

# ELECTRIC RELIABILITY PLAN

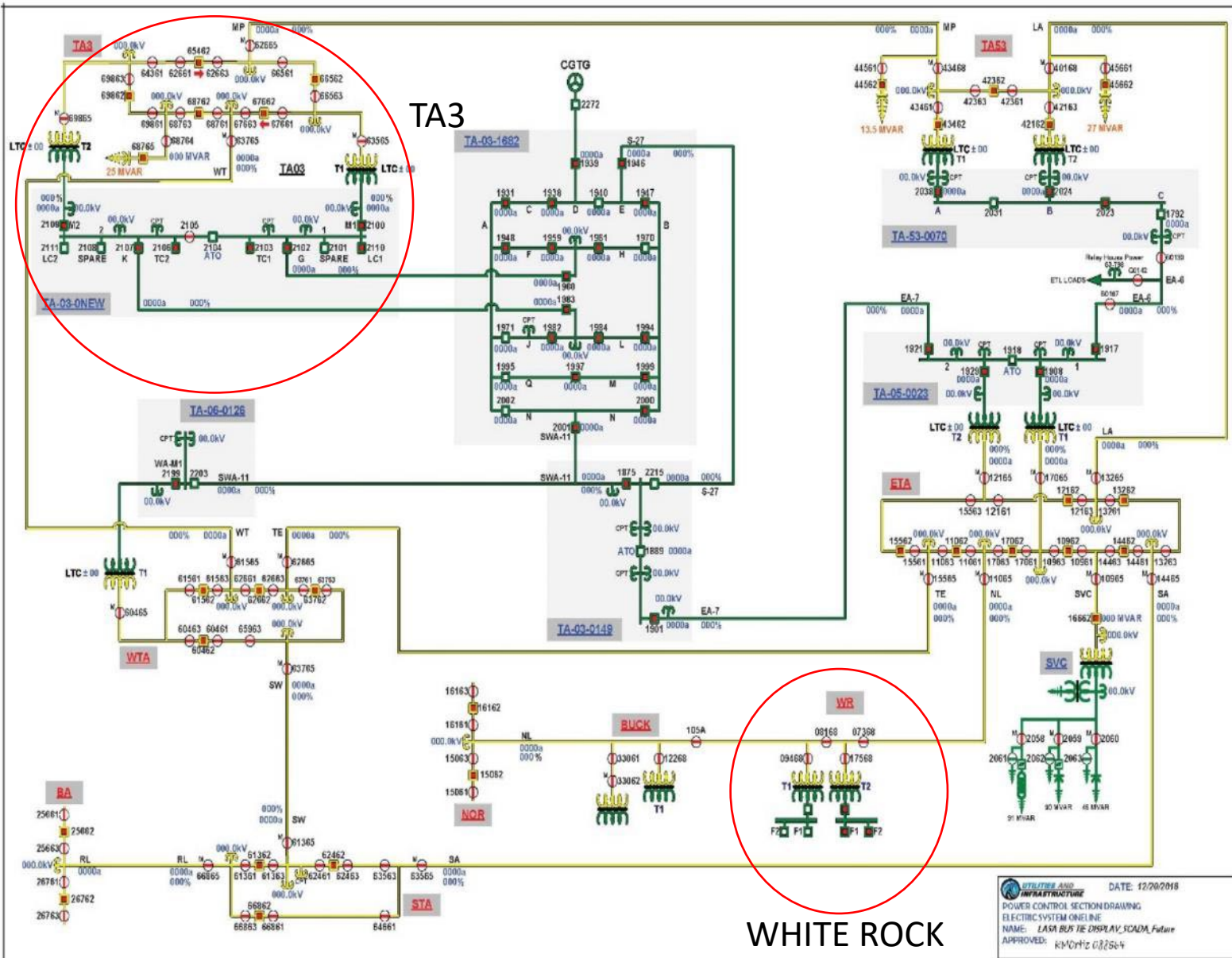
## INFORMATION AND DISCUSSION

Stephen Marez, PE, PMP  
Deputy Utility Manager  
Electric Distribution




- DISTRIBUTION SYSTEM
- RELIABILITY MEASURES
- SHORT TERM ACTION PLANS
- LONG TERM ACTION PLANS

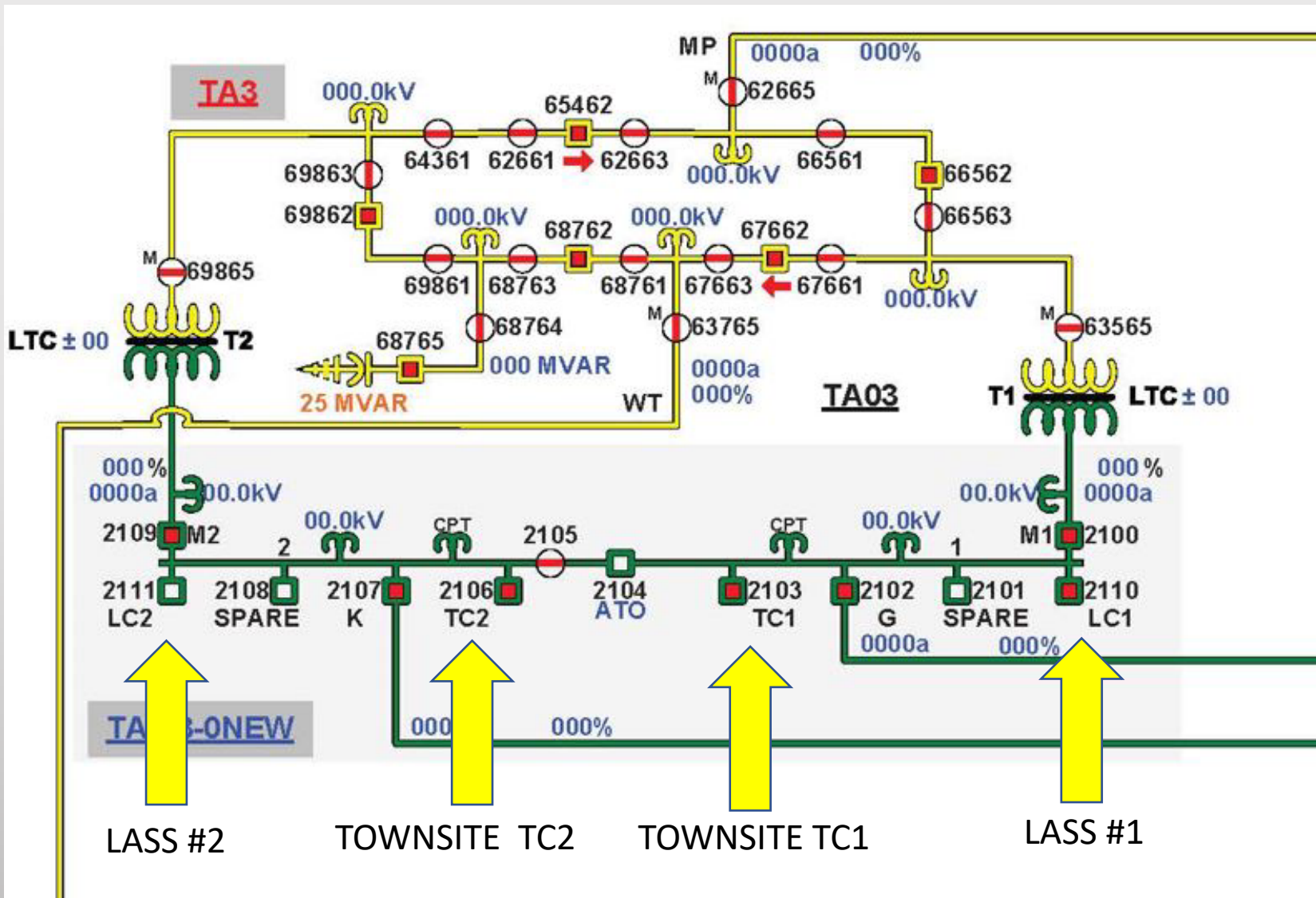
# LOS ALAMOS COUNTY AREA TRANSMISSION SYSTEM



