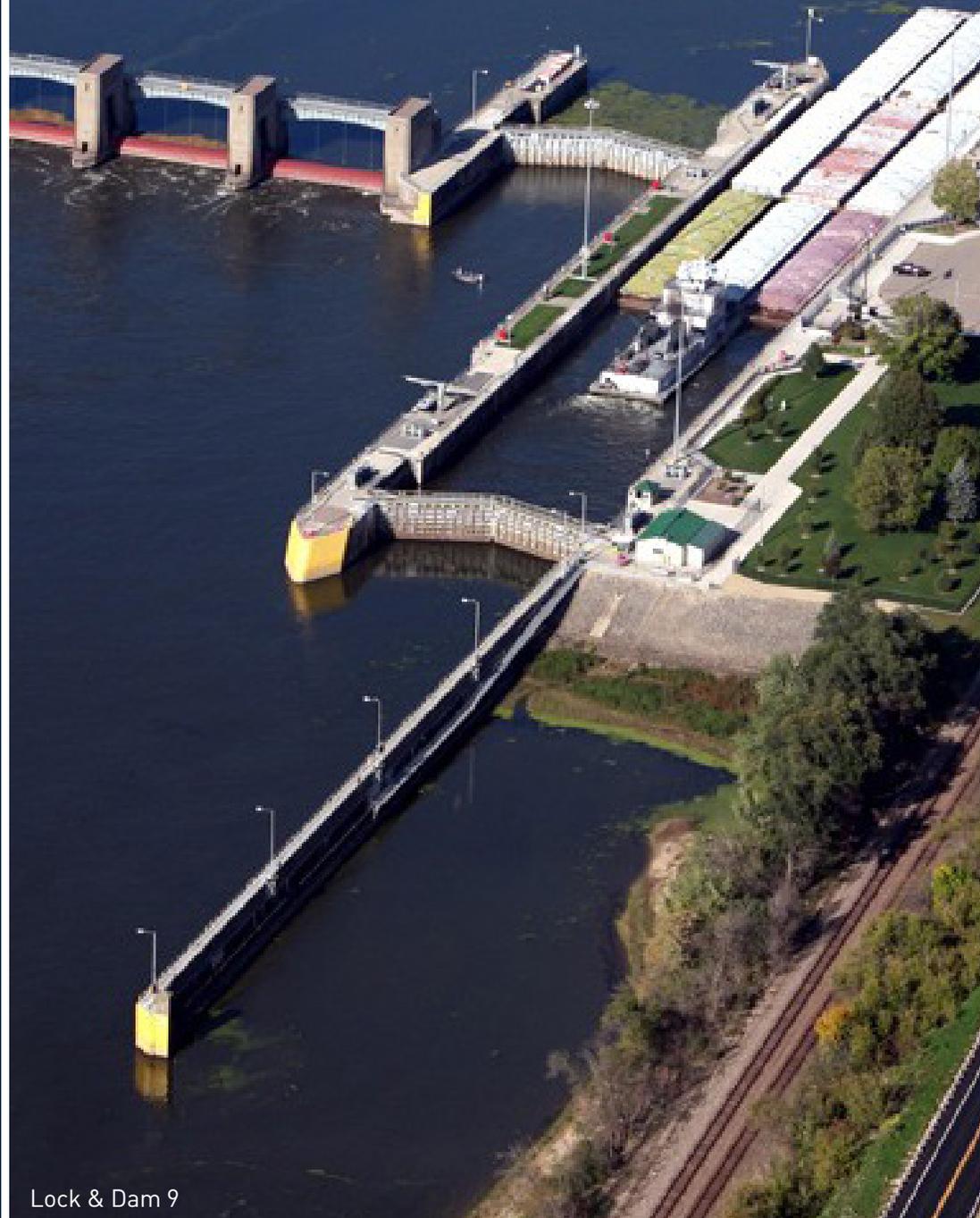


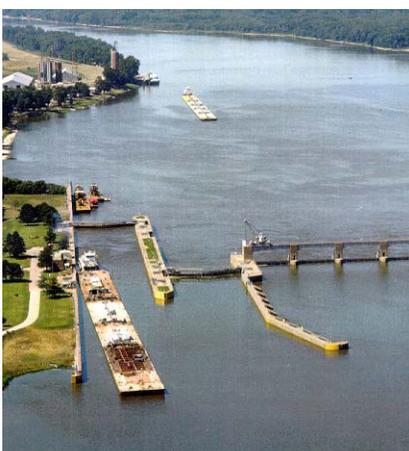
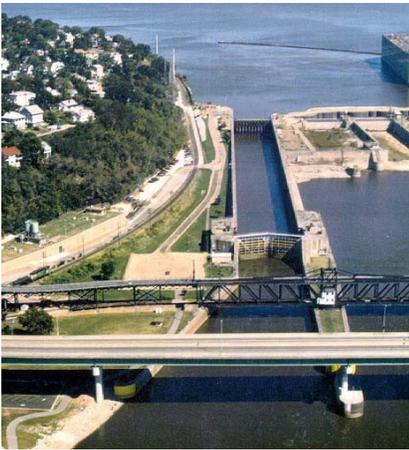
U.S. Inland Waterway System
Upper Mississippi River Navigation
SYSTEM PLANNING STUDY



A TIGER Planning
Grant Application
submitted by the
Iowa Department
of Transportation



Lock & Dam 9



U.S. Inland Waterway System
**Upper Mississippi
River Navigation**

SYSTEM PLANNING STUDY

TIGER GRANT APPLICATION

PROJECT NAME

U.S. Inland Waterway System
Upper Mississippi River
Navigation System Planning
Study

PROJECT TYPE

Regional Planning

LOCATION

Upper Mississippi River

APPLICANT

Iowa Department
of Transportation
DUNS/CCR Number:
12-052-7275

CONTACT

Garrett Pedersen, CPM

Office of Systems Planning
Iowa Department of Transportation
800 Lincoln Way, Ames, IA 50010
P 515.239.1520
E Garrett.Pedersen@dot.iowa.gov

April 25, 2014



Lock and Dam No. 10



Executive Summary

By supporting a complete assessment of the infrastructure and operations, and an exploration of improvement opportunities, the TIGER funds will help advance the next steps essential for assuring the Mississippi River's continued substantial contributions to the economy...

I therefore urge you full consideration of this proposal.

- U.S. Senator Tom Harkin



FALLING BEHIND

The Upper Mississippi River System (UMRS) is of vital importance to the economy of the United States as it enables efficient movement of goods and services.

In 2013, the American Society of Civil Engineers' Report Card for America's Infrastructure gave the nation's inland waterway infrastructure a report grade of D-. The inland waterways rely primarily on public investment and have suffered from chronic underfunding, seriously affecting the nation's potential to participate in the highly competitive global market for exportable commodities that will be in great demand in the future due to growing international trade as a rise in demand that will result from the Panama Canal expansion.

The Iowa Department of Transportation has participated in panel discussions with state officials from Iowa, Illinois, Minnesota, Missouri, and Wisconsin, as well as other local and federal agencies and private parties to identify potential improvements and studies to address the failings and shortcomings of the aging lock and dam system.



Iowa DOT is requesting \$730,000 in TIGER Planning Grant funds to support a multi-state investment of \$230,000 for a proposed \$1M planning study to:

- Assess the current state of navigation on the UMRS
- Evaluate potential actions that would increase the efficiency and reliability of the system
- Explore opportunities for the Upper Midwest states to increase utilization of the UMRS

Five states are involved in the well-being of the UMRS. To complete this TIGER-funded study, Iowa DOT will continue to collaborate with these states, USACE, river transportation providers and shippers, economic development groups, and local, regional and metropolitan organizers.



A GROWING PROBLEM

If the U.S. does no more than maintain its current level of investment in its inland waterways, the losses to its economy due to delays and constricted traffic will continue to increase shipping costs.

