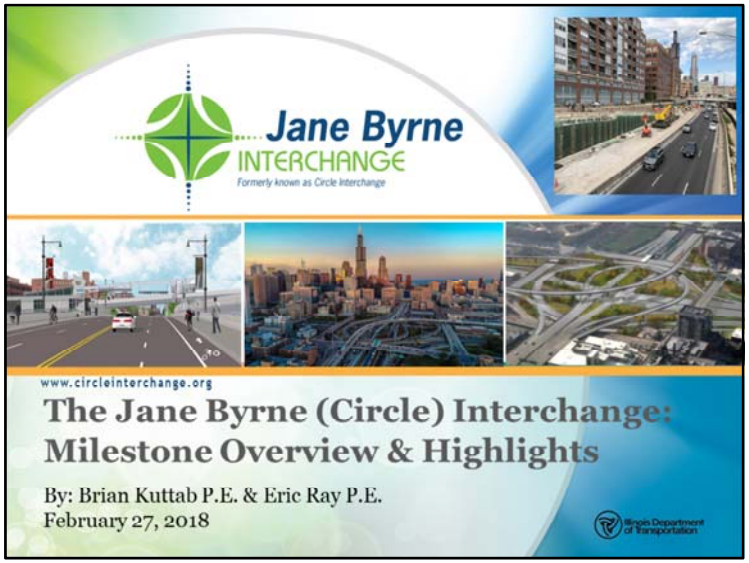
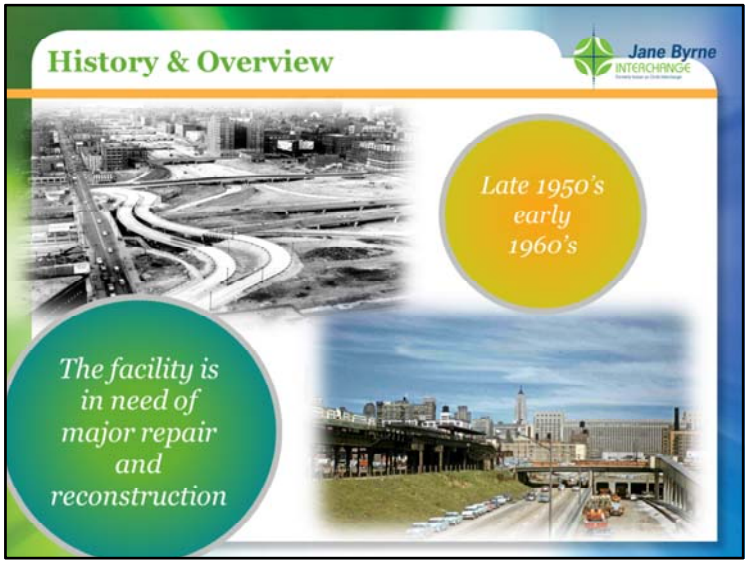
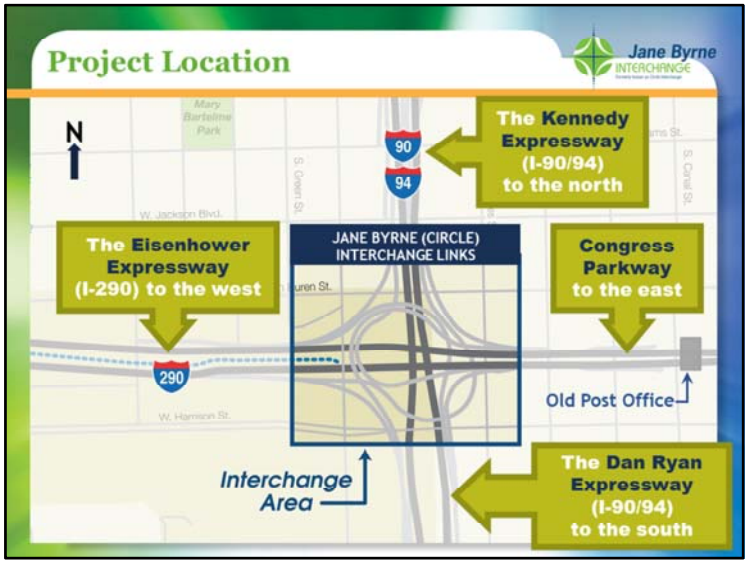

Jane Byrne
INTERCHANGE
Formerly known as Circle Interchange
www.circleinterchange.org
The Jane Byrne (Circle) Interchange:
Milestone Overview & Highlights
By: Brian Kuttab P.E. & Eric Ray P.E.
February 27, 2018
Illinois Department of Transportation


Presentation Overview
Jane Byrne
INTERCHANGE
• Project Background & History
• Design Features & Challenges
• Project Status
• Upcoming Contracts
• Construction Features & Challenges - ER
• Current Construction Activities - ER
• Questions & Answers


History & Overview
Jane Byrne
INTERCHANGE
Late 1950's
early
1960's
The facility is
in need of
major repair
and
reconstruction

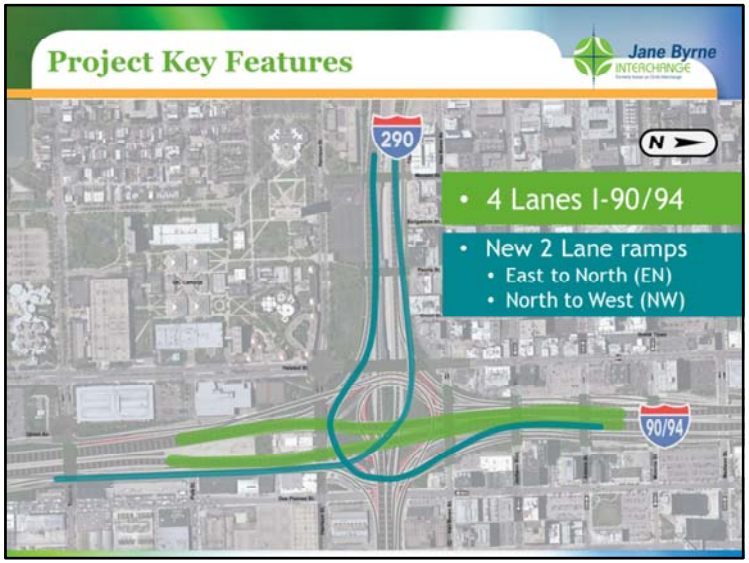


The Jane Byrne interchange is located in the heart of Chicago connecting I-290 to I-90/94. The Kennedy Expressway is located to the north of the interchange, Congress Parkway to the east, Dan Ryan Expressway to the south, and Eisenhower Expressway to the west.


