Overhead Distribution Resilience Study

A step toward a comprehensive Distribution Resiliency Plan

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July 2025

Agenda

Austin Energy System Overview & Background

Overhead Resilience Study

Next Steps & Questions

The Why

Recent Events

Recent storms, including Uri, Mara, and the May Microburst — reinforce the importance of investments to strengthen the electric grid.

Federal Funding

Austin Energy proactively sought federal funding to assess and improve resiliency.

Goal

Strengthen Austin Energy's electric distribution system to better withstand and recover from major events.

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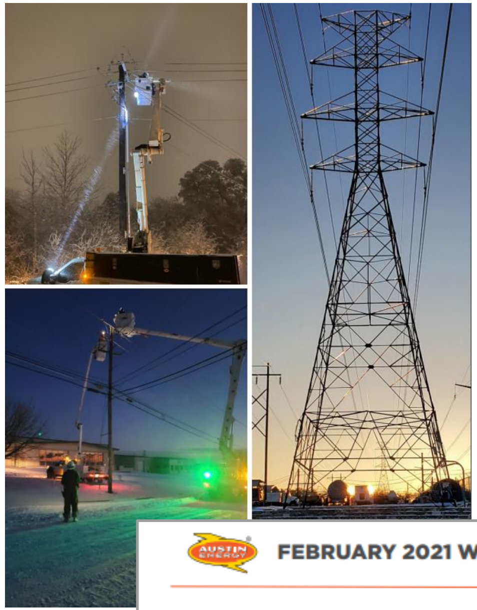
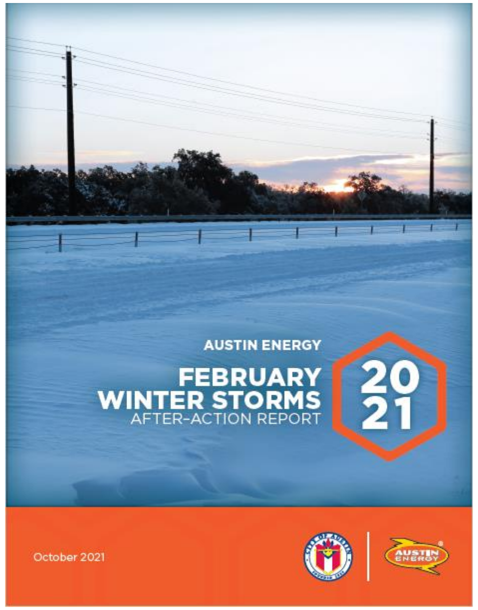
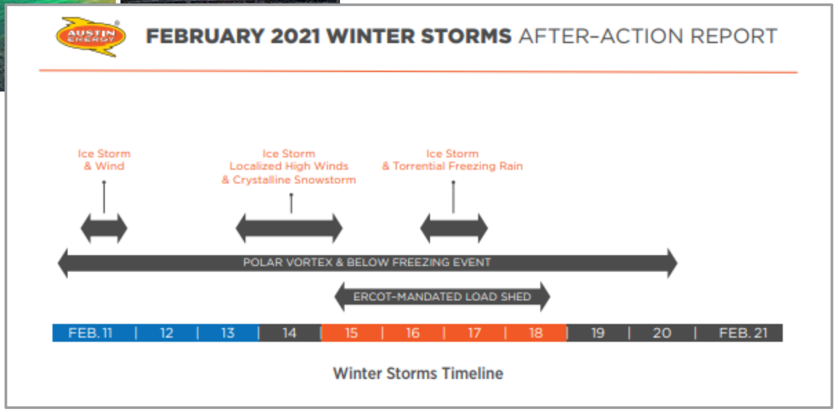
FEMA Building Resilient Infrastructure and Communities (BRIC)

