Caltrans District 11
Cultural Resource Management
Current and Future GIS Use

Michelle Blake and Koji Tsunoda
California Department of Transportation District 11
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Goals of this presentation

-Present how Caltrans utilizes ArcGIS in the field of Cultural Resource Management

-Share Caltrans’ experiences in using ArcGIS with other practitioners

-Obtain feedback for our future improvements
Limitations of this presentation

- Details on cultural resources are confidential
- Figures and exhibits may not be accurate
- Focus on results vs. focus on methods
Caltrans Mission
Provide a safe, sustainable, integrated and efficient transportation system to enhance California’s economy and livability

Caltrans Vision
A performance-driven, transparent and accountable organization that values its people, resources and partners, and meets new challenges through leadership, innovation and teamwork
Caltrans Goals and Values

Of the 9 Goals and Values...

**Stewardship and Efficiency**

Money counts. Responsibly manage California’s transportation-related assets.

**Innovation**

We are empowered to seek creative solutions and take intelligent risks.
Where we fit in:

Project Analysis
Cultural Resource Studies Branch
Caltrans D11
Archaeologists’ Responsibilities

- identify cultural resources and analyze projects impacts
- stewardship of resources within state road right-of-way and Caltrans-owned property
<table>
<thead>
<tr>
<th></th>
<th>Past</th>
<th>Present</th>
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<tbody>
<tr>
<td>Agency’s Mission / Vision</td>
<td>Caltrans improves mobility across California</td>
<td>Provide a safe, <strong>sustainable</strong>, integrated and <strong>efficient</strong> transportation system to enhance California’s economy and livability</td>
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<td></td>
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<td>A performance-driven, transparent and accountable organization that values its people, resources and partners, and meets new challenges through leadership, <strong>innovation</strong> and teamwork</td>
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<tr>
<td># of projects/ year</td>
<td>Smaller quantity</td>
<td>Larger quantity</td>
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<tr>
<td>Types of projects</td>
<td>New roads</td>
<td>Maintenance of existing roads, realignments</td>
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<tr>
<td>Schedule lengths</td>
<td>Longer</td>
<td>Quicker</td>
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<tr>
<td># Cultural Resource Staff</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Staff responsibilities</td>
<td>Staff familiar with a couple routes</td>
<td>Staff share all the routes</td>
</tr>
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Efficiency

GIS is a big part of our branch’s efficiency and innovation

Enables:
- Easy data input
- Quick access to resource information
- Information organization
Traditional GIS Use in Cultural Resource Management

“X” Marks the Spot

Map production for reports
Caltrans District 11

While not GIS experts, Caltrans Cultural Resource Staff go beyond traditional GIS uses in CRM

The following four case studies illustrate:
1. historic landscape reconstruction
2. historic survey reconstruction
3. historic district visual impact analysis
4. agency-wide resource database
Case Study #1

Reconstruction of Historic Landscape
Situation

1. Caltrans proposes to construct a sound wall for noise abatement

2. A known cultural resource is present at the proposed sound wall location

3. Development occurred in the past (cultural resource destroyed?)

4. Concerns over the resource (it may be still there, but how do we know?)
Methods

1. Obtained the current elevations (Post-development)
2. Obtained the past elevations (Pre-development)
3. Obtained the cultural resource data
4. Obtained the sound wall design
5. Compared in ArcGIS
Results of Comparison

Sound Wall Limits

- Current Grade (1999)
- Approximate SW Depth
- Original Grade (1985)

Recorded Site Boundary
Results

The proposed sound wall is within fill material.

The original ground was graded to prepare for fill material.

Therefore, the proposed sound wall is less likely to impact the archaeological deposit originally identified at the project site.
Case Study #2
Re-construction of Historic Survey
Rancho Jamacha
Situation

1. Caltrans is trying to identify historical resources as required under PRC Section 5024

2. It has been suspected that the old Rancho Jamacha house was located in the vicinity

3. Several cultural resource investigations were conducted but no one relocated the house to date

4. According to the previous research, the house was already a ruin in 1885
Methods

1. Obtained historic survey records

2. Calculated directions and distances

3. From a known point, the survey results were backtracked to pin-point the location of the Old Rancho Jamacha house in ArcGIS
1872 Survey

San Diego County Old Survey #4 Map

The map shows the location of Jamacha House to the north of a stream within Section 35.

San Diego County Old Survey #4 Field Notes

“Begin this survey by setting stake marked No. 1 50 links northerly from the old Jamacha House”

Stake No. 7
“at 3 chains cross gully culvert required.
12.40 station from which corner to secs 26, 27, 34, & 35, T.16S – R1W bears S0 ½ E distant 8.70 chains”
Survey Measurements

1 chain = 66 feet = 100 links

1 link = 7.92 inches

Backtracking Direction

Backtracking direction = direction + 180
Results
Potential Application for Future Research

Reconstructed route avoids archaeological sites

An unidentified dirt road leads to an archaeological site
Case Study #3

Visual Impact Analysis
Cabrillo Freeway Historic District
Situation

1. Caltrans is analyzing potential impacts to a built environment resource

2. It was pointed out that the proposed project may have visual (indirect) impacts to the resource. Project locations are outside of the Historic District, but they may be visible.

3. Adverse effects to historic properties need to be avoided.
Methods

1. Established boundaries of the historic property

2. Mapped the project locations

3. Performed viewshed analysis to determine if locations are visible from the historic district

→ “If you cannot see me, I cannot see you”
Viewshed Analysis

Instead of performing viewshed from the Historic District, we performed viewshed from project locations.

But.....
Are these results really true?
Always check the validity of the results
Case Study #4

Caltrans Cultural Resource Database "CCRD" – GIS / Database Integration
Situation

1. Caltrans is the steward of historical resources on Caltrans property

2. Caltrans inventories historical resources as required under PRC Section 5024

3. Caltrans needs to efficiently manage these resources
Methods
Summary of Case Studies

1. Reconstruction of an historic landscape
2. Reconstruction of an historic survey
3. Visual Impact Analysis of an historic district
4. Caltrans Cultural Resource Database
Potential Future of Caltrans CRM GIS Use

1. Integration of GPR / LiDAR into GIS
2. State-wide eGIS implementation
3. Mobile GIS
4. And much more.....
Conclusions

Caltrans uses GIS and will continue to use GIS:
- enables efficiency
- improves resource management accuracy
- reliable agency-wide database

You do not have to be a GIS expert to perform specialized analysis.

Mission:
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Vision:
A performance-driven, transparent and accountable organization that values its people, resources and partners, and meets new challenges through leadership, innovation and teamwork.
Thank you!

ESRI
Caltrans Cultural Studies Office
Caltrans District 11 Environmental
Caltrans Public Information Office

Contact:
Michelle Blake  michelle_blake@dot.ca.dot
Koji Tsunoda   koji_tsunoda@dot.ca.dot