

GIS Community of Practice Monthly Forum

Last Wednesday of the month

Wednesday, August 28th , 2024
1:30 – 2:30 PM



California
DEPARTMENT OF TECHNOLOGY
STRATEGY INNOVATION DELIVERY



GIS Community of Practice (CoP)

- Welcome to the GIS CoP forum.
- For the best experience, please use your computer to join the meeting.
- Mute your audio.
- Turn off your video unless you're presenting or in active discussion.
- Use the raise hand button or the meeting chat for comments and questions.
- We will begin shortly.

GIS CoP Agenda

Welcome

- Lothar Petrik, State of CA GIO

Main Topics

- Louie Rowley (louie.rowley@state.ca.gov), Michael Andrade (michael.andrade@state.ca.gov), Middle Mile Broadband Initiative- "Accessibility Challenges Middle-Mile Broadband Initiative (MMBI) with Data and GIS."
- Aaron Ott (aaron.ott@dot.ca.gov), Supervising Transp Surveyor, Caltrans- "CaRS Road Network and SDI"

Announcements

- Lothar Petrik – Geoportal feedback: ODSdataservices@state.ca.gov
- Cost-sharing opportunity from USGS for LiDAR and 3D Hydrography acquisition.
Jane Schafer-Kramer (jane.schafer-kramer@water.ca.gov)
<https://www.usgs.gov/3d-national-topography-model/data-collaboration-announcement-portal>
- Open to participants – (Job openings, events, looking for assistance)

Conferences/ Events

Accessibility Challenges Middle-Mile Broadband Initiative (MMBI) with Data and GIS



MMBI Program Oversight and Support

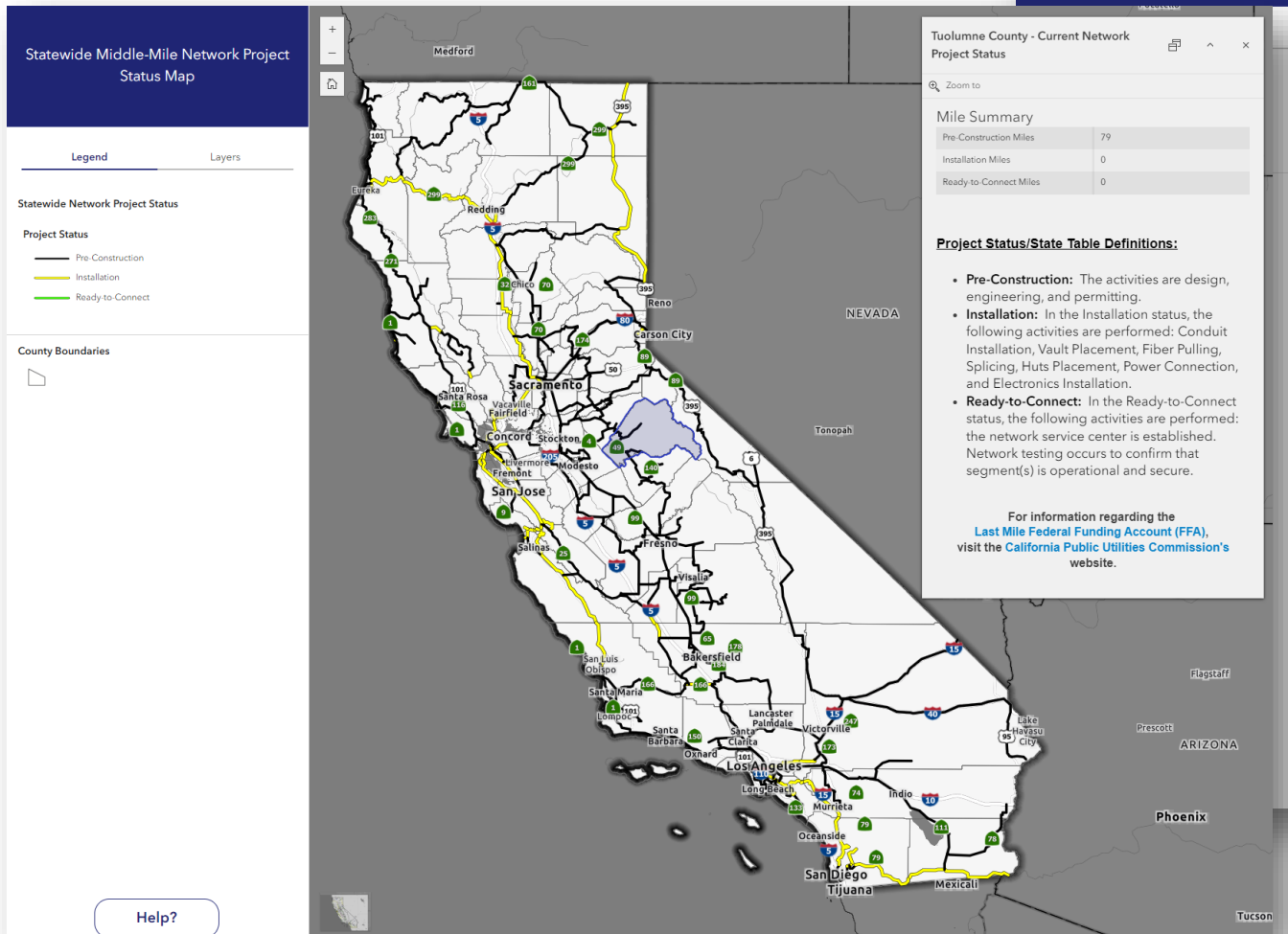
- CDT and the Office of Broadband and Digital Literacy is overseeing the acquisition and management of contracts for the development, construction, maintenance, and operation of the broadband network.
- The MMBI Data & GIS Team plays a critical role in this endeavor and provides many services that support the Middle-Mile Broadband Initiative.
 - Provide transparency to California residents through maps and web applications.
 - Provide day-to-day support for decision makers.
 - Provide consistent results that adhere to best practices and standards.
 - Provide oversight of accessibility (Government Code Sections 7405 and 11135, and the Web Content Accessibility Guidelines 2.0) as an example.