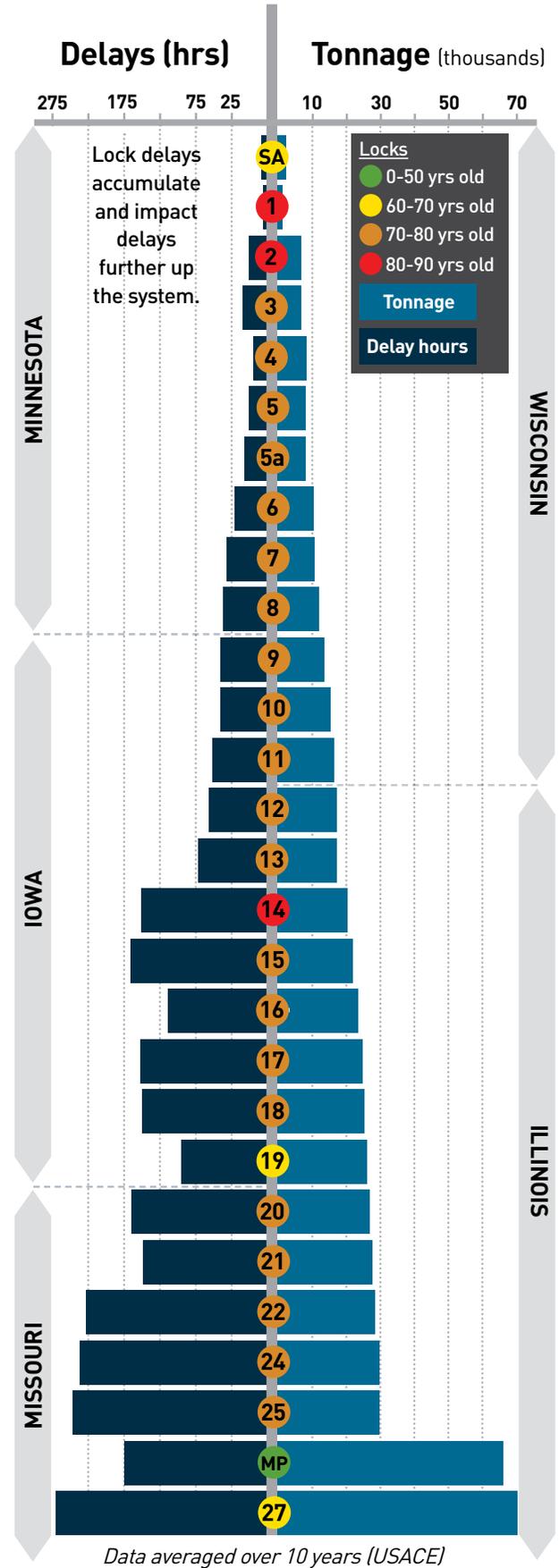
The state of Iowa is seriously concerned about maintaining and enhancing the efficiency and reliability of transportation on the UMRS. Barge transportation is critical in keeping shipment costs down for bulk commodities. The U.S. economy relies on an efficient and low cost transportation network for movement of its domestic and export commodities. In particular, U.S. export commodities depend on the transportation network to offset higher wage levels and costs of production when compared with international competitors.

If the nation does not invest in its inland waterways infrastructure, transportation costs will continue to increase, thus increasing export costs. This increase in costs to export goods will affect the nation's ability to compete in global markets. If current needs and stagnant investment in inland waterways and marine ports continue, the nation's competitiveness will erode, affecting its ability to sustain well-paying jobs, in many economic sectors.

Based on USACE data trends, maintaining existing levels of unscheduled delays on inland waterways, and not further exacerbating delays, will require almost \$13 billion by 2020. Current funding levels can support only \$7 billion through 2020. Of these costs, 73% are estimated for the rehabilitation of current facilities instead of the construction of new facilities. Current backlog of USACE priority projects on the UMRS already total \$241.3 million. The demands for these funds will peak by 2020, when funding level thresholds are unable to maintain current operating standards, as most are already past their design age.

What happens if the inland waterway system remains underfunded?

-  -740,000 loss in jobs by 2020
-  -\$1.30T loss in sales by 2020
-  -\$700B loss to GDP by 2020
-  -\$270B loss in value of exports by 2020



FINDING A SOLUTION

The multi-state partners represent local, state and federal interests and leverage technical and practical expertise with a focus on different elements of the project.

The Iowa Department of Transportation (Iowa DOT) finalized a study in early 2013 that documented the importance of the UMRS as well as the need for repairs and operational improvements in order to maintain and enhance its efficiency and reliability.

In applying for a TIGER Planning Grant, the Iowa DOT hopes to expedite the process for improving the inland waterway, ports, harbors, roads, and freight rail systems of the UMRS. The draft Water Resources Development Act (WRDA) bill, currently under discussion in Congress, includes enhanced opportunities for local project partners to be more involved in planning, design and construction of projects beyond the traditional cost share for Lands, Easements, Rights of Way, Relocations and Disposal (LERRDS). This new language opens the door to alternative funding options similar to U.S. port systems. In order to make the UMRS economically viable to alternative funding sources, projects must be implemented now.

Why invest in the inland waterways?

Move MORE

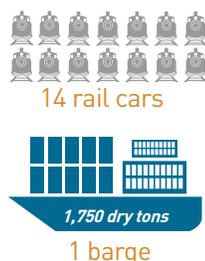
 **\$7B** Annual economic benefits /year

With LESS

 **\$11 LESS** vs. truck & rail costs /ton

 **47 LESS** GHG emission vs. truck tons/million ton-mile

 **7 LESS** GHG emission vs. rail tons/million ton-mile



SUMMARY OF STEPS TAKEN TO DATE

Entity	Date	Action
Iowa DOT	2012 - 2013	Performed a study to document the: <ul style="list-style-type: none"> The importance of the UMRS The need for repairs and operational improvements in order to maintain and enhance its efficiency and reliability
Iowa Governor Branstad and Lt. Governor Reynolds	Feb. 2013	Hosted a panel discussion attended by shippers, carriers, farmers, business owners, USACE, as well as staff from many different departments of state government.
Iowa DOT	Jun. 2013	Hosted a smaller group of interests to identify potential lock and dam infrastructure improvements as well as studies that would address needed improvements to this system.
USACE & Iowa DOT	2013 - 2014	Ongoing discussions with USACE on moving forward with one or more of these initiatives.
Illinois, Iowa, Minnesota, Missouri and Wisconsin DOTs	Feb. 2014	Submitted a Marine-Highway Corridor (M-35 or "Waterway of the Saints") application to the U.S. Department of Transportation Maritime Administration.

IMPROVEMENTS WITH REGIONAL AND NATIONAL BENEFITS

It is broadly recognized that transportation of cargo by barge on inland waterways provides shippers and the U.S. economy substantial economic benefits. The proposed planning study will result in additional information in support of all objectives and criteria of the TIGER Planning Grant program. From the elements of State of Good Repair and

Economic Competitiveness to Environmental Sustainability and Partnership, the planning study will further develop and recommend strategies and projects needed to maintain existing benefits as well as fully realize potential opportunities such as the completion of the Panama Canal expansion.

Selection Criteria	Description of Benefit	Present Value of Benefit (20 yr lifecycle, 7% discount)
State of Good Repair	Operation and Maintenance Savings: A more reliable lock and dam system will result in less cargo being transported by truck or rail, reducing wear and tear on roadways, railways and grade crossings.	\$87M
Economic Competitiveness	Shipper Cost Savings: Shippers save \$24 per ton by shipping their product by barge on the UMRS. A more reliable system would allow the U.S. to transport more products to Asia Pacific markets with the Panama Canal expansion, particularly agricultural.	\$497M
Quality of Life	Traffic Congestion Reduction: Shifting cargo to barge rather than to truck or rail will reduce local roadway and grade crossing congestion in communities across the U.S.	\$32M
Environmental Sustainability	Emission Reduction: Barge is the most efficient mode of transportation in terms of energy consumption and emissions. A barge consumes 1 gallon of fuel for every 616 ton miles versus 478 for rail and 150 for truck, and emits 90% less CO ₂ than truck and 23% less than rail (per ton mile).	\$51M
Safety	Accident Exposure Reduction: Transportation by barge is the safest mode of transportation. Rail, the next safest mode, has 18 times the fatalities as barge transportation on a ton mile basis.	\$253M
TOTAL BENEFIT ESTIMATE:		\$920M



PANAMA CANAL EXPANSION

Inland waterways are vital to the transportation of U.S. agricultural commodities for export. The UMRS is the primary cargo conduit from the midwest grain belt to Gulf of Mexico ports.

