

Approach to PTC Implementation by 2012 in LA Basin

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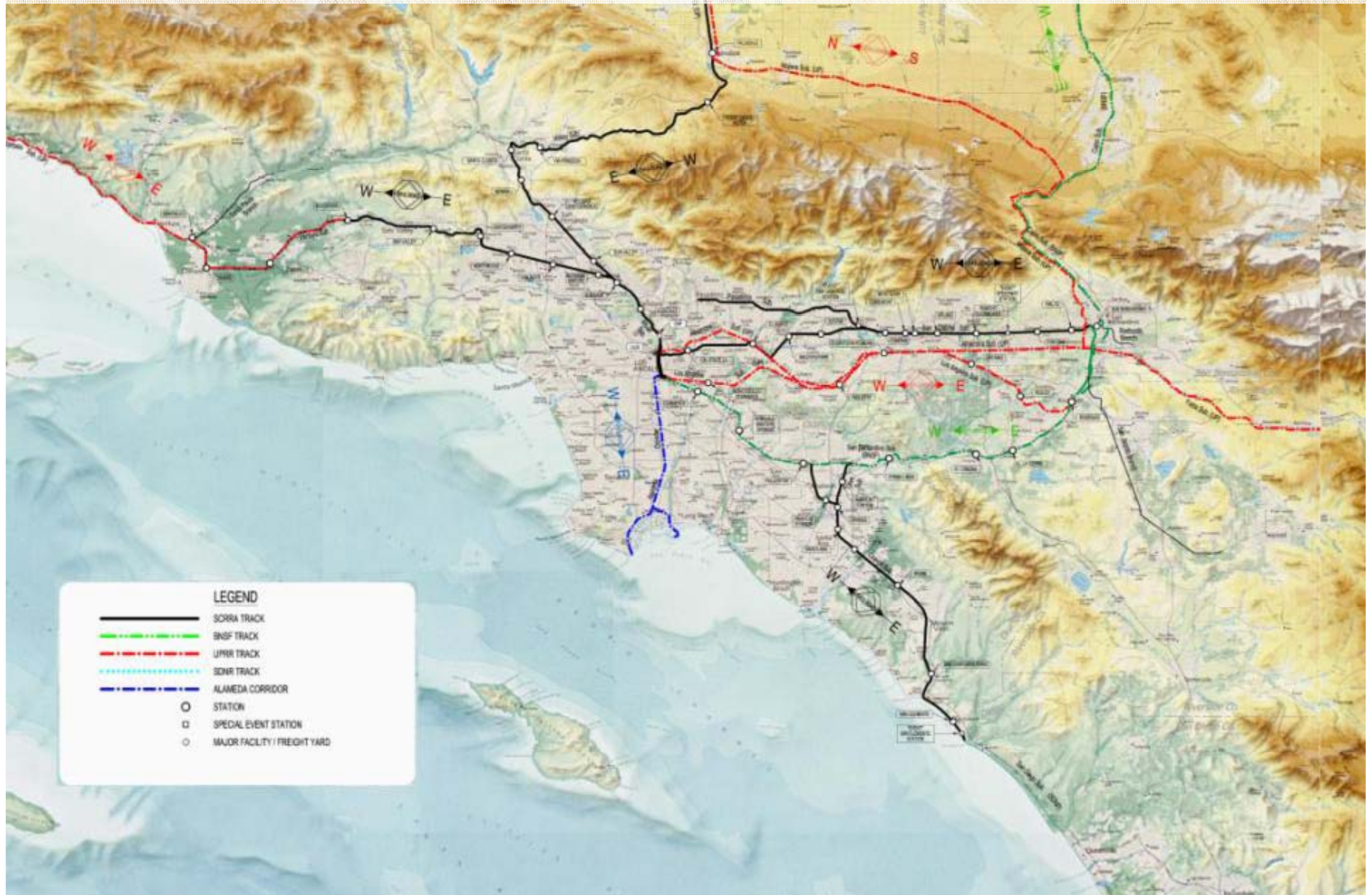
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Summary of Metrolink's Key Characteristics