History & Overview
Jane Byrne
INTERCHANGE
American Transportation Research Institute (ATRI) +
Federal Highway Administration
Slowest,
most congested
highway freight bottleneck
in the nation
More than
400,000 vehicles a day
travel through the interchange
On average, 940
crashes per year


Proposed Improvements
Jane Byrne
INTERCHANGE
• Improve the safety and mobility
• Improve the bridges, roadway, & drainage system
• Minimizes environmental impacts
• Enhances community connectivity on the local street network
290
90/94
N

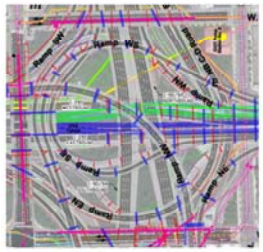

Project Key Features
Jane Byrne INTERCHANGE
• Cross Road Bridges
• Flyover Ramps
• Other Bridges
Morgan Street
290
Peoria Street
Halsted Street
Harrison Street
Van Buren Street
Jackson Blvd.
Adams Street
Monroe Street
90/94
Taylor Street
N


Project Key Features
Jane Byrne
INTERCHANGE
290
N
• 4 Lanes I-90/94
• New 2 Lane ramps
• East to North (EN)
• North to West (NW)
90/94

Unique Features/Challenges

Jane Byrne INTERCHANGE

- Only Drilled Shaft (Caissons) as Foundation option - No Steel Piles due to Vibration Concerns
- Poor Soils
- Existing and Future CTA tunnels
- Contractors' Overlaps within Constrained Project Site
- Complex Staging while maintaining large ADT's



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Unique Features/Challenges

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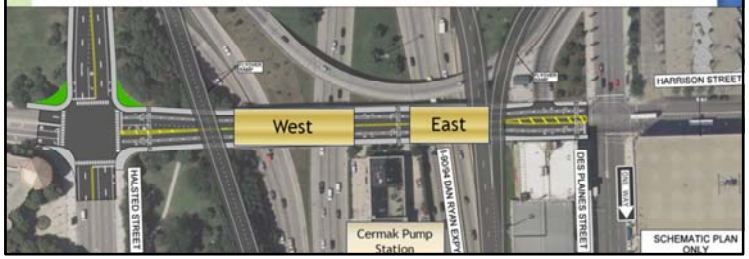
- Coordination with CDOT, CTA, Chicago Department of Water Management
  Several Neighborhoods and Adjacent Properties, including UIC and Greektown
- Access to Cermak Pump Station needed at all times



Unique Features/Challenges

Jane Byrne INTERCHANGE

- Existing Piers and Foundations

11

Unique Features/Challenges

Jane Byrne INTERCHANGE

- Existing Piers and Foundations
- Existing and Future CTA Tunnels

12

Unique Features/Challenges

Jane Byrne INTERCHANGE

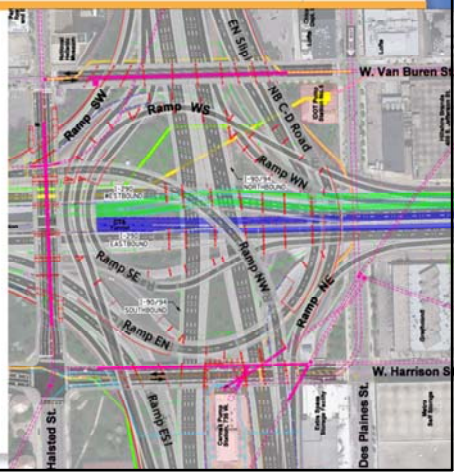
- Existing Piers and Foundations
- Existing and Future CTA Tunnels
- Existing and Proposed Main Drain Sewers

13

Unique Features/Challenges

Jane Byrne INTERCHANGE

- Existing Piers and Foundations
- Existing and Future CTA Tunnels
- Existing and Proposed Main Drain Sewers
- Watermain Tunnel Bulkheading

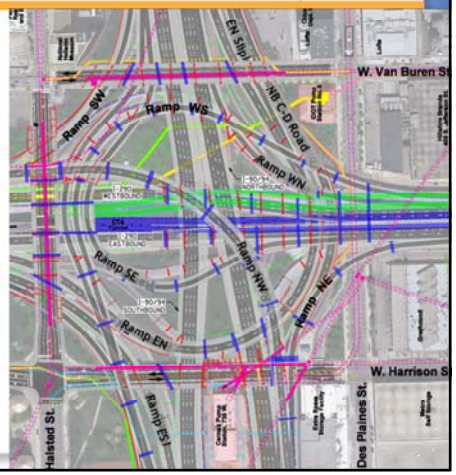


14

Unique Features/Challenges

Jane Byrne INTERCHANGE

- Existing Piers and Foundations
- Existing and Future CTA Tunnels
- Existing and Proposed Main Drain Sewers
- Watermain Tunnel Bulkheading
- Proposed Bridge Piers and Foundations



15

Project Status

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- Total Construction Cost: $585 Million
- **14** Contracts "Substantially" Complete ($199 M)
- **10** Contracts Under Construction ($154 M)
- **11** Contracts Remain ($232 M)
- Design > 60% Complete
- Construction > 55% Complete


