ensure all parts of the system work together. This is particularly important in this bi-state Region that has policies established by multiple parties, and in some cases these policies are not harmonized.
- **Partnerships.** Stakeholders often find infrastructure-related recommendations to be the most tangible, however likely the most important category of recommendations is “partnerships.” As much of the multimodal freight transportation system is not within the public (or ECIA’s or BHRC’s) domain, partnerships and collaboration will be critical to advancing any efforts off the highway system and where the highway system intersects with other modes and developments. And, in most cases, even projects on the highway system require partnership due to the multiple jurisdictions that have interest, ownership or operations roles in the system.

Each of the general recommendations shown in the figure is presented in more detail in the following subsections.

Figure 2-1: Summary of Freight Plan Recommendations

Projects	Programs
<ul style="list-style-type: none"> <li>• Spot highway improvements to address congestion and safety</li> <li>• Pavement improvements</li> <li>• Bridge improvements</li> <li>• New/improved intermodal, transload and/or port facilities</li> <li>• Lock and dam improvements</li> </ul>	<ul style="list-style-type: none"> <li>• Freight planning program to monitor needs, issues and progress</li> <li>• Programs focused on highway and railway safety (including grade separations)</li> <li>• Programs focused on technology applications to the (freight) transportation system</li> <li>• Programs focused on enhancing skills of local workforce</li> </ul>
Policies	Partnerships
<ul style="list-style-type: none"> <li>• Truck regulation harmonization between Iowa and Illinois</li> <li>• Freight-appropriate design standards</li> </ul>	<ul style="list-style-type: none"> <li>• Establish key partnerships to better understand freight system needs and work toward advancing strategies to improve the Eight-County Regional freight system and its connections</li> </ul>

## 2.2 Project Recommendations

Infrastructure investments that could benefit freight system users were identified through data analysis, review of established state and local planning documents, and then validated through stakeholder consultations. The majority of infrastructure investments identified relate to simply ensuring that the existing system is well maintained and that spot improvements are made to improve safety. There is the potential need in the future for major new investments along two key east-west corridors that connect the Region to centers of transload and consolidation activity, including existing centers of Rockford, Rochelle, and Greater Chicago, and the burgeoning development in Cedar Rapids (i.e., Cedar Rapids Logistics Park). Three key project-related recommendations have been identified that ensure strategic infrastructure investments are made and to ensure that funding is available to advance those investments.

**Recommendation 1: Advance roadway projects that provide benefits to freight users.**

**Recommendation 2: Advocate for multimodal improvements to the Eight-County freight transportation system.**

**Recommendation 3: Advocate for adequate funding and investment to maintain and improve the freight transportation system.**

The supporting details for each of these recommendations is provided below.

**2.2.1 Spot Highway Improvements to Address Identified Congestion and Safety Issues**

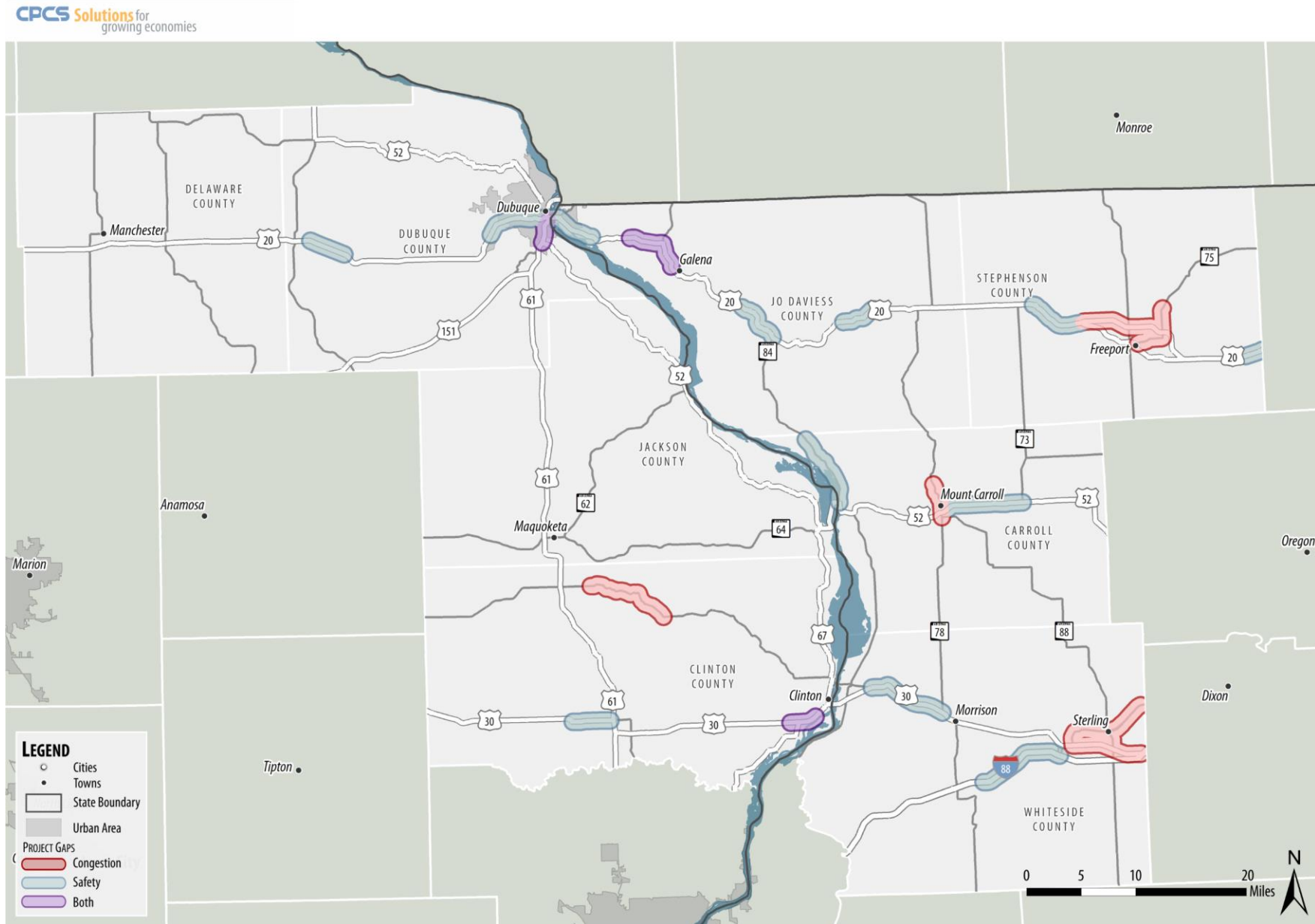
Working Paper 3 – Needs Assessment presented a comprehensive evaluation of the Eight-County Region’s highway system through both freight congestion and freight safety lenses. The results of the analyses were overlaid upon each other to better understand where unique congestion or safety issues occur, as well as where these issues overlap with each other. This information was then compared against ECIA’s Long Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP), and transportation plans provided by BHRC on behalf of local agencies, so that where projects were actively being advanced, they could be removed from the listing of project needs/gaps. As shown in the following figures, eighteen (18) corridor segments were identified using congestion and safety related criteria. Following these figures is additional information on recent efforts to improve US 20, US 30 and US 151. While important, other identified routes have not had similar levels of planning/project advancement associated with them.

Figure 2-2: Congestion and Safety Related Project Listing

ID	Route	Location	Issue Type
1	US 20	Old Castle Road to Old Hawkeye Road (Between Farley and Dyersville)	Safety
2	US 20	North Cascade (west end of Dubuque) to US 20 Frontage Road (East Dubuque)	Safety
3	US 20	N. Main Street to Franklin Street (North of Galena)	Safety, Congestion
4	US 20	Tapley Woods to IL-84 junction	Safety
5	US 20	Woodbine to S. Logemann Road	Safety
6	US 20	W. Salem Road to N. Bolton Road (Eleroy area)	Safety
7	US 20	Freeport Area (Includes IL-75)	Congestion
8	US 20	Farwell Bridge Road to Stephenson County Line	Safety
9	US 30	Grand Mound to DeWitt	Safety
10	US 30	Downtown Clinton	Safety, Congestion
11	US 30	IL-136 junction to IL-78 junction	Safety
12	US 30	Sterling/Rock Falls Area (includes IL-2 and IL-40)	Congestion
13	US 151	Dubuque Area	Safety, Congestion
14	IA-136	Delmar to Charlotte	Congestion
15	IL-78	Lowden Road to IL-40 (Mount Carroll area)	Congestion
16	US 52	Mount Carroll to Lanark	Safety
17	IL-84	Savanna to Jo Daviess County Line	Safety
18	I-88	IL-78 to Lincoln Road	Safety

Source: CPCS Analysis of ATRI Truck GPS data, and Iowa DOT and Illinois DOT crash data.

Figure 2-3: Congestion and Safety Related Project Map



Source: CPCS Analysis of ATRI Truck GPS data, and Iowa DOT and Illinois DOT crash data.

## US 20

US 20 has been flagged for several reasons in this Plan, including the limited capacity of the route – particularly on 2-lane sections between Freeport and northern Galena and the 2-lane Julien Dubuque Bridge, congestion in the Dubuque area and during peak tourist season in Illinois, and safety concerns due to roadway design, narrow and deteriorated shoulders, and reduced visibility on hills and curves. Some projects are advancing along several segments of US 20 including:

- Old Castle Road to Old Hawkeye Road (Between Farley and Dyersville)
  - Iowa DOT recently completed interchange at X49 in Dyersville.
- North Cascade (west end of Dubuque) to US 20 Frontage Road (East Dubuque)
  - Iowa DOT is building an interchange at Swiss Valley Road and N. Cascade Road. This project will be completed by 2019.
  - Iowa DOT is building US 20 interchange at Seipple Road and will have a controlled access between Swiss Valley Rd and Seipple Road.
  - Iowa DOT is making improvements at Old Highway as part of US 20 improvements.
  - Iowa DOT completed a planning level study on US 20 between Peosta and NW Arterial.

No steps have been take to address the 2-lane Julien Dubuque Bridge.

US 20 was deemed by stakeholders as a corridor warranting additional analysis as part of this study. As shown in Section 3, a benefit-cost analysis was conducted for the 2-lane corridor between Freeport and East Dubuque to determine the costs that could be invested to achieve improved freight efficiency and safety in this corridor.

## US 30

US 30 is a key east-west route connecting DeWitt, IA, Clinton, IA, Morrison, IL, and Sterling/Rock Falls, IL, to each other, as well as to the burgeoning logistics center in Cedar Rapids, IA (i.e., Cedar Rapids Logistics Park). US 30 is mostly two-lane, with the exception of a 20 mile, four-lane expressway between DeWitt, IA and Clinton, IA, and area stakeholders have noted that US 30 condition, safety and connectivity limits their ability to maintain and attract new businesses. Some progress is being made to address area concerns related to US 30, namely that Iowa DOT will be conducting a Planning and Environmental Linkages (PEL) Study. The Study will cover the following activities:

- Evaluate improvement strategies.
- Consider environmental and economic impacts.
- Include public involvement and agency coordination.
- Develop implementation plan for best strategy.

US 30 was deemed by stakeholders a corridor warranting additional analysis as part of this study. As shown in Section 3, a benefit-cost analysis was conducted for the corridor between DeWitt and the western Study Area boundary to determine the costs that could be invested to achieve improved freight efficiency in this corridor.

## US 151

US 151 serves a relatively small portion of the Region – only passing through Dubuque County – however, the 4-lane route provides access to Cedar Rapids, IA, and Madison, WI. Truck volumes and percentages are relatively high across the whole corridor, with higher volumes and percentages near the US 151 and US 61 merge near Dubuque, IA. Some projects are advancing to ensure US 151 continues to be able to serve critical bi-state freight movements, in particular in the Dubuque area, including:

- Completion of US 52/Southwest Arterial will divert residential traffic traveling to the west end of Dubuque through US 151/US 61 and US 20, resulting in improved safety on US 151 and US 20.
- Iowa DOT made improvements to the Grandview Interchange by increasing the height of the bridge in 2016.
- Iowa DOT replaced the railroad bridge on US 151/US 61 providing more capacity and reducing the slope of the road.

### 2.2.2 Other Roadways to Monitor

#### Other Locally Identified

As the list of congestion and safety related projects were being vetted with ECIA, BHRC and county engineering departments, a few additional projects were identified by local stakeholders. These spot locations for continued monitoring are noted below.

- **Carroll County.**
  - The Ideal Road Bridge over the BNSF railway 3 miles west of Milledgeville. Carroll County is currently working on the design of this project and is targeting replacement in 2019.
  - Routes that grain trucks use are a concern in terms of design – geometrics and weight, including (1) Scenic Ridge Road from Jo Daviess County and turning onto Mill Hollow Road to get to IL-84, (2) Mill Hollow Road, and (3) Brookville Road from Benson Route east to IL-64/US 52. Improvements to these roads are not funded.
- **Stephenson County.**
  - McConnell Road from IL-26 east to Afolkey Road. This project was recently programmed for federal funds, however, the local portion (20 percent) can only be accomplished with the assistance of private funding from a food processing company that has a vested interest in upgrading the county highway to 80,000 pounds.

In the Illinois portion of the Study Area, capital improvement programs are maintained by each county engineering or highway department. In Iowa, ECIA (or more specifically, Dubuque Metropolitan Area Transportation Study (DMATS) and Regional Planning Affiliation 8) maintain a list of projects they will

fund in the coming years in their transportation improvement program (TIP). This program is updated regularly and is available on the EICA agency website.<sup>1</sup>

**Illinois DOT Identified**

In October 2017 the Illinois DOT completed the Illinois State Freight Plan. As part of the Plan, highway freight bottlenecks were identified where roadways performed poorly in terms of truck delay or unreliability. According to that Plan, a roadway segment was categorized as a bottleneck if it ranked in the top five percent of all roadway segments analyzed in terms of truck delay, unreliability, or both.

