

Support Material Agenda Item No. 16

General Policy Committee Meeting

May 11, 2022

9:00 AM

Location

San Bernardino County Transportation Authority
First Floor Lobby Board Room
1170 W. 3rd Street, San Bernardino, CA 92410

VIDEO CONFERENCING WILL BE AVAILABLE AT THE FOLLOWING LOCATION:

City Council Chambers
1111 Bailey Ave.
Needles, CA 92363



DISCUSSION ITEMS

Council of Governments



16. Presentation from Southern California Edison on Wildfire Risk Mitigation

Receive a presentation from Southern California Edison on wildfire mitigation efforts.

A Power Point presentation was added to this item after the posting of the agenda and is attached for your review.

San Bernardino County Transportation Authority
May 11, 2022

Our Commitment to California
Keeping our communities safe from wildfires

A COMPREHENSIVE STRATEGY TO PREVENT, COMBAT AND RESPOND



**HARDENING
THE ELECTRIC
GRID**

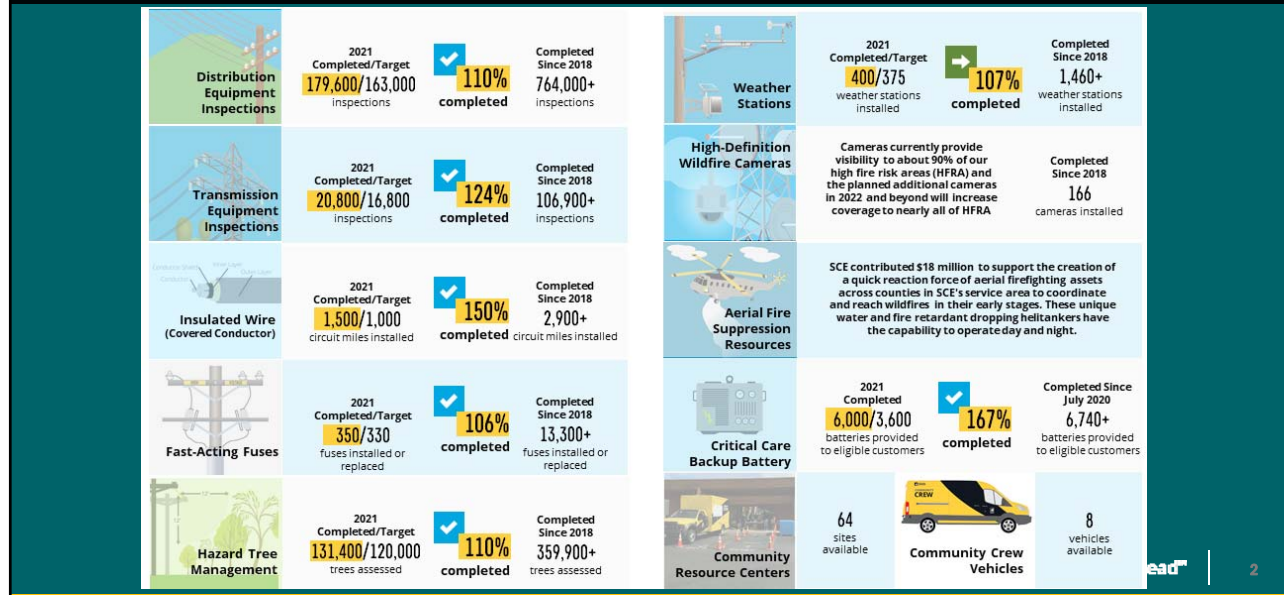


**ENHANCING
OPERATIONAL
PRACTICES**



**BOLSTERING
SITUATIONAL
AWARENESS
CAPABILITIES**

2021 YEAR-END PROGRESS UPDATE



REDUCING WILDFIRE RISK & PSPS IMPACTS – BY THE NUMBERS

SCE estimates its wildfire mitigation and PSPS measures have reduced the risk of damage from catastrophic¹ wildfires by **65% to 70%**, relative to pre-2018 levels.



ONGOING WILDFIRE MITIGATION EFFORTS

~**30%** of overhead wires in high fire risk areas installed with covered conductor

Suite of mitigations include system hardening, inspections, vegetation management and situational awareness measures



IMPROVED PSPS EXECUTION & CUSTOMER SUPPORT

73% reduction in PSPS outage time in 2021 on frequently impacted circuits²

81,000 customers removed from scope from exceptions and switching protocols

64 Community Resource Centers available



AERIAL FIRE SUPPRESSION SUPPORT

Contributed \$18 million for the creation of the quick reaction force of the world's largest helitankers

Used on more than 50 fires in 2021, helping to suppress fires in its early stages

1. A wildfire directly causing one or more deaths, damaging or destroying more than 500 structures, or burning more than 140,000 acres of land
 2. Based on 2021 weather and fuel conditions

HARDENING ELECTRIC GRID & INFRASTRUCTURE



COVERED CONDUCTOR

Replacing bare wire with insulated wire (covered conductor) to reduce wildfire risk as well as safely raise windspeed thresholds for PSPS in targeted areas. About 2,900 miles of insulated wire installed since 2018



FIRE-RESISTANT POLES

Installing mix of composite poles and wooden poles with fire-resistant wrap to reduce risk of damaged poles during an emergency



PROTECTIVE DEVICES

Installing fast-acting fuses to interrupt electric current more quickly when there's an electrical fault and remote-controlled sectionalizing devices to segment and isolate portions of circuits during PSPS events



UNDERGROUNDING

Complete 17 miles of undergrounding in 2021-22 in targeted high fire risk areas based on risk and feasibility. Potential for significant increase in subsequent years.



MICROGRIDS

Partnered with San Jacinto High School for a microgrid resiliency pilot. Second pilot site at a school in the Rialto Unified School District will be available in 2022.

Data as of 12/31/21



4

COVERED CONDUCTOR

- **2,900+** miles of covered conductor
- Plan to install a total of **4,000** miles by end of 2022, covering 40% of SCE's overhead distribution lines in high fire risk areas
- Covered conductor estimated to be about **70% effective** in mitigating ignition risk



Data as of 12/31/21



5

UNDERGROUNDING

- Completed approximately **6 miles** of undergrounding in targeted high fire risk areas based on risk and feasibility
- Plan to complete a total of **17 miles** by end of 2022; potential for significant increase in subsequent years



Data as of 12/31/21



6

ENHANCING OPERATIONAL PRACTICES



HIGH FIRE RISK INSPECTIONS & REMEDIATIONS

Inspect overhead equipment in high fire risk areas for repairs via ground and aerially, prioritizing the highest-risk structures. In 2022, will inspect 53% of distribution and 43% of transmission equipment in high fire risk areas, covering 97% of total wildfire risk



VEGETATION MANAGEMENT

Inspect, trim and remove trees to prevent vegetation from coming into contact with electrical equipment and potentially sparking a fire. Tall trees beyond standard pruning zones that could potentially fall into power lines are also assessed and pruned or removed. SCE will begin removing palm trees that may come in contact with power lines.



