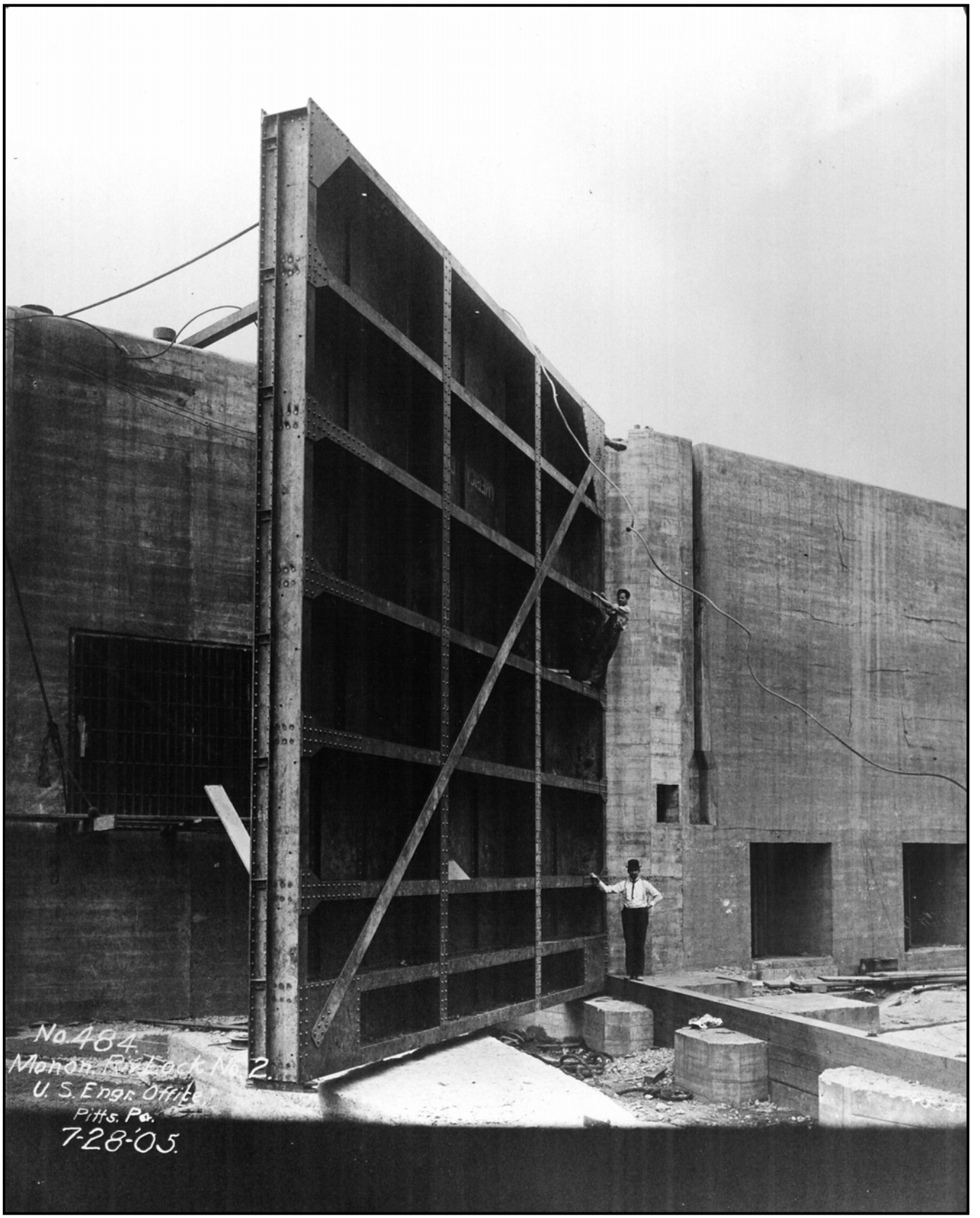
State
of the
Infrastructure

Braddock Locks & Dam

Braddock, Pennsylvania
Thursday, July 3, 2008

US Army Corps
of Engineers ®
Pittsburgh District


No. 484.
Monon. River Lock No. 2
U. S. Engr. Office
Pitts. Pa.
7-28-05.

AGENDA

Braddock Locks and Dam
10 a.m. - Noon, July 3, 2008

Welcome, Site Orientation, Agenda & Safety

Lenna Hawkins, Deputy for Programs & Project Management
U.S. Army Corps of Engineers, Pittsburgh

State of the Infrastructure Address

Colonel Michael P. Crall, District Engineer
U.S. Army Corps of Engineers, Pittsburgh

Keynote Speakers

John P. Murtha
U.S. House of Representatives, Pennsylvania District 12

Timothy Murphy
U.S. House of Representatives, Pennsylvania District 18

Jason Altmire
U.S. House of Representatives, Pennsylvania District 4

James R. McCarville
Port of Pittsburgh Commission

James C. Grech
CONSOL Energy Inc.

Lisa Roudabush
U.S. Steel Corporation

Designation/Organization of Tour Groups & Safety Brief Tours (3 concurrent tours)

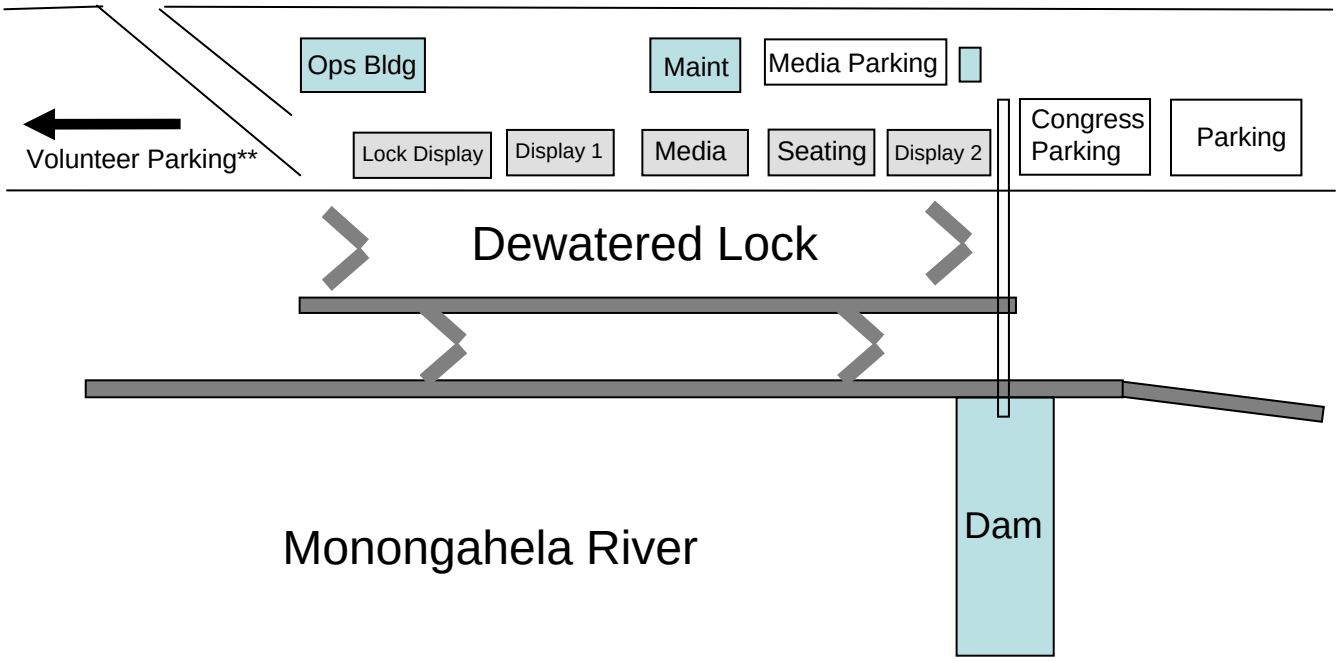
Aging Chamber Tour: Participants will descend into lock chamber via scaffold stairs for a tour and presentation; those who do not want to tour the chamber will have a landwall presentation.

