CVSRN-Central Valley Spatial Reference Network

- Pilot Project
- Build-out
- Monument Styles
- Communication/Telemetry
- Project Update

Presenter: Darrell Bain, Caltrans
CVSRN - Central Valley Spatial Reference Network Pilot Project

14 stations
8-PBO
5-Caltrans
1-3rd Party
Build-Out

- 39 total stations
- Includes 5 counties
Monument styles

Caltrans Monument design is a “modified” NGS Specification.

Extended the pillar 10 feet above ground to minimize multi-path and open up sky view.

20 foot fiberglass “rebar” rather than 8 feet.

The height gave us added security!
Example:
Monument Style

PBO
Communication

bol Hard-wired into Caltrans Backbone Network
bol Radio telemetry into POE (point of entry)
Telemetry

1. GPS ANTENNA
2. RECEIVER
+ 3. RADIO
4. RADIO ANTENNA

1. RADIO ANTENNA
2. RADIO
3. CONVERTER
4. CALTRANS NETWORK
Field Testing

1. Telemetry lines should avoid populated areas
2. Get highest elevation
Field Testing

with WiLAN Radio and Parabolic Antenna

30 miles
1. Signal strength
2. Radio traffic - noise
Caltrans site example:
PBO site example:
Data connectivity to CT backbone

Reference Station → Connectivity Example 1 → Internet → Connectivity Example 2
→ Reference Station

Connectivity Example 3 → Reference Station

Caltrans Network → Firewall → Caltrans Network

Point of Entry
CVSRN Update

Progress
Market Analysis
Software
Partnering Developments
Pilot Project
What’s next?

Giana “Gigi” Cardoza, PLS
April 30, 2007
Central Valley Spatial Reference Network (CVSRN)

The California Department of Transportation’s Central Region is moving forward with the planning and building of a scalable regional spatial network that will have Real Time Kinematic Network (RTKN) capabilities. The CVSRN will be comprised of Global Positioning System (GPS) stations that are permanently in place and operate continuously. The data from this network will be used for post processing as well as instantaneous real time processing.
CVSRN 2 years ago

- Permitted 4 PBO sites within Pilot project area.
- Processing Permits for 3 additional PBO Sites (2 of which are part of the Pilot Project).
- 5 Locations had been sited at existing Caltrans Maintenance Stations.
- 1 Site had been located at the Reedley Municipal Airport – Permit in progress
- 1 remote station was sited along Route 145.
Progress - 2 years later

- Permitted 9 PBO sites, 6 being within Pilot Project
- Partnering with USBR, added an additional station
- Built 5 Caltrans Permanent GPS stations on CT facilities or within R/W
- Completed agreement and construction of a CT station with the City of Reedley. Reedley Airport site.
- Completed agreement with the City of Porterville and PBO, incorporating Porterville airport site into network
Network encompasses 7500 Sq. Mi. and 1053 Highway miles
Progress cont’d
Software – Market Analysis

- July 2006-RFI
- 5 Vendor Responses
  - Trimble
  - Leica
  - Geodetics Inc.
  - Topcon
  - Eagle Point

Request For Information

CGPS / RTK Network Software
For The State of California Department of Transportation - Central Region
Fresno, CA

Introduction
The State of California Department of Transportation, CalTrans, is issuing this Request for Information (RFI) to gain detailed information on installation, operation, training, IT requirements, maintenance and cost of a network of survey grade Continuous Dual Tracking System (CGPS) reference stations and a network of reference network (RTKM).

This is NOT A SOLICITATION for the sale of products and/or services and no award will result.

Any information submitted will be used solely for the purpose of developing product budgets and the acquisition of the necessary products and services. CalTrans Information is not be disclosed to any other party in the future. All information will be stored on a secure database.

The State reserves the right to contact respondents for additional information as it sees fit and to issue additional RFIs.

Inquiries regarding the information gathering process, the submission of general or specific information, including the need for any information from CalTrans staff, and any other questions shall be submitted in writing to:

Central Office, P.O. Box 133
1000 North Market Street
Fresno, CA 93724

Email: BTSCentralRegion@ct.ca.gov

Office: 559-445-8200
Fax: 559-445-8205

July 11, 2006
This was done at no cost to the State

Market Analysis

- Written Response to RFI
- Vendor Installation
- 30 day evaluation period
  - IT DMZ security
  - Network operation and monitoring
- Field Surveys
- GIS applications
- Vendor support and training
Software Procurement

- Approved FSR
- Secured COS software funding
- Market Analysis enabled determination of software specifications to meet our needs
- SOW-Scope of Work
- ITPP-Information Technology Procurement plan
- CMAS procurement process
- Working closely with DPAC and HQ OLS
Potential partnering developments

- PG&E
- CA. State Dept. of Water Resources
- Districts 11,7,8

(All dependent on developing a satisfactory business models for data sharing.)
What’s left to complete the Pilot Project

- Telemetry/Radio Solutions
  - ALTHEA, P300 + Repeater $8000
  - RAPT, CORO+Blue Ridge Repeater $25,000
  - P056
  - 1 GPS Receiver & Antenna $25,000

Total $58,000

- Software Procurement/Installation Funded
Goals

- Complete Pilot Project Telemetry
- Implement Pilot Project June 30, 2007
- Begin Tracking Pilot Project results
- Foster partnerships for build-out opportunities and load sharing
  - PG&E → DWR → Local Cities & Counties
  - Explore Project funded station installation → Machine Guidance
- Develop Business Models
- 1 year pilot project analysis report
Central Valley Spatial Reference Network (CVSRN)

2 years ago the concept was born...

Today- 9 stations streaming...

2 months from now....a fully functional 14 station Pilot Network...

The first Caltrans Real-time GPS network in the State!

Questions?