Electric Reliability in the Hickory Nut Gorge

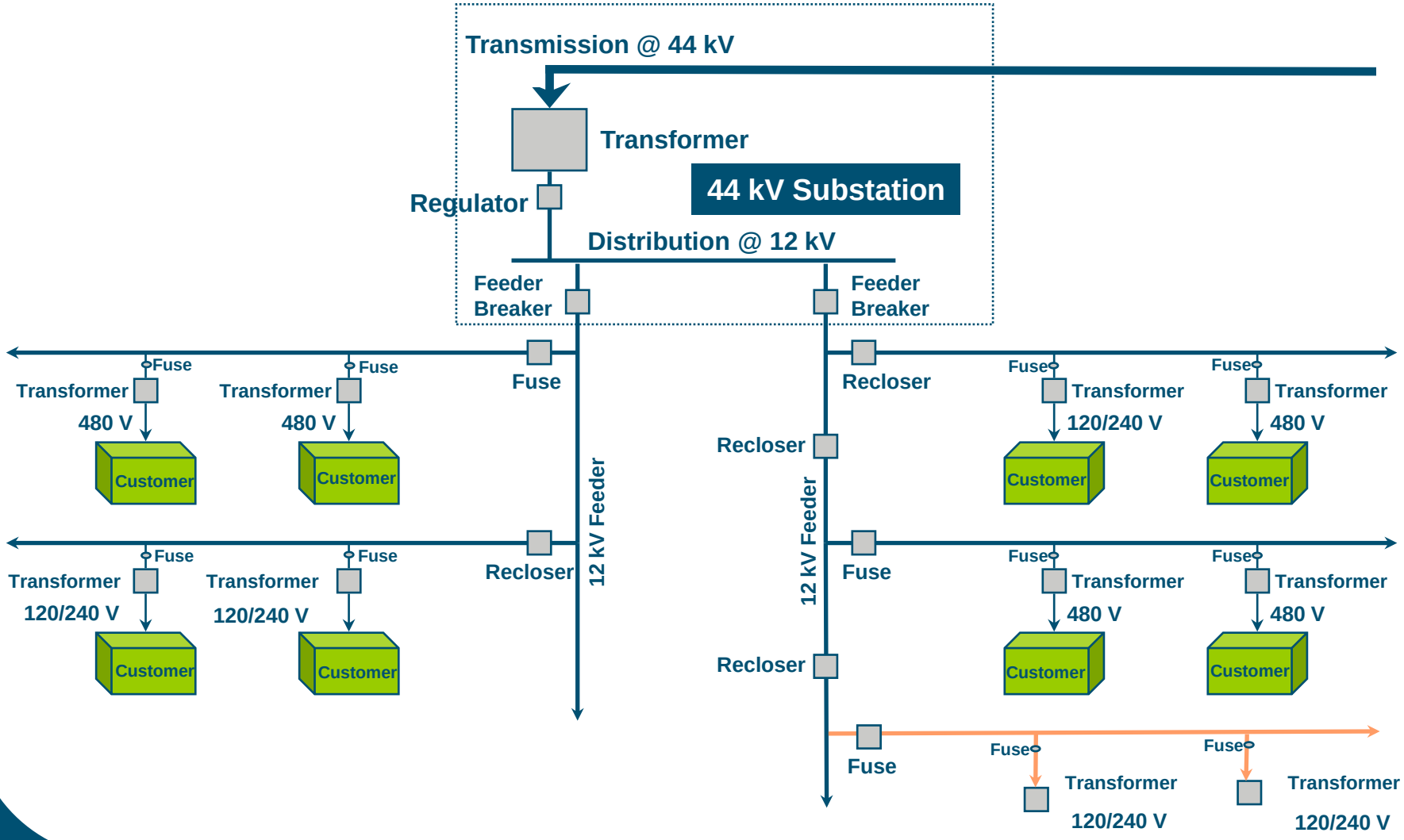
February 20, 2024

DUKE ENERGY®

Duke Energy Team responsible for service to Lake Lure

- **Alton Greene**, Director - Customer Delivery Operations
- **Sammy Pruett**, Supervisor – Construction & Maintenance
- **Matthew Robinson,** Manager - Customer Delivery Operations Support
- **Danny Painter**, Engineering Technologist
- **Ron Burkhalter**, Manager - Distribution Vegetation
- **Terry Smith**, Lead Vegetation Program Manager
- **Craig DeBrew**, Local Government and Community Relations Manager