WHITE ROCK


 DATE: 12/20/2018  
 POWER CONTROL SECTION DRAWING  
 ELECTRIC SYSTEM ONE LINE  
 NAME: LAMR BUS RE DISPLAY\_SCADM\_Future  
 APPROVED: R/M/01/20/2018

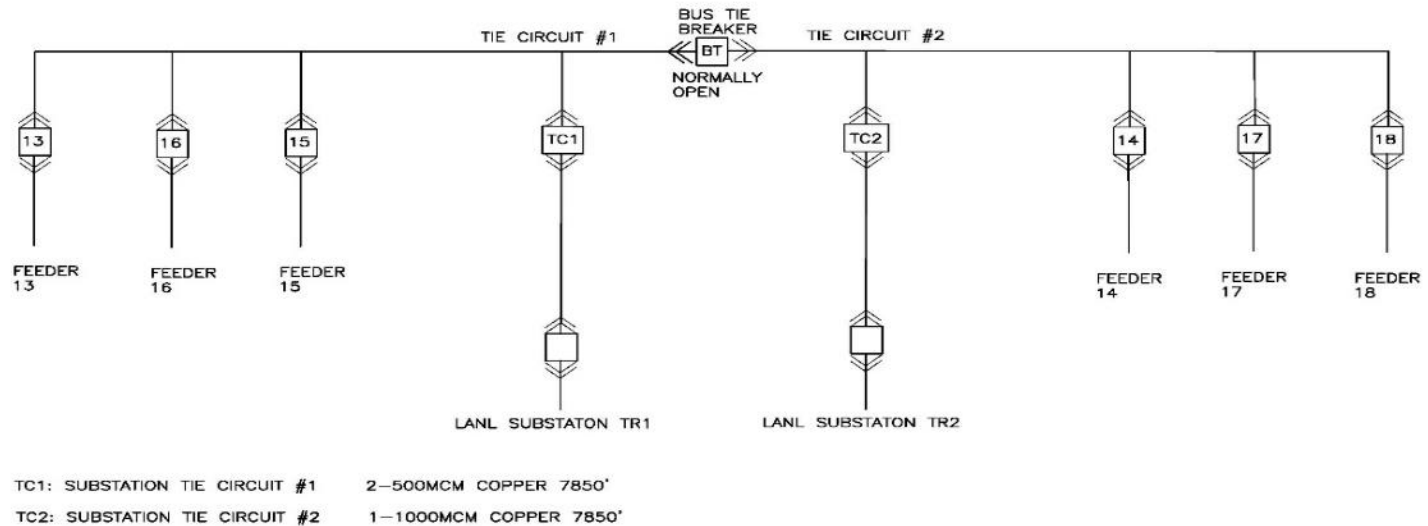
# TA-3 SUBSTATION





# TOWNSITE SWITCH STATION

LOS ALAMOS TOWNSITE SWITCHGEAR



Circuit 13: Western Area and Ski Hill

Circuit 14: Eastern Area and Pajarito Cliff Site

Circuit 15: Quemazon , North Community, Ponderosa Estates