Reductions in transportation costs due to the Panama Canal expansion could affect the movement of goods through the inland waterways by:

- A reduction in ocean transportation costs out of Gulf of Mexico ports due to the use of larger, more efficient bulk ships will tend to reduce aggregate costs of exporting bulk commodities.
- Lower transportation costs attributable to the expansion could increase export volumes as the transportation element of U.S.-produced commodity costs helps to make U.S. exports more competitive in world markets.



Lock and Dam No. 11



Background and Project Description

I have contacted Secretary Foxx of the U.S. Department of Transportation regarding the TIGER application being submitted by the Iowa Department of Transportation for the Upper Mississippi River Planning Study.

I asked that it be given all due consideration.

- U.S. Senator Charles E. Grassley



The Mississippi River system is of vital importance to the economy of the United States as it enables efficient movement of goods and services.

Over the course of the last century, a network of federally owned locks and dams constructed and operated by USACE have facilitated commerce along the river. Many of these facilities have reached or even far exceeded their designed life cycle and rehabilitation and modernization is becoming critical to keep the waterways commercially viable.

As the state of Iowa has a vested interest in a viable waterway commerce and transportation system, the Iowa Department of Transportation (Iowa DOT), in partnership with the other four Upper Mississippi River states (Illinois, Minnesota, Missouri, and Wisconsin), is examining alternatives to the USACE's traditional approach to funding and implementing projects to help modernize and improve the inland waterway navigation system on the Upper Mississippi River System (UMRS).

In 2013, The American Society of Civil Engineers' Report Card for America's Infrastructure gave the nation's inland waterway infrastructure a report grade of D-. The inland waterways rely primarily on public investment and have suffered from chronic underfunding, seriously affecting the nation's potential to participate in the highly competitive global market for exportable commodities that will be in great demand in the future.

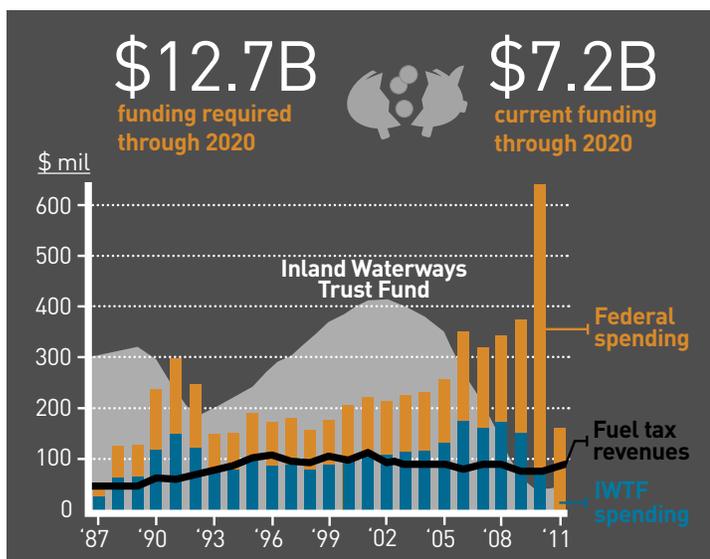
If the inland waterway system remains chronically underfunded, recent studies by the American Society of Civil Engineers show that the accumulated loss in national GDP will be approximately \$700 billion by 2020.

This failure to adequately invest in a publicly-managed inland waterway system affects the nation's ability to export key commodities like grain, energy, and specialized manufactured goods. It also provides competing countries with an opening to capture market share, which in some cases is tied to long-term contracts.

In contrast to the U.S.'s inland waterway system, the investment in the U.S.'s marine ports (report grade of C) is dominated by public port authorities and private port-operating companies. The potential exists for the successes realized at U.S. marine ports to be applied to the U.S. inland waterway system as a means for maintaining and improving U.S. competitiveness in global trade markets.

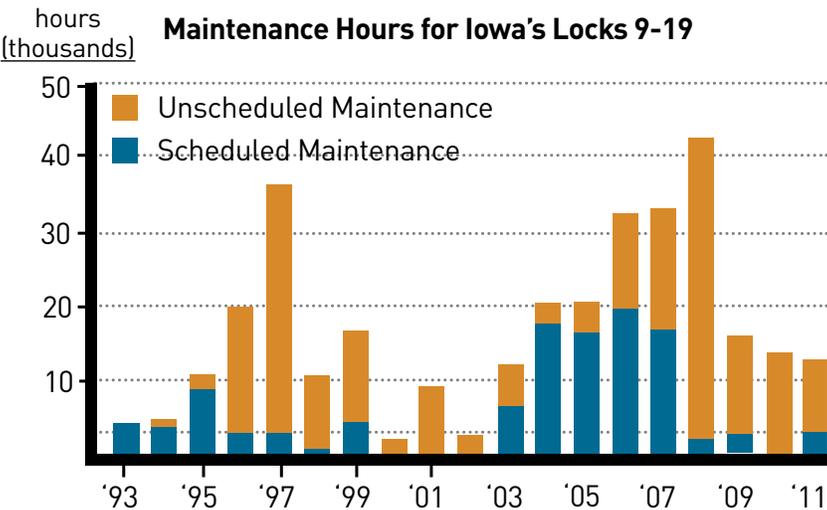
The U.S. economy relies on an efficient and low-cost transportation network for movement of its domestic and export commodities. In particular, U.S. export commodities depend on the transportation network to offset higher wage levels and costs of production when compared with international competitors.

If the nation does not invest in its waterways infrastructure, transportation costs will increase and export costs will therefore increase, and this increase in costs to export goods will affect the nation's ability to compete in global markets for goods produced in the U.S. If current needs and stagnant investment in inland waterways and marine ports continue, the nation's competitiveness will erode, affecting its ability to sustain well-paying jobs, especially in export sectors.



If the U.S. does no more than maintain its current level of investment in its inland waterways, the losses to its economy due to delays and constricted traffic will increase shipping costs annually. It is projected that such a reduction in production, income, and spending will result in 738,000 fewer jobs in 2020— jobs lost due to the lack of U.S. competitiveness in global trade and because the nation’s households and businesses will be spending more for commodities that arrive by marine ports and are transported to market via inland waterways (*American Society of Civil Engineers, 2013*).

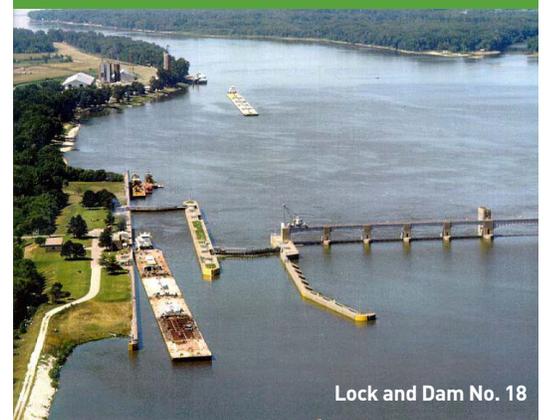
Based on USACE data trends, maintaining existing levels of unscheduled delays on inland waterways, and not further exacerbating delays, will require almost \$13 billion by 2020. Current funding levels can support only \$7 billion through 2020. Of these costs, 73 percent are estimated for the rehabilitation of current facilities instead of the construction of new facilities. The demands for these funds will peak by 2020, when critical age and capacity thresholds are likely reached (*American Society of Civil Engineers, 2013*).



Lock and Dam No. 10

Current backlog of USACE priority projects on the UMRS already total \$241.3 million.

Refer to the Appendix for a full list of the projects.



Lock and Dam No. 18

Federal resources have been steadily dwindling since the 1980s and only limited funds have been available for water infrastructure operations, maintenance, and rehabilitation.