Overall, nearly 520 miles of roadway in the state were classified as truck bottlenecks, representing 2.4 percent of the NHS roadway miles analyzed. Bottlenecks were classified by severity, where severity was defined as the summation of the percentile rank of the bottleneck segments in terms of delay and unreliability. In other words, based on classifications of High, Medium, and Low, a location classified as a “High” would tend to rank in the top third of bottleneck locations in both delay and unreliability.

The majority of bottlenecks were located in and around the Chicago metropolitan area. To be precise, 474.2 miles of the 516.9 bottleneck miles (91.7 percent) were located in greater Chicago. 42.7 miles of bottlenecks were identified in other parts of Illinois, representing 8.3 percent of the bottleneck miles identified. The figure below identifies bottlenecks identified in Carroll, Jo Daviess, Stephenson and Whiteside Counties using the Illinois DOT identification process (note, only one low priority bottleneck was identified in Whiteside County). This location should continue to be monitored locally.

Figure 2-4: Carroll, Jo Daviess, Stephenson and Whiteside County Truck Bottlenecks (as Identified by Illinois DOT)

Type of Road	Road Name 1	Road Name 2	Road Distance	Road Direction	Bottleneck Tier	Link ID	TMC
Carroll County – N/A							
Jo Daviess County – N/A							
Stephenson County – N/A							
Whiteside County							
Other Highway	Locust Street	IL-40	0.82988	Southbound	Low	92526885	107N10795

Source: Illinois Department of Transportation Freight Plan, Prepared for Illinois DOT, Prepared by WSP, Oct. 3, 2017.

**Iowa DOT Identified**

In 2017 the Iowa DOT amended the Iowa State Freight Plan. As part of that effort, 94 potential highway investments were identified and prioritized by evaluating each projects’ “value,” “condition,” and “performance” benefits to freight. This approach was designed to take into account a number of existing tools that Iowa DOT maintains including the Freight Mobility Issues Survey, Iowa Travel Analysis Model, (iTRAM), Infrastructure Condition Evaluation (ICE), INRIX bottleneck ranking tool, and Iowa’s annual traffic counts.

<sup>1</sup> Dubuque Metropolitan Area Transportation Study & Regional Planning Affiliation 8 Transportation Improvement Program. Weblink: [http://www.eciatrans.org/DMATS/tip\\_map.cfm](http://www.eciatrans.org/DMATS/tip_map.cfm)

Value was measured using the iTRAM tool, and determined to be the value of efficiency improvements for truck movements after an investment was made. Condition was measured using the ICE tool, a tool that was originally developed for evaluating the Interstate Highway System based on seven criteria: Pavement Condition Index, International Roughness Index, structure sufficiency rating, passenger traffic, single-unit truck traffic, combination truck traffic, and congestion. Performance was measured using INRIX data and its ranking of truck bottlenecks in the state. To determine the performance of each candidate location, the number of annual bottleneck occurrences for each location was used, with higher priority being assigned to locations with more occurrences.

The results of each analysis step to evaluate the 94 highway projects was combined in a Value, Condition, and Performance (VCAP) rating, and the results for Iowa Counties of Clinton, Delaware, Dubuque and Jackson Counties are shown in the figure. Iowa DOT notes that these locations represent areas that should be considered for further study (e.g., environmental, design, engineering), with the possibility of being considered for programming by the Iowa Transportation Commission.

Figure 2-5: Clinton, Delaware, Dubuque and Jackson County Project Identification (as Identified by Iowa DOT)

Location	Value Rank	Condition Rank	Performance Rank	Average Ranking	Truck Volume	Iowa DOT Priority
<b>Clinton County – N/A</b>						
<b>Delaware County – N/A</b>						
<b>Dubuque County</b>						
U.S.151 N/S @ Maquoketa Dr.	38	6	6	16.67	2115	2
U.S. 20 E/W@ Iowa 946	35	8	48	30.33	2212	15
U.S. 52 N/S @ Iowa 3	82	24	22	42.67	731	40
Iowa 32 N/S @ Chavenelle Rd.	83	14	73	56.67	1066	73
<b>Jackson County – N/A</b>						

Source: Iowa State Freight Plan, Iowa DOT, Amended 2017.

### 2.2.3 Bridge Improvements

The five road crossings over the Mississippi River in the Eight-County Region are important transportation assets and must be maintained in order for the region to function efficiently. For example, if the Savanna-Sabula Bridge was impassable, traffic crossing the river would have to detour about 50 miles north to Dubuque, IA, or about 20 miles south to Clinton, IA (see next paragraph). These bridges are the only road links between the two halves of the Region, and all but one (the Dubuque-Wisconsin Bridge) are two-lanes. Because of their limited traffic capacity, and long distance between towns, these bridges could be regional chokepoints for road freight movement. Figure 2-6 provides reference information for each of the Region’s bridge connections. Two bridges are located in Dubuque, IA, and two are located in Clinton, IA, and Fulton, IL. The remaining bridge links Savanna, IL and Sabula, IA, in the center of the Region.

The oldest of the crossings, the Savanna-Sabula Bridge, has recently been replaced by the Dale Gardner Veterans Memorial Bridge – a bridge with wider lanes and shoulders than the Savanna-Sabula Bridge, and expected to bring safety benefits to the region. While expected to open in November 2017, the Dale Gardner Veterans Memorial Bridge likely will not open until September

2018 due to safety issues with the adjacent causeway. As a result, drivers are in fact facing a 30+ mile detour to cross the river.<sup>2</sup>

The Julien Dubuque Bridge is the next oldest bridge, and is currently a 2-lane bottleneck between 4-lane sections on either end of the bridge. This bridge has been specifically mentioned by stakeholders as a US 20 bottleneck due to both narrow lanes and that it is 2-lanes vs. 4-lanes. It also has been identified as part of general safety issues along US 20 – as part of the segment from North Cascade (west end of Dubuque) to US 20 Frontage Road (East Dubuque).

Figure 2-6: Regional Highway Bridges over the Mississippi River

Bridge	Routes Carried	City	Lanes	Year Opened
Dubuque-Wisconsin Bridge	US 61, US 151	Dubuque, IA	4	1982
Julien Dubuque Bridge	US 20	Dubuque, IA & East Dubuque, IL	2	1943
Savanna-Sabula Bridge	US 52, IL 64, IA 64	Savanna, IL & Sabula, IA	2	1932*
Dale Gardner Veterans Memorial Bridge	US 52, IL 64, IA 64	Savanna, IL & Sabula, IA	2	Oct. 2017
Mark Morris Memorial Bridge	IL 136, IA 136	Fulton, IL & Clinton, IA	2	1975
Gateway Bridge	US 30	Fulton, IL & Clinton, IA	2	1956

Source: National Bridge Inventory. Federal Highway Administration. 2016. \*The Dale Gardner Veterans Memorial Bridge was constructed as a replacement for the Savanna-Sabula Bridge. The Savanna-Sabula Bridge is being dismantled.

### 2.2.4 Spot Pavement Improvements

During outreach, one of the top issues mentioned by stakeholders was the poor condition of the Region’s roads. While most responses simply noted that poor pavement was an issue, some stakeholders noted specific concerns such as damage to vehicles and cargo from rough roads. One stakeholder advocated for the region to take care of current roadways before expanding, specifically ensuring highways are in good condition. While pavement maintenance projects do not have the prestige of major new capital projects, they are absolutely critical to ensuring the Eight-County freight system remains useable and efficient.

Both Iowa and Illinois DOT monitor pavement conditions on their systems. Illinois DOT’s 2016 Condition Rating Survey reported that 23.6 percent of the state-managed road mileage in District 2 needed immediate improvement.<sup>3</sup> And, an additional 27.8 percent of the state-managed road mileage in the District would need improvement in the next six years. In Iowa, the most recent long range transportation plan notes that pavement management has received a renewed focus; while the DOT has had pavement management tools for some time, there is work underway to improve pavement models and broaden their use.<sup>4</sup>

As previously noted, in the Illinois portions of the Study Area, maintenance programs are maintained by the Carroll, Jo Daviess, Stephenson, and Whiteside County engineering or highway departments. In Iowa, ECIA (or more specifically, Dubuque Metropolitan Area Transportation Study (DMATS) and Regional Planning Affiliation 8) maintains a list of maintenance projects they will fund with their

<sup>2</sup> “Opening of Savanna-Sabula bridge delayed again,” saukvalley.com, May 10, 2018.

<sup>3</sup> Condition Rating Summary Report FY2016, Illinois Department of Transportation, 2017.

<sup>4</sup> IOWA IN MOTION 2045 – STATE TRANSPORTATION PLAN, Iowa DOT, adopted May 2017.



federal funds in the coming years in their transportation improvement program (TIP). This program is updated regularly and is available on the EICA agency website.<sup>5</sup> This program is developed in coordination with the Clinton, Delaware, Dubuque, and Jackson County engineering departments. However, each of these engineering departments also maintains an additional list of projects they will fund with their local funds.

### 2.2.5 Intermodal, Transload, or Port Facility Improvements

The Eight-County Region is very dependent on key freight facilities that are today located outside the Region in cities such as Rockford, Rochelle, and Greater Chicago, resulting in longer average truck hauls compared to the US average truck haul distance. The Region has the potential to lower overall transportation system costs by providing improved connections within, or within a closer reach to local businesses. One facility that is currently under development has the potential to do this by providing improved rail connectivity – the Cedar Rapids Logistics Park will have transload operations (and potential intermodal container service in the future).

A large freight connectivity gap was found on the waterway system. While the Region is bisected by the Mississippi River, local businesses use the waterway for shipping less than peer regions. This could be due to historic use dominated by coal shipping that has waned in recent years. It could also be due to the handling capacities at local facilities – that may not be best matched with local production and shipping needs.

Enhancement to Dubuque, East Dubuque, or Savanna, IL, area barge terminals to diversify regional cargo handling capabilities was deemed by stakeholders as warranting additional analysis as part of this study. As shown in Section 3, a benefit-cost analysis was conducted to determine the costs that could be invested to provide improved connectivity for local commodities that could more cost effectively be transported via the inland waterway system. This analysis is based on enhancement to existing Dubuque/East Dubuque area barge terminals.<sup>6</sup>

### 2.2.6 Lock and Dam Improvements

Working Paper 3 – Needs Assessment presented an overview of the Mississippi River system reliability issues due to the lack of historic and on-going investment in lock and dam maintenance. While the Eight-County Region is home to only three locks (Locks and Dams 11, 12 and 13), goods that are loaded in the Region may travel through up to 16 locks to reach the Gulf of Mexico and export markets. Almost all of these locks and dams were constructed in the 1930s, and they have reached the end or have exceeded their service lives. When lock facilities or equipment fail, river shutdowns can halt the flow of traffic and negatively impact freight shippers and receivers who rely on river service.

When compared to downstream locks and dams, the Region’s three locks and dams perform favorably. However, the performance of downstream locks is not as good, and while the performance

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<sup>5</sup> Dubuque Metropolitan Area Transportation Study & Regional Planning Affiliation 8 Transportation Improvement Program, [http://www.eciatrans.org/DMATS/tip\\_map.cfm](http://www.eciatrans.org/DMATS/tip_map.cfm)

<sup>6</sup> While Savanna, IL, also presents a maritime-related opportunity, the site is at a different stage of development, as well as over 45 miles from Dubuque/East Dubuque; therefore the benefit-cost results in this Working Paper should not be generally applied to the Savanna location.

of locks and dams serving the Region has improved, continued disinvestment in the lock system threatens future performance. There is currently an estimated \$1 billion backlog in maintenance for the system,<sup>7</sup> which if left untended, will cause serious issues for shippers in the region. For example, one grain farmer in the Region noted that when river service is disrupted, the price of fertilizer (normally transported upstream by barge) increases to reflect limited supplies. Producers of outbound barge shipments, such as grain farmers, may also be negatively affected, as they must pay more to have their product shipped via rail or truck. Diverting shipments from barge to truck or rail has additional negative impacts for the transportation system as a whole, as additional trucks increase road congestion and damage.

Unfortunately, the public agencies in the Eight-County Region have little control over the maintenance and operations of the river system, which are handled by the US Army Corps of Engineers (USACE). Funding for maintenance and operations is allocated by Congress, so the most effective means of improving the system may be participating in lobbying efforts meant to improve funding for river infrastructure, or other outreach to local US representatives and senators.

The Iowa State Freight Plan notes that in addition to supporting the USACE in developing and completing the slated lock and dam rehabilitation, dredging, facility and equipment upgrades, and other channel maintenance projects, the Iowa DOT will continue to work with the Upper Mississippi River and Missouri River states, as well as other stakeholders toward common goals of improved inland waterway infrastructure and navigation on Mississippi River System.<sup>8</sup> Also, the Illinois Chamber of Commerce and industry partners have studied the importance of improving locks and dams,<sup>9</sup> and have advocated for increased funding to make improvements. While the Illinois efforts have been historically focused on the Illinois River, the Illinois DOT is beginning to consider a strategic approach to overall maritime system needs and investment. The Eight-County Region should partner with both Iowa and Illinois DOTs to ensure the Region's needs continue to be part of broader inland waterway advocacy efforts.

## 2.3 Program Recommendations

Neither ECIA nor BHRC construct, own, operate or maintain any part of the freight transportation system, therefore it is important that these agencies advance transparent processes that include outside freight perspectives in their daily activities that influence the system. This will not only produce a more comprehensive assessment and understanding of the freight system and what is needed, but also helps ensure that the solutions that are ultimately advanced are ones that work in the “real world” for freight users. An inclusive approach to freight planning where both public and private sector voices are heard will help minimize opposition to projects and form a foundation of trust for expanded public and private sector partnerships in the future. Three key program-related recommendations have been identified to continue with the collaborative process established during the development of this Eight-County Freight Plan. These recommendations provide an opportunity for long-term engagement within key areas including freight planning, safety, and design. While it is

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<sup>7</sup> “Locks and Dams have \$1 Billion in Repair Backlog,” KCRG Cedar Rapids, June 15, 2017.

<sup>8</sup> Iowa State Freight Plan, Iowa DOT, Amended 2017.

<sup>9</sup> An Economic Impact and Cluster Analysis of Illinois River Lock and Dam Facilities for Beneficial Users, Prepared by EDR Group, August 2016.

recommended that each ECIA and BHRC take these steps independently, they should also continue to coordinate with each other, across planning boundaries.