PUBLIC SAFETY POWER SHUTOFFS

SCE strives to reduce the scope, frequency and duration of PSPS events as more wildfire mitigations are implemented, but PSPS remains a tool of last resort to mitigate wildfire risk during elevated fire weather conditions.

Data as of 12/31/21



7

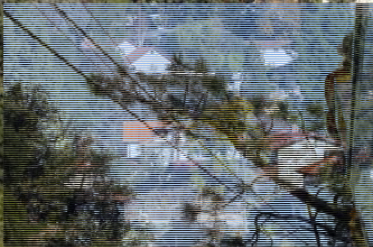
PUBLIC SAFETY POWER SHUTOFFS

2021 HIGHLIGHTS

81,000 customers removed from PSPS scope through exceptions and switching protocols

45% reduction in Customer Minutes of Interruption (CMI)¹

73% reduction in CMI on frequently impacted circuits¹



Damage/hazards found after strong winds during PSPS

- A tool of last resort used during dangerous fire conditions (weather and fuels)
- De-energizing lines to prevent a spark from our equipment starting a significant wildfire
- Primarily impacts circuits in high fire risk areas
- Use of multiple methods to notify customers and partners in affected areas before, during and after a PSPS event
- In 2021, continued PSPS improvements and reduced frequency, scope and duration of PSPS

1. Based on 2021 weather and fuel conditions

Data as of 12/31/21



PSPS OUTREACH & CUSTOMER SUPPORT

- Expanded enhanced notifications to all Medical Baseline customers, partnered with 211 to provide support to customers with Access and Functional Needs (AFN) and activated new AFN coordinator during PSPS
- Expanded customer battery programs and in-event support using Community Crew Vehicle and Community Resource Center locations
- Improved collaboration with state agencies, public safety partners, critical infrastructure customers and community-based organizations with new Public Safety Partner Portal
- Conducted extensive outreach to community-based organizations, public safety partners and local and tribal governments

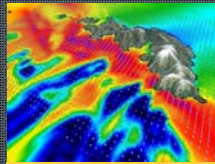


BOLSTERING SITUATIONAL AWARENESS CAPABILITIES



Weather Stations

1,460+ weather stations that provide wind speed, humidity and temperature data. Plan to add 150 stations in 2022 to increase accuracy of PSPS operations



Weather Modeling

Continuing to improve weather modeling and incorporating machine learning capabilities to weather stations to enhance weather forecasts



Fuel Sampling

Measuring vegetation moisture at 15 fuel sampling sites on a biweekly basis to help determine dry fuel conditions. Using data to train fuel moisture model to enhance operations



Wildfire Cameras

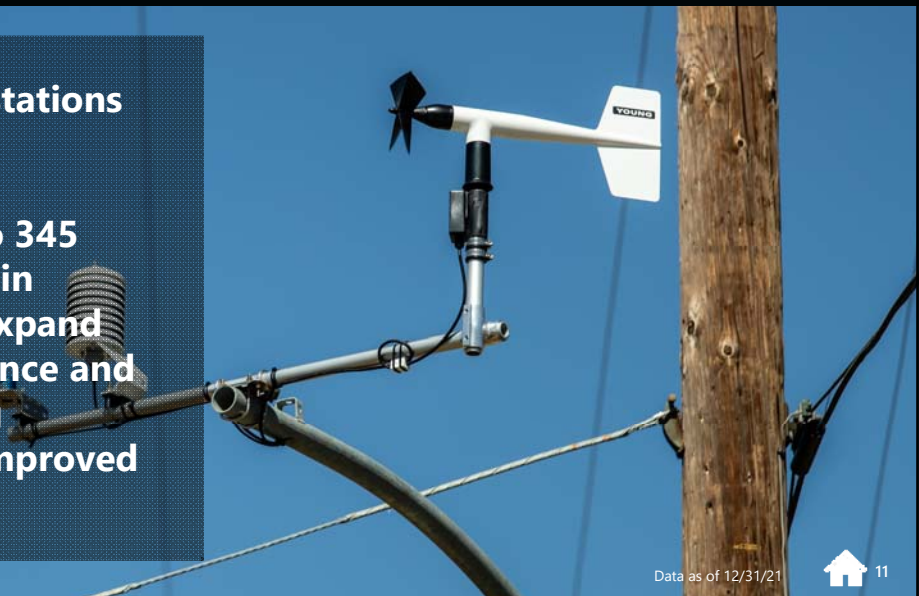
166 cameras that provide visibility to about 90% high fire risk areas to monitor wildfire conditions. Planning additional cameras in 2022 and beyond to increase coverage

Data as of 12/31/21



WEATHER STATIONS

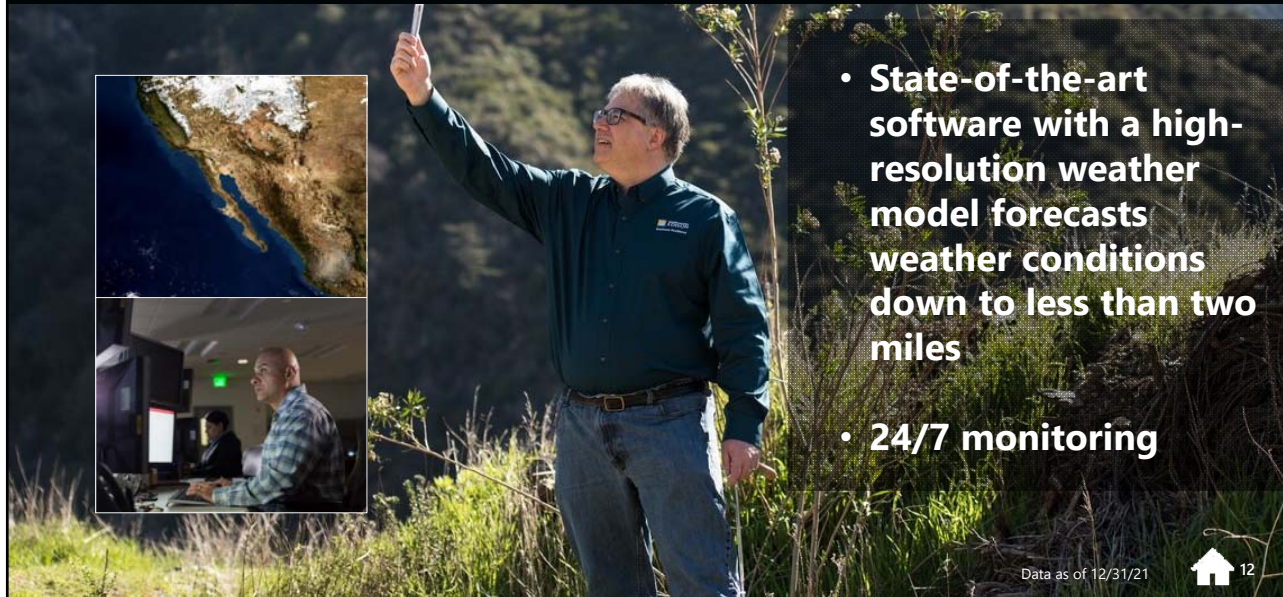
- **1,460+** weather stations installed
- Plan to add up to 345 weather stations in 2022-2025 and expand artificial intelligence and machine learning capabilities for improved forecasting



