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Eight County Freight Plan

East Central Intergovernmental Association &
Blackhawk Hills Regional Council

February 26, 2018
Dubuque Area Chamber of Commerce
Dubuque, IA

Project Sponsors

bhrc Blackhawk Hills Regional Council

ECIA Business Growth INC. Financing for Growing Businesses

Clinton County Development Association

DeWitt Chamber & Development Company

Delaware County Economic Development

Greater Dubuque Development Corp.

Illinois Farmers Union

ILLINOIS SOYBEAN ASSOCIATION

Jackson County Economic Alliance

Jo Daviess County, Illinois

Riverport Railroad, LLC

TCEDA Tri-County Economic Development Alliance

Elizabeth The heart of Jo Daviess County

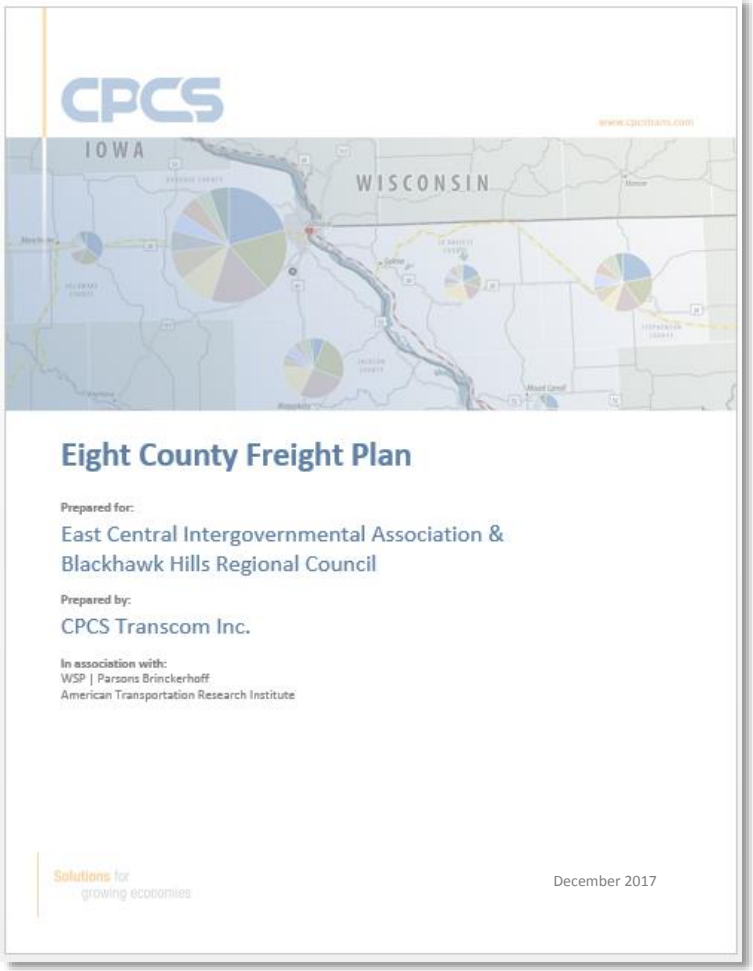
Presentation Map

Review of Progress To Date

Benefit-Cost Analysis

Next Steps

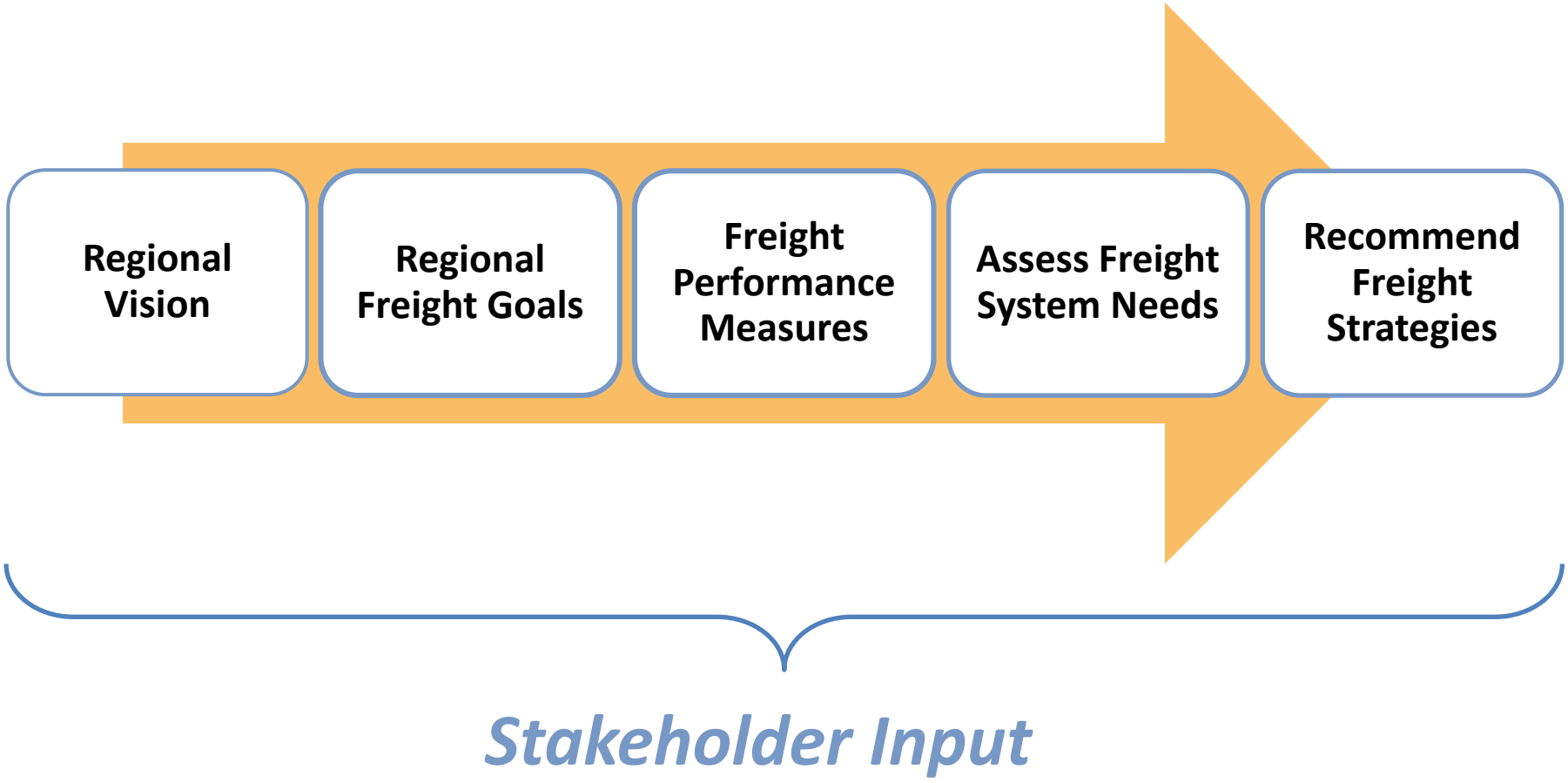
Eight County Freight Study



Key Tasks

- Physical System Inventory
- Commodity Flow Profile
- Freight System Needs Assessment
- Freight System Recommendations & Benefits Evaluation
- Stakeholder Outreach