**Recommendation 4: Formalize a freight planning program as part of activities to identify and address freight system needs, and to ensure freight system stakeholders are an ongoing and integral part of regional transportation planning processes.**

**Recommendation 5: Ensure that highway and railway safety is considered as part of all freight planning activities.**

**Recommendation 6: Establish and incorporate freight-appropriate guidelines to ensure infrastructure improvements consider all users of the transportation system.**

The supporting details for each of these recommendations is provided below.

### 2.3.1 Freight Planning Program

As ECIA and BHRC do not construct, own, operate or maintain any part of the freight transportation system, it is critically important that these agencies advance transparent processes to including freight perspectives in their activities. This will not only produce a more comprehensive slate of needs and recommendations but ensure opposition to projects or other recommendations is minimized while building trust and nurturing relationships for expanded engagement and partnership in the future.

There are several small steps that ECIA and BHRC can take together, or each on their own, to better incorporate freight in agency planning and decision making processes over time.

- **Develop Freight-Specific Evaluation Criteria.** ECIA and BHRC should incorporate one or more freight-specific performance measures used in developing the Eight-County Freight Plan in ongoing plan and project evaluation. A quick win is including a performance measure related to freight system mobility (Truck Travel Time Reliability (TTTR)), an FHWA required performance measure that will need to be calculated at both state (by Iowa and Illinois DOTs) and MPO (metropolitan planning organization) levels in 2018.
- **Monitor Freight Needs and Identify Options to Address Needs.** The purpose of developing freight-specific evaluation criteria is so that the transportation system can be assessed through a “freight lens.” As these criteria are gradually applied, the results of the performance analysis should be used to quantitatively identify freight system deficiencies and their potential solutions. They should also be used to monitor progress toward meeting set goals.
- **Conduct Freight Studies.** As the need arises, ECIA and BHRC should conduct freight and economic development related studies to assess the need for various solutions and public or private investments. For example, in the future the need to study corridor safety, or freight-related development at or adjacent to the inland waterway system may arise.
- **Consider Freight an Integral Part of Ongoing Agency Activities.** While “one off” freight studies can provide targeted analysis and answer specific questions, ECIA and BHRC should consider incorporating freight in all agency activities. For example, these agencies currently address safety- and technology-related considerations in their day-to-day decision-making, but may

not necessarily consider safety or technology through a “freight lens.” Freight users have needs that are different than the general travelling public, and including these perspectives in addition to those of pedestrians, cyclists, tourists and others (in particular while developing project solutions) will ensure the system can be efficiently used by all.

- **Approval of Plans and Projects.** All MPO plans must go through a public review process to receive final approval. It is important to ensure that all invitations and public notices are available to local business and industry, there is also benefit in identifying a few key freight stakeholders that can be available and maintain involvement during the entire plan development process.
- **Seek Funding for Freight Projects.** Funding opportunities that could be considered to support freight projects in the Region are presented in Section 4, Freight Project Funding. As shown, options are limited, and the Eight-County Region will need to be strategic and collaborative to ensure funds are secured for local project priorities.
- **Private Sector Engagement.** While there are several opportunities for ECIA and BHRC to make small tweaks to integrate freight into their on-going planning activities, none is of greater importance than ensuring freight stakeholders are part of the short- and long-range planning processes. It is recommended that stakeholders engaged during development of the Eight-County Freight Plan continue to be engaged on a regular or semi-regular basis, in line with available ECIA and BHRC resources. *These engagement activities are closely linked to the partnership recommendation presented in Section 2.5.*

In order to effectively advance these steps, both a mandate and funding should be available for ECIA and BHRC. ECIA (through DMATS – Dubuque Metropolitan Area Transportation Study) is a federally-designated MPO tasked with regional planning and stakeholder engagement, receiving sub-allocated funding from Iowa DOT, combined with local dollars, to conduct transportation planning activities. ECIA should ensure that freight remains an integral part of agency activities, and that funding is allocated so that the bulleted steps above may be incorporated in ongoing transportation planning. BHRC is not a federally-mandated MPO, and does not have the same transportation planning mandate or funding resources as ECIA, limiting its ability to explore freight/transportation issues on an ongoing basis. BHRC must receive both a mandate and adequate funding from sponsoring county agencies to ensure that freight/transportation planning continues, but also to support advancement of the overall recommendations contained in this Eight-County Freight Plan.

### 2.3.2 Freight Safety Planning

*This freight-specific program should be linked to already existing transportation safety programs pursued by ECIA and BHRC that are currently focused on highway, bike and pedestrian safety.*

#### Highway Safety

As noted in Section 2.2.1, highway safety has been identified as a concern along several key corridors in the Eight-County Region, including US 20, US 30, and US 151 in the vicinity of Dubuque. While next steps for further study and making safety-related improvements to US 20 and US 30 are recommended by this Plan (and are advancing), ECIA and BHRC should continue to monitor the safety of the transportation system through a “freight lens” and advance solutions, as appropriate, in line with their existing highway safety planning efforts.

## Rail Safety

The Eight-County Region has 331 publicly-owned railroad grade crossings, and an additional 477 privately-owned crossings. These crossings are conflict points between road and rail modes and, in the past ten years, 24 of the Region's 37 highway-rail incidents occurred at publicly-owned grade crossings. Data analysis shows that there are clusters of concern; between 2007 and 2017 three incidents occurred along the Union Pacific line in Morrison, and five incidents on the Canadian Pacific line in Clinton. Two of the five incidents in Clinton occurred at the 17<sup>th</sup> Street North crossing, which serves a manufacturing plant close to the tracks. The severity of incidents in Clinton has been limited – only one of the five incidents resulted in an injury, and there have not been any fatalities in the past ten years. The three incidents in Morrison are centered on the city's downtown. In September 2010, one fatality was recorded at the Orange Street crossing, when a pedestrian was struck by a westbound train. None of the other reported incidents resulted in injuries or deaths.

Over the past five years, the rate of grade crossing incidents in the Region has increased slightly with between one and three incidents each year, and a five-year average that has risen from 2.0 to 2.4 incidents per year. Without additional information, it is difficult to determine why the five-year average rate of incidents per year has slightly increased. The increase could be due to an increase in rail traffic, an increase in road traffic, changes to crossing protection equipment like lights, or by natural variation in accident rates from year to year. Currently, a lack of historic highway and rail traffic volume data makes it difficult to gain a deeper understanding of crossing incidents.

ECIA and BHRC should introduce rail safety to ongoing efforts to monitor rail crossings in the Region, and annually collect rail volume and crash data from the Federal Railroad Administration (FRA), to better assess crossing incident trends and if countermeasures should be pursued to address areas of continual concern. The data analyzed in this Plan does show that there are at least two general locations (i.e. Morrison and Clinton) that warrant further study. These studies could lead to a variety of countermeasures that may include upgrades to crossing warning devices, gates, or even potential grade separations.

### 2.3.3 Freight Context and Freight-Appropriate Solutions

Several issues were identified by stakeholders during development of the Eight-County Freight Plan that could be addressed by advancing a program that considers the freight context and users in determining solutions, in particular for infrastructure investments.

#### Truck Route Guidance

The primary concern with truck routes is a lack of designated routes in Illinois counties, which means that shippers, especially agricultural producers are required to route their trucks along circuitous routes in order to follow truck routes. This feedback was confirmed by a mapping of Illinois truck routes, which showed a limited number of routes available in the Region. Local producers suggested designating additional roads as truck routes to improve freight travel times.

Concerns about low road and bridge weight limits were common and are related to concerns about a lack of designated truck routes – that is to say, stakeholders were concerned that low limits meant freight, especially agricultural freight, had to take overly-long routes to reach major roadways in the Region.

Designating truck routes in the Region, combined with making spot improvement to ensure those routes are able accommodate 80,000 pound weights, could improve freight mobility, especially for agricultural producers. Some examples of roads in Stephenson County that the County Engineer notes should be upgraded to 80,000 pounds to accommodate fully loaded trucks include:

- Rock Grove Road: Rock Grove to Orangeville,
- Rock City Road: 1 mile to IL Route 75, and
- Springfield Road: Business Route 20 to Lamm Road.

This is not a comprehensive list, and ECIA and BHRC should work with local engineering departments to map out logical routing for a designated truck route network, take an inventory of weight restricted routes along those routes (if any), and systematically update all designated truck routes to accommodate 80,000 pound loads. This will likely be an iterative process, as it is not recommended that routes unable to handle 80,000 pounds be designated.

### Freight-Appropriate Guidelines

For the past decade planners have begun to recognize that the transportation system has many users, and a one-size-fits-all approach to planning, project development and implementation does not work. This has been most evident in the Complete Streets movement that considers passenger vehicles, buses, bicyclists and pedestrians in each solution. Absent in many of these discussions have been freight users, primarily trucks, that share the roads with each of these users, too. In 2012 the Federal Highway Administration released the “FHWA Freight and Land Use Handbook”<sup>10</sup> which began awareness that multimodal freight users should be considered in local planning, but stopped short of providing guidance on how to specifically incorporate “freight” into project implementation.

Since then, many jurisdictions across the US and Canada have endeavored to define their own “freight-appropriate” design guidelines for projects, but no national standard has been established. One particularly good example of common-sense approaches to including freight in transport system planning and design was published by the Ministry of Transportation, Ontario.<sup>11</sup> Regarding developing minimum standards for freight corridors, the Ontario guide notes that standards should include:

- **Design elements**, such as minimum lane widths, minimum curve radii, minimum intersection standards, minimum intersection spacing, bridge design;
- **Construction elements**, such as surface materials, subsurface materials, signage, and traffic control standards;
- **Maintenance elements**, such as providing priority snow clearing, providing emergency road repairs, scheduling general maintenance to minimize delays and detours;
- **Operational elements**, such as timing of signals; and

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<sup>10</sup> FHWA Freight and Land Use Handbook, FHWA, April 2012.

<sup>11</sup> Freight Supportive Guidelines, Ministry of Transportation, Ontario 2016.

Weblink: <https://www.ceaa-acee.gc.ca/050/documents/p80100/118334E.pdf>

- **Communication elements**, such as appropriate signage. In some cases special standards may need to be developed for special routes, such as those with very heavy usage, and routes frequently used for oversized loads.

Additionally Ontario's guide notes it should be ensured that municipal road and laneway design standards for all road types in a community can accommodate the appropriate size of truck, and that design standards will accommodate all road users safely. The Ontario guidebook provides specific design guidance.

A slightly different approach was recently suggested in Illinois, focused on those routes most heavily used by trucks. The Will County, Illinois "Community Friendly Freight Mobility Plan"<sup>12</sup> was developed to ensure that freight was holistically considered in project development, and provided a "check list" for planners on considerations for truck routes, which includes:

- Establish pavement and geometry design criteria for anticipated freight traffic weights and volumes.
- Design intersections, turn radii, shoulders, lane widths and location and lengths of turn lanes to accommodate the freight traffic.
- Allow for turn-around areas for freight traffic to avoid restricted areas.
- Identify signage needs for truck routes, restrictions and prohibited areas.
- Establish idling restrictions and prohibited engine braking zones for sensitive areas along truck routes or near land use conflicts.
- Allow for additional signage to route trucks to appropriate facilities.
- Identify maintenance needs and costs for freight routes.

While initial Complete Streets guidance did not consider freight adequately, in using the Ontario and Will County examples as freight planning/design guides, caution should be used to avoid not only looking at the system through the "freight lens." It will continue to remain critical that freight issues and solutions be considered in context of other system users. The National Association of City Transportation Officials<sup>13</sup> has published a series of street design guides that should be used as companions when designing for freight, to ensure that concepts related to traffic calming, narrowing intersections for pedestrian crossing, and others are not lost in the process.

ECIA and BHRC should consult with both Iowa and Illinois DOTs to determine the status of formalizing freight-specific guidelines/standards in state design manuals. It will also be important for ECIA and BHRC to consult with the DOTs to understand how freight is considered in advancing practical solutions. One stakeholder in Illinois noted concern over a solution being implemented (i.e. a signalized intersection), questioned whether the application is appropriate for the context and potential users, and wondered whether or not a lower cost, roundabout could be a viable solution. The Eight-County Freight Study did not conduct detailed intersection analysis, nor did it determine appropriate design standards to be implemented in the Region; these steps should be taken in

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<sup>12</sup> Will County Community Friendly Freight Mobility Plan, CDM Smith for Will County, September 2017.

<sup>13</sup> National Association of City Transportation Officials, Weblink: <https://nacto.org/>

coordination with Iowa and Illinois DOTs and be sure to take into account both the urban and rural context in the Eight Counties. However, at least one intersection has been identified for further study, and for freight-appropriate design considerations due to the increasing volume of traffic and the presence of trucks – US 20 and IL 73.

## 2.4 Policy Recommendations

Truck regulation harmonization between Iowa and Illinois is important to this freight study, as when the system is “harmonized” trucks are allowed unencumbered operations within and beyond the Region, to the benefit of the local economy. While a variety of regulatory barriers exist between Iowa and Illinois, the Eight-County stakeholders have identified inconsistent truck weight limits as the biggest issue and one that keeps companies in Iowa and Illinois on an uneven playing field.

Each of the policy recommendations made go beyond the jurisdiction of ECIA and BHRC and will require close partnership with the states of Iowa and Illinois to advance, as well as advocacy groups such as American Association of State Highway and Transportation Officials (AASHTO) and others.

**Recommendation 7: Harmonize overall trucking regulations between Iowa and Illinois for seamless freight operations between the states.**

**Recommendation 8: Harmonize truck weight limits between Iowa and Illinois.**

The supporting details for each of these recommendations is provided below.

