



JOLIET MOVABLE BRIDGES

HISTORY & FUTURE OF THE DES PLAINES CROSSINGS

TEAM



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MOVABLE BRIDGES BACKGROUND INFO

Whereabouts

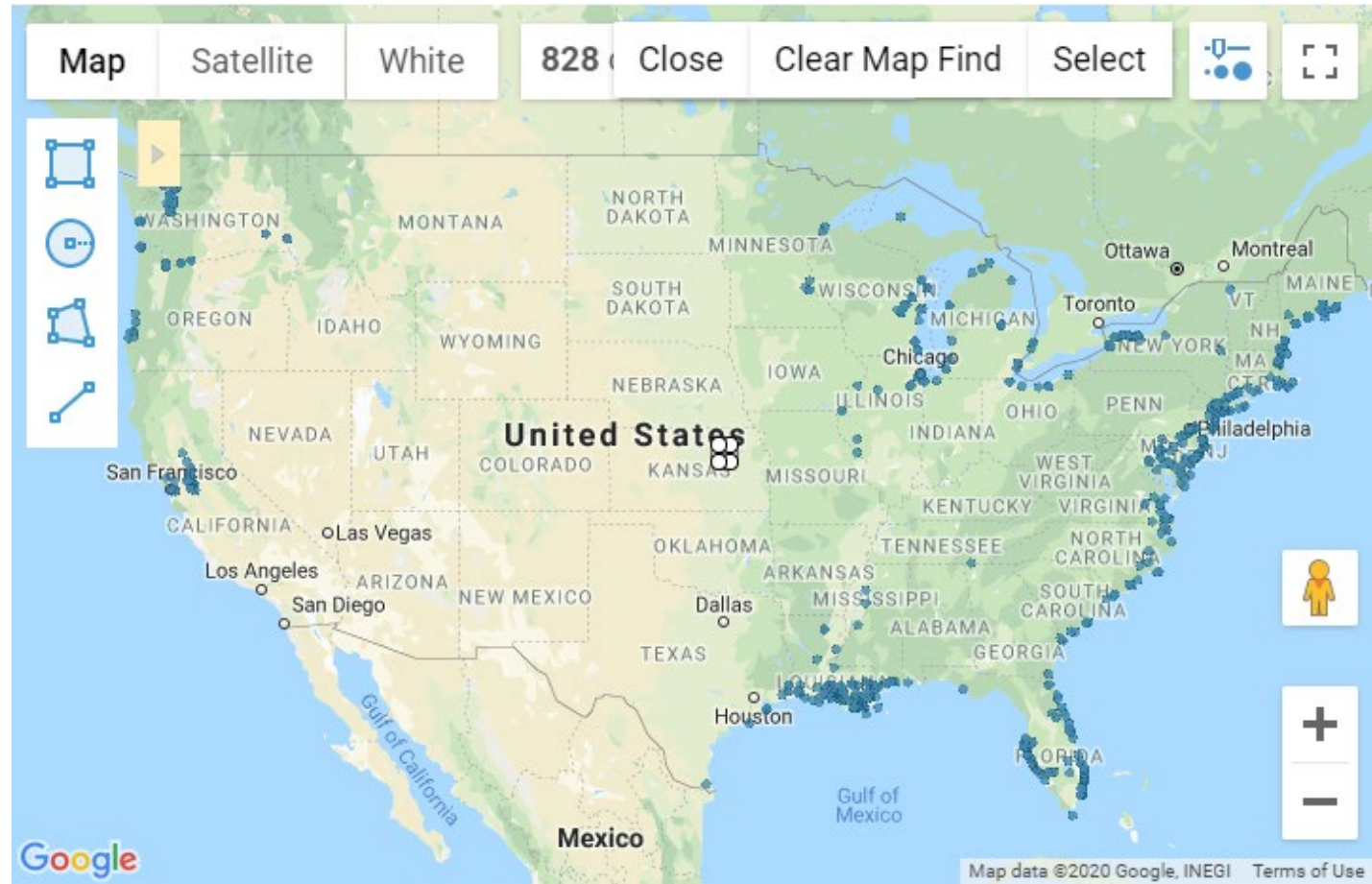


NATIONWIDE – WHERE ARE THE MOVABLE BRIDGES?

NATIONWIDE MOVABLES

828 Blue DOTs on the Map

Compliments of the FHWA's InfoBridge
Database



TOP STATES WITH MOVABLE BRIDGES

State	# Moveables
Louisiana	142
Florida	141
New York	69
Illinois	56
Washington	51
New Jersey	48
Wisconsin	39
California	37
Maryland	25
Massachusetts	25
Michigan	25

MIDWEST – WHERE ARE THE MOVABLE BRIDGES?

MIDWEST

Follow the navigation channels....



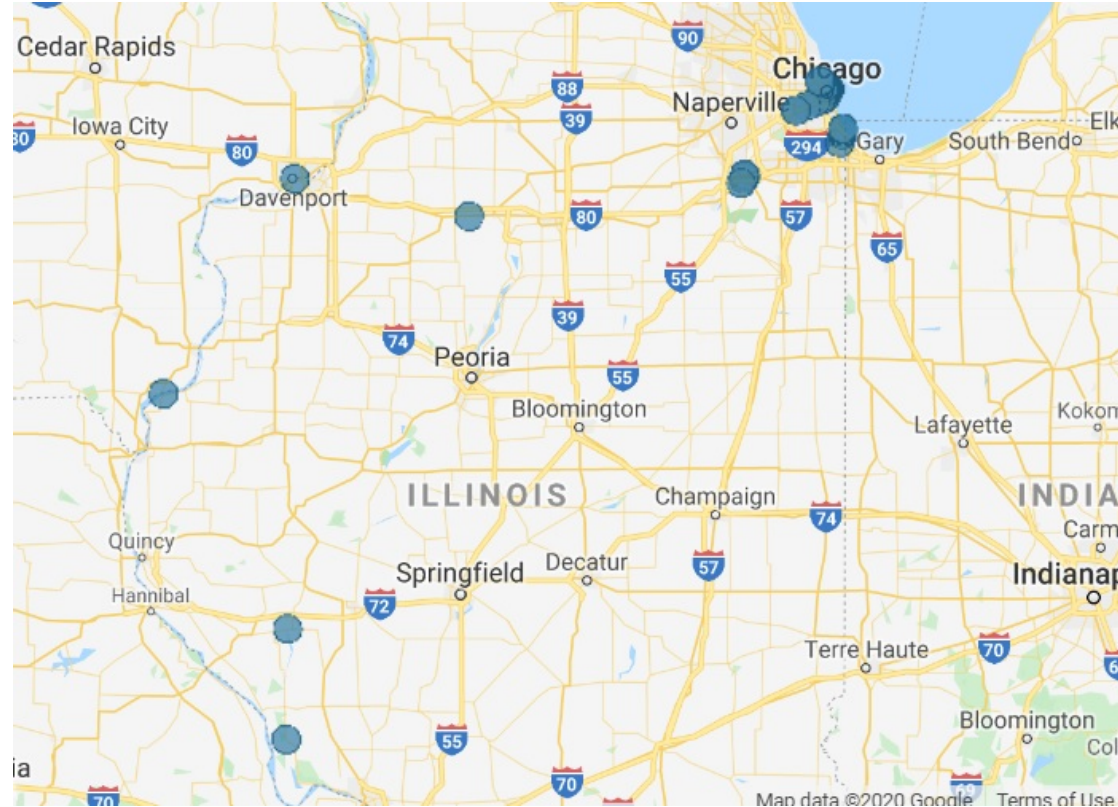
ILLINOIS – WHERE ARE THE MOVABLE BRIDGES?