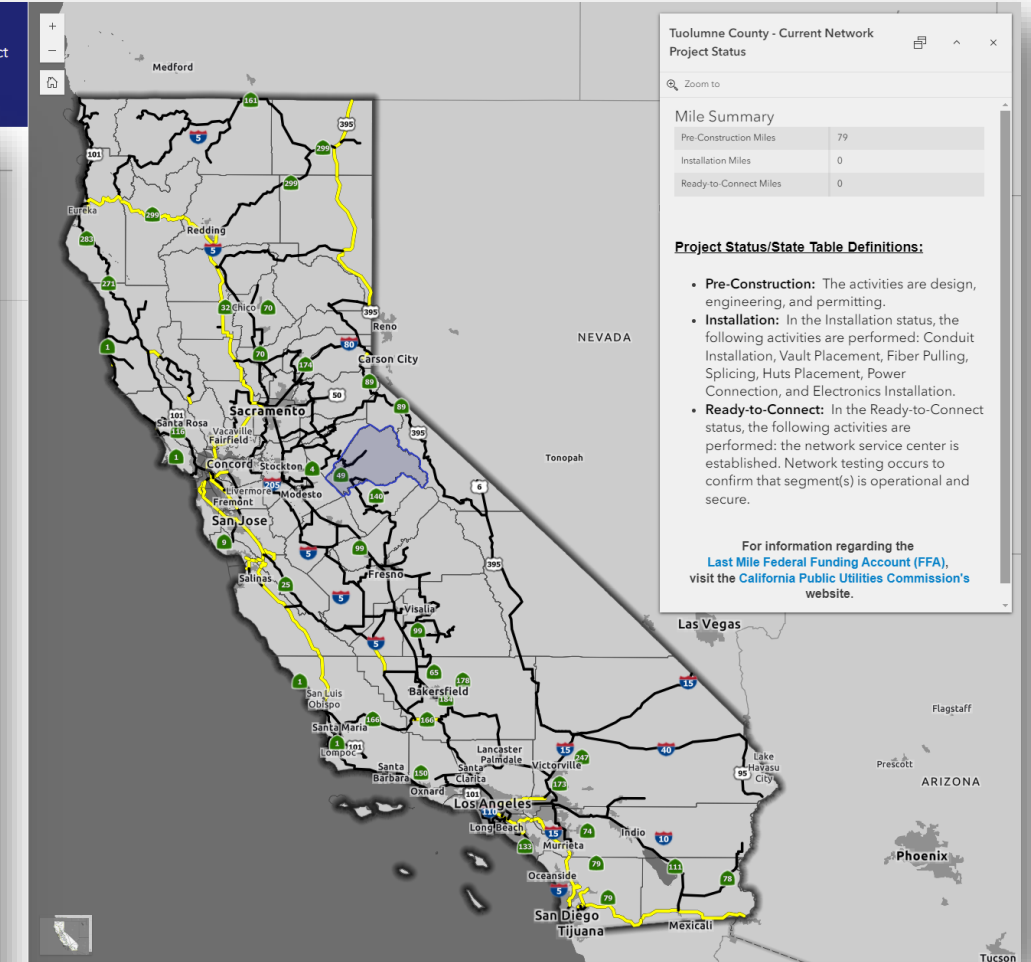
Quick Look at Products

Middle-Mile Broadband Network Public Web Applications

Default version of the Project Status Map



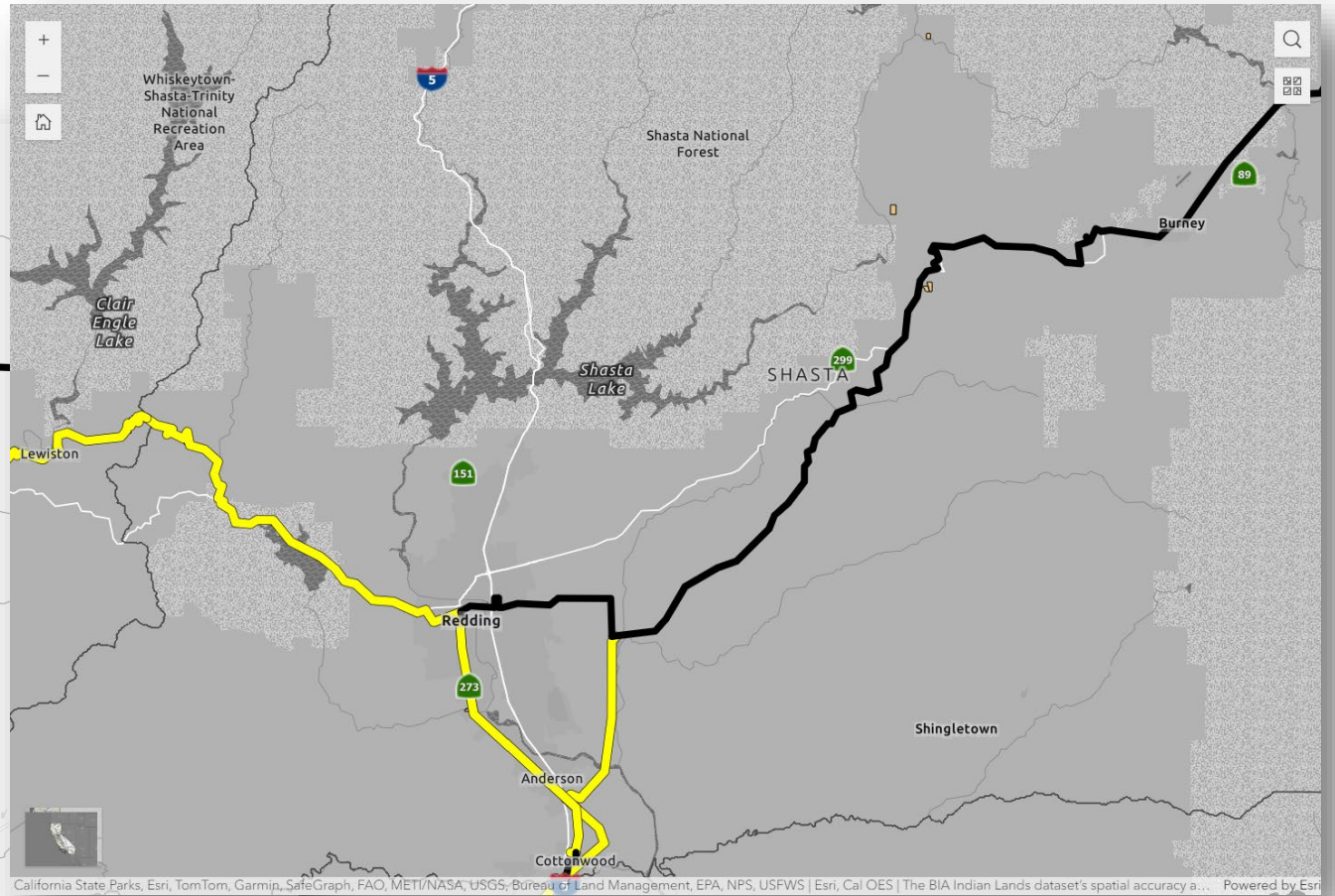
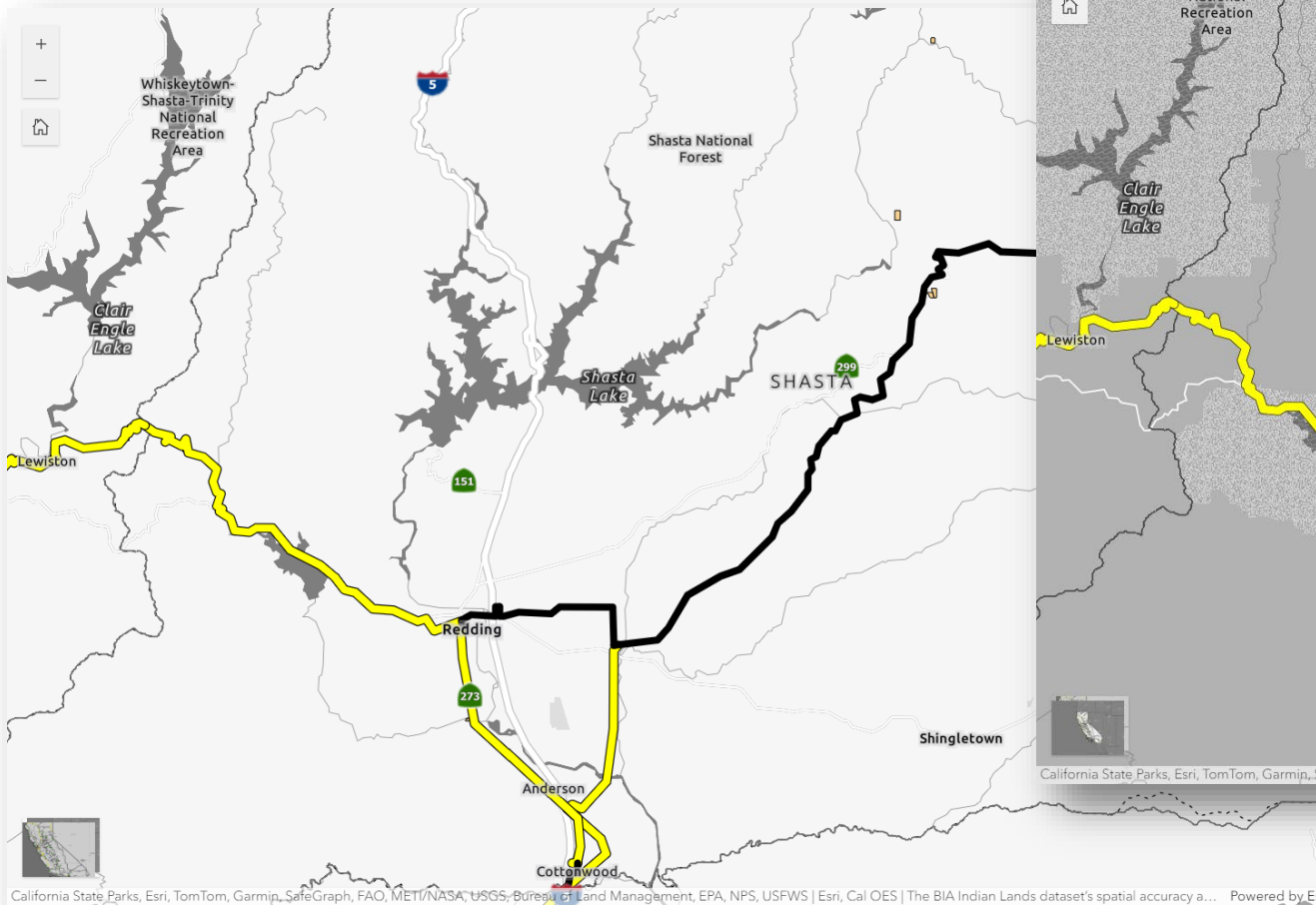
Statewide Middle-Mile Network Project Status Map



Accessible version of the Project Status Map

Public Web Applications - Basemap

Light Gray Canvas Basemap



Adapted Accessible Basemap Gray version

Public Web Applications – Tabular Format & Static Maps

Official website of the State of California California Department of Technology

CALIFORNIA ALL Middle-Mile Broadband Initiative

What's New | FAQs | Statewide Network Map | Resources | Meetings | Contact & Comment

Installation Miles by County

Table Description:

- Pre-Construction: The activities are design, engineering, and permitting.
- Installation: In the Installation status, the following activities are performed: Conduit Installation, Vault Placement, Fiber Pulling, Splicing, Huts Placement, Power Connection, and Electronics Installation.
- Ready-to-Connect: In the Ready-to-Connect status, the following activities are performed: the network service center is established. Network testing occurs to confirm that segment(s) is operational and secure.
- Total: Total network miles.