### 2.4.1 Truck Regulation Harmonization

In 2014, a study<sup>14</sup> was conducted to better understand trucking challenges due to regulations in the Midwest between Iowa and its surrounding states, including Illinois. In that study the challenges due to lack of harmonization between the states related to:

- Vehicle dimensions
- Vehicle weights
- Speed limits
- Weight compliance enforcement
- Fees and taxes
- Driver qualifications
- Medical certification
- Hours of service

The lack of harmonization between Illinois and Iowa noted by stakeholders during development of the Eight-County Freight Plan, was in some cases echoed and quantified in the study. The primary

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<sup>14</sup> Study of the Regulatory Issues Affecting Truck Freight Movement in the Midwest, Center for Transportation Research and Education – Iowa State University, Jing Dong, Chris Albrecht, Patrick Johnson, and Micah Makaiwi, December 2014.



harmonization issues between Iowa and Illinois are related to vehicle weight, International Fuel Tax Agreement (IFTA), and permitting. Each of these is described in the following sections.

### Truck Vehicle Weight

Vehicle weights on the National Network are governed by federal regulations. Minimum weight limits required are 20,000 pounds single axle weight, 34,000 pounds tandem axle weight, and 80,000 pounds gross vehicle weight. These are the weight limits in Iowa, and recently Illinois also updated their limits to be the same as National interstate regulations. However, only several years previous weight limits in Illinois were 18,000 pounds single axle weight, 32,000 pounds tandem axle weight, and 78,000 pounds gross vehicle weight.<sup>15</sup>

While developing the Eight-County Freight Plan truck weights were frequently mentioned as a key issue, primarily related to a desire for harmonized weight regulations in Illinois that matched those in Iowa. Firms in both states expressed a desire for harmonization of weight regulations related to agriculture. In particular, agricultural producers noted that Illinois' lower weight limits relative to Iowa and Wisconsin, and lack of seasonal allowances for higher limits at harvest season were a barrier to more efficient operation. This issue affected producers who shipped products to both sides of the river, as Illinois' lower limit became the *de facto* limit for any inter-state shipments.

Illinois currently does not give any blanket exemptions for specific commodities. The Illinois DOT is authorized to issue special permits for a period of up to 40 days that authorize the movement of agricultural commodities. And, recently a temporary seasonal exemption was provided in Illinois for agricultural loads (up to 90,000 pounds, a 10-percent increase) for 45 days due to the need to harvest and haul crops quickly.<sup>16</sup>

It is Iowa's standard practice to provide several exemptions. In fact, several provisions in Iowa State law allow trucks to exceed some elements of federal limits. These exemptions include:<sup>17</sup>

- Six-axle vehicles on non-Interstate highways are allowed a gross vehicle weight of 90,000 pounds.
- Seven-axle vehicles on non-Interstate highways are allowed a gross vehicle weight of 96,000 pounds.
- Iowa State statute allows for several axle and GVW exemptions for various types of vehicles and commodities.
- Some agricultural vehicles are allowed higher single axle weights and GVWs on a seasonal basis.

Regarding agricultural commodities (i.e., grain), Iowa allows the maximum gross vehicle weight of hauling vehicles not to exceed 96,000 pounds between February 1 and May 31.

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<sup>15</sup> Study of the Regulatory Issues Affecting Truck Freight Movement in the Midwest, Center for Transportation Research and Education – Iowa State University, Jing Dong, Chris Albrecht, Patrick Johnson, and Micah Makaiwi, December 2014.

<sup>16</sup> Governor declares Illinois' first harvest emergency, November 5, 2017.

Weblink: <http://wqad.com/2017/11/05/governor-declares-illinois-first-harvest-emergency/>

<sup>17</sup> Compilation of Existing State Truck Size and Weight Limit Laws - Report to Congress, FHWA, May 2015

As a starting point to for harmonizing truck vehicle weights, Illinois DOT should commission or conduct a study of the impacts of increased truck weights on Illinois roadways.

### **International Fuel Tax Agreement**

Both Iowa and Illinois are member jurisdictions of the International Fuel Tax Agreement (IFTA). The IFTA, which is an agreement between the lower 48 states of the US and the Canadian provinces that simplifies the reporting of fuel use by the Interstate motor carriers. Carriers from any IFTA jurisdiction operating in another IFTA jurisdiction must obtain an IFTA permit from their base state or purchase a temporary fuel permit for the jurisdiction in which they are operating.

In Iowa the IFTA license is \$10 and is permanent; annual truck decals are \$0.50/set.<sup>18</sup> Vehicles based in non-IFTA jurisdictions traveling in Iowa need to comply with one of the following: (1) Enter Iowa with 30 gallons or less of fuel in the supply tanks of the vehicle, purchase fuel as the vehicle travels through the state, and display evidence of adequate fuel purchases for inspection by law enforcement personnel. (2) Purchase a \$20 temporary fuel permit, which is valid for one trip or 72 hours, whichever comes first. In Illinois there is no cost for the IFTA license; annual truck decals are \$03.75/set.<sup>19</sup> In Illinois, a single trip permit is available, valid for 96 hours for \$40.

There are some US states that have “harmonized” between states, or that offer reciprocity to IFTA states. Illinois does not have fuel tax reciprocity agreements with any of the neighboring states. Iowa and Missouri have an agreement to operate IFTA-qualified farm and ranch vehicles by private carriers and school buses within 30 miles of the state border without a fuel license or decal. The agreement does not include for-hire carriers.

### **Permitting**

While not brought forth as a prominent issue by Eight-County stakeholders, the Iowa State Freight Plan<sup>20</sup> noted that the lack of harmonization on Oversight/Overweight (OS/OW) permitting was an issue for Iowa, and in the Midwest generally. While most states have different size and weight restrictions (in addition to federal restrictions), the process of moving through multiple states with an OS/OW load is very complex.

The Iowa State Freight Plan recommends that the DOT should continue to stay involved in the AASHTO and the Standing Committee on Highway Transport so that the State of Iowa can continue to provide input and be integral to solutions on overall harmonization effort and to reach a consensus on certain standardized truck size permitting requirements.

## **2.5 Partnership Recommendations**

The Eight-County Freight Plan was sponsored by a consortium of public and private stakeholders that each has an interest in improving the Region. Four goals, shown in Figure 2-7, were established that underpin the Vision for the Eight-County freight system, and align with what is most important to those stakeholders. While the Eight-County Freight Plan is focused on making improvements to the

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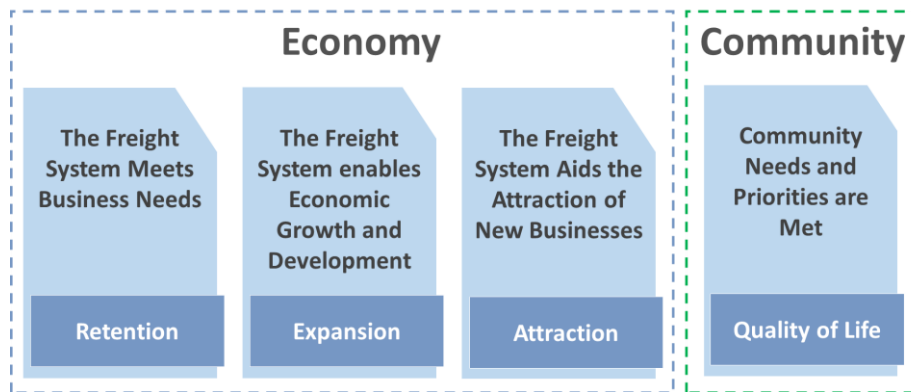
<sup>18</sup> Compilation of Existing State Truck Size and Weight Limit Laws - Report to Congress, FHWA, May 2015

<sup>19</sup> Ibid.

<sup>20</sup> Iowa State Freight Plan, Iowa DOT, Amended 2017.

transportation system, these goals underscore that the movement of freight should support the economy while not having adverse impacts on the communities in the Region. As such, not only do the transportation planners of the Region (ECIA and BHRC) have a role in advancing the recommendations of this Plan, but so too does each project sponsor, as well as other public and private stakeholders at the local, regional and state level. Only through working together will the full benefits of Eight-County Freight Plan recommendations be realized.

Figure 2-7: Eight-County Freight Plan Goals



**Recommendation 9: Coordinate with local public sector and industry partners to advocate for and improve the transportation system in the Eight-County Region.**

**Recommendation 10: Support workforce development programs to ensure local businesses have access to skilled employees.**

The supporting details for each of these recommendations is provided below.

### 2.5.1 Partnership

The lead sponsors of the Eight-County Freight Plan are the East Central Intergovernmental Association in Iowa, and the Blackhawk Hills Regional Council in Illinois. The ECIA is a council of governments that assists its members with planning and policymaking in six areas: Community Development, Economic Development, Transportation Planning, Housing Assistance, Employment and Training, and Rural Transit Services.<sup>21</sup> The BHRC is similar; it is a regional planning organization that provides services in community planning, development assistance, natural resource conservation, and grant writing and administration,<sup>22</sup> but not specifically transportation.

From a transportation perspective, the major role of ECIA relates to the coordination of long range transportation system planning, forming regional transportation policy, and making programming decisions to best apply federal, state and local transportation dollars to regional needs. As previously noted, BHRC does not have the same transportation planning mandate or dedicated funding, but like ECIA, does have a history of coordinating with local stakeholders for the benefit of the region. To advance the Eight-County Freight Plan recommendations, ECIA's and BHRC's natural facilitator roles

<sup>21</sup> East Central Intergovernmental Association, 2017. Weblink: <http://www.ecia.org/programs/index.cfm>

<sup>22</sup> Blackhawk Hills Regional Council, 2017. Weblink: <http://www.blackhawkhills.com/about-us/>

should be expanded to include key public and private sector stakeholders that have an interest in advancing these, too. These stakeholders could include:

- State, county and local public agencies,
- Federal transportation agencies, including USDOT and the USACE,
- Regional and local economic development agencies,
- Class I and short line railroads,
- Airports,
- Water ports,
- Local private sector businesses representing freight generating industries, and
- Individuals or industries impacted by the generation of freight, including tourism.

Coordination with these stakeholders is integral to advancing an effective freight planning program in the Region and is closely tied to this recommendation described in Section 2.3.1. And, as also noted in that section, funding should be made available to ECIA and BHRC commensurate with this expanded coordination role.

## 2.5.2 Workforce Development Programs

The Region has a shortage of the skilled and semi-skilled employees required for industries like manufacturing, agriculture, and transportation. The shortage in the transportation and logistics industries is especially relevant to the Eight-County Freight Plan, as these industries directly facilitate freight movements. A lack of employees in transportation and logistics could reduce the supply of services like trucking, which may result in higher transportation costs, and less competitive conditions for firms in the Region.

Workforce development is important because it helps the Region tailor its workforce's skills to changing economic conditions. As such, ECIA's economic development plan established a goal to "improve the quantity and quality of the Region's workforce to address employers' demands in advanced manufacturing; healthcare; and professional, scientific, and technical services."<sup>23</sup> The BHRC economic development plan reached a similar conclusion, it identified "need for a technologically skilled labor force" as a regional weakness.<sup>24</sup>

The Region is served by four community colleges: Highland and Sauk Valley Community Colleges cover most of the Illinois portion of the Region, with small portions served by Black Hawk and Rock Valley Colleges. The Iowa portion of the Region is served by Northeast Iowa and East Iowa Community Colleges. These institutions are critical sources of medium-skills training, which usually requires a 2-year degree.

Both ECIA, BHRC and other Regional freight stakeholders should work with these college programs to link training programs with Regional employment needs, in an effort to help keep graduates with skills in the Region, as well as address vacancies at existing and future employers.

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<sup>23</sup> Comprehensive Economic Development Strategy, East Central Intergovernmental Association, 2015.

<sup>24</sup> Comprehensive Economic Development Strategy, Blackhawk Hills Regional Council, 2015.

# 3 Benefit-Cost Analysis of Key Project Recommendations

## Key Chapter Takeaway

Three project concepts were identified by the study stakeholders as potentially offering significant benefit to the study region and surrounding states: the US 20 Safety/Performance Corridor, the US 30 Multimodal Access Corridor, and Dubuque/East Dubuque Area Marine Terminal Enhancements.

Each concept was evaluated using Benefit-Cost Analyses models and methods developed for, and consistent with, USDOT guidance for competitive grant applications. Spreadsheet models were created for each project, and were populated with the best available empirical data and – in cases where detailed information has not yet been developed – reasonable interim estimates to be modified or confirmed through future planning.

All three project concepts offer positive and substantial public benefit. The US 20 and US 30 projects have the highest levels of expected benefits, and each warrant significant capital investments. The Dubuque/East Dubuque Area Marine Terminal Enhancements offer lower levels of benefit, but could be beneficial if the necessary improvements can be accomplished at modest cost. The results support further investigation and potential advancement of all three project concepts.

## 3.1 Introduction to Benefit-Cost Analysis

To help the Eight-County stakeholders better understand the importance of comparative investments, as well as understand how projects may score in competitive grant solicitations, benefit cost analyses (BCAs) were prepared for three potential freight projects.

Normally, BCAs are prepared for “shovel ready” freight projects that have advanced to a significant level of completion, where project definition, engineering design/cost factors, environmental issues and responses, travel/market demand, and other critical factors are known with a relatively high level of confidence.

An alternative use of BCAs is to look at freight projects that are not yet fully defined, to get a sense of what kinds of projects would yield better or worse BCA results, and understand the critical relationships between factors – principally project cost and volume of benefiting traffic. This kind of “parametric” or relational BCA analysis develops a wide range of scores, based on the input assumptions.

Given that the study stakeholders have not identified “shovel ready” projects to be tested, the “parametric” BCA approach was followed. It should be understood that many of the critical input factors – including project description and definition, site / route information and attributes, amount of benefiting traffic, likely cost range, etc. – are conceptual in nature, and have not yet been supported

by engineering, environmental, or market analysis. The primary value of BCA development at this stage in the project planning process is to determine whether there are realistic conditions under which a potential project type would score well, as guidance to the Region on whether that project type should be further developed.

### 3.1.1 Methodology

WSP developed BCAs for three project concepts defined by the study stakeholders. Two are potential highway improvements; the third is the potential introduction of new cargo handling capacity at Dubuque/East Dubuque area barge facilities.