Construction Completed
Jane Byrne
INTERCHANGE
N
Morgan St
Peoria St
Halsted St
Harrison St (W&E)
290
Taylor St
Ramp NW Flyover
90 94
Dan Ryan Expy
90 94
Kennedy Expy
Congress Parkway

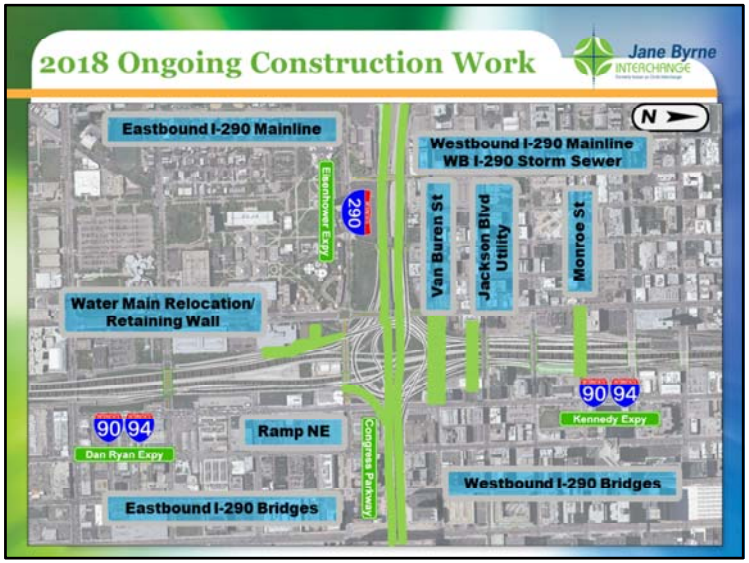
2018 Ongoing Construction Work

Jane Byrne INTERCHANGE

1. WB I-290 78" Storm Sewer (62D78) (Completion 5/18)
2. WB Congress Parkway Viaduct (60X78) (Completion 8/18)
3. WB I-290 Mainline (60X77) (Completion 8/18)
4. Jackson Boulevard Utility Relocation (62A75) (Completion 9/18)
5. Ramp NE (62B76) (Completion 10/18)
6. Water Main Relocation/Rehabilitation at Cermak Pumping Station (62A74) (Completion 11/18)
7. Van Buren Street Bridge (60X99) (Completion 6/19)
8. Monroe Street Bridge & Peoria Street Siphon Lining (60X95) (Completion 6/19)
9. EB I-290/Congress Parkway Bridges (60X75) (Completion 6/19)
10. EB I-290 Mainline Reconstruction (60X76) (Completion 11/19)

(Completion Dates are based on Contract Drawings)

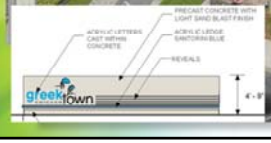
18


2018 Ongoing Construction Work
Jane Byrne
INTERCHANGE
N
Eastbound I-290 Mainline
Westbound I-290 Mainline
WB I-290 Storm Sewer
Eisenhower Expy
290
Van Buren St
Jackson Blvd
Utility
Monroe St
Water Main Relocation/
Retaining Wall
90 94
Kennedy Expy
90 94
Dan Ryan Expy
Ramp NE
Congress Parkway
Westbound I-290 Bridges
Eastbound I-290 Bridges

Van Buren Street – Elysian Field

Jane Byrne INTERCHANGE

- Southeast corner of Halsted Street and Van Buren Street
- Coordinated Design with Greektown Branding and Signage
- Relocated Greektown Monument and Artificial Turf Green Space




Flyover Pier
Circle
INTERCHANGE

Retaining Walls


Halsted Street Bridge Reconstruction
Existing View Looking South
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Halsted Street Bridge Reconstruction
Proposed View Looking South
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Old and new looking north


Peoria Street
(Looking North)
Jane Byrne
INTERCHANGE


Upcoming Contracts
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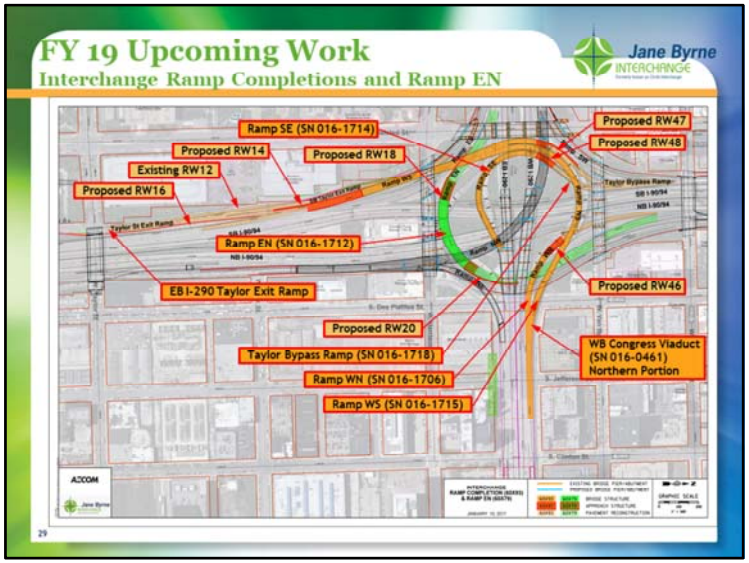
Fiscal Year 2019
Tree Planting #4 - Letting 11/18
Ramp EN - Letting 11/18
Interchange Ramp Completion- Letting 11/18
Congress Parkway Bridge Painting- Letting 6/19
Fiscal Year 2020
Tree Planting #5 - Letting 6/19
NB I-90/94 (Roosevelt to Lake St/Madison St) - Letting 4/20
SB I-90/94 (Roosevelt to Lake St/Madison St) - Letting 4/20
Interchange High Mast Lighting & ITS - Letting 4/20
Fiscal Year 2021
Adams Street - Letting 6/20
Jackson Boulevard - Letting 6/20
Green Space Contract - Letting 9/20
27

Following the East-West piece, the reconstruction of I-90/94 along with the cross road bridges of Van Buren Street, Jackson Boulevard, Adams Street and Monroe Street over I-90/94 will take place in the 2017 timeframe.