Data as of 12/31/21



ADVANCED WEATHER MODELING



- State-of-the-art software with a high-resolution weather model forecasts weather conditions down to less than two miles
- 24/7 monitoring

Data as of 12/31/21

12

WILDFIRE CAMERAS



- **166** wildfire cameras installed, providing visual coverage of ~90% of high fire risk areas to monitor wildfire conditions
- Plan to add up to 60 cameras in 2022-2024 to increase coverage and equip cameras with artificial intelligence capabilities

Data as of 12/31/21

13

SCE CUSTOMER PROGRAMS & RESOURCES

[Add Notes](#)


CUSTOMER RESOURCE CENTERS & COMMUNITY CREW VEHICLES

- Services offered: information, charging of mobile and portable medical devices, PSPS outage alert enrollment support, access to water, light snacks, ice and ice vouchers, restrooms, and small insulated bags to keep medication cool
- Translations services for over 120 languages including American Sign Language (ASL)



CUSTOMER PROGRAMS

- Partnered with 211 to help customers with Access and Functional Needs (AFN) develop a resiliency plan and enroll in eligible assistance programs
- 211 provides specialized referrals for customers with AFN experiencing PSPS, and services include connecting customers to shelf-stable food, hot meal delivery, transportation and/or temporary shelter
- SCE will improve communications methods, including videos utilizing ASL for marketing and PSPS notifications



CUSTOMER RESILIENCY EQUIPMENT

- Critical Care Backup Battery program and the In-Event Battery Loan pilot provide eligible customers with a portable backup battery to power a medical device during a PSPS event
- Rebates on portable batteries and generators for customers residing in high fire risk areas on marketplace.sce.com



14

Website: sce.com/wildfire
 Energized by Edison Stories & Videos: edison.com/wildfire-safety
 SCE Customer Support: 1-800-655-4555

STAY INFORMED



- Visit our website
- Attend a community meeting

SIGN UP



- PSPS alerts
- SCE's Medical Baseline program
- SCE programs and rebates

BE PREPARED



- Be prepared with a safety preparedness plan, some basic supplies and advance planning
- Power outage tips



15

FOR MORE INFORMATION:

SCE Wildfire Webpage – [sce.com/wildfire](https://www.sce.com/wildfire)

SCE Notifications

- Sign up for PSPS alerts – [sce.com/pspsalerts](https://www.sce.com/pspsalerts)
- Sign up for the Energized by Edison Wildfire Mitigation Newsletter – energized.edison.com/newsletter

Situational Awareness

PSPS maps and information – [sce.com/psps](https://www.sce.com/psps)

- PSPS decision making – [sce.com/pspsdecisionmaking](https://www.sce.com/pspsdecisionmaking)
- Role of weather in PSPS – [sce.com/fireweather](https://www.sce.com/fireweather)
- CPUC wildfire maps – ia.cpuc.ca.gov/firemap/
- Wildfire cameras – [alertwildfire.org](https://www.alertwildfire.org)

Preparedness

- SCE emergency preparedness – [sce.com/beprepared](https://www.sce.com/beprepared)
- CAL FIRE preparedness – [readyforwildfire.org](https://www.readyforwildfire.org)

Vegetation Management

- Vegetation Management – [sce.com/safety/power-lines](https://www.sce.com/safety/power-lines); contact 1-800-655-4555 or safetrees@sce.com

Customer Programs & Rebates

- SCE Customer Programs & Resources – [sce.com/customerresources](https://www.sce.com/customerresources)
- SCE Marketplace (rebates and programs) – marketplace.sce.com
- SCE Medical Baseline Program – [sce.com/medicalbaseline](https://www.sce.com/medicalbaseline)
- Self Generation Incentive Program (SGIP) – [sce.com/sgip](https://www.sce.com/sgip) or [selfgenca.com](https://www.selfgenca.com)
- SCE Customer Support: 1-800-655-4555

Community Meetings

- Join SCE's wildfire safety community meetings – [sce.com/wildfiresafetymeetings](https://www.sce.com/wildfiresafetymeetings)

Energized by Edison

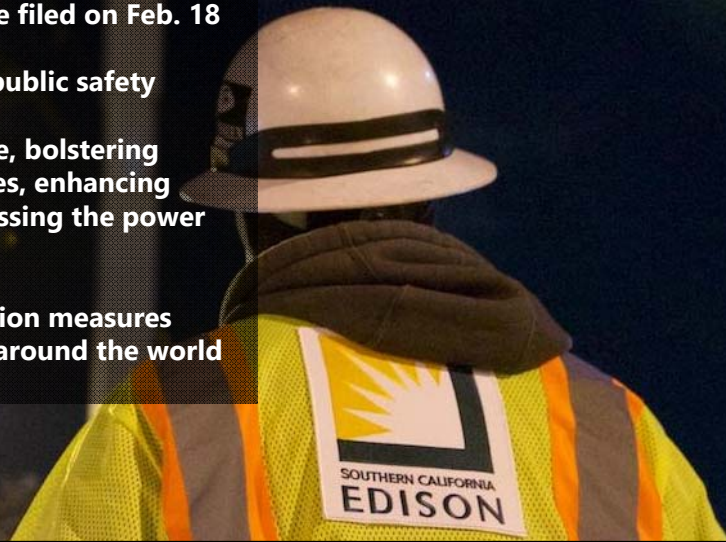
- Stories and videos on SCE's wildfire mitigation efforts and PSPS – [edison.com/wildfire-safety](https://www.edison.com/wildfire-safety)

