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

CA.GOV

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.

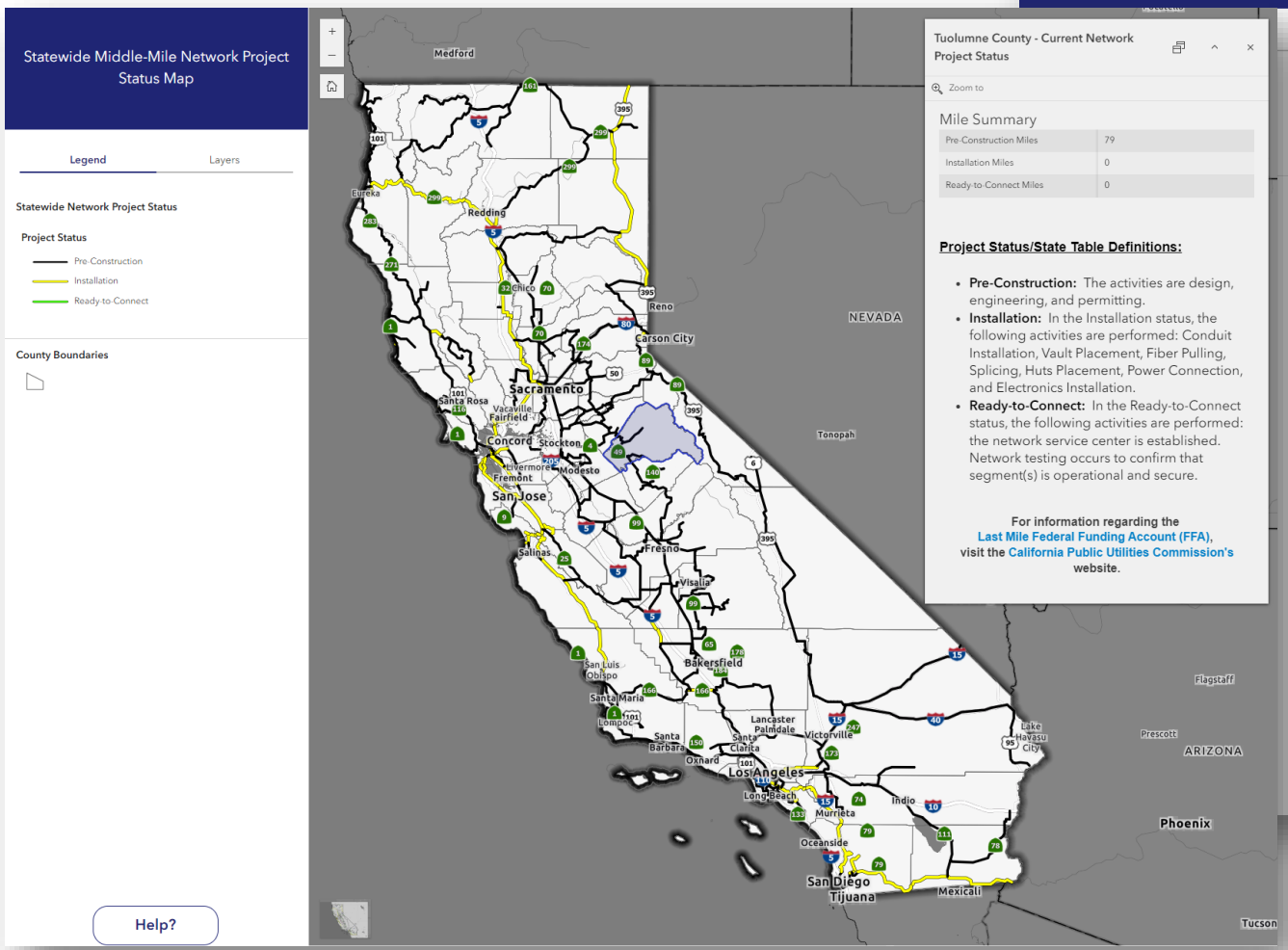
    - Provide transparency to California residents through maps and web applications.
    - Provide day-to-day support for decision makers.
    - Provide consistent results that adhere to best practices and standards.
    - Provide oversight of accessibility (Government Code Sections 7405 and 11135, and the Web Content Accessibility Guidelines 2.0) as an example.