Broken Gear Tour: Participants will move to the upstream landwall gates to receive a presentation on the cracked anchorage assembly and other gear.

Risk & Consequences Tour: Participants will move to the graphic display area where presenters will brief on economic consequences, risk and reliability, and asset management challenges.

Thank You & Farewell

State of the Infrastructure



**Volunteer Parking will be adjacent to the brick pumphouse before the entrance to the Lock and Dam

Order of tours

Red Chips: **Lock Chamber/land wall → Display 2 → Display 1**

White Chips: **Display 1 → Lock Chamber/land wall → Display 2**

Blue Chips: **Display 2 → Display 1 → Lock Chamber/land wall**

2008 State of the Infrastructure Address

US Army Corps
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Pittsburgh District

2008 State of the Infrastructure

I stand before you today to address the state of our navigation infrastructure and I must report that it is not strong. The Pittsburgh District has the largest, oldest, and arguably, most fatigued lock and dam inventory of any other Corps district. Several of our structures are at risk of suffering catastrophic failure within the foreseeable future.

We are here to address navigation and infrastructure rehabilitation, but our district's missions also include flood damage reduction, regulation of the Clean Water Act and the River and Harbors Act, water supply, water quality, environmental restoration, and emergency response. First, I want to explain our watershed approach to these missions.

We operate our 16 flood damage reduction reservoirs and 23 lock and dam facilities within the Upper Ohio River watershed to reduce the risk of flooding, to restore our environment, to enhance recreation, and to ensure we have navigable waterways.

When a storm hits, the Corps' upstream reservoirs minimize flooding by capturing precipitation that falls in one third of our district boundaries. We release that excess water as the rain decreases to regain flood storage capacity for the next storm. During dry times, up to eighty percent of the water that passes by the Point of Pittsburgh comes from our reservoirs. This flow augmentation allows industry to operate, public water supply and sanitary sewer systems to function, and the environment to thrive. Most appropriately for this discussion, our flow augmentations ensure that the rivers remain navigable.

The Corps of Engineers is transitioning to a risk-informed approach to better assess the performance and condition of our critical infrastructure and the potential consequences of failure. These consequences include impacts to public health and safety, the environment, and the economy.

Through a risk-informed process, we have determined that two of our navigation dams at Emsworth and Elizabeth are "critically near failure." Others, such as Montgomery Locks and Dam on the Ohio River, are not much better. We have implemented several short-term risk reduction measures at these facilities to ensure that they are operated safely, but these are not permanent fixes.

The key challenge is the pending insolvency of the Inland Waterways Trust Fund, a funding mechanism financed by a 20 cent diesel fuel tax on commercial transportation using inland waterways. The IWTF funds 50 percent of the federal capital investment in the inland waterways system and it will soon be unable to pay that bill.

This funding shortfall threatens to impact the construction schedule of our two failing navigation facilities -- Emsworth on the Ohio River and Locks and Dam #3 at Elizabeth on the Monongahela River. The failure of the dam at Emsworth would have catastrophic consequences to public health and safety, the regional economy, and the environment.

2008 State of the Infrastructure (cont.)

The loss of the dam would drain the Pittsburgh navigation pool, resulting in the isolation of all river activity and commerce on the Monongahela and Allegheny River Basins, as well as impact public utilities, industry, the aquatic ecosystem, water supply and quality, and the riverside services in the Upper Ohio Valley. Approximately 11,700 jobs would be directly at risk. The workforce would lose an estimated two million dollars a day in lost wages. The loss of pool would severely impact two steel companies, five coal-fired power plants, the largest United States underground coal mine, and the largest United States coke plant, which is vital for steel production. This would place at least eight water intakes and several sanitary outflows in jeopardy. Those are the consequences of losing one dam out of 23 within the Pittsburgh District inventory.

Our century-old Elizabeth Locks and Dam structure is at high risk of failure. As part of the Lower Monongahela River Navigation project, the removal of Elizabeth Locks and Dam is in jeopardy. Prior to the IWTF insolvency, the project was 12 years behind completion schedule. The Trust's insolvency will further delay the completion of the project to at least 2020. The loss of Elizabeth Dam would choke off 20 million annual tons of commodities, primarily coal used to generate power and supply the nation's largest coke plant. The total benefits of traffic through the Lower Mon River facilities equal a yearly savings of $400 million above and beyond other modes of transportation.

As the region's federal engineer, it is my responsibility to report that the Lower Mon Project is facing a perfect storm. Inefficient funding; the insolvency of the IWTF; an aging and crumbling infrastructure; an increase in unscheduled, unexpected repairs; and a flat-lined operations and maintenance budget coupled with rising costs in labor, services and materials threaten the reliability of the system. We are in fix-as-it-fails mode, which pulls funds from scheduled priority maintenance. We must be proactive in preparing for the worst while addressing long-term solutions for critical repairs and rehabilitation.

How does this impact the individual citizen? I mentioned the public health impacts regarding water intakes and sanitary outflows that arise when we lose the ability to regulate pools between facilities. The consumer will pay higher electricity rates as industry pays emergency rates for fuel delivery to power plants. Recreation on the rivers will be severely hampered. Jobs will be lost within the navigation industry and the industries it supports. Our regional economy will suffer. Congestion on our highways will increase as more trucks are put on the road. The benefits of using clean, efficient transportation will decrease.

We may lose an opportunity to generate green power. Currently, our district has 16 pending hydropower permits to construct power plants at our reservoir and navigation dams. The condition and stability of our dams may prevent or discourage the construction of hydropower facilities.

2008 State of the Infrastructure (cont.)

We can extend these consequences in all directions, even in terms of life safety. Each year, a half million people aboard recreational or commercial vessels lock through Pittsburgh District's navigation system. We need to ensure the navigation facilities they use are safe.

Two recent incidents at Braddock Locks and Dam highlight the potential hazards when fatigued and aging structures clash with human activity. Early in the morning of October 12, 2007, a vessel carrying 9,000 tons of coal was locking through the main chamber when a valve shaft located under steel grates pulled away from the worn threads of a rocker arm. The valve collapsed, closing off a channel that allows water to pass through the lock during a lockage.

With the channel blocked and no where for the water to go, it burst out from a set of grates, shooting above the 30-ft lock tower and flinging the grates with it. Fortunately, no one was standing on those grates or they would have been launched with them. An alert deckhand manning a barge quickly clung to a lockwall timber to keep from being thrown into the lock chamber by a powerful deluge of water. The deluge quickly increased the chamber's water level by 10 inches.

Just three weeks ago at midnight, a Braddock Lock worker noticed an anchorage assembly plate on the upstream landwall had popped up. Under the plate, he found a crack in a steel plate that runs into the landwall concrete and holds one of the 120-ton gates in place. The lockmaster immediately shut down the main lock chamber and called our maintenance party to begin fixing the damage. For the next 53 hours, our dedicated repair party and lock employees worked night and day to return the chamber to service. We were fortunate to have an auxiliary chamber; some of our facilities don't enjoy that redundancy.

Still, barge traffic backed up on the river, waiting 17 hours, or about eight times longer than normal, to lock through the smaller chamber. Hard work minimized what could have been a long unscheduled delay for the navigation industry. We did not anticipate the damage and had to divert other priority repairs to fund this work. We fixed the cracked steel and fortified the remaining three anchorage assemblies. The extra work extended our dewatering scheduled of Braddock's main lock chamber and added an additional quarter million dollars to our maintenance tab. Most concerning, had the gates been open when that steel ripped, the 120-ton gate would have probably come crashing down into the lock chamber and upon anyone in it.

The consequences of failure can be life-threatening. And everyday that we do not address critical maintenance needs, the risk of catastrophic failure multiplies.

Fortunately, the Pittsburgh District is filled with amazing people who respond within a moment's notice to any emergency, and who work tirelessly and skillfully so that people may safely enjoy the rivers and the benefits they bring to the region.