Circuit 16: North Mesa and Barranca Mesa

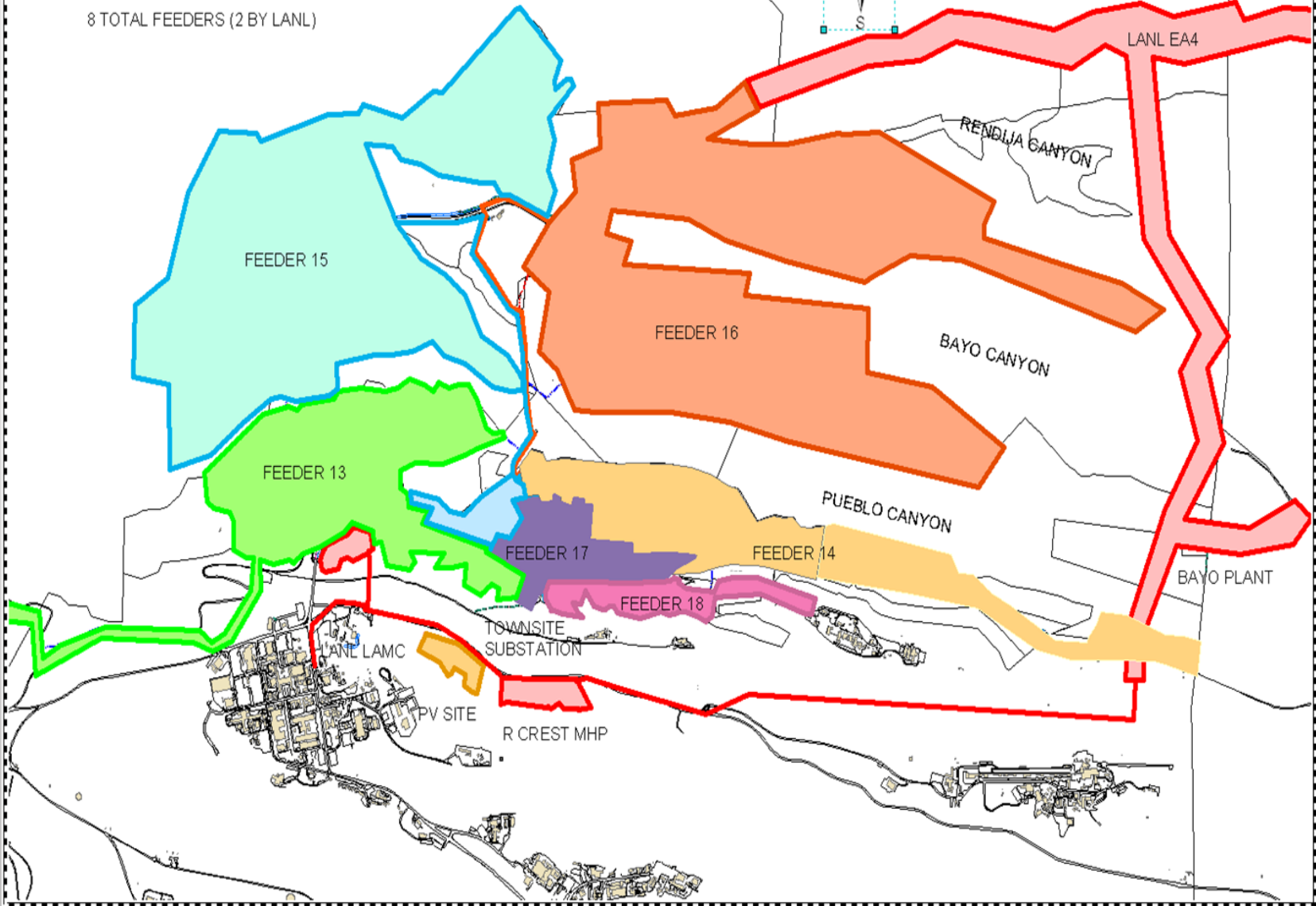
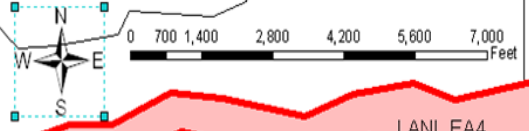
Circuit 17: Downtown Commercial North of Trinity

Circuit 18: Downtown Commercial South of Trinity and DP Road

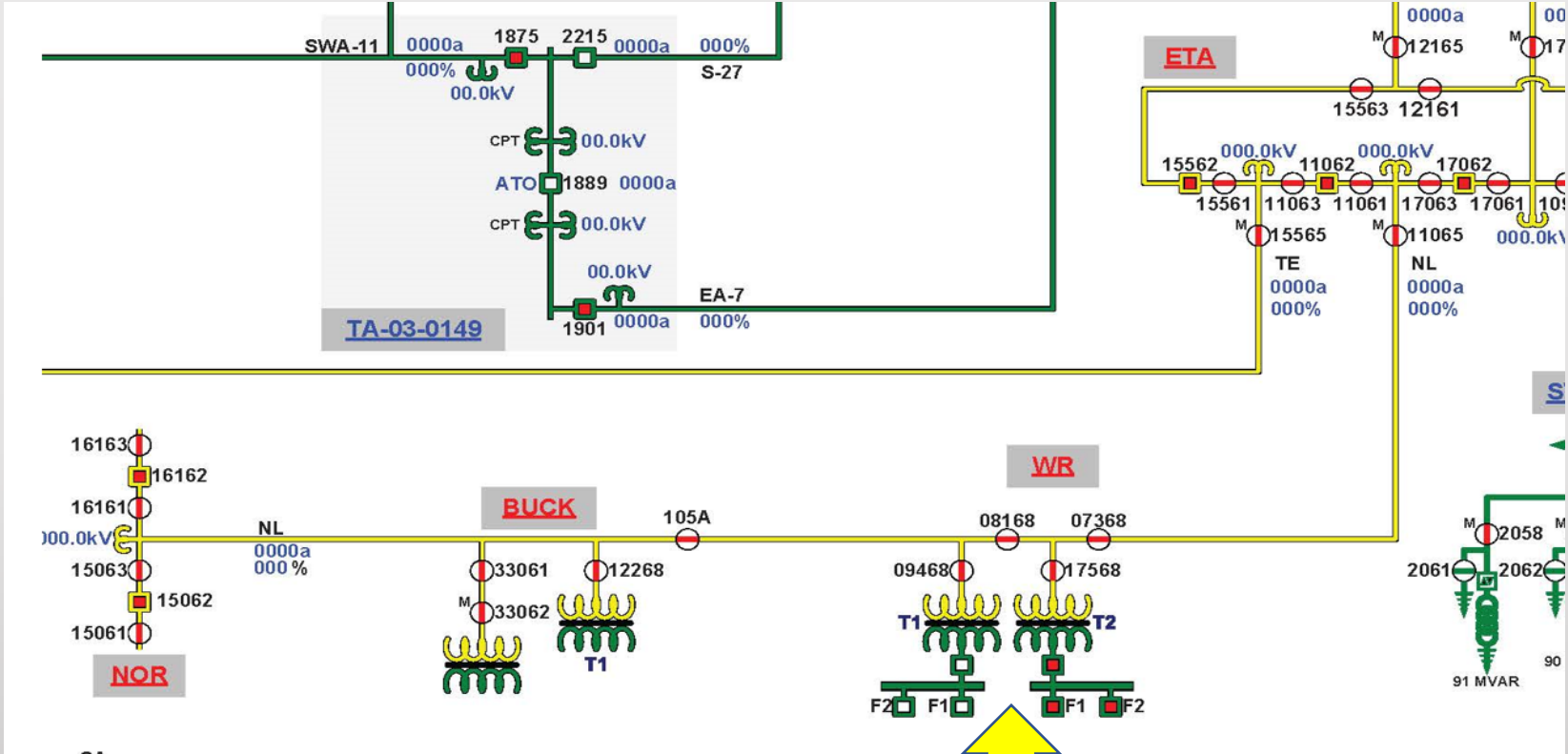
# LACDPU Townsite Electric Distribution System

EXISTING FEEDER SYSTEM CONFIGURATION  
(AREAS IN RED PROVIDED BY LANL)

