



San Joaquin Pilot Reliability

Rulemaking 15-03-010

May 7th, 2019
Tulare, California

Larry Franco, SCE Engineer and Jonathan Brownstein, SCE Engineer

Meeting Topics

- SCE System
- Reliability Programs
- Pilot Communities
- Metrics
- Reliability Overview
 - California City
 - Ducor
 - West Goshen



SCE System

Overview

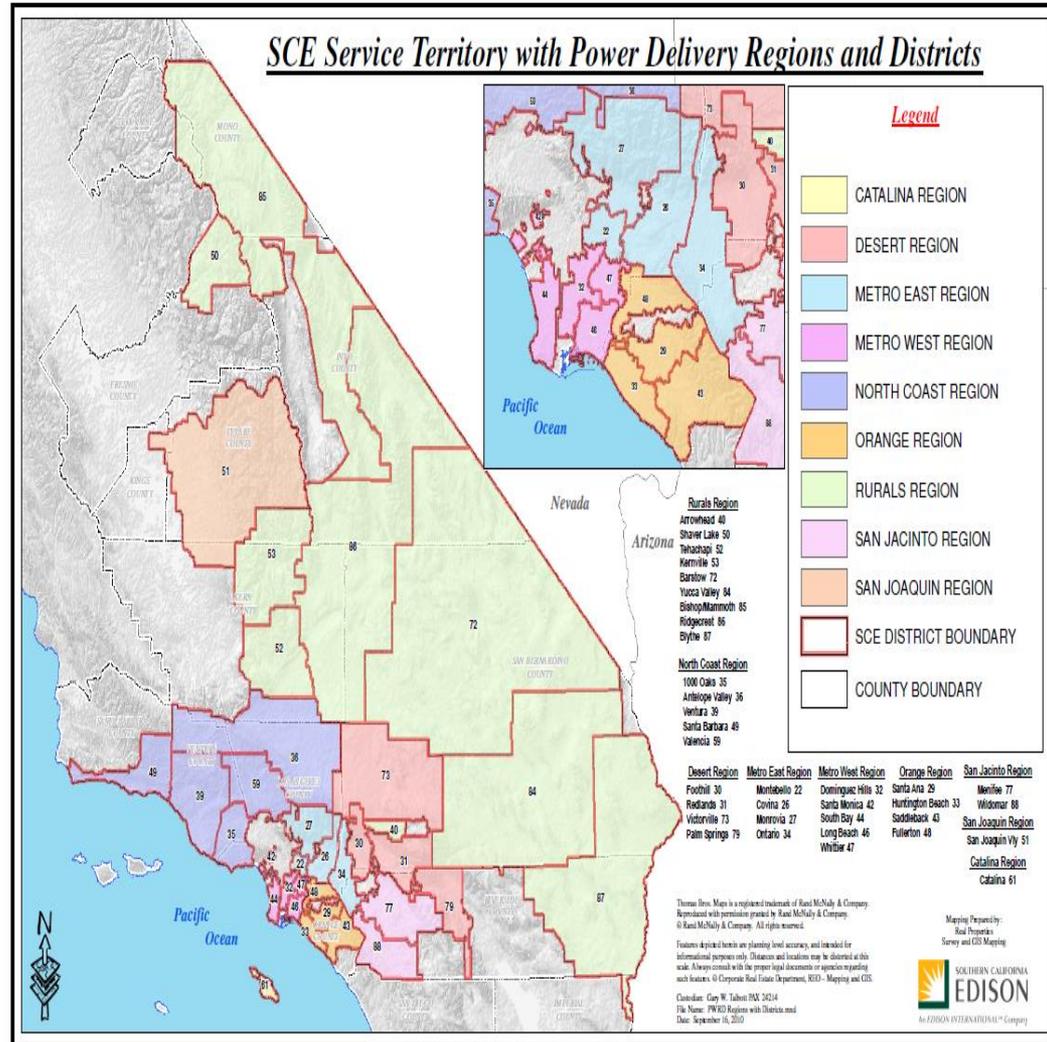
- We delivered more than 87 billion kWh of electricity and powered a total of

15M Residents

5M Customers

5K Large business
280K Small business

180 Unincorporated Cities



SCE System

Assets

- To deliver power safely, reliably and affordably, we monitor and maintain a vast electricity system

50K Square Mile

4,600 Circuits

1.5M Poles

119K Miles of D&T lines

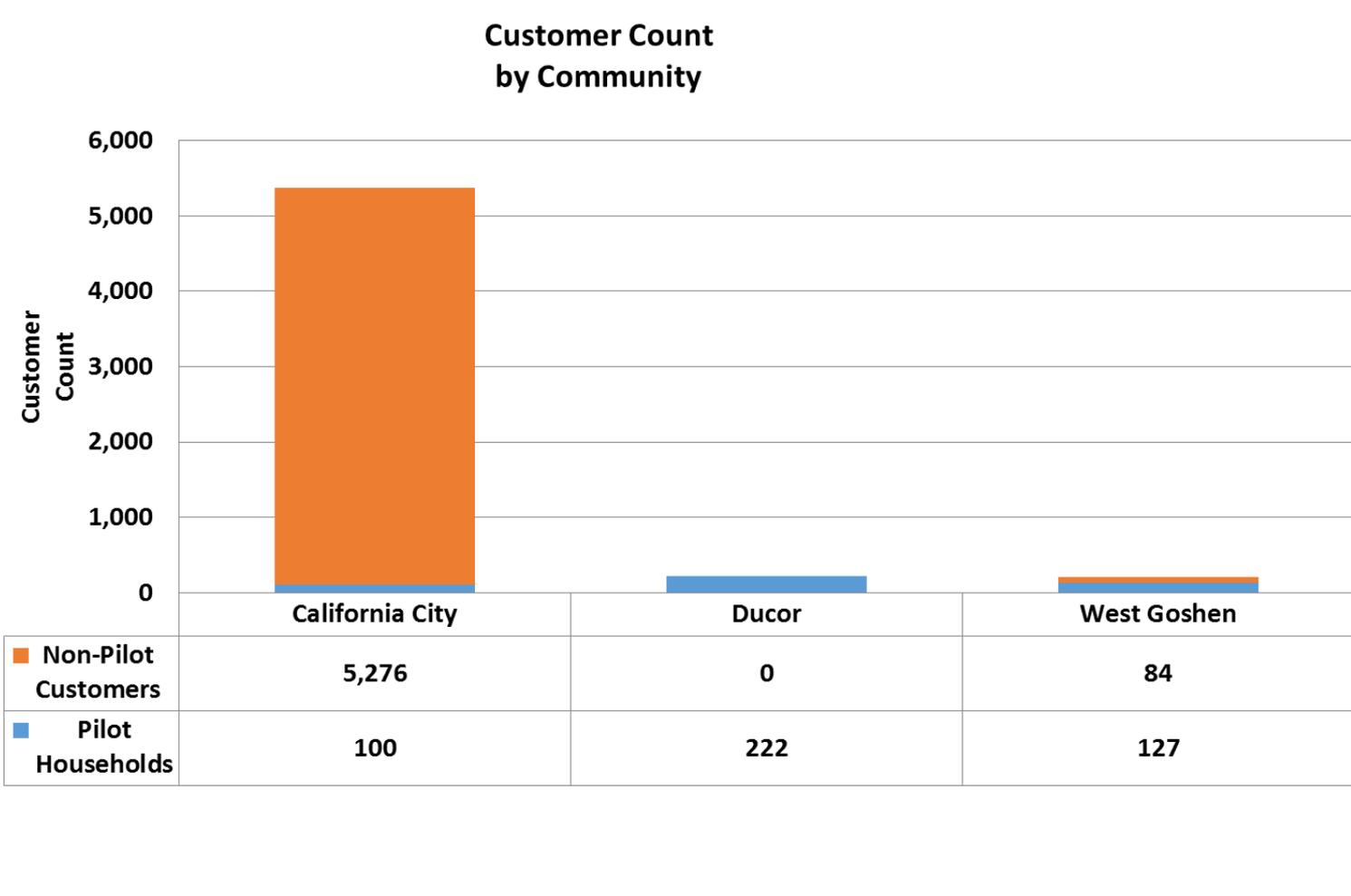
730K Transformers



Reliability Programs

- **Daily Operations Call**
 - Review large outages
 - Discuss operational performance and lessons learned
 - Discuss projects/solutions for easier/quicker restoration
- **Regional/District Grid Team Meetings**
 - Discuss rolling circuit performance list
 - Identifies circuit issues and solutions
 - Create projects on a local level
- **Worst Performing Circuits (WPC) Program**
 - Historical performance for problematic circuits
 - Identify projects on circuits in worst 1% of durations and frequency indices
 - Solutions for ease of restoration as well as preventing outages
- **Worst Circuit Rehabilitation (WCR) Program**
 - Risk based circuit identification for reliability projects
 - Similar projects to WPC program