The BCAs were prepared and calculated in a form and manner consistent with the most recent requirements of the USDOT TIGER and INFRA grant programs (further discussed in Section 4.2, Federal Freight Funding Opportunities). Federally-compliant Benefit-Cost Analysis generally involves five steps. WSP executed each step as follows:

1. **Clearly define the With Project and Without Project conditions.** This means understanding and specifying the location, extent and timing of improvements. For this analysis, WSP made representative assumptions.
2. **Determine capital and operations/maintenance costs over the life of the analysis period (30 years of benefit-generating operations), under With Project and Without Project conditions.** In this case, project costs are not known, so the calculated project benefits were used to estimate “target” project costs that offered attractive (1.5 or better) Benefit-Cost Ratios.
3. **Determine the difference in transportation effects between the With Project and Without Project scenarios.** Major transportation differences might include changes in freight volume and capacity, improvements in travel time and reliability and safety, ability to handle new transportation equipment and cargo types, etc.
4. **Calculate monetized benefits over the analysis period.** For freight infrastructure projects, WSP prefers a 30-year analysis period. WSP utilized a Benefit Cost Analysis Model Spreadsheet developed for the most recent round of TIGER and INFRA grant applications. The Model includes all the calculation steps and factors necessary to produce monetized estimates of the value of transportation effects generated by the project, in a manner consistent with federal requirements. The Model calculates five types of monetized benefits:
  - Lower **state of good repair** costs due to reduced maintenance needs. This effect can be produced by modernization of infrastructure, or by diversion of trucks to lower-maintenance facilities or modes.
  - Improved **economic competitiveness** from reduced transportation service/logistics costs. This effect can be produced from reductions in travel time (since time equals money), travel time unreliability (since unreliability requires the addition of ‘buffer time’ to delivery schedules), and vehicle operating costs. Note that recent federal guidance does not allow credit for reduced transportation costs associated with modal diversion from truck to barge; however, this benefit was also calculated for information purposes.

- Lower **livability** costs (noise, vibration, neighborhood effects, roadway congestion, etc.). For freight projects, these effects can be subtle, and the data necessary to calculate them for the three project concepts is not yet available.
  - Lower **sustainability** costs from reductions in criteria pollutant emissions. This effect can be produced from reductions in highway travel distance, or from shifting freight from modes with lower fuel efficiency to modes with higher fuel efficiency.
  - Lower **safety** costs due to reduced fatality/injury/property damage crashes. This effect can be produced from safety improvements (geometric design, operational controls, conflict elimination, etc.), reductions in highway travel distance, or shifting freight from modes with higher crash rates to modes with lower crash rates.
5. **Calculate discounted benefits and costs and determine the Benefit Cost Ratio.** Federal guidance requires the use of a 7 percent discount rate for future year costs and benefits, and optionally invites the use of an alternative 3 percent rate, which were used for this analysis. All values were standardized to current (2018) dollars. However, as previously noted, the analysis focused on calculating the benefit value, which is the numerator in the Benefit-Cost Analysis calculation. The target project cost, or denominator, was calculated based on the goal of achieving a Benefit-Cost Ratio of 1.5; in other words, target cost = calculated benefit divided by 1.5.

The results can be used to make decisions about:

- The type of benefits each project should aim to achieve,
- The nature and definition of each project necessary to achieve those benefits,
- The appropriate cost of each project based on the value of its benefits, or
- The potential eligibility of each project for discretionary grant funding, or for ranking within applicable prioritization mechanisms.

## 3.2 Project Concepts

Three Regional projects were identified by the Freight Study Steering Committee for examination.

### 3.2.1 US 20 Safety/Performance Corridor (IL)

- **Mode of focus:** Roadway.
- **Why this is being pursued:** Improvements to US 20 have been identified by stakeholders as a top priority, especially the possibility of improving the roadway and Julien Dubuque Bridge to 4-lanes. The Eight-County Freight Study has determined that there are safety issues dotted throughout the corridor. While a full 4-lane improvement may not be warranted (given cost, loss of farmland, disruption to economically productive businesses, cost of maintaining new

infrastructure and old at the same time),<sup>25</sup> safety improvements (shoulder widening, improved geometrics, intersection improvements) should be pursued in the near-term horizon.

- **Anticipated transportation benefits:** Improvements in travel speed, reliability, vehicle miles of travel, and vehicle operating costs; reduced crash rates.
- **Data sources and limitations:** Projections of Without Project and With Project traffic conditions and performance characteristics were developed by WSP based on existing traffic and safety data, and on web-based highway routing software.

### 3.2.2 US 30 Multimodal Access Corridor (IA)

- **Mode of focus:** Highway
- **Why this is being pursued:** New investments in multimodal freight handling capacity in Cedar Rapids (i.e., Cedar Rapids Logistics Park) offer the opportunity for improved freight access to/from the Region, but this will depend on efficient connectivity between the Region and Cedar Rapids. Future development of barge terminal capacity in the Clinton area could provide additional demand for this corridor.
- **Anticipated transportation benefits:** Improvements in travel speed, reliability, vehicle miles of travel, and vehicle operating cost; reduced crash rates.
- **Data sources and limitations:** Projections of Without Project and With Project traffic conditions and performance characteristics were developed by WSP based on existing traffic and safety data, and on web-based highway routing software.

### 3.2.3 Dubuque/East Dubuque Area Marine Terminal Enhancement (serving IA, IL, and WI)

- **Mode of focus:** Maritime barge transfer facility for non-containerized goods – oversize/overweight manufactured equipment, building materials, scrap, and similar – at one or more locations in the Dubuque/East Dubuque area.
- **Why this is being pursued:** The Eight-County Freight Study has shown that the maritime system in the region is underutilized. This facility concept aims to build on what the Region currently does well (manufacturing) and shift some products that today are shipped via road and rail to the maritime system.
- **Anticipated transportation benefits:** Reductions in truck VMT and operating cost; user cost savings from modal substitution.
- **Data sources and limitations:** The Study Team held discussions with area barge operators to validate market and operational assumptions used in the analysis. Market projections were generated using the Freight Analysis Framework disaggregation (see study Working Paper #2). Note that the results do not address comparisons between possible alternative sites for a barge terminal. Understanding the strengths and weaknesses of different sites requires a higher level of market analysis and engineering/environmental investigation. The market

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<sup>25</sup> RECORD OF DECISION – US Route 20 (FAP 301) Jo Daviess and Stephenson Counties, FHWA-IL-EIS-00-03-F, September 22, 2005. Weblink: <http://www.idot.illinois.gov/assets/uploads/idot-projects/district-2/us-20-galena-bypass/files/us%2020%20rod.pdf>



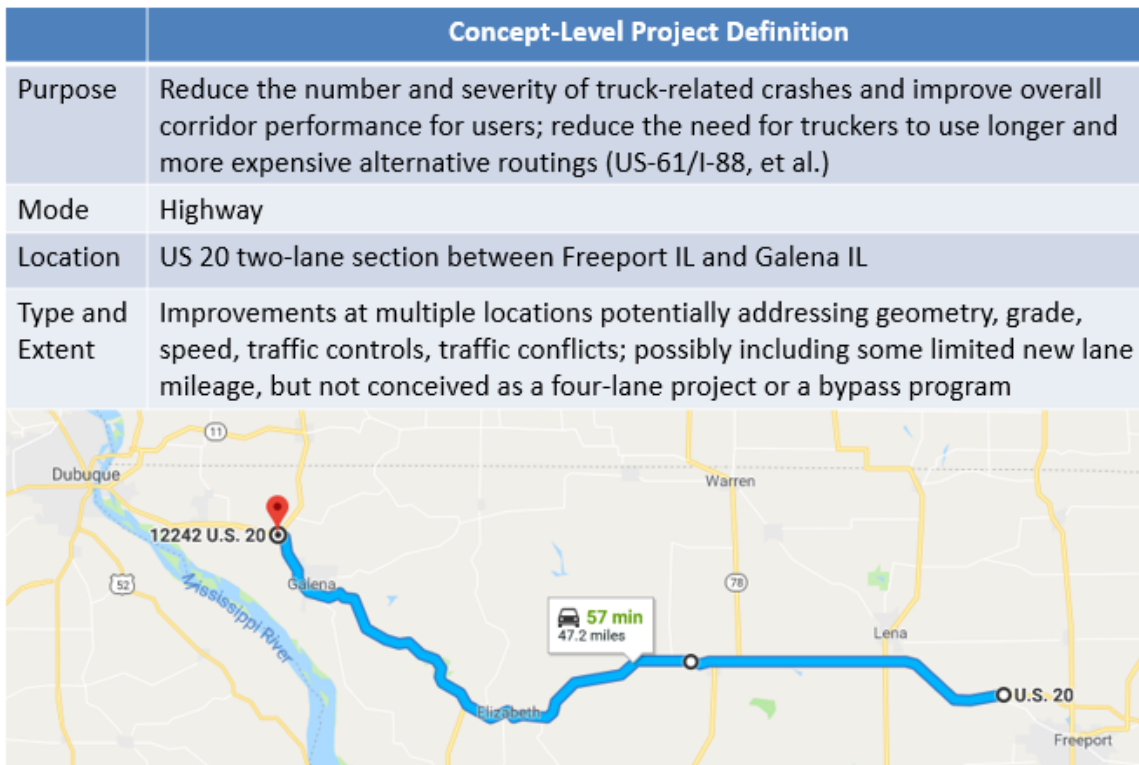
analysis is valid for any single terminal site, or functional combination of terminal sites, in the region, within a roughly 25-mile radius of the Julien Dubuque Bridge. Importantly, the market analysis is based on the diversion of existing truck traffic to barge, and does not assume or rely on attracting existing barge traffic from other river terminals.

### 3.3 Benefit-Cost Analysis Results

#### 3.3.1 BCA Results: US 20 Safety/Performance Corridor

The US 20 Safety/Performance Corridor concept analyzed in this study would provide various improvements at multiple locations to reduce the number and severity of truck-related crashes and improve overall performance along a 47-mile section of US 20, as described in Figure 3-1. The specific improvements have not yet been identified.

Figure 3-1: US 20 Concept-Level Project Definition



The primary transportation effects of the project are summarized in Figure 3-2, and include:

- Distance.** Trucks may experience slight changes in distance if parts of US 20 are realigned, but for analysis purposes we assume no change. Trucks currently using US-61 and I-88 for trips including segments between Dubuque and Chicago (236 miles) would benefit from reduced travel distance on US-20 and I-90 (178 miles). Trucks currently using US-61 and I-88 for trips between Dubuque and Rochelle (159 miles) would benefit from reduced travel distance on US-20 and I-90 (116 miles).
- Travel Time.** The analysis assumes current US 20 trucks would see an increased average speed of approximately 20 percent, with segment travel times dropping from 65 minutes to 54 minutes. Trucks currently using US-61 and I-88 for trips including segments between Dubuque

and Chicago (4:20) would benefit from reduced travel time on US-20 and I-90 (3:27). Trucks currently using US-61 and I-88 for trips including segments between Dubuque and Rochelle (2:40) would benefit from reduced travel time on US-20 and I-90 (2:17).

- **Crashes.** This segment of US 20 experiences an average of 29 truck involved crashes per year and 263 non-truck involved crashes per year. The improvements aim to achieve a 30 percent reduction in truck crash rates and a 15 percent reduction in non-truck crash rates.

Figure 3-2: US 20 Transportation Effects

Performance Factors	Current Condition	Improved US-20
Distance		
• US-20 Segment	47 miles	47 miles
• Dubuque-Chicago	236 miles (US-61/I-88)	178 miles (US-20/I-90)
• Dubuque-Rochelle	159 miles (US 61/I-88)	116 miles (US-20/I-90/I-39)
Travel Time (AM Peak, Max)		
• US-20 Segment	1:05 (44 mph)	0:52 (54 mph)
• Dubuque-Chicago	4:20 (US-61/I-88)	3:27 (US-20/I-90)
• Dubuque-Rochelle	2:40 (US-61/I-88)	2:17 (US-20/I-90/I-39)
Crashes		
• Truck-Involved	175 / 6 years = 29 per year	30% reduction
• Non-Truck Involved	1575 / 6 years = 263 per year	15% reduction
Time and Cost Savings (2016\$)		
• US-20 Segment Users	\$5.90 per one-way truck trip	
• Dubuque-Chicago Users	\$79.70 per one-way truck trip	
• Dubuque-Rochelle Users	\$51.70 per one-way truck trip	
• Avoided Crash Savings	\$8.4 million per year	

Based on monetization factors from current USDOT Benefit-Cost Analysis guidance, current US 20 segment users would see travel time and vehicle operating cost savings of \$5.90 per truck trip; Dubuque-Chicago users would see benefits of \$79.70 per truck trip; Dubuque-Rochelle users would see benefits of \$51.70 per truck trip; and the avoided crash savings based on current traffic levels would be \$8.4 million per year.

The amount of traffic benefiting from the improvements is described in Figure 3-3 following.

- **Current traffic levels** over the extent of the improved segment are assumed equal to the lowest truck AADT segment volume. Future growth in this baseline traffic is assumed at 1.1 percent per year, based on Freight Analysis Framework (FAF)<sup>26</sup> forecasts.
- **Diverted** traffic that would shift from US-61 / I-88 routings to the improved corridor is estimated at half of the baseline traffic, assuming half to/from Chicago and half to/from Rochelle. These interim estimates are considered reasonable for purposes of this analysis, but need to be verified by more detailed network analysis and modeling before the findings are conclusive. Diverted traffic would also grow at 1.1 percent per year.

<sup>26</sup> The Freight Analysis Framework (FAF) is a publicly available commodity flow database developed by the FHWA. This resource is described in detail in Working Paper 2 – Existing and Future Commodity Profile.

- **Total demand** is estimated at 1,420 trips per year and generates travel time/cost savings and vehicle miles of travel savings. Safety savings are calculated only from baseline traffic, because the diverted traffic would shift from routes that already have relatively low crash rates.