Quick Look at Products

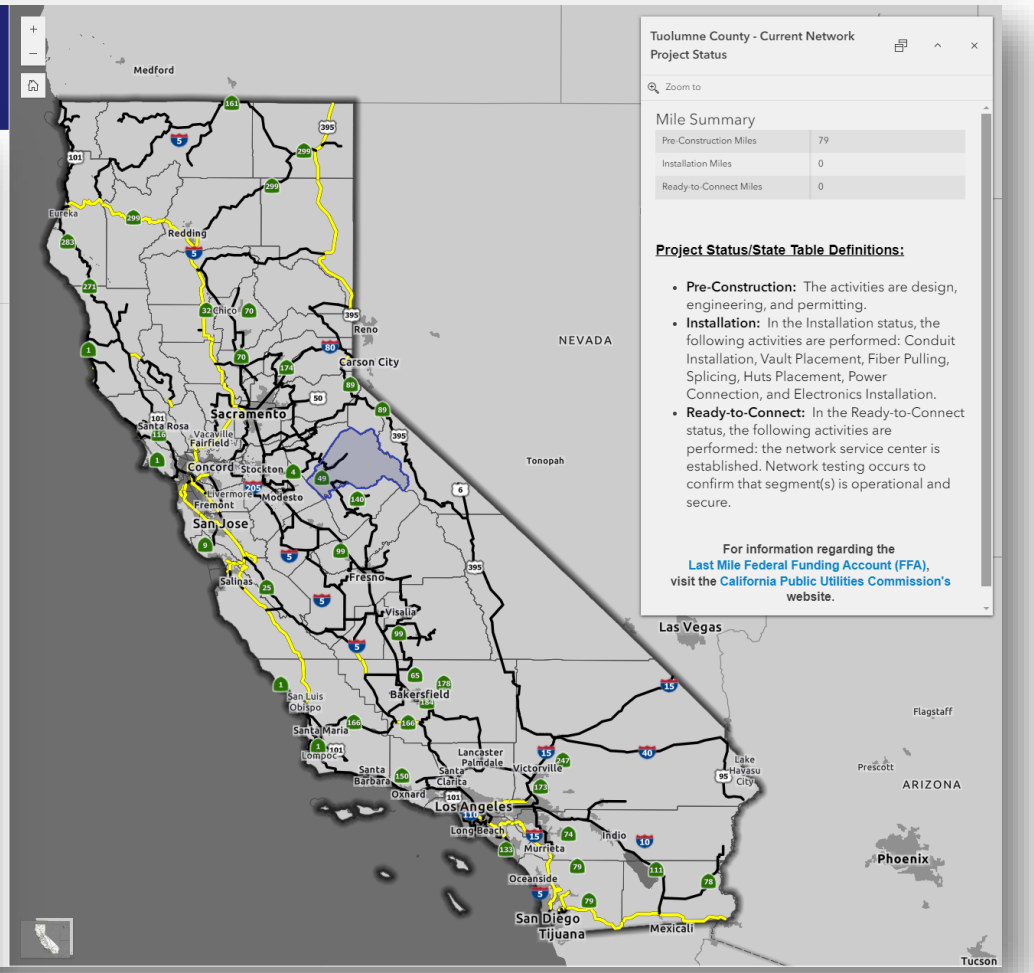
MMBI Data & GIS

Middle-Mile Broadband Network Public Web Applications

Default version of the Project Status Map



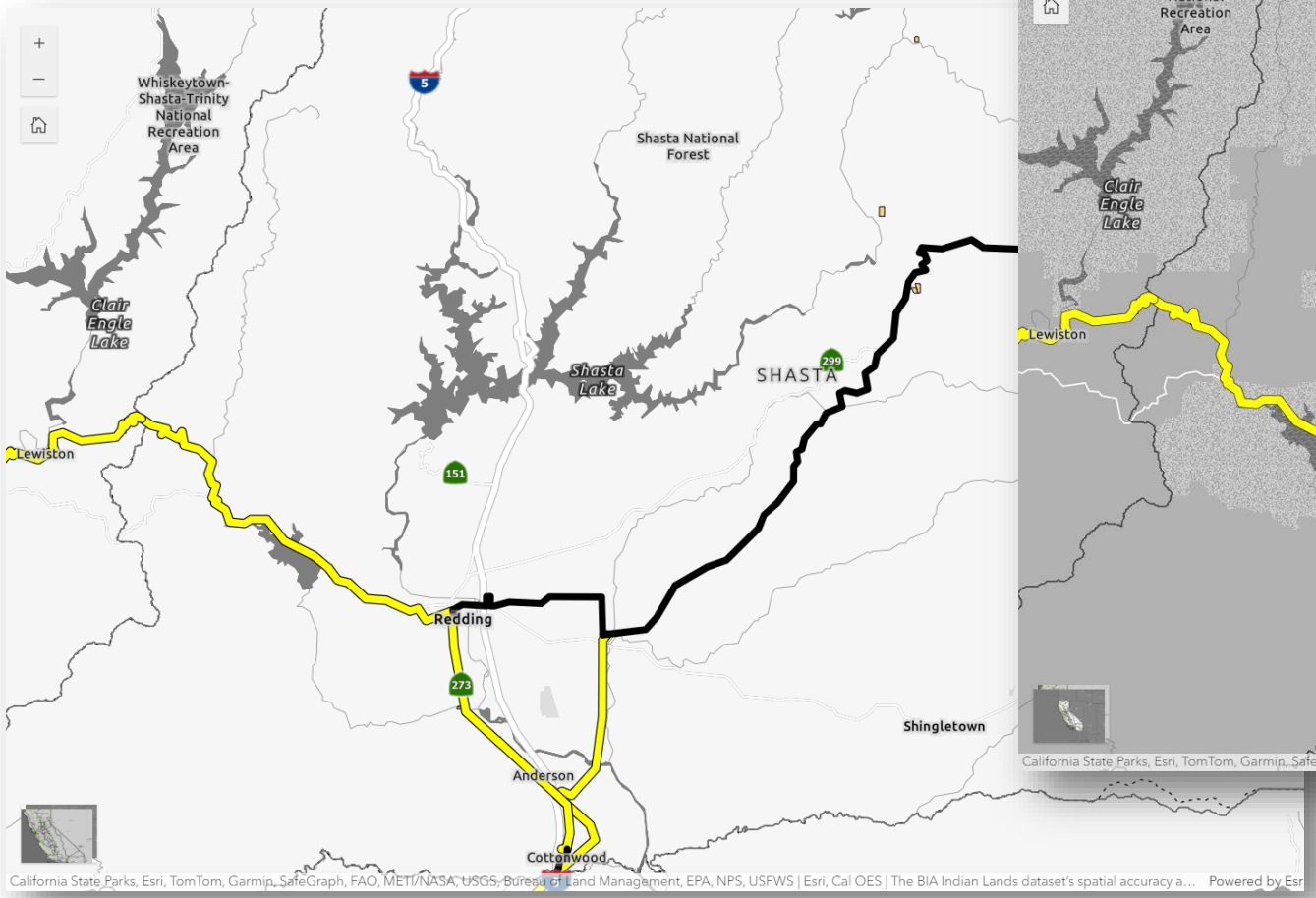
Statewide Middle-Mile Network Project Status Map

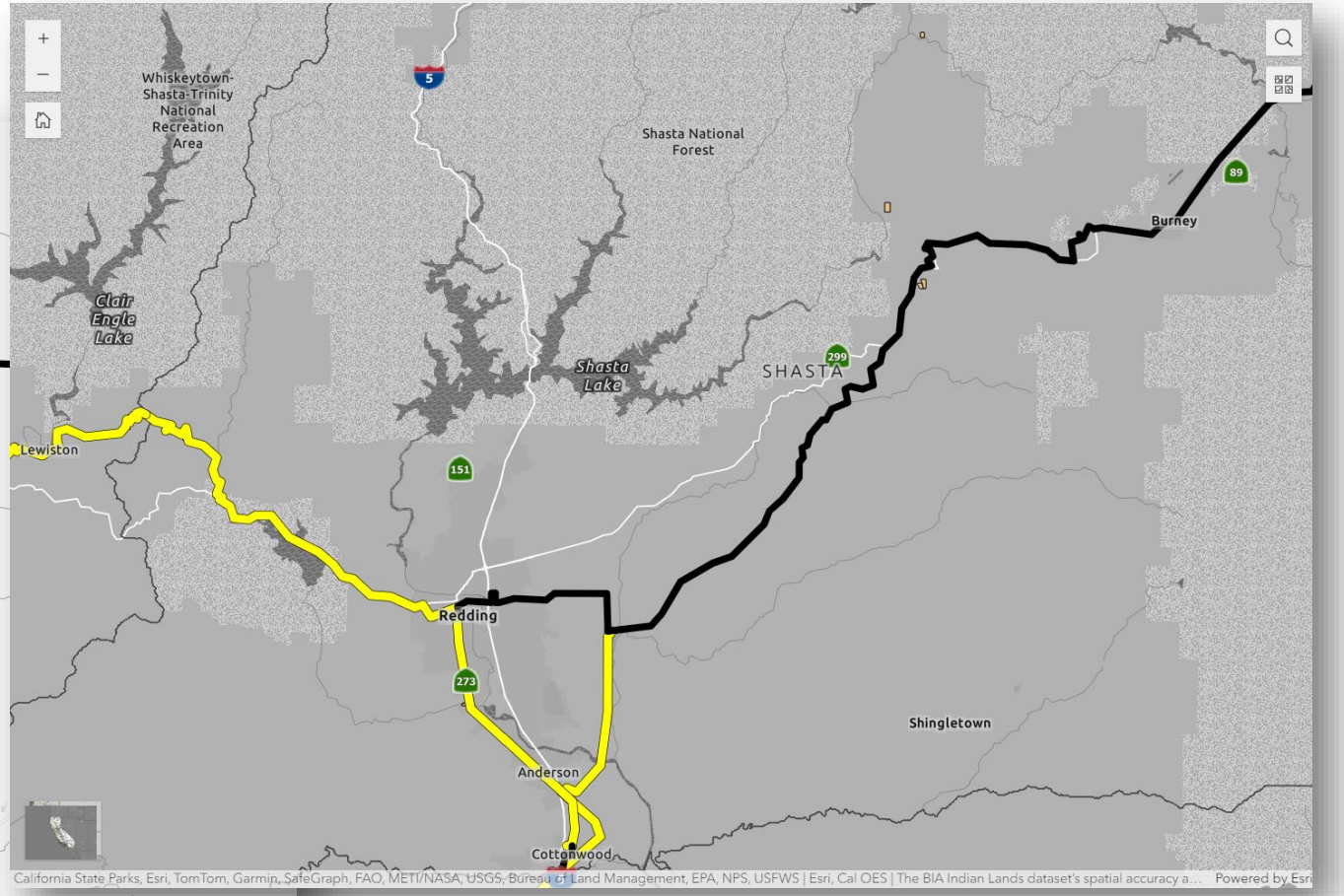


Accessible version of the Project Status Map

Public Web Applications - Basemap

Light Gray Canvas Basemap





Adapted Accessible Basemap Gray version

MMBI Data & GIS

Public Web Applications – Tabular Format & Static Maps

Official website of the State of California — California Department of Technology

CALIFORNIA ALL **Middle-Mile Broadband Initiative**

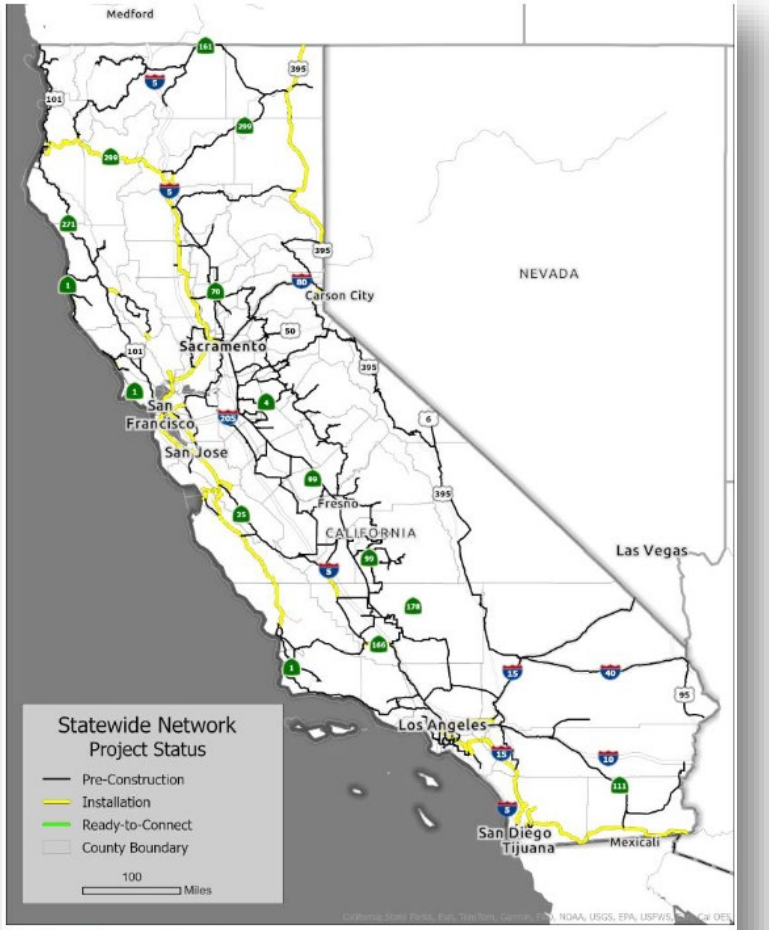
What's New | FAQs | Statewide Network Map | Resources | Meetings | Contact & Comment

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
[illegible]	23 Miles	[illegible]	0 Mile	[illegible]
[illegible]	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**



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?

