

2017

FRA Rail Program Delivery

Meeting

Rail Project Delivery: Coordinating with Railroads and Utilities

Marian Rule, Rob Ball, Jonathan Seager, and French Thompson

Railroad and Utility Coordination – Top Ten List

Marian Rule

Identifying Interface with Third Parties

- ▶ For projects that:
 - ▶ Cross over or under existing tracks/utilities
 - ▶ Run adjacent to railroads/utilities
 - ▶ Share use with railroads
 - ▶ Require utility service
 - ▶ Involve utility/track relocation, or cause other impacts
- ▶ **Top Ten** areas of focus for successful project execution...



#1. Safety

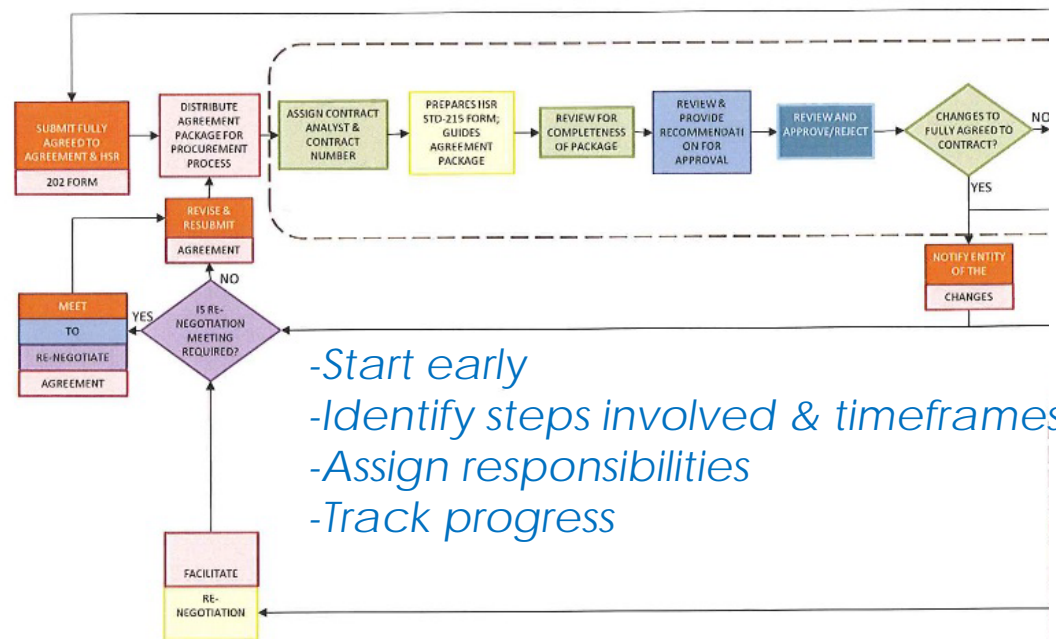
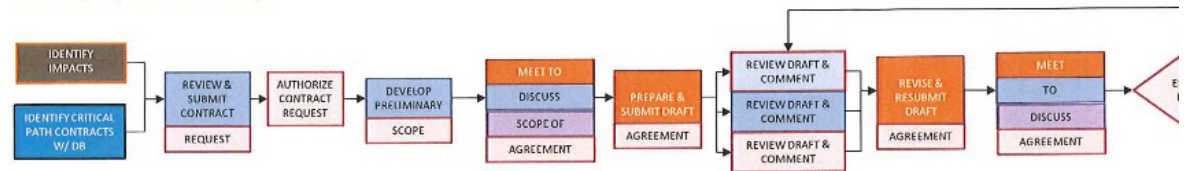
- ▶ Safety during project planning and design
- ▶ Safety during construction
- ▶ Safety during operations
- ▶ Accomplished with:
 - ▶ Rights of Entry
 - ▶ Flagging
 - ▶ Complying with requirements and maintaining clearances
 - ▶ Safety training & certifications



Credit: FRA, R. Brown 11/19/14

#2. Agreements

- ▶ Master agreements and specific agreements
 - ▶ Right of Entry
 - ▶ Encroachment
 - ▶ Funding
 - ▶ Insurance & indemnification
 - ▶ Relocation
 - ▶ Construction and Maintenance
 - ▶ Operating / Use
 - ▶ Some with multiple third parties



-Start early
 -Identify steps involved & timeframes
 -Assign responsibilities
 -Track progress

RESPONSIBLE PARTY LEGEND

CHSRA - 3 rd PARTY LIAISON ENGINEER	ENTITY (CITY, COUNTY, UTIL, DIST., ETC.)	CHSRA - OPAC PEER CONTRACT ANALYST	CHSRA - FINANCIAL OPERATIONS SECTION	CHSRA-CHIEF CONTRACTS ADMINISTRATOR
CHSRA - CONTRACT MANAGER	CHSRA - OPAC CONTRACT MANAGER	CHSRA - AUDIT DIVISION	CHSRA EXECUTIVE REVIEW (CHIEF COUNSEL, CFO, CHIEF DEPUTY DIRECTOR)	REGIONAL CONSULTANT (RC)
PMT	CHSRA - OPAC CONTRACT ANALYST	CHSRA - LEGAL		PCM