Pilot Communities



Metrics

SAIDI: System Average Interruption Duration Index

- **The amount of time the average SCE customer experiences a sustained outage(s) in a given year**
 - “What’s the total time my power service will be unexpectedly interrupted this year?”

$$\text{SAIDI} = \frac{\text{Total minutes every SCE customer was without power due to sustained outages (CMI)}}{\text{Total number of customers}}$$

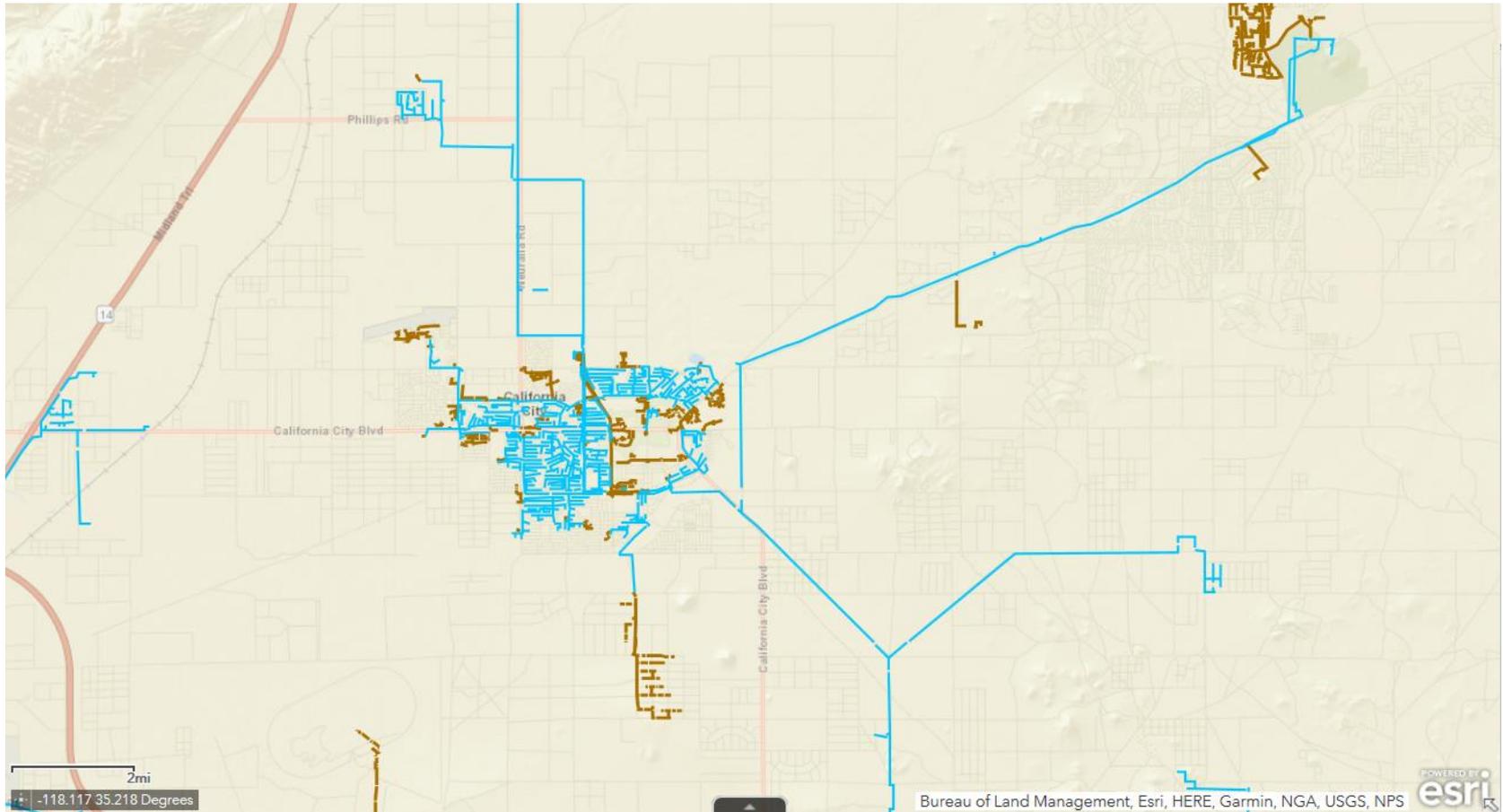
SAIFI: System Average Interruption Frequency Index

- **The number of times the average SCE customer experiences a sustained outage in a given year**
 - “How many times will my power service be unexpectedly interrupted this year?”

$$\text{SAIFI} = \frac{\text{Number of sustained customer outages experienced by all SCE customers (CI)}}{\text{Total number of customers}}$$