- Property acquired from freight railroads 1990-1994
- 7 Routes, 55 Stations, 45,000 average daily riders
- 221 Route Miles maintained. Another 123 miles shared
- 331 Track Miles maintained. 180/150 double/single track
- 149 - Weekday Revenue Trains
- 500 - Daily Train Movements – Metrolink (revenue & non-revenue) Amtrak, and freight (UP and BNSF)



Southern California Rail Network



Metrolink's Train Control and Signal System

- Over 90 intermediate signal locations
- Over 90 Control Points
- 5 County Southern California communication network
 - Commercial telecommunication lease lines
 - Metrolink owned fiber, copper cable, wireless antennas
 - Voice & data transmissions
 - Microwave
- No longer supported computer aided train dispatching system
- 350 grade crossings – CWTD for train detection



Metrolink's Method of Operation

- 12 miles Dark - Track Warrant Control (TWC)
- 19 miles Automatic Block Signals (ABS) and TWC
- 296 miles Centralized Traffic Control (CTC)
- 32 miles Automatic Train Stop (ATS) & CTC



LA Basin PTC Characteristics

- BNSF/UPRR/Amtrak/Coaster Interoperability
- Dense mixed passenger and freight territories
- Numerous inter-railroad movements
- Complex multiple main tracks
- Very high use of wireless communication systems



LA Basin PTC Characteristics

- Numerous grade crossings
- Steep mountain grades
- Complex passenger terminals
- Main Track commuter turnback movements



SCRRA PTC - Project Execution Approach

- *Owner's Role* - Utilize SCRRA staff & existing on-call consultants & contractors working on an expedited basis:
 1. Perform initial assessments, scoping, cost estimates
 2. Develop high level PTC technical requirements
 3. Develop procurement documents – RFP
 4. Prepare PTC Implementation Plan



SCRRA PTC - Project Execution Approach

- *Owner's Role* - Utilize SCRRA staff & existing on-call consultants & contractors working on an expedited basis:
 5. Install wayside interface modules
 6. Standardize application programs, including enhancements such as limited tumbledown
 7. Procure 220 MHz spectrum



SCRRA PTC - Project Execution Approach

- *Owner's Role* - Utilize SCRRA staff & existing on-call consultants & contractors working on an expedited basis:
 8. Fitness for use study
 9. Harden Communications Backbone
 10. Perform up-front long lead items – system mapping, infrastructure validations
 11. Obtain grant funding and manage budget



SCRRA PTC - Project Execution Approach (cont.)

- *Contractor Vendor/Integrator VI's Role*
 1. PTC system development, engineering & *integration*
 2. Modify or add all PTC new assets -test & place in-service
 - Provide new train dispatch system with full PTC compatibility
 - Provide PTC Back Office Server (BOS)
 - Provide Vital Safety Server in Back Office
 - Install on-board equipment in locomotives & cab cars
 - Install PTC radios at signals & CP's
 - Provide PTC communication system
 3. Perform training of all SCRRA staff & contractors
 4. Provide spare part and warranties

SCRRA PTC Major Project Delivery Risks

1. Schedule compression - catching up to the same level of expertise as BNSF, UP.
2. Competition for specialized technical resources.
3. Quickly assembling and organizing the owner's team with the right mix of experience and expertise.
4. Quickly procuring a qualified Prime Contractor/Vendor /Integrator – VI
5. Funding - both amount and timing
6. Interoperability (ITC standards not available)



Interoperable Train Control (ITC) Group

- Big Four Freight Railroads Agree on PTC
- Union Pacific, BNSF, CSX, NS (1 vote each)
- Other Railroads Participating (Non-voting)
- PTC Interoperability Standards Established
- Intense Effort Involving 200 + RR Staff
- Most Standards Development is Confidential
- Final Standards Not Yet Issued
 - ITC Standards to AAR Then Become Public



Key Issues Arising From ITC

- Private Sector vs. Public Sector Issues
- Proprietary Product(s) in ITC Standards
- Utilization and Sharing of Radio Spectrum
- Standards for Passenger Trains
- Passenger Braking Algorithms
- Adopt Vital ITC PTC Standards ?
- Follow UPRR, BNSF or Hybrid Approach?
- Timing for Release of ITC/AAR Standards?