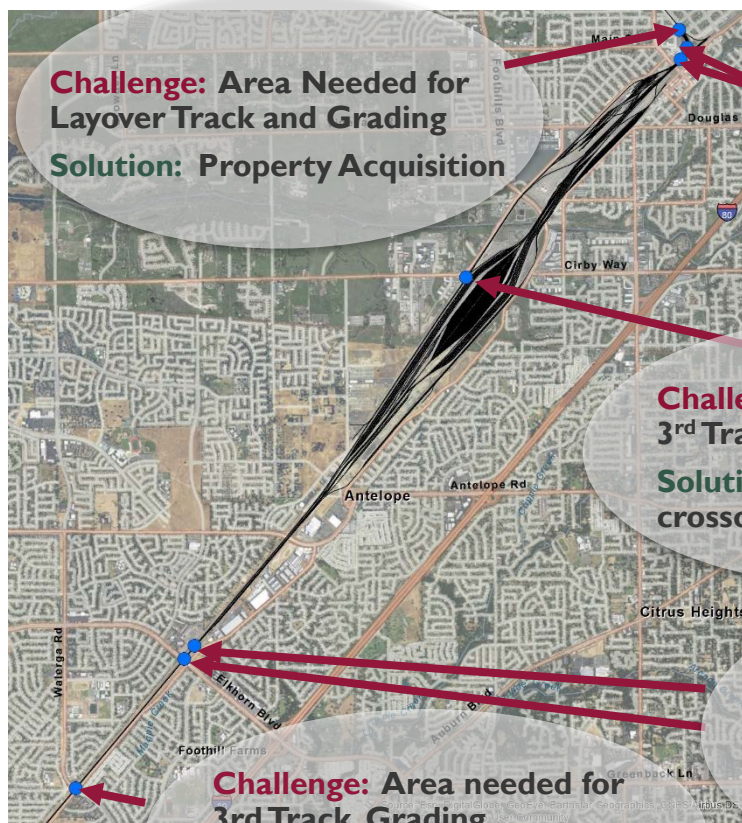
#3. Facility Layout

- ▶ Compliance with Railroad requirements
 - ▶ Track spacing
 - ▶ Accommodations for future tracks within railroad right of way
 - ▶ Access and maintenance roads
 - ▶ Crash walls
 - ▶ Trainman's walkways
 - ▶ At-grade crossings



#4. Right of Way

- ▶ Environmental
 - ▶ Assess conformance to EIR
- ▶ ROW Impacts
 - ▶ Solutions to mitigate
 - ▶ Acquisition
 - ▶ Temporary and permanent easements



Challenge: Area Needed for Layover Track and Grading
Solution: Property Acquisition

Challenge: Area Needed for Track Geometry and Clearances
Solution: Property Acquisition or Shift Track

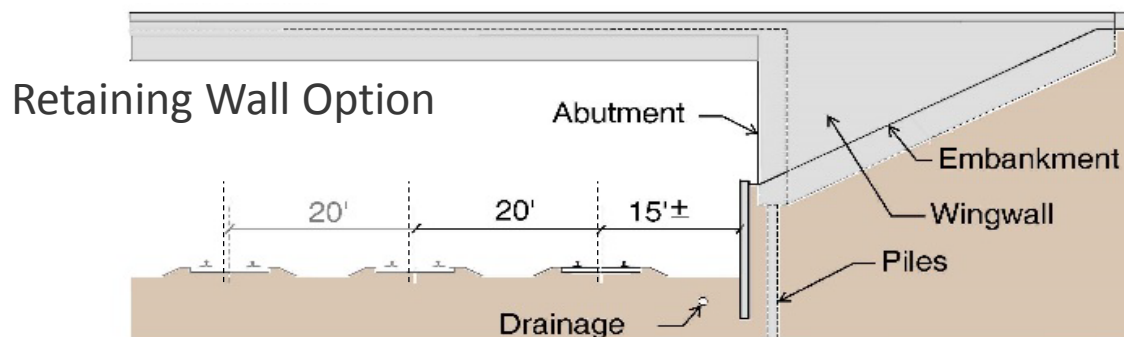
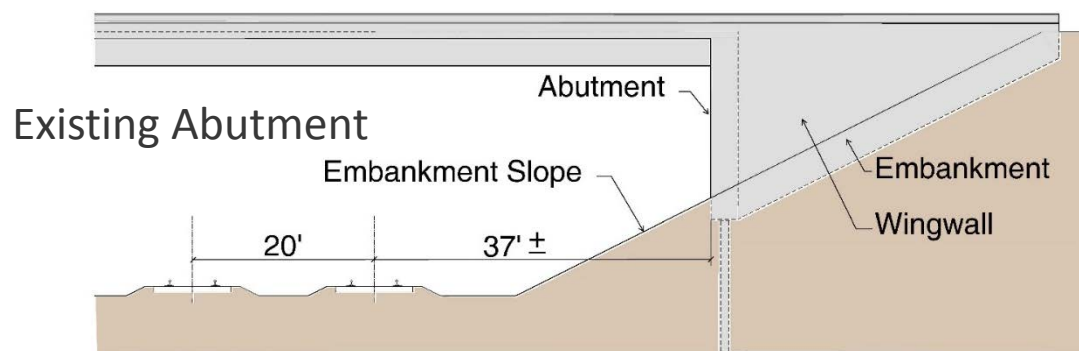
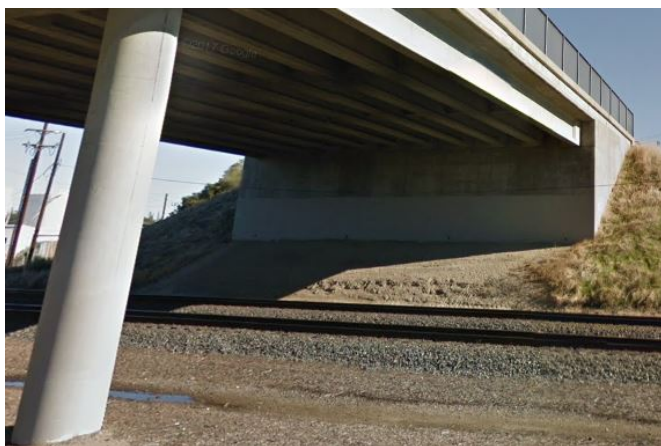
Challenge: Area needed for 3rd Track
Solution: Retaining Wall for crossover