FY 19 Upcoming Work
Interchange Ramp Completions and Ramp EN
Jane Byrne INTERCHANGE
Ramp SE (SN 016-1714)
Proposed RW14
Proposed RW18
Existing RW12
Proposed RW16
Ramp EN (SN 016-1712)
EB I-290 Taylor Exit Ramp
Proposed RW20
Taylor Bypass Ramp (SN 016-1718)
Ramp WN (SN 016-1706)
Ramp WS (SN 016-1715)
Proposed RW47
Proposed RW48
Proposed RW46
WB Congress Viaduct (SN 016-0461) Northern Portion
AECOM
29


FY 2019 Contract Ramp Closures
Expressway Impacts
Jane Byrne
INTERCHANGE
Ramp WS Closed
7,200 ADT
Ramp WN Closed
8,900 ADT
Ramp NE Closed
3,100 ADT
Ramp SE Closed
4,600 ADT
Ramp EN Closed
26,600 ADT
EB 290 to Taylor St Exit Closed
2,900 ADT
SB 90/94 Taylor St Exit Closed
7,800 ADT
FY 2019 Contract Ramp Closures
• Ramp SE
• Ramp NE
• Ramp WS
• Ramp WN
• Ramp EN
• SB 90/94 Taylor St Exit
• EB 290 to Taylor St Exit

Project Benefits

Jane Byrne INTERCHANGE

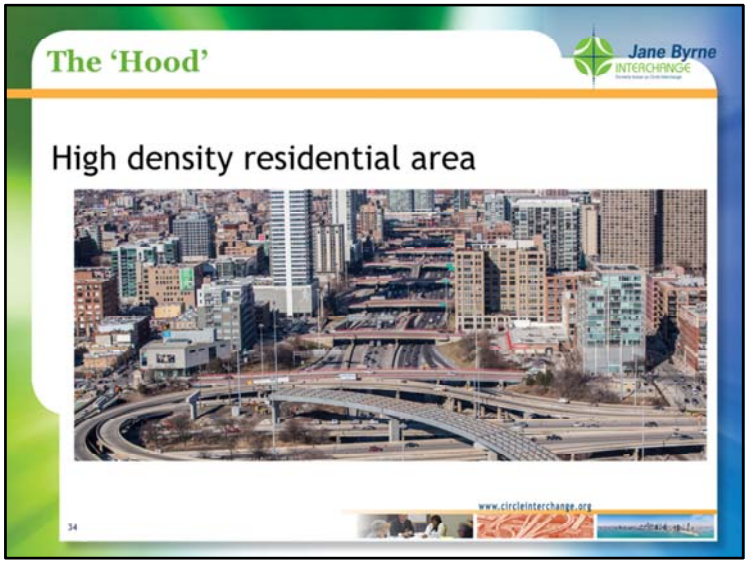
The improvement will create a safer environment for the motoring public by reducing the predicted number of severe crashes by up to **25%**.

After Project Completion,
A **50% reduction in delay** for all vehicles over the course of the day.

- *Reduction of up to 5 million hours annually of drivers sitting in congested traffic.*
- *Savings of $185 million annually in lost production from delayed travelers.*
- *Reduction in idle time resulting in nearly 1.6 million gallons annually.*
- *Reduce greenhouse gas emissions by one-third.*

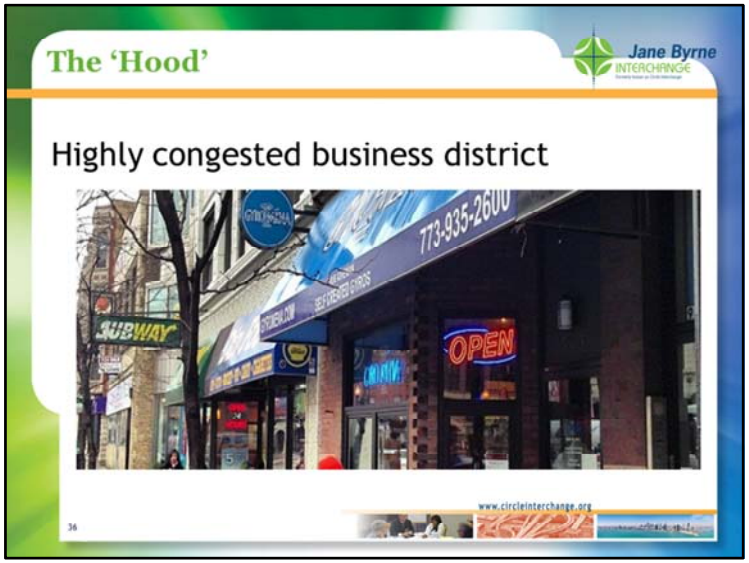
- The Illinois Department of Transportation (IDOT) and Federal Highway Administration (FHWA) will act as lead agencies for the Circle Interchange project. As such, FHWA (Division Administrator) and IDOT will be responsible for making final project recommendations and decisions.
- IDOT Project Management Consultant is Stanley Consultants
- Joint Venture Consultant team of AECOM and TranSystems
- The PST has primary responsibility for the project development process and will meet regularly as the project progresses to provide technical oversight and expertise in key areas including study process, agency procedures and standards, and technical approaches.
- Go around room and have everyone introduce themselves.