16

Additional Slides

OUR WILDFIRE MITIGATION PLAN

- 2022 Wildfire Mitigation Update filed on Feb. 18
- Primary objective is to protect public safety
- Further hardening infrastructure, bolstering situational awareness capabilities, enhancing operational practices and harnessing the power of data and technology
- Incorporating advanced mitigation measures deployed in high fire risk areas around the world



18

VEGETATION MANAGEMENT

2021 HIGHLIGHTS

Assessed **131,400** hazard trees and removed **3,400** trees that were deemed unsafe

- Hazard tree removal beyond traditional trim zone
- Inspect **1.5 million** trees across our service area annually and typically trim **900,000** of those trees. More than half are located in high fire risk areas
- Vegetation removal at poles and around power lines
- LiDAR surveying



Data as of 12/31/21



19

HIGH FIRE RISK INSPECTIONS

2021 HIGHLIGHTS

Completed **179,600** distribution inspections and **20,800** transmission inspections

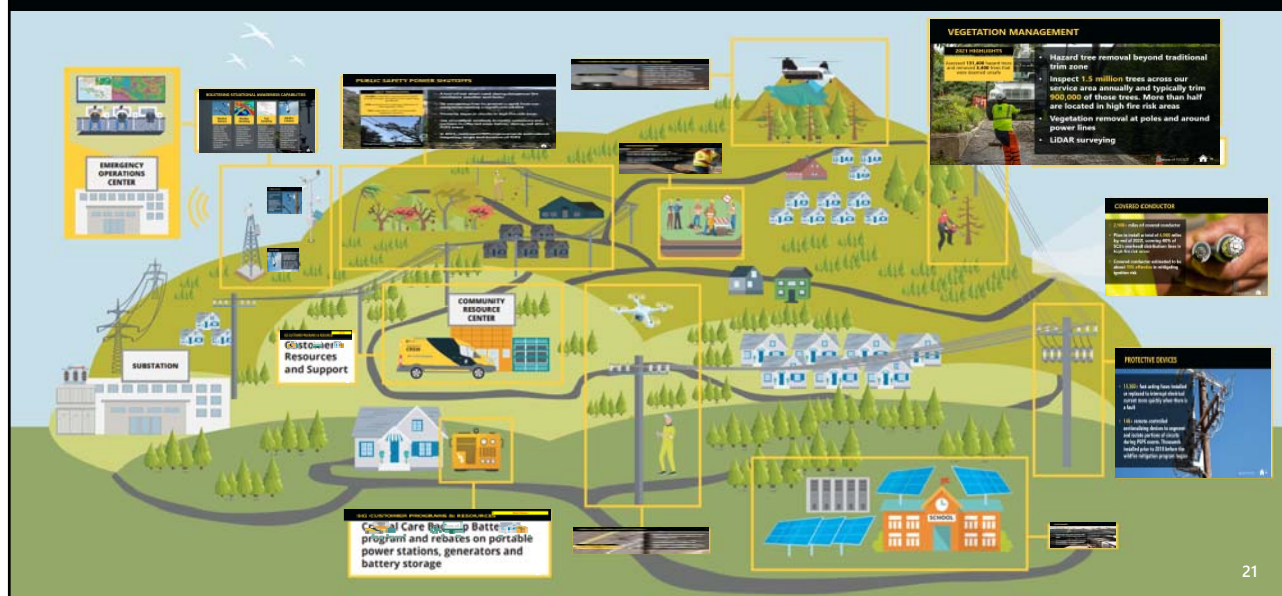
- Inspect electrical equipment for maintenance, repairs or replacement

- In 2022, will inspect 53% of distribution and 43% of transmission equipment in high fire risk areas, covering 97% of total wildfire risk

Data as of 12/31/21

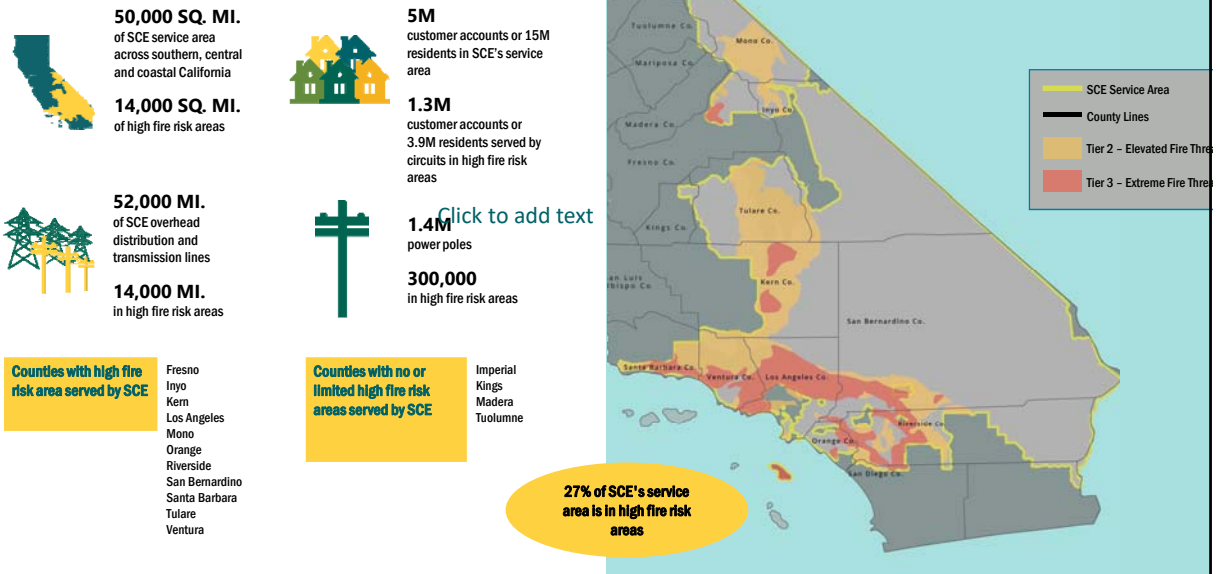


REDUCING WILDFIRE RISK IN OUR COMMUNITIES



21

SCE SERVICE AREA & HIGH FIRE RISK AREAS



NEW TECHNOLOGIES



Early Fault Detection

Early Fault Detection (EFD) detects high frequency radio emissions which can occur from incipient failure, such as severed strands on a conductor, vegetation contact, or tracking on insulators



Fault Detection

Distribution Open Phase Detection (DOPD) detects one or more open phase (broken conductor) conditions to reduce risks associated with down-wire incidents



High Impedance Detection

High Impedance (Hi-Z) relays use protective elements to reduce the propagation of low-magnitude fault conditions (Hi-Z conditions) that can lead to ignition risk, such as downed conductor or arcing events



Asset Defect Detection Using AI/ML

Applies image recognition algorithms to speed up identification of potential asset defects. Detection algorithm will continue to improve over time with **artificial intelligence and machine learning**.