ILLINOIS MOVABLES

43 in Chicago

6 in Joliet

2 in Southern Illinois near St. Louis

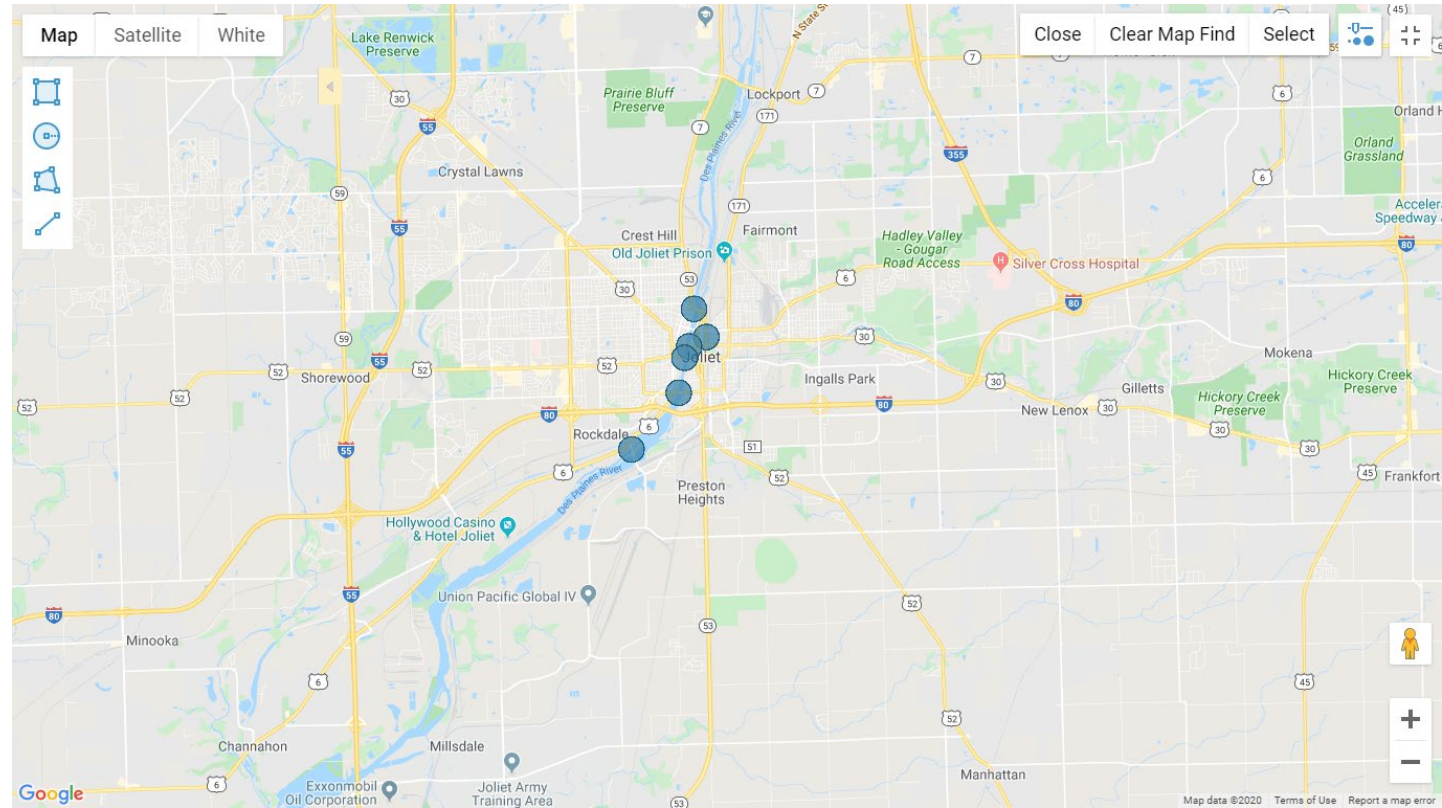


JOLIET – WHERE ARE THE MOVABLE BRIDGES?

JOLIET, ILLINOIS

Blue DOTs on the Map

Compliments of the FHWA's InfoBridge Database



JOLIET – WHERE ARE THE MOVABLE BRIDGES?

JOLIET, ILLINOIS

Looking north along the waterway



MOVABLE BRIDGES BACKGROUND INFO

Why Joliet?



JOLIET AREA HISTORY

Joliet was incorporated as a city in 1852; at the heart of the city is the Des Plaines River.

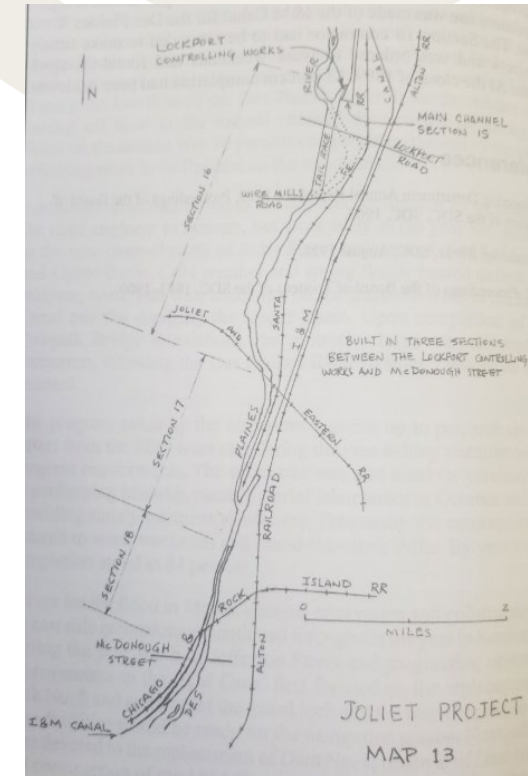
The early bridges across the Des Plaines River were fixed bridges, because commercial traffic along the river didn't exist.

Ever since early explorers canoed along small streams in Illinois, there's been a desire for commercial traffic from the Great Lakes to be able to access the Mississippi River – the path to accomplish that would be through downtown Joliet...