Iowa DOT, in order to facilitate discussion on improving the inland waterway navigation system on the UMRS, commissioned a study of possible alternative funding and project implementation and found several key findings:

1. No increase in the current funding plan will result in loss of economic benefits and a missed opportunity for Iowa to take economic advantage of the plans for expansion of the Panama Canal (i.e., opportunities to increase grain shipments).
2. Leveraging increased funding from traditional sources is the only practical option to deal with the funding issues in the short term.

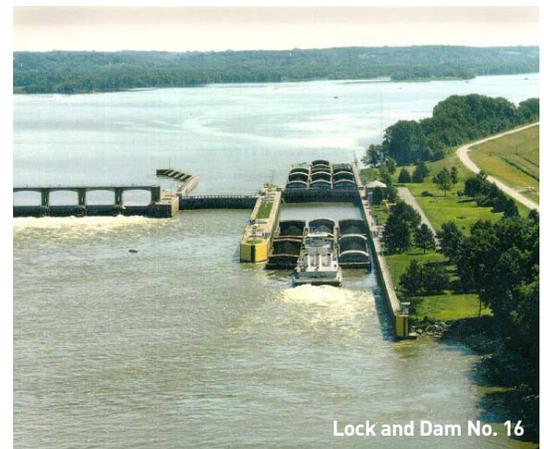


Lock delays force freight to shift to **more expensive** modes like rail & truck, costing barge owners, industry, and consumers alike. Infrastructure maintenance costs for rail and roadway also increases.

3. If no new funding is identified, partial divestiture of the system where traffic does not warrant heavy operations should be examined to minimize economic loss and to potentially increase opportunities for USACE to redirect budget allocations. However, the impact and extent of divestiture would need to be carefully examined for other long-term impacts.
4. A public-private partnership to upgrade and then operate/maintain discrete elements of the waterway system is feasible if a dedicated funding source is found and assuming changes to current policies are made as outlined in the recommendations for 2013 Water Resources Development Act (WRDA) SF 601. For consideration of user fees as a repayment source for availability payments, it should be noted that implementation of such fees would require policy action by the government to modify the prohibition on tolling in 33 USC 565.
5. Revenue bonding against existing and/or new Inland Waterways Trust Fund (IWTF) revenues could provide an infusion of large amounts of capital for lock and dam infrastructure projects. While this would result in higher borrowing costs, the benefits of executing projects sooner might outweigh these costs.
6. While augmentation of traditional (federal appropriations and user fees) funding sources by state/local entities would be beneficial (assuming legislative authorization) in both the near and long-term, these additional public funding sources would not be a stand-alone solution. Rather, this funding would be only part of a more comprehensive solution that includes increased and/or expanded user fees and federal appropriations.
7. Continued decline of the inland waterway system will push additional traffic to the roadway and rail systems.

Building on the key findings of the study, Iowa DOT hosted a workshop with federal, state and local agency representatives, key stakeholders, businesses and interested parties to discuss next steps for the UMRS's navigation system. Key issues with short term and long-term priorities were brought forward for discussion and pilot projects that could be moved forward by the state were identified during the workshop.

As a follow-up to the regional discussion the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin partnered and sponsored an application to the U.S. DOT Maritime Administration (MARAD) for consideration of establishing a Maritime Corridor linkage along the Mississippi River from St. Paul, Minnesota to St. Louis, Missouri. Marine Highway designation provides access to crucial knowledge and resources for terminals along the corridor by receiving technical assistance and consultation from the Maritime Administration. Furthermore, Marine Highway designation acts as an important federal endorsement for supporting economic development and increasing the potential of future federal funding awards.



Lock and Dam No. 16

In applying for a TIGER Planning Grant, the Iowa DOT hopes to expedite the process for improving the inland waterway, ports, harbors, roads, and freight rail systems of the UMRS.

The draft WRDA bill includes enhanced opportunities for local project partners to be more involved in planning, design and construction of projects beyond the traditional cost share for Lands, Easements, Rights of Way, Relocations and Disposal (LERRDS). This new language opens the door to alternative funding options similar to the port system.

In order to make the UMRS economically viable to alternative funding sources, projects must be implemented now.



Lock and Dam No. 12



Project Parties

I write in strong support of the Iowa Department of Transportation's TIGER application for the Upper Mississippi River Navigation Study. There is little doubt in the extreme need for repair and updates to the ancient and frail Upper Mississippi lock and dam system. [This study] would add valuable input to the importance of the Mississippi River system.

- U.S. Congressman Dave Loebsack | Iowa's Second District



PROJECT PARTIES

The multi-state partners that will be a part of the team represent local, state and federal interests with a focus on different elements of the project. The multi-state partnership will leverage technical and practical expertise as well as funding from the state partners (Illinois, Iowa, Minnesota, Missouri and Wisconsin).

Beginning in February 2013, Iowa Governor Terry Branstad hosted a regional discussion focused on a collective stakeholder approach to addressing inland waterway transportation needs as highlighted in the feasibility study completed during that time.

On June 27, 2013, Iowa DOT hosted a one-day workshop in Bettendorf, Iowa, to engage a range of stakeholders in the planning process for the Mississippi Waterway System Action Plan. The workshop consisted of three interactive exercises with a goal of consolidating the variety of stakeholder issues, concerns and priorities into several recommended pilot projects, including financing and planning studies as well as brick and mortar construction projects. The pilot construction projects were framed as an implementable build project that would test new funding mechanisms and/or new partnerships, possibly in line with the 2013 Water Resources Development Act, to repair and/or modernize the Mississippi River inland waterway system.

Attendees included a variety of area stakeholders including representatives from state Departments of Transportation, USACE, elected officials from states bordering the Mississippi River, industries related to freight transportation, and special interest groups.

Earlier in 2014 the Illinois, Iowa, Minnesota, Missouri and Wisconsin Departments of Transportation (DOTs) jointly applied to the United States DOT Maritime Administration (MARAD) to establish a Marine Highway Connector along the UMRS from St. Paul, Minnesota to St. Louis, Missouri. The M-35 Marine Highway connects seamlessly into the US Transportation system, relieving landside congestion and increasing efficiency of other surface transportation modes. To complete this TIGER-funded study, Iowa DOT will continue to collaborate with USACE, the five states along the Upper



This planning study would be led by a consultant with active involvement of the five states along the Upper Mississippi River.

The study would include significant outreach to USACE, river transportation providers, river transportation shippers, economic development groups, and local, regional and metropolitan jurisdictions/organizations.

Mississippi River, river transportation providers and shippers, economic development groups, and local, regional and metropolitan organizations.

While not formal applicants, the USACE St. Paul, Rock Island and St. Louis Districts have been active participants in project development and have provided lists of inland waterway navigation system projects that need to be addressed as a part of improving the system in response to global trade demands.

A summary of the workshop, its attendees, the M-35 application submitted by the multi-state partnership, and a list of USACE priority projects are available at www.iowadot.gov/TIGER14-river



Lock and Dam No. 14



Grant Funds and Uses

The Illinois Department of Transportation would like to offer strong support for the TIGER VI planning grant application submitted by the Iowa Department of Transportation...The department believes that this request for TIGER VI planning funds not only would benefit the Upper Mississippi region, but also serves as an essential study for the nation.