County	Pre-Construction	Installation	Ready-to-Connect	Total
Alameda	125 Miles	37 Miles	0 Mile	162 Miles
Alpine	44 Miles	0 Mile	0 Mile	44 Miles
Amador	107 Miles	0 Mile	0 Mile	107 Miles
Butte	155 Miles	0 Mile	0 Mile	155 Miles
Calaveras	125 Miles	0 Mile	0 Mile	125 Miles
Colusa	23 Miles	40 Miles	0 Mile	63 Miles
Yuba	65 Miles	36 Miles	0 Mile	101 Miles
Yuba	47 Miles	0 Mile	0 Mile	47 Miles
Grand Total	9,354 Miles	1,205 Miles	0 Mile	10,559 Miles

Statewide Network Project Status

- Pre-Construction
- Installation
- Ready-to-Connect
- County Boundary

100 Miles

Project Status Map

Legend Guide:

- Black lines: Pre-Construction
- Yellow lines: Installation
- Green lines: Ready-to-Connect
- Outline in grey box: County Boundaries

How Do We Do It?



Application Accessibility



Goal: State website accessibility



Challenge: Map is visual; interactive content may not be accessible



Current solution: Web page with text description with link(s) to interactive app



Standards: All our products have an eye on the web accessibility to the best of the tool



Official website of the State of California

California Department of Technology



Middle-Mile Broadband Initiative

[What's New](#) [FAQs](#) [Statewide Network Map](#) [Resources](#) [Meetings](#) [Contact & Comment](#)

Statewide Middle-Mile Network Map

[Interactive Network Map](#) [Network Development](#)

[Home](#) > [Statewide Network Map](#)

Track Your Build: Project Status Map

The [Project Status](#) Map visualizes the current progress of network route miles across various statuses: Pre-Construction, Installation, and Ready-to-Connect. If you're specifically interested in when the Middle-Mile will be available in your area, explore the map and click on a county. This action will highlight the statuses at which those miles are currently being installed. A pop-up box will also appear, offering further details about the county.

For a more detailed breakdown, refer to the chart below, which outlines each county's installation miles (pre-construction, installation, and ready-to-connect).

Further information regarding Joint Build, Lease, and Purchase details can be found on the [Network Development](#) page.



Accessibility: Color Contrast

Internal MMBI Status of Construction application

The image shows a screenshot of the 'MMBI Status of Construction' application. The application has a blue header with the title and a navigation bar with tabs for 'Statewide', 'Assembly Districts', and 'Caltrans Districts'. A list of counties is visible on the left, including Alameda, Alpine, Amador, Butte, Calaveras, Colusa, Contra Costa, Del Norte, El Dorado, Fresno, and Glenn. The main content area displays construction statistics: 'Lease / Purchase' (302.40), 'Joint Build' (225.31), 'Construction' (36.75), 'Pre-Construction Miles' (40.34), 'Under Construction Miles' (0.00), and 'Ready-to-Connect Miles' (0.00). Three 'Accessible Web Contrast Checker' windows are overlaid on the application, each showing a different color pair and its contrast ratio. The first window shows a black foreground on an orange background (#f9b860) with a 12.05:1 ratio. The second window shows a black foreground on a light green background (#e9f273) with a 17.41:1 ratio. The third window shows a black foreground on a light blue background (#acd3ff) with a 13.52:1 ratio. Each window also displays 'WCAG Conformance Results' for Small Text, Large Text, and UI Component, all of which are marked as 'Pass' for both AA and AAA levels. A green-bordered box at the bottom of the image summarizes the conformance results for three different color pairs, all showing 'AA: Pass' and 'AAA: Pass' for Small Text, Large Text, and UI Component.

Color Pair	Contrast Ratio	Small Text	Large Text	UI Component
Black / Orange (#f9b860)	12.05:1	AA: Pass AAA: Pass	AA: Pass AAA: Pass	AA: Pass AAA: Pass
Black / Light Green (#e9f273)	17.41:1	AA: Pass AAA: Pass	AA: Pass AAA: Pass	AA: Pass AAA: Pass
Black / Light Blue (#acd3ff)	13.52:1	AA: Pass AAA: Pass	AA: Pass AAA: Pass	AA: Pass AAA: Pass

Accessibility: HTML Tables

HTML

```

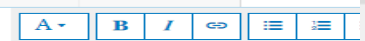
1 <style> table { font-family: arial, sans-serif; border-collapse: collapse; width: 100%; } td, th { border: 1px solid #dddddd; text-align: left; padding: 5px; }
</style> <table border="1" style="width: 100%; border-collapse: collapse;">
<thead>
<tr>
<th style="color: #ffffff;">County Name
<th style="color: #ffffff;">Pre-Construction
<th style="color: #ffffff;">Installation
<th style="color: #ffffff;">Ready-to-Connect
<th style="color: #ffffff;">Total
</tr>
</thead>
<tbody>
<tr>
<td>Alameda
<td>59 Miles
<td>45 Miles
<td>0 Miles
<td>104 Miles
</tr>
<tr>
<td>Alpine
<td>44 Miles
<td>0 Miles
<td>0 Miles
<td>44 Miles
</tr>
<tr>
<td>Amador
<td>107 Miles
<td>0 Miles
<td>0 Miles
<td>107 Miles
</tr>
<tr>
<td>Butte
<td>104 Miles
<td>0 Miles
<td>0 Miles
<td>104 Miles
</tr>
<tr>
<td>Calaveras
<td>104 Miles
<td>0 Miles
<td>0 Miles
<td>104 Miles
</tr>
<tr>
<td>Colusa
<td>4 Miles
<td>40 Miles
<td>0 Miles
<td>44 Miles
</tr>
<tr>
<td>Contra Costa
<td>68 Miles
<td>26 Miles
<td>0 Miles
<td>94 Miles
</tr>
<tr>
<td>Del Norte
<td>66 Miles
<td>0 Miles
<td>0 Miles
<td>66 Miles
</tr>
<tr>
<td>El Dorado
<td>113 Miles
<td>0 Miles
<td>0 Miles
<td>113 Miles
</tr>
<tr>
<td>Fresno
<td>292 Miles
<td>0 Miles
<td>0 Miles
<td>292 Miles
</tr>
<tr>
<td>Glenn
<td>15 Miles
<td>34 Miles
<td>0 Miles
<td>49 Miles
</tr>
<tr>
<td>Humboldt
<td>187 Miles
<td>0 Miles
<td>0 Miles
<td>187 Miles
</tr>
<tr>
<td>Inyo
<td>147 Miles
<td>0 Miles
<td>0 Miles
<td>147 Miles
</tr>
<tr>
<td>Kern
<td>411 Miles
<td>36 Miles
<td>0 Miles
<td>447 Miles
</tr>
<tr>
<td>Lassen
<td>69 Miles
<td>130 Miles
<td>0 Miles
<td>199 Miles
</tr>
<tr>
<td>Mariposa
<td>91 Miles
<td>0 Miles
<td>0 Miles
<td>91 Miles
</tr>
<tr>
<td>Mendocino
<td>242 Miles
<td>0 Miles
<td>0 Miles
<td>242 Miles
</tr>
<tr>
<td>Modoc
<td>110 Miles
<td>61 Miles
<td>0 Miles
<td>171 Miles
</tr>
<tr>
<td>Mono
<td>184 Miles
<td>0 Miles
<td>0 Miles
<td>184 Miles
</tr>
<tr>
<td>Napa
<td>0 Miles
<td>18 Miles
<td>0 Miles
<td>18 Miles
</tr>
<tr>
<td>Nevada
<td>76 Miles
<td>0 Miles
<td>0 Miles
<td>76 Miles
</tr>
<tr>
<td>Plumas
<td>57 Miles
<td>0 Miles
<td>0 Miles
<td>57 Miles
</tr>
<tr>
<td>Riverside
<td>167 Miles
<td>0 Miles
<td>0 Miles
<td>167 Miles
</tr>
<tr>
<td>San Benito
<td>73 Miles
<td>15 Miles
<td>0 Miles
<td>88 Miles
</tr>
<tr>
<td>San Bernardino
<td>189 Miles
<td>0 Miles
<td>0 Miles
<td>189 Miles
</tr>
<tr>
<td>San Francisco
<td>3 Miles
<td>16 Miles
<td>0 Miles
<td>19 Miles
</tr>
<tr>
<td>San Joaquin
<td>156 Miles
<td>0 Miles
<td>0 Miles
<td>156 Miles
</tr>
<tr>
<td>San Mateo
<td>2 Miles
<td>32 Miles
<td>0 Miles
<td>34 Miles
</tr>
<tr>
<td>Santa Clara
<td>43 Miles
<td>79 Miles
<td>0 Miles
<td>122 Miles
</tr>
<tr>
<td>Shasta
<td>89 Miles
<td>58 Miles
<td>0 Miles
<td>147 Miles
</tr>
<tr>
<td>Sierra
<td>29 Miles
<td>3 Miles
<td>0 Miles
<td>32 Miles
</tr>
<tr>
<td>Sonoma
<td>44 Miles
<td>0 Miles
<td>62 Miles
<td>106 Miles
</tr>
<tr>
<td>Tehama
<td>125 Miles
<td>1 Miles
<td>0 Miles
<td>126 Miles
</tr>
<tr>
<td>Trinity
<td>0 Miles
<td>67 Miles
<td>0 Miles
<td>67 Miles
</tr>
<tr>
<td>Tulahoma
<td>67 Miles
<td>0 Miles
<td>0 Miles
<td>67 Miles
</tr>
<tr>
<td>Tuolumne
<td>79 Miles
<td>0 Miles
<td>0 Miles
<td>79 Miles
</tr>
<tr>
<td>Yolo
<td>48 Miles
<td>47 Miles
<td>0 Miles
<td>95 Miles
</tr>
<tr>
<td>Yuba
<td>356 Miles
<td>62 Miles
<td>0 Miles
<td>418 Miles
</tr>
<tr>
<td>Ventura
<td>99 Miles
<td>0 Miles
<td>0 Miles
<td>99 Miles
</tr>
<tr>
<td><b>Total</b>
<td><b>6,532 Miles</b>
<td><b>1,485 Miles</b>
<td><b>8,017 Miles</b>
<td><b>8,017 Miles</b>
</tr>
</tbody>
</table>

