



National Transportation Safety Board

High-Profile Grade Crossings

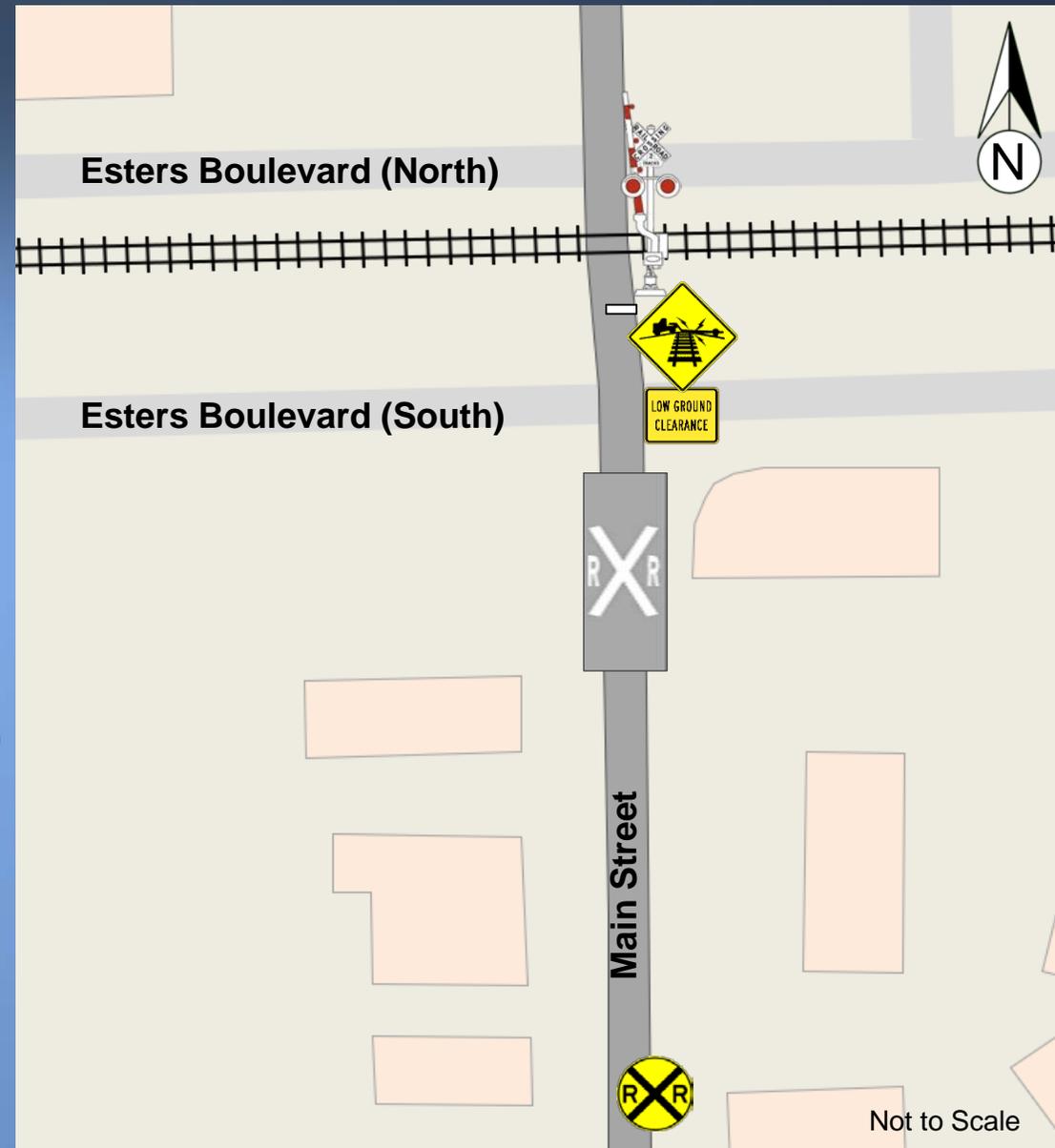
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Overview

- Precrash site conditions
 - Signage and pavement markings
 - Vertical profile of Main Street grade crossing
- Sign effectiveness
 - Low ground clearance grade crossing (LGCGC) warning sign
 - Postcollision signage
- Grade crossing reconstruction
- Communication
 - Premaintenance
 - Risk monitoring

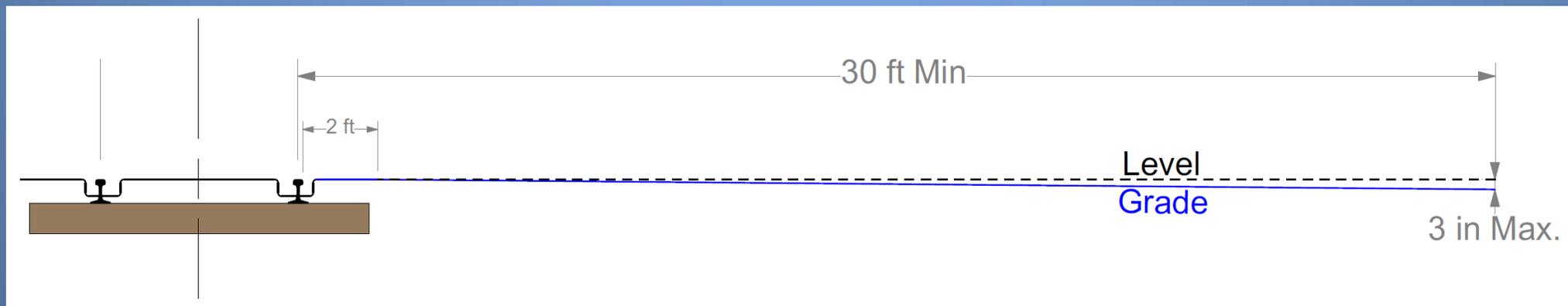
Signage and Markings

- Grade crossing advance warning symbol
- Grade crossing pavement marking symbol
- White stop line
- Grade crossing warning (crossbuck)
- Low ground clearance grade crossing warning sign