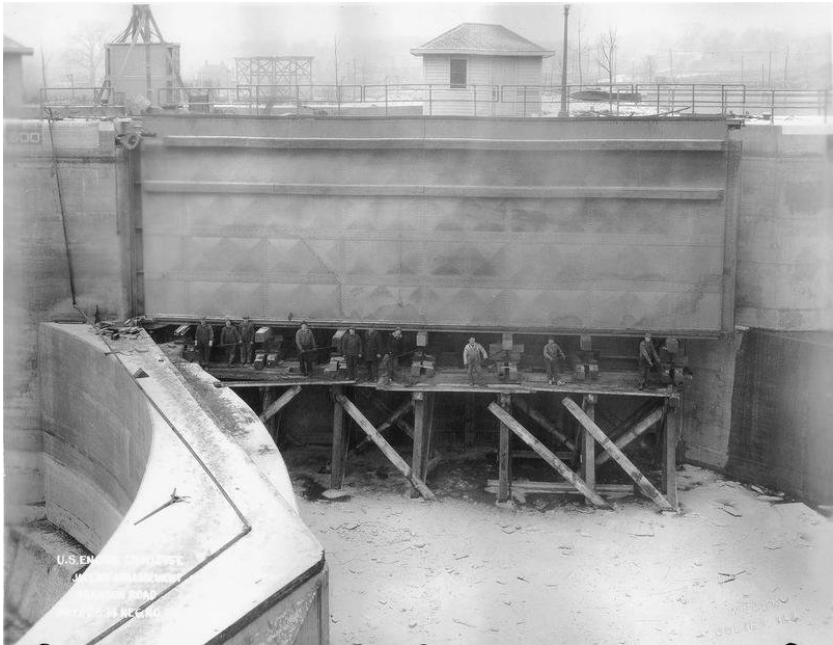
JOLIET AREA HISTORY

- Circa 1890-1900 Chicago Sanitary and Ship Canal constructed
- 1900-1920 – San & Ship and Cal-Sag make regional shipping feasible, but I&M undersized for shipping
- Pre 1930s navigable waterway ends north of Joliet



JOLIET AREA HISTORY

- 1919 Illinois Waterway navigation improvement passed by Illinois general assembly called for connecting the shipping canals to the Mississippi River via the Des Plaines and Illinois rivers
- 1920-1930 State of Illinois completes 2/3 of work, Great Depression intercedes

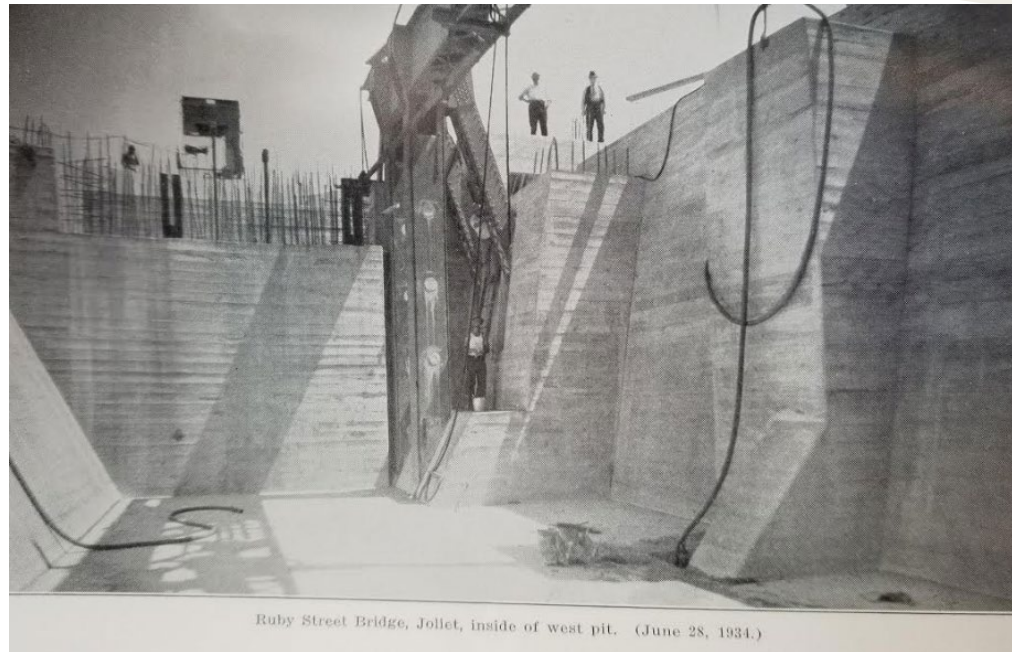


**ILLINOIS
WATERWAY
BUILT 1921-1933**



JOLIET AREA HISTORY

- 1930-1933 US Army Corps of Engineers completes waterway project
- Illinois Division of Waterway (Department of Public Works and Buildings) builds and operates movable bridges circa 1932-1934



WHY MOVABLE BRIDGES?

- Movable bridges allow for much lower approaches and shorter bridges
- Movable Bridges require little additional land beyond the road itself.
- Maintenance & Operating costs cheaper in 1930's



WHY NOT MOVABLE BRIDGES?

- Movable Bridges require expensive routine maintenance on a daily / weekly / monthly basis
- Fixed bridges much cheaper to maintain and operate over time
- Staffing / Staffing / Staffing / Staffing



FUTURE OF ILLINOIS MOVABLE BRIDGES

Since the 1960's IDOT has actively been eliminating low level movable bridges:

- 1971 The Lockport moveable bridge known as the 9th St Swing bridge was decommissioned
- 1983 The Lemont movable swing bridge was replaced by the 'Lemont Rd High Level Bridge'
- mid 1990s – The Romeo Road Bridge over the Des Plaines Rd near Romeoville was taken out of service. Several years later it was replaced by the 135th St High Level Bridge
- 2003 The Shippingsport vertical lift bridge in La Salle County Illinois was replaced with a high level fixed bridge
- Beyond 2020 – both the Florence and Hardin Vertical Lifts in southern Illinois have been identified in the program for replacement with fixed bridges

WHAT ABOUT THE JOLIET BRIDGES?

Due to the urban environment and close spacing of rail tracks and other obstacles, it would be prohibitively expensive in Land Acquisition costs for most of the Joliet movable bridges to be replaced with fixed bridges.

So, it's unlikely that the primary route crossings of the Des Plaines in Joliet will be upgraded to high level fixed bridges.