Freight Plan Development Framework

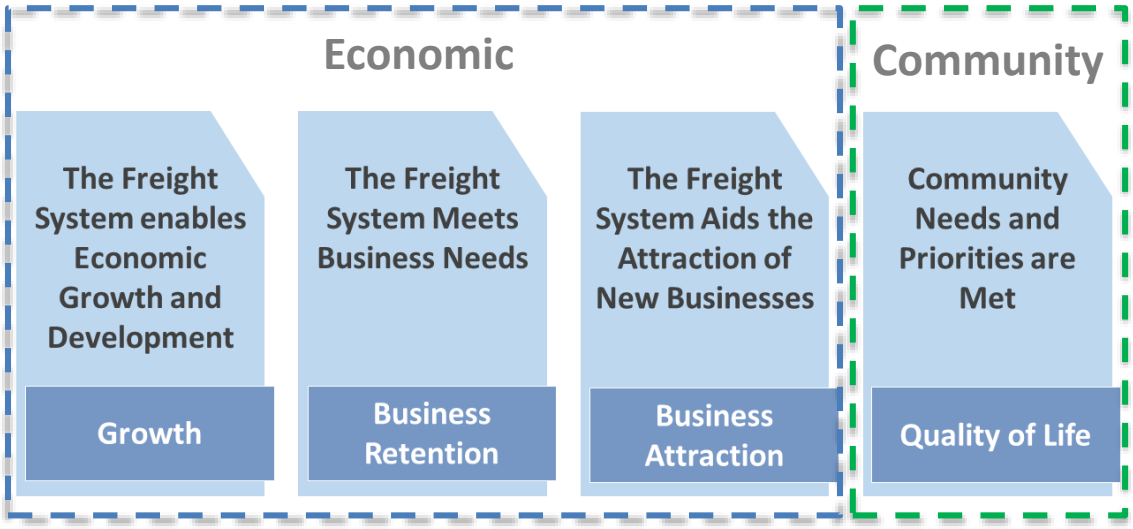


Freight Plan Vision

*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.*

Freight Plan Goals and Objectives

Goals



Objectives

Freight system performance measures developed to align with objectives

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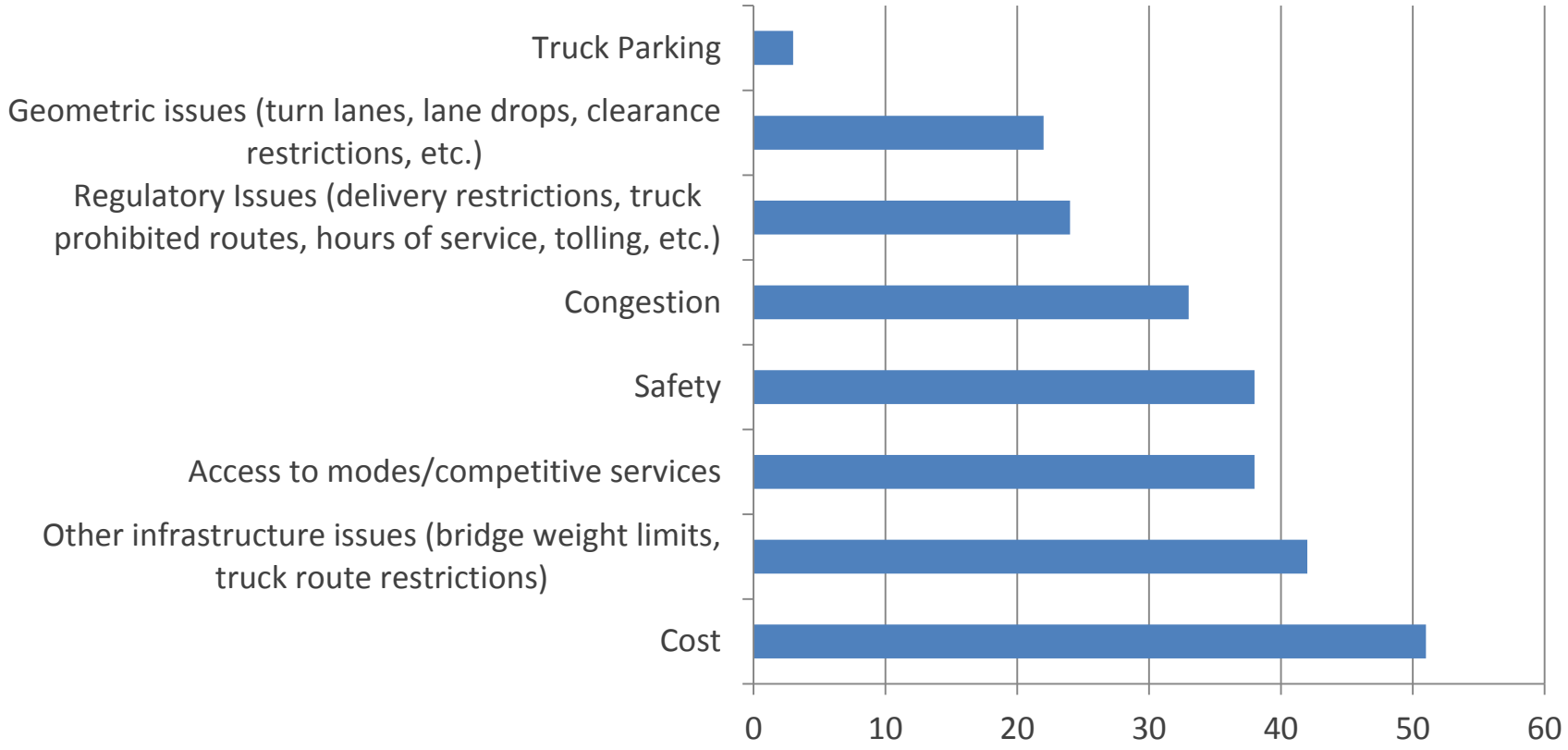
"Top 3" Transportation Issues in Eight County Region

SurveyMonkey®

96 company responses



Note: Companies were able to provide multiple responses.