Pre-Project Funding Grant

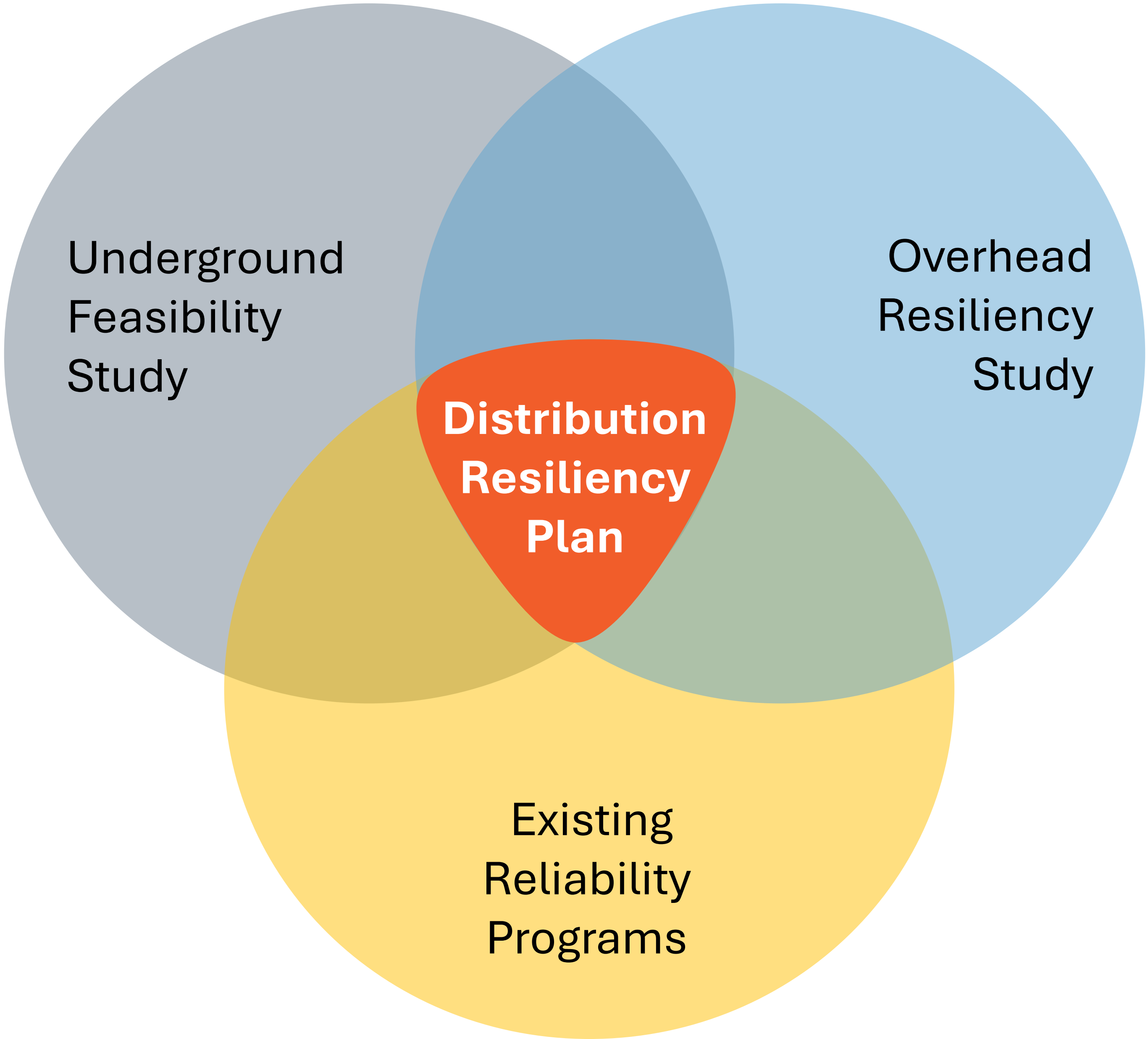
Assess the current-state overhead distribution system for opportunities to harden, automate, and sectionalize to enhance load shed, critical load isolation, and cold load pickup capabilities during blue sky and severe weather events.