8 TOTAL FEEDERS (2 BY LANL)



# WHITE ROCK SUBSTATION



WHITE ROCK SUBSTATION

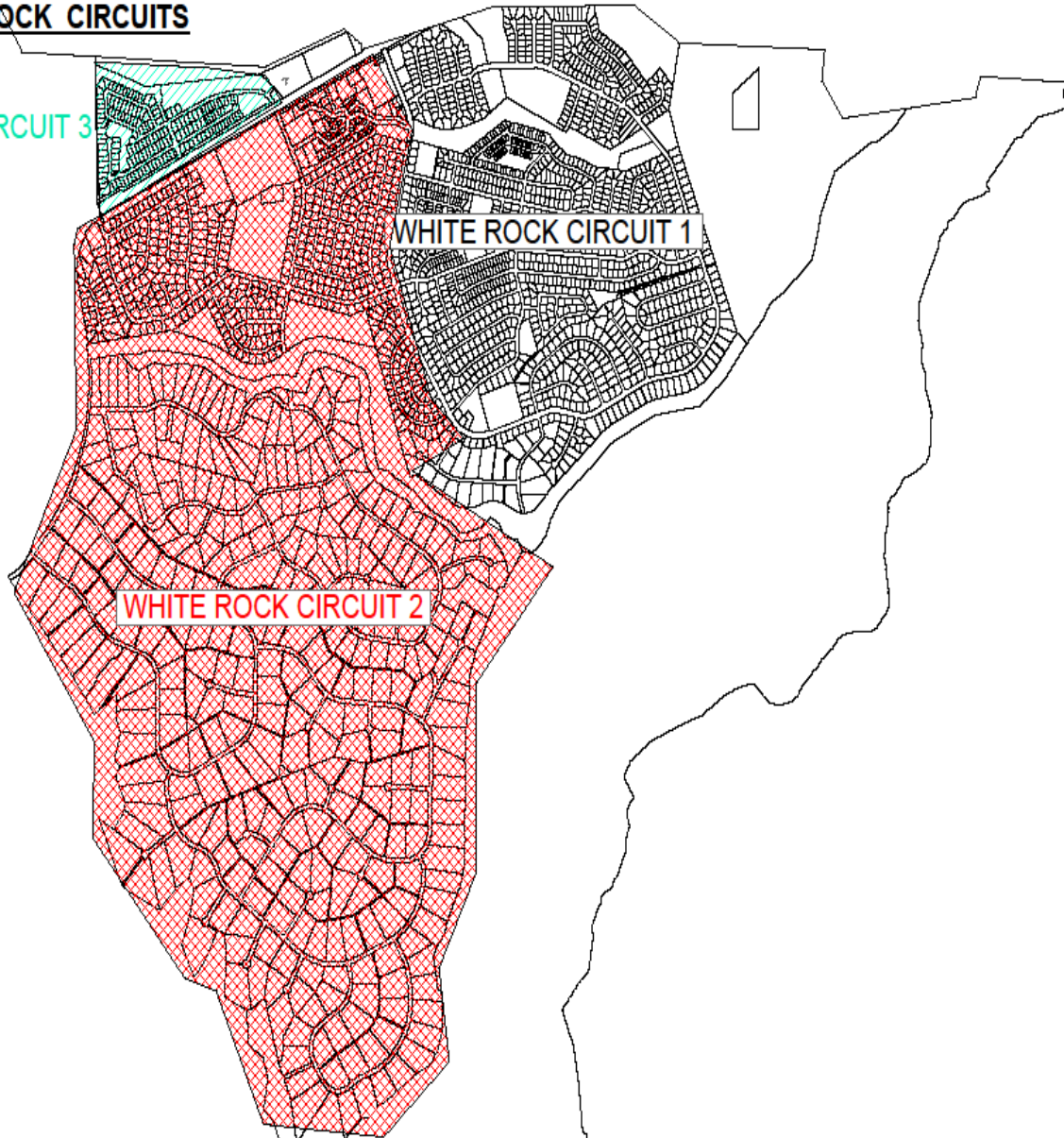


**WHITE ROCK CIRCUITS**

WHITE ROCK CIRCUIT 3

WHITE ROCK CIRCUIT 1

WHITE ROCK CIRCUIT 2





# RECENT SYSTEM OUTAGES

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**SNOW CAUSING  
TREE CONTACT  