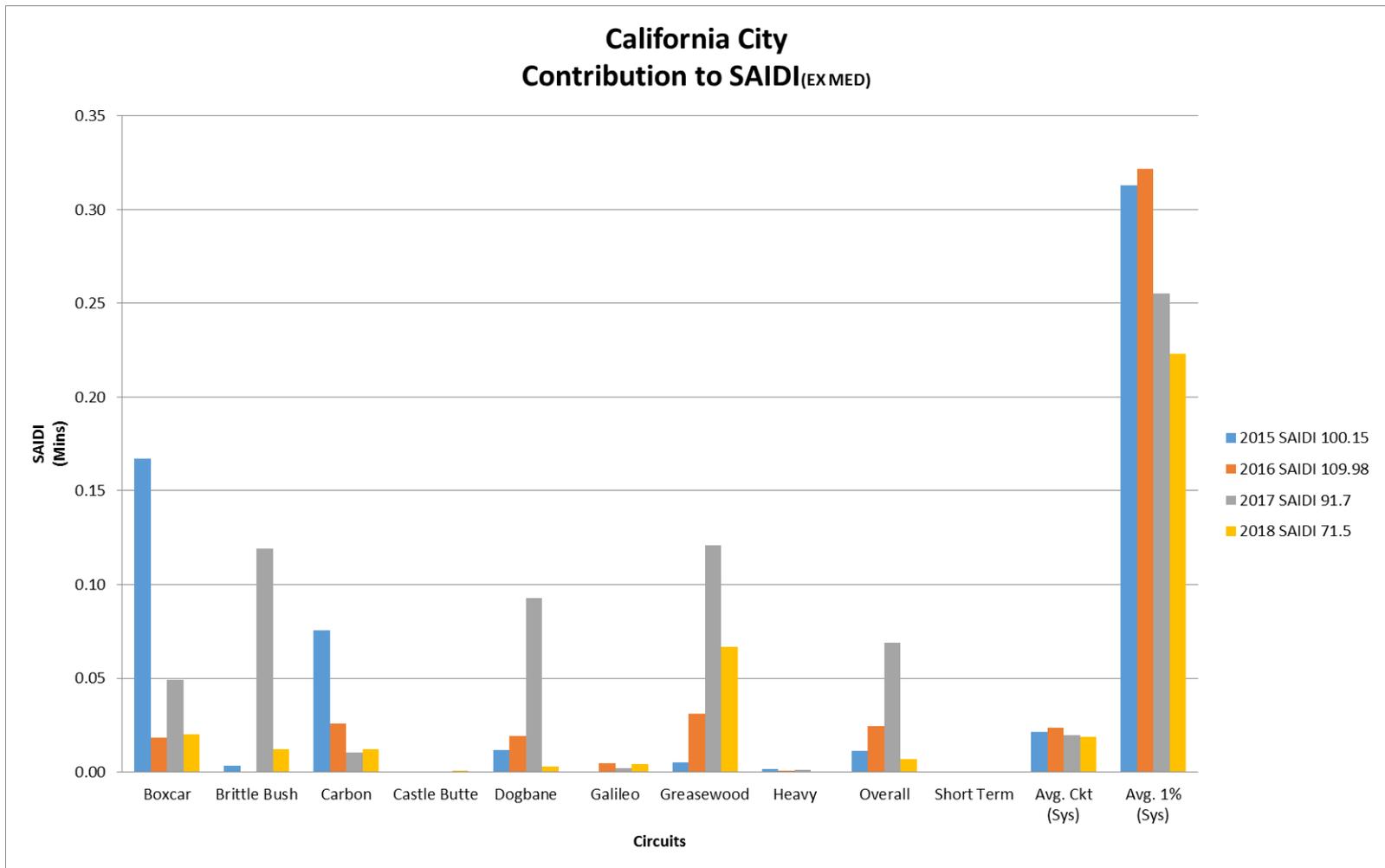
California City

City Map and Feeders



California City

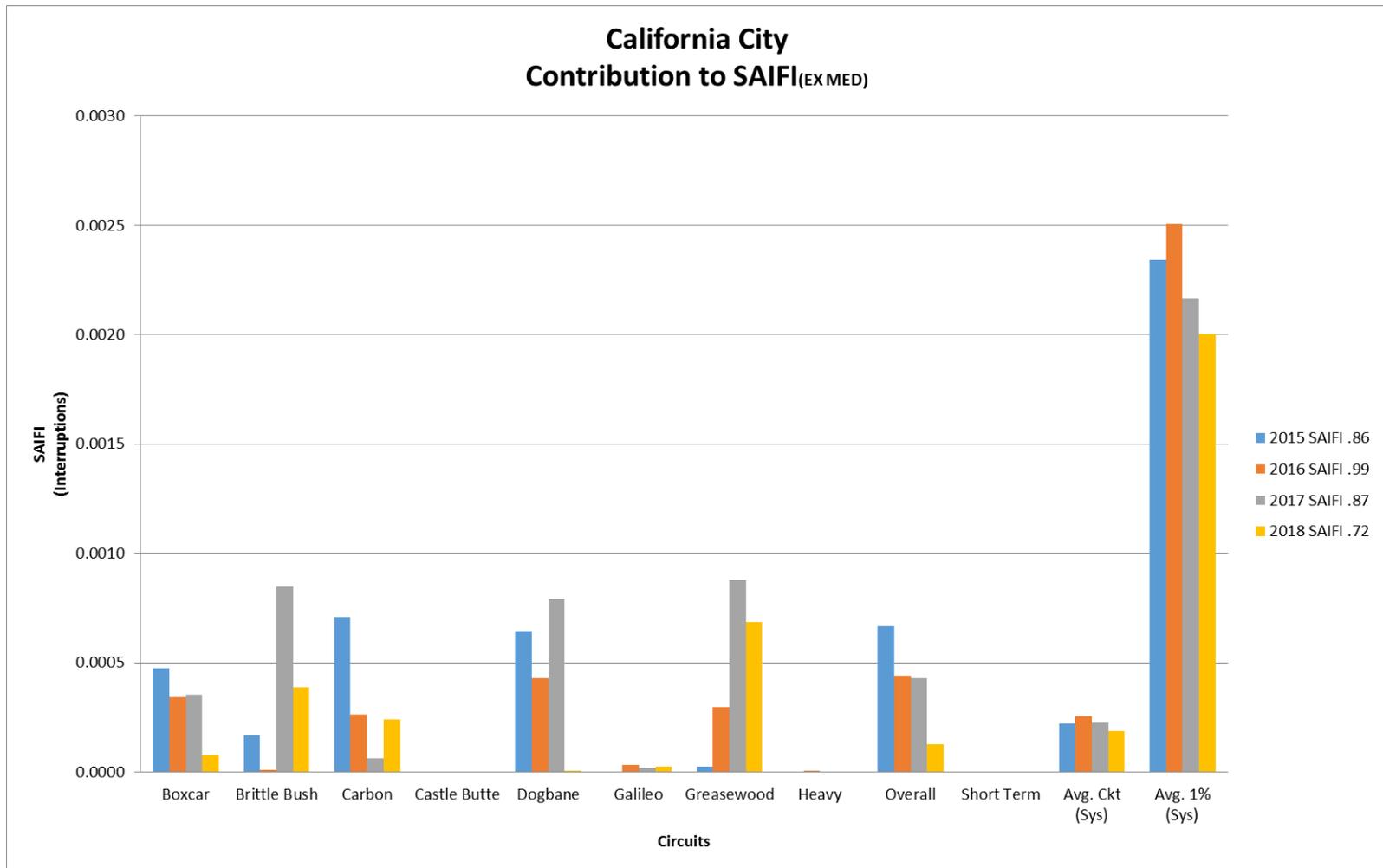
SAIDI Contribution



Circuits feeding California City compared to the average SCE circuits contribution.
Circuits feeding California City compared to the average circuit contribution of the top 1%.

California City

SAIFI Contribution



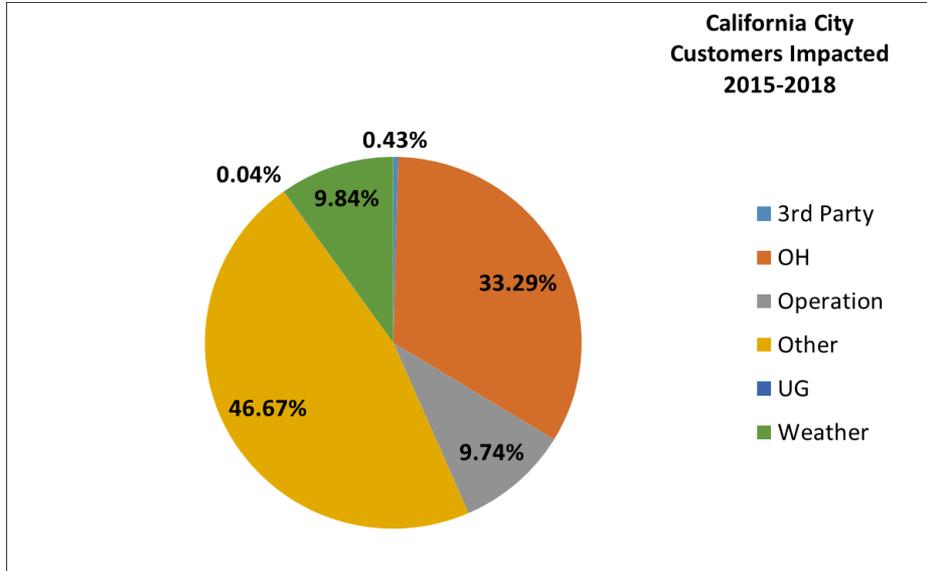
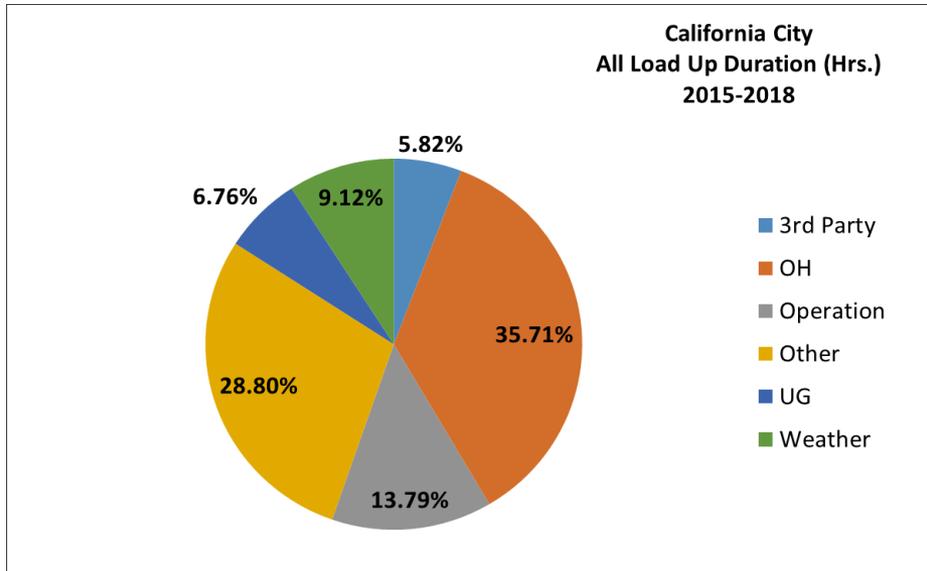
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California City