MMBI Data & GIS

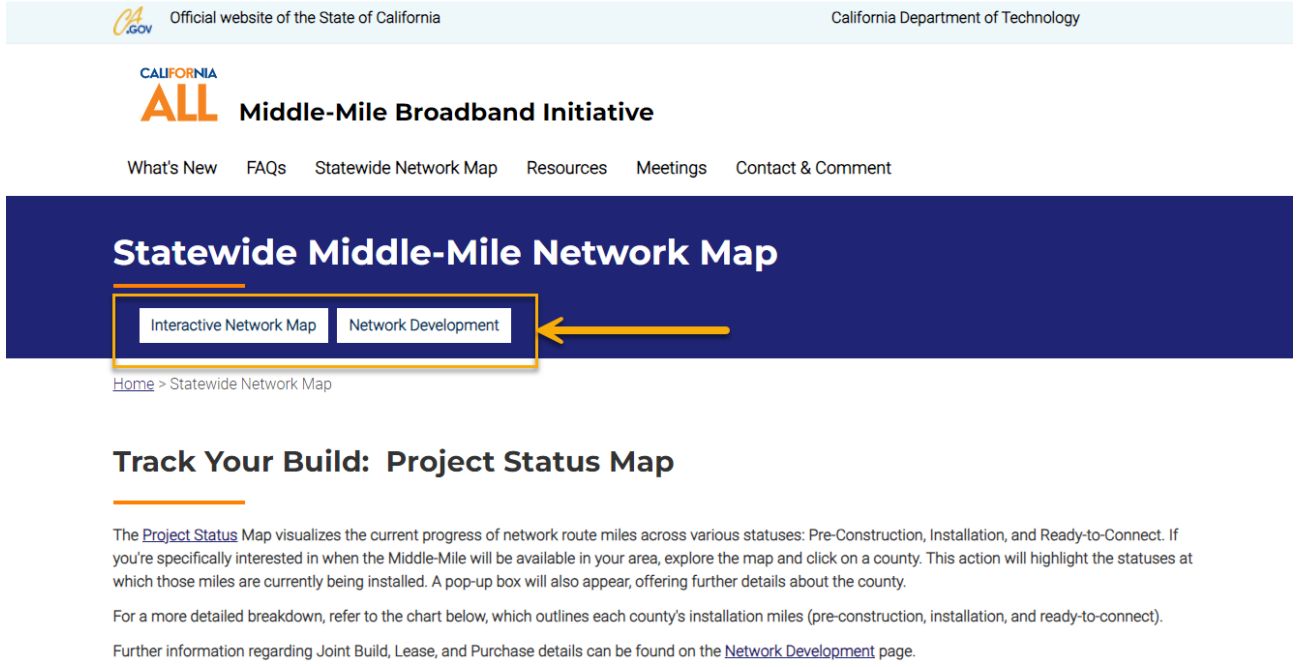
Application Accessibility

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

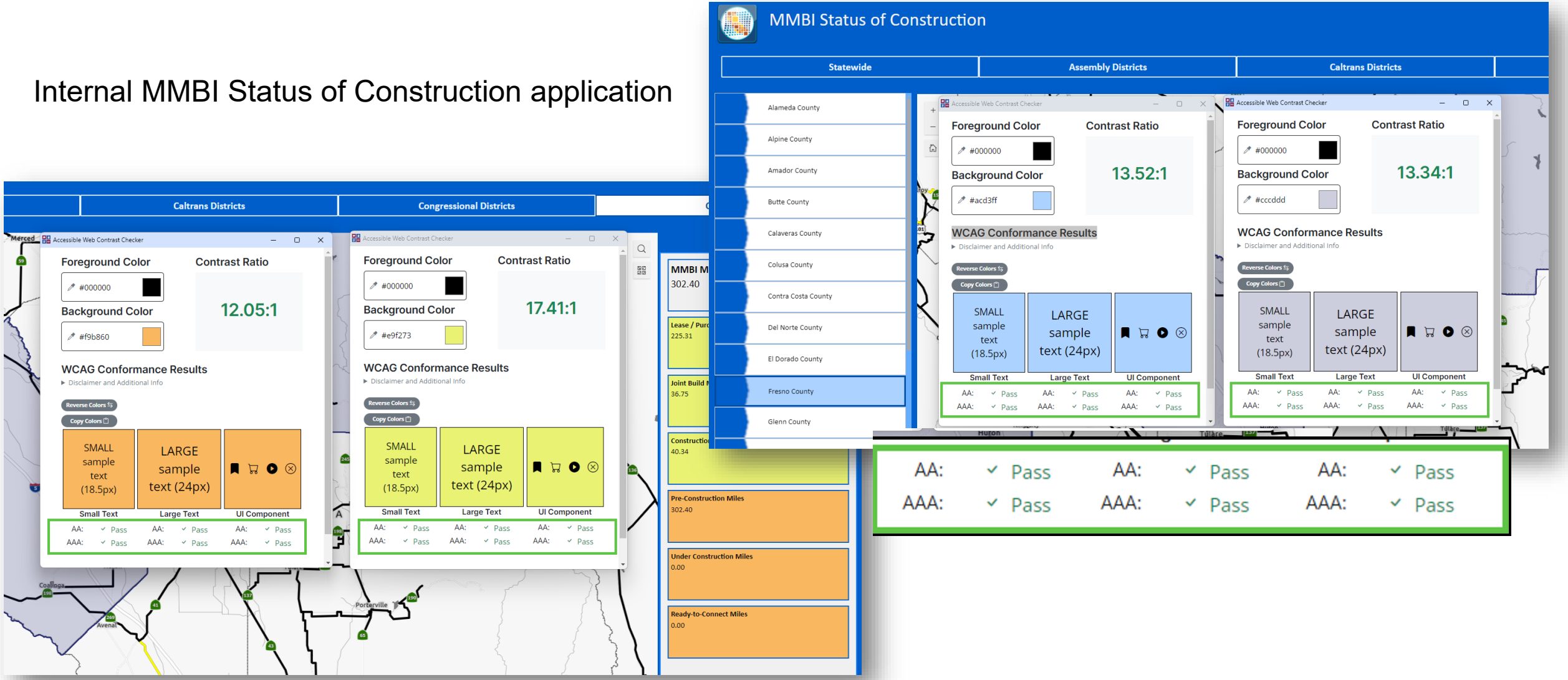
Standards: All our products have an eye on the web accessibility to the best of the tool