1930's ERA STAFFING

- Staff up per 1934 waterways report
- “eighteen men selected to staff five bridges”
- Three men per bridge in 8 hour shifts
- Three relief operators
- One day relief per man
- Electrical man
- Mechanical man
- Chief Operator
- Storekeeper
- 27 Total Men for O&M 5 bridges



CURRENT STAFFING

- Approximately 20 tenders staffing six bridges
- Three tenders per bridge in 8 hour shifts
- two relief operators
- two day relief per tender

Other staff:

- Operations Supervisor
- Four Mechanics



STAFFING ISSUES

Since Bridge Tenders are allowed benefit time, and the Department hasn't been able to maintain a full complement of Bridge Tenders -

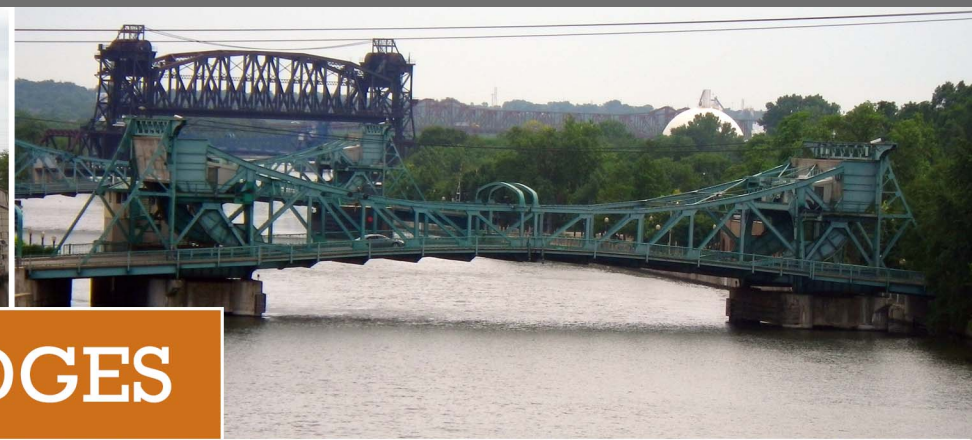
- Limited options –
 - based on the precedence of waterway traffic being superior, bridge must be closed to roadway traffic.
 - Hire more staff
 - Pay overtime
 - Seek a technological solution??



COMING CHANGES

So for Joliet – replacing movable bridges with fixed bridges isn't in the cards... But can something be done to improve the operating systems?





VARIOUS MOVABLE BRIDGES



LOCAL CENTRALIZED CONTROL & OPERATION



Six Bridges Involved



▲ Ruby Street Bridge / IL 53



▲ Jefferson Street / US 30 Eastbound Bridge



▲ Jackson Street / Bridge Street Bridge



▲ McDonough Street / US 6 / US 52 Bridge



▲ Cass Street / US 30 Westbound Bridge



▲ Brandon Road Bridge

Purpose of the Project

- Centralized Control and Operation of Six Drawbridges on Des Plaines River from the IDOT Bridge Office on Bridge Street
- Safety of the Public on River and Roadway and Bridge Operators

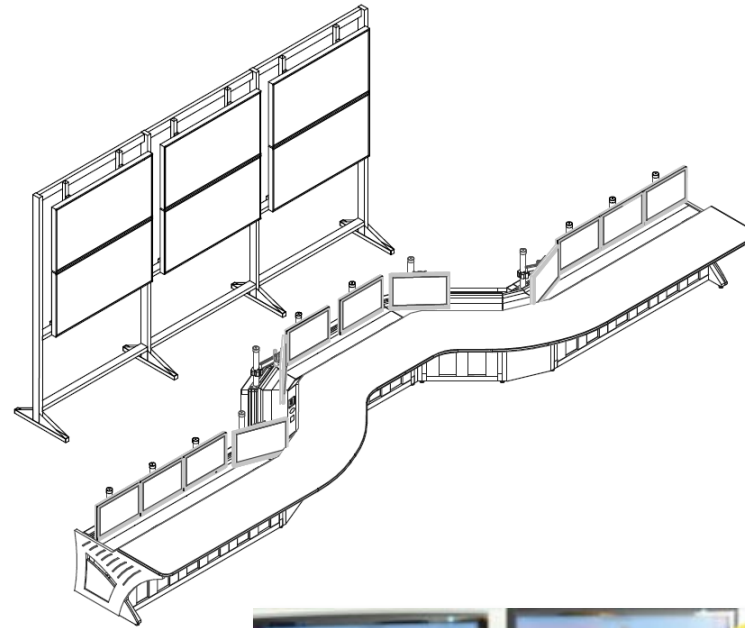


▲ IDOT Bridge Office on Bridge Street

Centralized Bridge Operating Location

IDOT Bridge Office on Bridge Street

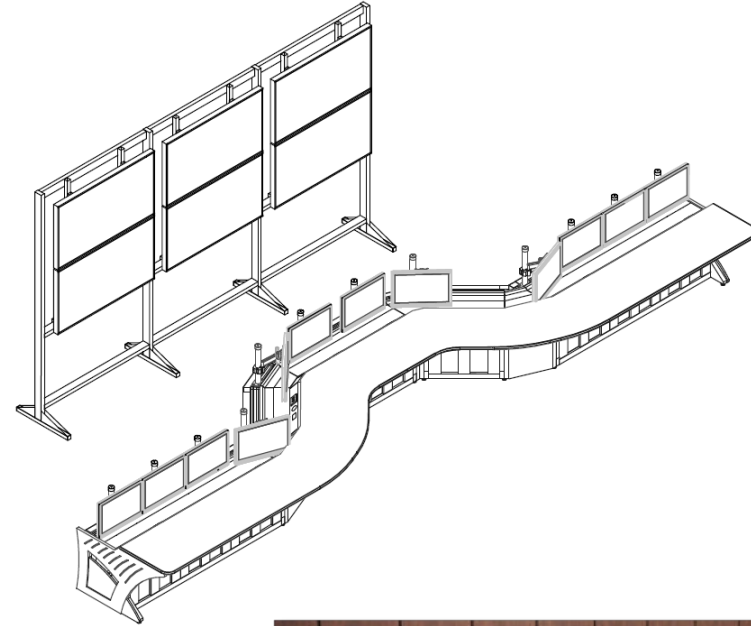
- Operating Stations Will Be Installed Side by Side
- Three Bridge Operators Always on Duty
- Each Operator Capable of Controlling the Bridges From Their Station



Centralized Bridge Operating Location

IDOT Bridge Office on Bridge Street

- Multiple Video Surveillance Monitors for Each Operator
- Control System Servers & Network Equipment
- Increased Safety of Operators



Project Specifics

- Fiber Optic Network Connecting All 6 Bridges to IDOT Bridge Office – Main Connection
- Industrial Wireless Control Network – Backup Connection
- Upgraded Electrical Controls – All 6 Bridges