Extended Electric Cause Categories

Extended Electric Outage: is identified as an interruption greater than four hours that affects at least 10 customers

- **3rd Party**
e.g. balloon, car hit pole, dig-in
- **OH (Overhead)**
e.g. equipment failure
- **Operations**
E.g. urgent maintenance w/o 3-day notice
- **Other**
E.g. patrolled
- **UG (Underground)**
e.g. equipment failure
- **Weather**
e.g. wind, fire



California City

In Flight Projects

IR Circuits & Cable

- ▲ WCR - Circuits (OH)
- ▲ WCR - Circuits (UG)
- ▲ WCR - UG Cable
- ▲ CIC - Cable in Conduit
- ▲ OCP

DSP Load Growth

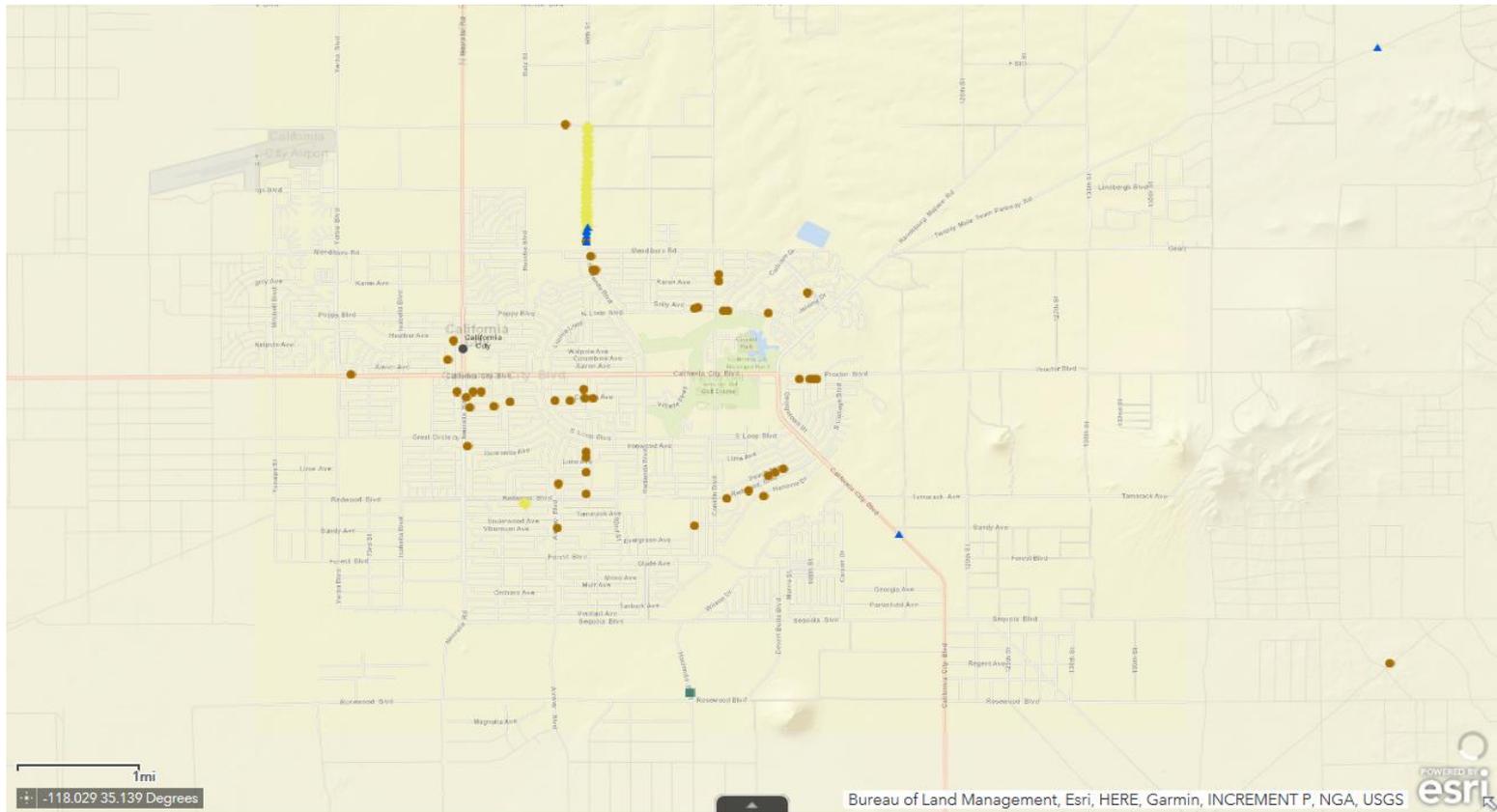
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- ◆ 4kV Sub-Elimination (UG)
- ◆ New Circuit (UG)
- ◆ New Circuits (OH)
- ◆ Non-New Circuit (OH)
- ◆ Non-New Circuit (UG)

Structures & Equipment

- Plant Betterment (OH)
- Underground Structures
- New Caps (OH)
- 485 Cap Banks (OH)
- RCS & RAR Auto (OH)
- Auto Reclosures (OH)
- Oil Switches
- Plant Betterment (UG)
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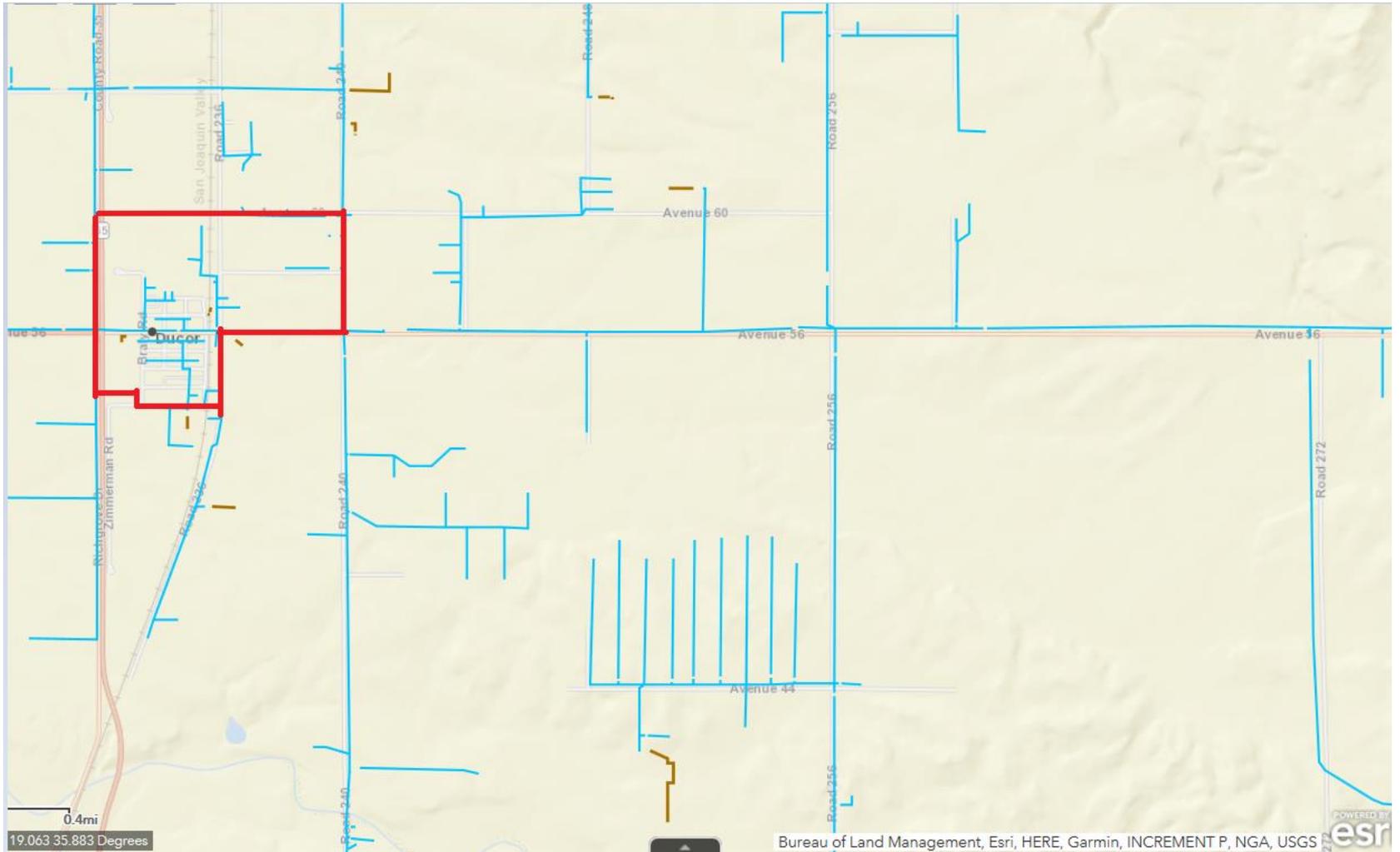
Poles