MMBI Data & GIS

Accessibility: Color Contrast

Internal MMBI Status of Construction application



MMBI Data & GIS

Accessibility: HTML Tables

HTML

```
<style> table {  font-family: arial, sans-serif;  border-collapse: collapse;  width: 100%; } td, th {  border: 1px solid #dddddd;  text-align: left;  paddi
  ="installation-table" class="20240826">  <thead><tr><th style="color:#ffffff;">County Name</th><th style="color:#ffffff;">Pre-Construction</th><th style="color
  ><td>Alameda</td><td>59 Miles</td><td>45 Miles</td><td>0 Miles</td><td>104 Miles</td></tr><tr><td>Alpine</td><td>44 Miles</td><td>0 Miles</td><td>0 Miles</td><t
  Miles</td><td>0 Miles</td><td>0 Miles</td><td>104 Miles</td></tr><tr><td>Calaveras</td><td>104 Miles</td><td>0 Miles</td><td>0 Miles</td><td>104 Miles</td></tr
  Miles</td><td>0 Miles</td><td>94 Miles</td></tr><tr><td>Del Norte</td><td>66 Miles</td><td>0 Miles</td><td>0 Miles</td><td>66 Miles</td></tr><tr><td>El Dorado</
  </td><td>292 Miles</td></tr><tr><td>Glenn</td><td>15 Miles</td><td>34 Miles</td><td>0 Miles</td><td>49 Miles</td></tr><tr><td>Humboldt</td><td>187 Miles</td><td
  ></tr><tr><td>Inyo</td><td>147 Miles</td><td>0 Miles</td><td>0 Miles</td><td>147 Miles</td></tr><tr><td>Kern</td><td>411 Miles</td><td>36 Miles</td><td>0 Miles
  Miles</td><td>6 Miles</td><td>0 Miles</td><td>86 Miles</td></tr><tr><td>Lassen</td><td>69 Miles</td><td>130 Miles</td><td>0 Miles</td><td>199 Miles</td></tr><tr
  >0 Miles</td><td>35 Miles</td></tr><tr><td>Mariposa</td><td>91 Miles</td><td>0 Miles</td><td>0 Miles</td><td>91 Miles</td></tr><tr><td>Mendocino</td><td>242 Mil
  Miles</td></tr><tr><td>Modoc</td><td>110 Miles</td><td>61 Miles</td><td>0 Miles</td><td>171 Miles</td></tr><tr><td>Mono</td><td>184 Miles</td><td>0 Miles</td><t
  >Napa</td><td>0 Miles</td><td>18 Miles</td><td>0 Miles</td><td>18 Miles</td></tr><tr><td>Nevada</td><td>76 Miles</td><td>0 Miles</td><td>0 Miles</td><td>76 Mile
  >9 Miles</td><td>0 Miles</td><td>118 Miles</td></tr><tr><td>Plumas</td><td>57 Miles</td><td>0 Miles</td><td>0 Miles</td><td>57 Miles</td></tr><tr><td>Riverside
  Miles</td><td>167 Miles</td></tr><tr><td>San Benito</td><td>73 Miles</td><td>15 Miles</td><td>0 Miles</td><td>88 Miles</td></tr><tr><td>San Bernardino</td><td>5
  ><td>189 Miles</td></tr><tr><td>San Francisco</td><td>3 Miles</td><td>16 Miles</td><td>0 Miles</td><td>19 Miles</td></tr><tr><td>San Joaquin</td><td>156 Miles</
  >132 Miles</td></tr><tr><td>San Mateo</td><td>2 Miles</td><td>32 Miles</td><td>0 Miles</td><td>34 Miles</td></tr><tr><td>Santa Clara</td><td>43 Miles</td><td>7
  ><tr><td>Shasta</td><td>89 Miles</td><td>58 Miles</td><td>0 Miles</td><td>147 Miles</td></tr><tr><td>Sierra</td><td>29 Miles</td><td>3 Miles</td><td>0 Miles</
  Miles</td><td>44 Miles</td><td>0 Miles</td><td>62 Miles</td></tr><tr><td>Sonoma</td><td>125 Miles</td><td>1 Miles</td><td>0 Miles</td><td>126 Miles</td></tr><tr
  </td><td>0 Miles</td><td>67 Miles</td></tr><tr><td>Tehama</td><td>88 Miles</td><td>47 Miles</td><td>0 Miles</td><td>135 Miles</td></tr><tr><td>Trinity</td><td>1
  Miles</td></tr><tr><td>Tuolumne</td><td>79 Miles</td><td>0 Miles</td><td>0 Miles</td><td>79 Miles</td></tr><tr><td>Yolo</td><td>48 Miles</td><td>47 Miles</td><t
  Angeles</td><td>356 Miles</td><td>62 Miles</td><td>0 Miles</td><td>418 Miles</td></tr><tr><td>Ventura</td><td>99 Miles</td><td>0 Miles</td><td>0 Miles</td><td>5
  ></td><td><b>6,532 Miles</b></td><td><b>1,485 Miles</b></td><td><b>0 Miles</b></td><td><b>8,017 Miles</b></td></tr></tbody> </table>
```

Installation Miles by County

Table Description:

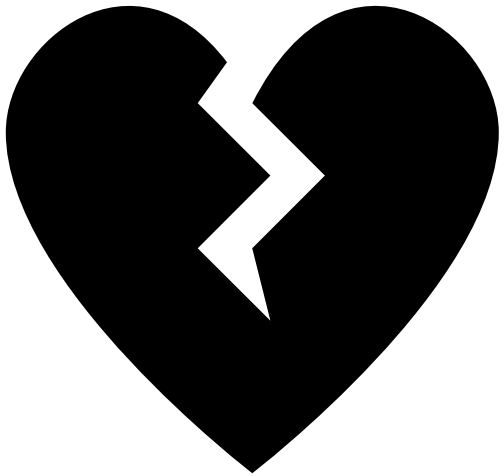
- Pre-Construction: The activiti
- Installation: In the Installation
  Huts Placement, Power Conn
- Ready-to-Connect: In the Rea
  occurs to confirm that segme

ork miles.

Text

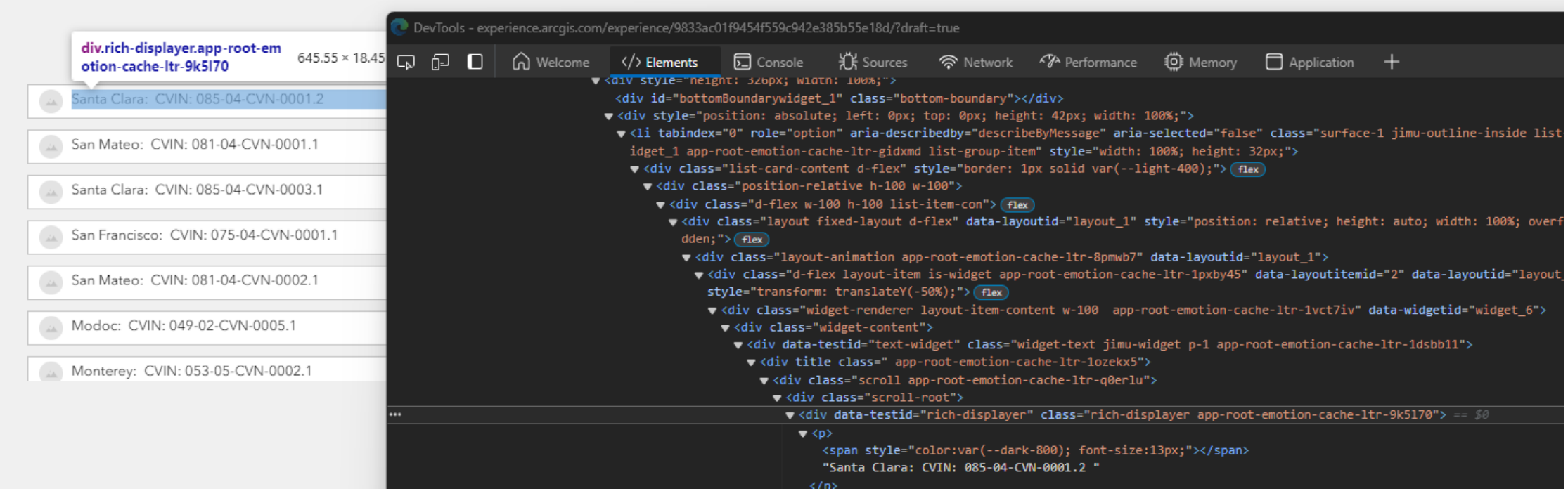
County Name	Pre-Construction	Installation	Ready-to-Connect	Total
Alameda	59 Miles	45 Miles	0 Miles	104 Miles
Alpine	44 Miles	0 Miles	0 Miles	44 Miles
Amador	107 Miles	0 Miles	0 Miles	107 Miles
Butte	104 Miles	0 Miles	0 Miles	104 Miles
Calaveras	104 Miles	0 Miles	0 Miles	104 Miles
Colusa	4 Miles	40 Miles	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