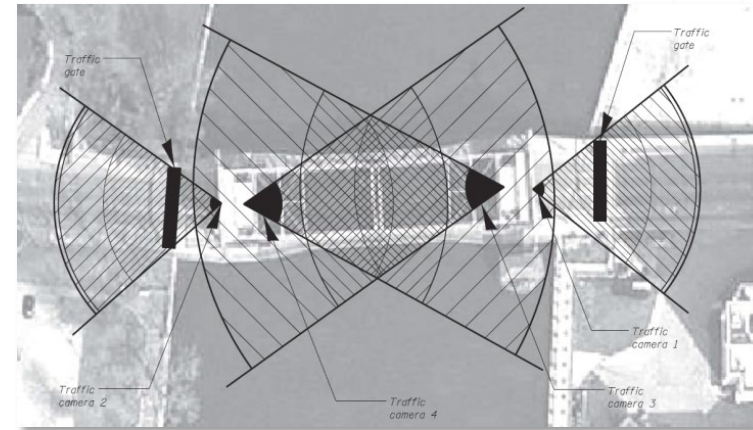
Project Specifics

- Video Surveillance System – All 6 Bridges
- Marine Radio Communication System
- Backup Generator at IDOT Bridge Office and Each Bridge



Safety Features

- Multiple CCTV Cameras at Each Bridge
 - Average of 14 Cameras per Bridge
 - Currently, Bridge Operator only has view from 1 or 2 cameras
- Infrared Imaging Cameras for Waterway Surveillance at Each Bridge
- Boat Detection System at Each Bridge



▲ Typical Traffic Camera Layout



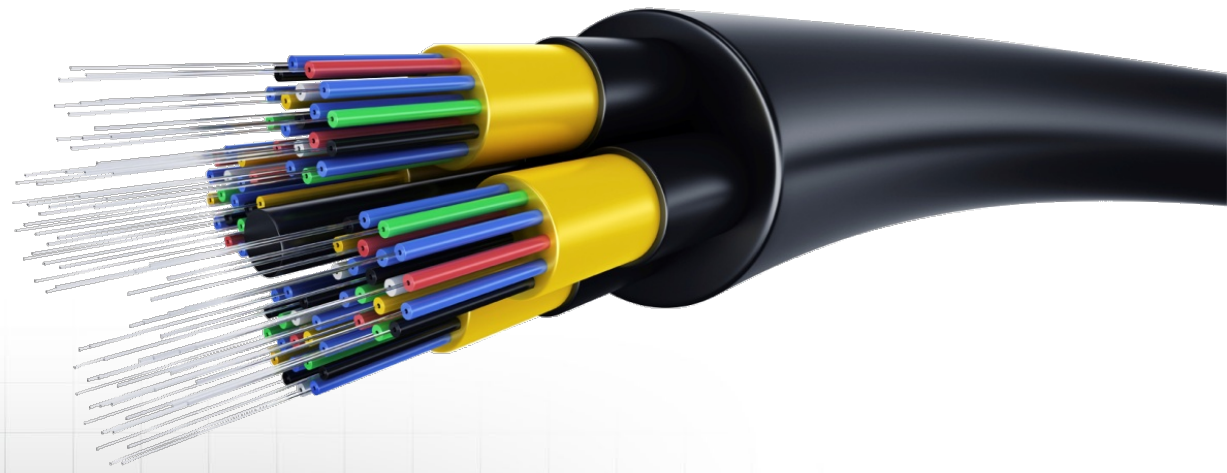
Safety Features

- Talk-Back PA System for Addressing Pedestrians
- Signal Horn/Siren at Each Bridge
- Warning Bells/Gongs at Traffic Gates



Redundancy Features

- Dual Fiber Optic Loops
 - Redundant Loops
 - Daisy-Chain Loops: Break in Loop Allows that Loop to Continue Operating
- Backup Industrial Network Radio Links to Each Bridge



Backup Plan for Emergencies

- Backup Generator at IDOT Bridge Office
 - Control Network and Communications Remain On-Line During Local Power Failures
- Backup Generator at Each Bridge



Backup Plan for Emergencies

- Local Controls at Each Bridge House Allows Independent Operation at the Bridge
- Distance From Central Location to Bridges:
 - McDonough: 1.1 Miles
 - Brandon: 2.3 Miles



PROJECT CHALLENGES

A Complex Project Presenting Unique Challenges



PROJECT CHALLENGES: U.S. COAST GUARD COORDINATION

- ▶ February 2007 – Feasibility Study
- ▶ October 2011 – Initial Meeting with USCG 8TH District

- ▶ No Immediate Concerns or Comments
- ▶ Approval Anticipated

- ▶ July 2012 – Preliminary Plan Submittal
Request to Revise Bridge Operations

PROJECT CHALLENGES: U.S. COAST GUARD COORDINATION

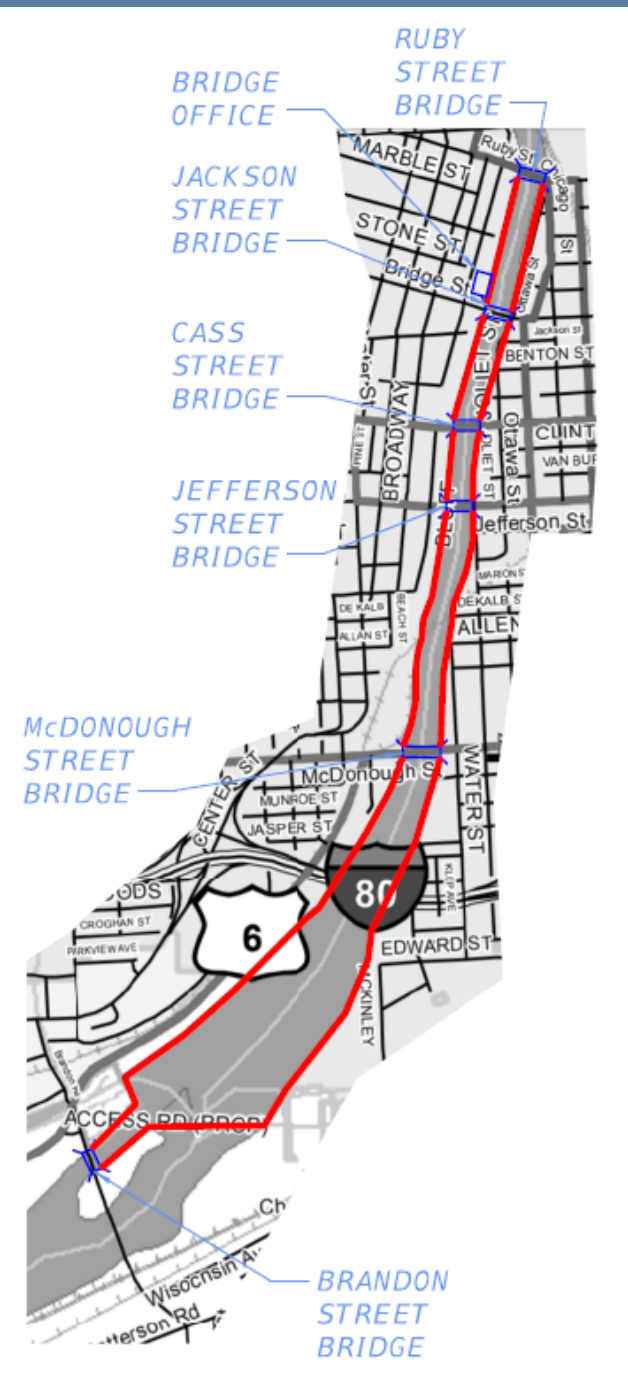
- ▶ August 2012 – Request Denied
- ▶ November 2012 – Meeting with USCG 8TH District
 - Virtually all remote operated bridges are rail structures
 - Had experienced occasional bridge opening issues
- ▶ November 2012 – Appeal to USCG Washington DC

