W. W. HAY SEMINAR SERIES

TOWER 55 MULTIMODAL IMPROVEMENTS

BNSF Railway / Union Pacific Railroad
Fort Worth, Texas

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LEARNING OBJECTIVES
TOWER 55 MULTIMODAL IMPROVEMENTS PROJECT

- Understand opportunity to partner with Class I railroads to assist them and their stakeholders in achieving their objectives

- Identify ways to add value to complex projects by providing logical, timely, and economical solutions WITH clients (rather than FOR clients)

- Assess the Tower 55 “Lessons Learned” and translate them into value-added services
TOWER 55: BACKGROUND

Railroads in Fort Worth & Tower 55 History

- In 1873, B.B. Paddock envisioned Fort Worth as a bustling railroad town.

- He published a “Tarantula Railroad Map” with nine rail lines stretching out from the city’s center like a spider’s legs.

- In 1904, the railroads collaborated to construct Tower 55 - an interlocker or railroad intersection controlled by a tower operator or dispatcher.
More than a century after its installation, Tower 55 remains a critical connector of rail traffic throughout the United States and into Canada and Mexico.

Union Pacific Railroad (UP) and BNSF Railway move
- high-priority intermodal goods,
- agricultural products,
- low-sulfur coal,
- industrial and manufactured goods through this critical at-grade junction.
TOWER 55: BACKGROUND
Consultants, suppliers and contractors partnered with Class I Railroads and their stakeholders to assist in achieving their objectives.
MODELING

BNSF Delays
- Transit times through T55 up more than 30% since 2002
- Trains staged over 220 miles from the Red River to Temple
- Impaired service & growth of Alliance IMF

Union Pacific Delays
- E/W traffic restricted to 30 MPH
- Trains staged from 130 miles west of FTW to 80 miles east of Dallas
- Impaired service to South Dallas IMF
Public/Private Partnership
BNSF/Union Pacific/FRA/TxDOT
HDR assisted in obtaining TIGER II funding
Project received funding from the following sources:
• UP – $39 million
• BNSF – $37 million
• TIGER II Grant – $34 million
• NCTCOG – $2.5 million
• TxDOT – $1 million
• City of Fort Worth – $1 million
ENGINEERING & MANAGEMENT

- Revised preliminary alignments on the BNSF
- Provided Historical Documentation Report
- Assisted both railroads in obtaining ROW
- Coordinated w/ the City of Fort Worth CFAs
- Assisted BNSF, UPRR, & TxDOT in contract coordination leading into Bid Phase
- Assisted BNSF by providing RE/PM services throughout the construction phase
Amtrak

- Currently 4 trains/day
  - Texas Eagle (2)
  - Heartland Flyer (2)
- Provides improved operations
  - Efficient terminal movements
  - Potential service growth
 OPERATIONS

- Trains had to continue to move throughout the duration of the project, including construction.
- Construction Phasing was revised 25 times.
- Moved Diamond replacements and East Lancaster Bridge demo/construction to end.
STRUCTURES

- Assessed existing structures
- Conceptualized proposed improvements
- Provided economical solutions
- Facilitated public agency partnering
Developed track alignments based upon operations models
- Included turnouts, x-overs & connections
- Coordinated connecting geometry between BNSF & UPRR to ensure proper alignments
- Evaluated & coordinated bridge clearances with City of Fort Worth and BNSF Structures
- Closing of 2 existing at-grade crossings, required appearing before Fort Worth Planning & Development Board
SIGNALS COORDINATION

- Wanted a “Final Track Plan” before they designed new signal blocks and structures
- Tended to make changes or add elements toward the end of the project
- Multiple “When did THIS happen?” moments
- Coordinated to determine Signal and Communications appurtenances
- Provided signal maintenance equipment access to signals, bungalows, and PTC
- Secondary power supply for signals (LP or Propane Gas)
CITY COORDINATION

- City Planning & Development
- Fire Protection Engineering
- Transportation & Public Works
- Storm Water Management
- Water/ Sanitary Sewer
- Traffic Engineering
- Tree Permitting
- Multiple Plan Reviews & Comment Resolutions
Adding value to complex projects by providing logical, timely, and economical solutions WITH clients (rather than FOR clients)
SAVING TIME & MONEY

Retaining Wall vs Purchasing New ROW
Replace Lime Treatment with Geogrid
Replace Timber Trestle with RC Box Culvert
Demo & Re-Construct Bridge in 2 Work Windows
CONSTRUCTION MANAGEMENT TEAM

- Project CM
  - Managed staff of six on daily basis
  - Developed materials testing schedules
  - Provided construction observation
    - Coordinated with BNSF staff
    - Coordinated with TxDOT staff & compliance team
    - Coordinated with City of Fort Worth inspectors
- Construction coordination with other contracts
- Review and submit monthly pay applications
- Review and submit Change Orders through the BNSF
It Can Save Your Life…

….or Get You Dismissed From the Site.

Proximity to Trains  Bridge Safety  Variety of Materials  Overhead Movements
CONSTRUCTION OBSERVATION ACTIVITIES

- Placement of Bridge Girder & Walkway
- Testing Moisture & Density of Embankment
- Night Work Removing Existing Diamonds
- New Block Signals & Structures
Distribution of New CWR Ahead of TLM

Tie Spacer Bridge Placing Ties Before Rail

Flat Cars Carrying New Ties with Gantry Crane

TLM Moving from Mainline to Roadbed
Translate Tower 55 “Lessons Learned” and translate them into value-added services

- Single Work Window
  - Installing Diamonds
- Rock Riprap Installed Between Mainlines
- Railroads Managed City Utility Improvements
- Hazardous Materials Permitting & Disposal
RESULTS NOW

Exceeding Client/Owner Needs

- Began construction in March 2013 & completed construction in December 2014
- Bids received were approximate to the Engineer’s Opinion of Probable Costs
- Executed all contracts within the FRA Flow-Down Agreement guidelines on time and within budget
TOWER 55 MULTIMODAL IMPROVEMENTS
RESULTS NOW

- Adds 40% capacity for rail operations
- Provides short-term solution for up to 25 years
- Improves safety for travelling public
- Improves air quality
PROJECT COMPLETION AND RIBBON CUTTING
NOVEMBER 7, 2014
“With over $1.1 billion in public benefits, the Tower 55 Project has addressed needed network capacity and eliminated a key freight and passenger rail bottleneck through implementing a creative engineering approach and extraordinary collaboration between two western Class I railroads and the creation of a public private partnership.”

– Ed Hamberger, President and Chief Executive Officer Association of American Railroads
TOWER 55: FOLLOW-UP PROJECT
OPERATIONS AFFECTS

- Sponsored by UPRR, BNSF, FRA & TxDOT
- Monitor and update rail traffic conditions pre-project at 10 grade crossings along initial route
- Project updates data each year for a period of 5 years following the completion of construction
- Data includes train queues, roadway traffic, air quality, occurrence of accidents
TOWER 55 MULTIMODAL IMPROVEMENTS

- AREMA 2015 W. W. Hay Award for Excellence in Railroad Engineering
- AASHTO 2015 President's Award
Thank you to