- Secretary Ann L. Schneider | Illinois Department of Transportation



Iowa DOT is requesting TIGER Planning Grant funds in support of a proposed planning study for further exploration of opportunities to enhance the Upper Mississippi River lock and dam operational efficiency, reliability, and utilization. This five-state planning study would involve the following elements:

- **Assessment of the current state of river navigation on the UMRS**

- » Inventory assessment of public and private ports, terminals, locks and dams, and intermodal facilities along the M-35 marine highway corridor
- » Lock and dam infrastructure condition and operations assessment
- » Operational efficiency of the lock and dam system
- » Impact analysis for extended failure/shutdown of each lock and dam along M-35 for identification of potential impacts to other state's highway and railway modal networks

- **Evaluation of activities that could be undertaken to increase the efficiency and reliability of the UMRS**

- » Technological (e.g. optimization of real-time barge location data with lock and dam system operations)
- » Infrastructure (e.g. guidewall improvements)
- » Operations (e.g. utilization of strategically placed helper boats)
- » Governmental partnerships

- **Evaluation of opportunities for the Upper Midwest states to increase utilization of the UMRS**

- » Benefits of M-35 designation
- » Commodity flow analysis of future demands, needs, and opportunities
 - Industry/user survey and interviews
 - Commodity type (agriculture, energy, aggregate, manufactured goods)
 - Product type (bulk, liquid, oversized, container-on-barge, etc.)
 - Panama Canal expansion

- » Port development opportunities
 - Multimodal facility options including the Burlington, Iowa option as outlined in the Vickerman Report appended to the Iowa DOT feasibility study, available at www.iowadot.gov/TIGER14-river
 - » Public-private partnerships
 - » Regional marketing/communication initiatives
- **Recommendation of activities for enhancement of efficiency, reliability, and utilization of the Upper Mississippi River M-35 corridor**
 - » Planning/Policy (i.e. means for incorporating maritime opportunities into State Freight Strategic Plans)
 - » Operations
 - » Infrastructure
 - » Public and private stakeholder outreach
 - » Intergovernmental and public-private partnerships

The findings and recommendations from the planning study will outline specific activities and projects for advancement by various stakeholders, creating a menu of prioritized strategies, initiatives, and projects for implementation.

As evidence of the existing partnership of the five states along the Upper Mississippi River, letters of support have been received from all five states. Furthermore, three states have pledged financial contribution and availability of funds to the planning study, and, as the lead applicant, Iowa DOT has alone committed the minimum 20 percent match requirement.

The proposed planning study will result in additional information in support of all objectives and criteria of the TIGER Planning Grant program, as detailed in the Selection Criteria section of this application. From the elements of State of Good Repair and Economic Competitiveness to Environmental Sustainability and Partnership, the planning study will further develop and recommend strategies and projects needed to maintain existing benefits as well as fully realize potential opportunities such as the completion of the Panama Canal expansion. Specific examples within the proposed planning study that will support these objectives include:

- **State of Good Repair and Innovation** – study evaluations will build upon the existing backlog of USACE projects already identified by the St. Louis, Rock Island, and St. Paul USACE Districts (see USACE UMRS Lock and Dam Priority Project list in the appendix and online at www.iowadot.gov/TIGER14-river while investigating non-traditional funding mechanisms and commodity/product types for system improvements.
- **Economic Competitiveness** – identifying means for improving system reliability and taking advantage of the upcoming completion of the Panama Canal expansion will maintain and enhance the low-cost transportation system and increasing the global interest in U.S. exports.

- **Partnerships** – interviews/outreach to industry and the public, supported by regional governmental agency coordination provide the foundation for assessing the state of the current system and projecting the future needs and opportunities. Outreach will be a key element throughout the course of the proposed planning study, and an implementation strategy for study recommendations will be developed through additional, focused outreach.

The proposed planning study would be led by a consultant with active involvement of the five states along the Upper Mississippi River. The study would include significant outreach to USACE, river transportation providers, river transportation shippers, economic development groups, and local, regional and metropolitan jurisdictions/organizations.

The proposed schedule for execution of the planning study upon notice of award of TIGER Planning Grant funds is illustrated below. Major milestones for project initiation, completion of key study components, and reporting of study recommendations are outlined. As an example of project readiness, while the deadline for TIGER Grant funds to be obligated is June 2016, with a successful notice of award for TIGER Planning Grant funds, the proposed planning study is anticipated to be completed by March 2016, three months before the June 2016 deadline for TIGER Grant funds to even be obligated. The estimated cost of the proposed planning study is \$1 million.

PROJECT SCHEDULE AND BUDGET

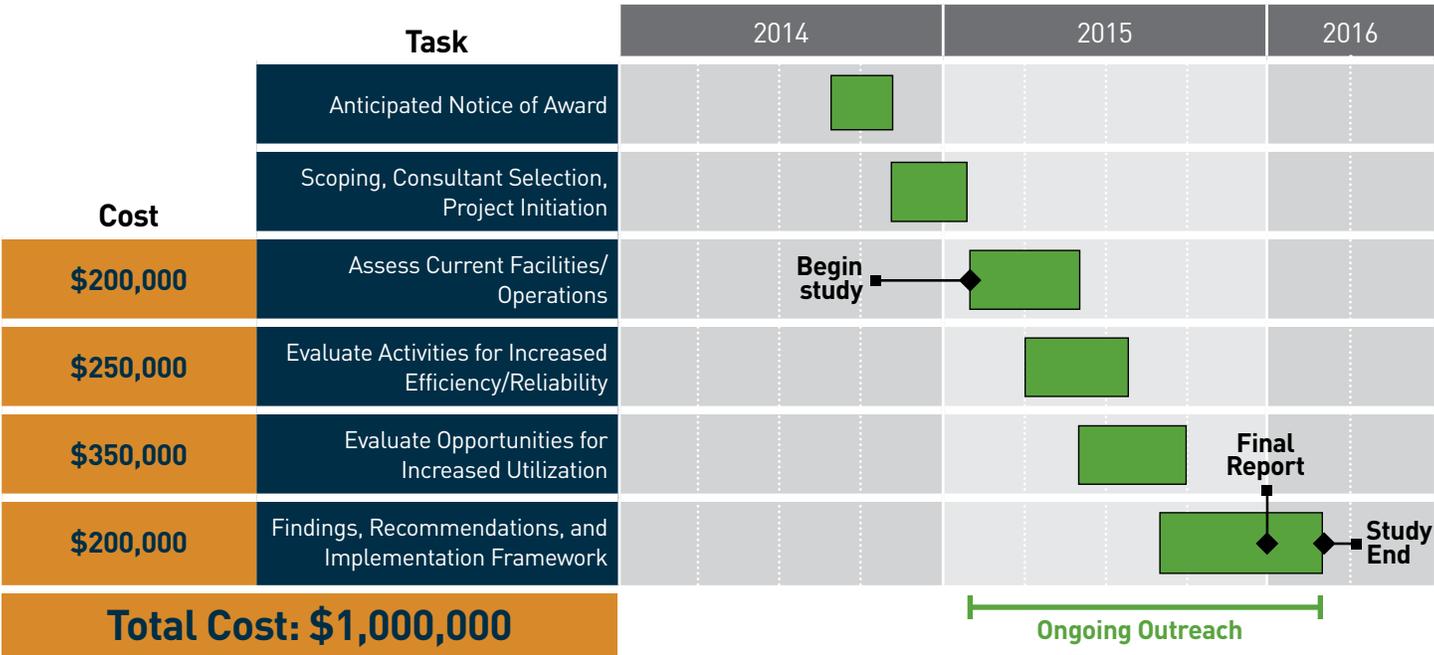


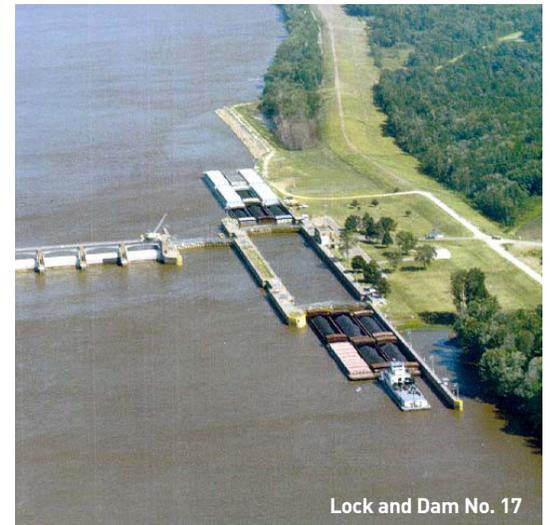
Table 1: Proposed Project Budget

Proposed Project Budget		
1	Assessment of Current Facilities/Operations	\$200,000
1.1	Inventory of facilities	
1.2	Infrastructure condition and operations assessment	
1.3	Operational efficiency evaluation	
1.4	Impact analysis for failure/shutdown	
2	Evaluation of Activities for Increased Efficiency and Reliability	\$250,000
2.1	Technology, infrastructure, and operations	
2.2	Governmental partnerships	
3	Evaluation of Opportunities for Increased Utilization	\$350,000
3.1	Evaluate benefits of M-35 designation	
3.2	Commodity Flow Analysis	
3.3	Investigate port development and P3 opportunities	
3.4	Identify regional communication initiatives	
4	Findings and Recommendations	\$200,000
4.1	Draft and Final Report	
4.2	Framework for Implementation of Activities	
TOTAL:		\$1,000,000

The funding sources and participating share of each funding source are shown below. A TIGER Planning Grant for \$730,000 is requested to cover 73 percent of the proposed planning study. No other federal funding sources will be utilized for the proposed planning study.