2008 State of the Infrastructure (cont.)

We must foster private-public partnerships to address these issues. The District has proactively engaged industry and recreation interests through two new groups – the Corps of Engineers and Rivers Recreational Users Summit (CERRUS), and the Corps of Engineers and Waterways Association Action Group, (CEWAAG). CERRUS reviews the Pittsburgh District's Integrated Inland Navigation System and evaluates how it interfaces with recreational and other needs. CEWAAG reviews Pittsburgh District's locks and dams operations and how they meet the needs of the commercial navigation industry. These are working groups focused on problem-solving, engagement, and communications between the various stakeholders.

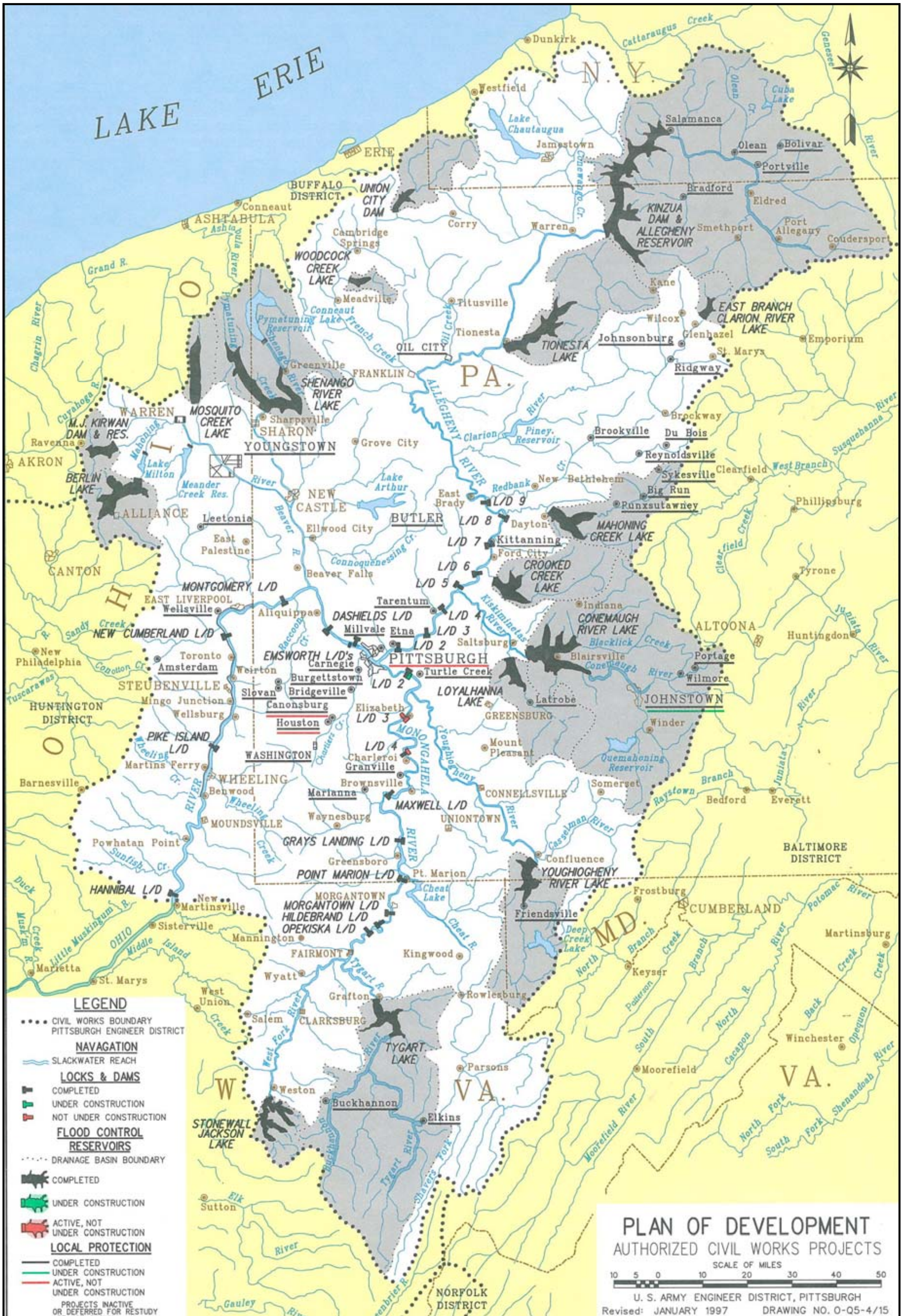
In conclusion, we're fortunate to have a strong, engaged, and vocal Congressional delegation that has effectively carried our urgent message to lawmakers representing other regions and interests. They understand the direct impact to the individual citizen. They also recognize that this not only a regional issue, but a national one.

The Pittsburgh District commits to clearly defining and accurately reporting risks associated with its structures. We will work with you to reduce those risks.

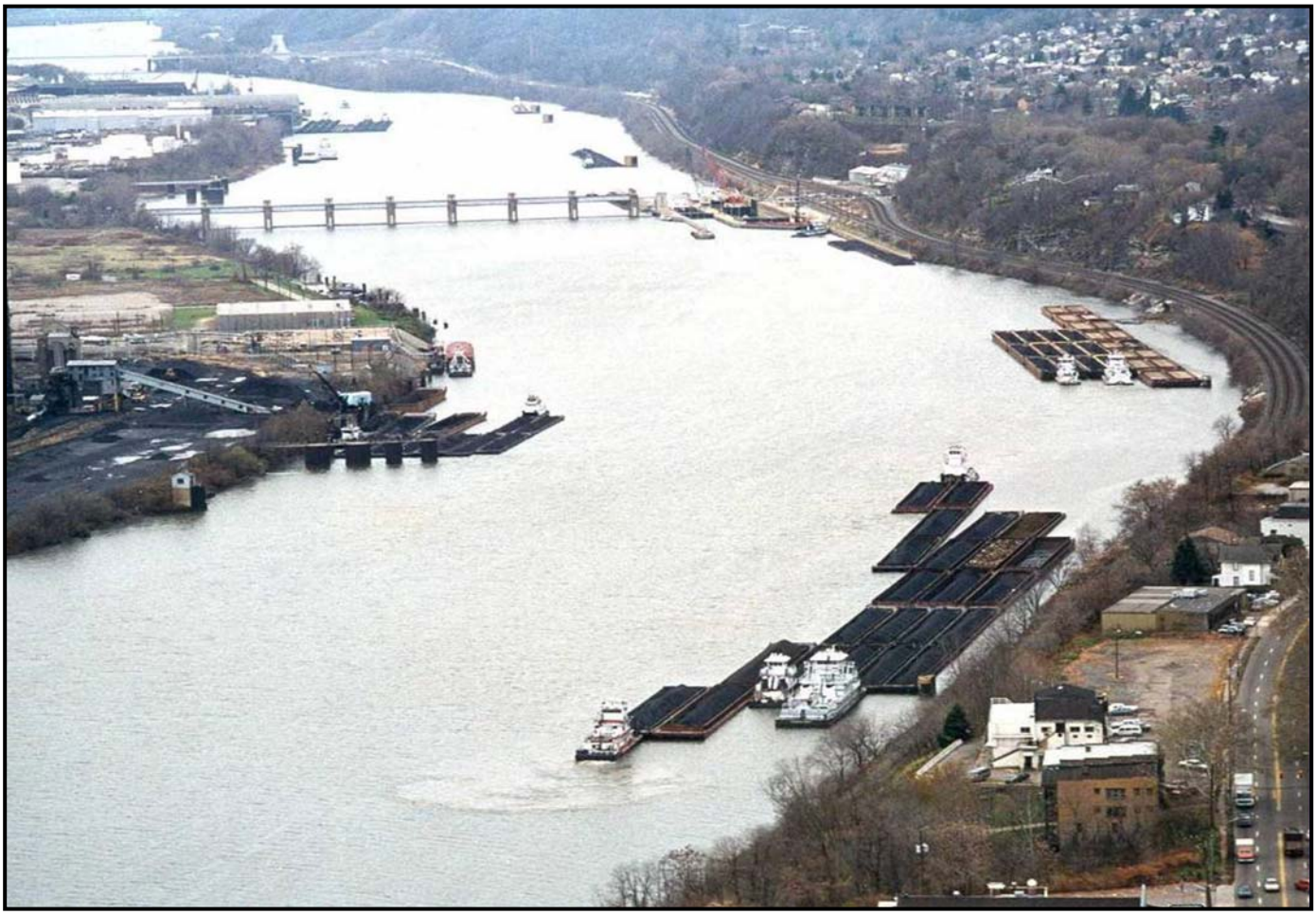
Thank you.