Challenge: Area needed for 3rd Track, Grading, and Interrupted ROW
Solution: Property Acquisition

Challenge: Area needed for 3rd Track, Grading
Solution: Property Acquisition & Retaining Wall

#5. Drainage

- ▶ Ditches and piped systems
- ▶ Detention and outfall



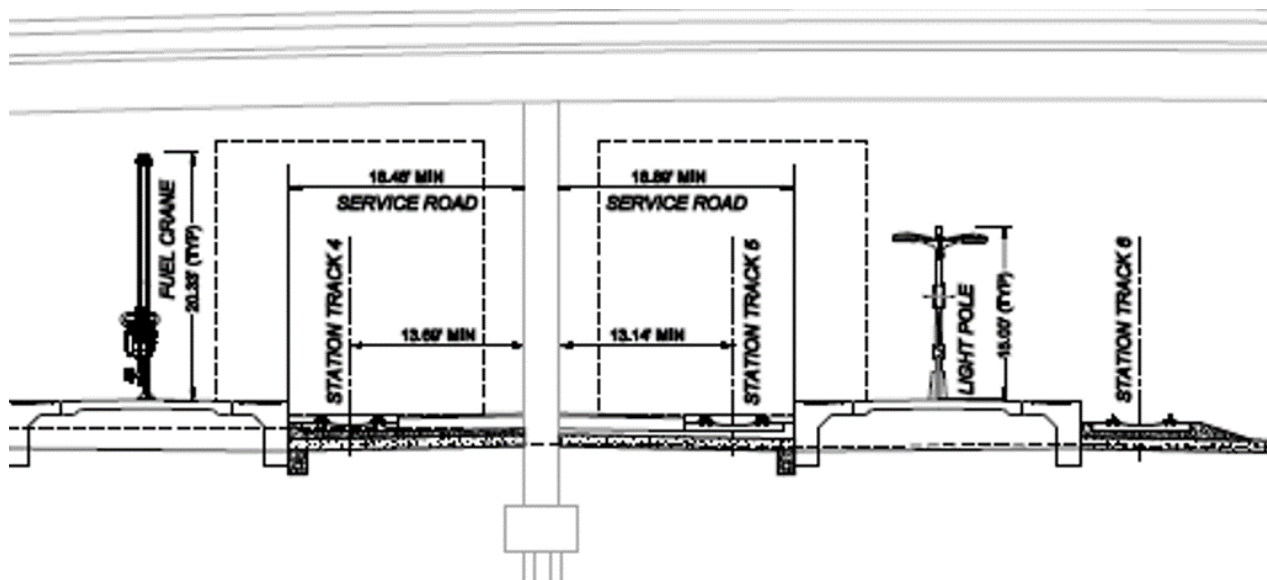
#6. Clearances - Structures

▶ Horizontal

- ▶ Railroad and PUC requirements
- ▶ Clearance envelopes
- ▶ Curved and tangent track conditions