Simplified Utility System



Lake Lure Substation: Served by a 44,000 volt transmission line from Turner Shoals at Lake Adger

Outage on Oct 29, 2020

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Restoration after Hurricane Zeta

Good evening key leaders in Rutherford County.

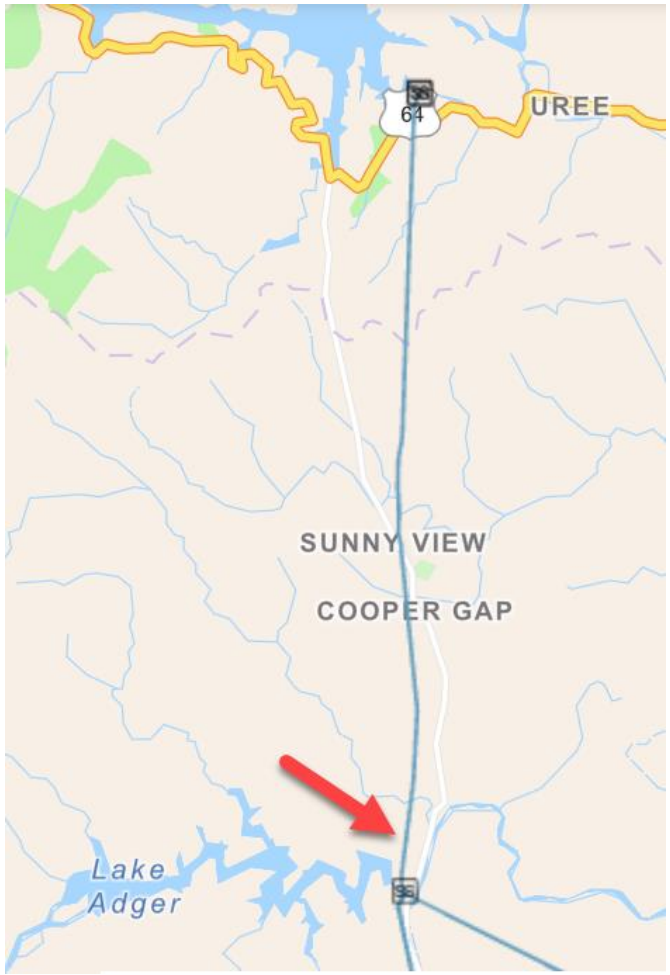
After Tropical Storm Zeta's powerful winds raced through the Carolinas, Duke Energy crews began work to restore power to more than 500,000 customers in what is expected to be a multi-day power restoration process.

The company is moving crews to the Carolinas from the Midwest and Florida to assist. In addition, Duke Energy has requested supplemental repair crews from other electric utility companies through the Southeastern Electric Exchange. Click here to read the company's news release issued this evening.

Rutherford County is one of the hardest hit areas in the Carolinas and we have suffered significant damage on the transmission grid, as well as to our distribution system. There are **332 events** and **16,334 customers** without service as of 8 PM. Transmission crews are in the field and working toward a goal of re-energizing substations at Lake Lure, Cleghorn, Washburn and Corinth Retail this evening. Tomorrow we will have additional line crews, tree crews, and damage assessors supporting the Spindale Ops center and expect to make good progress on restoring service to customers.

