How to design around & with railroads.
Designing with the Railroad

- 23 CFR 646.214 (b)(2) requires that crossings be evaluated when they are within limits or “near terminus” of Federally Funded project.

- Some rough numbers for planning:
  - Active Warning Devices: ~$250,000 (100% Federally Funded)
  - Crossing Surfaces: $54,000 for 2 lane road (varies by material and railroad)
  - Timelines- Railroad permits average 12 months (road widening type of project).
  - This is why it is important to get RR Safety Unit involved as soon as you think a crossing may be within project limits.
Manuals and Guidelines

- Manual on Uniform Traffic Control Devices (MUTCD)
- Part 8 of the MUTCD.
- Minimum distances from “Closest Rail” as well as edge of roadway or face of curb.
- Section 8D- Sidewalks crossing railroads.
Manuals and Guidelines

- AASHTO A Policy on Geometric Design of Highways & Streets- New Construction
  - Recommendations on Horizontal and Vertical alignments
  - Crossing should be as close to 90 degrees as possible.
  - Vertical alignment should be as flat as possible.
  - Consider the site distances and obstructions for the crossing especially if it will use passive warning devices (Crossbuck Assembly-CBA).
  - If sufficient sight distance is not achievable, may need Engineering Study to determine if a Stop Sign is needed (instead of a Yield Sign) on the CBA.
Manuals and Guidelines

- For overpass or underpass projects—horizontal and vertical clearance requirements from the railroad.
- Railroads have published guidelines for horizontal and vertical clearances.
- AREMA (American Railway Engineering and Maintenance Association) is similar to AASHTO and has some guidelines for overpasses and crashwalls.
Project Types

- Widening:
  - Will require a Diagnostic Review (DR) to determine the appropriate type of warning needed for the crossing.
  - May require widening of the crossing surface.
  - Potentially relocating the warning devices.
  - Adjusting the crossing servitude.
Project Types

- Preservation Treatments:
  - If the geometry of the roadway is not changing - Safety Review
  - Keep in mind - if the lane widths are adjusted, may need to relocate the Warning Devices.
Project Types

- Bridges - Replacement:
  - New bridge must meet the current requirements.
Project Types

- Bridges- Rehabilitation:
  - Still need coordination and permits.
  - RRss usually have more lenient temporary clearances for construction projects.
• Turnouts near RR

• Turn lane on road parallel to RR: Reducing storage for vehicles crossing tracks.

• Turn lane on road crossing: potentially add crossing surface and move warning devices.

• Need RR coordination, permits, and servitude.

Project Types
Profile issues:

- State highways are truck routes and, when possible, crossings should be designed so that low-profile vehicles can traverse them.
- If a crossing is "close" to being high profile, treat it as a high profile and try to address in design.

Drainage near RR and coordination and permits needed. RRs need to account for any impacts the project will have on the drainage in their ROW.

Project Types
Accounting for all users of your road:

- Vehicles such as placard vehicles, school buses, etc. are required to stop at railroad crossings.
- Pedestrians and Bicycles
What’s Wrong with this picture?
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During Construction

- If the project will require a diversion road over a railroad- This crossing will be evaluated to determine the type of warning devices needed.
  - These crossings are the one that public traffic utilizes.
  - The standards of these crossings are the same as a permanent crossing.

- Contractor/Construction Crossing.
  - Not open to the public- only used by contractor’s equipment
  - Will be built to same standards as public for surfacing; however, usually will have passive warning devices (Crossbuck assembly).
Questions?

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