About Experience Builder & Hub iframe



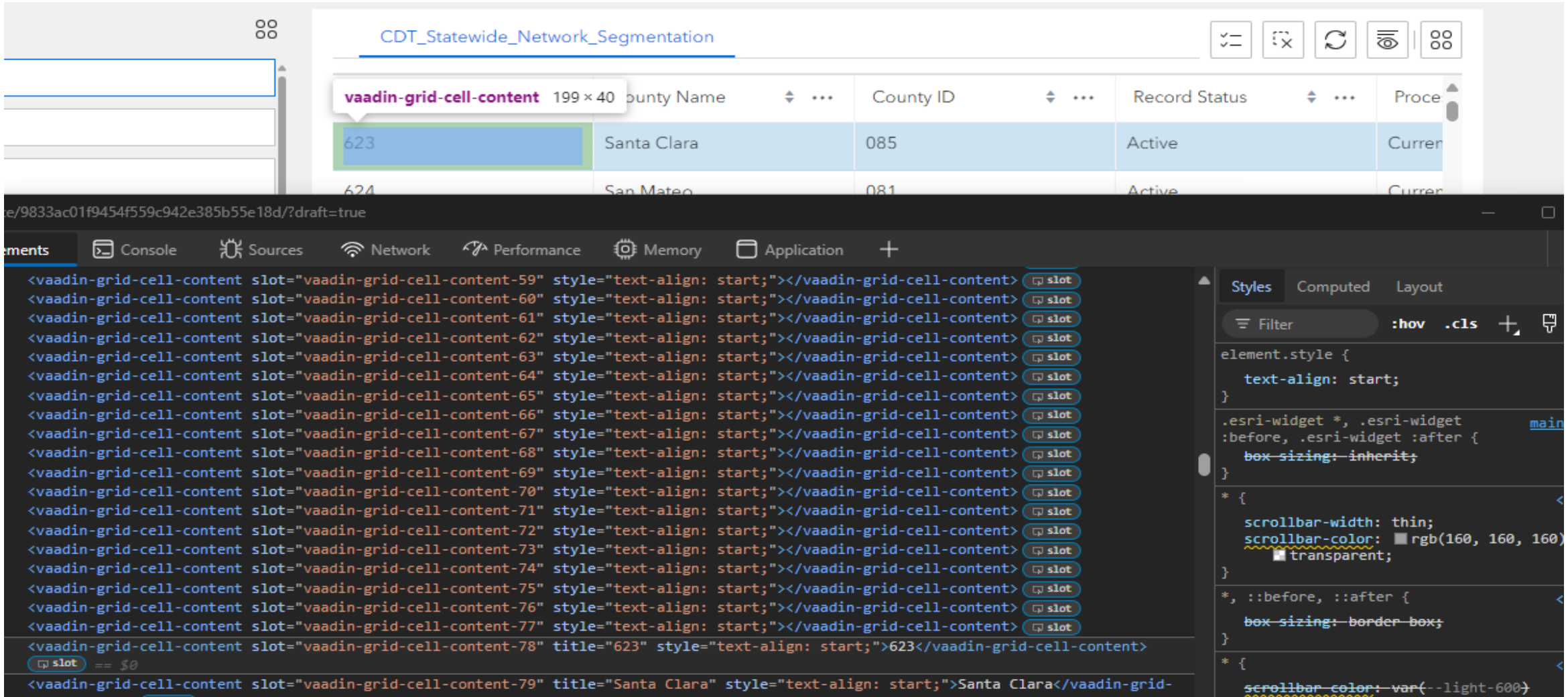
Experience Builder – List - Accessibility

Limited Accessibility



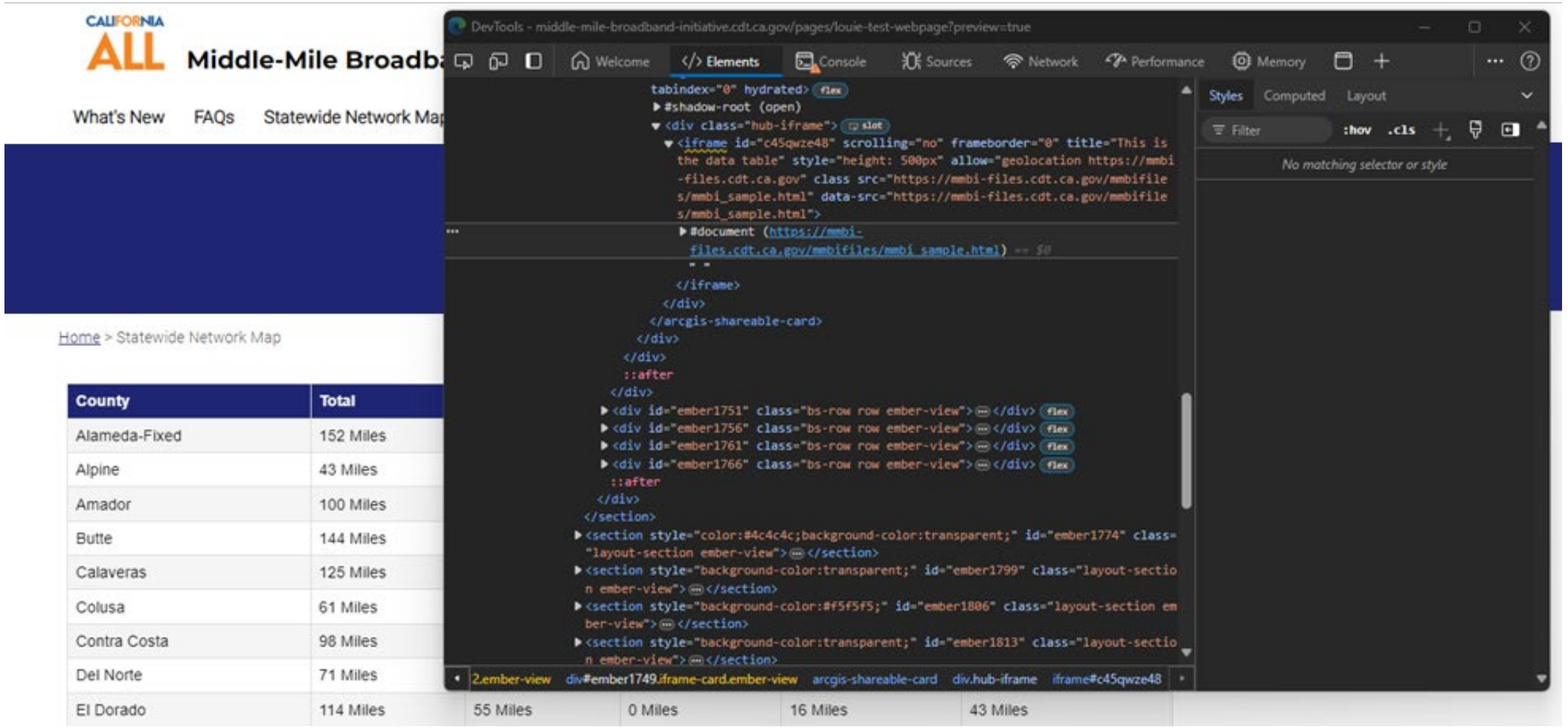
Experience Builder – Table - Accessibility