```

Installation Miles by County
Table Description:

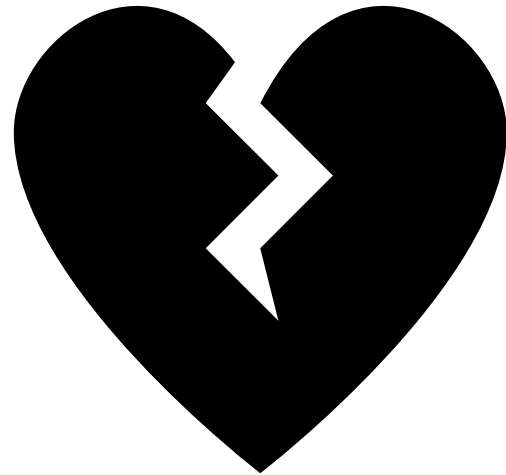
- Pre-Construction: The activities that occur before construction begins.
- Installation: In the Installation Hubs Placement, Power Connection, and other activities.
- Ready-to-Connect: In the Ready-to-Connect phase, the system is ready to be connected to the grid.

ork miles.

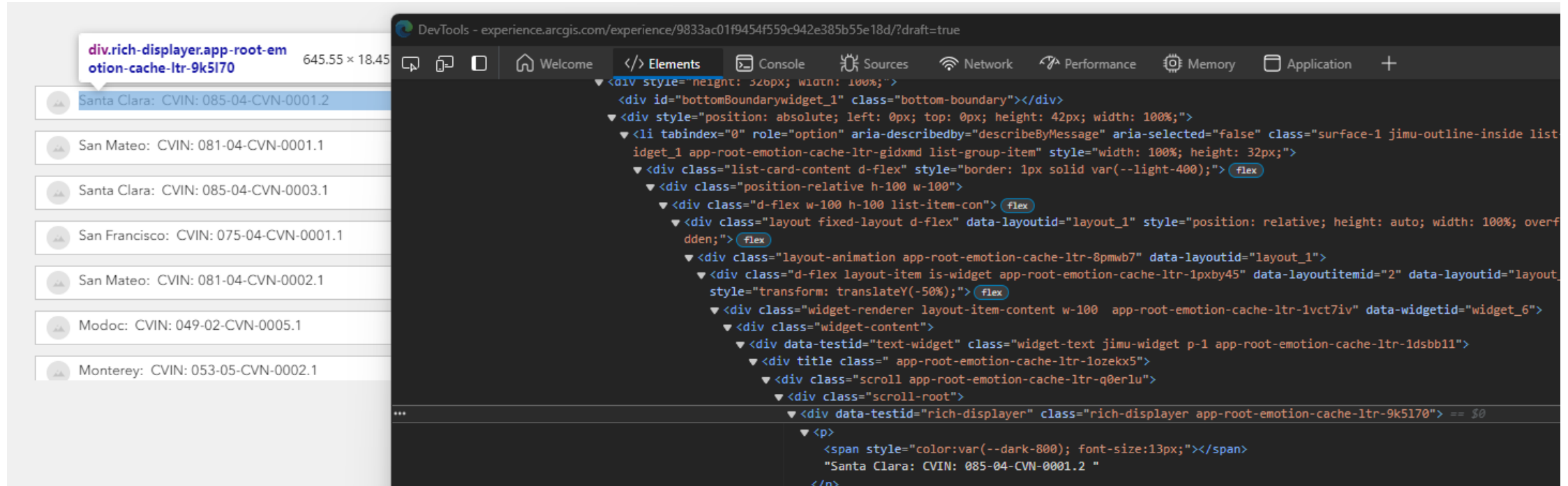


County Name	Pre-Construction	Installation	Ready-to-Connect	Total
Alameda	59 Miles	45 Miles	0 Miles	104 Miles
Alpine	44 Miles	0 Miles	0 Miles	44 Miles
Amador	107 Miles	0 Miles	0 Miles	107 Miles
Butte	104 Miles	0 Miles	0 Miles	104 Miles
Calaveras	104 Miles	0 Miles	0 Miles	104 Miles
Colusa	4 Miles	40 Miles	0 Miles	44 Miles
Contra Costa	68 Miles	26 Miles	0 Miles	94 Miles
Del Norte	66 Miles	0 Miles	0 Miles	66 Miles
El Dorado	113 Miles	0 Miles	0 Miles	113 Miles
Fresno	292 Miles	0 Miles	0 Miles	292 Miles
Glenn	15 Miles	34 Miles	0 Miles	49 Miles
Total	6,532 Miles	1,485 Miles	8,017 Miles	8,017 Miles

About Experience Builder & Hub iframe



Limited Accessibility



Limited Accessibility

The screenshot displays a web application interface with a table titled "CDT_Statewide_Network_Segmentation". The table has the following columns: County Name, County ID, Record Status, and Process. The first row is highlighted, showing the value "623" in the County Name column, "Santa Clara" in the County ID column, "085" in the Record Status column, and "Active" in the Process column. A tooltip is visible over the first cell, indicating "vaadin-grid-cell-content 199 x 40".

The browser's developer tools are open, showing the DOM tree and styles for the selected cell. The DOM tree shows the following structure:

```
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-59" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-60" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-61" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-62" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-63" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-64" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-65" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-66" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-67" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-68" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-69" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-70" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-71" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-72" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-73" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-74" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-75" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-76" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-77" style="text-align: start;"></vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-78" title="623" style="text-align: start;">623</vaadin-grid-cell-content>
<vaadin-grid-cell-content slot="vaadin-grid-cell-content-79" title="Santa Clara" style="text-align: start;">Santa Clara</vaadin-grid-
```

The styles panel shows the following styles for the selected cell:

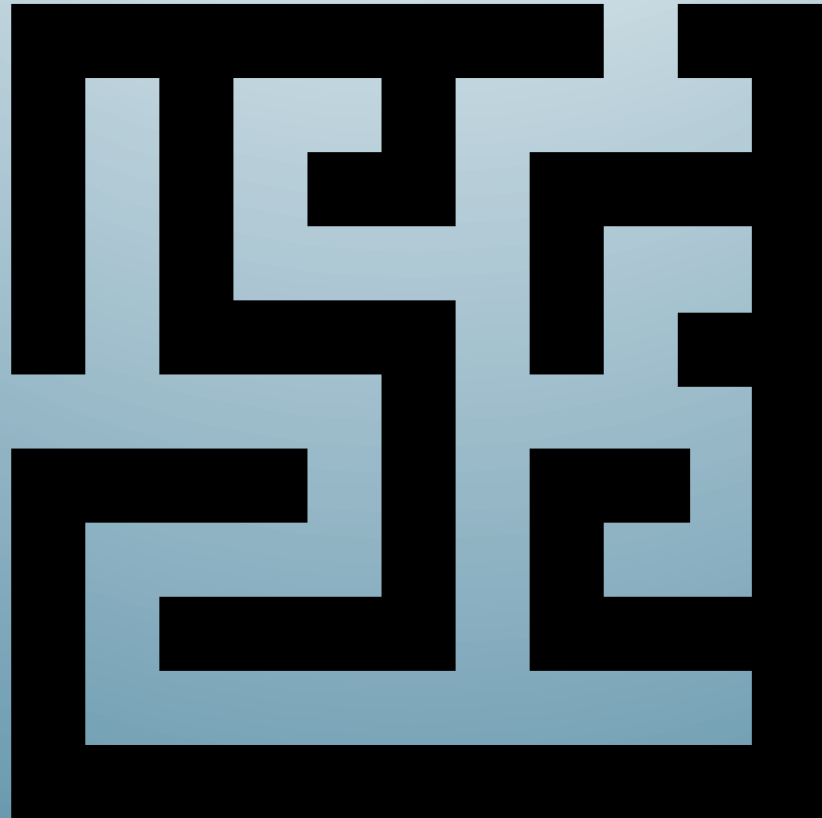
```
element.style {
  text-align: start;
}
.esri-widget *, .esri-widget
:before, .esri-widget :after {
  box-sizing: inherit;
}
* {
  scrollbar-width: thin;
  scrollbar-color: rgb(160, 160, 160)
  transparent;
}
*, ::before, ::after {
  box-sizing: border-box;
}
* {
  scrollbar-color: var(--light-600)
```


Accessibility tools do not step into the iframe

The screenshot shows a web browser displaying a table of broadband data for various counties in California. A blue box highlights a portion of the table. Overlaid on the browser is the Chrome DevTools 'Elements' panel, which shows the HTML structure of the page. The 'Elements' panel highlights an `<iframe>` element within a `<div class='hub-iframe'>` container. The `<iframe>` element has the following attributes: `id='c45qwze48'`, `scrolling='no'`, `frameborder='0'`, and `title='This is the data table'`. The `src` attribute is a long URL pointing to a data table file. The 'Styles' panel on the right shows no matching selector or style for the selected element.

