Case Study: Widening Dead Man’s Gap

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Project Objective

Increase safety of train traffic through an extremely tight rock cut while also removing the existing Slide Fence safety measure.
Project Location

Dead Man's Gap - NS Milepost 225A
Ooltewah, TN
Project Location
Project Location
Project Location
Location History

- Original Construction – approx. 1856
  - Val Map: 100’ R.O.W. from track centerline
Existing Conditions

- Substandard side clearance
  - TN: 8’ + 1.5”/Deg of Curve each side
  - NS: 9’ + 1.5”/Deg of Curve each side
- 5.5 Deg Curve = 9’ – 9” each side

16’ - 9”
Existing Conditions

• No drainage – ballast fouling an issue
Existing Conditions

• Existing Safety Measures
Existing Conditions

- Geologic
Existing Conditions

- Geographic Challenges
  - US Hwy 11
  - Utilities
  - Creek
  - Track Geometry
Existing Conditions

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- Geographic Challenges
  - US Hwy 11
  - Utilities
  - Creek
  - Track
  - Geometry
Proposed Improvements

• Remove slide fence
• Widen Cut for Catch Ditch
• Shift Track
  – Improve Side Clearance
  – Improve Track Geometry
Project Planning and Preparation

- Site Survey
- Track Geometry Analysis and Design
- Grading Analysis and Design
- Permitting
- Utility Notification and Relocation
- DOT Coordination
- Train Coordination
Project Planning and Preparation

• Site Survey

• Track Geometry Analysis and Design
  – Investigation into possible track speed improvement COST PROHIBITIVE
  – Improve geometry of triple-compound curve and able to reduce track super-elevation

• Grading Analysis and Design
Track Geometry Analysis & Design

- Track Geometry Analysis and Design
  - Existing Track Timetable Speed: 35 mph
  - Desired Improvement to 50 mph
Project Planning and Preparation

• Site Survey
• Track Geometry Analysis and Design
• Grading Analysis and Design
  – Cross sections
  – 17000 CY cut, mostly rock, to be wasted on 1.8 acre site

Plan Preparation

– 18,900 CY with swell!!!
Project Planning and Preparation

Graph showing elevation changes with marked distances and labels.
Project Planning and Preparation

• Permitting
  – NOI, careful use of proper BMP’s

• Utility Notification and Relocation
  – Electric, telephone, NS Communications, Cable TV

• DOT Coordination
  – Road Closures while blasting

• Train Coordination
Project Planning and Preparation
Project Planning and Preparation
Project Execution

• Clearing and BMP Installation
• Soil Removal and Slope Scaling
• Rock Excavation
  – Hammering
  – Blasting
  – Track Preparation
  – Train Coordination
  – Drilling Pattern
  – Road Closure and Traffic Measures
  – Site Seeding and Stabilization
• Track Relocation
Clearing and BMPs
Rock Excavation
Rock Excavation
Rock Excavation
Train Coordination
Track Relocation
Track Relocation
Track Relocation
Results
Results
Results
Results
Results & Analysis

• Final Side Clearance Improvements
  – Side clearance increased from 7.5’ to 11.2’ at worst location

• Duration of project – 4 months

• Project Cost – $445,000

• Incalculable benefits
  – Track Geometry Improvement
  – Improved Safety for personnel
  – Improved Drainage – track stability and ballast life
  – Elimination of Track-outages from Slide Fence false activation
Conclusion

Transportation Projects that improve operational safety, reduce long-term cost, and affirm dedication to both safety and performance should be strong candidates for funding consideration.
Questions?