- Distribution Det Pole
- Transmission Det Pole



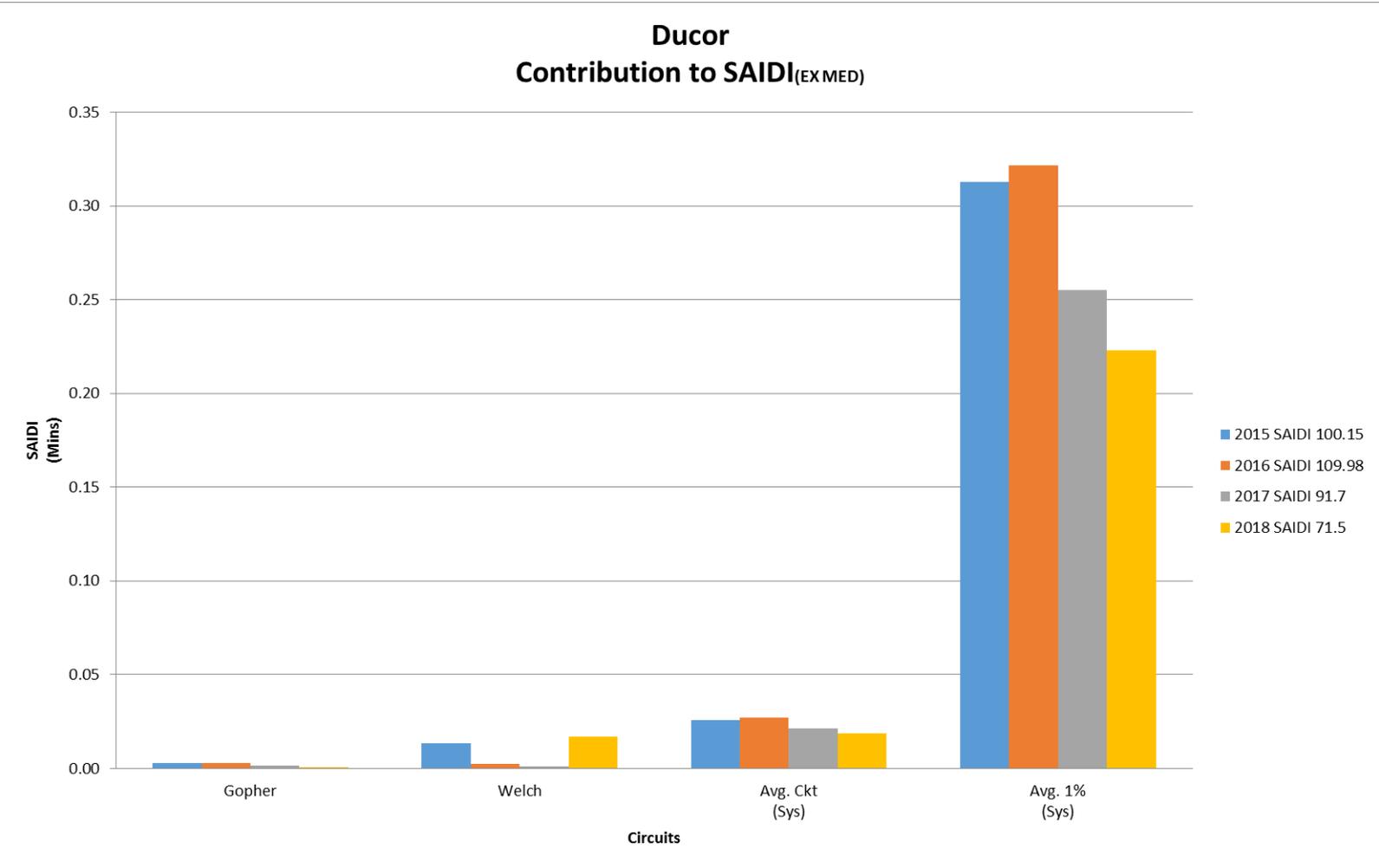
Ducor

City Map and Feeders



Ducor

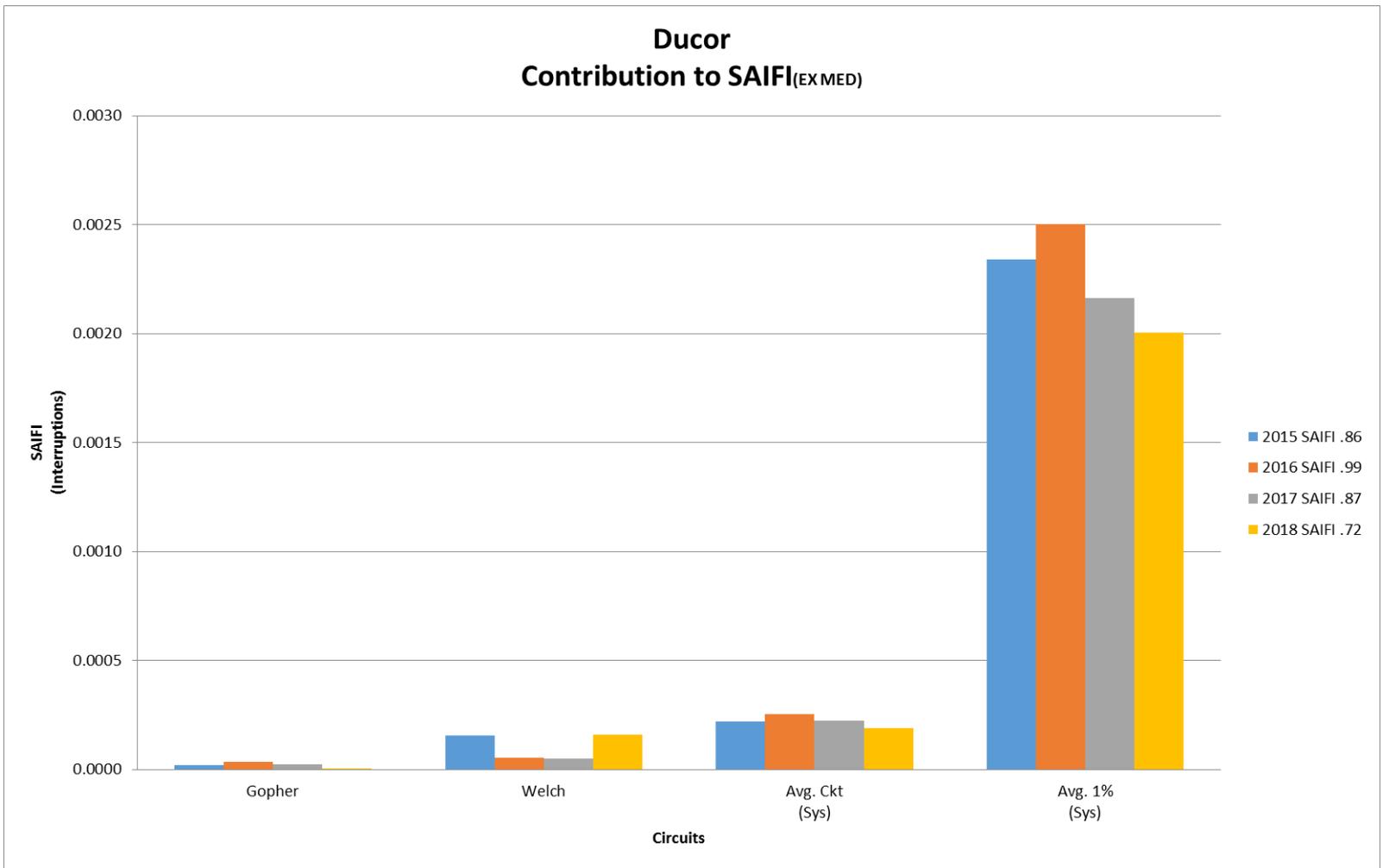