County	Total
Alameda-Fixed	152 Miles
Alpine	43 Miles
Amador	100 Miles
Butte	144 Miles
Calaveras	125 Miles
Colusa	61 Miles
Contra Costa	98 Miles
Del Norte	71 Miles
El Dorado	114 Miles

Hubbub of the Hub



Hub Challenge – Automation

- Hub Module Walk Through ✓
- Save to Production ☹️

- > arcgis.geocoding module
- > arcgis.geoenrichment module
- > arcgis.geometry module
- > arcgis.geoprocessing module
- > arcgis.graph module
- > arcgis.mapping module
- > arcgis.realtime module
- > arcgis.schematics module
- > arcgis.widgets module
- ▼ arcgis.apps module
 - build_collector_url
 - build_explorer_url

arcgis.apps.hub module

The `Hub` is the main entry point into the Hub module. It can be used as shown in the following code example.

```
from arcgis.gis import GIS
gis = GIS("https://arcgis.com", "<username>", "<password>")
myHub = gis.hub
a_Initiative = myHub.initiatives.get(itemId)
a_Site = myHub.sites.get(a_Initiative.site_id)
b_Site = myHub.sites.get(itemId)
c_Page = myHub.pages.get(itemId)
myEvents = myHub.events.search()
```

Hub Challenge – Automation -Solution

- ArcGIS API for Python
 - Get Page draft resource
 - Modify
 - Overwrite draft resource
 - Upload new images

```
#get draft from resources
item.resources.get('draft-#####.json')

#----- some code here
#modify json
#save json local path:\draft-#####.json

#update the draft file
item.resources.update('path:\draft-#####.json')
#add new image
item.resources.add('path:\image.jpg')
```

- ArcGIS API for Python - Item
<https://developers.arcgis.com/python/api-reference/arcgis.gis.toc.html#item>
- ArcGIS API for Python – Resource Manager
<https://developers.arcgis.com/python/api-reference/arcgis.gis.toc.html#resourcemanager>
- arcgis.apps.hub module
<https://developers.arcgis.com/python/api-reference/arcgis.apps.hub.html>
- ArcGIS Online Hub
<https://hub.arcgis.com>
- ArcGIS Experience Builder
<https://developers.arcgis.com/experience-builder>
- Tables Tutorial – W3C Web Accessibility Initiative
<https://www.w3.org/WAI/tutorials/tables/>
- [Statewide Middle-Mile Network Map | State of California Middle-Mile Broadband Initiative](#)

MMBI Data & GIS
Thank you!

Questions?

Contact: Mmbi-gis@state.ca.gov



Building a Brighter Future for All

The California Road Sharing (CaRS) Project





Enabling the Power of GIS for Everyone



Caltrans Data is Authoritative, Trusted, and Accessible

Introduction

Aaron Ott, PLS

**Chief, Office of Data Services and
Technology**

**Division of Research, Innovation and
System Information**

aaron.ott@dot.ca.gov

Topics Covered Today

What is the California Road Sharing (CaRS) Project

Implementing CaRS - Collaboration Vision

Success stories from other States: Arizona, Georgia

Sustainable Process for Data Sharing and Integration



Applications of Enterprise GIS in Transportation (AEGIST)

Road to Governed California Centerlines

Caltrans: Chad Baker, Aaron Ott, Gerald Schumacher, Tim Tadlock, Kathleen Mohla

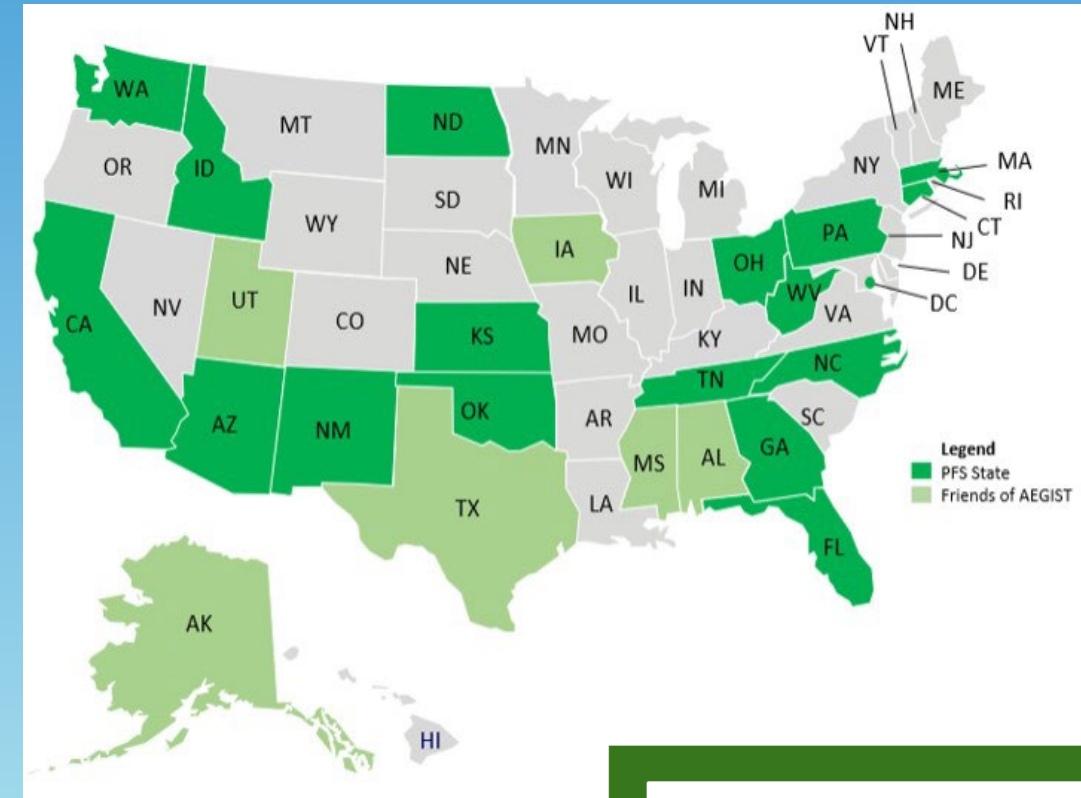
Merced County: Gene Barrera

Cal OES: Budge Currier, Natasha Potter, Sam Sedgwick, Amanda Kabisch-Herzog

FHWA AEGIST: Joe Hausman, Abhishek Bhargava

AEGIST is a FHWA-led National Initiative for Spatial Data Modeling, Management, Governance and Analytics

- **Participation:** 18 States in the AEGIST Pooled Fund Study (PFS). There are 6 Engaged (Friend) States. **California is one of the participating States.**
- **Goal:** Encourage and support deployment of Enterprise GIS Applications that utilize Spatial Data Modeling Standards and enable Data Governance within and across agencies. That is, Building Information Modeling (BIM) for Spatial Transportation data using **National and State pilot projects**