Distribution Resiliency Plan



STUDY INTRODUCTION

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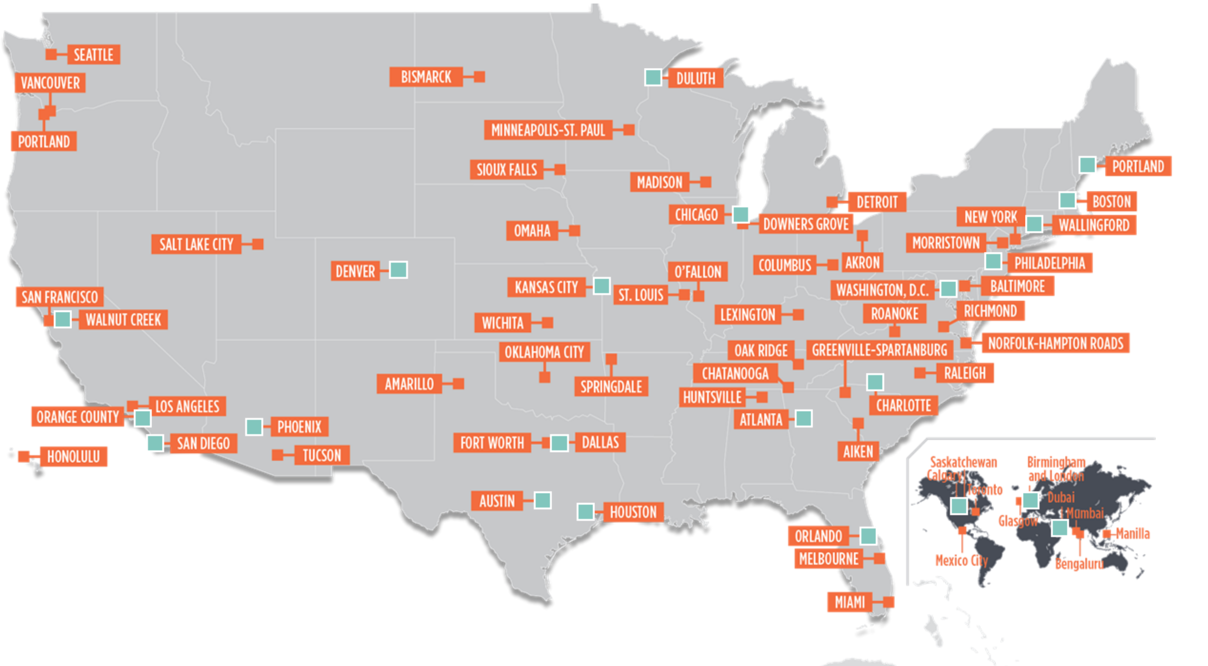
1898 & Co. | PEOPLE

600+ Specialists in Planning, Technology, and Consulting



■ 12,000+ Burns & McDonnell

■ 600+ 1898 & Co.

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CPS ENERGY

TNMP

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AEP TEXAS
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STUDY SCOPE

OVERHEAD DISTRIBUTION RESILIENCE STUDY Grant Funded Opportunity	
TASK 1	**AS-IS STATE:** Analyze the design and operation of the distribution system against Austin Energy's current philosophies and standards to identify areas of improvement.
TASK 2	**FEEDER COORDINATION STUDIES:** Individual coordination studies performed on each feeder incorporating Austin Energy's current fusing and grid automation devices.
TASK 3	**FUTURE STATE:** Initiatives detailing new technologies and industry trends Austin Energy should consider when developing future resilience strategies.

Included interviews across Austin Energy work groups.

Benchmarked against industry trends.

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AS-IS STATE

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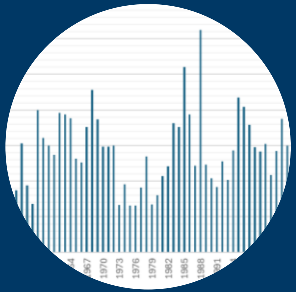
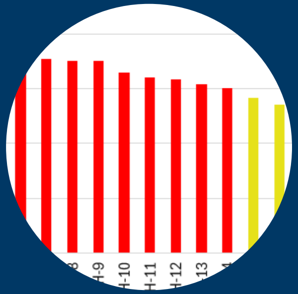
AS-IS STATE | SCOPE

Evaluate the current capabilities of Austin Energy's overhead distribution system to inform future planning.