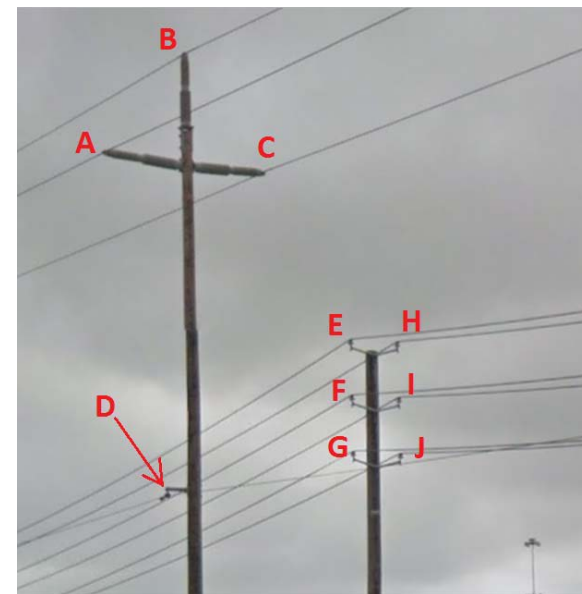
▶ Vertical

- ▶ Temporary
- ▶ Permanent



#7. Clearances - Wireline

- ▶ Railroad or utility requirements: the more stringent will govern
- ▶ Higher voltage lines require greater clearances



	Existing Line Elev [1]	Existing Ground Elev [2]	Ht above Ex ground [1] - [2] = [3]	Prop Track Elev [4]	Ht above Prop Track Elev [1] - [4] = [5]	CPUC Vertical Clearance Required ¹	RUS (UP) Vertical Clearance Required ²	Conclusion
E	46.31	15.99	30.32	15.33	30.98	28.0	29.5	OK - no need to adjust line height
F	42.20	15.99	26.21	15.33	26.87	28.0	29.5	Need to raise line height
G	37.26	15.99	21.27	15.33	21.93	28.0	29.5	Need to raise line height
H	46.09	15.91	30.18	15.34	30.75	28.0	29.5	OK - no need to adjust line height
I	41.25	15.91	25.34	15.34	25.91	28.0	29.5	Need to raise line height
J	37.98	15.91	22.07	15.34	22.64	28.0	29.5	Need to raise line height

#9. Utilities in Railroad ROW

- ▶ Utility Location
- ▶ Utility protection
 - ▶ Casings, utility bridges, and slabs
- ▶ Railroad/utility company review and approval

Existing Utilities Matrix

Utility Companies	Utility Type	Contacts
AT&T	Fiber Optic	Astrid Willard (
Cal American Water Company	Water	Spencer Phillip:
City of Roseville	Water/Sewer	Roy Van Ness (
City of Roseville	Electric	Tiffany McAvoy
City of Sacramento	Water/Sewer	Ron Fujioka (91
Comcast	Fiber Optic	Andrew Kotz (5
Golden State Water Company	Water	Ernest Rauback
Kinder Morgan	Fuel	Timothy Szto (7
Level 3	Fiber Optic	Matt Prink (72)
MCI	Fiber Optic	Verizon Busine: Investigations@
PG&E	Gas Transmission	Pete Miskovich Rick Adams (91
PG&E	Gas Distribution	Pete Miskovich Rick Adams (91
PG&E	Electric	Greg Hernande
Qwest	Fiber Optic	Brett Hankins (

...will be permitted within two (2) week turn-around...provision

...only have pipelines soil displ

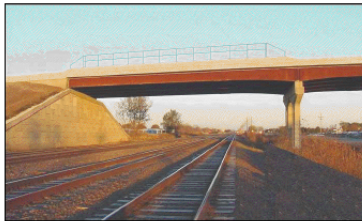
TranSystems		UPRR RAILROAD - UTILITY CONFLICT MATRIX															Color Index						
UPRR Field Cable Project Manager: Stan Dicksen		Project Name: LATC YARD EXPANSION, Amalgamating Sub., MP 482.0 to MP 485.0															Conflict Matrix Adjustment						
Project Location: Los Angeles, CA		Sheet Address/Reference: UPRR to Caltrans															Conflict to Further Work						
UPRR Project or Construction Method: 100127001_PRR_105		Project Status: 100% 2D/3D/AS-BUILT/AS-BUILT															Notes						
Revision: 1/1/2010																							
Conflict No.	T&E Utility Layout Sheet No.	Permit Agreement #	Utility Owner	Contact Person	Mapcut	Start Station	End Station	Overhead or Underground	Type	Description	Sub Class (FVA Or ED#)	Top/Bottom of Existing Utility	Proposed Bottom of Rail Elevation	Depth Below Base of Rail	Top of Existing Grade	Top of Proposed Grade	Depth of Utility Below Proposed Grade	Excavation Length	Public Right-of-Way Y/N?	Adjustment? Y/N	Can Construction Proceed? Y/N	Action	Notes
0A	U001	250553	PRIVATE UPRR LADWP-POWER	UPRR				OVERHEAD	ELECTRIC	ON-LINE CROSSING TO ELECTRICAL, 300-3000FT S-POLES & 2-TRANSFORMERS	POLE N 200.00' Pole S: 200.30'								NO	YES	COORDINATE WITH LADWP	DESIGN FOR 34.5V METERED SERVICE. POLES TO BE REMOVED BASED ON DISTANCE FROM RAIL	
0B	U001	810718	LADWP - POWER	1111 N. HOPE STREET, ROOM #13 LOS ANGELES, CA 90012 RICKIAN.HANCOCK@LADWP.COM 213.207.2795				OVERHEAD	ELECTRIC	POLES ON E-W CIRCUIT (UNKNOWN VOLTAGE)									NO	YES	COORDINATE WITH LADWP	COORDINATE WITH LADWP ON LINE HEIGHT	
0C	U003		SOUTHERN CALIFORNIA EDISON	CHRISTINE ADAMS 6910 VERNON METRO WEST TRANSMISSION CHRISTINE.ADAMS@SCE.COM 213.207.2795				OVERHEAD	ELECTRIC	ON-LINE CROSSING (UNKNOWN VOLTAGE)									NO	YES	LINE TO REMAIN		
0D	U003	2708110	SOUTHERN CALIFORNIA GAS	ALBERTO V. CAMPOS SCAMP@SCE.COM 213.207.2795				UNDERGROUND	GASOL	30" STEEL, 30" CASING	ED - 5'F								NO	YES	LINE TO REMAIN		
0E	U003		LADWP-WATER	1000 W. 10TH JANET D. BROWN FACILITY ENGINEER JANET.D.BROWN@LADWP.COM 213.207.2795				UNDERGROUND	WATER	NOT FOUND BY BSE									NO	YES	NOT FOUND		
0F	U003		AT&T	Anna M. Linn Anna.Linn@att.net Facility Engineer Los Angeles Engineering District 405.251.5214 405.251.7600 Fax att.net@aig.com				UNDERGROUND	COMMUNICATION/TELE	BURIED DUCT	ED - 5'F									NO	YES	TO REMAIN	