Limited Accessibility

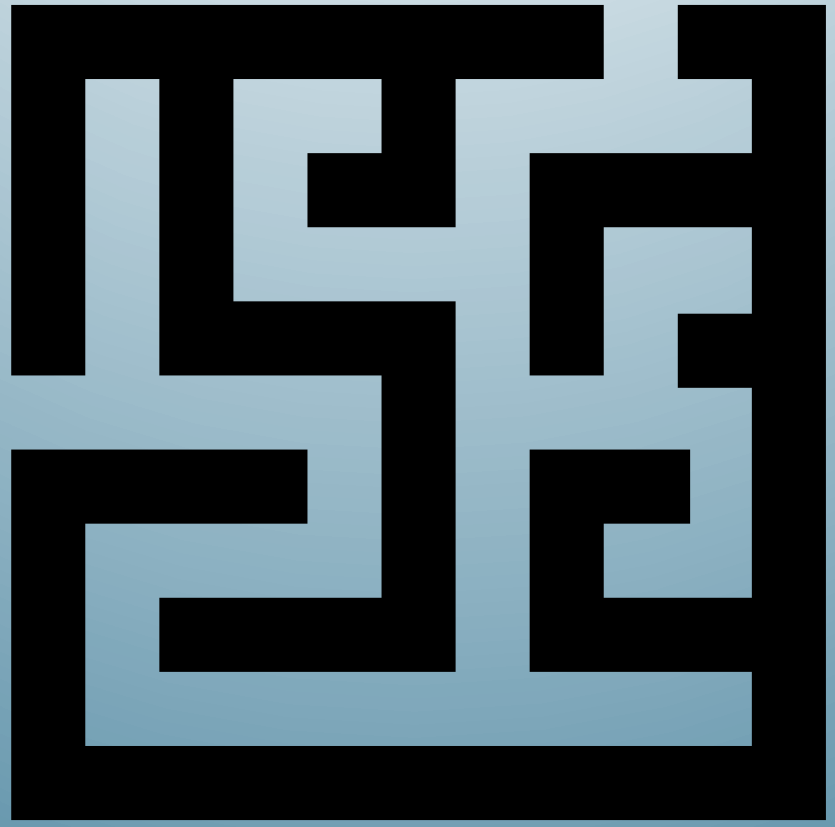


Iframe - Accessibility

Accessibility tools do not step into the iframe



Hubbub of the Hub



Hub Challenge – Automation

- Hub Module Walk Through ✓
- Save to Production ☹

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')
```

Resources

- 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

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

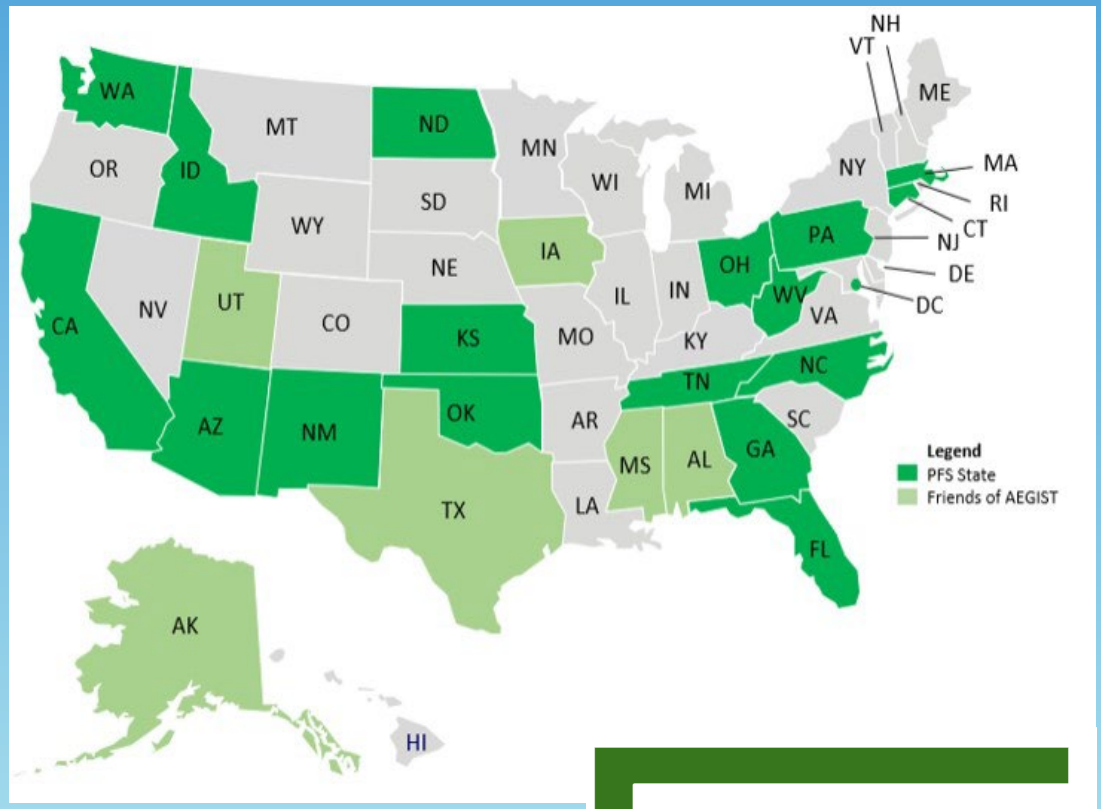
Sustainable Process for Data Sharing and Integration

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

More Information about AEGIST: https://www.gisintransportation.com/about/pfs-state-activities/

Collaboration Vision
Create Statewide Roads Dataset

Counties

Local Governments

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

State Agencies: Caltrans & CalOES

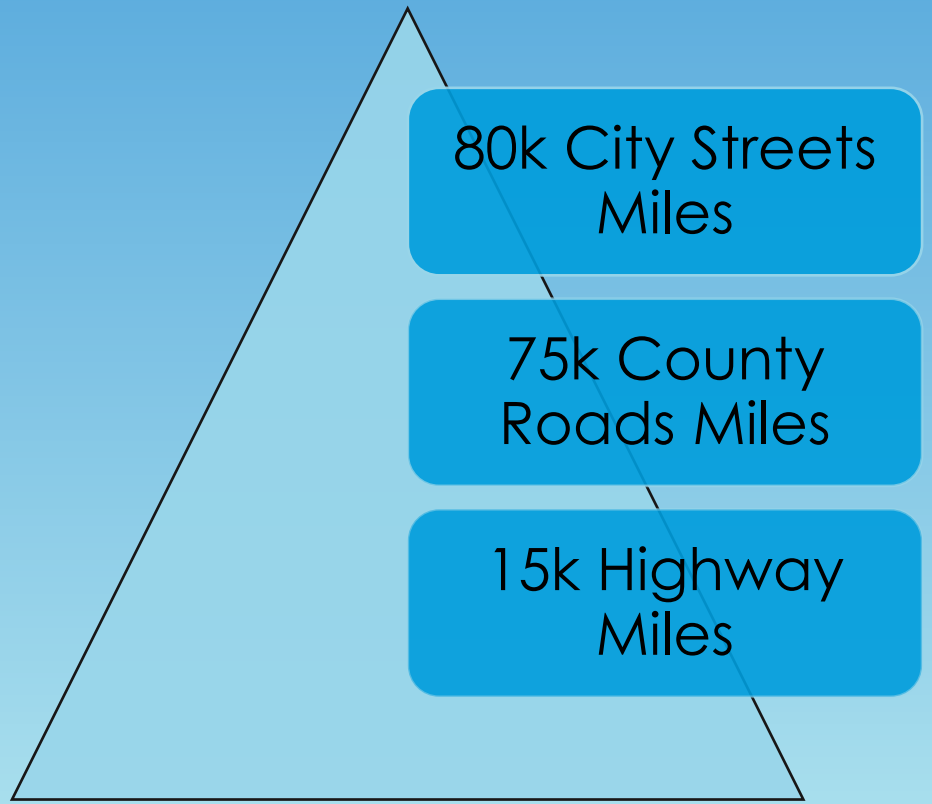
- Roads Network Modeling, Reporting
- Emergency Management: NG911
- Highway Safety Analysis
