We’ve Been Working with the Railroad, all the live long day

Presented by Robert Travis, PE
ADOT Railroad Liaison

602-712-6193/ rtravis@azdot.gov
ADOT Utility & Railroad Section

- U&RR handles 3 primary Railroad functions
  - Liaison between ADOT and the Railroads
  - Management of the FHWA Railroad-Highway Safety Program
  - Management of the Statewide Crossing Inventory

- Work includes coordination with all levels of ADOT
- Working directly with FHWA, FRA, Az Corporation Commission, various Local Government Agencies, Contractors and the Railroads
- Working on projects both on and off of the State Highway System
Railroad Background

- 2 Major Railroads and 10 short-line railroads in Arizona
- Includes 4 Passenger/ Tourist Railroads
- Railroad operations governed by Federal Railroad Administration and Arizona Corporation Commission
- Railroads follow different engineering standards than road projects
- FHWA Railroad-Highway Grade Crossing Handbook used for at-grade crossing projects.
- Railroads will perform railroad track, crossing and signal work
- Railroads almost always have universal prior rights and permission needed for projects within their right of way
- Railroads have their own utilities or lease their land for 3rd party utilities.
  - Utilities in Railroad right of way may not show up on Arizona Blue Stake requests
  - Railroad has own “call before you dig” phone number
Railroad Design Consideration

• For Public projects, Start talking to RR Liaison at Project Scoping Phase
• UPRR and BNSF have many guidelines available online. Short Line Railroads tend to follow UP/ BNSF guidelines
• New At-grade railroad crossings are very hard to get approved. Project may need to remove existing public crossings
• Railroad permits are needed for survey, geotech and utility work on RR property
• Railroads will perform work on their signals and/or tracks
• Try to have new road bridges over railroad tracks, not other way around
• If a new bridge will allow a public at-grade crossing to be removed, Railroad may contribute to the project
• Railroad will comment on Project Concept, 30/60/95 and 100% Plans
• Contractor Entry Permit required for Construction activities
• Railroad flagging required for any activity within 25 feet of centerline of track. Distance may be increased for potential tipping hazards
• Arizona Corporation Commission approval needed for the following railroad signal work activities:
  • Install, widen or remove an existing public crossing
  • Modification to railroad traffic signal preemption
Railroad Agreements

Construction & Maintenance Agreements
• Allow Public Agency to construct and maintain crossing with Agency forces
• Allows Railroad to relocate infrastructure as needed
• Allow Agency to purchase temporary and permanent easements
• Starts after 95% plans approved by Railroad
• Once executed, project is cleared for Advertisement
• Typically takes 6-18 months to obtain

Utility License
• Allows for Agency to install conduits, storm drains or other utilities
• Railroad requires most utilities to be in a steel sleeve bored under their track
Railroad Agreements, Continued

**Contractor Right of Entry**
- Allows Agency Contractor to be on Railroad Property
- Includes indemnification, insurance and reporting requirements
- Blank or actual right of entry should be included in Special Provisions

**Consent letter and/or Temporary Occupancy Permit**
- Simple agreement allowing Agency or Contractor to modify existing crossing
- Typically 4 week process to obtain
- Useful for pavement preservation, sidewalk work, etc. within existing easement
Sample ADOT-UPRR Railroad Callout sheet for grade separated projects
Design considerations

Adequate Clearance?
Utilities in Railroad right of way?
DESIGN CONSIDERATIONS, Cont.

Underpass hit by oversized load & Why Railroads do not like underpass

Pavement failure allowing impact to panel. Ensure adequate compaction
Successful Project Development
At-grade crossing Examples

4 lane crossing with medians, sidewalks

Example of sidewalk behind gate counterweight
Example of Orange Fence installed during Construction

Remind Contractor to remain clear of 25 foot rail zone

May remove need for Railroad flagging
Twin Peaks Interchange
Constructed in 2011

- Remove existing at-grade crossing
- Provide grade separated 6+ lane bridge
- Will become Regional primary road
- Railroad contributed $660,000 to the project
BRIDGE DEMOLITION CONSIDERATIONS

East Flagstaff TI Bridge Removal

20 ft Bucket on Excavator
Bridge Demolition, Continued

Wooden false work between steel girders

Positive lifting of deck panels
When Projects go bad!
AKA why we have agreements in place

Unexpected rain event caused fill failure and mudflow onto tracks
Deck Panel removal incident

- Railroad agreement in effect
- Railroad flagger onsite and coordinating with Contractor
- Coordination meant no trains present while panels were lifted on deck
- Railroad flagger immediately stopped train traffic after incident
- Track closed for 30 minutes, with multiple trains delayed
- 1 train was within 5 miles of bridge when incident occurred
- No permanent damage to track
TIPPING HAZARD EXAMPLE
Railroad Project Process Flow

- Project Identified
- Railroad preliminary engineering authorized
- Onsite Diagnostic Meeting
- Railroad permits acquired for survey, geotech, etc.
- Railroad reviews & approves design plans
- Railroad provides estimates for their work
- Railroad agreements executed
- AZ Corporation Commission Opinion & Order issued (as needed)
- Railroad work authorized & construct work
- Local Agency perform work
- Project closeout
Additional Information

ADOT Utility & Railroad Section

ADOT Local Public Agency Section (LPA Project manual)
http://www.azdot.gov/highways/LocalPublicAgency/index.asp

Arizona Corporation Commission
Railroad Safety Division
http://www.cc.state.az.us/Divisions/Safety/Railroad.asp

Federal Highway Administration Railway-Highway Grade Crossing Safety
http://safety fhwa dot gov/xings/
Additional Information
Continued

http://www.mcdot.maricopa.gov/technical/eng-manuals/railroad.pdf

BNSF-Union Pacific Railroad Grade Separation Guidelines

FHWA Railroad Highway Grade crossing Handbook