Construction Features & Challenges
Jane Byrne
INTERCHANGE
Preconstruction
Rendering
In-Progress
33

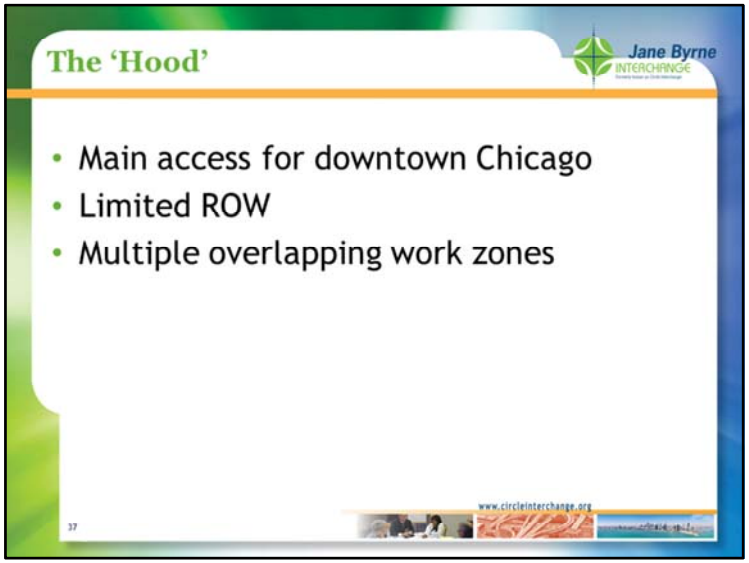


The Jane Byrne Interchange project includes unique work zones. The interstate corridors are lined with high-rise condos. Many more are scattered throughout the neighborhood with new ones currently under construction.

The UIC campus provides a steady supply of pedestrians, some with "wheels." They come with skate boards, bikes, roller blades, motorized wheel chairs etc.



Office buildings, stores, restaurants, parking garages, arenas, schools, churches, you name it!



All of these things combine to make the contractor's job more difficult. He must perform his work while maintaining access to businesses and without impacting adjacent properties. Often times he has to share the work zone or wait to access portions of the work. Brian and the design team took care to add provisions in the contract to advise bidders of special work zone limitations or coordination requirements.

Something that I want to stress is how interconnected these projects are. Think of these contracts as a series of dominoes being lined up. If one doesn't fall then it affects all of the dominoes down the line. So our challenge in Construction is to keep pushing those dominoes that won't fall over. These are some of those dominoes.

Construction Issues

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WHAT WENT WRONG?

WHY DID IT HAPPEN?

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Construction Issues

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HOW DO WE FIX IT?

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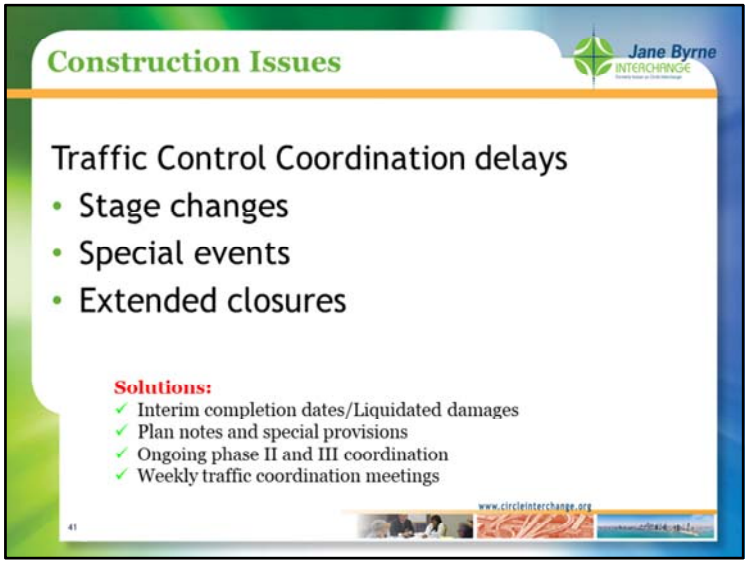
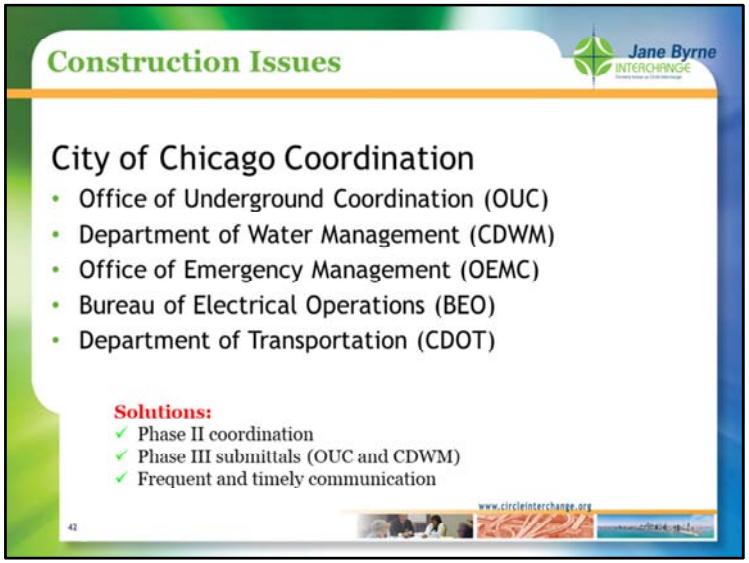
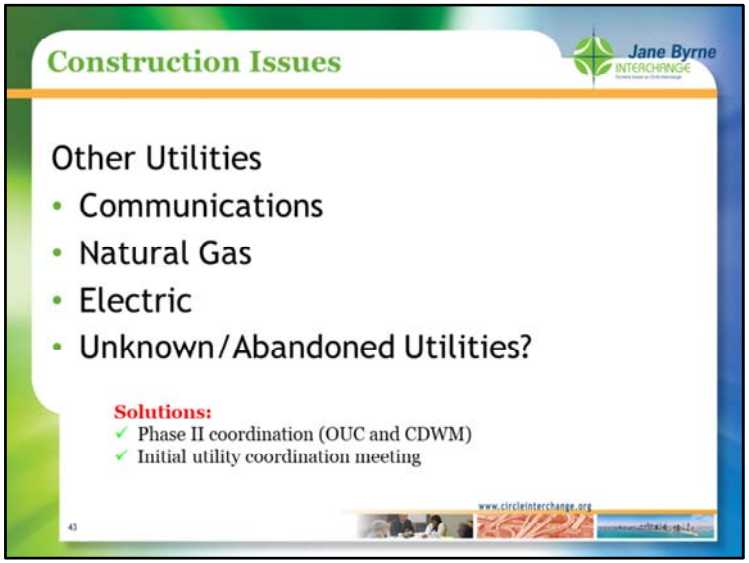


Traffic control for each project usually impacts the adjacent projects. Also, stage changes must be coordinated between the contracts. Traffic staging conflicts in the JBI projects were very common. **Solution**: Brian included interim completion dates in some of the contracts with liquidated damages attached to make sure contractors are aware of the impact of delays to certain items. Construction and Design work together once work begins to find ways to eliminate delay impacts to other contracts.

