The Hiawatha Project – Challenges of Urban Construction

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Happy Veterans Day DAD

I love you DAD

Thank you for your help.

Mom
Overview

- Project Components
- Project Schedule
- Stakeholder Engagement
- Project Challenges
  - A. Urban Substation Design
  - B. Undergrounding Transmission Construction
- Lessons Learned
Who is Xcel Energy?

Company Roots

1900’s
- Rural Minnesota Utility Company
- 19 employees
- 2.7 miles of transmission line
- Serving over 700 customers

2015
- 6th Largest Transmission Co. (US)
- Over 12,000 Employees
- Over 18,000 miles of transmission line
- Serving over 3 million customers
Project Components

Project Budget - $55M

1) Underground Transmission/Distribution – $26M
   - 1.5 miles Transmission (115kV)
   - 2 miles Distribution (13.8kV)

2) Hiawatha Substation - $14M

3) Midtown Substation - $15M
Project Schedule

Spring 2009
Route Permit Application (RPA) Filed

Spring 2010
Certificate of Need (CON) Filed

January 2012
MPUC Issues Project Permit

October 2012
Construction Commences

February-October 2012
Public Outreach & Design

June 2014
Hiawatha West Substation Energized

December 2014
Midtown Substation Energized
Substation Perspective – Permit Application

Hiawatha West – Hwy 55

Midtown – Portland Avenue
Stakeholder Engagement

- Xcel Energy
- Regulatory Officials
- Elected Officials
- General Public

stakeholder_dynamics.wmv
Aesthetic Design Process

**Purpose**

1) Ensure Substation final designs reflect community vision, values and ideas about aesthetics.

2) Designs are compliant with Route Permit and Certificate of Need orders established by MN PUC.

**Advisory Work Group (AWG) Objectives**

1) **Develop** process for achieving AWG purpose.

2) **Oversee** implementation of chosen process.

3) **Liaise** with community on chosen process.

4) Ensure final substation design options **balance** community perspectives about aesthetics with design considerations and process parameters.
Stakeholder Engagement
Urban Substation Design
Hiawatha Substation Site Map

- Challenges
  - Contaminated Soil
  - Fiber /Rail Relocation
  - Landlocked property
  - LRT Vehicle
  - Theft/Vandalism
  - Multi-discipline Team
Hiawatha West Perspective

Initial:
- (7) Feeders
- 118-14.3kV, (1) 70MVA transformer

Future:
- (3) total 70MVA units
- (15) possible feeders
Hiawatha West Substation
Hiawatha West Substation

Rendering

Actual
Midtown Substation Site Map

- Challenges
  - SHPO Protected Slope
  - Land Acquisition
  - Soil Conditions
  - Residential Land Use
  - Multi-discipline Team
Midtown Perspective

- **Initial:**
  - 118-14.3kV, (1) 70MVA transformer
  - (7) Feeders

- **Future:**
  - (2) total 70MVA units
  - (14) possible feeders
Midtown Substation
Midtown Substation
Project Challenges

- Extreme Utility congestion
- Storm Sewer Reconstruction
- Storm Sewer Reconstruction
- Midtown
- Maintain Access Hospital
- Sanitary Sewer Reconstruction
- Superfund Site
- Skyway & Tunnel Obstruction
- Lower Fiber Optic
- 120 year old Watermain
- Access to Commercial & Industrial Businesses
- Future Street Car Location
- Hiawatha West

Project wide constraint:
- Gas main relocated throughout corridor
- Watermain replacement at 20 locations
- Maintain thru traffic
- Historic Resources throughout route

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Hiawatha Project
Proposed Underground Construction

Date: September, 2012

Xcel Energy
Underground Construction

- Vault Manhole Size: 11’ W x 25’ L x 10’ H
- Cable Diameter: ~5”
- Cable Weight: 13.3 lbs/ft
- Cable Installed after Duct Installation
Existing Utility Relocation

- Gas – $400,000
- Fiber/Telecom – $300,000
- Watermain – $800,000
- Sanitary & Storm – $100,000
How Did the Duct Cross the Road?

- Major Arterial into Downtown Minneapolis
- 40,000 vehicles/day
- MN DOT – “No Impacts to Traveling Public”
- Jack & Bore Crossing vs Open Cut Excavation

Video Clip – Highway 55
HiawathaProjectHwy55.wmv
Lessons Learned

- Early Project Risk Assessment
- Progressive Elaboration
- Education/Outreach
- Multi-Discipline Interaction
- Innovation & Constructability
- Engaged Stakeholders = Success
Thank You!

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