Fire Detection

Uses **satellite technology** and SCE's HD wildfire cameras to detect and map wildfire ignitions. Results in a more comprehensive view of fires that improves intelligence for more rapid and effective fire response.

PARTNERING WITH LOCAL FIRE AGENCIES

2021 PERFORMANCE

Used on more than **50** fires
433 hours of flight time
1,836 total drops (493 at night)
2.6 million gallons of water
123,000 gallons of fire retardant



- Contributed **\$18 million** to support the creation of a quick reaction force of aerial firefighting assets in SCE's service area, including the world's largest helitankers
- Continue partnerships with Orange, Los Angeles and Ventura county fire agencies in 2022

Data as of 12/31/21



MAINTAINING FOUNDATIONAL STRATEGY WHILE ADVANCING KEY INCREMENTAL FOCUS AREAS EACH YEAR

2019	2020 - 2021	2022
FOUNDATIONAL STRATEGY	GRANULAR WILDFIRE RISK, PSPS MITIGATION	UPDATE OF LONG-TERM SYSTEM HARDENING STRATEGY
<p>Grid hardening</p> <p>Bolstering situational awareness capabilities</p> <p>Enhancing operational practices</p>	<p>Refining risk analysis models</p> <p>Inspection strategy evolution</p> <p>Reducing PSPS impacts</p> <p>Aerial fire suppression</p> <p>Advancing new technologies</p>	<p>Expanded grid hardening</p> <p>Updating risk prioritization for vegetation management</p> <p>Continue reducing PSPS impacts</p> <p>Adding new mitigation strategies</p>





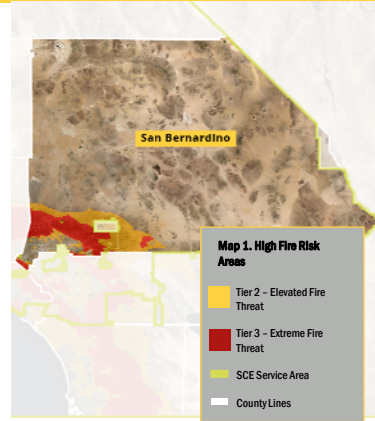
Wildfire Mitigation Activities SAN BERNARDINO COUNTY

2021 Year-End Progress Report

Data as of 12/31/21

Completed

	2021	SINCE 2018
DISTRIBUTION EQUIPMENT INSPECTIONS	28,795 inspections	121,840 inspections
TRANSMISSION EQUIPMENT INSPECTIONS	2,238 inspections	13,259 inspections
COVERED CONDUCTOR	213 circuit miles installed	255 circuit miles installed
FAST-ACTING FUSES	59 fuses installed or replaced	2,870 fuses installed or replaced
SECTIONALIZING DEVICES	3 devices installed	11 devices installed
HAZARD TREE MANAGEMENT	33,110 trees assessed	137,684 trees assessed
WEATHER STATIONS	59 weather stations installed	257 weather stations installed
HIGH-DEFINITION WILDFIRE CAMERAS	22 cameras installed	
COMMUNITY RESOURCE CENTERS	12 sites available	
COMMUNITY CREW VEHICLES	8 vehicles available throughout SCE's service area	



SCE's service area covers about **99%** of San Bernardino County. About **228,300** customer accounts are served by circuits in high fire risk areas.

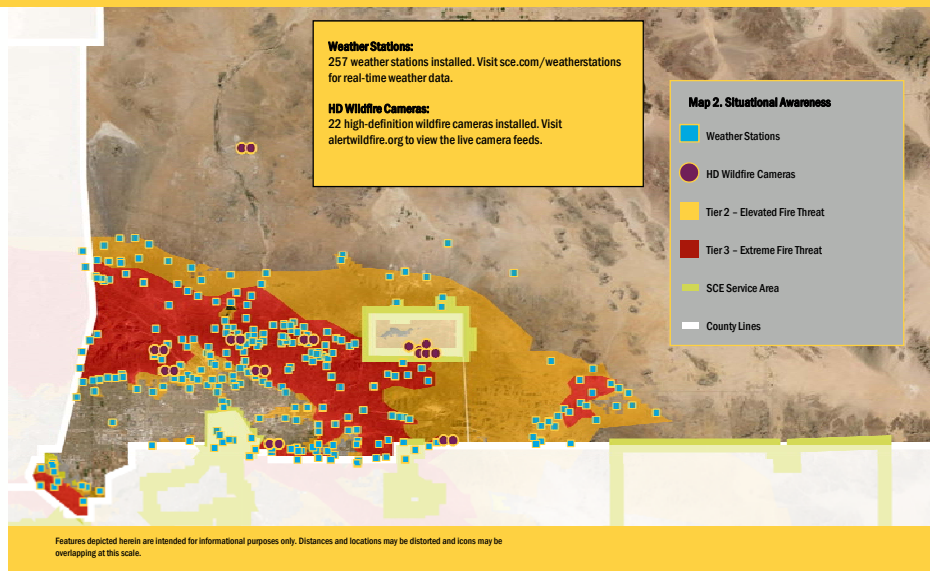
SCE tracks wildfire initiative progress by SCE districts and extrapolates to the county level as a reasonable approximation. There may be additional circuit miles of covered conductor installed due to fire restoration work.



Wildfire Mitigation Activities SAN BERNARDINO COUNTY

2021 Year-End Progress Report

Data as of 12/31/21



PROTECTIVE DEVICES

- **13,300+** fast-acting fuses installed or replaced to interrupt electrical current more quickly when there is a fault
- **140+** remote-controlled sectionalizing devices to segment and isolate portions of circuits during PSPS events. Thousands installed prior to 2018 before the wildfire mitigation program began

Data as of 12/31/21



28

RAPID EARTH FAULT CURRENT LIMITER (REFCL)

- REFCL technology detects when a single power line has fallen to the ground and almost instantly reduces energy released
- If deployed with covered conductor and other mitigations, risk reduction potential can be close to undergrounding. Pending initial deployment evaluation, may transition to using on wider scale in the future

Data as of 12/31/21



29

MICROGRIDS

- Partnered with San Jacinto High School for a microgrid resiliency pilot
- Second pilot site will be available at a school in the Rialto Unified School District in 2022

Data as of 12/31/21



30

INTEGRATED GRID HARDENING STRATEGY

SCE's refined integrated grid hardening strategy considers wildfire risk drivers and PSPS risk at circuit segments and mitigations that cost effectively addresses those risk drivers. We continue to prioritize hardening our riskiest areas first.