Michael P. Crall
Colonel, U.S. Army
District Engineer
U.S. Army Corps of Engineers, Pittsburgh

Pittsburgh District



Economic Impact Study
Port of Pittsburgh



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Economic Impact Study of The Port of Pittsburgh

The Port of Pittsburgh retained the services of Martin Associates to estimate the local and regional economic impacts generated by the river terminals and industries dependent upon the movement of cargo on the Ohio, Allegheny and Monongahela rivers. Martin Associates, located in Lancaster, Pennsylvania, has developed more than 150 economic impact studies for ports and port systems throughout the United States and Canada. In 2002, these river terminals in the Port of Pittsburgh Commission District handled more than **52 million tons of cargo**. It is the purpose of this study to quantify the economic impacts generated by the river system activity within the Port of Pittsburgh Commission District. The methodology used is based on interviews with about **220** firms providing services to the cargo and barges moving on the river system as well as those providing recreational services on the river system.

Specifically, the river system activity generated the following economic impacts in 2002:

217, 877 direct, induced and indirect jobs were generated by the river system activity within the Port of Pittsburgh Commission District.

Of the **217,877** jobs:

- **45,079** jobs were directly generated by the river system activity, of which:
  - **14,887** jobs were with providers of transportation services
  - **30,192** jobs were with users of the river system – shippers and consignees using barge transportation

149,534 jobs were indirect jobs generated as a result of $9.1 billion of local purchases by the firms dependent upon the river system.

23,264 jobs were induced jobs generated by the $2.2 billion of local purchases made by the directly generated employees.

Furthermore, 5,975 related jobs were generated by the river system activity within the Port of Pittsburgh Commission District.

$10.3 billion of local wages and salaries were generated by the river system activity within the Port of Pittsburgh Commission District in 2002.

Of the **$10.3 Billion**:

- **$2.2 billion** of direct wages and salaries were generated and received by the **45,079** directly generated jobs, for an average salary of **$47,748** per direct employee.

- As the result of re-spending, another **$2.2 billion** of re-spending and consumption purchases were generated and supported the **23,264** induced jobs.

- The **149,534** indirect job holders received **$6 billion** of wages and salaries.

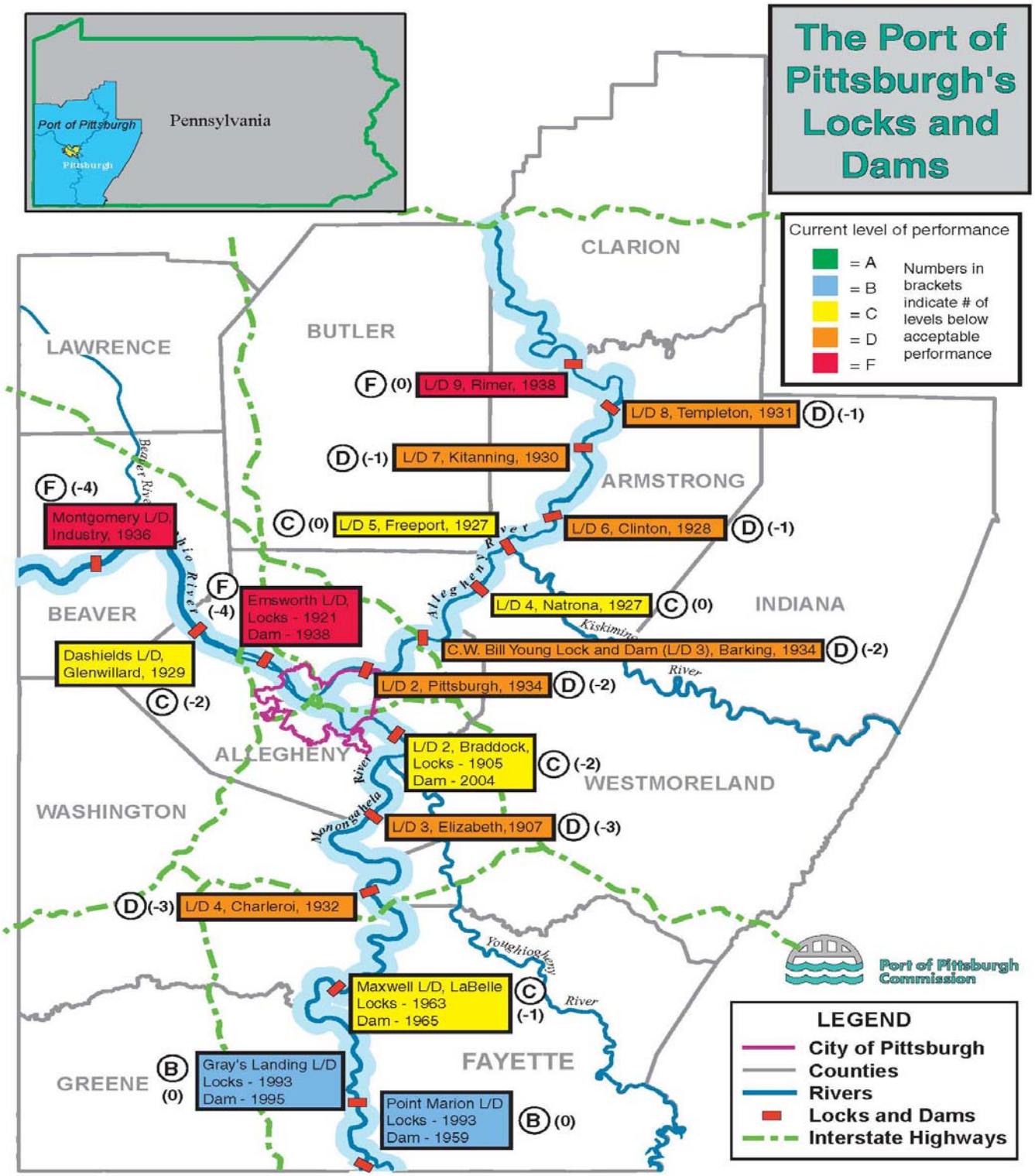
Businesses providing cargo handling and river transportation services, recreational services, and rail and truck transportation on the river system within the Port of Pittsburgh Commission District received

$873.2 million of revenue.