Table 2: Planning Study Funding Sources, 2014 Dollars

Funding Source	Contribution
State Partnership	\$270,000 (27%)
TIGER TIGER Planning Grant	\$730,000 (73%)
Total	\$1,000,000



Lock and Dam No. 17

From the elements of State of Good Repair and Economic Competitiveness to Environmental Sustainability and Partnership,

the planning study will further develop and recommend strategies and projects needed to maintain existing benefits as well as fully realize potential opportunities such as the completion of the Panama Canal expansion.



Lock and Dam No. 15



Selection Criteria

We fully support the FY 2014 TIGER application for a planning study to help identify a long-term, economically sustainable way to manage the Upper Mississippi River and bring its infrastructure into the 21st century.

- Governor Terry E. Branstad | State of Iowa
 - Lt. Governor Kim Reynolds | State of Iowa
 - Secretary Bill Northey | Iowa Dept. of Agriculture & Land Stewardship
 - Director Debi V. Durham | Iowa Economic Development Authority
 - Director Paul Trombino III | Iowa Dept. of Transportation
-



SELECTION CRITERIA

It is broadly recognized that transportation of cargo by barge on inland waterways provides shippers and the U.S. economy substantial economic benefits. Studies conducted by USACE, the Texas Transportation Institute, the Tennessee Valley Authority, the European Union and other institutions are consistent in their assertion that cargo transportation by barge provides a broad range of large-scale economic benefits relative to other modes of transportation.

In USACE's *Inland Waterway Navigation: Value to the Nation*, they estimate that cargo moved on the U.S.'s inland waterway system provide shippers with savings of over \$7 billion

per year (Texas Transportation Institute, 2012) making the U.S. more competitive: producers are more competitive, consumers reap price reductions and U.S. exports are better able to compete globally. This estimate does not include the other positive effects of shipping by inland waterways: fewer emissions, less crashes and fatalities, reduced roadway and rail congestion and less wear and tear on the nation's roadways. The economic benefits provided by the inland waterway system fit directly into the selection criteria established by the USDOT for its TIGER Grant program. These are highlighted in the table below.

Table 3: Alignment of Improved UMRS to Primary Selection Criteria

Selection Criteria	NOFA Description	Alignment of an Improved UMRS
State of Good Repair	Improving the condition of existing transportation facilities and systems with a particular emphasis on projects that minimize life-cycle costs and improve resilience.	The existing lock and dam system has reached or has far exceeded its designed lifecycle. There is a significant deferred maintenance backlog valued at \$2+ billion and the reliability of the system is in decline.
Economic Competitiveness	Contributing to the economic competitiveness of the U.S over the medium to long-term and creating and preserving jobs.	The inland waterway system is the primary transportation system for the U.S. export of grains. Cargo moving from the U.S. Midwest by barge is predominantly grains for export. Transportation by barge from the Upper Mississippi River provides about a \$24/ton savings to shippers.
Quality of Life	Increasing transportation choices and access to transportation services.	Barge transportation reduces the number of trucks on the roads and rail cars on the tracks, providing significant congestion related benefits for communities improving the quality of life for residents.
Environmental Sustainability	Improving energy efficiency, reducing greenhouse gas emissions and mitigating environmental impacts.	Barge is the most efficient mode of transportation in terms of energy consumption and emissions. The Texas Transportation Institute (Texas Transportation Institute, 2012) estimates that a barge consumes 1 gallon of fuel for every 616 ton miles compared to 478 for rail and 150 for truck. Similarly, TTI also estimates that barge transportation results in one-tenth the CO2 emissions for trucks and has 23 percent less than rail (per ton mile).
Safety	Improving the safety of U.S. transportation facilities and systems for all modes of transportation and users.	Transportation by barge is the safest mode of transportation. Rail, the next safest mode for shipping cargo, has 18 times the fatalities as barge transportation on a ton mile basis.

Table 4: Economic Benefits of Barge Freight Traffic Passing Through Upper Mississippi River, Historical

Impact Category	Annual Economic Benefits (\$2013 in millions)				
	CY2009	CY2010	CY2011	CY2012	CY2013
Economic Competitiveness	\$753	\$697	\$670	\$642	\$488
Environmental Sustainability	\$64	\$60	\$57	\$55	\$42
Safety	\$330	\$305	\$293	\$281	\$214
State of Good Repair	\$113	\$104	\$100	\$96	\$73
Quality of Life	\$42	\$39	\$37	\$36	\$27
Total Economic Benefits:	\$1,302	\$1,205	\$1,157	\$1,110	\$844

These types of benefits directly apply to the UMRS. While economic benefits span all of the USDOT's primary selection criteria, the largest benefit relates to economic competitiveness through cost savings for shippers thus making U.S. exports more competitive globally. USACE estimate that on average, cargo shipped via barge on the UMRS is approximately \$24 cheaper per ton relative to competing modes.

USACE estimate that on average, cargo shipped via barge on the UMRS is approximately \$24 cheaper per ton relative to competing modes.

Barge transportation is extremely important to the U.S. Midwestern economy with its large harvest of soybean and other grains. Despite recent significant declines in barge modal share due at least in part to declines in the reliability of the inland waterway system, barge transportation still transports about one-half of all U.S. grain exports to ports for international shipment.

This is extremely important as the value of U.S. exports of agriculture products is soaring and is at all time highs. While the overall U.S. economy is in a net trade deficit, there is a growing trade surplus for agriculture products of more than \$20 billion. Soybeans are the top U.S. export crop with value of about \$25 billion in 2012. More than half of all U.S. grain

exports leave Mississippi, Texas and East Gulf ports and most of this travels down the Mississippi River to reach these ports.

According to the Panama Canal Authority, this is a record year for U.S. grain cargoes passing through the Canal, with more than 20.4 million metric tons shipped so far this marketing year, October 2013 through January 2014. That's a 36 percent increase over the same time period last year.

U.S. corn cargoes shipped through the Canal have increased more than 78 percent compared to 2012 volumes. According to the USDA's January World Agricultural Supply and Demand Estimates, U.S. corn production is expected to be a record 252.7 million tons (9.9 billion bushels) for the 2013/2014 marketing year that began in September 2013. This is a 30 percent increase compared to the 2012/2013 marketing year.

China was the primary destination of these cargoes with a 48 percent increase in shipments, followed by Japan and South Korea (U.S. Grains Council).

The U.S. relies on transportation competitive advantages to compete with agriculture producers in countries such as Brazil. The American Society of Civil Engineers estimate that if waterway infrastructure continues to deteriorate, total U.S. exports will decline by over \$40 billion by 2020, with agriculture accounting for about \$4 billion of that amount. Of all U.S. export industries, agriculture is the one most impacted by a decline in waterborne trade. With the Panama Canal expansion and the high demand of Asian markets for agriculture products, a less reliable inland waterway system will jeopardize this economic growth engine for the U.S. economy.

With the largest U.S. production of soybeans centered in Iowa and the Midwestern states, the further deterioration of the Mississippi River lock and dam system puts these states at the greatest risk of missing the export opportunities for agriculture products. Without a reliable lock and dam system, U.S. exports of soybeans and other grains will be less able to compete on the global stage.