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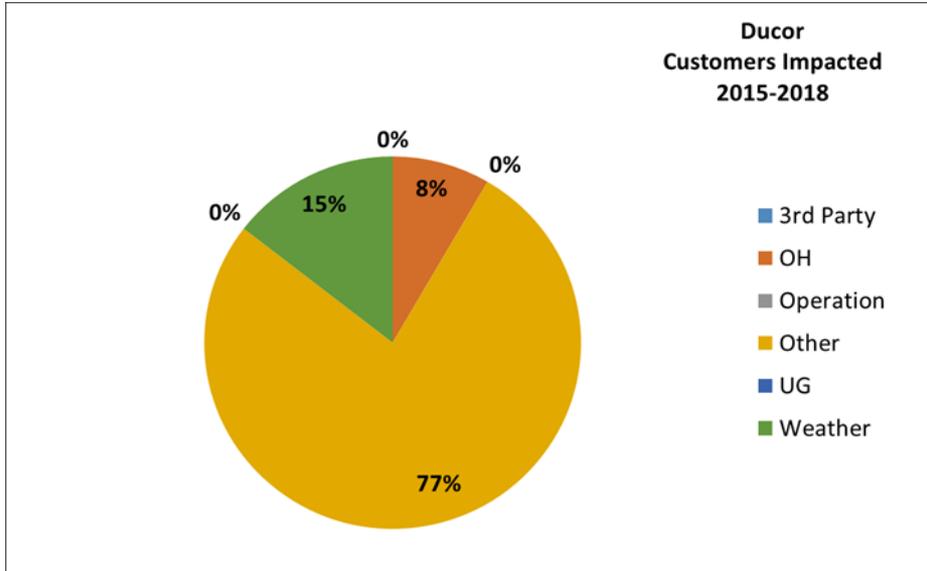
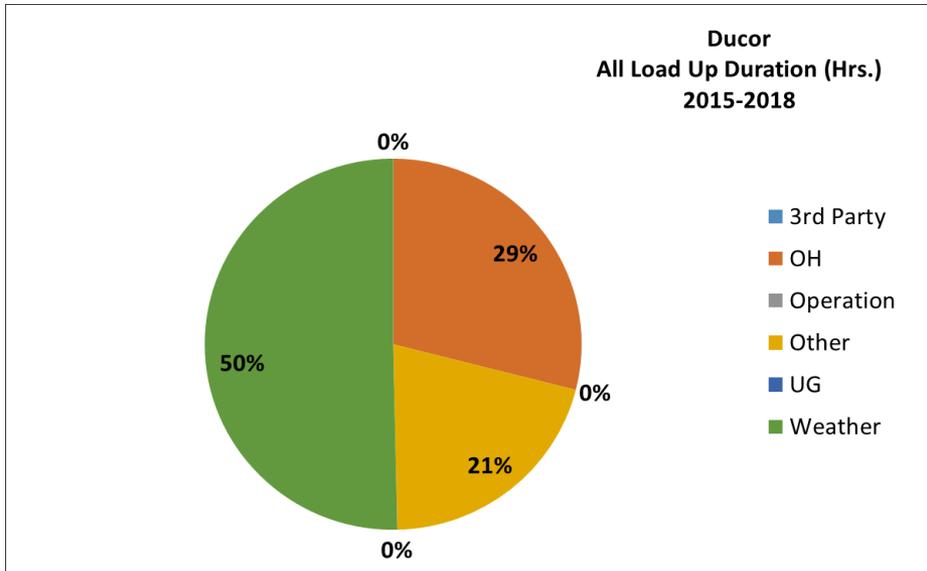
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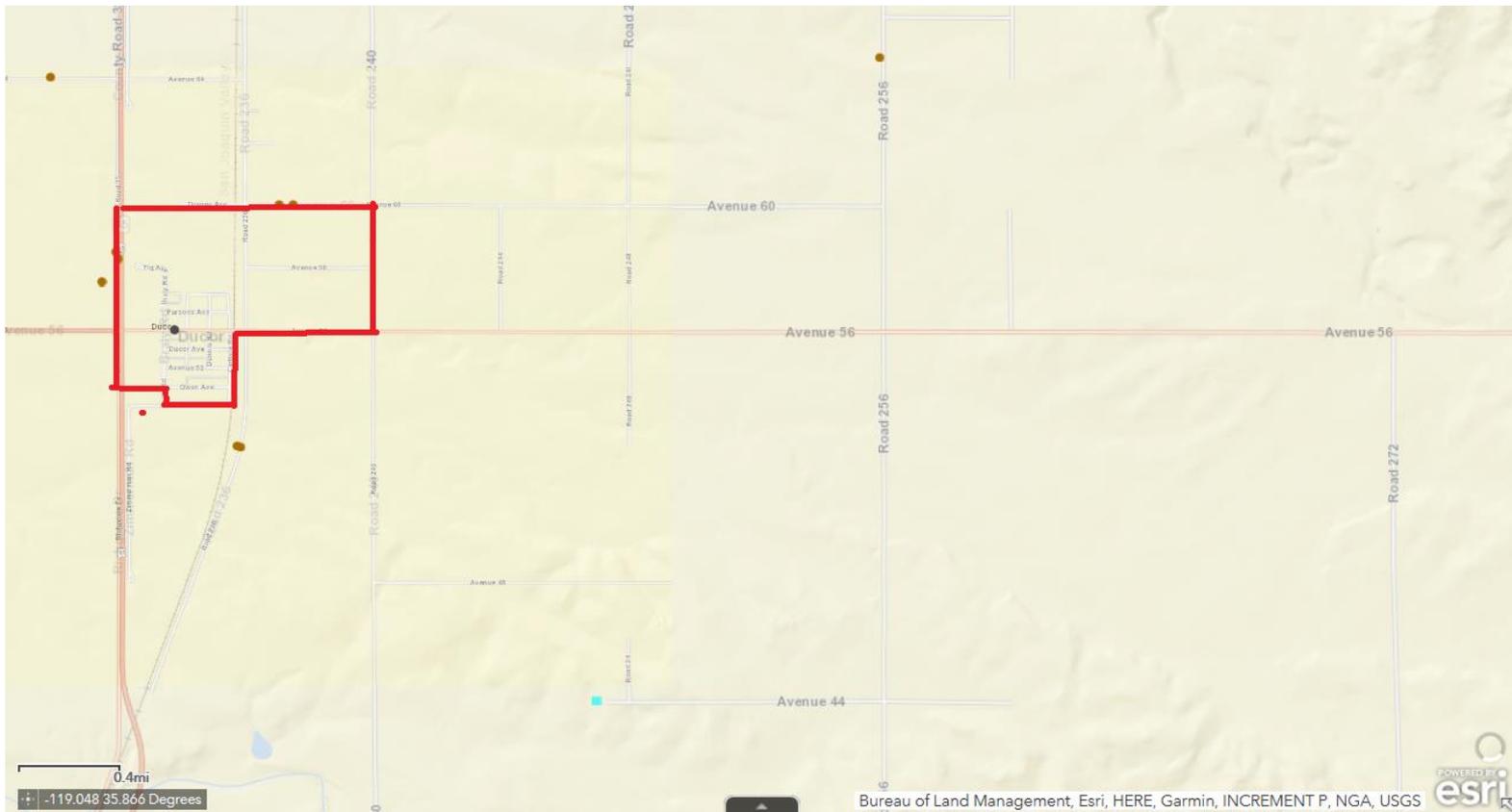