Freight Study Recommendations

Projects	Programs
• Spot highway improvements to address congestion and safety (next slide) • Pavement improvements • Bridge improvements • New/improved intermodal and/or port facilities • Transload/consolidation facilities • Lock and dam improvements	• Programs focused on highway and railway safety (including grade separations) • Programs focused on enhancing skills of local workforce • Programs focused on technology applications to the (freight) transportation system • Freight planning program to monitor needs, issues and progress
Policies	**Partnerships**
• Truck regulation harmonization between Iowa and Illinois • Illinois seasonal exemption for agricultural loads (up to 90,000 lbs.) • Truck route guidance • Freight-appropriate design standards	• State, county and local public agency partnerships • Federal transportation agencies, including USDOT and the USACE • Regional and local economic development agencies • Class I and short line railroads • Airports • Water ports • Other local private industry/businesses

Project Gaps

Shown with Safety and Congestion Data

Note: Black circles show overlap between safety and congestion project gaps.

Project Gaps Listing

Route	Location	"Gaps"
US-20	Old Castle Road to Old Hawkeye Road (Between Farley and Dyersville)	Safety
US-20	North Cascade (west end of Dubuque) to US-20 Frontage Road (East Dubuque)	Safety
US-20	N. Main Street to Franklin Street (North of Galena)	Safety, Congestion
US-20	Tapley Woods to IL-84 junction	Safety
US-20	Woodbine to S. Logemann Road	Safety
US-20	W. Salem Road to N. Bolton Road (Eleroy area)	Safety
US-20	Freeport Area (Includes IL-75)	Congestion
US-20	Farwell Bridge Road to Stephenson County Line	Safety
US-30	Grand Mound to DeWitt	Safety
US-30	Downtown Clinton	Safety, Congestion
US-30	IL-136 junction to IL-78 junction	Safety
US-30	Sterling Area (includes IL-2 and IL-40)	Congestion
US-151	Dubuque Area	Safety, Congestion
IA-136	Delmar to Charlotte	Congestion
IL-78	Lowden Road to IL-40 (Mount Carroll area)	Congestion
US-52	Mount Carroll to Lanark	Safety
IL-84	Savanna to Jo Daviess County Line	Safety
I-88	IL-78 to Lincoln Road	Safety

Note: Additional project recommendations are being provided by County Engineers.

Presentation Map

Review of Progress To Date

Benefit-Cost Analysis

Next Steps

Benefit-Cost Analysis

Goal: "pre-test" potential freight-related improvements to understand their potential to generate public benefits, and the cost ranges where these improvements represent good investments

Stakeholders directed three analyses:

- US 20 Safety/Performance Corridor (IL)
- US 30 Multimodal Access Corridor (IA)
- East Dubuque Marine Terminal (serving IA and IL)

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Methodology

1. Define Project at Concept Level

- Purpose, mode, location, and type and extent of improvements
- Change in performance: modeled or "what if" changes in highway mileage and travel time, highway crash rates, and/or user costs

2. Quantify Demand Ranges

- Current use and natural growth
- Induced growth, route diversion, modal diversion

3. Model Public Benefits

- Recent TIGER / INFRA guidance, plus modal diversion cost savings
- Good repair, economic competitiveness, livability, sustainability, safety

4. Calculate Benefit-Cost Ratios (BCRs)

- Identify project costs that support a target BCR
- Show how much investment may be warranted