STANDARDS

Evaluate design standards and check equipment compliance using Geographic Information Systems (GIS) and system models



CAPACITY ANALYSIS

Identify feeders and substations nearing thermal or voltage limits

LOAD SHED

Quantify current and potential load shed capability in response to ERCOT-directed events

DER HOSTING CAPACITY

Assess system readiness to integrate more Distributed Energy Resources (DERs) without power quality issues

AS-IS STATE | RECOMMENDATIONS

01 Prioritize Replacement of Legacy or High-Risk Infrastructure

Conduct condition-based assessments and accelerate phased replacement of aging, underperforming, or non-standard equipment, particularly those on lower-performing feeders.

02 Improve Data Integration Across Systems

Develop consistent asset identification numbers/names that enable data-sharing and correlation across Advanced Metering Infrastructure (AMI), Supervisory Control and Data Acquisition (SCADA), Geographic Information System(GIS), and planning models to streamline studies.

03 Monitor High-Need Substations for Capacity Planning

Consider prioritizing the substations identified as nearing thermal or voltage thresholds for modeling refinement and closer monitoring for potential upgrades.

04 Modernize Distributed Energy Resource (DER) Interconnection Standards

Include smart inverter settings, voltage and frequency ride-through behavior, limited export functionality, and enhanced screening processes aligned with IEEE 1547-2018 and peer utility practices.

05 Expand Load Shed Flexibility Through Automation

Austin Energy can shed through full-circuit SCADA control. Enhancing automation with reclosers and smart switches could boost load shed capacity while minimizing customer impact.

06 Refine Hosting Capacity Methodology

Incorporate forecasted load profiles, raise transformer DER penetration thresholds, and tighten voltage deviation limits. Consider proactive hosting capacity infrastructure upgrades and refined DER siting support to alleviate future bottlenecks.

FEEDER STUDIES

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FEEDER STUDIES | SCOPE

Feeder-by-feeder studies to recommend devices and evaluate protection coordination to support grid resiliency.

Determine recommended count and location of <u>**mainline reclosers**</u> per circuit for optimal sectionalization.

Determine recommended count and location of <u>**lateral reclosers**</u> per circuit to further improve resiliency.

Coordinate recommended protective device as defined in the Austin Energy protection manual.

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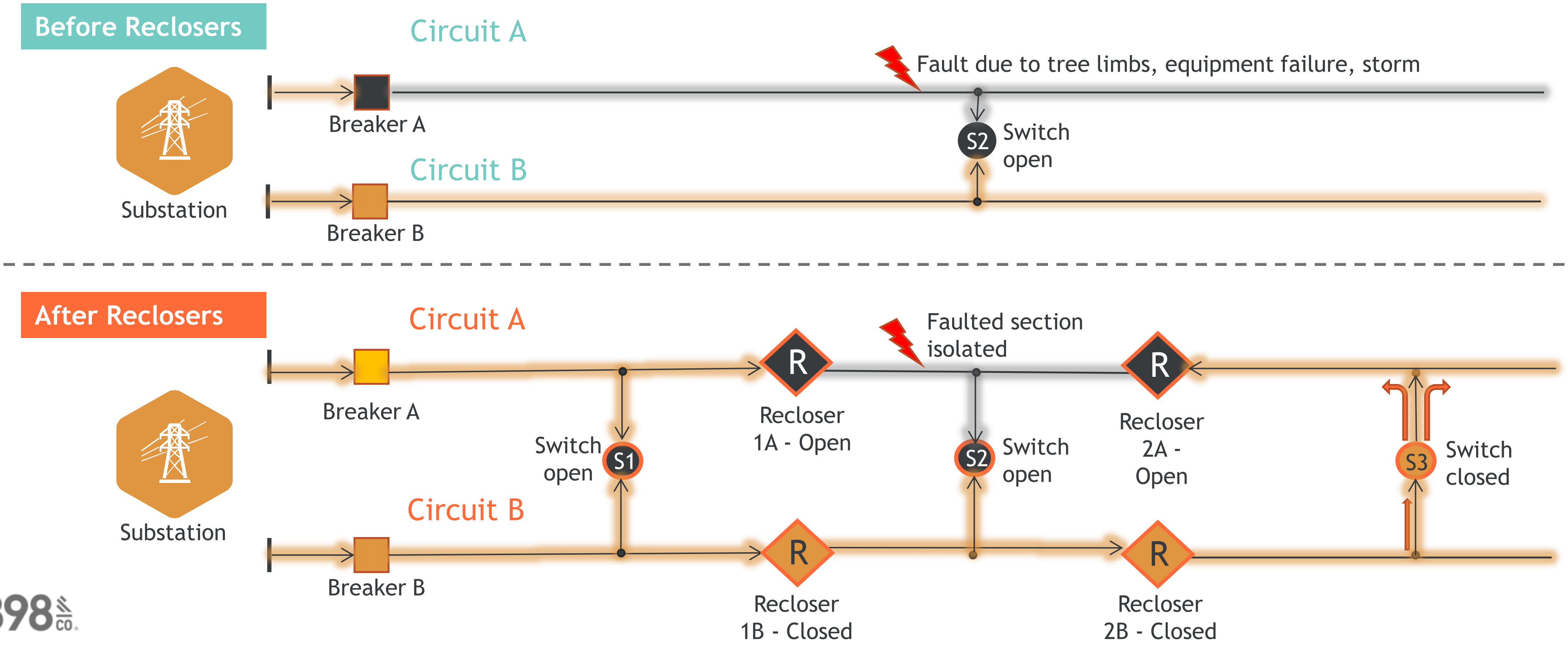
DEVICE PLACEMENT | PURPOSE AND METHOD