WITH POWER LINES**





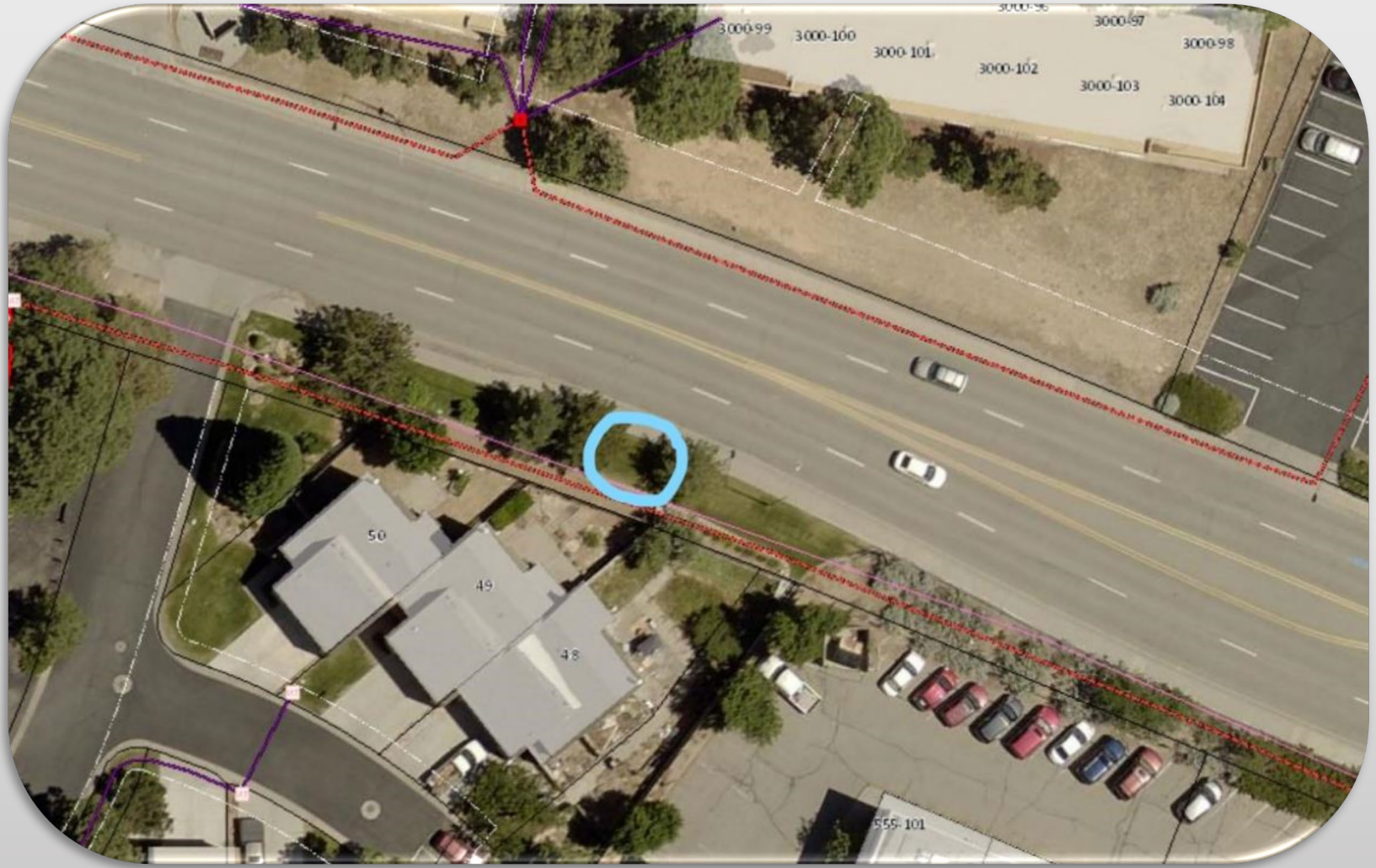
## RECENT SYSTEM OUTAGES



Contractor damage to primary service line at the ice rink



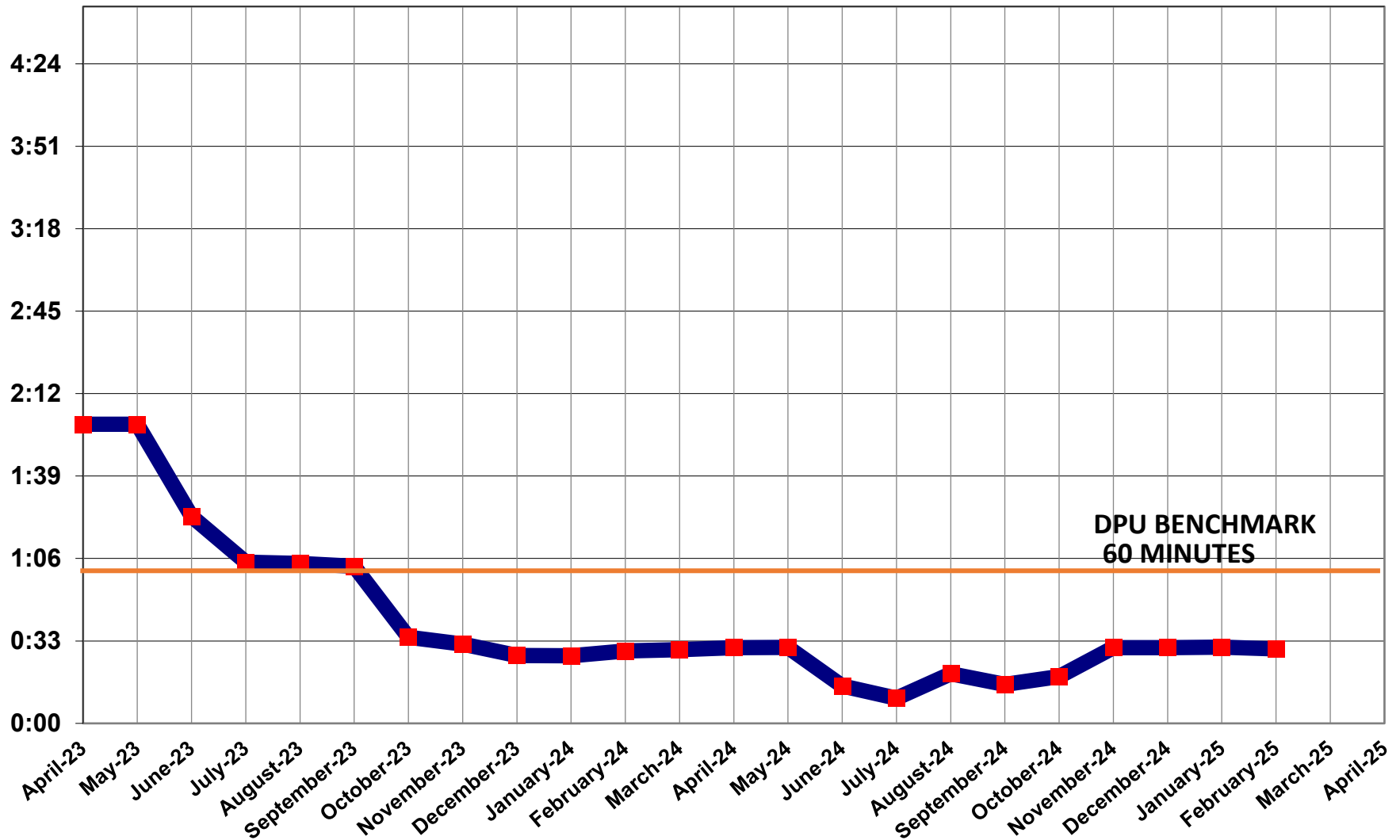
# RECENT SYSTEM OUTAGES



UNDERGROUND FAULT ON FEEDER 13 BY TIMBER RIDGE  
Feeder 13 Replacement Project will begin construction In May 2025.