Primary Selection Criteria

In addition to examining the historical economic benefits made possible through the shipping of cargo through the UMRS, the long-term outcomes of an improved lock and dam system that could be facilitated by this planning grant application are also estimated. The objective of the planning grant is to ultimately find a way to improve efficiency of navigation on the UMRS. A more reliable system will result in more transport of cargo by barge on the Mississippi River relative to other modes, especially rail. This is especially important given the competition for rail service due to the increased utilization and congestion of the nation's rail system for delivery inputs to and outputs from the growing energy sector.

To estimate the quantitative economic benefits of a more reliable lock and dam system, certain assumptions are required (which are outlined in the Cost Benefit Analysis technical appendix). Over time, we have seen a significant decline in modal share of barge transportation for getting

grains to the export markets as the system became drastically more unreliable. This modal share has declined by at least 10 percentage points in the last 10 to 15 years resulting in more than a 20 percent decline in cargo moved by barge.

During this same period, unscheduled system downtime for the lock and dam system increased drastically. We have estimated these long-term outcomes over a 20-year period by assuming that a more reliable lock and dam system would have curtailed some of this market share erosion. For the purposes of quantification, we have assumed conservatively that one half of this loss in barge market share would not have taken place or would be recovered in a more reliable system.

PRIMARY SELECTION CRITERIA 1: STATE OF GOOD REPAIR

A more reliable lock and dam system will result in more cargo being transported by barge as opposed to truck or rail, reducing wear and tear on these transportation systems. Over a 20-year project lifecycle, we estimate that a more reliable system will reduce ongoing operation and maintenance costs on existing roadways, railways and grade crossings by \$87 million (Net Present Value, using a 7% discount rate). This estimate is likely very conservative as it does not explicitly factor in the lifecycle maintenance cost savings from an improved lock and dam system itself.

Global Commodity Flow Through the Panama Canal



PRIMARY SELECTION CRITERIA 2: ECONOMIC COMPETITIVENESS

A more reliable lock and dam system will facilitate more cargo being transported by barge rather than via truck or rail. USACE estimate that on the UMRS, shippers realize a \$24 per ton savings by shipping their product by barge which improves their competitive position greatly, especially in making the U.S. agriculture products more competitive globally leading to an increase in exports. Over the 20-year project lifecycle, we estimate that the shippers will save \$497 million in reduced shipping costs. A reliable inland waterway system is essential to ensuring that the United States reaps the economic benefits associated with the potential to transport more products to Asia Pacific markets with the Panama Canal expansion.

PRIMARY SELECTION CRITERIA 3: QUALITY OF LIFE

The shifting of cargo to barge as opposed to truck or rail will yield significant quality of life benefits through reduced local roadway and grade crossing congestion in communities across the U.S. Over the 20-year project lifecycle, this is estimated to be valued at \$32 million.

PRIMARY SELECTION CRITERIA 4: ENVIRONMENTAL SUSTAINABILITY

A more reliable inland waterway system will result in fewer emissions derived from the transport of goods. The proposed project would contribute to environmental sustainability through a reduction in emission levels due to the modal switch

from truck and rail to barge. On a per ton-mile basis, barge transportation has the lowest emission factors in terms of nitrous oxide (NO_x), carbon dioxide (CO₂), particulate matter (PM₁₀), carbon monoxide (CO), hydrocarbon (HC), and volatile organic compound (VOC) emissions. Over the 20-year project lifecycle, these benefits are estimated to be \$51 million.

PRIMARY SELECTION CRITERIA 5: SAFETY

The proposed project would contribute to promoting each of the five state DOT's long-term outcome of safety through a reduction in accident risk due to displacing cargoes from heavy trucks and rail to barge on inland waterways. Accident risk is evaluated at an individual level based on the average fatalities and injuries per ton-mile by mode. As referenced above, barge transportation is the safest transportation mode by a significant margin. The safety benefits over a 20-year period are estimated to be \$253 million.

SUMMARY OF PRIMARY SELECTION CRITERIA

The table below summarizes the benefit analysis findings. Annual benefits are computed over the lifecycle of the study period (20 years) and are shown in Present Value (PV). Benefits accrue during the full study period. The analysis demonstrates that improvements in the reliability of the lock and dam system can provide substantial benefits, even when very conservative assumptions are used.

Table 5: Summary of Cost Benefit Analysis, Present Value of Incremental Benefits over 20 Year Period (in millions of 2013 dollars)

Long-Term Outcomes	Benefit Categories	7% Discount Rate (Present Value)	3% Discount Rate (Present Value)
State of Good Repair	Operation and Maintenance Savings	\$87	\$125
Economic Competitiveness	Shipper Cost Savings	\$497	\$698
Quality of Life	Traffic Congestion Reduction	\$32	\$46
Environmental Sustainability	Emission Reduction	\$51	\$74
Safety	Accident Exposure Reduction	\$253	\$365
Total Benefit Estimates:		\$920	\$1,308

Secondary Selection Criteria

SECONDARY SELECTION CRITERIA 1: INNOVATION

Several components of the study that is being proposed include assessment and evaluation of many innovative solutions. This includes research of new technologies that can be leveraged towards improving efficiency and reliability and innovative ideas to own, operate and maintain the current lock and dam system through potential governmental and non-governmental (P3) partnerships.

SECONDARY SELECTION CRITERIA 2: PARTNERSHIP

Our partners that will be a part of the team represent local, state and federal interests with a focus on different elements of the project. The partnership will leverage technical and practical expertise as well as funding from a multi-state partnership (Illinois, Iowa, Minnesota, Missouri and Wisconsin). While not formal applicants, the USACE St. Paul, Rock Island and St. Louis Districts have been active participants in the project development and have provided lists of inland waterway navigation system projects that need to be addressed as a part of improving the system in response to global trade demands.

The five-state partnership has already worked together on initial investigations and designation of the M-35 Marine Highway Corridor and will continue to work together to further the benefits of improving the UMRS for many stakeholder groups.

This regional collaboration to date has included several dozen different agencies and diverse groups of stakeholders in attendance at the Iowa DOT's UMRS Stakeholder Workshop in June 2013, the united effort of the Illinois, Iowa, Missouri, Minnesota, and Wisconsin state DOTs to apply for establishing a Marine Highway Connector in early 2014, and the continued support as seen with letters of support for this application.



Using cargo that passes through Lock 19 as representative of the entire UMRS, historical data indicates that the shipment of this cargo by barge (relative to other transportation modes) yielded economic benefits of **\$0.8 billion for the UMRS in 2013 and more than \$5 billion over the period of 2009 through 2013**. It is anticipated that the same analysis for a lock further downstream would yield even higher benefits.

Cost-benefit analysis suggests a more reliable UMRS would yield an **incremental benefit of \$920 million over 20 years**, adding to the existing annual benefit of approximately \$1 billion.



Multimodal Port Facility



Results of Cost-Benefit Analysis

MoDOT recognizes the importance of commercial barge traffic to many sectors of the economy. [We] support the 2014 TIGER Grant application being submitted by the Iowa Department of Transportation...the planning study proposed by the five Upper Mississippi River states...will have regional and national benefits.

- Director David B. Nichols, PE | Missouri DOT



COST-BENEFIT ANALYSIS

Economic analysis is conducted to assess the quantitative economic benefits for each of the primary selection criteria and is consistent with the cost benefit analysis guidelines required by U.S. DOT.

A more reliable lock and dam system on the Upper Mississippi River will yield more cargo carried by barge transport as opposed to the rail and truck alternatives and the positive economic benefits of this modal shift are estimated. The

economic benefits are quite significant and would support public investments of up to \$0.9 billion and still result in a positive cost-benefit analysis. This amount is far in excess of the investments identified by the Rock Island District for improving the system.

The full cost-benefit analysis can be found in online at www.iowadot.gov/TIGER14-river and Table 6 below summarizes these outcomes.