	Risk Designation	Risk Criteria	Mitigation Selection
Total High Fire Risk Area (HFRA) Overhead Distribution Segments (Total of ~9,700 circuit miles, of which 30% is already hardened)	Severe Risk Areas (~1,925 circuit miles) ¹	Fire risk egress constrained locations, extreme high wind areas, and extreme consequence areas	Pursue undergrounding unless covered conductor already installed or specific terrain not practical for undergrounding and necessitates feasible alternative mitigations
	High Consequence Segments (~5,075 circuit miles)	Locations that meet 300-acre consequence threshold at 8 hours or at risk of Public Safety Power Shutoff (PSPS)	Pursue covered conductor plus other mitigations such as asset inspections, vegetation management, and fast curve settings
	Other HFRA Segments (~2,700 circuit miles)	Locations that are not in a Severe Risk Area and do not meet High Consequence criteria	Naturally replace retired or damaged bare wire with covered conductor per high fire risk area standard; continue mitigations such as asset inspections, vegetation management, and fast-curve settings

¹Based on initial feasibility analysis of ~1,925 circuit miles, several hundred miles currently under consideration for additional enhanced mitigation, including undergrounding



31

PSPS DECISION POINTS

Decision points include, but are not limited to:



- NWS Red Flag Warnings
- SCE meteorologists forecast **strong wind** conditions in service area
- SCE fire scientist assessment **of fire potential** to include consideration of **weather** and **fuels**



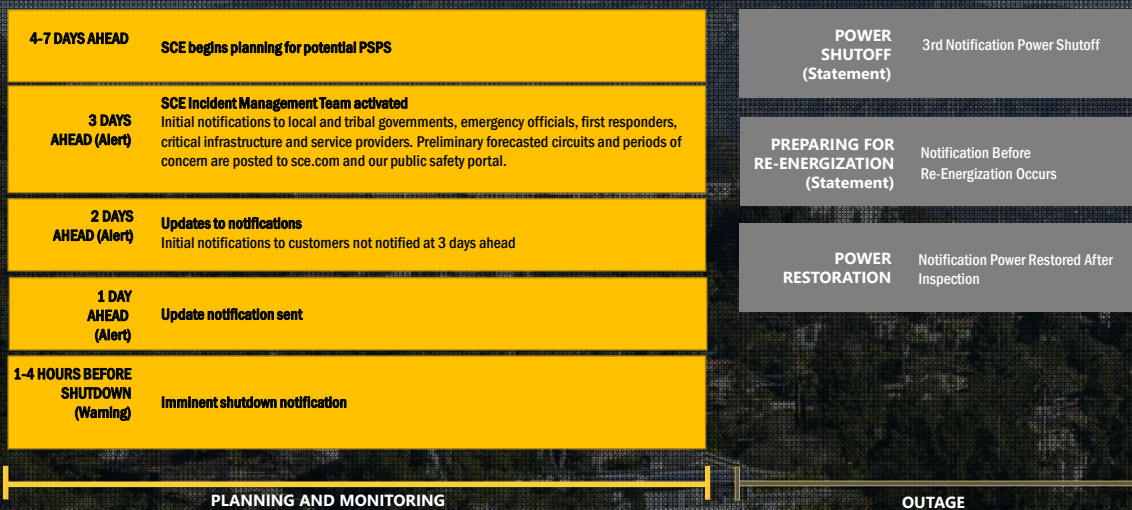
- Real-time observations from qualified electrical workers monitoring for **hazardous conditions** in the field



- Impact of de-energizing circuits on **first responders and essential services**

32

PSPS IDEAL TIMELINE

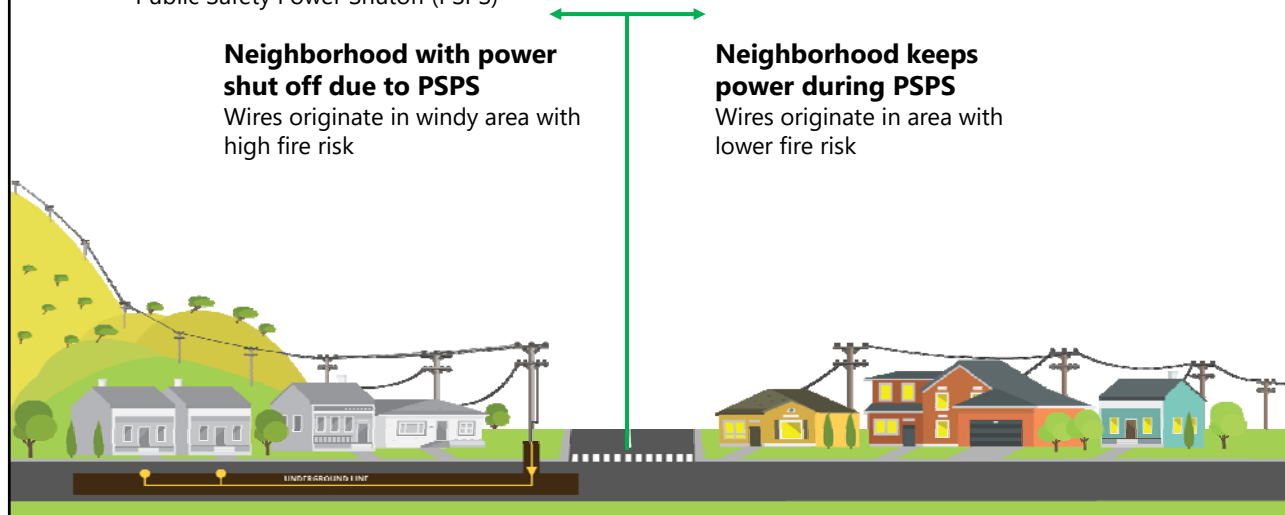


SCE will target the schedule above to notify customers. Sudden onset of hazardous conditions that jeopardize public safety may impact SCE's ability to provide advanced notice to customers. Notifications can be provided via email, text, voice call, and TTY formats; zip code-level alerts; and NextDoor.