Figure 3-3: US 20 Travel Demand

Project Demand	Value	Comment
Truck AADT, Current US 20 Users (2015)	<ul style="list-style-type: none"> <li>• Lowest Segment = 710</li> <li>• Average Segment = 1264</li> <li>• Highest Segment = 2400</li> </ul>	Assume lowest AADT segment is most representative
Truck AADT, Diverted US 20 Users	Assume diversion from US-61 / I-88 could be half of current US 20 volume; split between Chicago and Rochelle	Conservative working assumption, should be verified by network modeling
Total Demand	1420 trips per day <ul style="list-style-type: none"> <li>• 710 existing</li> <li>• 178 Chicago diversion</li> <li>• 178 Rochelle diversion</li> </ul> No induced demand assumed	Safety benefit applies only to existing demand
Growth	1.1% / year AADT growth for trucks; same for autos	Truck rate from FAF
Phasing	First analysis year = 2021 Full diversion = 2023	Assumed for BCA purposes

Benefit-Cost Analysis results are presented in Figure 3-4. Over 30 years, the benefit totals are:

- \$603 M (0% discount);
- \$361 M (3% discount); and
- \$204 M (7% discount).

Approximately 53 percent of the benefit is from safety benefits, and 45 percent of the benefit is from travel time/cost savings. At a target BCR of 1.5, the supported level of project investment would be \$136 M (7% discount) to \$240 M (3% discount). These funds could be allocated towards any and all types of projects necessary to achieve the performance gains assumed in the analysis.

Figure 3-4: US 20 Benefit-Cost Analysis Summary

**Benefit Summary (0% Discounting)**

Economic Competitiveness	\$ 271,931,268	45.1%
State of Good Repair	\$ 6,270,851	1.0%
Sustainability	\$ 7,799,216	1.3%
Safety	\$ 316,737,937	52.5%
<b>Total Benefit</b>	<b>\$ 602,739,272</b>	<b>100.0%</b>
<b>Project Cost</b>	<b>\$ 401,826,181</b>	
<b>BCR</b>	<b>1.50</b>	

**Benefit Summary (3% Discounting)**

Economic Competitiveness	\$ 161,470,284	44.8%
State of Good Repair	\$ 3,715,008	1.0%
Sustainability	\$ 5,076,327	1.4%
Safety	\$ 190,426,895	52.8%
<b>Total Benefit</b>	<b>\$ 360,688,515</b>	<b>100.0%</b>
<b>Project Cost</b>	<b>\$ 240,459,010</b>	
<b>BCR</b>	<b>1.50</b>	

**Benefit Summary (7% Discounting)**

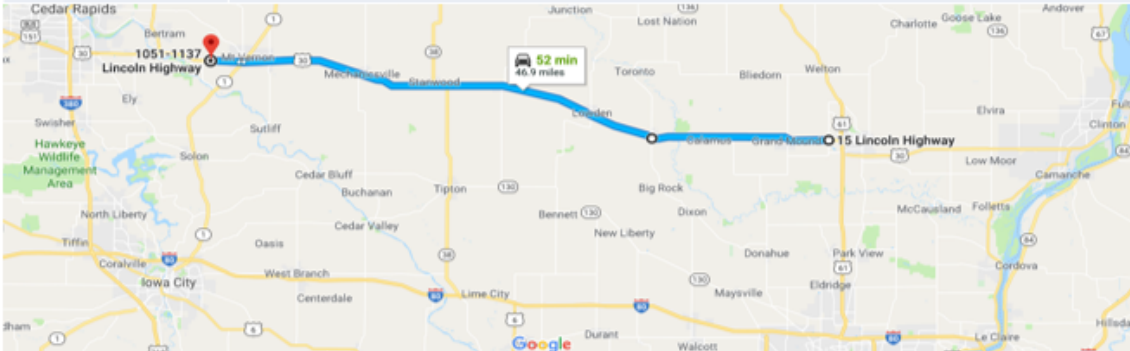
Economic Competitiveness	\$ 90,186,077	44.2%
State of Good Repair	\$ 2,066,932	1.0%
Sustainability	\$ 3,180,035	1.6%
Safety	\$ 108,558,524	53.2%
<b>Total Benefit</b>	<b>\$ 203,991,569</b>	<b>100.0%</b>
<b>Project Cost</b>	<b>\$ 135,994,379</b>	
<b>BCR</b>	<b>1.50</b>	

**3.3.2 BCA Results: US 30 Multimodal Access Corridor**

The US 30 Multimodal Access Corridor concept analyzed in this Study would provide improvements along the two-lane section of US 30 between Dewitt, IA, and Mt. Vernon, IA – a 47-mile segment partially within and partially west of the Region. The goal is to improve access between the Region, the Cedar Rapids Logistics Park, and potential future marine terminals at or near East Clinton, IL. See Figure 3-5.

Figure 3-5: US 30 Concept-Level Project Definition

Concept-Level Project Definition	
Purpose	Improve access between the Study Area, new multimodal transfer facilities being developed at Cedar Rapids IA, and potential future marine terminal at or near East Clinton IL; reduce the need for truckers to use longer and more expensive alternative routings (US-61/I-80, et al.)
Mode	Highway
Location	US 30 two-lane section between Dewitt IA and Mt. Vernon IA (within and west of the Study Area)
Type and Extent	Selected performance improvements, TBD, possibly including additional lane mileage



The map shows a route along US 30 from Cedar Rapids, IA, in the west to Clinton, IA, in the east. A blue line highlights the project segment. A callout box indicates a travel time of 52 minutes and a distance of 46.9 miles. The map includes various towns and landmarks such as Bertram, Ely, Solon, Cedar Bluff, Buchanan, Tipton, Cedar Valley, West Branch, Centerdale, Lime City, New Liberty, Dixon, Big Rock, Bennett, Durant, Walcott, Maysville, Elbridge, Park View, Donahue, McCalland, Folletts, Low Moor, Gamanche, and Cordova. Major highways like I-35, I-80, and US-61 are also visible.

The primary transportation effects of the project are summarized in Figure 3-6, and include:

- Distance.** Current US 30 trucks might see slight changes in distance if parts of US 30 are realigned, however for analysis purposes no change was assumed. Trucks currently using US-61 and I-80 for trips including segments between Clinton and Cedar Rapids (112 miles) would benefit from reduced travel distance via US-30 (84 miles).
- Travel Time.** The analysis assumes current US 30 trucks would see an increase of roughly 20 percent in average speed, with segment travel times dropping from 55 minutes to 44 minutes. Trucks currently using US-61 and I-80 for trips including segments between Clinton and Cedar Rapids (1:47) would benefit from reduced travel time via US-30 (1:24).
- Crashes.** Within the Study Area, this segment of US 30 experiences an average of 23 truck involved crashes per year and 86 non-truck involved crashes per year. The improvements aim to achieve a 30 percent reduction in truck crash rates and a 15 percent reduction in non-truck crash rates.

Figure 3-6: US 30 Transportation Effects

Performance Factors	Current Condition	Future with Improvements
Distance <ul style="list-style-type: none"> <li>US-30 Segment</li> <li>Clinton to Cedar Rapids</li> </ul>	47 miles 112 miles (US-30/US-61/I-80)	47 miles 84 miles (US-30)
Travel Time (AM Peak) <ul style="list-style-type: none"> <li>US-30 Segment</li> <li>Clinton to Cedar Rapids</li> </ul>	0:55 (51 mph) 1:47 (US-30/US-61/I-80)	0:44 (64 mph) 1:24 (US-30)
Crashes <ul style="list-style-type: none"> <li>Truck-Involved</li> <li>Non-Truck Involved</li> </ul>	136 / 6 years = 23 per year 517 / 6 years = 86 per year	30% reduction 15% reduction
Time and Cost Savings (2016\$) <ul style="list-style-type: none"> <li>US-30 Segment</li> <li>Alt Route Users</li> <li>Avoided Crash Savings</li> </ul>	\$4.99 per one-way truck trip \$37.30 per one-way truck trip \$2.6 million per year	

Based on monetization factors from current USDOT Benefit-Cost Analysis guidance, current US 30 segment users would see travel time and vehicle operating cost savings of \$4.99 per truck trip; Clinton-Cedar Rapids users would see benefits of \$37.30 per truck trip; and the avoided crash savings based on current traffic levels would be \$2.6 million per year.

The amount of traffic benefiting from the improvements is described in Figure 3-7 .

- **Current traffic levels** over the extent of the improved segment are assumed equal to the lowest truck AADT segment volume. Future growth in this baseline traffic is assumed at 1.1 percent per year, based on FAF forecasts.
- **Diverted** traffic that would shift from US-61 / I-80 routings to the improved corridor is estimated to be equal to baseline traffic. This interim estimate is considered reasonable for purposes of this analysis, but needs to be verified by more detailed network analysis and modeling before the findings are conclusive. Diverted traffic would also grow at 1.1 percent per year.
- **Induced demand** might occur on the improved corridor due to business expansion/relocation decisions, to take advantage of better access. However, because such decisions would likely be shifts in freight movement between different current or potential locations within Iowa, we do not claim credit for this effect in the BCA.
- **Total demand** is estimated at 1,118 trips per year. Travel time/cost savings and vehicle miles of travel savings are generated by 894 of these trips. Safety savings are calculated only from baseline traffic, because the diverted traffic would be shifting from routes that already have relatively low crash rates.

Figure 3-7: US 30 Travel Demand

Project Demand	Value	Comment
Truck AADT, Current US 20 Users	<ul style="list-style-type: none"> <li>• Lowest Segment = 447</li> <li>• Average Segment = 493</li> <li>• Highest Segment = 720</li> </ul>	Assume lowest segment is most representative
Truck AADT, Diverted US 30 Users	Assume diversion from US-61 / I-80 is equal to current US 30 volume; all for Cedar Rapids	Working assumption, should be verified by network modeling
Truck AADT, Induced Demand, US 30 Users	Assume add'l growth equal to half of current traffic is driven by Cedar Rapids and US 30-served barges	Assume this traffic would otherwise be accommodated on IA roads with comparable VMT and crash impacts, so no effect on BCA
Total Demand	1118 trips per day <ul style="list-style-type: none"> <li>• 447 existing</li> <li>• 447 diverted</li> <li>• 224 induced</li> </ul>	Safety benefit applies only to existing demand
Growth	1.1% / year AADT growth for trucks; same for autos	Truck rate from FAF
Phasing	First analysis year = 2021 Full diversion = 2023 Full induced growth = 2025	Assumed for BCA purposes

Benefit-Cost Analysis results are presented in Figure 3-8. Over 30 years, the benefit totals are:

- \$272 M (0% discount);
- \$162 M (3% discount); and
- \$91 M (7% discount).

Approximately 28 percent of the benefit is from safety benefits, and 69 percent of the benefit is from travel time/cost savings. At a target BCR of 1.5, the supported level of project investment would be \$61 M (7% discount) to \$108 M (3% discount). These funds could be allocated towards any and all types of projects necessary to achieve the performance gains assumed in the analysis.

Figure 3-8: US 30 Benefit-Cost Analysis Summary

**Benefit Summary (0% Discounting)**

Economic Competitiveness	\$	186,246,541	68.6%
State of Good Repair	\$	4,365,668	1.6%
Sustainability	\$	5,429,691	2.0%
Safety	\$	75,639,189	27.8%
<b>Total Benefit</b>	<b>\$</b>	<b>271,681,089</b>	<b>100.0%</b>
<b>Project Cost</b>	<b>\$</b>	<b>181,120,726</b>	
<b>BCR</b>		<b>1.50</b>	

**Benefit Summary (3% Discounting)**

Economic Competitiveness	\$	110,534,957	68.2%
State of Good Repair	\$	2,586,330	1.6%
Sustainability	\$	3,534,059	2.2%
Safety	\$	45,475,247	28.0%
<b>Total Benefit</b>	<b>\$</b>	<b>162,130,593</b>	<b>100.0%</b>
<b>Project Cost</b>	<b>\$</b>	<b>108,087,062</b>	
<b>BCR</b>		<b>1.50</b>	

**Benefit Summary (7% Discounting)**

Economic Competitiveness	\$	61,684,262	67.6%
State of Good Repair	\$	1,438,966	1.6%
Sustainability	\$	2,213,891	2.4%
Safety	\$	25,924,519	28.4%
<b>Total Benefit</b>	<b>\$</b>	<b>91,261,637</b>	<b>100.0%</b>
<b>Project Cost</b>	<b>\$</b>	<b>60,841,092</b>	
<b>BCR</b>		<b>1.50</b>	

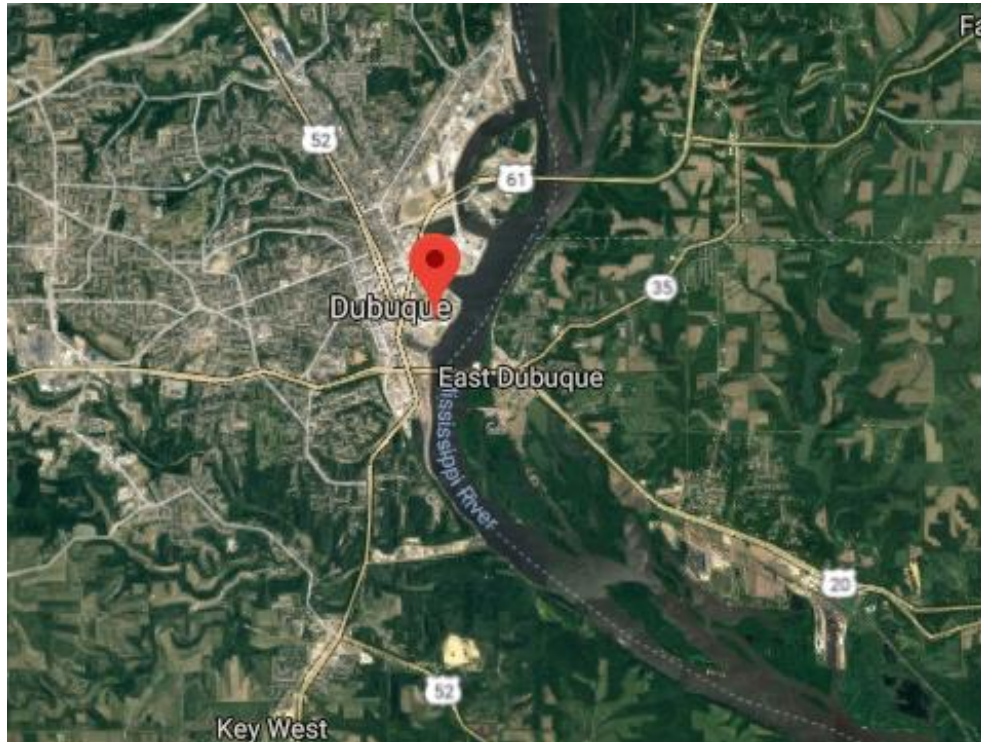
**3.3.3 BCA Results: Dubuque/East Dubuque Area Marine Terminal Enhancement**

The Dubuque/East Dubuque Area Marine Terminal Enhancement concept would provide improvements to existing barge terminal(s) in the region to accommodate new types of cargo. The focus would be on commodities other than liquid bulk or dry bulk (things like coal, grain, fertilizer, fuels, oils, etc.) that can be handled at existing terminals; and it would not target containerized commodities, given the undetermined market for such a service as well as potential competition from Muscatine, IA, for whatever demand exists. Even with these exclusions, the terminal(s) could handle a broad range of important and high-value goods: steel, dimensioned lumber, machinery and parts, transportation equipment, bagged organic and inorganic materials and products, construction equipment and fabricated shapes, etc. See Figure 3-9.