#10. Submittals & Approvals

- ▶ Timing, components
- ▶ Responsibility: if delegated, less control of quality and timeliness
- ▶ Materials required for submittals
 - ▶ Design, calculations, geotechnical, drainage, construction submittals, as-built submittals, etc.

BNSF RAILWAY - UNION PACIFIC RAILROAD

GUIDELINES FOR RAILROAD GRADE SEPARATION PROJECTS



DATE	BY	DESCRIPTION

BNSF  

BRIDGE STANDARDS
GRADE SEPARATION PROJECTS

COVER PAGE

FILE NUMBER: _____ DATE: _____
APPROVED BY: _____ CHECKED BY: _____

Phase		Types of Submittals	RR Review Time
Design	A	Concept (Plans and Site Pictures)	1 month
	B	30% (Applicant response, Design Plans, Specifications, Drainage, Shoofly, Construction Phasing Plans)	1 month
	C	100% (Applicant response, Design Plans, Specifications, Drainage, Shoofly, Construction Phasing Plans)	1 month
Construction		Shoring, Falsework, Demolition, Erection, Erosion Control, Construction Phasing Plans	1 month

California High-Speed Rail: Lessons Learned

Rob Ball, WSP / California High-Speed Rail Authority



High-Speed Rail: It's Happening!

Approximately 119 Miles
Madera to North of Bakersfield
Over \$3 Billion Investment

High-Speed Rail: Connecting California



Increase Mobility



Needed Alternative



Better Air Quality



Job Growth

HIGH-SPEED RAIL: Helping Shape Cities

- ▶ Ties Economies Together
 - San Jose to Fresno = 60 Min
 - Bakersfield to Los Angeles = 60 Min
 - San Francisco to Los Angeles = Capable of 2 Hrs. and 40 Min
- ▶ Connects With and Reinforces Local Mobility
- ▶ Foundation for Sustainable Growth
- ▶ Opportunities for Revitalization in Downtown Cores



Coordinating with Class Is, Short Lines, and Utility Companies

Experience from California High-Speed Rail Program

Coordination with Class I's

- ▶ Start early – working with railroads is not a short process
- ▶ All Railroads are not the same
- ▶ UPRR and BNSF agreements were not in place for issuance of first Construction Packages
- ▶ Requirements were still being negotiated and continues today
- ▶ Standard UPRR/BNSF standards did not address uniqueness of High-Speed Rail
 - ▶ HSR test speeds at 242 mph
 - ▶ HSR operating speeds up to 220 mph
 - ▶ Need for intrusion protection measures for offset distances less than 102 ft. from RR ROW and operating speeds over 125 mph
- ▶ Talk to decision makers – know who you are negotiating with