OBJECTIVE

Install more sectionalizing devices (Recloser) to increase Austin Energy's ability to isolate a fault or perform maintenance.

OUTCOMES

Fewer customers will be impacted by planned and unplanned outages by reducing customers per zone with potential alternative paths to supply power.



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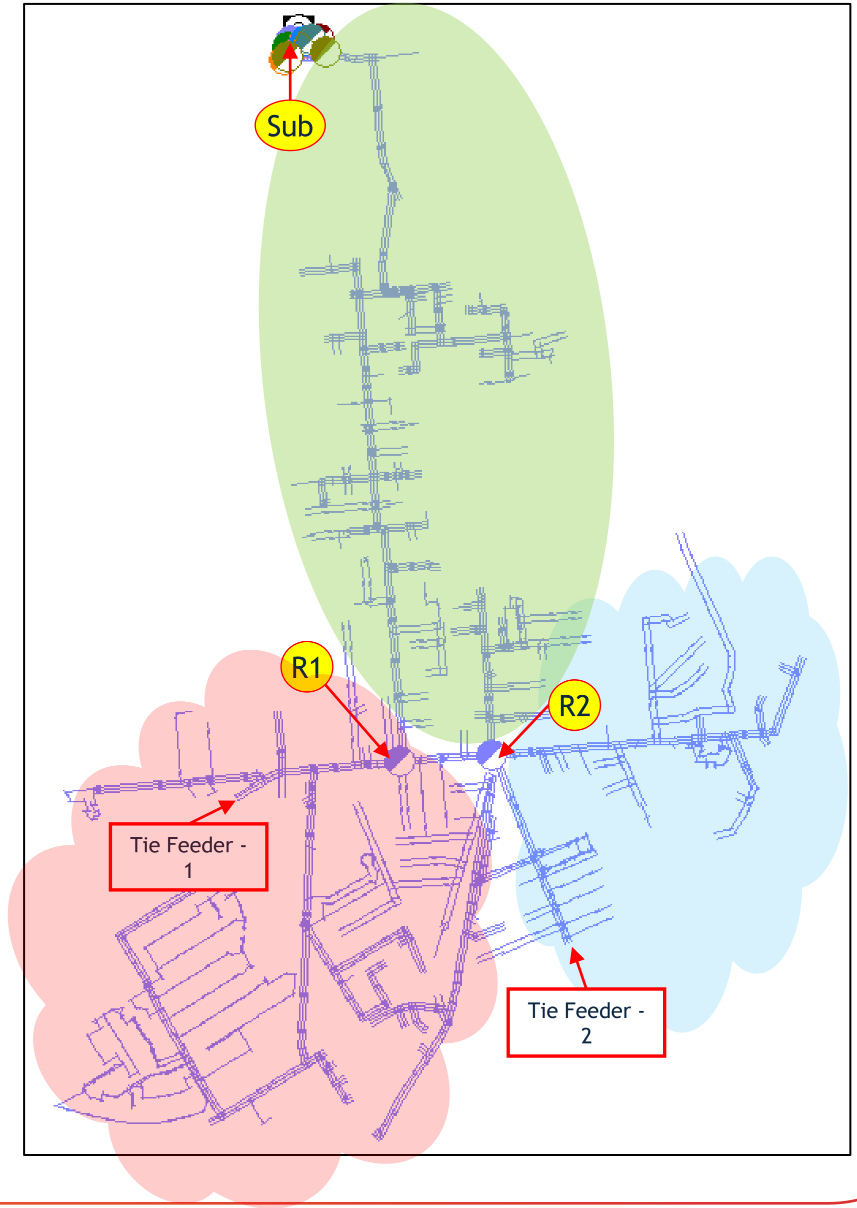
DEVICE PLACEMENT | PURPOSE AND METHOD