Figure 3-9: Dubuque/East Dubuque Area Marine Terminal Concept-Level Project Definition

	Concept-Level Project Definition
Purpose	Improve Marine Terminal capacity in the Dubuque/East Dubuque area to accommodate a broad range of higher-value ro-ro, break-bulk, and project cargo; does not include containers, liquid bulk, or dry bulk
Mode	Marine
Location	Dubuque/East Dubuque Area
Type and Extent	Improvements to existing terminal(s) to attract new cargo types/customers



The primary challenge in evaluating truck to barge modal diversion potential is understanding the service trade-offs between the two modes, and the conditions under which barges are likely to be most and least attractive for current truck users. Key variables and considerations include the following.

- Market Sheds and Drayage.** From previous experience, we assume the likely “market shed” for potential users of the terminal would be within a 75-mile radius. This includes areas as distant as Cedar Rapids, Davenport, Rockford, and Madison. Within this radius, users could truck to and from the terminal (known as “drayage”); at greater distances, they would likely truck to alternative barge locations, or to rail terminals, or utilize all-truck routings.
- Partner Markets.** The main trading partner markets for the Dubuque/East Dubuque facility would be Minneapolis/St. Paul; St. Louis; Memphis; and Baton Rouge/New Orleans/South Louisiana. Each of these partner market areas offers large production capacity, a large

consuming population, well-developed barge infrastructure, and strong truck and rail connectivity. The physical extent of each market was assumed at 75 miles.

- **Market Attraction Factors.** On a per ton-mile basis, barge is far less expensive than trucking – provided the commodities being moved are not highly sensitive to time. Barge is much slower than truck or rail, so commodities that are perishable or time-sensitive, or represent high inventory holding costs, are unlikely to use barge under any circumstances. The commodities that take best advantage of barge’s cost efficiencies tend to be heavy bulk materials and products – rock, coal, etc. – where maintaining a regular delivery schedule is more important than how fast a single shipment moves. However, other higher-value commodities can potentially take advantage of the cost efficiencies offered by barge, under the right conditions. Namely, there has to be a significant supply chain advantage, where the cost of the barge and associated truck drayage is less than the cost of an all truck or truck/rail move, and the delivery speed difference is not burdensome to the customer.
- **Load Factors.** A particularly attractive market is oversize-overweight commodities, which may require special permits or multiple truck trips to move over the road, but are easily accommodated on water. This analysis assumes performance and market demand based on fully-loaded truckload equivalents (22 tons), but with larger loads, the attractiveness of barge services is increased.
- **Cost Comparison.** This analysis looked at each of the four market area pairs and estimated truck costs versus potential costs through improved Dubuque/East Dubuque terminal(s). All-truck costs were estimated using national per-truckload averages recently updated by the American Trucking Association, considering the ‘centroid to centroid’ mileage between the markets plus or minus 75 miles from each centroid. Barge service costs were estimated reflecting assumed costs for barge operations, barge-to-terminal-to-truck transfer and handling, and truck drayage. Barge costs assumed average drayage of 37.5 miles at each end of the trip, with trucks loaded in one direction and empty in the other; inventory costs were not considered, since time-sensitive commodities are assumed not to be interested in barge service.

Based on these considerations, the primary transportation effects of the project (in this case, transport cost differences) are summarized in Figure 3-10.

- The cost of a **Dubuque-Minneapolis/St. Paul barge service is likely to be higher** than the average cost of all-trucking service, although barge could be competitive for a small portion of the market where trucking is at the high end of the cost range. This indicates the analysis should assume that only a small percentage of truck traffic could be diverted to barge service (e.g., a low “diversion rate”).
- The cost of a **Dubuque-St Louis barge service is generally comparable** with the average cost of trucking with barge costs being comparable. Around half of trucking customers will have a lower cost by truck, and will probably not be interested in barge; the other half will have a higher cost by truck, and may be interested in barge. This suggests a moderate diversion rate is appropriate. Often, barge studies assume – in the absence of detailed demand studies and modeling – diversion rates of 5 to 10 percent. In our opinion the 5 percent rate is a fair

representation of market attraction under conditions where average pricing between truck and barge services is equivalent.

- The cost of a **Dubuque-Memphis barge service is likely to be just below the lowest price** offered by trucking for this market pair. This suggests a relatively aggressive diversion rate should be used in the analysis.
- The cost of a **Dubuque-South Louisiana barge service is likely to be substantially below the lowest price** offered by trucking for this market pair. This suggests an aggressive diversion rate should be used in the analysis.

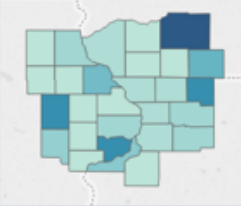
Figure 3-10: Dubuque/East Dubuque Area Marine Terminal Comparative Pricing

Performance Factors	Current (All Truck)	Future (Truck/Barge)
Dubuque Market Shed-MSP • Transport Cost, 22-ton unit	253 miles +/- 150 miles \$184- <del>\$452</del> -\$720	<b>\$593</b>
Dubuque Market Shed-St Louis • Transport Cost, 22-ton unit	335 miles +/- 150 miles \$330- <del>\$598</del> -\$866	<b>\$610</b>
Dubuque Market Shed-Memphis • Transport Cost, 22-ton unit	619 miles +/- 150 miles \$838- <del>\$1106</del> -\$1374	<b>\$723</b>
Dubuque Market Shed-South LA • Transport Cost, 22-ton unit	1000 miles +/- 150 miles \$1518- <del>\$1786</del> -\$2054	<b>\$975</b>

Next, the market demand for a potential expansion of barge service was estimated according to the following process. Results are summarized in Figure 3-11.

- The analysis boundaries of each market area were determined. For Dubuque, this included 27 counties in IL, IA, and WI, largely within a 75-mile radius of the Julien Dubuque Bridge. For partner markets, the census-defined Business Economic Area region was deemed representative for estimating commodity demand.
- The target relevant commodity groups were specified, based on the choices provided by the USDOT Freight Analysis Framework. Obvious liquid bulk and dry bulk commodities were excluded, as were high-value commodities known to be very-time sensitive, and/or known to prefer movement in containers or “dry van” trucks.
- Using the county-level FAF disaggregation developed by WSP for Illinois DOT, we tabulated the tonnages for target commodities moving between each of the four defined market pairs in year 2014. The total market consists of more than 1.8 million tons; the highest tonnage is to/from Minneapolis-St. Paul (1.1 million tons) and the lowest tonnage is to/from South Louisiana (less than 0.1 million tons).
- Next, we developed a simplified market capture model, assuming potential market demand would be captured at rates of 2.5 percent for MSP; 5.0 percent for St. Louis; 7.5 percent for Memphis; and 10.0 percent for South Louisiana.
- Summing all the model components, the total demand in year 2014 is estimated at just over 68,000 tons per year. This is equivalent to around 73 fully-loaded truck trips per week. Volume growth was assumed at 1.1 percent per year, based on FAF.

Figure 3-11: Dubuque/East Dubuque Area Marine Terminal Market Demand

Project Demand		Freight Analysis Framework (2014)	
75-mile radius 27 counties IA, IL, WI		Articles of Base Metal; Chemical Products; Machinery; Misc. Manufactured Products; Motorized Vehicles; Newsprint/Paper; Nonmetallic Mineral Products; Paper Articles; Plastics/Rubber; Precision Instruments; Printed Products; Transportation Equipment; Wood Products	
Partner Market (BEA Level)		<u>Current Truck Tons (2014)</u>	
• Minneapolis-St. Paul		1,148,548	
• St. Louis		521,047	
• Memphis		73,430	
• Baton Rouge/New Orleans		78,741	
<b>Total</b>		<b>1,821,776</b>	
Market Capture Model		<u>Potential Capture</u>	3,786 truckloads / year
• Minneapolis-St. Paul		28,184 (2.5%)	73 truckloads / week
• St. Louis		26,053 (5.0%)	First analysis year =
• Memphis		5,507 (7.5%)	2021; full market
• Baton Rouge/New Orleans		7,874 (10.0%)	absorption = 2023
<b>Total</b>		<b>68,148 (3.7%)</b>	Growth = 1.1% / year (FAF Truck Growth)

The Benefit-Cost Analysis then considered the likely effects of capturing this level of tonnage through Dubuque/East Dubuque area facilities. The main transportation effects were:

- Lower costs for barge service users compared to all-truck costs,
- Substantially reduced truck mileage, based on the elimination of long-haul truck trips and their replacement with short-distance drayage trips to and from the barge terminal, and
- Reduced highway maintenance needs, reduced tailpipe emissions, and reduced highway crashes associated with reduced truck mileage.

Benefit-Cost Analysis results are presented in Figure 3-12. Over 30 years, the benefit totals are:

- \$32.2 M (0% discount);
- \$19.2 M (3% discount); and
- \$10.8 M (7% discount).

Approximately 63 percent of the benefit is from economic competitiveness, in the form of cost savings to freight shippers who shift from truck to barge; note that USDOT guidance currently does not allow this to be counted as benefit, but for purposes of analysis it makes sense to provide the information. At a target BCR of 1.5, the supported level of project investment would be \$7.2 M (7% discount) to \$12.8 M (3% discount). These funds could be allocated towards any and all types of projects necessary to achieve the performance gains assumed in the analysis.

Figure 3-12: Dubuque/East Dubuque Area Marine Terminal Enhancement Benefit-Cost Analysis Summary

**Benefit Summary (0% Discounting)**

Economic Competitiveness	\$	20,210,988	62.7%
State of Good Repair	\$	2,008,075	6.2%
Sustainability	\$	1,736,445	5.4%
Safety	\$	8,272,992	25.7%
<b>Total Benefit</b>	<b>\$</b>	<b>32,228,500</b>	<b>100.0%</b>
<b>Project Cost</b>	<b>\$</b>	<b>21,485,667</b>	
<b>BCR</b>		<b>1.50</b>	

**Benefit Summary (3% Discounting)**

Economic Competitiveness	\$	11,973,493	62.4%
State of Good Repair	\$	1,189,633	6.2%
Sustainability	\$	1,130,122	5.9%
Safety	\$	4,901,127	25.5%
<b>Total Benefit</b>	<b>\$</b>	<b>19,194,375</b>	<b>100.0%</b>
<b>Project Cost</b>	<b>\$</b>	<b>12,796,250</b>	
<b>BCR</b>		<b>1.50</b>	

**Benefit Summary (7% Discounting)**

Economic Competitiveness	\$	6,661,734	61.9%
State of Good Repair	\$	661,881	6.2%
Sustainability	\$	707,892	6.6%
Safety	\$	2,726,857	25.3%
<b>Total Benefit</b>	<b>\$</b>	<b>10,758,364</b>	<b>100.0%</b>
<b>Project Cost</b>	<b>\$</b>	<b>7,172,243</b>	
<b>BCR</b>		<b>1.50</b>	

### 3.4 Findings of Benefit-Cost Analysis

As analyzed, each project concept offers benefits, but support very different levels of investment: 1) US 20 and US 30 projects have high benefits, and could support high costs; this is good news, since these projects are likely to be expensive, and 2) barge terminal improvements have modest benefits, but would be beneficial if they can be accomplished with modest expenditures. In order to advance these projects additional funding will be required to execute next steps, including to:

- Further define the location, type, and extent of project improvements,
- Further develop/confirm the demand estimates and estimate construction/operating costs,
- Revisit, revise, and finalize the benefit cost analysis based on updated inputs, and
- “Value engineer” the program concepts to maximize BCA and ROI metrics.

# 4 Freight Project Funding

## Key Chapter Takeaway

There is a continuous need for transportation funding for the essentials, such as the ongoing maintenance bridges and pavement in the Eight-County Region. These projects will benefit the freight users of the system, but lack the cachet of major new capital programs leaving little room in tight budgets for system expansion or innovation. New, freight-specific funding sources provide an opportunity to address freight system needs, however many of the grant programs that are now available are for very large projects (e.g. \$25M+) and are highly competitive. There is a smaller number of funding mechanisms that can more easily be secured at the local level to address the needs identified in this Plan.

## 4.1 Transportation Funding Context

There is a great need in the Region to utilize available funding for transportation system maintenance and preservation. Historically, federal, state and local funding has been centered on the movement of people rather than freight but that has begun to change with new federal freight legislation which passes funding down to states for allocation to projects on the state system, with the possibility of using that funding towards projects off the state transportation (i.e., within other local jurisdictions).

Regions such as ECIA and BHRC have small budgets for transportation funding and have had to prioritize those funds for basic maintenance needs, and to a lesser extent capital projects, leaving little funding for dedicated investment in the freight system. Because of this, the Region will need to be innovative and collaborative with the local business community in order to make every dollar count. In addition, it is necessary for the Eight-County Region to continue to work with partners in neighboring jurisdictions to ensure connectivity to the wider multimodal freight system to enable area businesses to more efficiently move the freight they need to sustain and grow.