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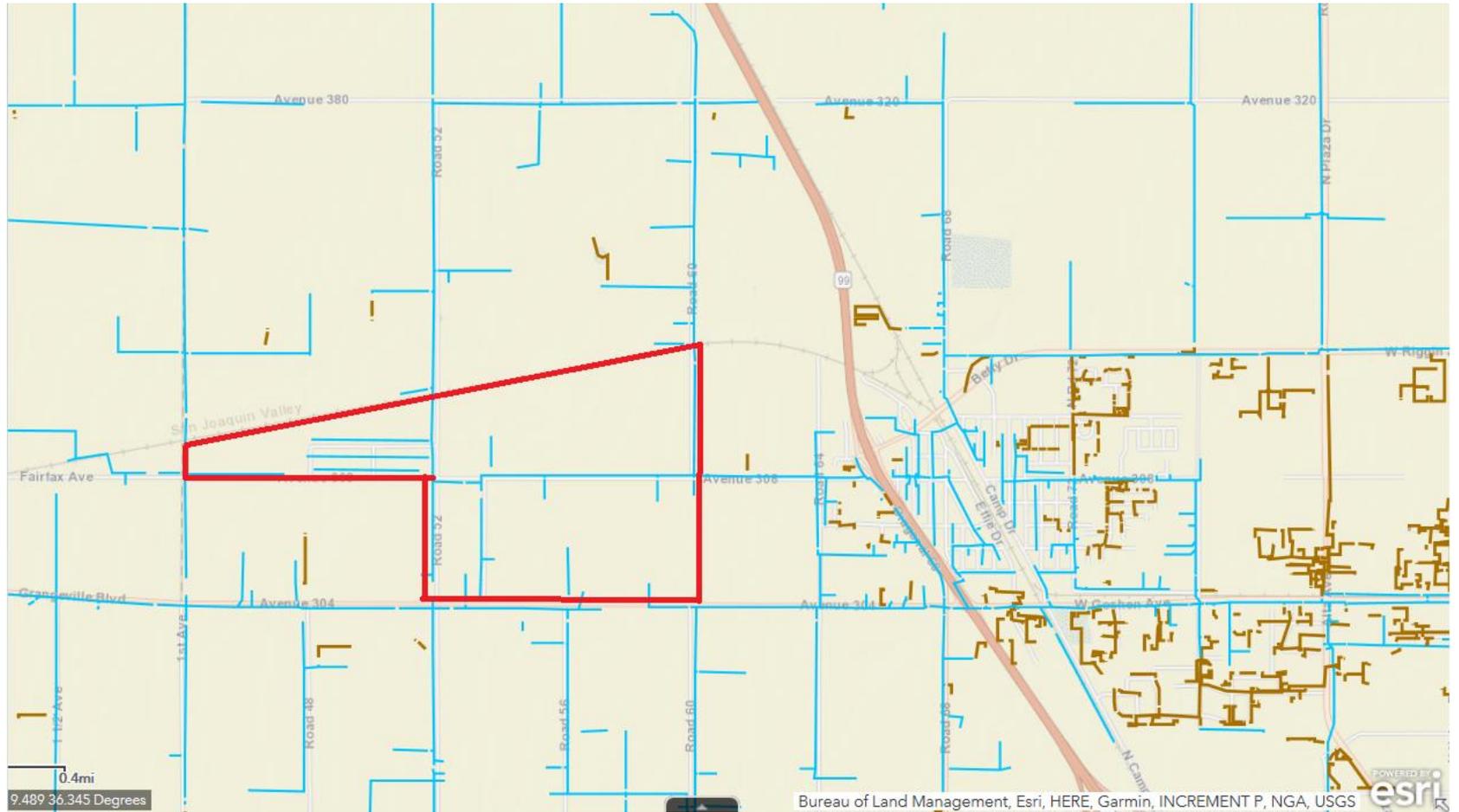
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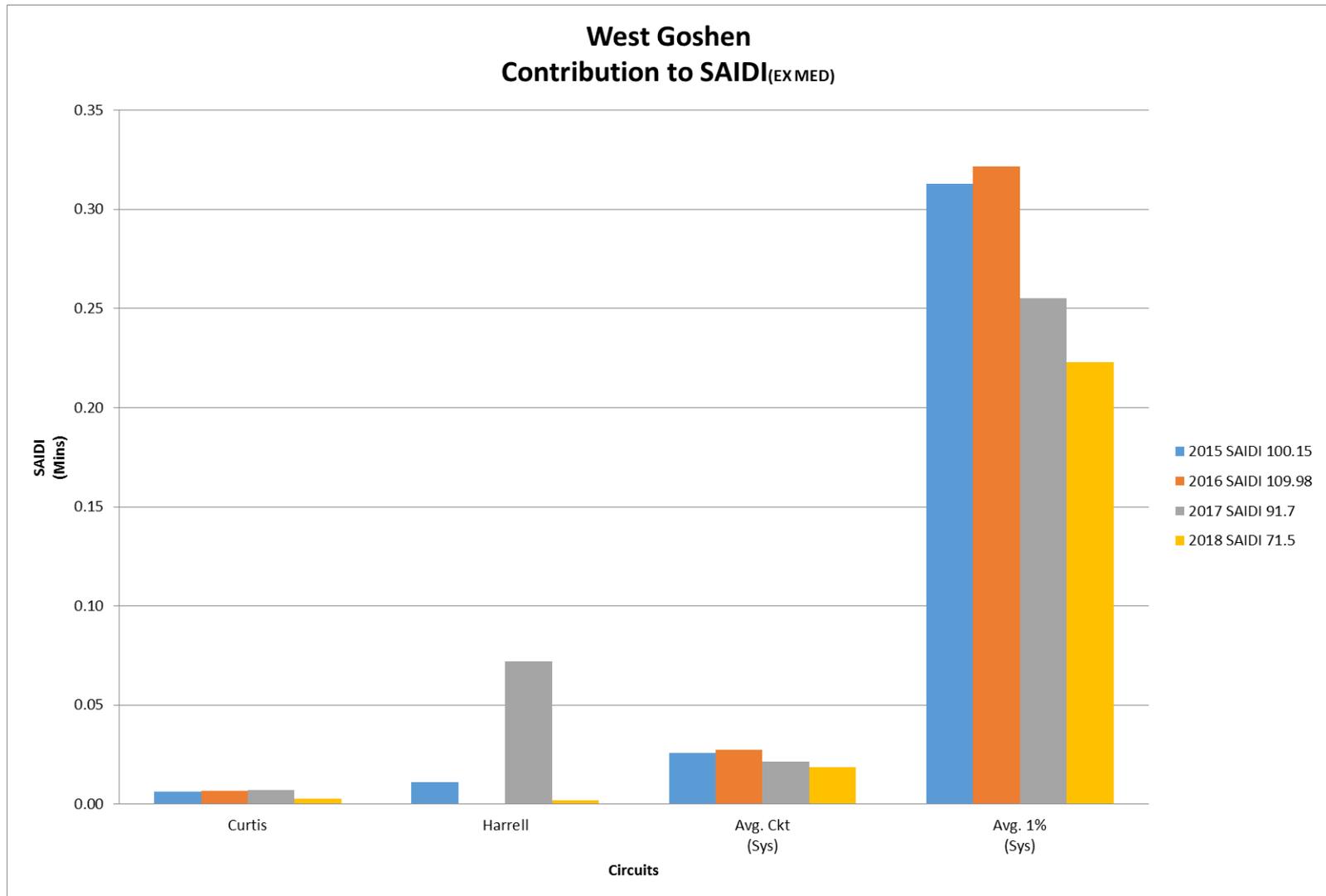
West Goshen