FHWA: Federal Highway Administration

Collaboration Vision

Create Statewide Roads Dataset

Local
Governments

Counties

State Agencies:
Caltrans &
CalOES

FHWA: Federal
Highway
Administration

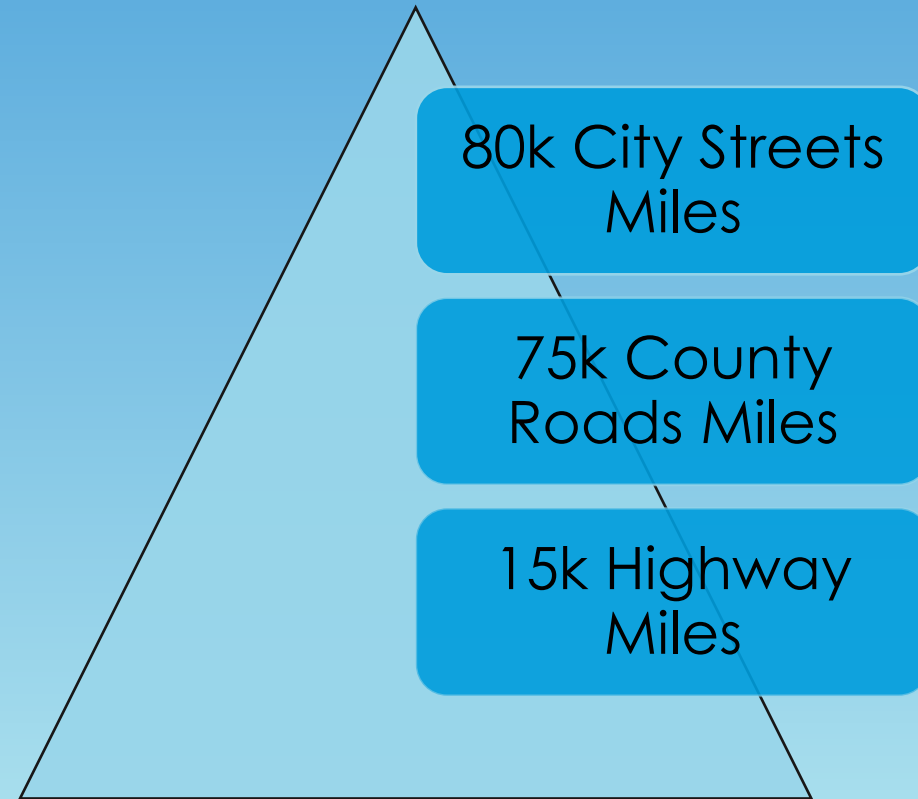
Roadway Mileage Reporting
Pavement Condition Monitoring
Traffic Performance Monitoring System (PEMS)
Transportation Improvement Programs (TIPs)

- Roads Network Modeling, Reporting
- Emergency Management: NG911
- Highway Safety Analysis
- Asset Management
- Project Planning & Programming (STIP)
- Road User Charging
- Travel Demand Modeling

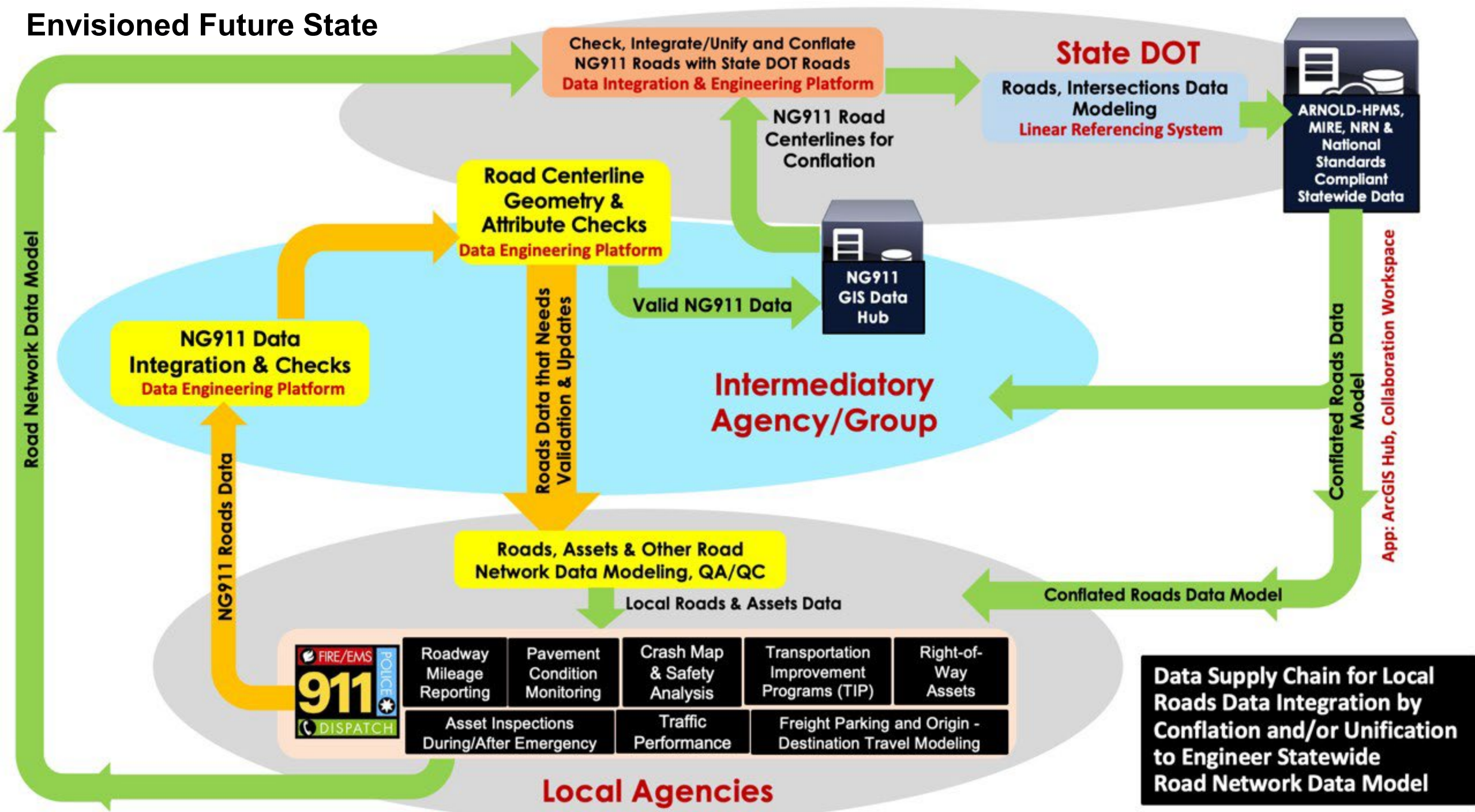
- All Roads Network (ARNOLD)
- National Road Network (NRN)
- Emergency Management
- Highway Safety Analysis
- Asset Performance Management

The Challenge

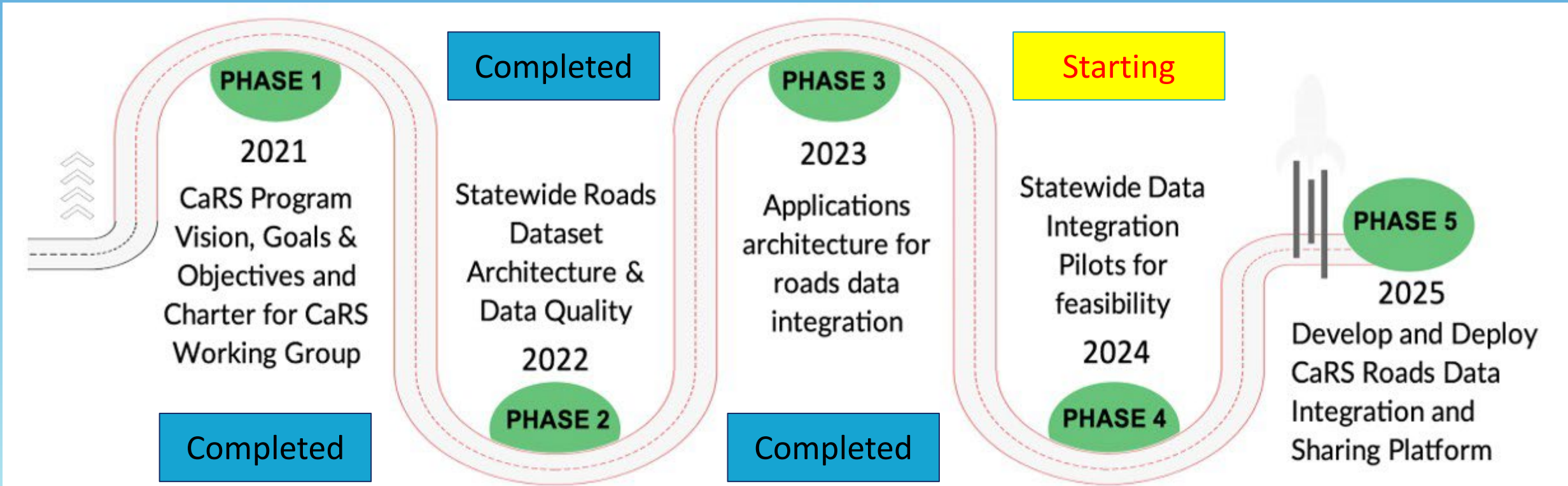
- **County Roads and City Streets are a Challenge**
- **State Highway System is Good**



Envisioned Future State



California Roads Sharing Timeline



Benefits of CaRS

- ✓ **Road Inventory Tracking**
- ✓ **Asset Management**
- ✓ **Highway Safety**
- ✓ **Project Planning & Programming**
- ✓ **Emergency Management**
- ✓ **Routing & Traffic Flow Studies**
- ✓ **California Road User Charging**

PROGRAM GOALS

- ✓ Create a governed state-wide roads dataset to meet roads data use cases of multiple agencies in California.
- ✓ Provide mutual benefits to State and local jurisdictions, especially to business users involved in highway project planning, survey, design, construction, safety, traffic and asset management operations.
- ✓ Coordinate roadway cartographic and data model recommendations
- ✓ Support Transportation for the Nation (TFTN), which promotes a publicly available, high quality road centerline that is coordinated across all levels of government.
- ✓ Building Information Modeling (BIM) for roads and assets using standards for supporting artificial intelligence (AI) /machine learning (ML) applications, CV/autonomous vehicles (AV), and uncrewed aerial systems (UAS).

