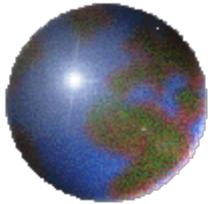


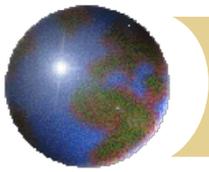
# *3D/4D Modeling and Visualization*



*Caltrans*

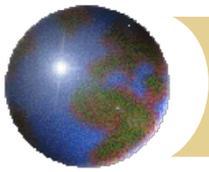


*Surveys*



## *3D/4D/BIM*

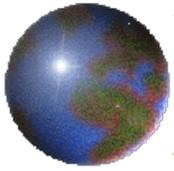
- ❖ Land Surveyors within Caltrans Embrace Innovation
- ❖ The Implementation of Innovative Approaches and Technologies has Increased Productivity and Safety of the Staff
- ❖ The Implementation of Innovation is Aided by Research Projects



# *3D/4D/BIM*

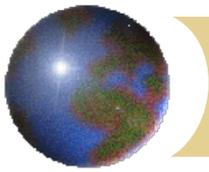
## Research Projects - OLS

- ✚ Stationary Laser Scanning
- ✚ Field Use Training on 3D Laser Scanning on Caltrans Projects
- ✚ Evaluating Mobile laser scanning
- ✚ Airborne GPS Photogrammetry



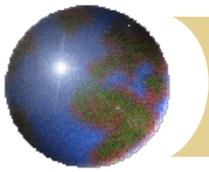
# *3D/4D Modeling and Visualization*

*The Future is Here Today*



# *3D/4D Modeling and Visualization and Building Information Modeling*

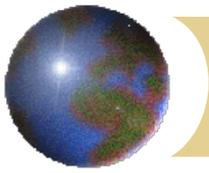
BIM is the process of generating and managing data during a project's life cycle. Typically it uses three-dimensional data related to a time component (4D) as well as other geospatial data to increase productivity during design and construction. The process produces a model, which encompasses project geometry, spatial relationships, geographic information, quantities, and properties of project components.



# *3D/4D/BIM*

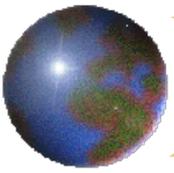
## Core Value: Innovation

- ✚ Terrestrial Laser Scanning
- ✚ Mobile Laser Scanning
- ✚ Automated Machine Guidance Systems