Coordination with Class I's

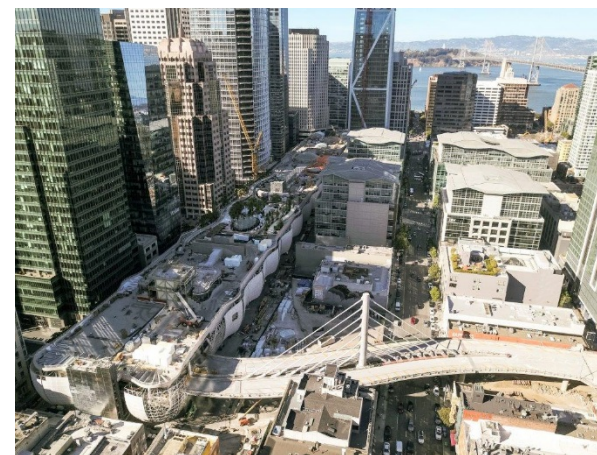
- ▶ HSR established benefits to railroads primarily through elimination of grade crossings
 - ▶ Provides Safety & Operational benefits
 - ▶ Provides for reduced maintenance
 - ▶ Provides for added security & access restrictive fencing



LA Union Station

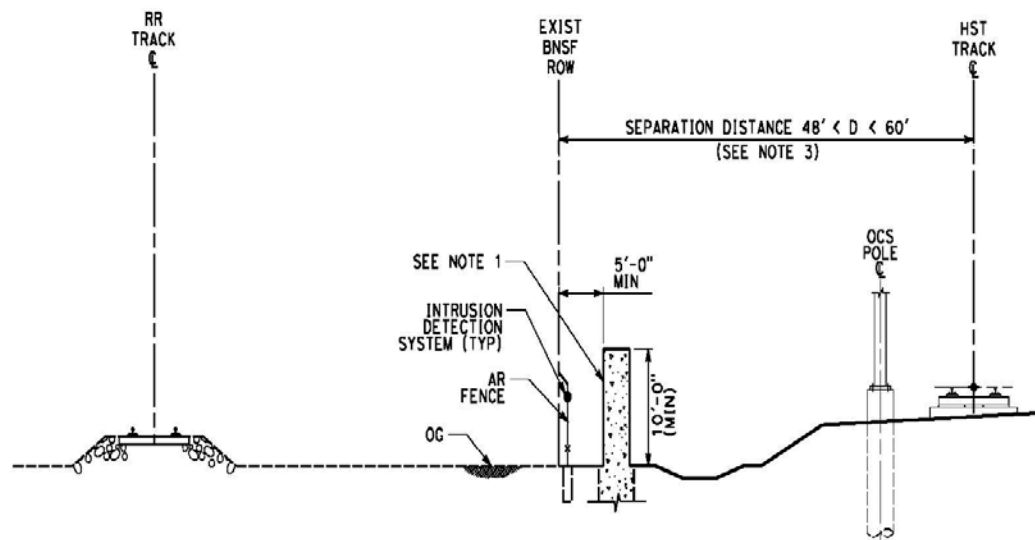
Coordination with Class Is

- ▶ Established Intrusion Protection requirements
 - ▶ Provides a high standard for HSR
 - ▶ Required extensive computer modeling and probabilistic analyses to evaluate risk of freight derailments
 - ▶ May set a precedence for other rail systems
 - ▶ Costly to implement as Change Orders