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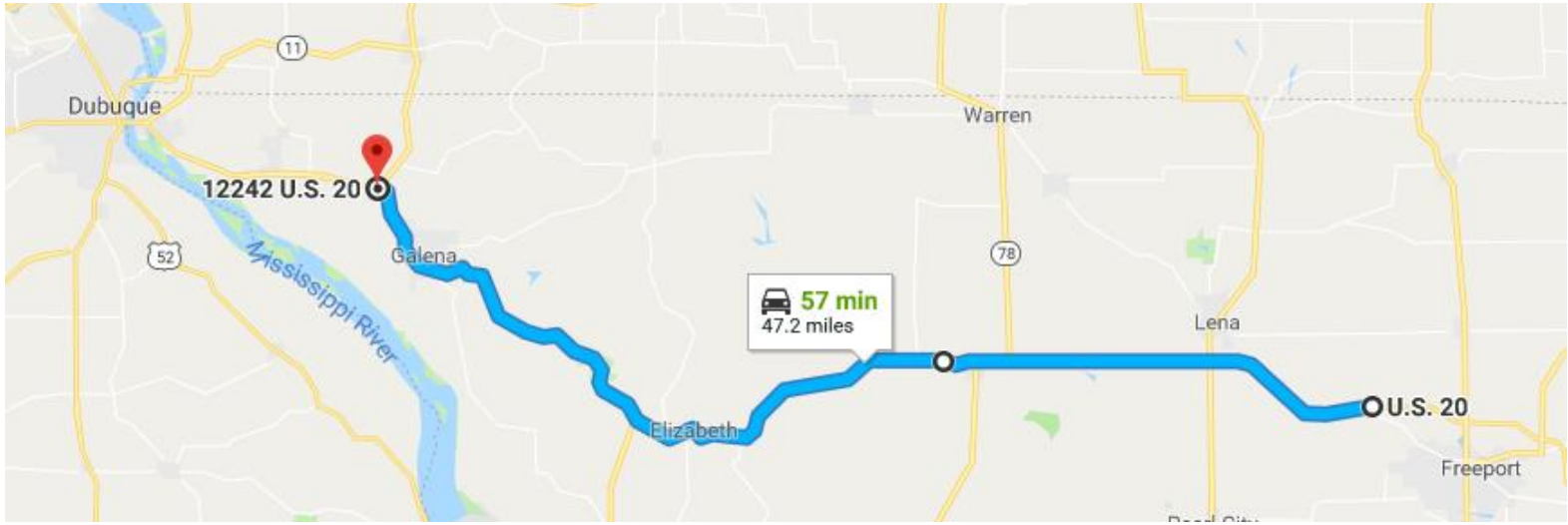
US 20 Safety/Performance Corridor

	Concept-Level Project Definition
Purpose	Reduce the number and severity of truck-related crashes and improve overall corridor performance for users; reduce the need for truckers to use longer and more expensive alternative routings (US-61/I-88, et al.)
Mode	Highway
Location	US 20 two-lane section between Freeport IL and Galena IL
Type and Extent	Improvements at multiple locations potentially addressing geometry, grade, speed, traffic controls, traffic conflicts; possibly including some limited new lane mileage, but not conceived as a four-lane project or a bypass program



US 20 Safety/Performance Corridor

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	

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US 20 Safety/Performance Corridor

Project Demand	Value	Comment
Truck AADT, Current US 20 Users (2015)	• Lowest Segment = 710 • Average Segment = 1264 • Highest Segment = 2400	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 • 710 existing • 178 Chicago diversion • 178 Rochelle diversion 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

US 20 Safety/Performance Corridor

BCA Results

- Benefits over 30 years
  - $603 M (0% discount)
  - $361 M (3% discount)
  - $204 M (7% discount)
- Justifiable investment at BCR of 1.5
  - $240 M (3% discount)
  - $136 M (7% discount)
- Underlying demand numbers should be confirmed by more detailed study
  - Current assumptions are believed reasonable, but the reality may be higher or lower

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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%
Total Benefit	**$**	**602,739,272**	100.0%
Project Cost	**$**	**401,826,181**	
BCR		**1.50**	

Benefit Summary (3% Discounting)