- Asset Management
- Project Planning & Programming (STIP)
- Road User Charging
- Travel Demand Modeling

FHWA: Federal Highway Administration

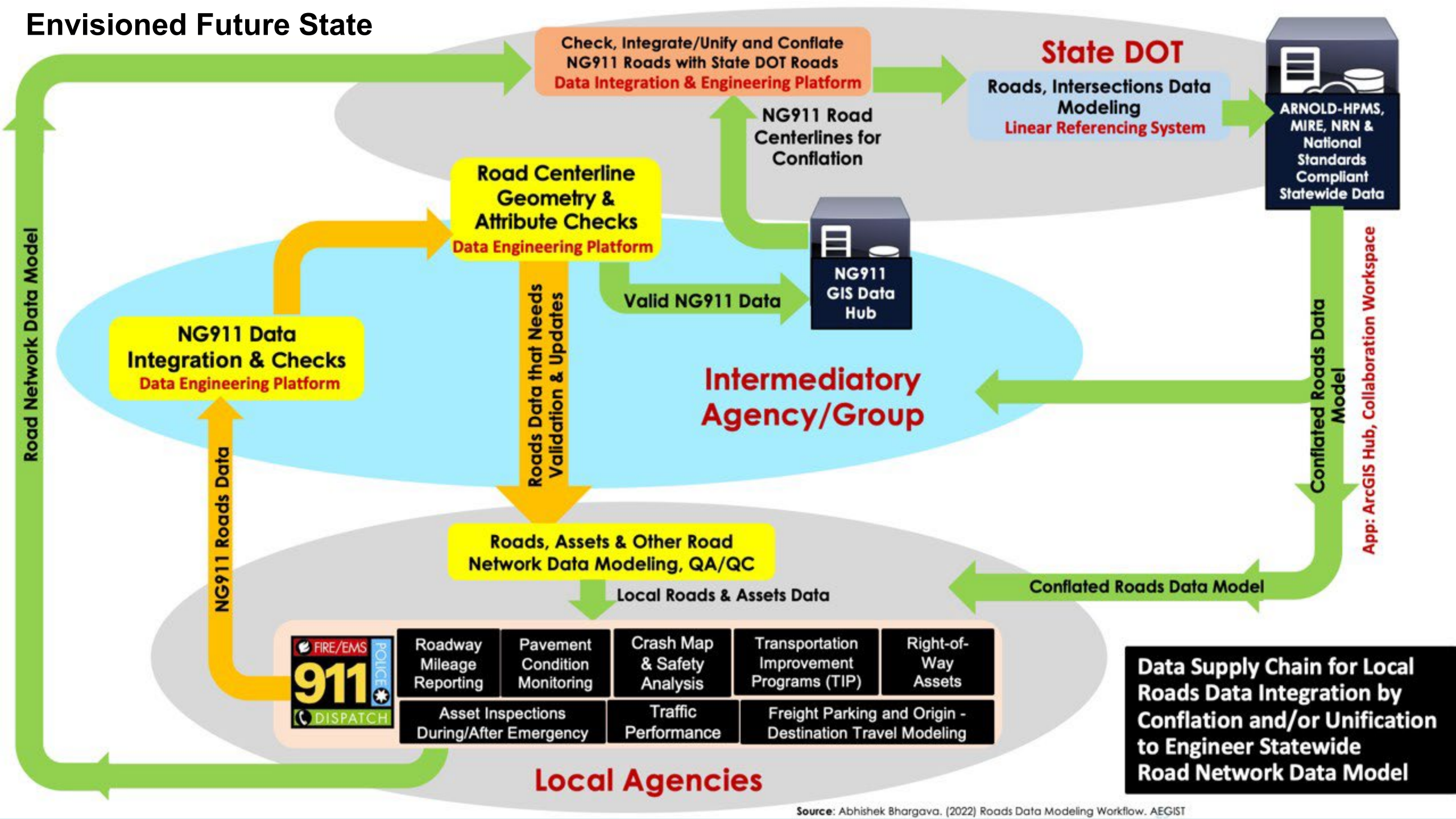
- All Roads Network (ARNOLD)
- National Road Network (NRN)
- Emergency Management
- Highway Safety Analysis
- Asset Performance Management

The Challenge

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



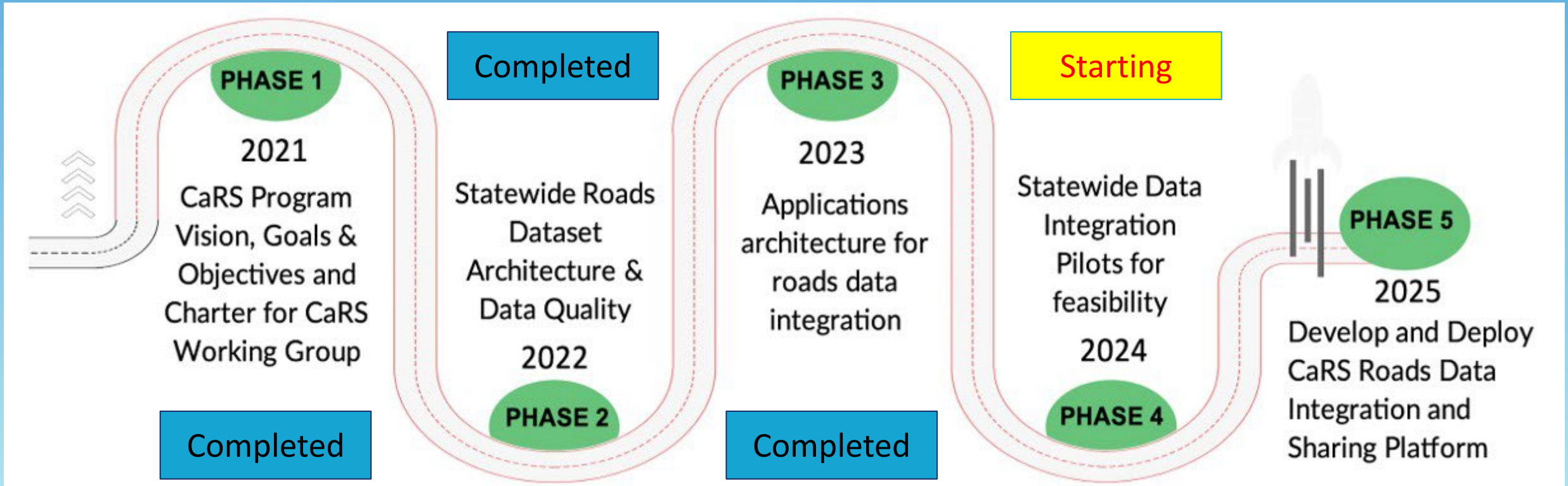
Envisioned Future State



Data Supply Chain for Local Roads Data Integration by Conflation and/or Unification to Engineer Statewide Road Network Data Model

Source: Abhishek Bhargava. (2022) Roads Data Modeling Workflow. AEGIST

California Roads Sharing Timeline



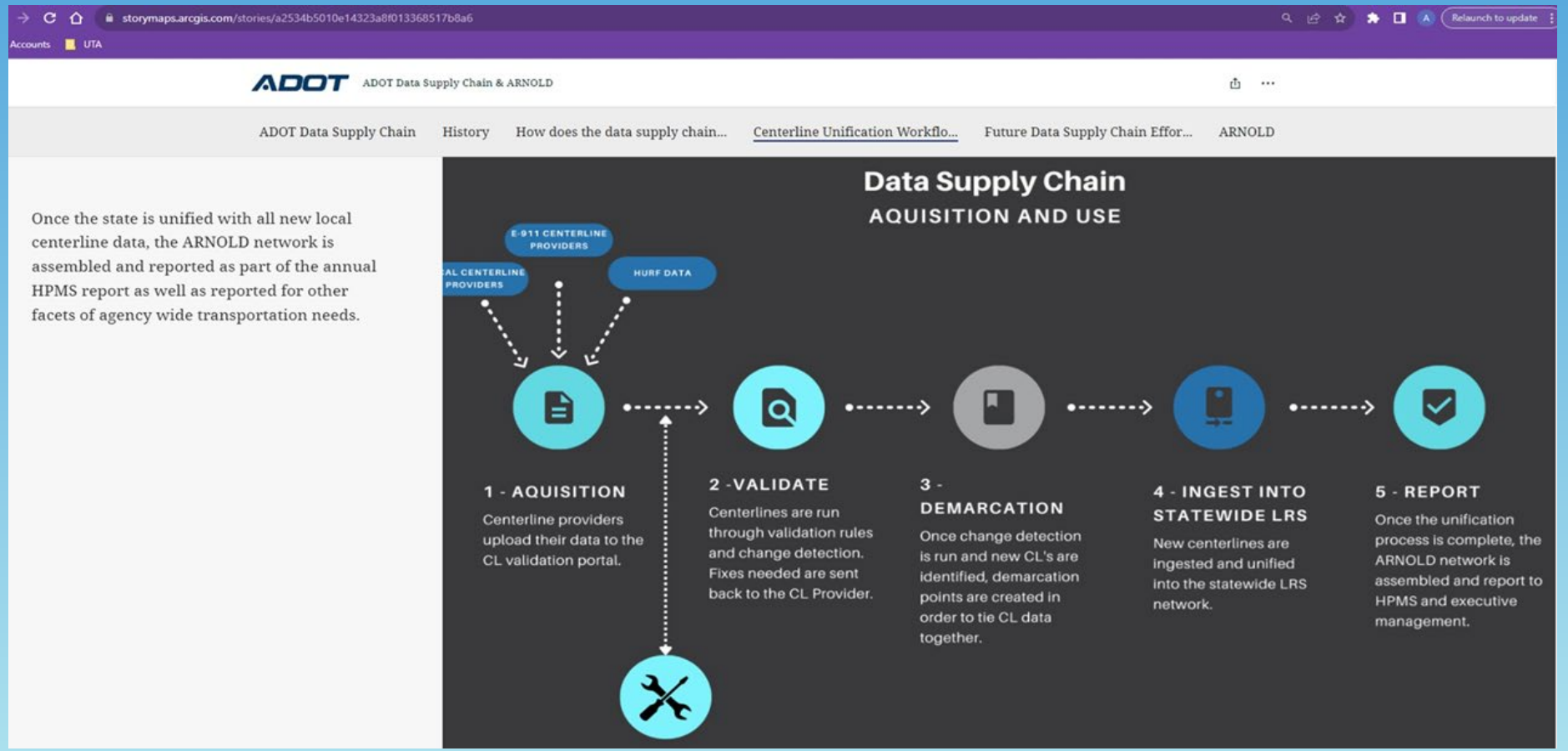
Benefits of CaRS

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

PROGRAM GOALS

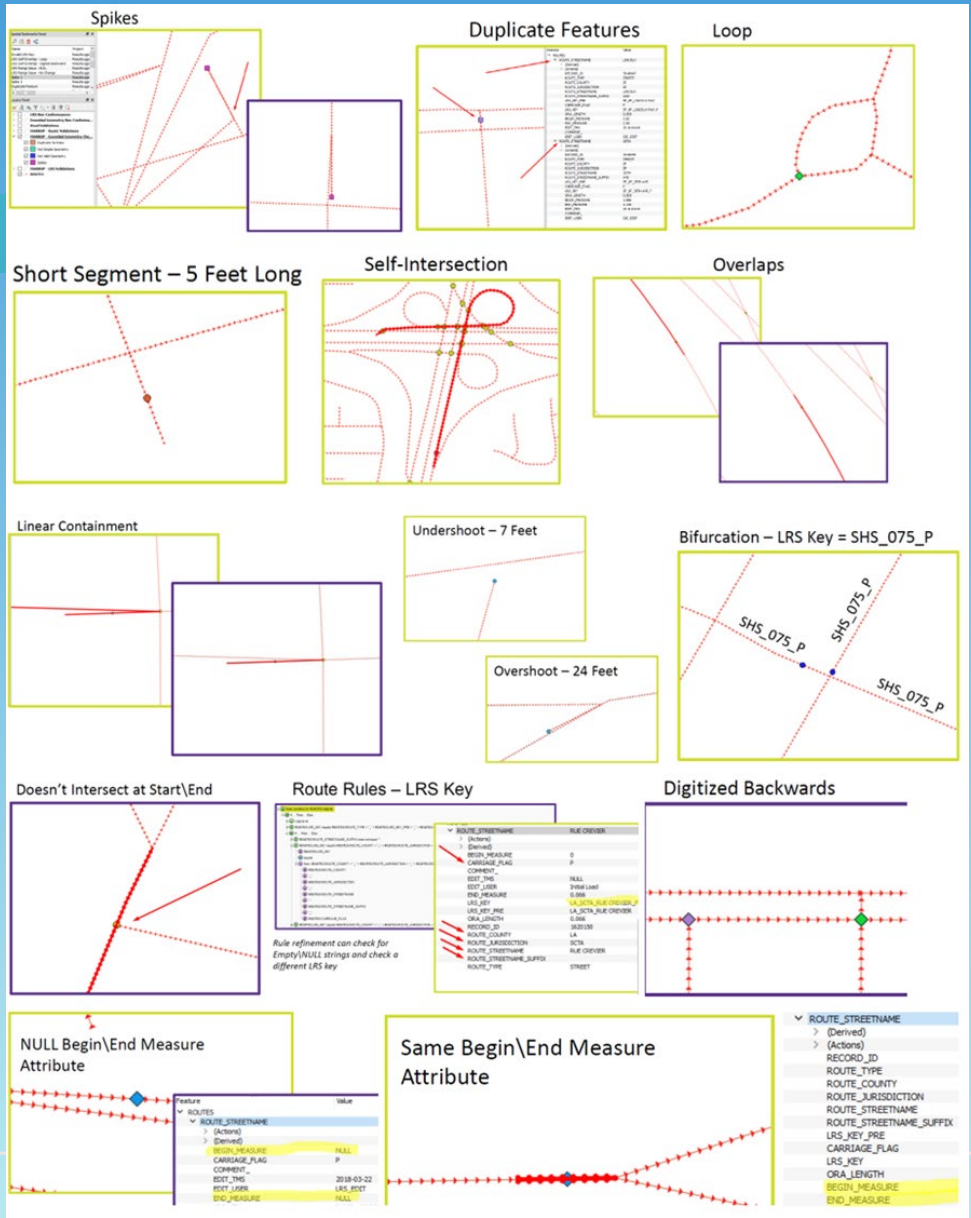
- ✓ Create a governed state-wide roads dataset to meet roads data use cases of multiple agencies in California.