PTC Program Execution Approach

1. Establish Long Term Owner's PTC Team
2. Very Quickly Get Up to Speed on PTC
3. Rely Heavily on BNSF & UPRR Experience
4. Focus on Delivering "Core" PTC Functions
5. Procure a System Which is Expandable and Extendable in Capacity and Functionality



PTC Program Execution Approach (cont.)

6. Determine Realistic Capabilities of Vendors
7. Determine Optimum Roles & Responsibilities for Owner and Vendor(s)
8. Make Use Large Turnkey Vendor/Integrator
9. Deliver PTC at Same Pace as UPRR, BNSF



PTC Work Accomplished to Date

- Up-Front High Level Engineering & Contract Procurement Development (90% Complete)
 1. Mapping & Track Data Base (85%)
 2. Validate Signal & Train Control System (60%)
 3. Validate Communications System (50%)
 4. Radio Spectrum Determination (25%)



PTC Work Accomplished to Date (cont.)

- Up-Front High Level Engineering & Contract Procurement Development (90% Complete)
 5. Locomotive/Cab Car Modification Plan (75%)
 6. Implementation Plan & Product Intent (100%)
 7. PTC Vendor/Integrator Eval. Criteria (100%)
 8. PTC Advertise – Request For Proposal (100%)



Owner's Role & Responsibilities Related to Contract Procurement

- Perform Initial Assessments, Scoping, Cost Estimates
- Perform Select Up-front Engineering Tasks & Installs
- Act as “Lead” Contact With FRA and Railroads
- Develop “Right” Mix of Contracts, Contract Packaging
- Determine Key High Level PTC Delivery Path
- Coordinate existing capital projects
 - Siding Extensions
 - Crossing Improvements



Owner's Role & Responsibilities Related to Contract Procurement (cont.)

- Develop Large Turnkey PTC Vendor/Integrator (V/I) Request for Proposal (RFP) Contract Documents
- Support (Partner with) Vendor Integrator on Delivery
- Obtain Permits, Properties, Radio Spectrum
- Review in Detail all V/I Submittals, Submit to FRA
- Actively Support V/I Training Program
- Provide Access to Facilities on a Working Railroad



Vendor's Roles & Responsibilities

- Large PTC Turnkey Vendor-Integrator
 1. PTC System Development and Engineering
 2. Furnish & Install New Dispatch System and BOS
 3. Furnish & Install all On-Board PTC Equipment
 4. Furnish & Install PTC Radio Base Stations (Not Backhaul)
 5. Furnish & Install Roadway Worker EIC Laptops



Vendor's Roles & Responsibilities (cont.)

- Large PTC Turnkey Vendor-Integrator
 1. Provide all FRA Required Safety Plans
 2. Perform PTC System Integration, Testing and Training
 3. Provide Spare Parts, Warranties
 4. Perform Project Management and Project Control
 5. Potentially Maintain the Installed PTC System



Vendor's Roles & Responsibilities

- Other Smaller PTC Vendors and Installers
 - Install Signal System Wayside Interface Radios and Antennas
 - Design & Construct New Train Control & Dispatch Building at Pomona
 - Expansion and Improvements to Line Haul Communication Network
 - Possibly Make Space Modifications to Locomotives and Cab Cars



Procurement Issues

PTC Vendor/Integrator RFP Contract

1. Not Routine Contract
2. Advertised as Competitive Negotiated Procurement (RFP)
3. All Final PTC Specifications Not Available
4. Limited Pool of Qualified Vendor/Integrators
5. First Large PTC Public Agency Solicitation
6. PTC Technology Not Mature
7. System Engr. & Integration



LA BASIN PTC TARGET 2012

- ✓ Comprehensive Survey Grade Mapping
 - ✓ PTC Module Installation
 - ✓ Operations Analysis
 - ✓ Create Workspace in Operations Center
 - ✓ Procure 220 MHz Spectrum
 - ✓ File PTCIP
- Improve Communications Backhaul
Award System Procurement and Installation
Contract



QUESTIONS

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