Trans Bay

Coordination with Class Is

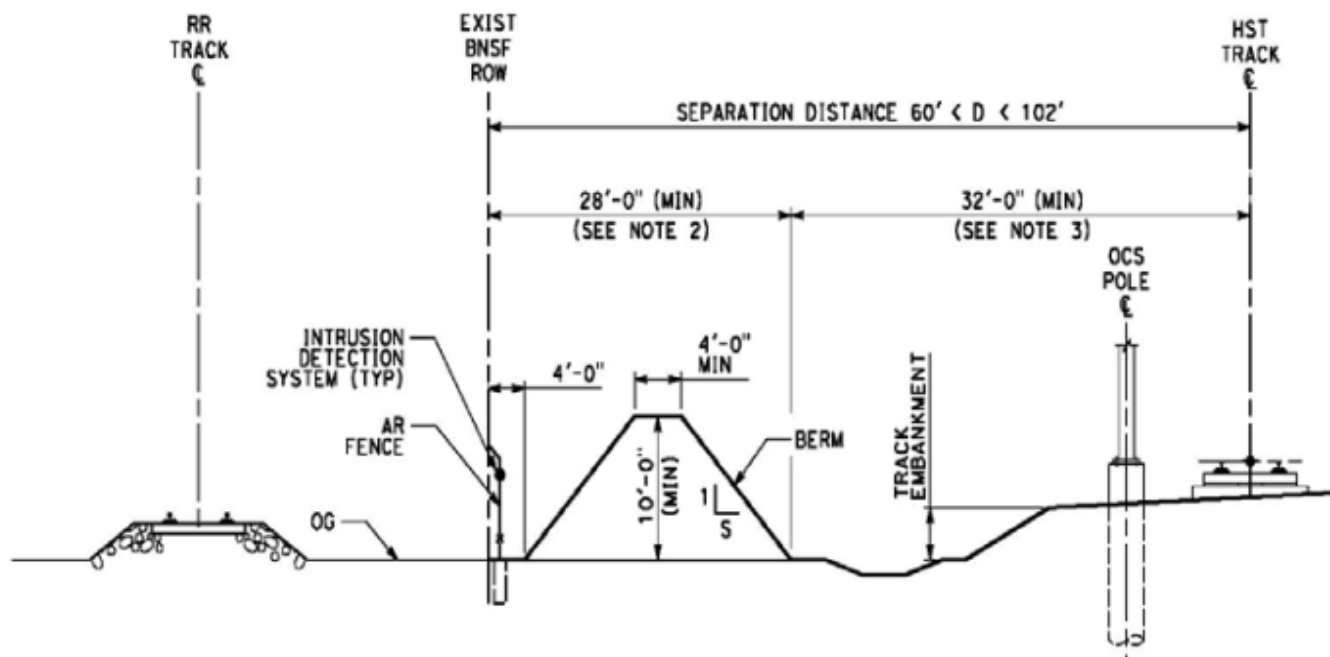


PROTECTION MEASURES
 CONCRETE BARRIER & INTRUSION DETECTION
 SEPARATION DISTANCE $48' < D < 60'$

NOTES

1. DESIGN FORCE $F=650$ KIPS, APPLIED 6' ABOVE OG
2. MINIMUM DISTANCE BASED ON $S=1$, SUBJECT TO SLOPE STABILITY ANALYSIS
3. MINIMUM DISTANCE CONSIDERS A MINIMUM OF 3'6" HIGH TRACK EMBANKMENT, INCLUSIVE OF SUBBALLAST

Coordination with Class I



PROTECTION MEASURES

EARTHEN BERM

Coordination with Class I's

- ▶ Reached agreement on physical mitigation measures
 - ▶ No intrusion protection required if separation from closest HSR track \geq 102 ft.
 - ▶ 10 ft. high earthen berm proposed as derailment protection for separation 60 to 102 ft. Berm height increased to 12 ft. Applied to BNSF only.
 - ▶ 10 ft. high reinforced barrier wall for separation 48 to 60 ft. Designed to 650 Kips lateral loading. Exceeds AASHTO and AREMA requirements
 - ▶ Intrusion detection fencing up to 250 ft. separation with advance signal of breach to HSR and freight trains

Coordination with Class Is

▶ Primary Lessons Learned:

- ▶ Stay a set distance back from freight corridors
- ▶ Railroads hazards assessment established distance as 102 ft. from RR ROW
- ▶ Establish terms and scope of work early and include in bid documents
- ▶ Negotiate track outages upfront with railroads – do not leave up to bidders
- ▶ Budget for unknowns
- ▶ Count on uncertainties to come up



San Joaquin Viaduct

Coordination with Utilities

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- ▶ Start early on establishing agreements
- ▶ Establish applicable technical standards
 - ▶ New General Order 176 was not in place – created new standard for 25 kv electrification systems for HSR
 - ▶ HSR carries a higher standard than GO 176 and has created issues with interpretation of different standards

Coordination with Utilities

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- ▶ Advance design for utility relocation in Preliminary Engineering phase
- ▶ Minimize use of provisional funds for utility relocation - requires issuance of COs
- ▶ Have Design Builder competitively bid utility relocation work
- ▶ Consider early utility relocation contracts to clear in advance of main Design Build contract



Cedar Viaduct

Procurement Strategies

- ▶ Evaluate alternative delivery methods
- ▶ Select the delivery method for the right reason
- ▶ Design-Build does not transfer all risk to a contractor
- ▶ Understand the project risks and allocate risk to the party best able to deal with it

Procurement Process

- ▶ Understand what Best Value is
- ▶ Score appropriately between technical and price
- ▶ Establish a Shortlist
- ▶ “Proposers will shortlist” if an agency does not



Fresno River Viaduct

Procurement Process

- ▶ Alternative Technical Concepts
 - ▶ Allows a bidder to propose alternative & more cost effective designs
 - ▶ Encourages innovation
 - ▶ Need adequate information to make informed decisions
 - ▶ Be careful with ATCs that create environmental re-examinations and right-of-way impacts
 - ▶ Contractor is solely responsible for the implementation of the ATC

Contract Administration

- ▶ Robust Contract Management
 - ▶ Enforce the Contract
- ▶ Aggressive Change Control
 - ▶ Manage the change process
- ▶ Implement Lessons Learned
 - ▶ Learn from past procurements
- ▶ Make and Keep Decisions
 - ▶ Critical on Design-Build
- ▶ Improve communications across functional teams
 - ▶ Communication is key on large mega projects

Aesthetics Requirements

- ▶ Make requirements clear
- ▶ Establish programmatic requirements to identify the system
- ▶ Be clear on input from local jurisdictions



Fresno River Viaduct

Benefits from HSR to Third Parties

- ▶ Elimination of railroad grade crossings
 - ▶ Improved Safety
 - ▶ Reduced maintenance

- ▶ Utilities
 - ▶ Extended service life with relocation and replacement
 - ▶ Upgrades to utility lines
 - ▶ Identify and negotiate betterments

Right-of-Way

- ▶ Identify right-of-way requirements and critical parcels
- ▶ Avoid changes where possible
- ▶ Establish a reasonable and realistic schedule for acquisition
- ▶ Communicate with Property Owners in advance
- ▶ Understand the benefits and risk with administrative settlements
- ▶ Establish parcel acquisition priorities early with Design-Builders to support construction work zones
 - ▶ Stay the course – refrain from making changes
- ▶ Establish a condemnation process and implement when necessary



Utility Coordination

Jonathan Seager, Pacific Gas & Electric

What is State Infrastructure?