- Feeder ‘X’ has 2,200 customers with a peak load of 9 MW
- This feeder will be segmented into functional “pods”
- Ideally, pods should contain an equal load, the same overhead exposure, a similar number of customers
- Due to the factors, including critical load locations, achieving ideal device placement is not always possible

Pod	Description	Feeder Length (Mi)	Customers	MW
1	Next to station breaker	3.6	400	2.1
2	Downstream of Recloser R1	2.1	1,000	3.1
3	Downstream of Recloser R2	0.7	800	3.8
	Total	6.4	2,200	9.0



DEVICE PLACEMENT | RECOMMENDATIONS

01 Expand Mainline Reclosers

Segment feeders with additional reclosers to isolate faults, reduce outage impacts, and lay the groundwork for future automation like Fault Location, Isolation, and Service Restoration (FLISR).

02 Leverage and Strengthen Feeder Ties

Increase capacity of existing ties and consider creating new ties to enable faster restoration and improve flexibility for load transfers during outages.

03 Deploy More Lateral Reclosers

Prioritize lateral reclosers in high-risk or remote areas to reduce sustained outages from momentary faults and enhance service reliability.

04 Modernize Lateral Protection Strategy

Combine lateral reclosers with updated fuse coordination practices to improve protection timing and reduce unnecessary fuse operations.

05 Standardize Breaker Relay Settings

Align relay settings where feasible to streamline coordination, simplify future recloser deployments, and support system consistency.

FUTURE STATE

FUTURE STATE | PURPOSE AND METHOD

Developed 24 actionable initiatives, grouped into five major themes to guide long-term resiliency investments.

Infrastructure Resilience

Strengthen grid assets to better withstand extreme weather and future demands.

Data-Driven Operations

Use analytics to guide proactive, risk-informed operational decisions.

Grid Connectivity

Expand and automate monitoring and control to improve real-time visibility and flexibility.

Emergency Readiness

Enhance preparation, training, and coordination to speed response and restoration during extreme events.

Operational Excellence

Optimize internal processes, governance, and resource management to accelerate resiliency outcomes.

FUTURE STATE | RECOMMENDATIONS

1898 & Co. recommends that Austin Energy take a low-risk parallel pathway approach that will provide some near-term impacts and establish a sustainable long-term program to transition infrastructure and operational practices toward a robust and resilient future.

Near-term Initiatives

Tackle priority initiatives in separate areas with distributed ownership for immediate impacts in various areas.

Realize modest improvements in areas and capture lessons learned to inform a comprehensive program.