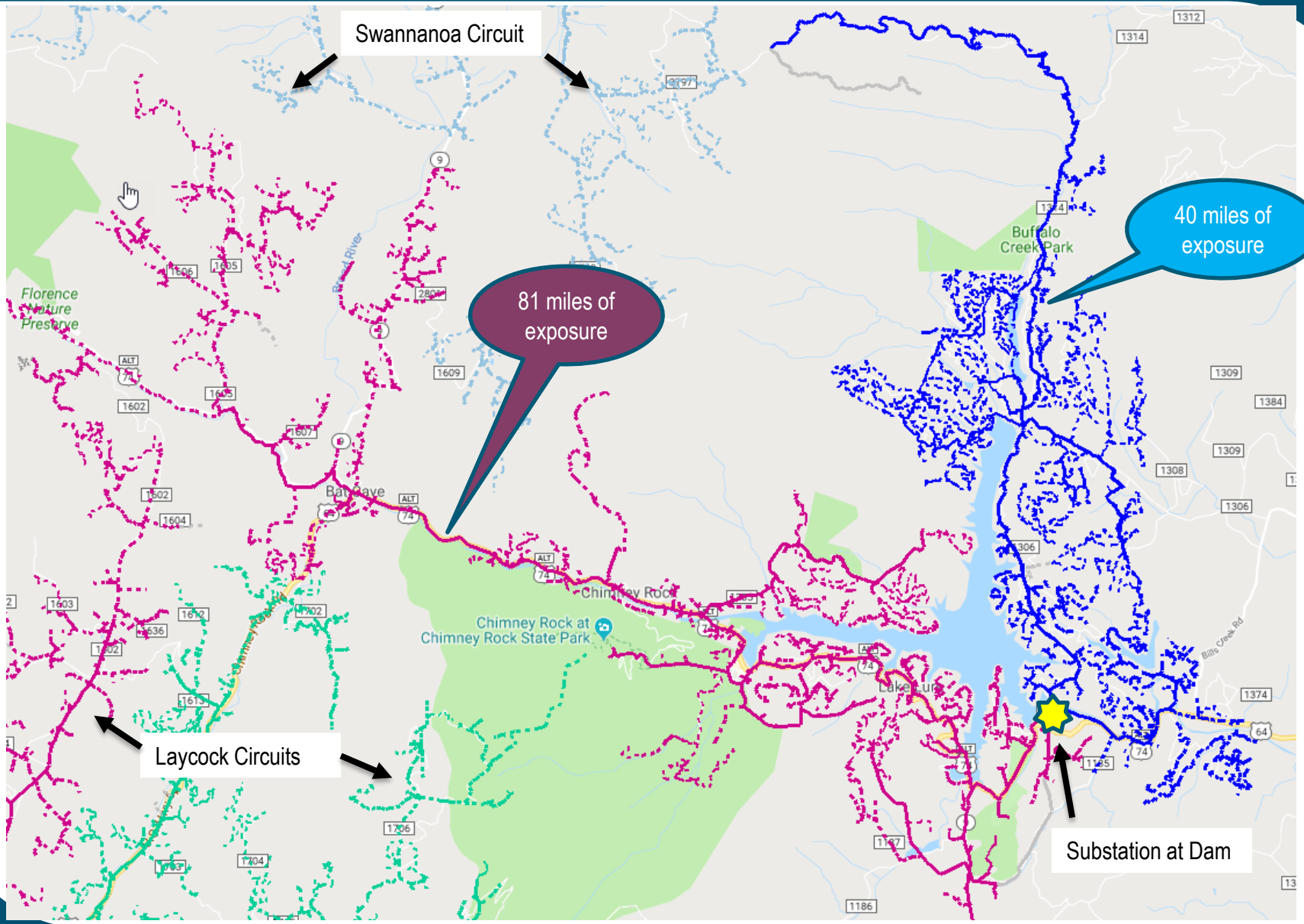
Duke Energy will provide power restoration times for specific counties, once those estimates are determined. Please visit www.duke-energy.com/outages/current-outages.