- ✓ Provide mutual benefits to State and local jurisdictions, especially to business users involved in highway project planning, survey, design, construction, safety, traffic and asset management 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



CaRS Proof of Concept: Caltrans and Merced Geometry Comparison

Initiating Caltrans 1Integrate Pilot

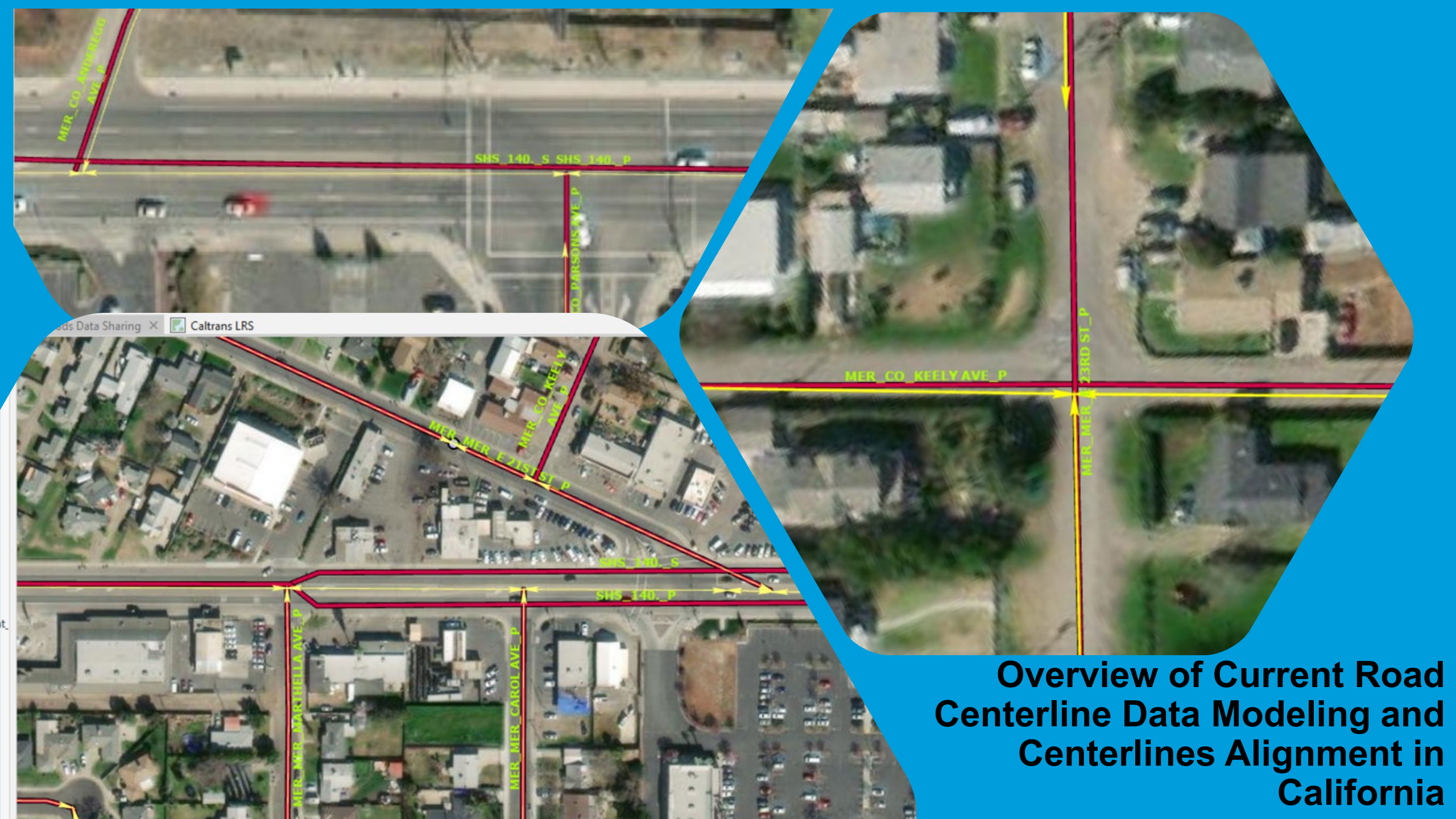


Category	Rule	Features	Non-Conformance
Essential Geometry Checks	Check Duplicate Features	2,127,459	14
	Check for Duplicate Vertices	2,127,459	332
	Check for Spikes	2,127,459	206
	Check for Kickbacks	2,127,459	47
	Check Multi-Part Features	2,127,459	6
	Check Features are Simple	2,127,459	559
	Check Feature are Valid	2,127,459	332
Transportation Checks	Road Geometry longer than 12 feet	2,127,459	3,175
	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	175,989
	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

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