$1.0 billion of state and local taxes were generated by the river system activity within the Port of Pittsburgh Commission District

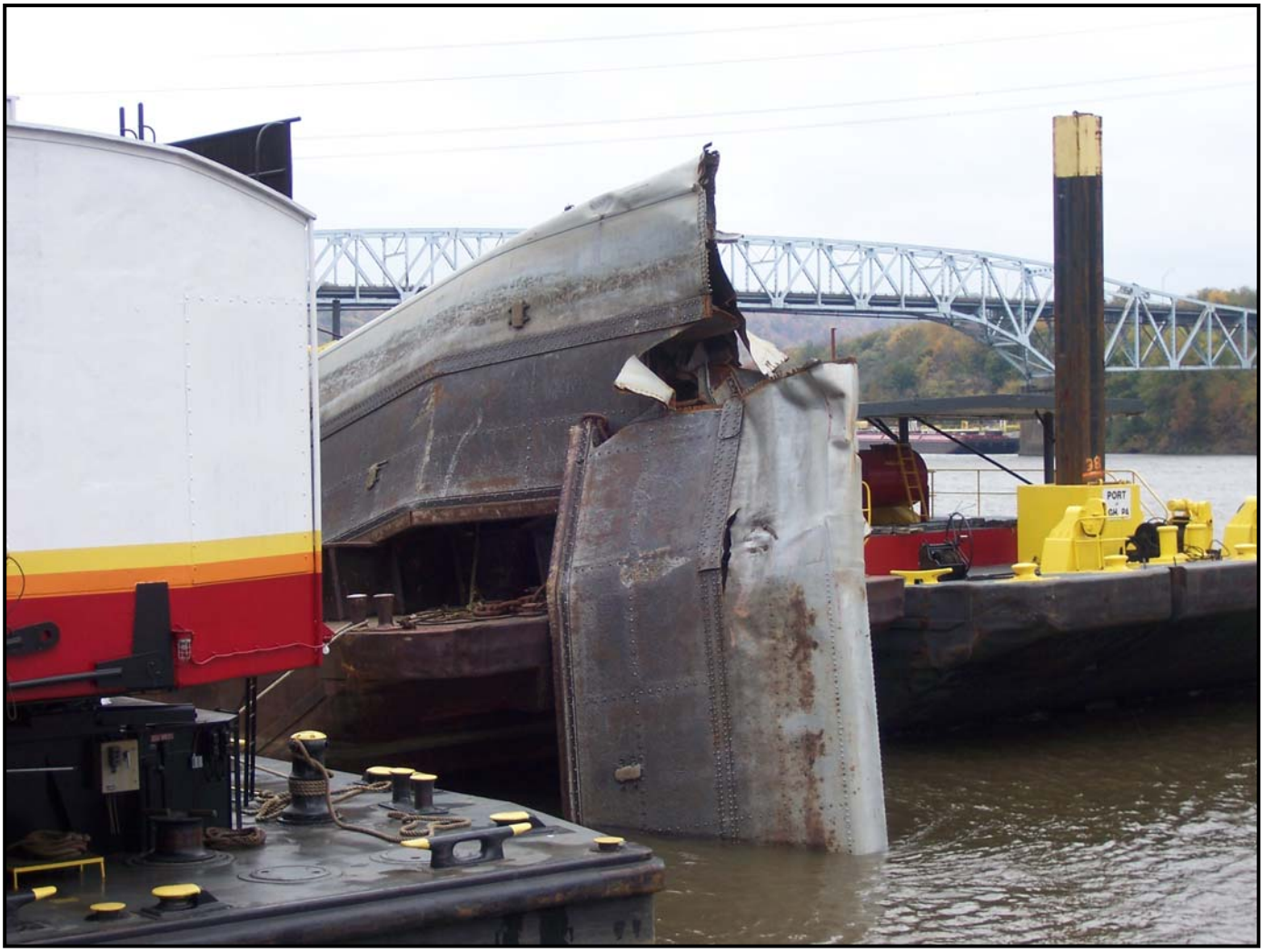
$2.2 billion of Federal taxes were generated by the river system activity within the Port of Pittsburgh Commission District

ASCE Report Card on Nav Infrastructure



*Data based on 2006 statistics: Conditions have steadily deteriorated since last study

Risk



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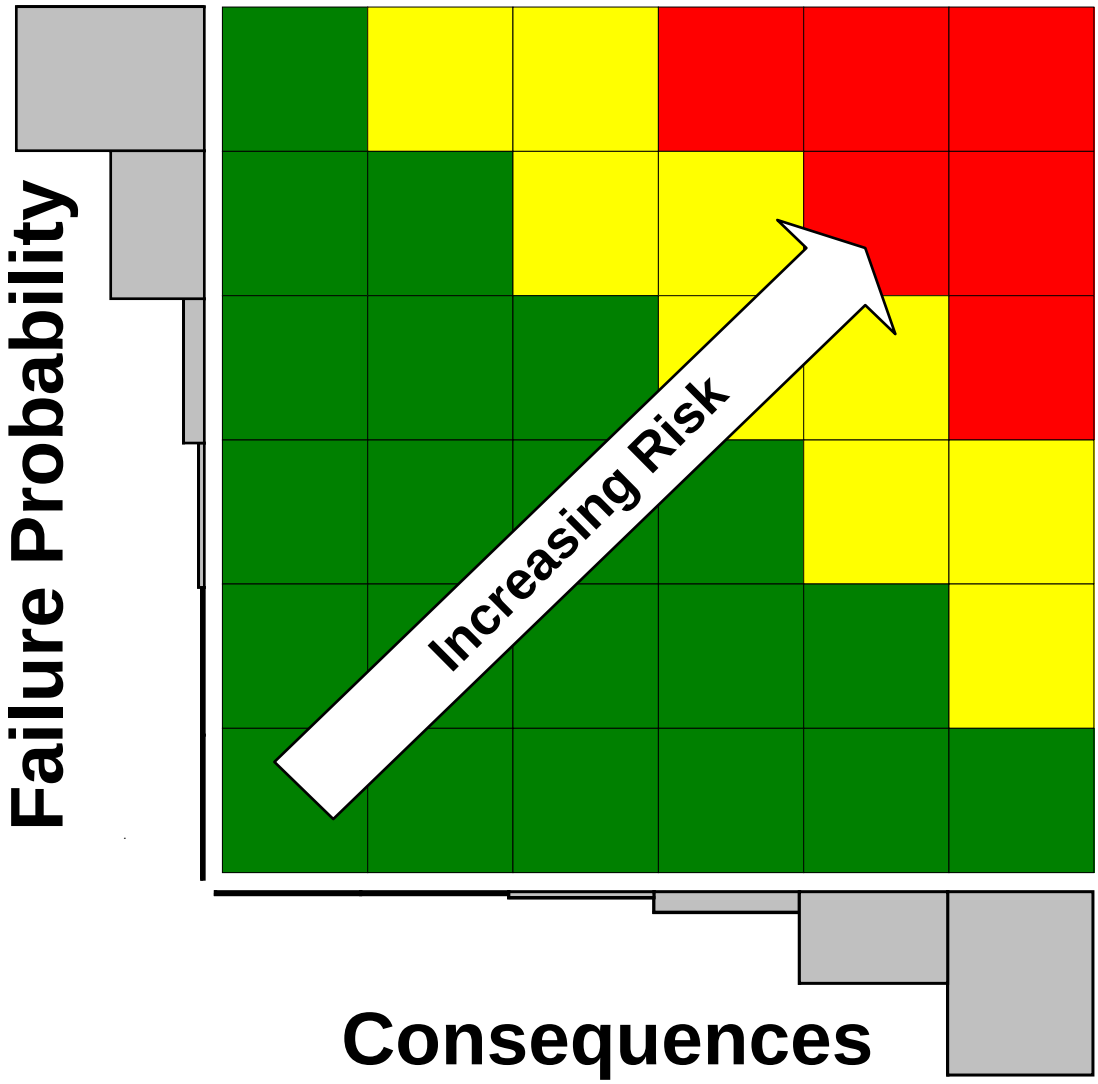
Risk