PROJECT CHALLENGES: U.S. COAST GUARD COORDINATION

- ▶ March 2013 – Appeal Receives Conditional Approval
- ▶ Public Notification Process
 - Notice of Proposed Rulemaking – Change to CFR Bridge Operations
 - Public Meeting (12/16/14)
 - Public Comment Period
- ▶ Successful Testing Phase – 30 days with fully functional system

PROJECT CHALLENGES: FIBER OPTIC NETWORK

- 2007 Feasibility Study
- Initial Network Layout



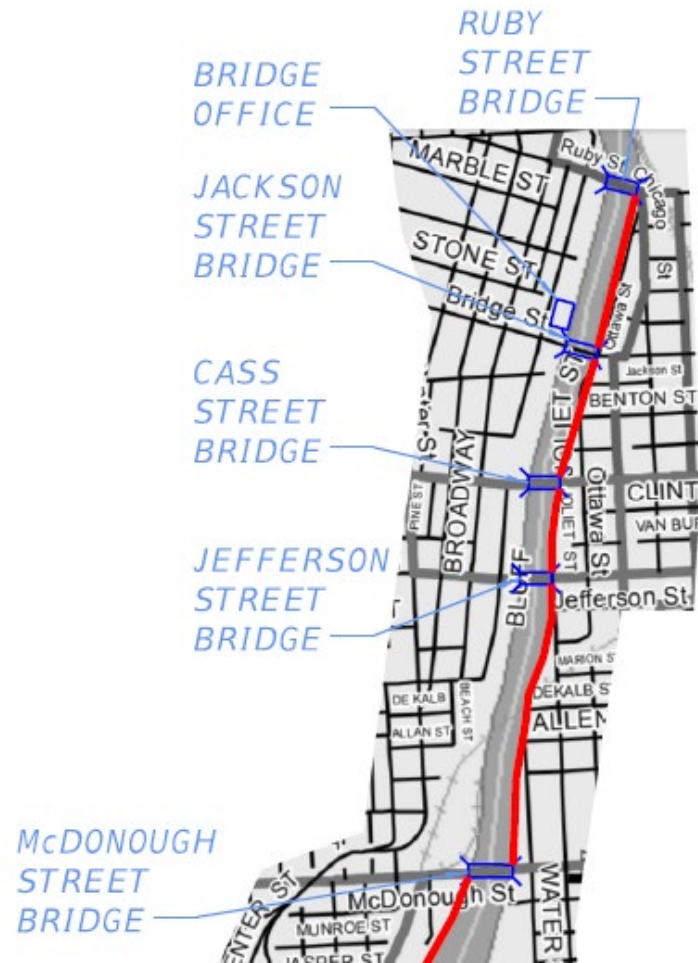
PROJECT CHALLENGES: FIBER OPTIC NETWORK

➤ Brandon Road Lock & Dam



PROJECT CHALLENGES: FIBER OPTIC NETWORK

➤ Northwestern Quadrant



PROJECT CHALLENGES: FIBER OPTIC NETWORK

➤ Southwestern Quadrant



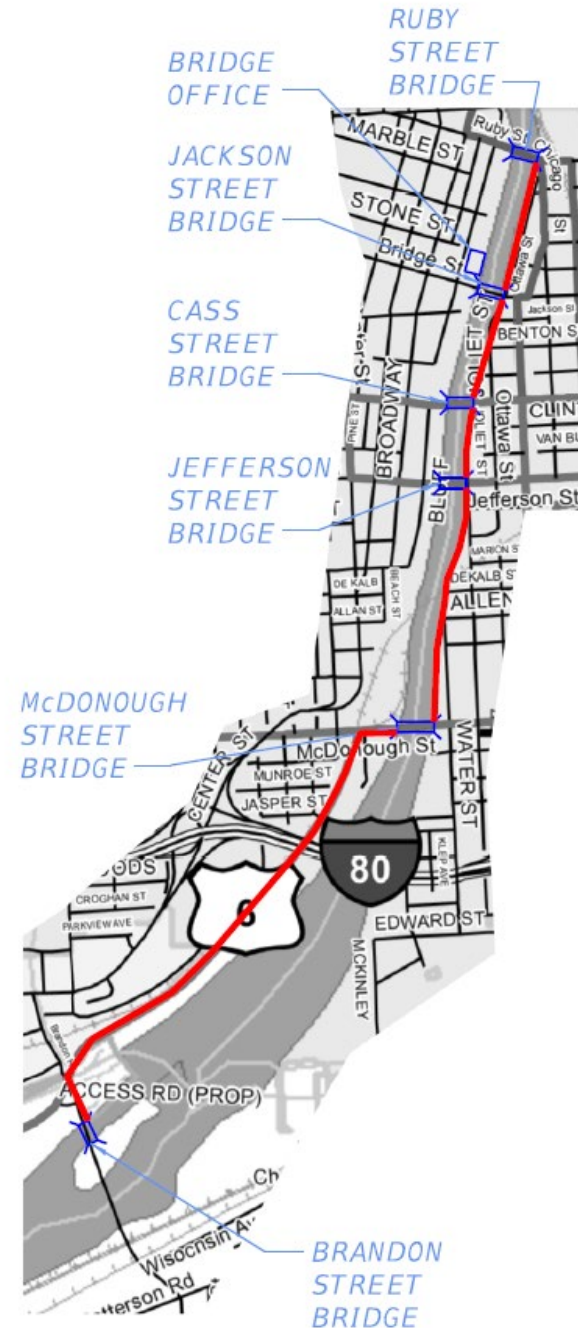
PROJECT CHALLENGES: FIBER OPTIC NETWORK

➤ Final Network Layout (?)