Table 6: Summary of Cost-Benefit Analysis

Benefit Categories	Present Value of Benefits (\$ Millions)	Comments
Operation and Maintenance Savings	\$87	Every 1,000 truck miles costs \$16.40 in roadway wear and tear. A more reliable UMRS results in 555.1 million fewer truck miles and 2.2 million fewer rail miles.
Shipper Cost Savings	\$497	On the UMRS, barge transportation saves shippers \$24 per ton. A more reliable UMRS results in 37 million more tons being moved by barge making US exports more competitive globally. Every additional \$1 billion in exports results in another 6,500 US jobs.
Traffic Congestion Reduction	\$32	The length of 1 barge tow is about 0.25 miles. The same cargo moved by rail is 2.75 miles and by truck is over 13 miles. Moving cargo to 1 barge tow can reduce replace 1,050 truck trips and 2.25 100-car unit trains.
Emission Reduction	\$51	Per gallon of fuel, one ton of cargo can travel by barge 616 miles compared to 478 for rail and 150 for truck. Cargo traveling by barge emits 28.3% fewer emissions than rail and 72.6% fewer emissions than truck. A more reliable UMRS results in 4,105 fewer tons of nitrous oxide (NOx), 635,444 fewer tons of carbon dioxide (CO2), 145 fewer tons of particulate matter (PM), and 65 fewer tons of volatile organic compounds (VOC).
Accident Exposure Reduction	\$253	Per ton mile of transport, trucks have more than 100 times more crashes than barge. Rail has 18 times more. A more reliable UMRS results in 840 fewer crashes.



Modern ship that pass through the Panama Canal can hold as many as 5,000 - 8,000 containers (TEUs)



Project Readiness

Approval of this grant will enhance the capacity and efficiency of our transportation infrastructure that will grow our presence in new markets and bolster the regional and national economy. We ask that you give consideration to this notable addition to the integrated freight transportation network that we are all working for.

- *Transportation Commissioner Charles A. Zelle* | *Minnesota DOT*



The Iowa DOT has already laid a substantial foundation upon which the proposed planning study will be built. Beginning in February 2013, Iowa Governor Terry Branstad hosted a regional discussion focused on a collective stakeholder approach to addressing inland waterway transportation needs. As a first step in examining funding alternatives and strategies for improving the UMRS inland waterway system, the Iowa DOT commissioned an initial investigation report completed in April 2013: U.S. Inland Waterway Modernization: A Reconnaissance Study (online at www.iowadot.gov/TIGER14-river). This study provided an overview of UMRS infrastructure and outlined potential traditional and non-traditional funding mechanisms, maintenance, and infrastructure replacement needed to maintain the viability of waterway transportation as well as take advantage of future opportunities such as the Panama Canal expansion.

Following this study, the Iowa DOT hosted a workshop session in June 2013 with over 60 attendees from state and federal agencies, industry, and special interest groups. This workshop solicited stakeholder issues, concerns, and priorities regarding the UMRS and focused on identifying potential pilot projects and studies that would address the identified items. The proposed regional planning study was one of the high priority action items identified from this workshop.

The outreach and reconnaissance study activities led by the Iowa DOT in 2013 have provided the background, support, and feasibility required to initiate a more comprehensive regional planning study of the UMRS. The addition of numerous other stakeholders in the form of letters of commitment and support emphasizes the regional interest and necessity for the proposed study. The scope, schedule, and budget information presented in the Grant Funds and Uses section demonstrates the elements needed for a successful project:

- Outline statement of work focused on assessing, evaluating, and analyzing the engineering and economic items needed to define and recommend implementation projects
- Project budget of planning study tasks and the funding sources used to support the planning study, including demonstrating that the minimum 20 percent funding match is exceeded
- Project schedule outlining major study milestones and demonstrating that the project will be completed by mid-2016, in advance of even the June 2016 TIGER Grant funding obligation deadline



June 2013 Workshop Summary

Iowa DOT hosted a one-day workshop to engage a range of stakeholders in the planning process for the Mississippi River Action Plan:

Held on:

Thursday, June 27th, 2013

Topics discussed:

- Consolidated stakeholder issues, concerns and priorities with the current lock and dam system along the UMRS
- Recommended pilot projects for the Iowa DOT

Attended:

60 attendees, including representatives from:

- State Departments of Transportation
- USACE
- Elected officials from states bordering the Mississippi River
- Industries related to freight transportation
- Special interest groups

Relative to broader multimodal transportation initiatives, this project is consistent with the Iowa DOT's long-range transportation plan, which can be found online at http://www.iowadot.gov/iowainmotion/files/lowainMotion_final.pdf. This project will support meeting the three goals of this plan of improving safety, efficiency, and quality of life.

- **Safety:** Shifting freight movement from highway and rail to barge can result in a reduction of crashes on the public roadway system.
- **Efficiency:** Barge transportation is a highly efficient mode of freight transportation, both in terms of unit capacity and energy consumption.
- **Quality of Life:** Shifting freight movement from highway and rail to barge can result in a reduction of transportation-related congestion and emissions.

Regarding project risk, funding is typically the primary risk for studies similar to the one being proposed. However, based on the existing commitments from the state partnership, no risk is present for the current project as proposed. Furthermore, the State of Iowa is willing to consider additional financial support should project costs exceed current estimates.

While other environmental reviews and approvals are not required for the proposed planning study, it is recognized that many actions and projects recommended by the study would likely require such review and approval as they move toward construction. Activities including completion of the National Environmental Policy Act (NEPA) process, federal/state legislative approvals, and state/local planning reviews would all occur in future environmental studies and engineering design efforts separate from the proposed planning study.



Letters of Support

Iowa DOT has received numerous letters of support for the consideration of this TIGER Planning Grant application, including:

Supporters:

- Governor Terry Branstad, State of Iowa
- Lt. Governor Kim Reynolds, State of Iowa
- Director Paul Trombino III, Iowa DOT
- Director Debi Durham, Iowa Economic Development Authority
- Secretary Bill Northey, Iowa Dept. of Agriculture & Land Stewardship
- Secretary Ann L. Schneider, Illinois DOT
- Transportation Commissioner Charles A. Zelle, Minnesota DOT
- Director David B. Nichols, Missouri DOT
- Secretary Mark Gottlieb, Wisconsin DOT
- U.S. Senator Charles Grassley
- U.S. Senator Tom Harkin
- U.S. Congressman Bruce L. Braley, 1st District of Iowa
- U.S. Congressman Dave Loebsack, 2nd District of Iowa
- Executive Director Mike Steenhoek, Soy Transportation Coalition



Lock and Dam No. 18



Federal Wage Rate Certification

The Wisconsin Department of Transportation strongly supports the Iowa Department of Transportation's submittal of a TIGER application for a 5-state planning study to improve Upper Mississippi River lock and dam operational efficiency and reliability.

- Secretary Mark Gottlieb, PE | Wisconsin DOT



Iowa Department of Transportation

800 Lincoln Way, Ames, Iowa 50010

Phone: 515-239-1414

Fax: 515-239-1325

April 18, 2014

To Whom It May Concern:

Federal Register, Volume 74, Number 115, June 17, 2009 states in Section VII, Subpart G:

“An application must include a certification, signed by the applicant, stating that it will comply with the requirements of subchapter IV of chapter 31 of title 40, United States Code (Federal wage rate requirements), as required by the Fiscal Year 2013 Continuing Appropriations Act.”

The Iowa Department of Transportation will comply with the requirements of subchapter IV of chapter 31 of title 40, United States Code (Federal wage rate requirements), as required by the Fiscal Year 2014 Continuing Appropriations Act if the Department receives any TIGER funding.

Sincerely,

A handwritten signature in blue ink that reads "Wes W. Musgrove".

Wes W. Musgrove, P.E.
Contracts Engineer

WWM/met

W:\highway\contracts\clerical section\secretary II shared documents\letters Wes\2014 TIGER Grant Funding Request



Lock and Dam No. 19



Appendix

All materials are available online at: www.iowadot.gov/TIGER14-river

SUPPLEMENTAL MATERIALS

- » Letters of Support
 - » USACE Priority Project List
 - » TIGER Planning Grant Application Cost-Benefit Economic Analysis
 - » Iowa Department of Transportation's "U.S. Inland Waterway Modernization Reconnaissance Study" April 2013
 - » Iowa Department of Transportation's Lock and Dam Modernization Handout
 - » Iowa Department of Transportation's UMRS Action Plan Workshop Summary
 - » M-35 Application for Marine Highway Corridor Designation
-