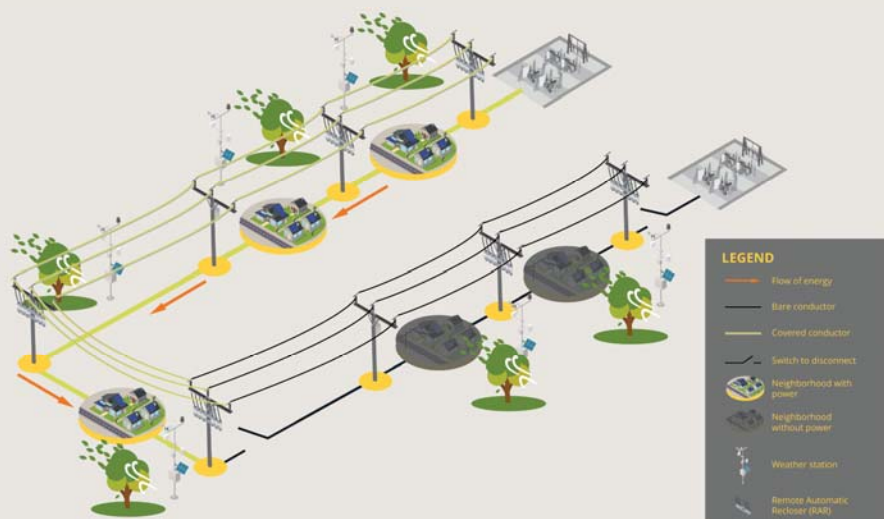
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Why Does My Neighbor Have Power and I Don't?

The location of your home or business on a circuit and the area of severe weather relative to your local substation are important factors in determining whether or not you are impacted by a Public Safety Power Shutoff (PSPS)



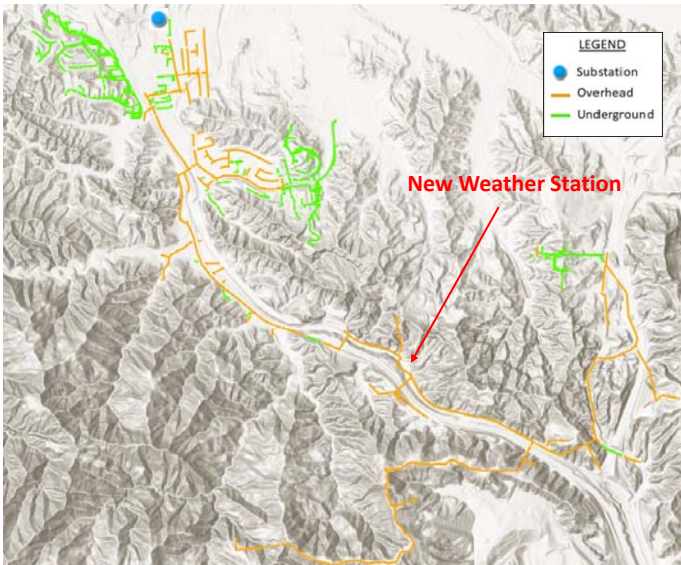
HOW PSPS CIRCUITS WORK



APPENDIX



Calgrove Circuit Plan



**INCLUDE CITY RELEVANT CIRCUITS
CALGROVE – LA COUNTY**

Planned Work:

- Install 1 weather station to improve situational awareness

Expected Completion Date:

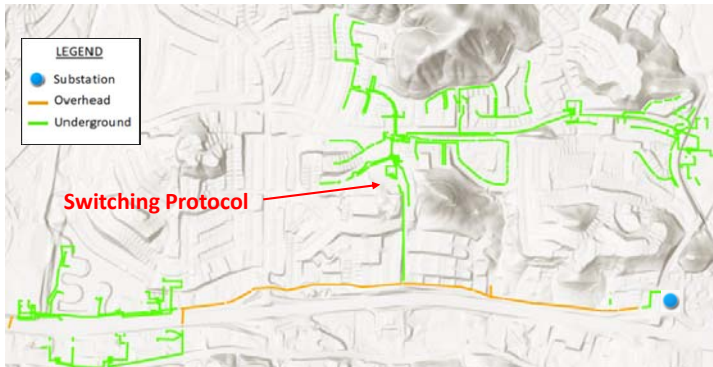
- 10/1/2022

Expected Improvements:

- Benefits from a new weather station are anticipated, but magnitude of benefits depend on the weather conditions

Conejo Circuit Plan

INCLUDE CITY RELEVANT CIRCUITS
CONEJO – LA COUNTY



Planned Work:

- Update switching protocols to improve our circuit segmentation

Expected Completion Date:

- 10/1/2022

Expected Improvements:

- Benefits from switching protocols are anticipated, but magnitude of benefits is unknown at this time

Ferrara Circuit Plan



Planned Work:

- Replace 14.58 miles of existing overhead wire with new insulated wire

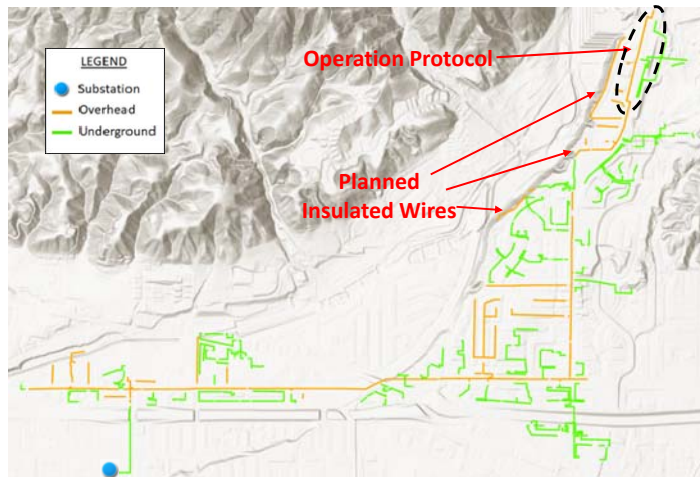
Expected Completion Date:

- 10/1/2022

Expected Improvements:

- **100% reduction** in customer outage time, assuming the extreme weather doesn't exceed the insulated wire threshold.

Foothill Circuit Plan



INCLUDE CITY RELEVANT CIRCUITS FOOTHILL – LA COUNTY

Planned Work:

- Replace 1 mile of existing overhead wire with new insulated wire
- Implement operation protocols to raise PSPS windspeed thresholds

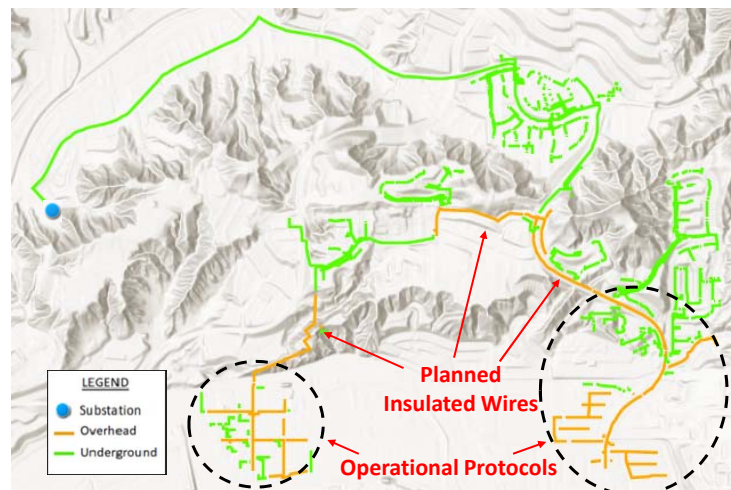
Expected Completion Date:

- 10/1/2022

Expected Improvements:

- **100% reduction** in customer outage time, assuming the same weather conditions in 2020

Julius Circuit Plan



INCLUDE CITY RELEVANT CIRCUITS JULIUS – LA COUNTY

Planned Work:

- Replace 2.2 miles of existing overhead wire with new insulated wire
- Implement operational protocols to raise PSPS windspeed thresholds

Expected Completion Date:

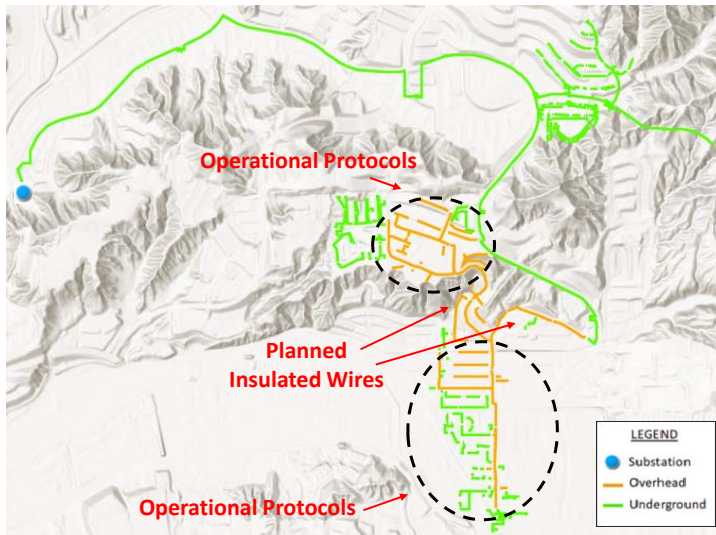
- 10/1/2022

Expected Improvements:

- **100% reduction** in customer outage time, assuming the same weather conditions in 2020 and 2021

Marcus Circuit Plan

INCLUDE CITY RELEVANT CIRCUITS
MARCUS – LA COUNTY



Planned Work:

- Replace 2.3 miles of existing overhead wire with new insulated wire
- Implement operational protocols to raise PSPS windspeed thresholds

Expected Completion Date:

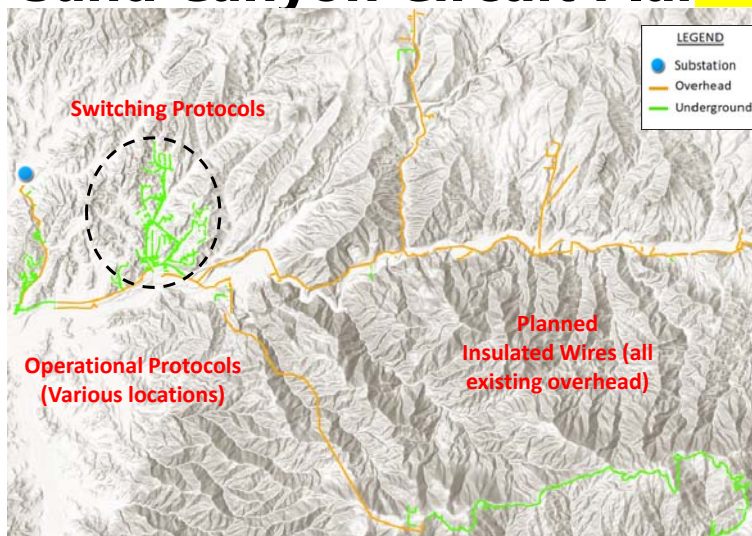
- 10/1/2022

Expected Improvements:

- **100% reduction** in customer outage time, assuming the same weather conditions in 2020 and 2021

Sand Canyon Circuit Plan

INCLUDE CITY RELEVANT CIRCUITS
SAND CANYON – LA COUNTY



Planned Work:

- Replace 22.8 miles of existing overhead wire with new insulated wire
- Update switching protocols
- Implement operations protocol for portions of the circuit

Expected Completion Date:

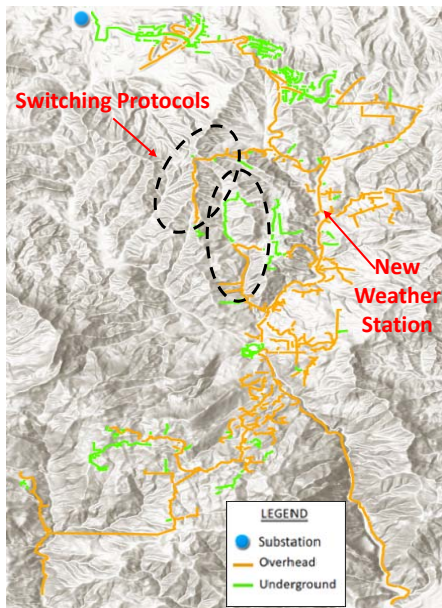
- 5/1/2022

Expected Improvements:

- **96% reduction** in customer outage time, assuming the same weather conditions in 2020

Vicasa Circuit Plan

INCLUDE CITY RELEVANT CIRCUITS
VICASA – LA COUNTY



Planned Work:

- Install 1 new weather station
- Implement switching protocols to improve segmentation

Expected Completion Date:

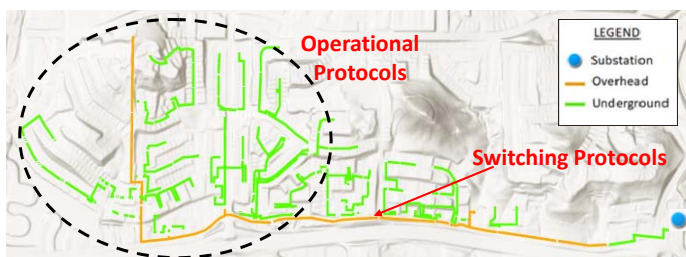
- 10/1/2022

Expected Improvements:

- Benefits from a new weather station are anticipated, but magnitude of benefits is still under review

Whizzin Circuit Plan

INCLUDE CITY RELEVANT CIRCUITS
WHIZZIN – LA COUNTY



Planned Work:

- Implement switching protocols to improve segmentation
- Implement operational protocols to raise PSPS windspeed thresholds

Expected Completion Date:

- 10/1/2022

Expected Improvements:

- Benefits from operational or switching protocols are anticipated, but magnitude of benefits is still under review