Long-term Preparation

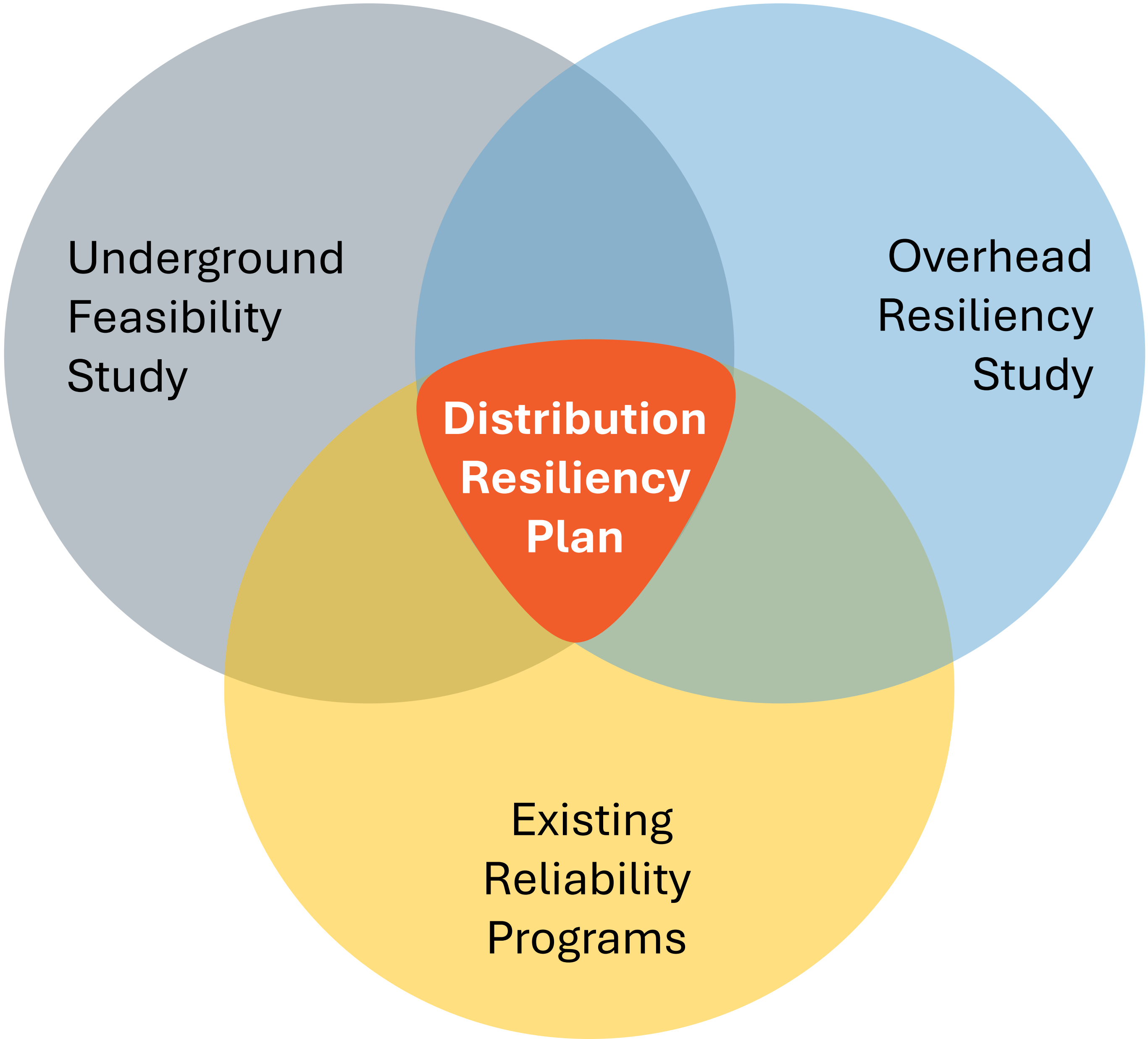
Develop Distribution Resiliency Plan and structure a comprehensive program and budget.

Launch Long-term Program

Launch a comprehensive and sustainable long-term program.

NEXT STEPS

Distribution Resiliency Plan



Next Steps Timeline

Analyze Undergrounding Study Results	Receive Overhead Study Results	Develop Comprehensive Distribution Resiliency Plan	Present Distribution Resiliency Plan
Ongoing	May 2025	Use studies, further analysis and stakeholder engagement to inform near- and long-term priorities	Late 2025

QUESTIONS?

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