City Map and Feeders



West Goshen

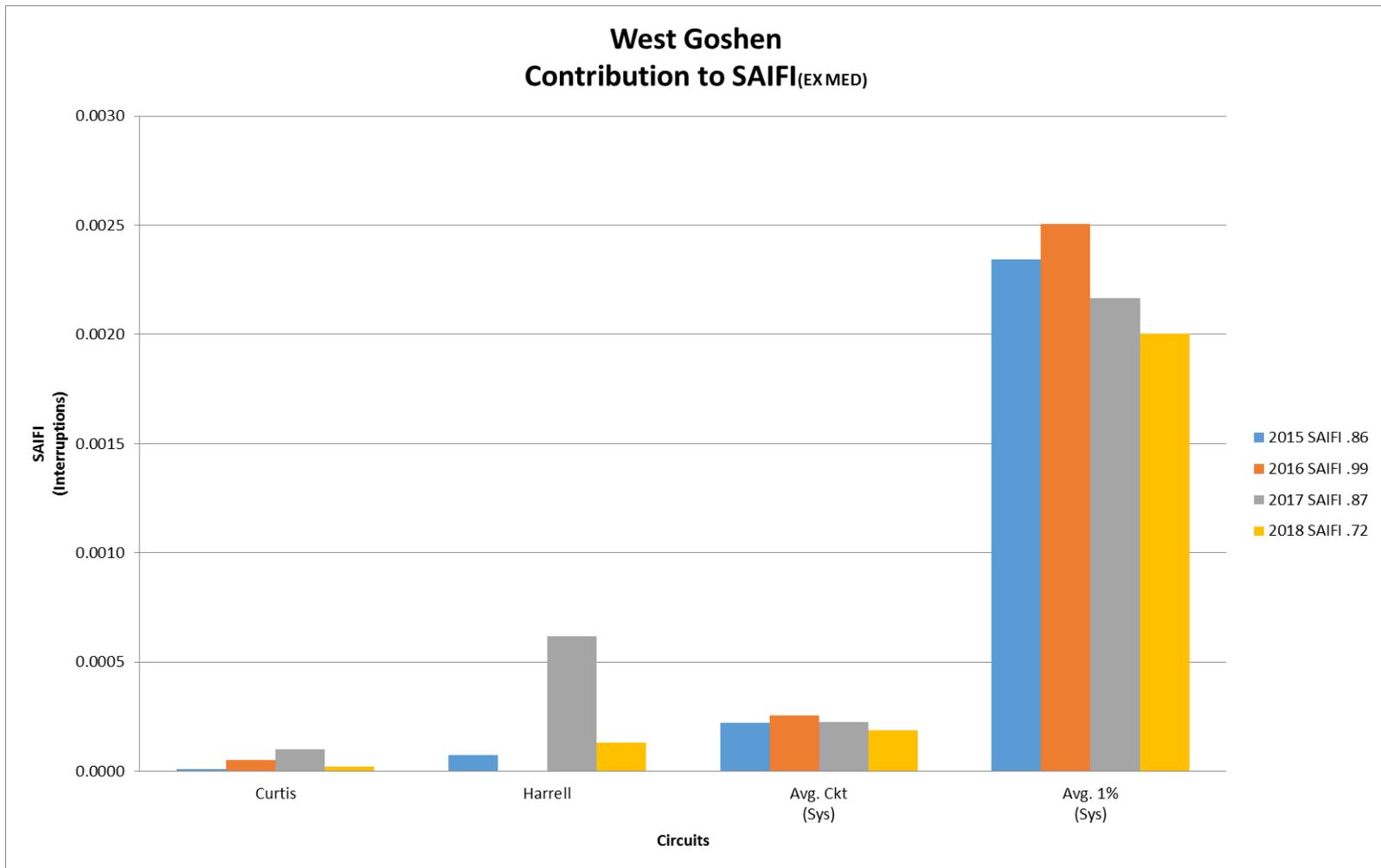
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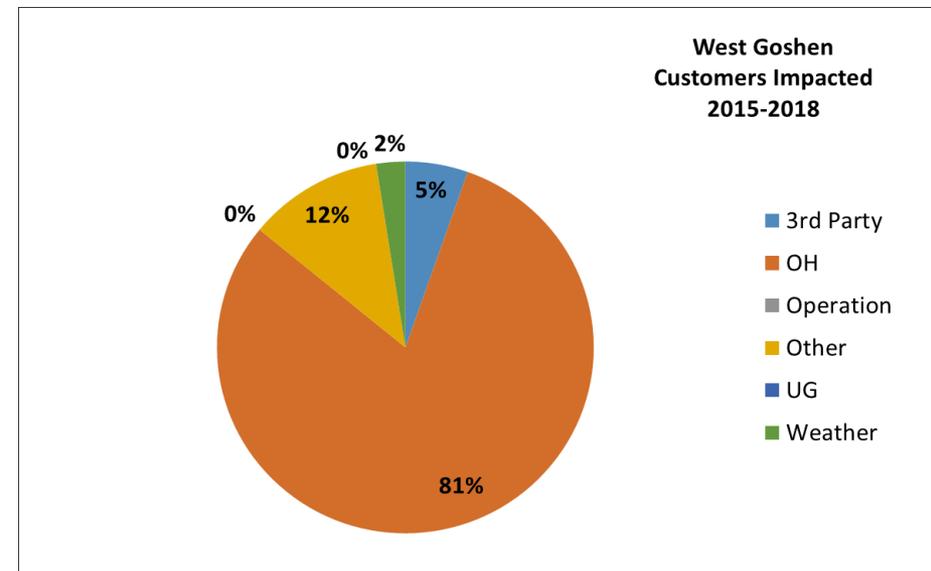
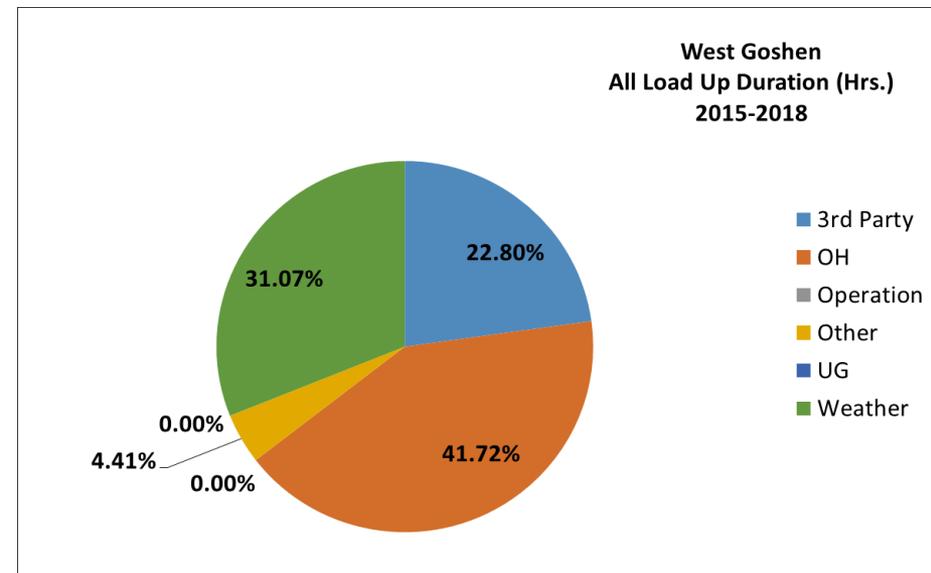
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- Poles
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Thank you

Customer Support

Home > Customer Support > Contact Us

**Report an Outage
(24-hours a day, 7-days a week):** 1-800-611-1911

**Customer Support
(USA & Canada):** 1-800-655-4555

Payments, Extensions or Payment Options: 1-800-950-2356

Multicultural Services

Cambodian: 1-800-843-1309

Chinese: 1-800-843-8343

Korean: 1-800-628-3061

Spanish: 1-800-441-2233

Vietnamese: 1-800-327-3031