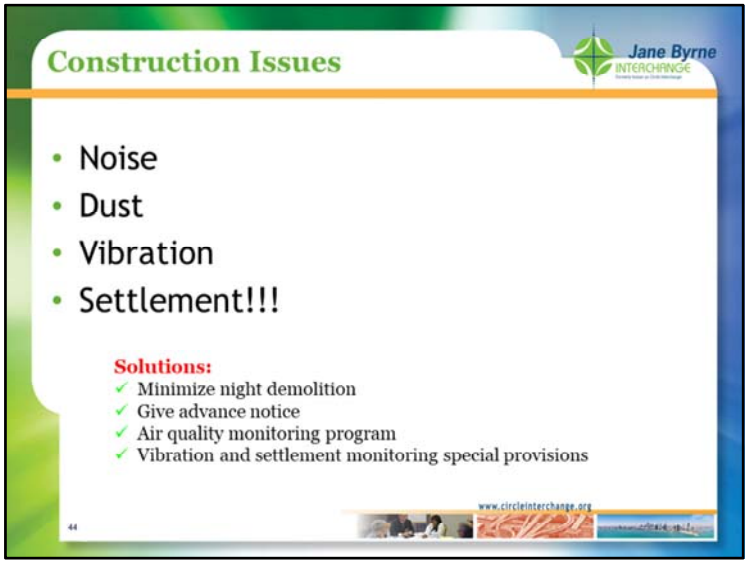
For example, for contract 62A74, we have performed some additional exploratory work to figure out if we can shift the location of a water main tie-in away from ramp ES pavement. Based on the field data, it looks like we will be able to perform the water main work without requiring traffic staging that conflicts with an adjacent contract. This eliminates an interim stage on both contracts and thumb twiddling by both contractors while they wait for their chance to complete work.



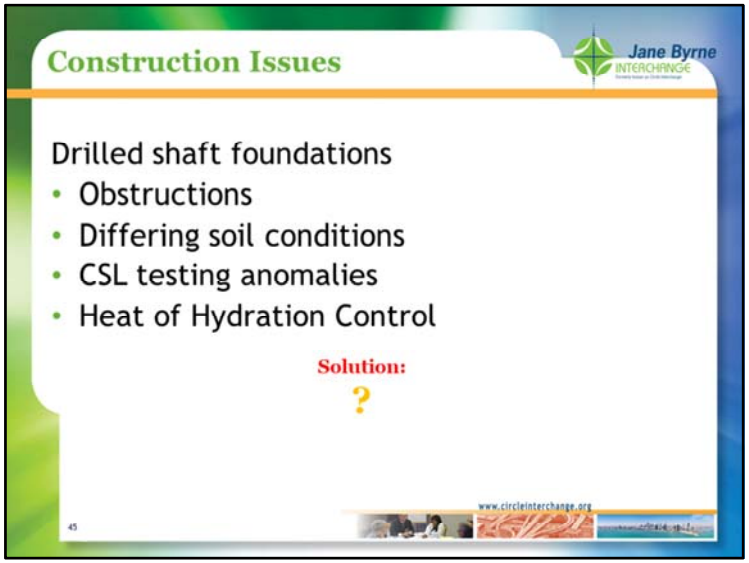
A big portion of utility coordination is with City of Chicago agencies. Planned excavation is cleared through CDOT before a city permit is issued. Excavations deeper than 12 ft must go through OUC. **Solution**: Much of this coordination was initiated in Phase II and continued in Phase III. Timely submittals is critical. (Issue a list of required submittals to the contractor and hammer them to get submittals in.) Frequent and timely communication helps to preempt city coordination issues and delays.



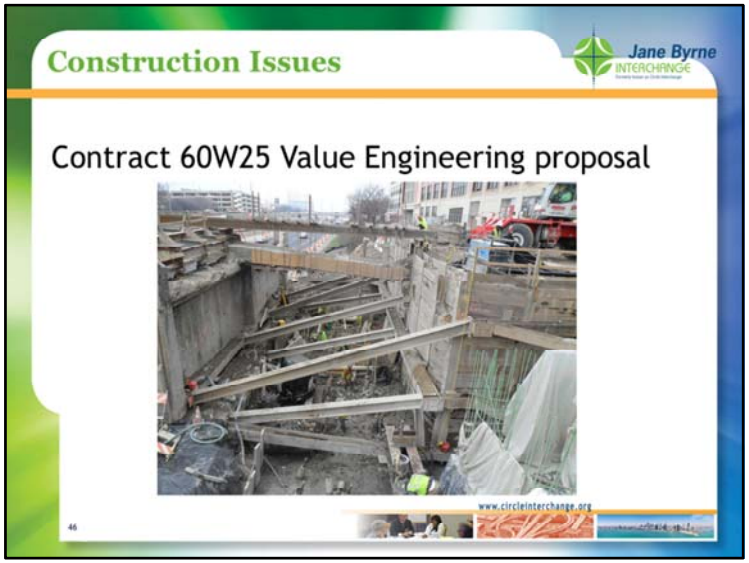
Unknown and abandoned utilities are always the most difficult to deal with. Solution: Nothing much can be done beyond the initial material coordination meeting. Deal with utility issues as they occur.