# SAIDI : STANDARD AVERAGE INTERUPTION DURATION INDEX

$$\text{SAIDI} = \frac{\text{Sum of all customer outage durations}}{\text{Total number of customers served}}$$



EACH POINT IS A MONTHLY SAIDI HISTORY

SAIDI NOW AT 29 MINUTES



## STRATEGY FOR IMPROVING THE SAIDI

- Continue to perform a root-cause analysis for every power outage.
- Continue with the Asset Management Program, “AMP”, for line inspections, operations & maintenance, “O&M”, etc.
- Continue to monitor line sections which have failed during the past; prioritize, and place into the AMP.
- Continue extensive tree trimming efforts , in house and with an on-call contractor.
- Continue to dedicate one crew for overhead power line O&M.
- Continue to dedicate one crew for underground power line replacement.
- Manage Outage Response to minimize outage times and reduce SAIDI.
- Increase quantity of fault indicators in the system to track and identify underground faults faster.
- Install new three phase reclosers in the system to isolate primary line faults and restore power in a safer manner.
- Install a SCADA system to monitor the electric grid in real time

## **SHORT-TERM ACTION PLANS**

- Asset Management Program for OH
- Overhead Pole and Line Replacement Program
- Asset Management Program for UG
- UG Primary Replacement Program

# SHORT-TERM ACTION PLANS

## New LASS Substation Addition



## **NEW LASS FEEDERS**

13T - WESTERN AREA

15T- NORTH COMMUNITY

16T- BARRANCA MESA

S6- LOS ALAMOS MEDICAL CENTER

SM6- TRINITY DRIVE

S18- EAST JEMEZ ROAD , EASTGATE, RENDIJA  
CANYON

S3- ECO STATION, CONCRETE PLANT



The LASS Substation will add feeder sources to maintain and improve the SAIDI and the system reliability in the Townsite area as illustrated in the next slide.

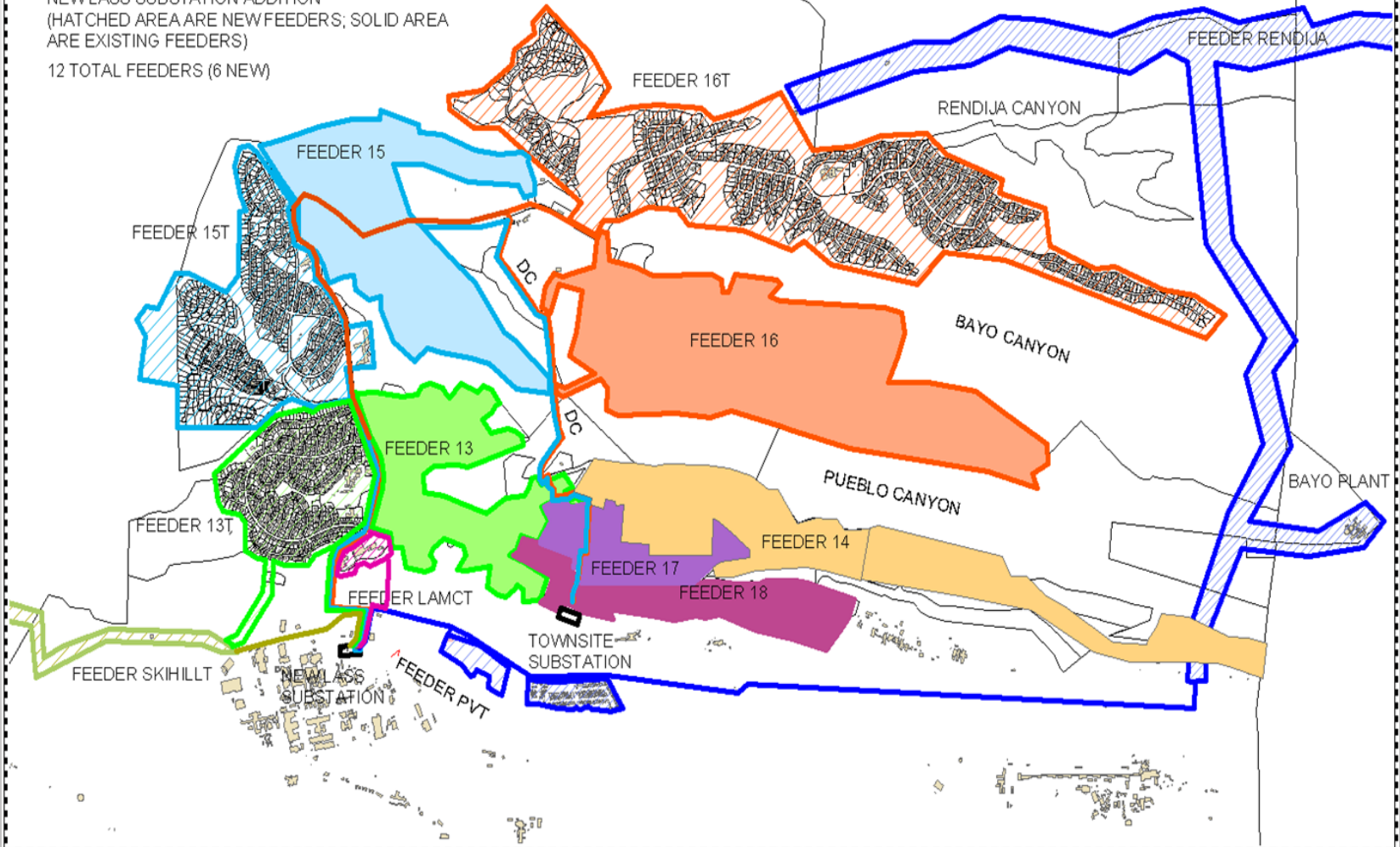
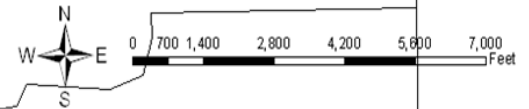
- Provide new feeders 13T, 15T, 16T, S6, SM6.
- Reduce the number of customers on Townsite substation feeders 13, 15, & 16 (by moving half the customers on those feeders to LASS). Reducing the number of customers affected by primary feeder outages.
- Provide power to LACDPU customers at the Eco Station, LA Medical Center (S6) and Elk Ridge MH Park.
- Add 50% additional system redundancy during scheduled or unscheduled outages to Townsite Substation Feeders. Feeders 13T, 15T, & 16T on LASS can back feed feeders on Townsite 13, 15, 16 and the Ski Hill.

# LOS ALAMOS DISTRIBUTION AREA WITH LASS

## LACDPU Townsite Electric Distribution System Proposed System PHASE I (Adds REDUNDANCY to Western Area, rids LANL sources)

PROPOSED FEEDER CONFIGURATION WITH  
NEWLASS SUBSTATION ADDITION  
(HATCHED AREA ARE NEW FEEDERS; SOLID AREA  
ARE EXISTING FEEDERS)

12 TOTAL FEEDERS (6 NEW)



## LONG-TERM ACTION PLANS

# Electrification Study

Project Timeline :  
January 2025 to August 2025



# 30-YEAR DISTRIBUTION SYSTEM MASTER PLAN



## QUANTIFY THE MARKET

Develop an assessment of the electrification potential for different technologies including building electrification, vehicle electrification and Solar PV and BESS.