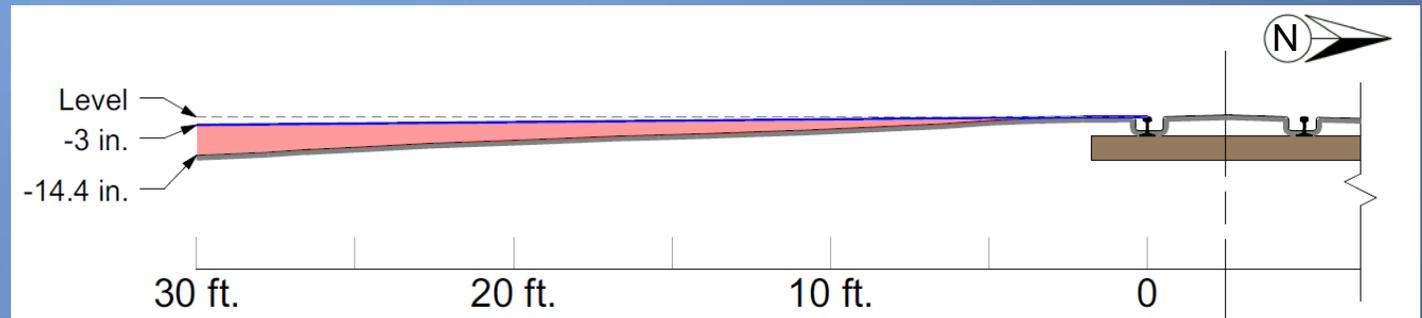
Vertical Profile – Design Guidance

- Crossing surface should be level
 - Between rails and 2 feet outside of rails
- Maximum slope
 - 3 inches above or below top of rails at 30 feet (0.9% grade)
- February 2014 maintenance likely increased track elevation



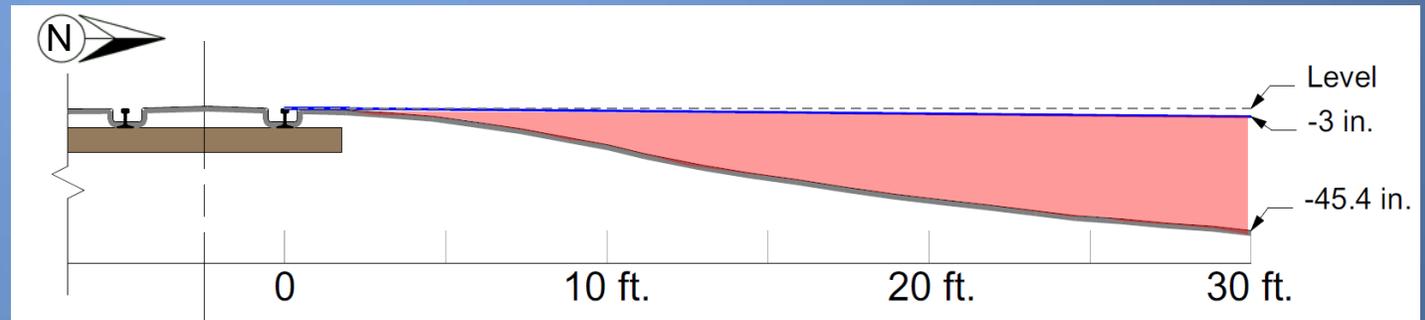
Main Street Grade Crossing (Northbound)

- Average slope: 4.2%
- Maximum slope: 7.5%
- Crossing surface was 14.4 inches below track level at 30 feet



Main Street Grade Crossing (Southbound)

- Average slope: 13.3%
- Maximum slope: 24.4%
- Crossing surface was 45.4 inches below track level at 30 feet



Effectiveness of LGCGC Warning Sign

- Purpose of the sign
 - Is only a warning informing road user of grounding risk
 - Does not indicate appropriate action
 - Does not restrict crossing
- Inconsistent installation of the sign
 - *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD) guidance



Selective Exclusion Signs

- Postcrash action
- No MUTCD guidance on installation at grade crossings
- Potential guidance based on
 - Roadway characteristics
 - Crash and/or grounding rate



Main Street Grounding History

- 26 prior grounding incidents since March 2012
- 23 groundings occurred after February 2014 maintenance



Grade Crossing Reconstruction

- Exclusion signs not practical at all high-profile grade crossings
- Continued track maintenance will cause track elevations to continue to rise
- No current guidance on when more comprehensive countermeasures are necessary



Communication

- Premaintenance communication
 - Communicate before any maintenance that may affect vertical profile and, therefore, safety
 - Provides an opportunity to consider increased risk potential and additional countermeasures



Communication

- Risk monitoring
 - Monitoring for crashes and incidents of vehicle grounding
 - Communication between railroad companies, state departments of transportation, and local municipalities

Summary

- Recommendations proposed related to—
 - Making effective use of signage
 - Establishing criteria for improving high-profile grade crossings
 - Tracking vehicle grounding incidents
 - Improving communication