Success stories from other States

storymaps.arcgis.com/stories/a2534b5010e14323a8f013368517b8a6

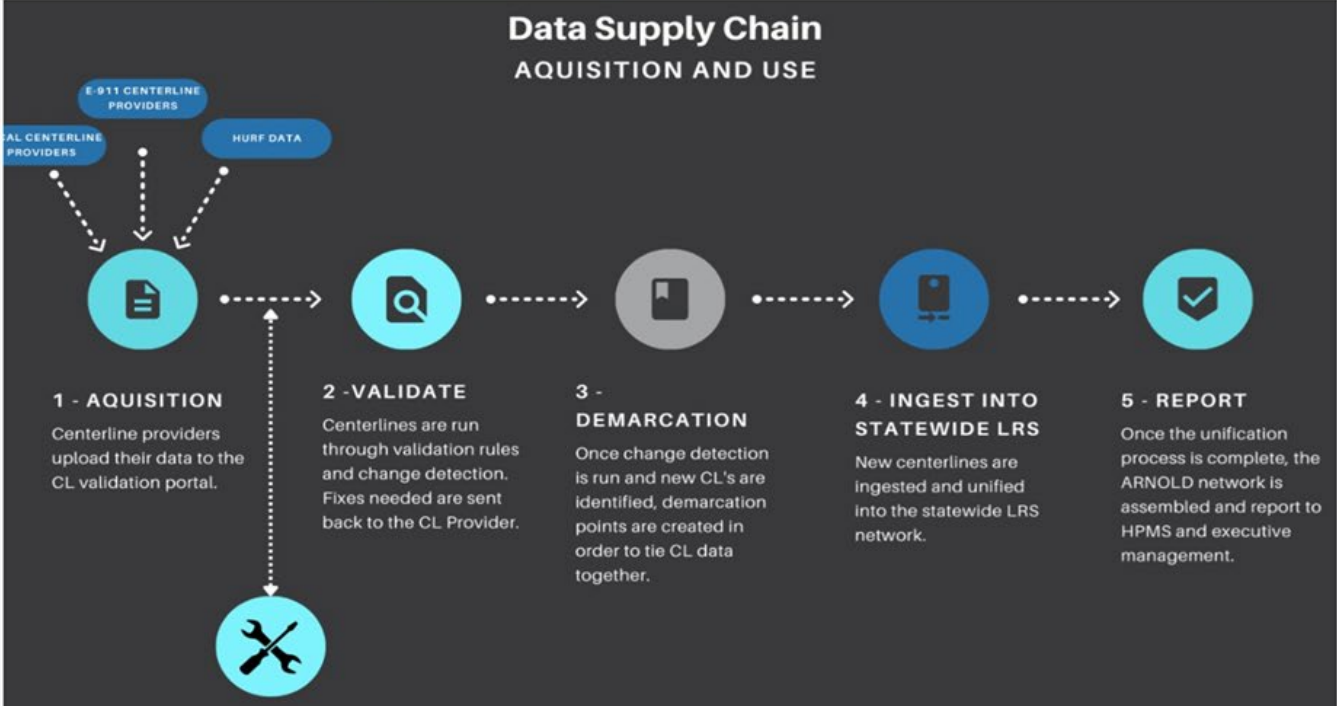
Accounts UTA

ADOT ADOT Data Supply Chain & ARNOLD

ADOT Data Supply Chain History How does the data supply chain... Centerline Unification Workflo... Future Data Supply Chain Effor... ARNOLD

Data Supply Chain ACQUISITION AND USE

Once the state is unified with all new local centerline data, the ARNOLD network is assembled and reported as part of the annual HPMS report as well as reported for other facets of agency wide transportation needs.



1 - ACQUISITION
Centerline providers upload their data to the CL validation portal.

2 - VALIDATE
Centerlines are run through validation rules and change detection. Fixes needed are sent back to the CL Provider.

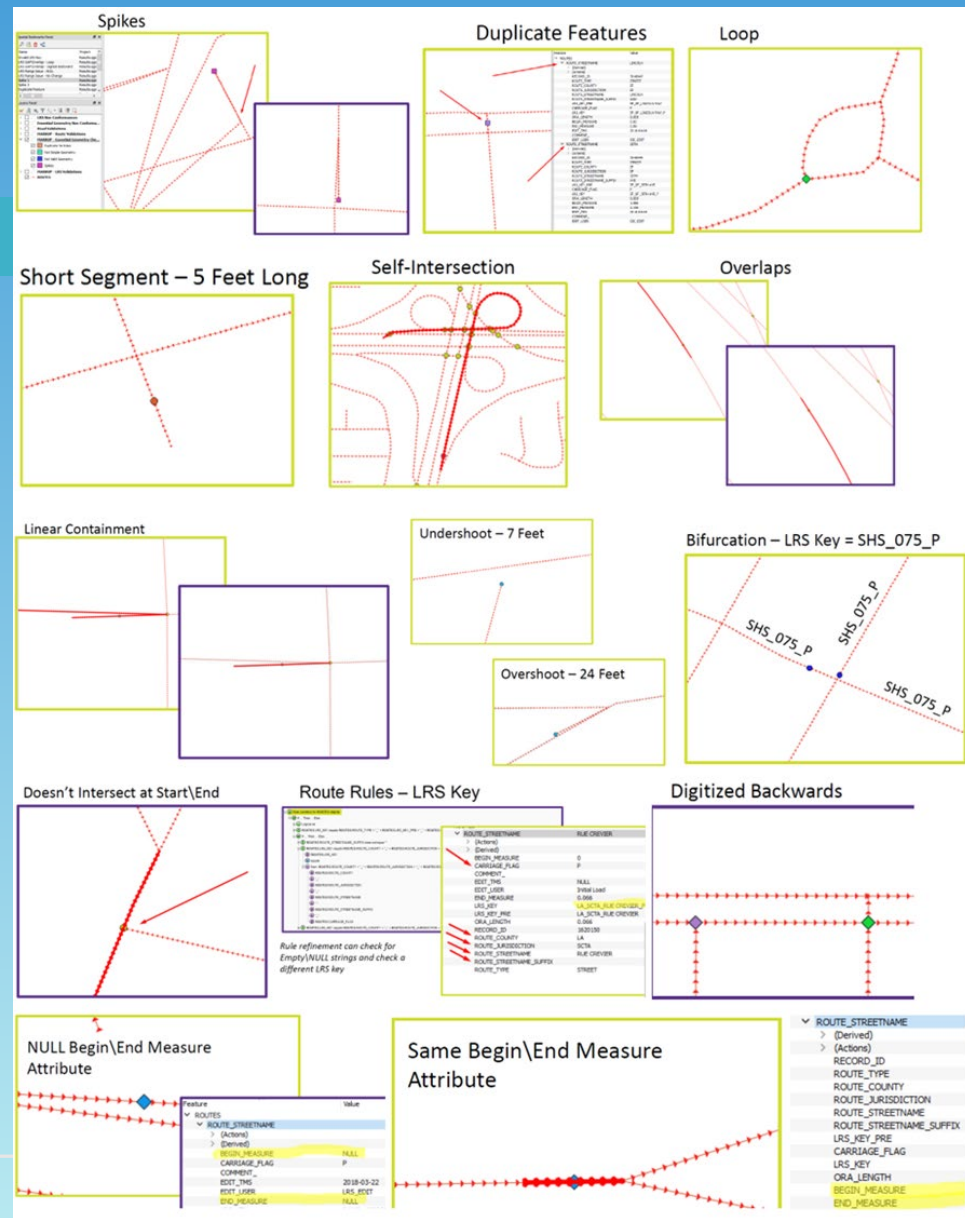
3 - DEMARCATION
Once change detection is run and new CL's are identified, demarcation points are created in order to tie CL data together.

4 - INGEST INTO STATEWIDE LRS
New centerlines are ingested and unified into the statewide LRS network.

5 - REPORT
Once the unification process is complete, the ARNOLD network is assembled and report to HPMS and executive management.