## ESTIMATE DEMAND

Calculate energy demand across the Los Alamos service territory for electrification of new technologies



## ADOPTION SCENARIOS

Develop 3-electrification scenarios and forecast adoption of electrification technologies to frame the potential load increase to the Los Alamos System.



## GRID SYSTEM IMPACTS

Review current system and se electrification scenarios to estimate impacts to the distribution system.

Identify equipment loading and voltage violations within the system. Determine capacity need and capital improvements necessary to maintain grid operation.



# POTENTIAL GRID CHANGES FROM ELECTRIFICATION

## Low Electrification

Traditional planning and system investment is effective:

- *Phase Balancing*
- *Reactive Power Optimization*
- *Voltage Regulation*
- *Line Rebuilds/Reconductor*

## Medium Electrification

Large projects and system investment may be required:

- *System Reconfiguration*
- *New Stations / modular stations*
- *Preparation for Voltage Conversion*
- *Retail Rate pressure / incentives*

## High Electrification

Novel solutions and large system investment may be required to maintain safe, reliable operation:

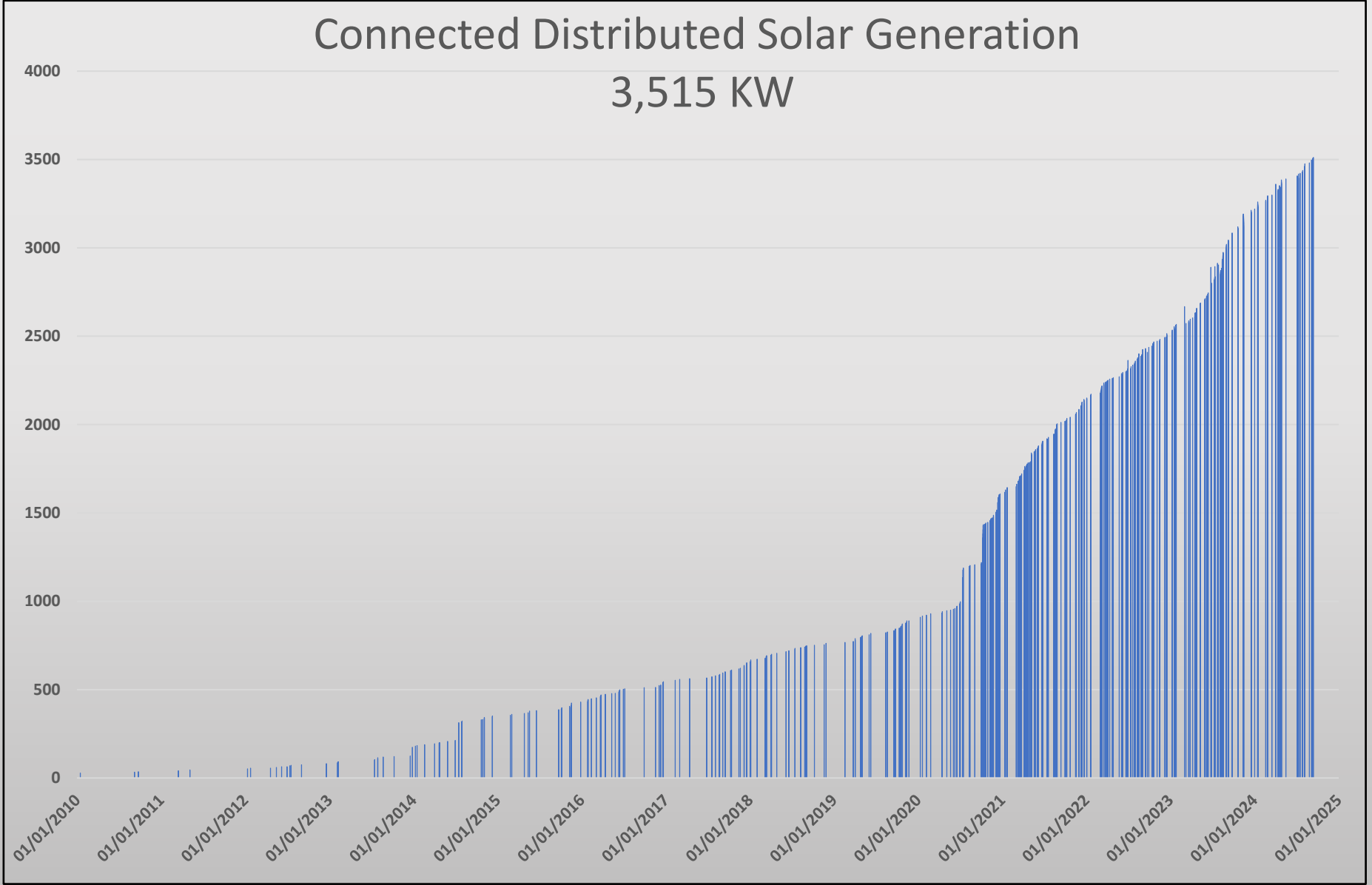
- *New Stations / modular stations*
- *Voltage Conversion*
- *Direct load control & V2G*
- *Non-wires alternatives (DER deployment)*

## **ELECTRIFICATION STUDY DELIVERABLES**

1. Assessment of conditions identified in the County Climate Action Plan that will impact the electric system
2. Assessment of conditions identified in the County Transit Fleet Electric Conversion Plan that will impact the electric system
3. The Contractor shall deliver draft Comprehensive Report, 15 year and 30-year plans to the Project Team for review and to solicit feedback. The Project Team will provide written feedback on the comprehensive report within two weeks.
4. The Contractor shall present the executive summary of findings and recommendations to the County Council and Board of Public Utilities
5. The Contractor shall provide a Final Comprehensive Report which is sealed by a licensed engineer of the State of New Mexico.
6. Applicable updates to the DPU Rules and Regulations based on this study
7. Assessment of conditions identified in the County Climate Action Plan that will impact the electric system
8. Assessment of conditions identified in the County Transit Fleet Electric Conversion Plan that will impact the electric system
9. The Contractor shall deliver draft Comprehensive Report, 15 year and 30-year plans to the Project Team for review and to solicit feedback. The Project Team will provide written feedback on the comprehensive report within two weeks.
10. The Contractor shall present the executive summary of findings and recommendations to the County Council and Board of Public Utilities
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# Connected Distributed Solar Generation

3,515 KW



## **FUTURE OUTLOOK**

Planning for future upgrades is dependent on the funding provided to the department. The Covid crisis, Trade Tariffs and current disasters in the United States have compounded the supply chain crisis. Costs continue to escalate and lead times are expanded. Many supply companies have stopped taking orders due to the backlog in orders.