➤ Ownership of River Wall

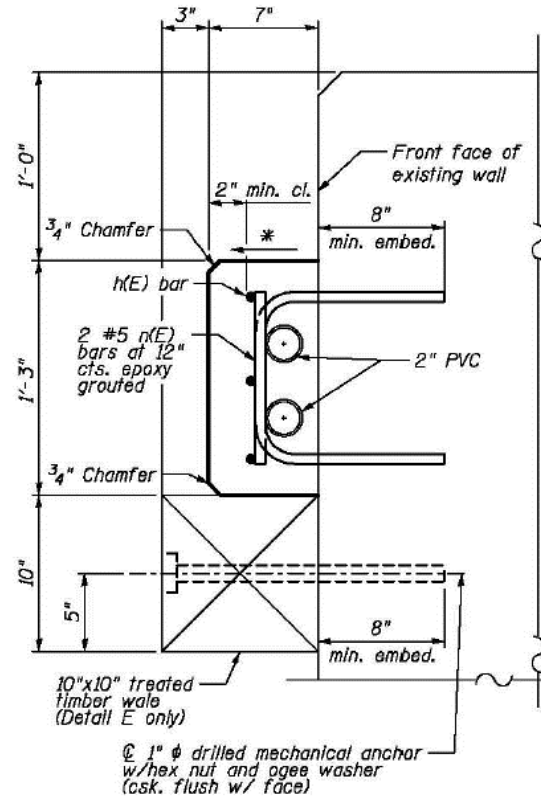
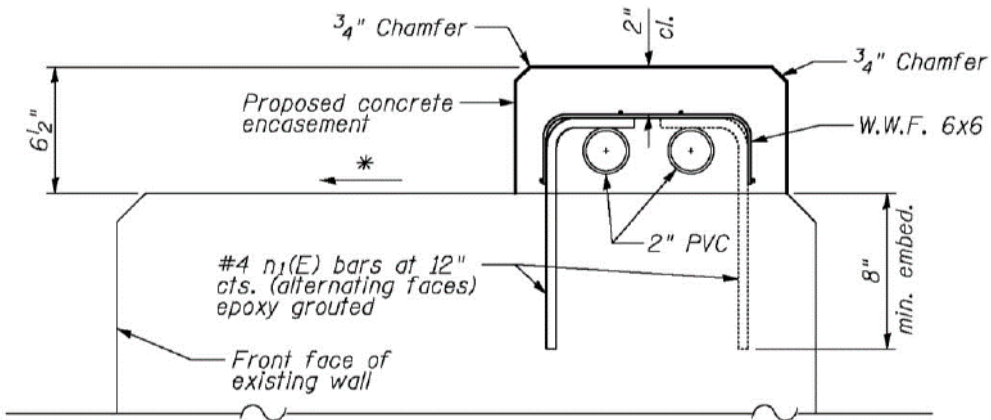
Wall owned and maintained
by the USACE

Landside adjacent to wall
owned by respective
property owners

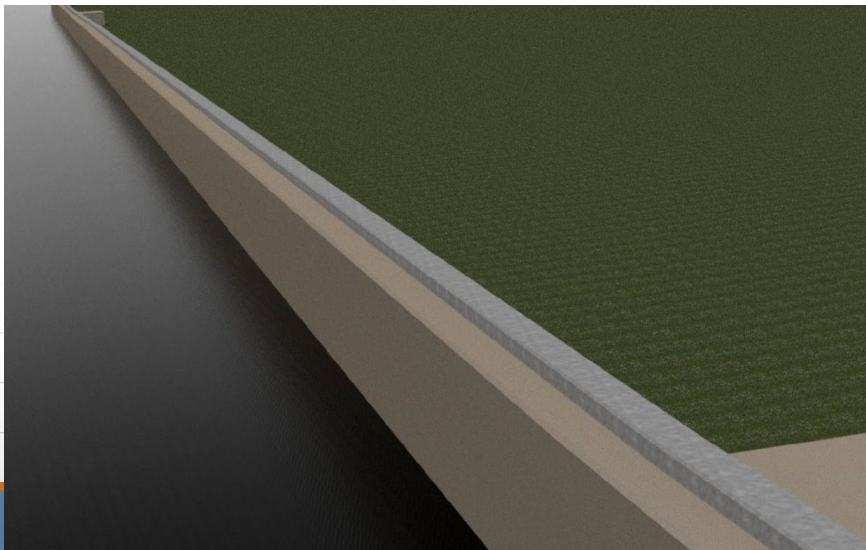
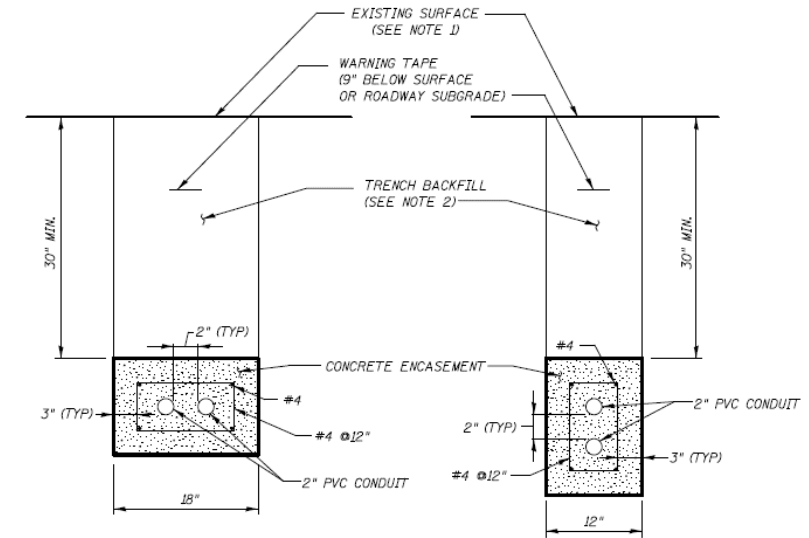