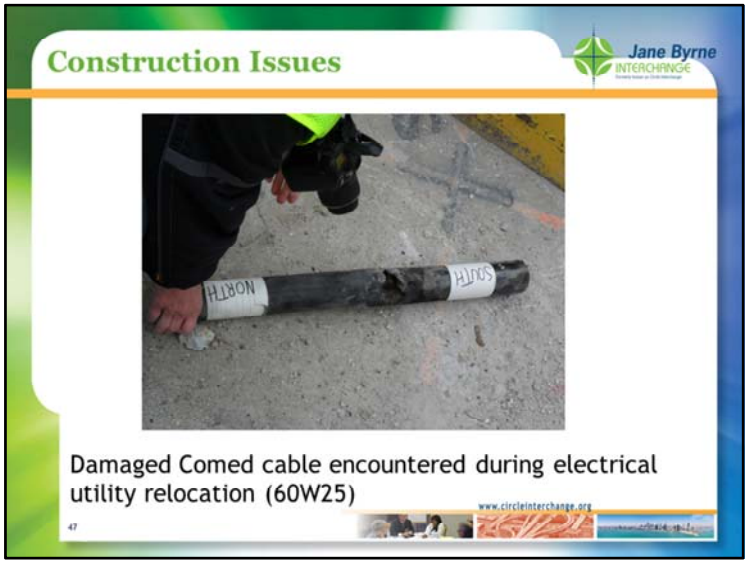
Due to the proximity of adjacent structures settlement/displacement monitoring became a critical issue. **Solution**: Be sure to address any settlement concerns whenever excavating near adjacent buildings!



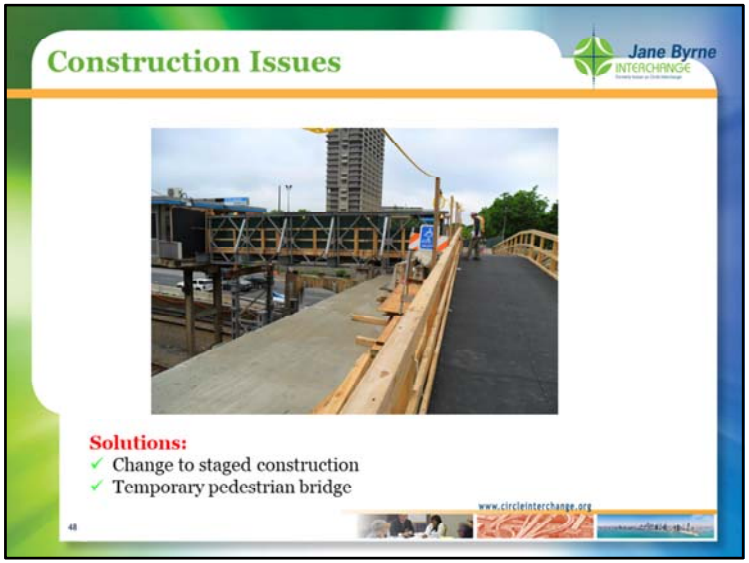
Unexpected obstructions and soils differing from the borings are common. Solution: None. However CSL test anomaly delays are difficult to reconcile. **Suggested solution**: IDOT is looking into alternate tests to determine the integrity of drilled shafts. Eliminate CSL testing altogether and focus on adherence to approved drilling procedure and construction inspection. Alternatively, install CSL test tubes in all shafts and only test if there is an observed problem. Cooling tubes were used in some large diameter shafts.



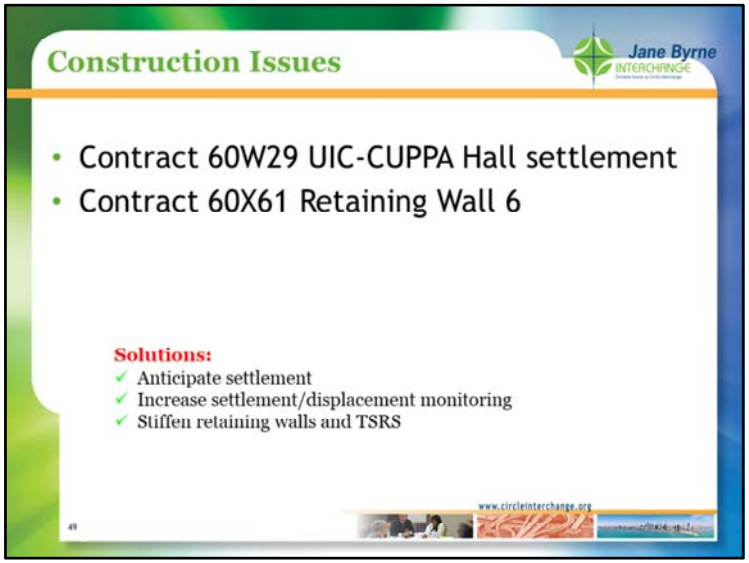
The Morgan St. bridge project involved a VE to change from drilled shafts to micropiles. It would have been too difficult to maneuver a large drill rig within the braced excavation due to the system of struts and whalers.



The original contract involved temporarily supporting a ComEd electrical duct package, demolishing the existing structure, reconstructing the new structure, then reattaching the duct package to the new structure. However, this cable arced while the contractor was working to temporarily support the duct package. One of the workers was injured and the plan to temporarily support the cables was scrapped.



IDOT committed to maintaining access for pedestrians to at least two of the three CTA station entrances for UIC.