Because of tight local budgets, state and federal funding opportunities may provide the necessary resources to improve the Region's freight system and address some of the needs identified in this Plan. Although many are highly competitive grants, the state and federal funding sources for freight improvements have been summarized to provide awareness on the options potentially available to the Region.

## 4.2 Federal Freight Funding Opportunities

Federal funding through the Highway Trust Fund provides federal funding to states and their regional planning partners. These formula funds are used almost exclusively for the highway system and for improvements to enhance the mobility of passengers. There are freight specific funding sources that could be utilized for regional multimodal freight mobility improvements.

#### 4.2.1 Fixing America's Surface Transportation (FAST) Act

On December 4, 2015, President Obama signed into law the Fixing America's Surface Transportation (FAST) Act that authorizes federal highway, highway safety, transit, and rail programs for five years from federal fiscal years (FY) 2016 through 2020. The FAST Act authorizes \$305 billion from both the Highway Trust Fund and the General Fund (GF) of the United States Treasury. It provides \$225 billion in Highway Trust Fund (HTF) contract authority over five years for the Federal-aid Highway Program, increasing funding from \$41 billion in 2015 to \$47 billion in 2020.

The bill places major emphasis on freight investments by creating a new National Highway Freight Program (NHFP) funded at an average of \$1.2 billion per year and distributed to the states by formula. The program includes a National Highway Freight Network (NHFN) consisting of four subsystems:

- The Primary Highway Freight System (PHFS),
- Other Interstate Highways not in the PHFS,
- Critical Rural Freight Corridors (CRFC) (to be defined by states), and
- Critical Urban Freight Corridors (CUFC) (to be defined by states).

Other discretionary, highly competitive grant opportunities offered by the USDOT include the Transportation Investment Generating Economic Recovery (TIGER) and the Infrastructure for Rebuilding America (INFRA) discretionary grant programs.<sup>27</sup>

#### 4.2.2 Transportation Investment Generating Economic Recovery

Transportation Investment Generating Economic Recovery (TIGER) provides funding for road, rail, transit and port projects that promise to achieve national objectives. This highly competitive program has funded between 31 and 52 projects each year since 2009. Each year the USDOT solicits and receives hundreds of grant applications for projects to build and repair critical portions of the freight and passenger transportation networks. Applications are evaluated and selected based on the highest value for the dollars invested. TIGER projects have historically achieved an average of more than 3.6 matching dollars for every TIGER grant dollar, representing the shared responsibility for funding infrastructure.

The eligibility requirements of TIGER allow project sponsors at the State and local levels to obtain funding for multimodal, multi-jurisdictional projects that are more difficult to support through traditional DOT programs. TIGER can fund port and freight rail projects, for example, which play a critical role in our ability to move freight, but have limited sources of federal funds.

#### 4.2.3 Infrastructure for Rebuilding America

Infrastructure for Rebuilding America (INFRA) awards are granted for both large and small projects. For a large project, the INFRA grant must be at least \$25 million. For a small project, the grant must be at least \$5 million. Ten percent of available funds are reserved for small projects and at least 25 percent of funding is set aside for rural projects.

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<sup>27</sup> The INFRA Program was previously referring to as the FASTLANE (Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies) Program

INFRA grants may be used to fund a variety of components of an infrastructure project, with the focus on projects with heavy local support and is ‘shovel ready.’ Eligible INFRA project costs could include reconstruction, rehabilitation, acquisition of property, environmental mitigation, construction contingencies, equipment acquisition, and operational improvements directly related to system performance.

#### 4.2.4 Congestion Mitigation and Air Quality

Congestion Mitigation and Air Quality (CMAQ) funds support transportation projects that reduce mobile source emissions in areas designated by the US Environmental Protection Agency (EPA) as in “nonattainment” or “maintenance” of national ambient air quality standards. To be eligible for funding the project must be demonstrated to result in a reduction of emissions of a criteria pollutant for which the area is in non-attainment. CMAQ funding is administered jointly by the FHWA and FTA and is allocated to states on the basis of the severity of their air quality status. A minimum 20 percent non-federal match is typically required.

#### 4.2.5 Transportation Infrastructure Finance and Innovation Act

The goal of Transportation Infrastructure Finance and Innovation Act (TIFIA) financing is to leverage limited federal resources and stimulate private capital investment in transportation infrastructure by providing credit assistance in the form of direct loans, loan guarantees, and standby lines of credit to projects of national or regional significance. TIFIA financing is available to public or private transportation projects, including rail and transit. The program is aimed at large projects (minimum of approximately \$50 million) with a maximum TIFIA-financed portion of 33 percent of the total project.

#### 4.2.6 Railroad Rehabilitation and Improvement Financing

Under the Railroad Rehabilitation and Improvement Financing (RRIF) program, the Federal Railroad Administration provides up to \$35 billion in direct loans at interest rates roughly equal to the 30-year Treasury rate, as well as loan guarantees. The loans can be used to refinance outstanding debt that results from infrastructure projects, which the program also helps to finance at up to the total cost. State and local governments, government-sponsored authorities, and corporations, railroads, and others are eligible to participate.

### 4.3 State Freight Funding Opportunities

#### 4.3.1 Iowa Funding

Funding for freight transportation improvements in Iowa is similar to that in other states; there is not enough to meet needs. Aging roads and bridges continue to consume most of the funding available for maintenance and repair. Iowa must improve its system of roads, highways and bridges to foster economic growth and ensure safe, and reliable mobility for freight reliant industries. There is consensus among transportation professionals that the fuel tax is not a sustainable source of revenue and other mechanisms should be explored at a state level to ensure a sustainable source of funding for transportation improvements, including freight.

The freight rail system utilizes very little aid from state or federal sources. As a primarily privately owned system, capital investment depends on the financial stability of the railroads themselves and



the customers that support them. There are some programs that have been established in the state to assist with small rail freight projects.

### **Freight Formula Funding**

As noted in Section 4.2.1, FAST Act funding for the National Highway Freight Program (NHFP) is distributed to each state by a standard formula. States are given flexibility on how they choose to allocate these funds, as such the Iowa DOT and Iowa Transportation Commission have elected to allocate these through a competitive grant program and updated version of the original LIFTS pilot program (see the LIFTS program, below). The updated version of LIFTS allows stakeholders outside of the Iowa DOT to apply for the flexible funding for use on freight projects. Project evaluation criteria will be designated and communicated prior to the application cycle and Iowa DOT staff, with support from external freight stakeholders, will review and prioritize applications on an annual basis.<sup>28</sup>

### **Linking Iowa's Freight Transportation System**

The Linking Iowa's Freight Transportation System (LIFTS) grant program was created in fall 2015 as a one-time, flexible funding source of \$2.6 million for freight-related projects. In part this program was designed to assess the need for dedicated freight funding by Iowa DOT, but it was also aimed at improving Iowa's freight transportation system by focusing on projects that are not typically eligible for highway funding program funds. Types of projects that qualified for this program included new transload facilities, increasing capacity at barge terminals, replacing rail infrastructure, and rehabbing old transportation infrastructure. During the first round, six projects were awarded grant funding including a study, a capacity improvement, and four transload projects. All six projects were multimodal with two involving highway, railroad, and waterways.<sup>29</sup> Based on the response and success of the program, as noted above, competitive grant program will continue using the NHFP funds.

### **Highway-Railroad Crossing Safety Program**

The crossing safety program provides funding specifically for safety improvements at highway-railroad grade crossings. These funds are used to install new crossing signal devices, to upgrade existing signals, and to provide low-cost improvements; such as increased sight distance, widened crossings, increased signal lens size, or crossing closures. In Iowa, railroads or road authorities can submit a request for crossing safety funding. Ninety percent of the costs (of approved projects) are funded by the Iowa DOT, with the remaining ten percent paid by local authorities, railroads, or some combination of the two. This funding is very limited and is provided for a small number of safety improvements each year.

### **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, improve the overall rail network, and contribute to better rail port planning and development. These grants require a 20 percent matching contribution.

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<sup>28</sup> Iowa State Freight Plan, Iowa DOT, Amended 2017.

<sup>29</sup> Ibid.

### **Iowa Clean Air Attainment Program**

The Iowa Clean Air Attainment Program (ICAAP) provides eligible recipients with funds for projects that help maintain or improve air quality by reducing transportation-related emissions. Freight projects are eligible. Proposed improvements to the highway system must be on the federal-aid system, which includes all federal functional class routes except local and rural minor collectors. A 20 percent match is required and must reduce emissions via traffic flow, reduce VMT, reduce single-occupant vehicle trips, or other transportation improvement projects which improve air quality or reduce congestion.

### **4.3.2 Illinois DOT**

Each year Illinois faces a significant shortfall in transportation funding compared to its needs. As like other states, Illinois relies heavily on its allocation of Highway Trust Fund monies to operate and maintain its highway infrastructure. In November 2016, Illinois voters approved the Safe Roads Amendment to the Illinois Constitution, also known as the “lockbox” amendment, which is intended to ensure that transportation-related funds (e.g., as derived from the motor fuels tax, driver’s license fees, etc.) are not used for other, non-transportation purposes. While the lockbox amendment is a good step for transportation in Illinois, it only protects existing transportation funds – it does not generate new revenue.

#### **Freight Formula Funds**

As noted in Section 4.2.1, FAST Act funding for the National Highway Freight Program (NHFP) is distributed to each state by a standard formula. States are given flexibility on how they choose to allocate these funds, as such the Illinois DOT has elected to allocate these funds in a manner similar to other DOTs across the US, through a competitive grant program (see the Illinois Competitive Freight Program, below).

#### **Illinois Competitive Freight Program**

The Illinois Competitive Freight Program (CFP) was developed to implement the goals of the 2017 Illinois State Freight Plan to improve safety, efficiency, and to grow the economy. The program will focus on reducing bottlenecks, improving freight related safety, improving intermodal access and the deployment of technology. This competitive program aims to effectively utilize 100 percent of Illinois’ NHFP funds.

#### **Grade Crossing Protection Fund**

The Illinois Commerce Commission administers a crossing improvement program on state roads which are funded through the State Road Fund, and local road improvements are funded via the Grade Crossing Protection Fund (GCPF). The GCPF receives \$3,500,000 per month, or \$39 million annually, from gas tax receipts to pay part of the expense of providing grade crossing protection at local public highway/rail crossings. Local authorities can submit applications for GCPF assistance. Federal rail safety funds are also available via application to Illinois DOT’s Bureau of Local Roads and Streets.

# 5 Conclusions and Next Steps

## 5.1 Conclusions

The Eight-County Freight Plan recommends that ten (10) strategic actions be taken as result of the thorough quantitative and qualitative analysis conducted during the study period. **Recommendation 1: Advance roadway projects that provide benefits to freight users** generally relates to the advancement of key infrastructure projects identified in the Plan, and is specifically focused on taking next steps toward improvements to US 20, US 30 and improvements to an existing barge terminal in the Region.

The benefit-cost analysis conducted for these three key project showed that there is “something there” to be explored further. Each project demonstrated benefits that could be commensurate with varying levels of cost. The US 20 and US 30 projects have high benefits, and could support high costs, and the barge terminal improvements have modest benefits, but could probably be accomplished with very modest expenditures.

Securing funding to advance these projects and other projects in the Region is important but could pose challenges. There is a continuous need for transportation funding for the essentials, such as the ongoing maintenance of bridges and pavement in the Eight-County Region. These projects will benefit the freight users of the system, but lack the cachet of major new capital programs leaving little room in tight budgets for system expansion or innovation. New, freight-specific funding sources may provide opportunities to address freight system needs, however many of the current federal grant programs that could be used to supplement local resources (e.g., TIGER or INFRA) are highly competitive.

In the Eight-County Region there are funding opportunities for the three key projects that underwent benefit-cost analysis:

- **US 20 Safety Performance Corridor.** In January 2018, ECIA and BHRC met with the Illinois DOT Secretary and District 2 staff to present the findings of the Eight-County Freight Plan US 20 safety analysis, and stress the need for increased attention to, and investment in, the corridor. Following that meeting, Illinois DOT noted that in the coming year they would fund a Road Safety Audit of the US 20 corridor to better understand where key safety issues exist, as well as identify and advance appropriate countermeasures. While this project was identified to benefit trucks and goods movement, the next steps taken by Illinois DOT will provide benefits to all users of the corridor.
- **US 30 Multimodal Access Corridor.** As part of this study a roundtable was held in Clinton, IA, to better understand key issues and needs in the US 30 corridor. With major development occurring along the corridor to the west of the Eight-County Region (i.e., Cedar Rapids Logistics Park), preserving and enhancing mobility in the corridor was noted as a concern. In January 2018, ECIA discussed next step options for the corridor, and the Iowa DOT agreed to advance

a US 30 Corridor Planning and Environmental Linkages (PEL) study to ensure that needs/issues arising due to the development are proactively addressed.

- Dubuque/East Dubuque Area Marine Terminal.** The enhancement of barge terminal capacity at multiple locations in Dubuque and East Dubuque (and as far south as Savanna, IL) has been contemplated. As the Eight-County Freight Plan was being completed, Illinois DOT announced the new, Illinois Competitive Freight Program. The program solicits applications from public sector entities, and aims to fund studies and projects focused on reducing bottlenecks, improving freight safety, improving intermodal access and the deployment of technology. ECIA is in the process of submitting an application for future funding for next steps (a planning study) related to further study of this opportunity, in collaboration with Iowa partners.

While the Eight-County Region has considerable momentum related to key Plan recommendations, it will be important for other planning and policy related recommendations to not sit idle. From a transportation perspective, the major roles of ECIA and BHRC relate to the coordination of long range transportation system planning, forming regional transportation policy, and making programming decisions to best apply federal, state and local transportation dollars to regional needs. In these roles both ECIA and BHRC have a history of coordinating with local stakeholders. To advance the Eight-County Freight Plan recommendations, their natural facilitator role should be expanded to include key public and private sector stakeholders that have an interest in advancing these recommendation to the benefit of the Region’s economy and community quality of life.

## 5.2 Next Steps

The present Working Paper is the output of Task 3 and is provided for review and comment by ECIA and BHRC and their stakeholders

