The CREATE Region Environmental & Transportation Efficiency Program

Northwestern University
November 16, 2023
Chicago: The American Rail Network Hub

Chicago’s rail system handles 47% of intermodal rail containers and 29% of rail cars in the U.S.; $652B worth of goods each year.

Source: Annual Carloads & Value, 2019 STB Confidential Waybill Sample
North American Rail Trade Depends on Chicago

• 47% of all intermodal units in the U.S. move through Chicago

• Between 2005-2019, Chicago outperformed the national rail market, particularly due to increasing intermodal traffic

• CA, TX, B.C. and WA top origins of rail traffic moving to and through Chicago*

• CA, Ontario, TX and PA top destinations of rail traffic moving from and through Chicago*

*Measured by value
Source: Confidential Surface Transportation Board Waybill Data, 2005-2019
Chicago Remains Largest North American Rail Gateway

- Chicago region dominates the U.S. rail market in market share and total volumes moved
  - Chicago handles about 69% of all East-West Gateway Traffic and 86% of intermodal East-West Gateway Traffic
  - Chicago’s market share among East-West Gateways is increasing

Source: Confidential Surface Transportation Board Waybill Data, 2005-2019
Top Global and North American Container Ports, 2019

Source: Chicago Metropolitan Agency for Planning Intermodal Facility Lift Counts and Regional TEU Estimate, 2019; World Shipping Council, July 2019.
The Chicago region remains the nation’s premier freight and rail hub

Freight rail trade (by value) within Chicago will more than double between 2012 and 2045

Many of the region’s rail lines are inadequate for current and future freight and passenger needs

Why CREATE?

We must modernize the rail network to maintain and improve our region’s economic competitiveness

Source: Chicago Metropolitan Agency for Planning
What is CREATE?

A $5 billion Public-Private Partnership (PPP) to improve transportation through the Chicago region.

CREATE is a cooperative program among:

US Dept. of Transportation (FHWA & FRA), Illinois Dept. of Transportation (IDOT), Cook County Dept. of Transportation and Highways (DOTH), Chicago Dept. of Transportation (CDOT), 6 major North American freight rail carriers and 2 switching railroads, 2 passenger carriers (Amtrak and Metra).

- Increases capacity, speed and reliability for freight train traffic
- Separates freight and commuter trains at 6 key junctions
- Eliminates 25 road/rail grade crossings through grade separations
Four Corridors

Passenger Corridors

East-West Corridor

Beltway Corridor

Western Ave. Corridor
Project Status

- Completed projects: 33
- Projects under construction (Phase III): 4
- Projects in final design (Phase II): 8
- Projects in environmental review (Phase I): 7
- Remaining projects: 18
The CREATE partners will seek future funding to undertake construction of P2 and EW2.
Forest Hill Flyover (P3) and 71st Street Grade Separation (GS19)
Forest Hill Flyover (P3) and 71st Street Grade Separation (GS19)

• First two components of 75th Street CIP:
  • P3, a North-South rail flyover structure, will eliminate train conflicts
  • GS19, a road/rail grade separation, will end delays to community members at blocked crossings
• Phase I PE – full viaduct
• Phase II FE – combination viaducts and retained fill
P3 Engineering Design Considerations

• Design Goals:
  • Design a structure with a 200-year service life
  • Maximize use of RR right-of-way
  • Minimize disruptions to train operations
  • Standardize maintenance and minimize maintenance costs
  • Utilize company forces and fabrication capabilities where feasible

• Service Life Considerations:
  • Cooper E-90 loading
  • Structure Types – concrete v. steel

• Maximize ROW:
  • Widen embankments
  • Full height retaining walls

• Minimize Disruptions:
  • Structure types – viaduct vs. retained
  • Temporary work – track and signal
  • Alignment of Shoofly
  • Maximized ROW for access and maintenance

• Standardize design elements
Geotechnical Design

• Soil Borings – the why and what:
  • Why are they done?
    • To understand what the team is working with below grade
  • What was discovered?
    • Native soils had low bearing strength
    • High clay content
    • High plasticity
    • These conditions necessitated foundation soil conditioning in select areas using compacted aggregated columns
Substructure Design

• Three separate structures:
  • 69th Street RR overpass
  • 71st Street RR overpass
  • Railroad flyover

• Designed for Cooper E-90 Loading:
  • Maximize future resiliency while minimizing functional constraints

• Foundation Type - Drilled Shafts
  • Multiple diameters for different applications
  • Railroad Flyover:
    • 36 in - for bent walls
    • 48 in & 54 in - for bent columns
  • 69th Street RR Overpass
    • 66 in - for bridge abutments

• Temporary Earth Retention Systems (ERS)
  • H-pile and lagging for stage line walls and sheet pile for ERS at bridge abutments
Superstructure Design

• Deck Plate Girders (DPG)
  • Utilized CSX standard design for approach spans
    • Simplifies future maintenance and repairs
  • Allowed for CSX to fabricate 28 of 38 total spans (73%)
  • Ship to jobsite via rail car
  • Primary flyover spans fabricated by contractor
Retaining Walls

• Allowed CSX to maximize our right-of-way and provide for an access road at the new elevation
• Mimics at-grade conditions
• Track can be maintained by Maintenance of Way (MOW) employees with standard equipment
• Minimizes the viaduct structures requiring accessibility for annual inspection program
  • Improves safety for CSX bridge inspectors by reducing risks associated with inspections - track time, climbing, environment, etc.
• Selected the proprietary T-Wall system by The Reinforced Earth Company
Stormwater Management

• Designed as open channel swales wherever possible for simplified maintenance.
• Designed to accommodate drainage for non-CSX properties.
  • Drainage improvements in SE quadrant have significant benefit to the adjacent residential neighborhood.
• Design provides detention near existing diamonds which were oversized to accommodate anticipated drainage needs for the future EW2 project.
• Design to meet City of Chicago Department of Buildings criteria.
  • Includes connection to City of Chicago storm sewers at multiple locations.
P3 Construction Phasing
EXISTING CONDITION

BEGIN STAGE 1
STAGE 1 - PHASE 0
INSTALL 75TH STREET CONTROL POINT
INSTALL TEMPORARY SHOVEL TRACKS
RELOCATE NS X' OVER

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1. (PS2) INSTALL WARNING SIGNS ON NORTH END OF PROJECT AND INTERSECTIONS WITH INTER SECTIONS HARD TO SEE PROCEED AS APPLIED, NOT TO INCLUDE WORK PERFORMED TO THE SOUTH.
2. INSTALL NEW 6TH ST. CONTROL POINT.

**STAGE 1 - PHASE 1**
INSTALL NEW 6TH ST. CONTROL POINT
RELOCATE NS X'OVER

**STAGE 1 - PHASE 2**
INSTALL 75TH STREET CONTROL POINT

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Project Contact

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