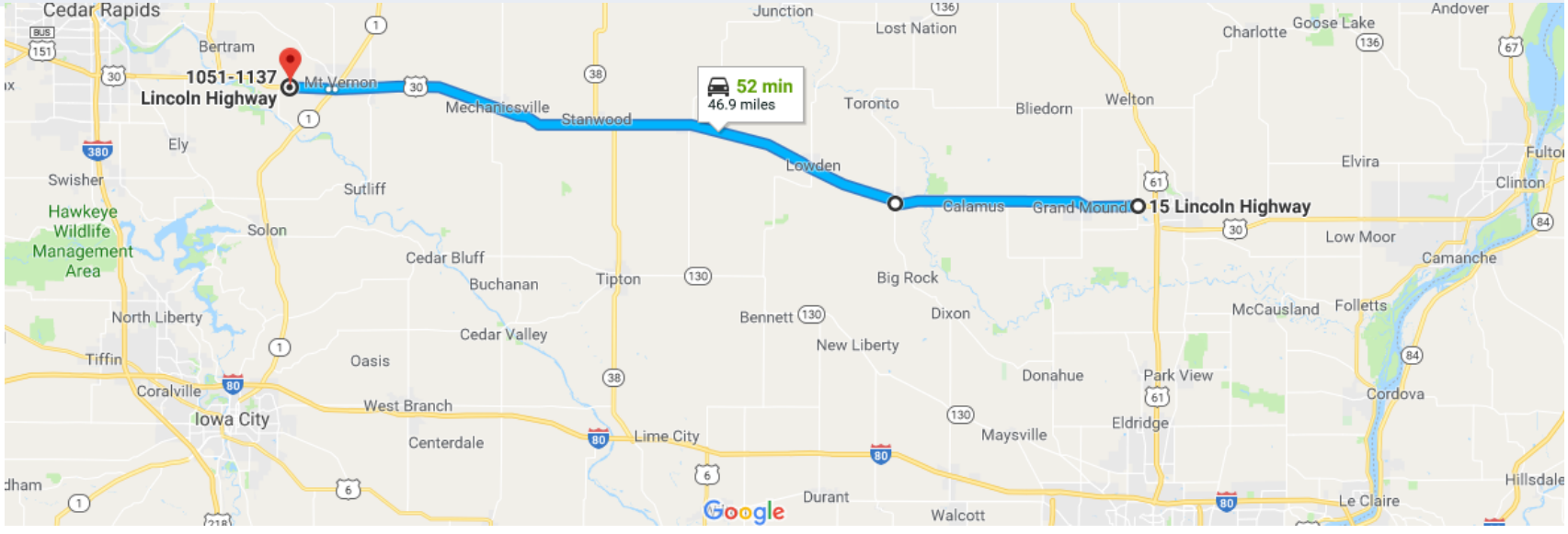
Economic Competitiveness	$	161,470,284	44.8%
State of Good Repair	$	3,715,008	1.0%
Sustainability	$	5,076,327	1.4%
Safety	$	190,426,895	52.8%
Total Benefit	**$**	**360,688,515**	100.0%
Project Cost	**$**	**240,459,010**	
BCR		**1.50**	

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%
Total Benefit	**$**	**203,991,569**	100.0%
Project Cost	**$**	**135,994,379**	
BCR		**1.50**	

US 30 Multimodal Access Corridor

	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



US 30 Multimodal Access Corridor

Performance Factors	Current Condition	Future with Improvements
Distance • US-30 Segment • Clinton to Cedar Rapids	47 miles 112 miles (US-30/US-61/I-80)	47 miles 84 miles (US-30)
Travel Time (AM Peak) • US-30 Segment • Clinton to Cedar Rapids	0:55 (51 mph) 1:47 (US-30/US-61/I-80)	0:44 (64 mph) 1:24 (US-30)
Crashes • Truck-Involved • Non-Truck Involved	136 / 6 years = 23 per year 517 / 6 years = 86 per year	30% reduction 15% reduction
Time and Cost Savings (2016$) • US-30 Segment • Alt Route Users • Avoided Crash Savings	$4.99 per one-way truck trip $37.30 per one-way truck trip $2.6 million per year	

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US 30 Multimodal Access Corridor

Project Demand	Value	Comment
Truck AADT, Current US 20 Users	• Lowest Segment = 447 • Average Segment = 493 • Highest Segment = 720	Assume lowest segment is most representative
Truck AADT, Diverted US 30 Users	Assume diversion from US-61 / I-88 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 • 447 existing • 447 diverted • 224 induced	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