PROJECT CHALLENGES: FIBER OPTIC NETWORK

➤ Concrete Encased Ductbanks



• Typical Trenched Concrete Ductbanks



PROJECT CHALLENGES: FIBER OPTIC NETWORK

➤ USACE Approval Process

Approved

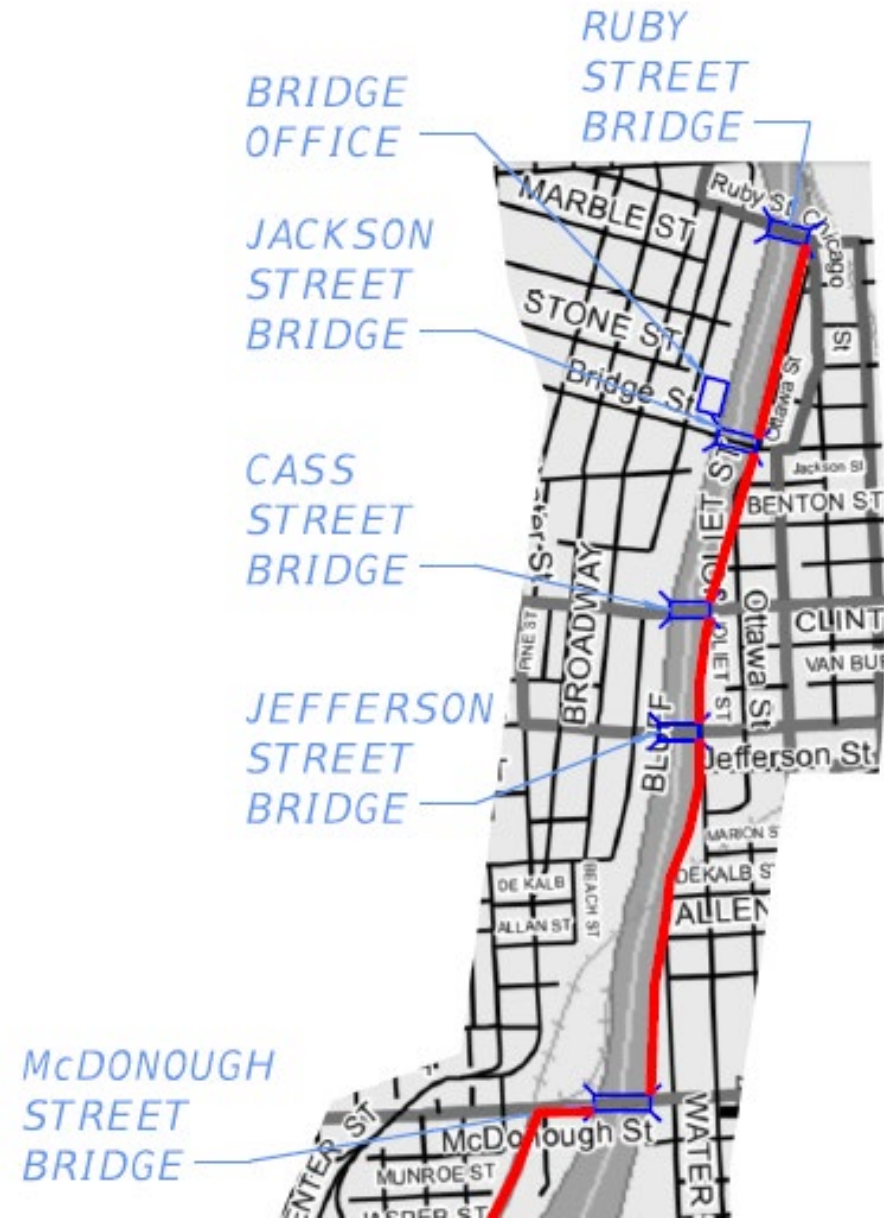
Denied

Numerous Meetings / Conf. Calls

IL River Carrier's Assoc. Meeting

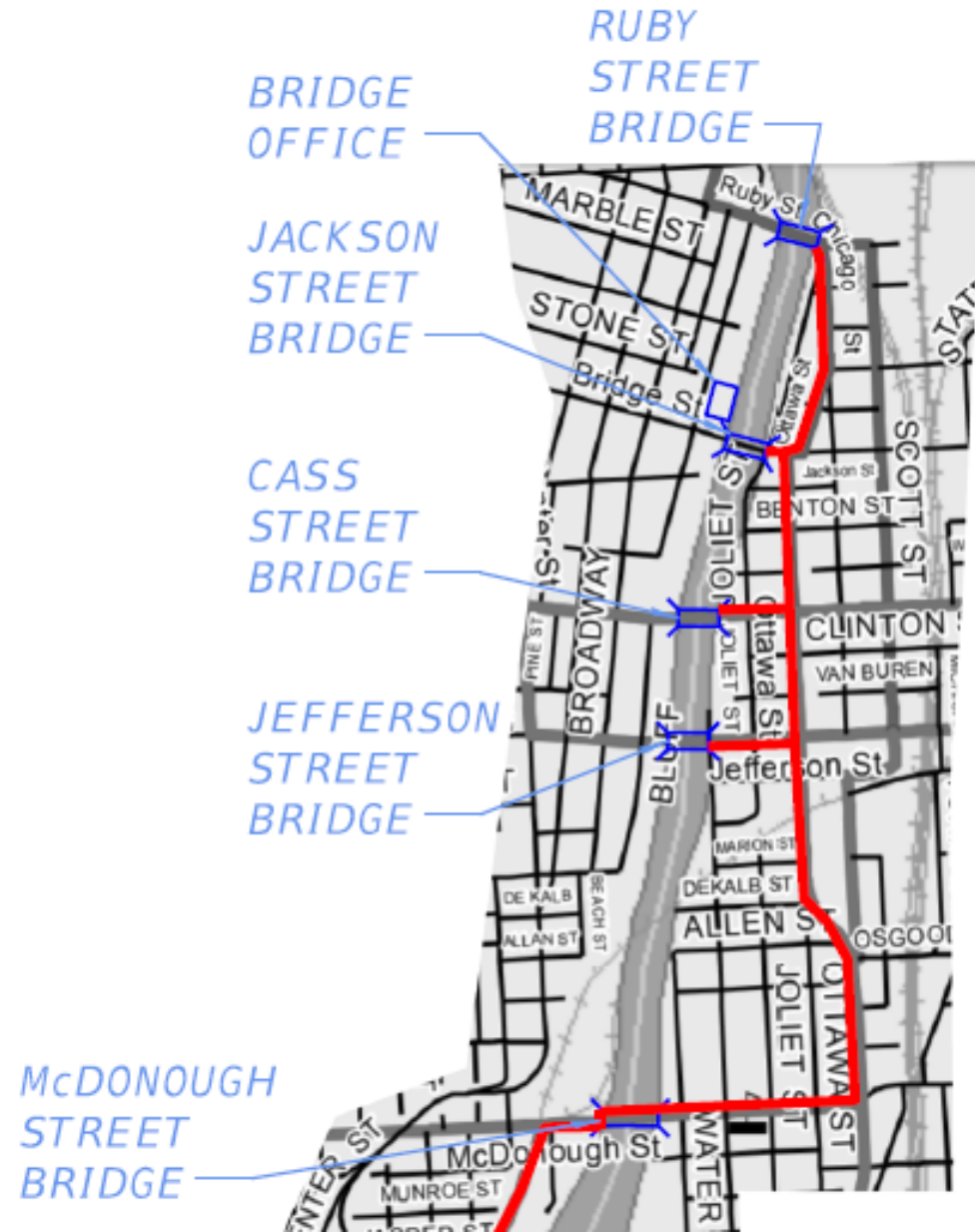
Approved

Permanent Easement Requirement



PROJECT CHALLENGES: FIBER OPTIC NETWORK

- ▶ Alternate Fiber Optic Network Routing Study
 - Virtually 100% State-Owned ROW
 - Horizontal Directional Drilling
- ▶ Separate Fiber Optic Network Contract
 - Design by HDR



CONSTRUCTION

- ▶ Base Contract

 - June 2018 Letting

 - Meade Electric

 - \$21.3M

- Fiber Optic Network Contract

 - January 2019 Letting

 - John Burns Construction

 - \$1.9M



THANK YOU!