CaRS Proof of Concept: Caltrans and Merced Geometry Comparison

Initiating Caltrans 1 Integrate Pilot

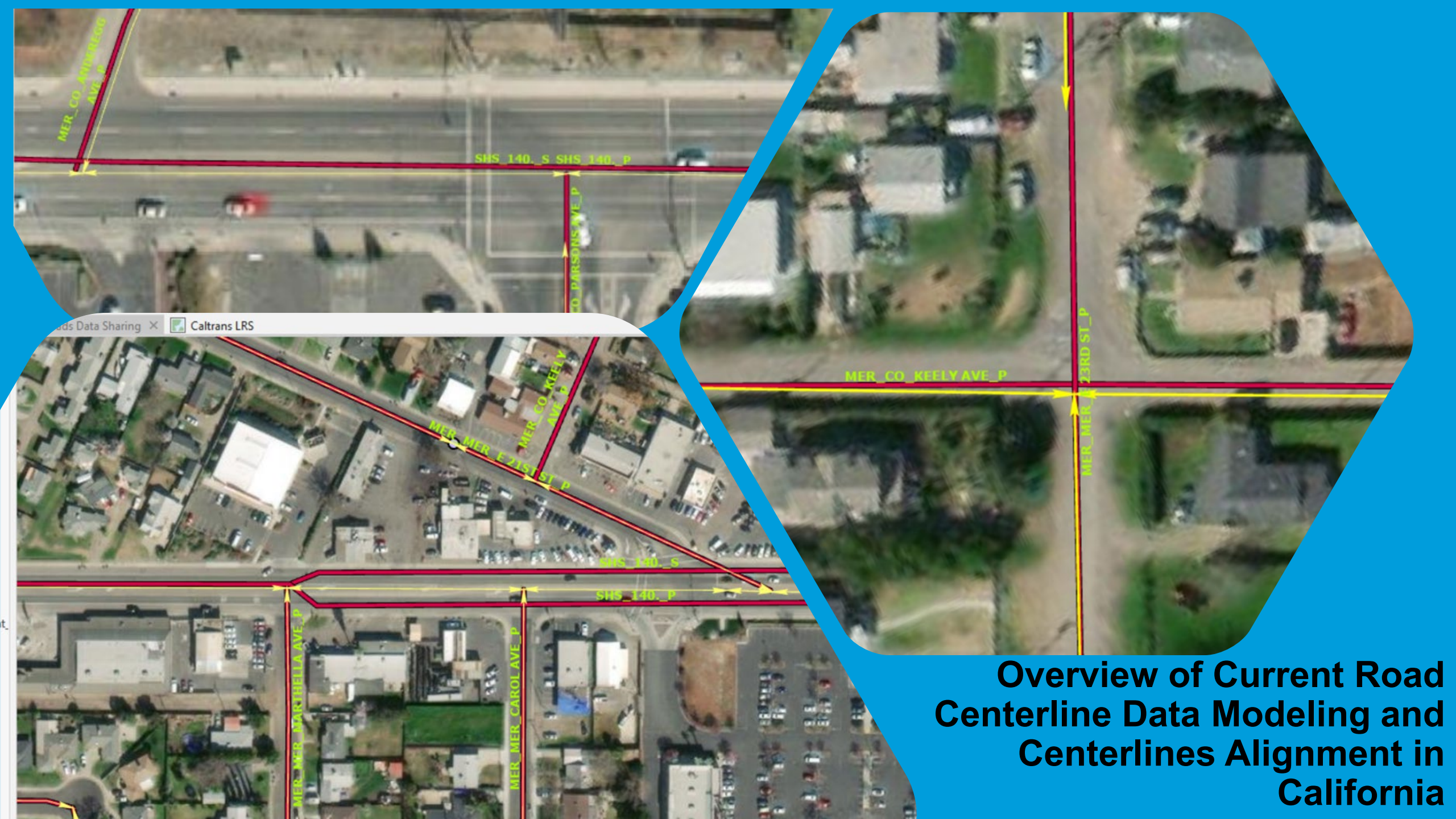


Category	Rule	Features	Non-Conformance
Essential Geometry Checks	Check Duplicate Features	2,127,459	14
	Check for Duplicate Vertices	2,127,459	332
	Check for Spikes	2,127,459	206
	Check for Kickbacks	2,127,459	47
	Check Multi-Part Features	2,127,459	6
	Check Features are Simple	2,127,459	559
	Check Feature are Valid	2,127,459	332
	Transportation Checks	Road Geometry longer than 12 feet	2,127,459
Self-Intersecting Segments		2,127,459	284
Overshoots\Undershoots		2,127,459	19,198
Bifurcations		2,127,459	4,203
Intersect at Start and End Points		2,127,459	73,474
Linear Containment		2,127,459	45
Overlapping Roads		2,127,459	1,153
LRS Attribute Checks		Validate LRS Key	2,127,459
	Validate LRS Range	2,127,459	7
	LRS GAP\Overlap Check	2,127,459	12,605

Tolerance vs Geometry Match

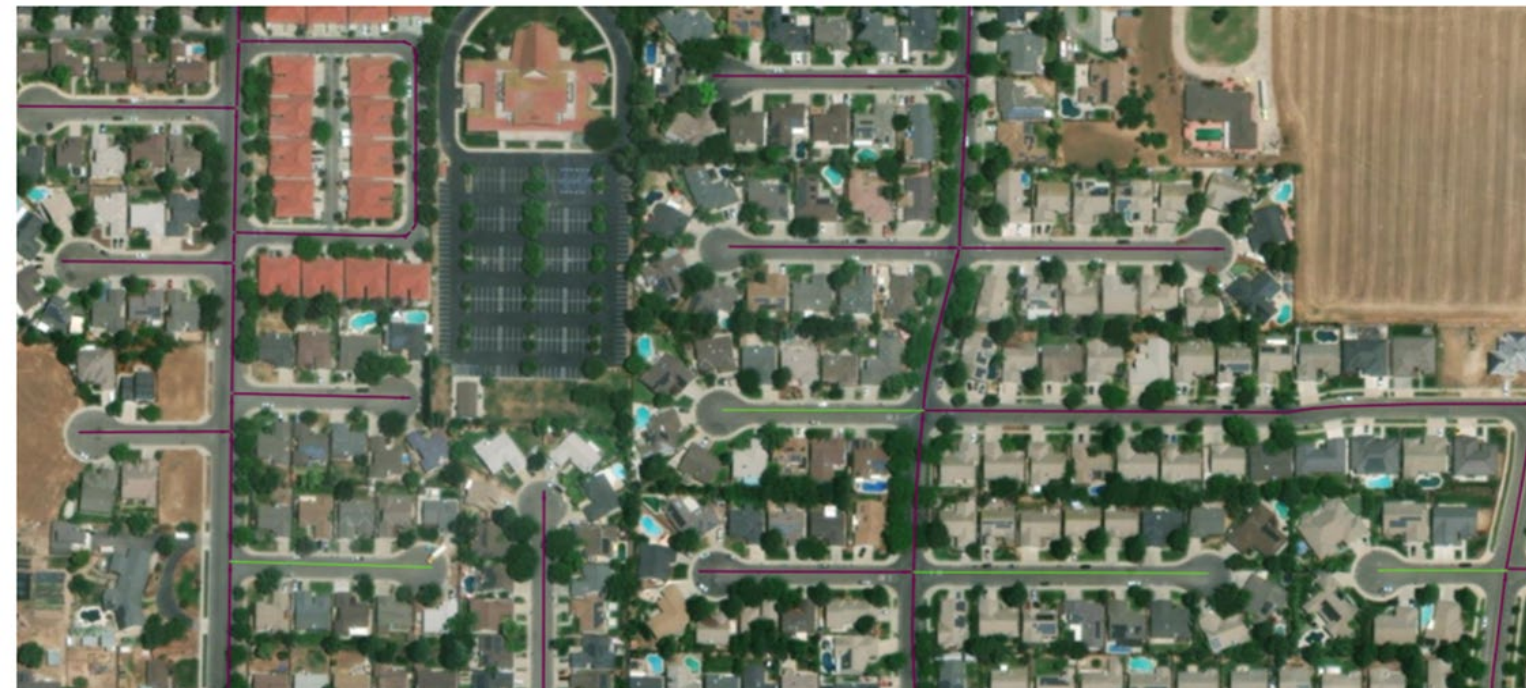
- 1 meter (3 feet) – 2083 Features Matched
- 3 meters (10 feet) – 2083 Features Matched
- 10 meters (33 feet) – 10,266 Features Matched

- 10 Meter Solution was Chosen
- Primary Reason was Caltrans uses Dual Carriageway and NG911 uses Centerline



Overview of Current Road Centerline Data Modeling and Centerlines Alignment in California

Adding Missing Roads



- ▾ Pre-Processing
 - ▾ NG911_RCL
 - ▶
 - ▾ RH_LRS_RH_LRSN_AllRoads
 - ▶

- ▾ Conflation Results
 - ▾ Post-Conflation Validation

Note

 - Gap in the LRS Network
 - LRS Route has no matching segment
 - Segment does not match to LRS
 - <all other values>

- ▾ LRS_Segmented_Event
 - ▶ NG911 Road Segment

QUESTIONS?

Contact – Aaron Ott, PLS
Aaron.ott@dot.ca.gov

Thank you

Next GIS CoP Monthly Forum

Wednesday, September 25th , 2024

Questions or comments send to: gio@state.ca.gov