US 30 Multimodal Access Corridor

BCA Results

- Benefits over 30 years
  - $272 M (0% discount)
  - $162 M (3% discount)
  - $91 M (7% discount)
- Justifiable investment at BCR of 1.5
  - $108 M (3% discount)
  - $61 M (7% discount)
- Underlying demand numbers should be confirmed by more detailed study
  - Current assumptions are believed reasonable, but the reality may be higher or lower

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%
Total Benefit	**$**	**271,681,089**	100.0%
Project Cost	**$**	**181,120,726**	
BCR		**1.50**	

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%
Total Benefit	**$**	**162,130,593**	100.0%
Project Cost	**$**	**108,087,062**	
BCR		**1.50**	

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%
Total Benefit	**$**	**91,261,637**	100.0%
Project Cost	**$**	**60,841,092**	
BCR		**1.50**	

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Dubuque Area Marine Terminal Enhancement

	Concept-Level Project Definition
Purpose	Improve Marine Terminal capacity in the 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	IEI Terminal off US 20 in East Dubuque, IL
Type and Extent	Upland improvements (storage areas/structures, equipment, etc.) to integrate new cargo types and customers into existing terminal

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Dubuque Area Marine Terminal Enhancement

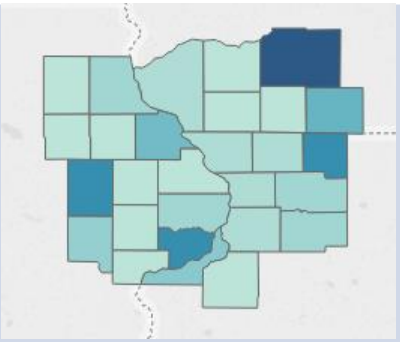
Performance Factors	Current (All Truck)	Future (Truck/Barge)
Dubuque Market Shed-MSP • Transport Cost, 18-ton unit	253 miles +/- 150 miles $184-**$452**-$720	**$593**
Dubuque Market Shed-St Louis • Transport Cost, 18-ton unit	335 miles +/- 150 miles $330-**$598**-$866	**$610**
Dubuque Market Shed-Memphis • Transport Cost, 18 ton unit	619 miles +/- 150 miles $838-**$1106**-$1374	**$723**
Dubuque Market Shed-South LA • Transport Cost, 18-ton unit	1000 miles +/- 150 miles $1518-**$1786**-$2054	**$975**

MARKET SHEDS AND DRAYAGE: Assumes 75-mile market shed radius for Dubuque Area (Cedar Rapids, Davenport, Rockford, and Madison) and comparable market shed radii for partner markets.

COST NOTES: Barge costs include drayage costs (37.5 miles average at each end with empty returns), water transport costs ($0.03-$0.05 per highway equivalent ton-mile), and terminal charges, but exclude time and inventory costs; time-sensitive commodities will not choose barge regardless of cost.

LOAD FACTOR NOTES: Barge's advantage is based on cost per ton-mile efficiencies. This analysis assumes 22 ton unit moves, equivalent to a fully loaded truck. With higher tonnage shipments requiring OSOW handling or multiple truck moves, barge will have a greater advantage.

Dubuque Area Marine Terminal Enhancement

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) • Minneapolis-St. Paul • St. Louis • Memphis • Baton Rouge/New Orleans **Total**		<u>Current Truck Tons (2014)</u> 1,148,548 521,047 73,430 78,741 **1,821,776**	
Market Capture Model • Minneapolis-St. Paul • St. Louis • Memphis • Baton Rouge/New Orleans **Total**		<u>Potential Capture</u> 28,184 (2.5%) 26,053 (5.0%) 5,507 (7.5%) 7,874 (10.0%) **68,148 (3.7%)**	3,786 truckloads / year 73 truckloads / week First analysis year = 2021; full market absorption = 2023 Growth = 1.1% / year (FAF Truck Growth)

Dubuque Area Marine Terminal Enhancement

BCA Results

- Benefits over 30 years with user cost savings
  - $32.2 M (0% discount)
  - $19.2 M (3% discount)
  - $10.8 M (7% discount)
- Justifiable investment at BCR of 1.5
  - $12.8 M (3% discount)
  - $7.2 M (7% discount)
- User cost savings from modal diversion (not allowed in current federal BCA guidance) represents 62-63% of benefits

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%
Total Benefit	**$**	**32,228,500**	100.0%
Project Cost	**$**	**21,485,667**	
BCR		**1.50**	