- ▶ A portfolio of some of the top infrastructure projects in North America - arguably some of the largest projects ever undertaken in California:
 - ▶ California High-Speed Rail
 - ▶ Caltrain Modernization
 - ▶ BART Silicon Valley Extension
 - ▶ California WaterFix & EcoRestore
 - ▶ Downtown Transbay Terminal Extension
 - ▶ Integration & Supporting Projects
- ▶ These highly complex projects span nearly all aspects of PG&E's business, requiring innovative approaches, extraordinary collaboration, and broad stakeholder engagement to achieve project goals

Safety

Utility Relocations

New Service /
Interconnection

Regulatory &
Compliance

Common Project Questions

- ▶ How do we most efficiently and effectively engage with utilities?
- ▶ What do utilities need in order to support our needs?
- ▶ Existing agreements – do they apply or do we need new ones?
- ▶ What about my compliance requirements (i.e. Buy America)?
- ▶ Why does it take so long and cost what it does?

Common Project Challenges

Environment

- Stakeholder pressure(s)
- Conflicting interests
- Project culture (what are you creating?)

Organization

- “Tunnel” vision
- Understaffing
- Experience on other projects
- Underestimating utility requirements
- Contractor / vendor management (who is running the project?)

Project

- Overly aggressive project scope and schedules
- Overly optimistic project budgeting

Potential Opportunities

▶ Collaboration

▶ Creativity

▶ Compromise

- ▶ Project culture is important
- ▶ Understand the utility operating environment
- ▶ The bigger it is, the longer it takes (start sooner)
- ▶ Be reasonable
- ▶ Focus on innovative solutions (not blame)
- ▶ Be accountable
- ▶ Tell the truth
- ▶ Thank your partners (publicly)

Railroad Coordination

French Thompson, BNSF Railway

Presentation Agenda

- ▶ BNSF Passenger Principles
- ▶ Observations
- ▶ Lessons Learned
- ▶ Future Opportunities

BNSF Commuter Principles

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specific callouts

- ▶ Any commuter operation **cannot degrade** BNSF's freight service, negatively affect BNSF's freight customers or BNSF's ability to provide them with service.
- ▶ BNSF must be **compensated** for any and all costs incurred in providing commuter service and make a reasonable return for providing the service.
- ▶ BNSF will not incur any liability for commuter operations that it would not have but for those operations. **These operations are provided by BNSF primarily as a public service**; the relatively modest compensation BNSF receives does not begin to justify assuming the significant liability associated with passenger service.

BNSF Commuter Principles

specific callouts

- ▶ Studies of how commuter service might be provided must take into account not only the current freight traffic levels, but ***projected freight traffic growth***.
- ▶ Improvements must include ***grade crossing protection*** and ***intertrack fencing*** as required to minimize the risk of accidents, due to liability and service interruption concerns.

Observations

▶ Differences On and Off BNSF Property

▶ On BNSF:

- ▶ *Completely Follow BNSF Commuter Principles*
- ▶ *Realize the impacts of your project on BNSF's ability to move freight*

▶ Off BNSF:

- ▶ *Assure separation of operations*
- ▶ *Prevent conflicts for access and maintenance*
- ▶ *Although parallel, avoid freight rail impacts as much as possible*

Observations

▶ Design-Build

- ▶ *Design and Submittal approval timelines*
- ▶ *Non-Linear construction – difficult for railroad coordination*

▶ Electrification

- ▶ *Assure no conflicts with freight rail operation or maintenance*
- ▶ *Safety of those working on or around ROW*

Lessons Learned

- ▶ Coordination: *Early and Often*
- ▶ Agreements: *Railroad 1st, Contractor 2nd*
- ▶ Property Access: *Railroads still require access on both sides*
- ▶ Utilities: *Follow BNSF utility accommodation policy to ensure expedition approvals*
- ▶ Approvals: *Pre-negotiated grade separation agreements – expedite individual projects*

Future Opportunities

- ▶ Coordination: *Early and Often*
- ▶ Agreements: *Railroad 1st, Contractor 2nd*
- ▶ Property Access: *Railroads still require access on both sides*
- ▶ Utilities: *Follow BNSF utility accommodation policy to ensure expedition approvals*
- ▶ Approvals: *Pre-negotiated grade separation agreements – expedite individual projects*
- ▶ Standard Plans: *Assure the latest and greatest versions (grade separation, standard plans, etc.)*

2017

FRA Rail Program Delivery

Meeting

Thank you!

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U.S. Department of Transportation
Federal Railroad Administration



Open Discussion / Q&A