# *Stationary Laser Scanner*





## Chevron Pipes

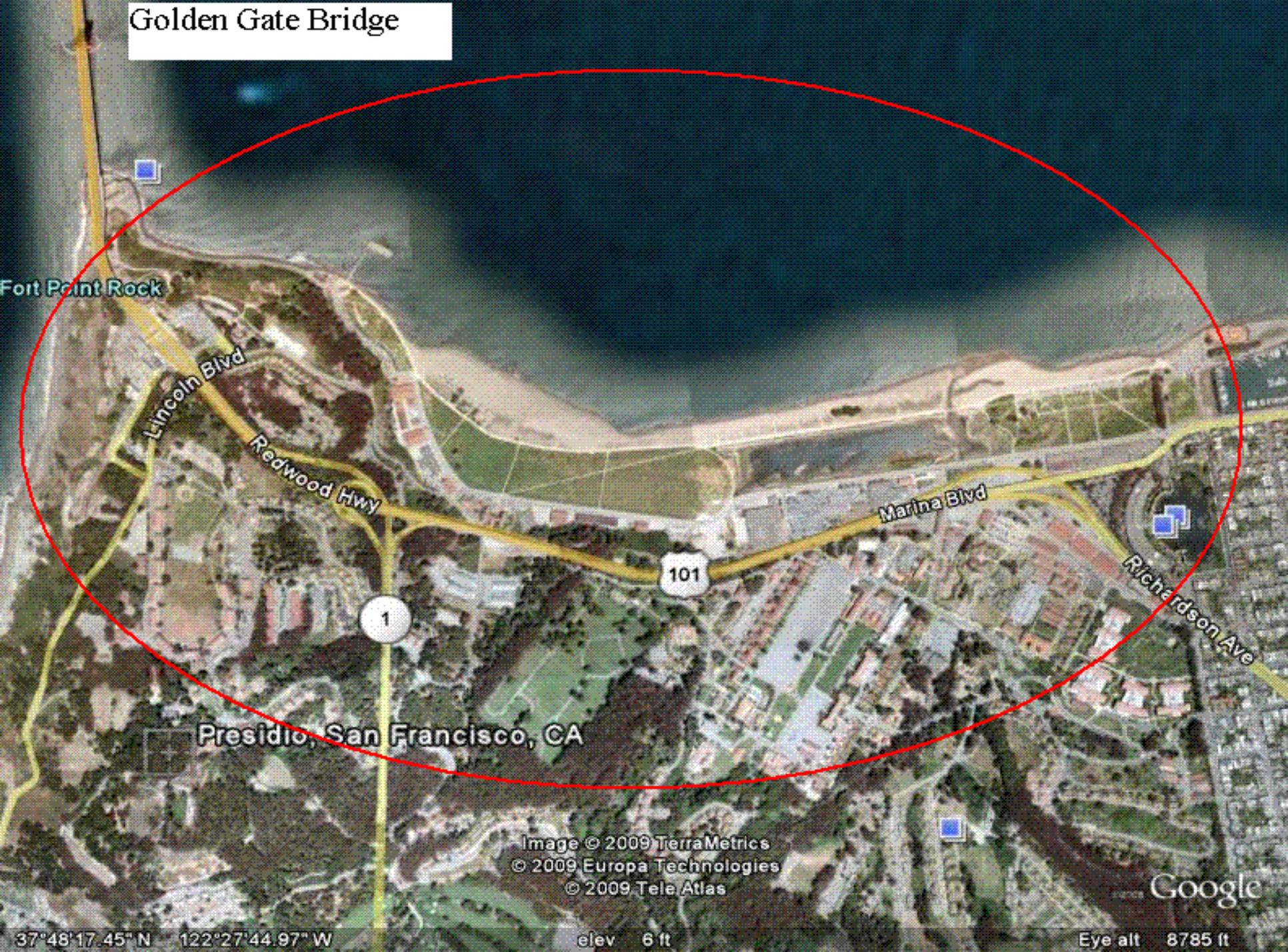


LYNX  
MOBILE MAPPER

WHPacific

LYNX  
MOBILE MAPPER

# Golden Gate Bridge



Fort Point Rock

Lincoln Blvd

Redwood Hwy

Marina Blvd

Richardson Ave

1

101

Presidio, San Francisco, CA

Image © 2009 TerraMetrics  
© 2009 Europa Technologies  
© 2009 Tele Atlas

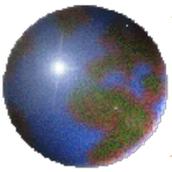
Google

37°48'17.45" N 122°27'44.97" W

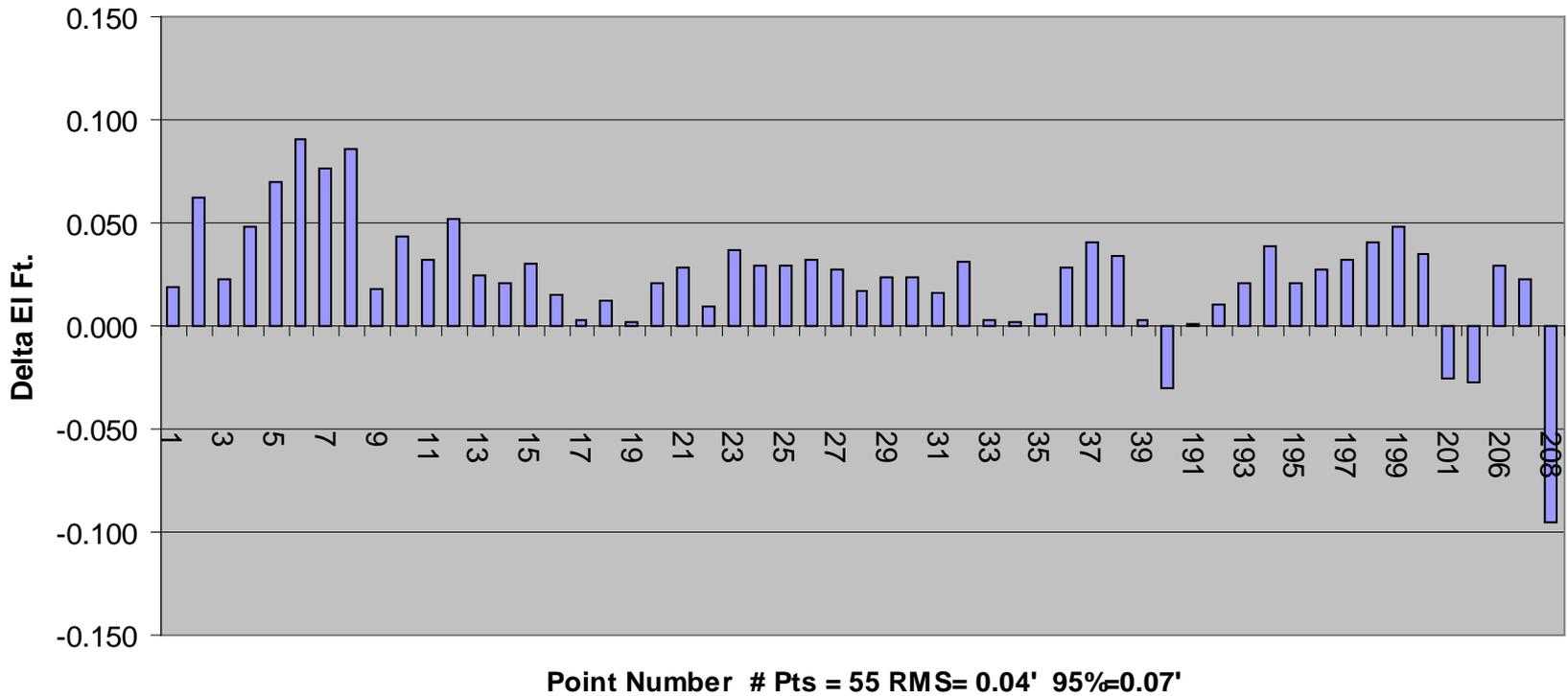
elev 6 ft

Eye alt 8785 ft



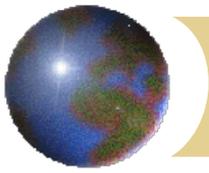


### WH Pacific Mobile Data Comparison CK Pt.-DTM



Cost/Benefit Analysis

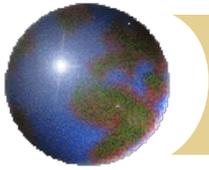
Guidelines



# *Building Information Modeling*

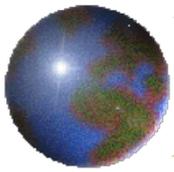
✚ Example 1

✚ Example 2



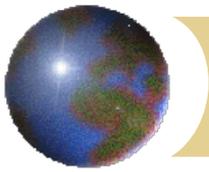
## *3D/4D/BIM Benefits*

- ✚ Constructability Review
- ✚ Quantity Tracking
- ✚ As-built Documentation
- ✚ Public Relations – Animations
- ✚ Schedule Optimization
- ✚ Improved Change Management
- ✚ Clash Detection



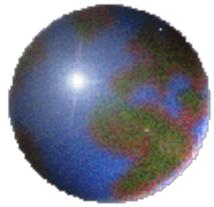
# *Machine Guidance*





## *Growing Pains with Implementing Innovative Technologies*

- ✚ Qualified Personnel
- ✚ Training
- ✚ Standards and Specifications
- ✚ Computing Power
- ✚ Computer Storage
- ✚ Customer Products



# *Questions*