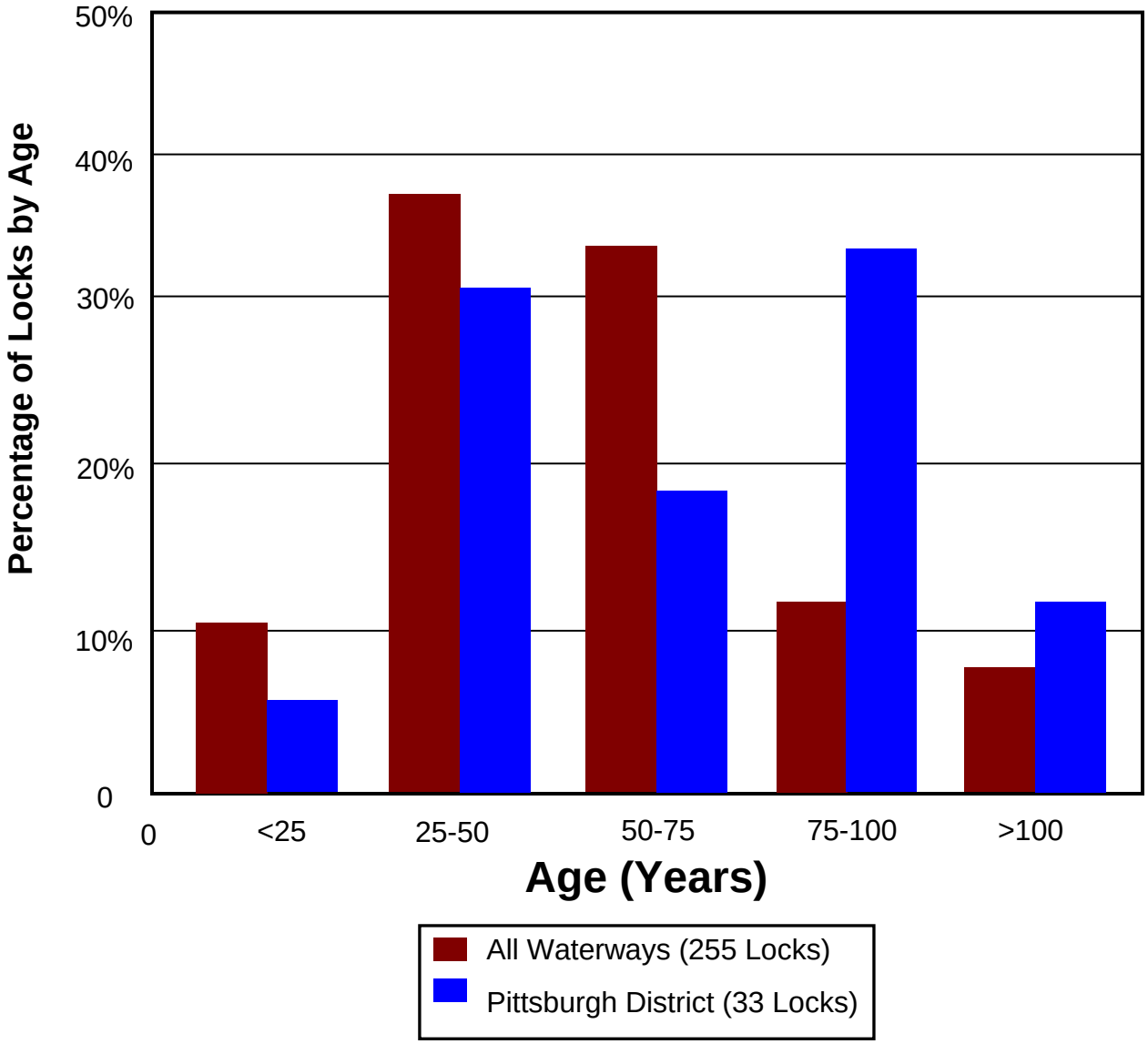
What is Risk?

Risk is defined by the likelihood (or probability) of failure combined with the consequences of the failure. “Failure “ describes minor breakdowns that require temporary closure of a lock chamber as well as catastrophic failure that renders the project unusable. Consequences of project failure include impacts to public safety, worker safety, economic impacts to the region and nation, and damage to the environment.

Why is the Corps using Risk?

The Corps is using a risk-informed approach to assess its inventory of more than 600 dams, which includes about 200 navigation projects. This risk management strategy allows the Corps to identify and prioritize projects that are in need of repair and focus our available resources on the most critical projects. Risk allows us to examine projects in a systematic and comprehensive manner so that we can improve our ability to make the right decisions for the right problems at the right time.

Age of Navigation Infrastructure



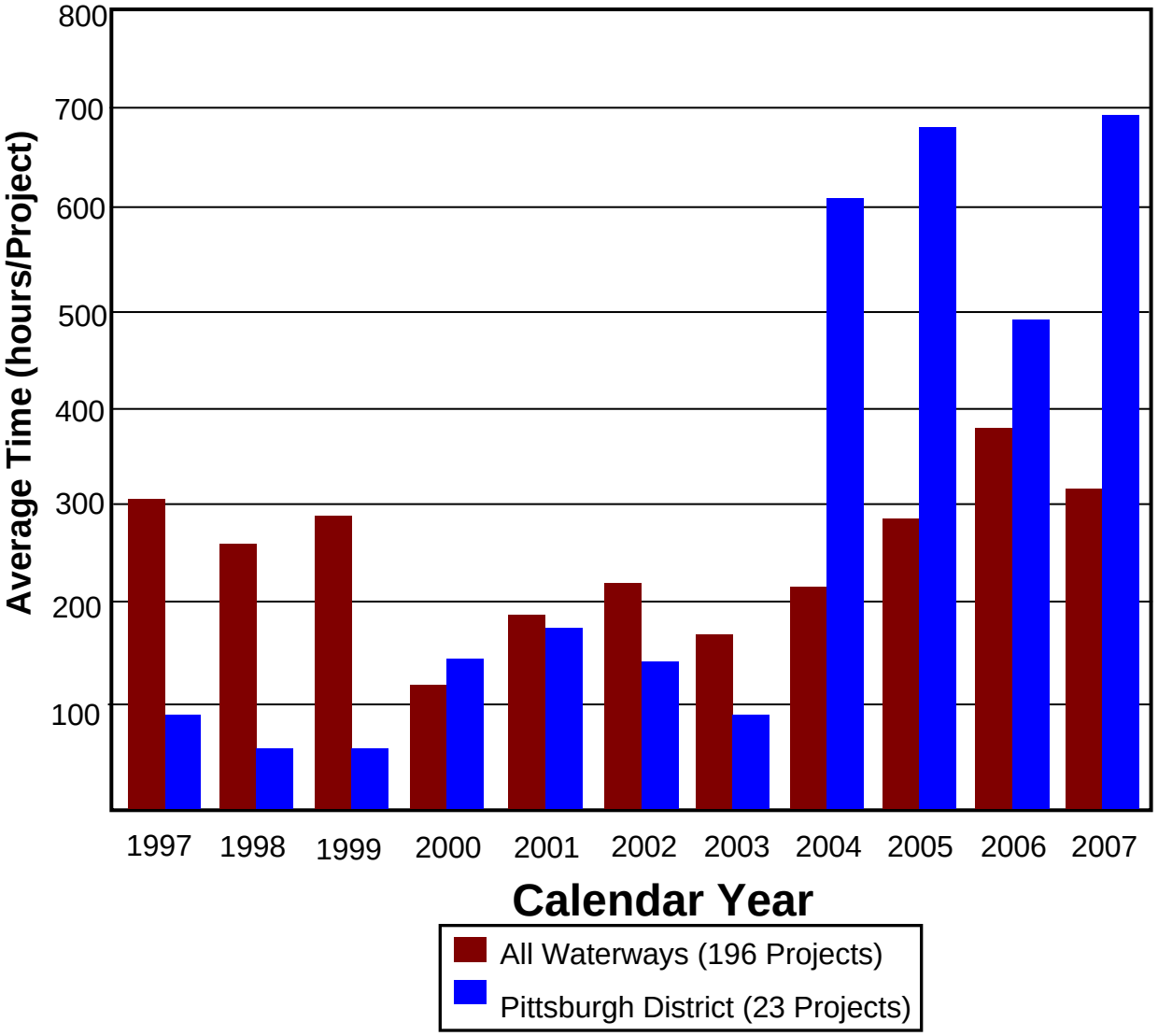
Aging Infrastructure

About 66% of Pittsburgh District's navigation structures have exceeded their economic design life of 50 years and are in need of repair and rehabilitation. As these projects continue to age and deteriorate, failures are becoming more common and impacts to the economy of the region and the nation are increasing. Efficient funding for rehabilitation of these projects is critical so that they can continue to function as the most efficient, cost effective, and environmentally friendly mode of transportation available.