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%
Total Benefit	**$**	**19,194,375**	100.0%
Project Cost	**$**	**12,796,250**	
BCR		**1.50**	

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%
Total Benefit	**$**	**10,758,364**	100.0%
Project Cost	**$**	**7,172,243**	
BCR		**1.50**	

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Conclusions and Next Steps

Main Findings

- As analyzed, all three project concepts offer public benefit, but support very different levels of public investment
  - US 20 and US 30 projects have high benefits, and could support high costs; good news, since these projects are likely to be expensive
  - Barge terminal improvements have modest benefits, but could probably be accomplished with very modest expenditures
- Substantial work is needed to:
  - Further define the location, type, and extent of project improvements
  - Further develop/confirm the demand estimates
  - Estimate construction and operating costs
  - "Value engineer" the program concepts to maximize BCA and ROI metrics
- Overall, the analysis suggests there is "something there" to be explored further, if desired, for each project concept

Presentation Map

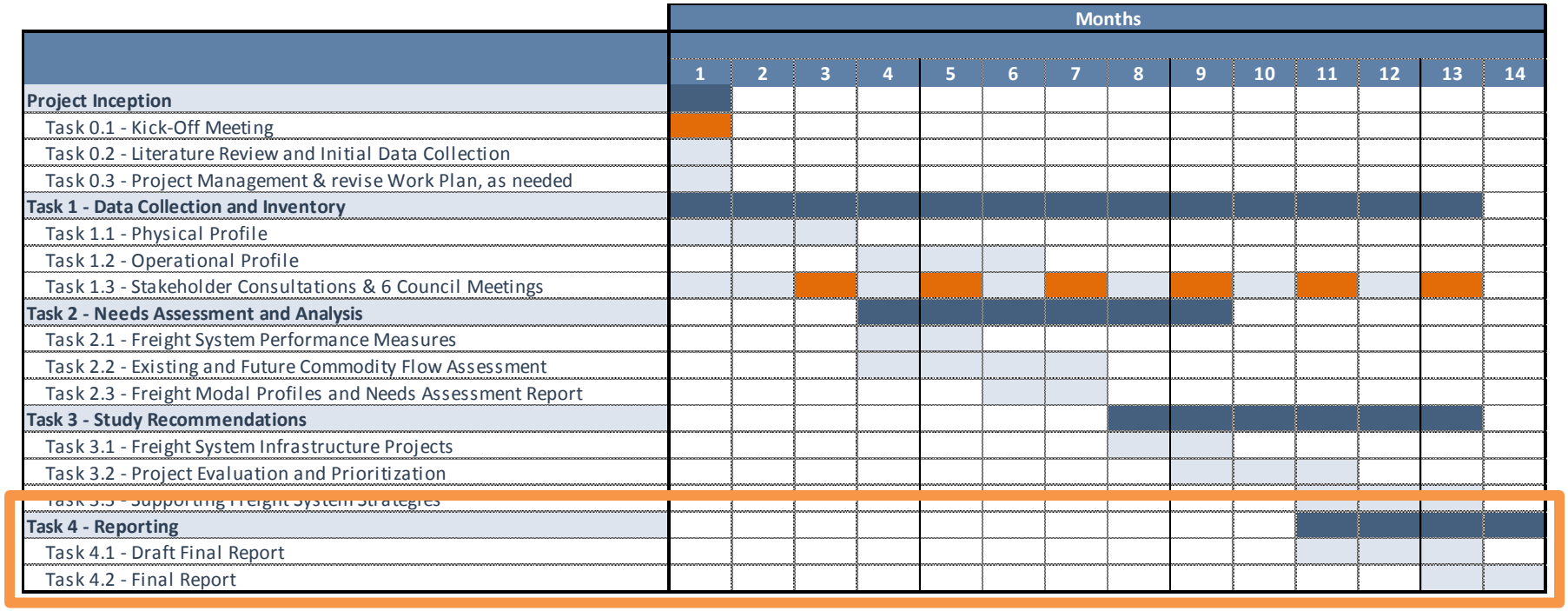
Review of Progress To Date

Benefit-Cost Analysis

Next Steps

Our Next Steps…

- Formalize freight plan recommendations (Working Paper 4)
- Develop final report (Executive Summary-style)



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Questions & Discussion

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