## **DISTRIBUTED GENERATION AND ELECTRIC VEHICLE IMPACTS ON THE SYSTEM**

The electric distribution grid is absorbing production from increased distributed generation (PV). The impact of the reverse flows will soon exceed the capacity of conductors and transformers in the system.

Electric vehicle chargers and battery installations will increase the load on the system at off-peak times.

Homes are also increasing the size of their services to accommodate air conditioning and heat pumps. The upgrades to transformers and conductors required will be scattered throughout the county as areas are affected and show signs of stress or failure.

## **FUTURE GOALS SET FOR AN ALL-ELECTRIC LOS ALAMOS COUNTY**

The Utility Board of Los Alamos County set a future goal to eliminate gas consumption in the County. This would mean that all homes and businesses would be completely operated with electricity.

The current distribution system will not support this as it exists today. Although the main backbone three phase systems have been upgraded, it would require replacement by 2050. The utility will require the reconstruction of all residential areas within the county.

In addition, a very large number of homes do not have the correct power panel size to provide whole home electric consumption.

## **DISTRIBUTION SYSTEM SCADA**

The DPU electric distribution department will develop and install a SCADA system which will monitor the electric equipment in the field.

The system will incorporate information from the AMI, ArcGIS, and the Milsoft Modeling system to provide real time system status to crews in the field and engineering. Construction is underway and projected to be complete by July 2025.

# AMI SYSTEM

## OUTAGE MESSAGE PROCESS

Momentary outage message threshold expires

Meter transmits 4 messages

Subsequent transmissions maximize receipt of larger outages ● | ● | ●

1<sup>st</sup> transmission in 32 second window after threshold

Maximizes receipt of small outages quickly ●



0-32

32-216

216-400

400-584



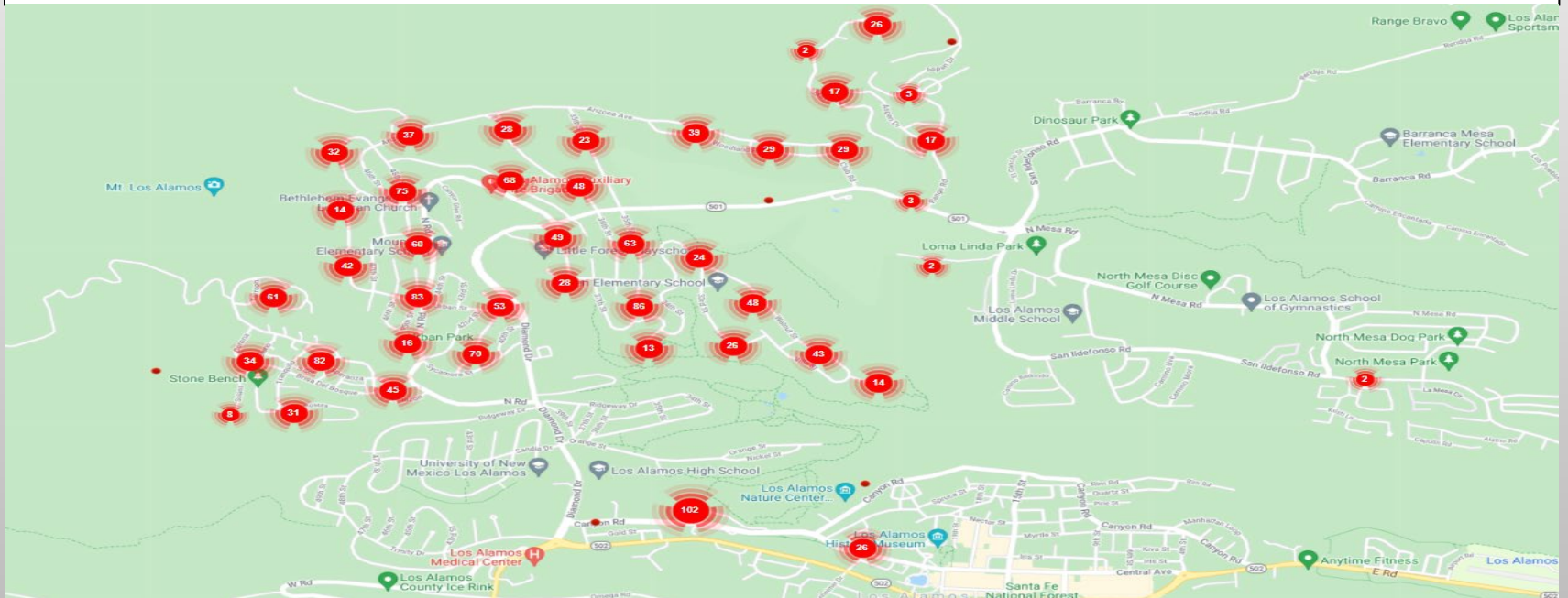
**FlexNet  
Base Station**



**RNI**

**Mutlispeak API**

**OMS**



## CAPITAL PROJECT PROPOSALS

- 2024 - DP Road Phase II \$600,000
- 2025 - EA4 Line Design \$250,000
- 2025 - Ski Hill \$2,800,000
- 2025 - Openheimer / Trinity / Timber Ridge \$1,200,000
- 2025 - 2026 - Piedra Loop \$800,000
- 2025 - 2026 - La Senda \$1 Million
- 2026 - 2027 - Los Pueblos \$1.6 Million
- 2028 - EA4 Reconstruction \$5 Million
- 2028 - East Gate Substation Design \$500,000
- 2029 - Estates – La Mesa \$700,000
- 2029 - Broadview – Copper – Mountain View \$450,000
- 2029 - Big Rock Loop - \$300,000
- 2029 - Aragon Ave \$900,000
- 2030 - Eastgate Substation \$4 Million
- 2030 - Bryce Ave. \$800,000
- 2030 - Ridgeway \$450,000
- 2031 - Western Area \$700,000
- 2031 - Eastern Area \$600,000
- 2031-2032 - Ponderosa Estates \$900,000
- 2032 - Denver Steels \$600,000
- 2033 - Rover \$1.2 Million



# QUESTIONS