Risk Assessment

The Corps uses a risk-informed assessment to characterize dam safety risk. Projects may be classified as having major problems with a very high risk, significant problems with a moderate risk, or minor problems with a low risk. To date, the Corps has identified 13 projects with major dam safety problems that require urgent action to repair. Three of these projects (about 25%) are located in the Pittsburgh District's inventory of navigation structures.

Unscheduled Lock Closures



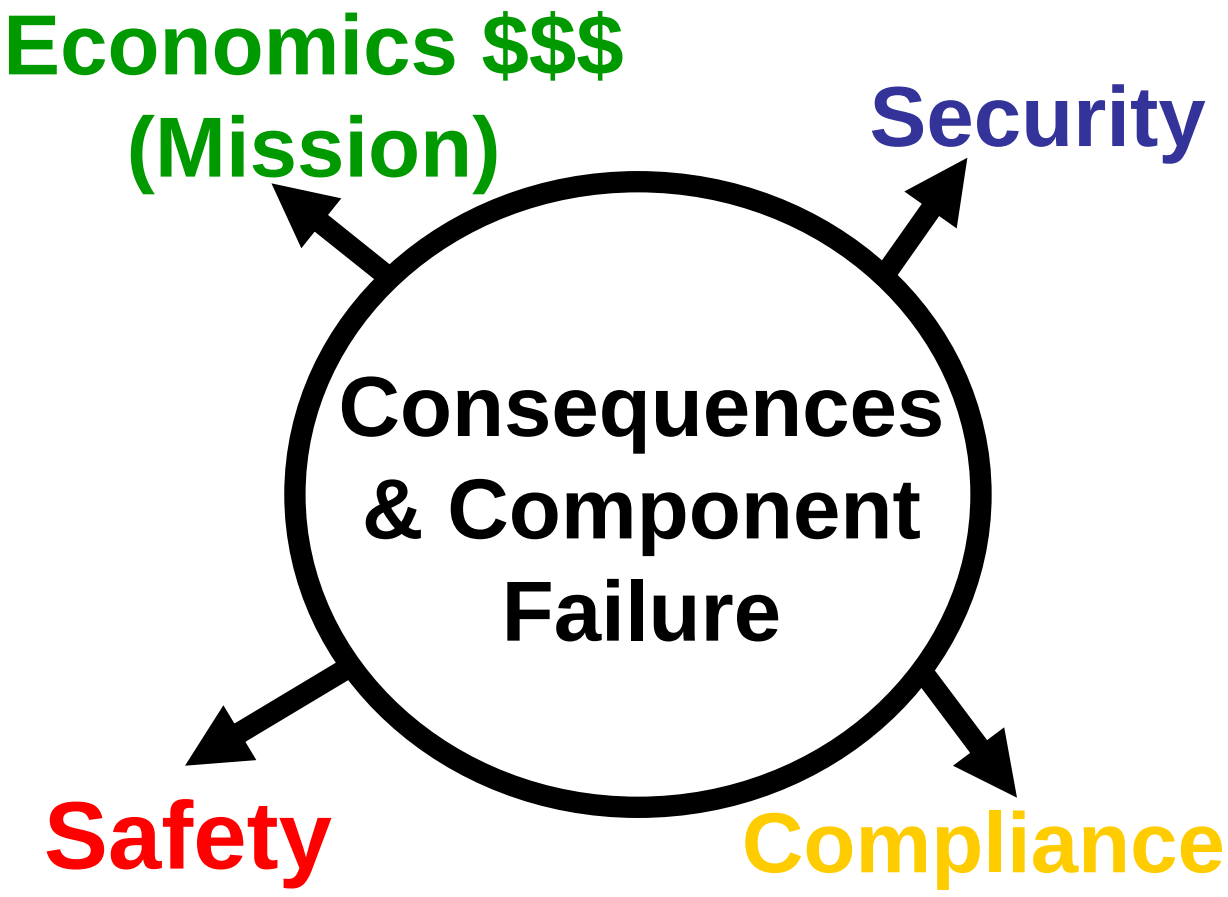
Considering the number, age, and condition of all of the locks in the country (196 Locks with half over 50 years old), it is no surprise that the Corps has an increasing demand to perform major maintenance and repairs on these projects. More maintenance and repair requires an increased in funding over traditional levels.

This is particularly true in the Pittsburgh District with its 23 Locks (approx 10% of the locks in the country). Over the last five years we have witnessed a trend that shows that our unscheduled lock closures, (many caused by breakdowns), are not only increasing but are surpassing all other locks in the country. The reliability of Pittsburgh District's 23 locks is drastically decreasing. Unscheduled loss of service impacts everyone in the long run.

With an increasing maintenance and repair workload and the same amount of maintenance funding, we move toward "breakdown maintenance" operating mode.

The Corps has initiated an asset management program to focus the available funding to the most effected areas by identifying the projects posing the greatest needs, greatest risks, and greatest impacts.

Consequences



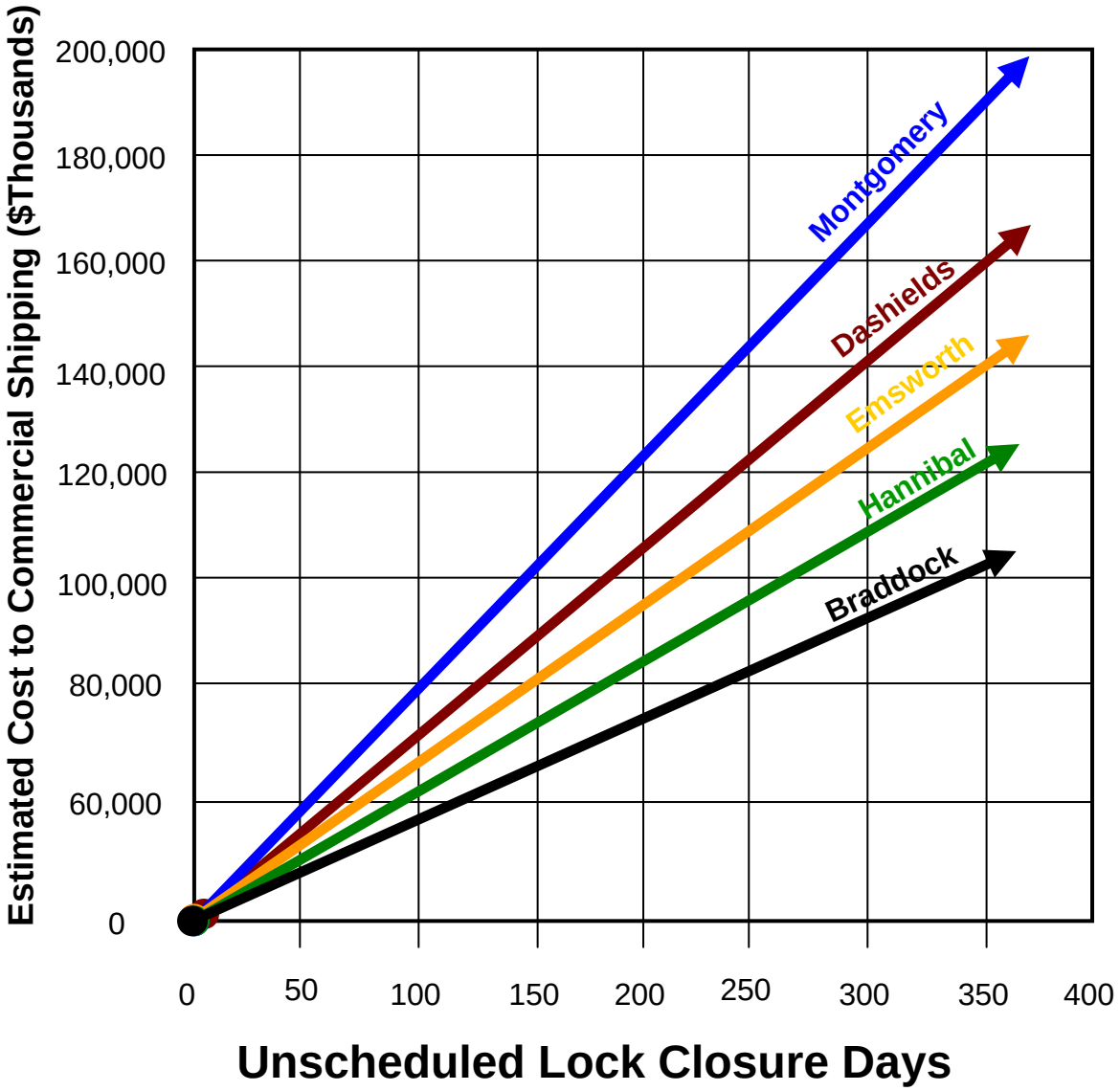
A component failure at a Lock will have multiple consequences:

Example – a corroded high pressure hydraulic pipe line that supplies lock gate operating machinery springs a leak. The resulting consequences include:

> **Mission** - Can't move the gate = unscheduled loss of service = river commerce stops or is delayed = $$$/Day to the shipper. These costs are passed on to the consumer.
>
> **Compliance** - Hydraulic oil seeps into the river = violation of clean water act = environmental clean up costs = water intakes are polluted and will require additional treatment action for continued use = $$$.
>
> **Safety** – Public safety = municipal water supply is contaminated through its river intakes; worker safety = lock worker exposed to high pressure oil spray, and potential injury.

One component failure could affect the project's ability to execute its **mission**, maintain project **security**, **protect** the users and workers at the facility, and to **comply** with the law.

Impact of Catastrophic Failure and Lock Closure



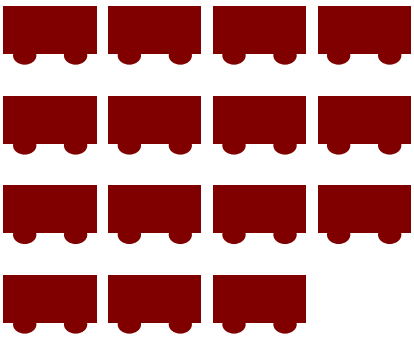
1. Unreliable system requires development of contingency plans, including construction of access roads and rail spurs that would allow transportation by other modes if necessary.
2. At best, unscheduled closures results in delays, use of alternative modes, increased production from alternative plants and/or mines.
3. At worst, an unreliable or closed systems results in a deterioration of the market position of area businesses to the point that some may close.
4. Many of the businesses are major producers and employers in the area:
    - -4.1 USS Mon Valley works - Edgar Thompson, Clairton, Irvin
    (Clairton is largest coke plant in US)
    - -4.2 Consolidated coal company - Bailey mine, Enslow Fork Mine, Alicia transfer complex
    (mines are largest underground mines in US)
    - -4.3 Other mining companies
    - -4.4 Electric generating plants

Alternate Transportation Mode Comparison

1 Barge

=

15 Jumbo Rail Hoppers



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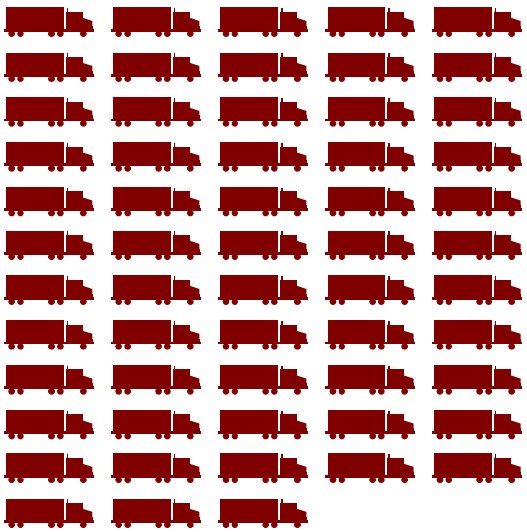
58 Trucks



Direct transportation benefits of navigation system

Barges move the largest amounts per trip:

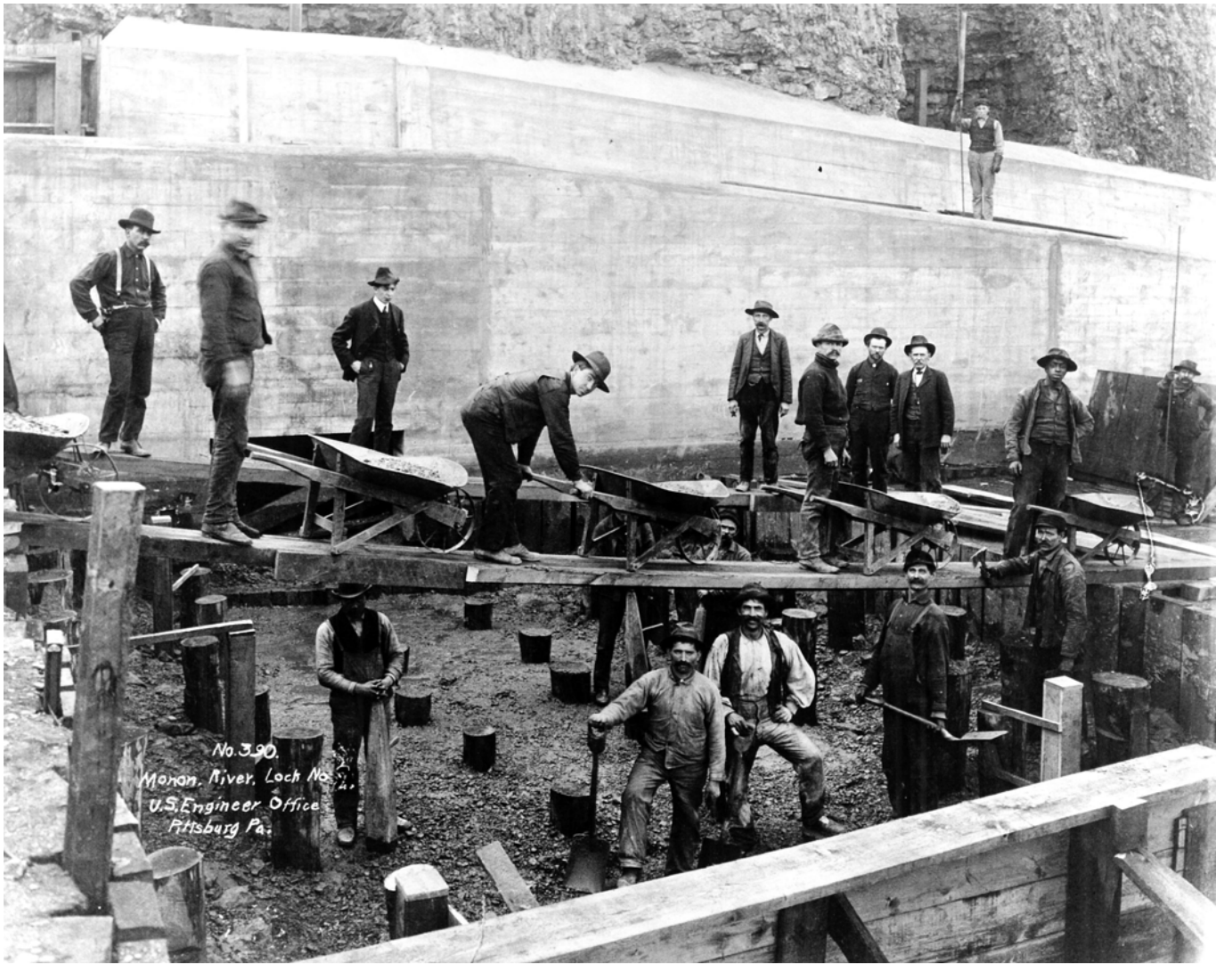
1. barge	22,500 tons
2. rail	11,000 tons
3. truck	120 tons

Barges can move more tons, more miles with less fuel:

1. barge	576
2. rail	413
3. truck	155

Secondary benefits of navigation system

1. increases competitive position of area industries
2. provides an alternative to rail and roadway traffic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