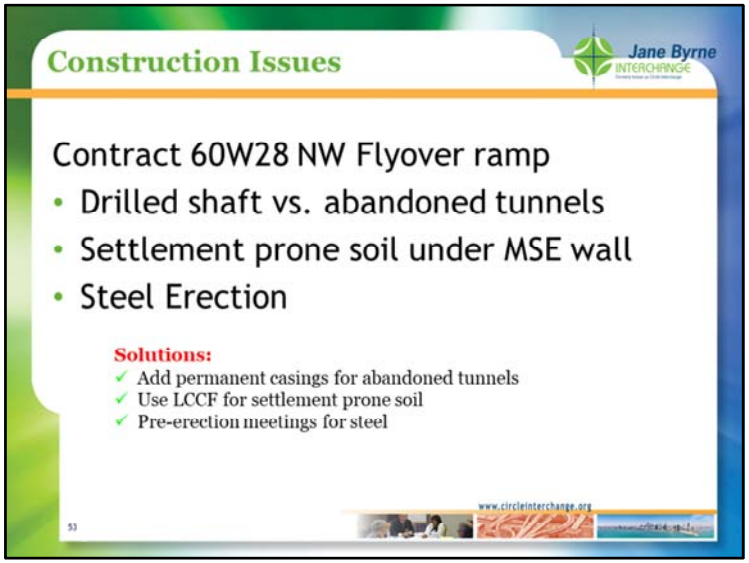


The building adjacent to the braced excavation for the Peoria St. north abutment settled. The issue is being litigated.
Solution: Increase settlement monitoring of adjacent structures. Stiffen walls and TSRS near adjacent structures.

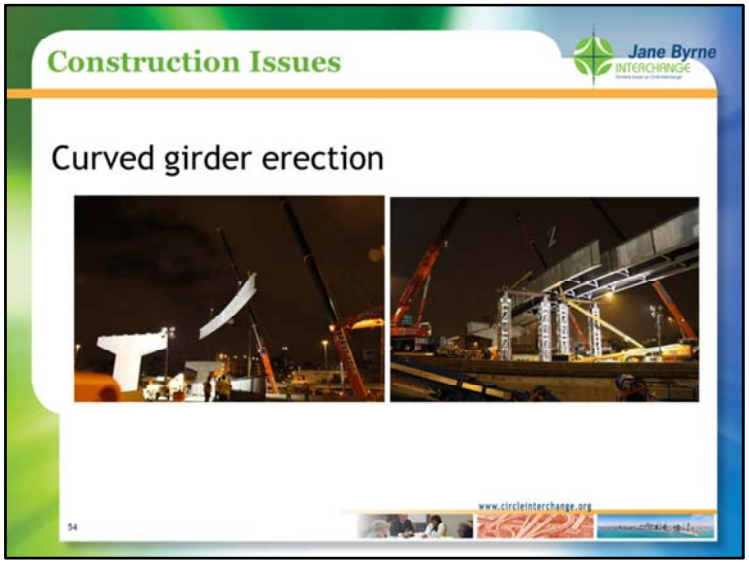
Note the brown building in the upper right corner of the picture. There is approximately 10 feet from the temp soil retention system to the face of the building.

This picture of Retaining Wall 6 shows the proximity of the construction to the buildings.

The wall was designed with ground anchors at 9 to 15 degrees from vertical to reduce deflection.



We encountered steel fit-up issues while placing curved girders for the critical span over I-290. Curved girders typically require additional preparation. **Solution**: Pre-erection meetings are recommended to address contingencies for fit up issues. Initial girders experienced significant fit up and splicing problems and were unable to be set during allowable contract times. Subsequent beams were set despite indications of mis-alignment. The deck and remaining structure was adjusted to account for the mis-alignment.
Solution to abandoned tunnels: Added permanent casing
Solution to settlement prone soil: LCCF



With curved girder construction, the first one or two beams are not stable. The second and third girder lines provide stability once the cross members are attached. A shoring tower was necessary to erect these girders. The shoring tower had to be modified on-the-fly due to the girder alignment issues. This work was performed over high-volume expressway lanes that were temporarily closed to traffic. This issue caused a significant overrun of the allowable lane closure time.

COOL CONSTRUCTION FEATURES!!!

Jane Byrne INTERCHANGE

Contract 60W29 Peoria St. Bridge precast deck panels

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55

Note the shear studs arranged in pockets. Also, there is approximately 8 inches of rebar extending from the panel edges.

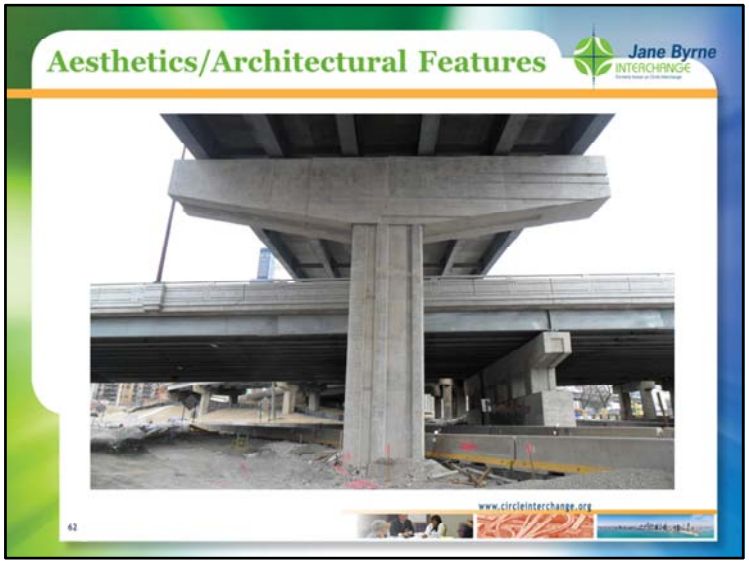
Ultra high strength concrete provides an alternative to rebar splices. This material provides 20 ksi. In contains metal fibers for tensile strength.

Another cool feature incorporated into the Peoria St. bridge project was the rehabilitation of the CTA station. This station was completely ADA compliant including the addition of an elevator. Here you can see the framing of the station.

These pictures show the completed station.

These projects impacted huge water distribution and sewer systems.

And finally there were a few aesthetic features incorporated into many aspects of construction.


Aesthetics/Architectural Features
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Aesthetics/Architectural Features

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These are just some members of the Phase III team. Also, IDOT BB&S, Traffic, Materials, and too many others to list.


Jane Byrne
INTERCHANGE
Questions / Comments
Thank You
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