Outage on July 29, 2023

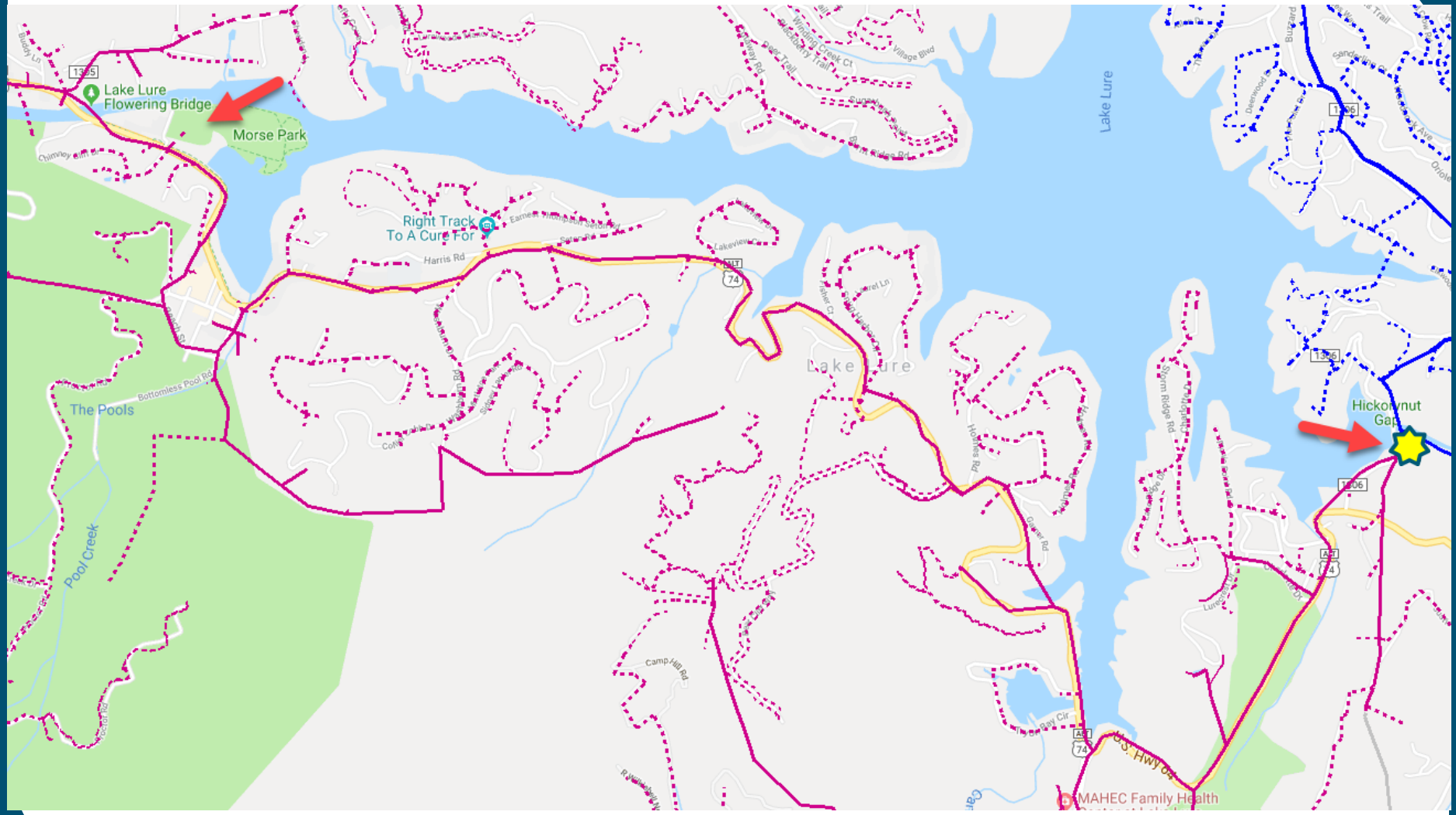


Healthy Red Oak, 10 ft outside the ROW, fell on the line at 6:36 PM during a storm. Technicians had to climb several structures to make repairs. Service restored at 5:20 AM.

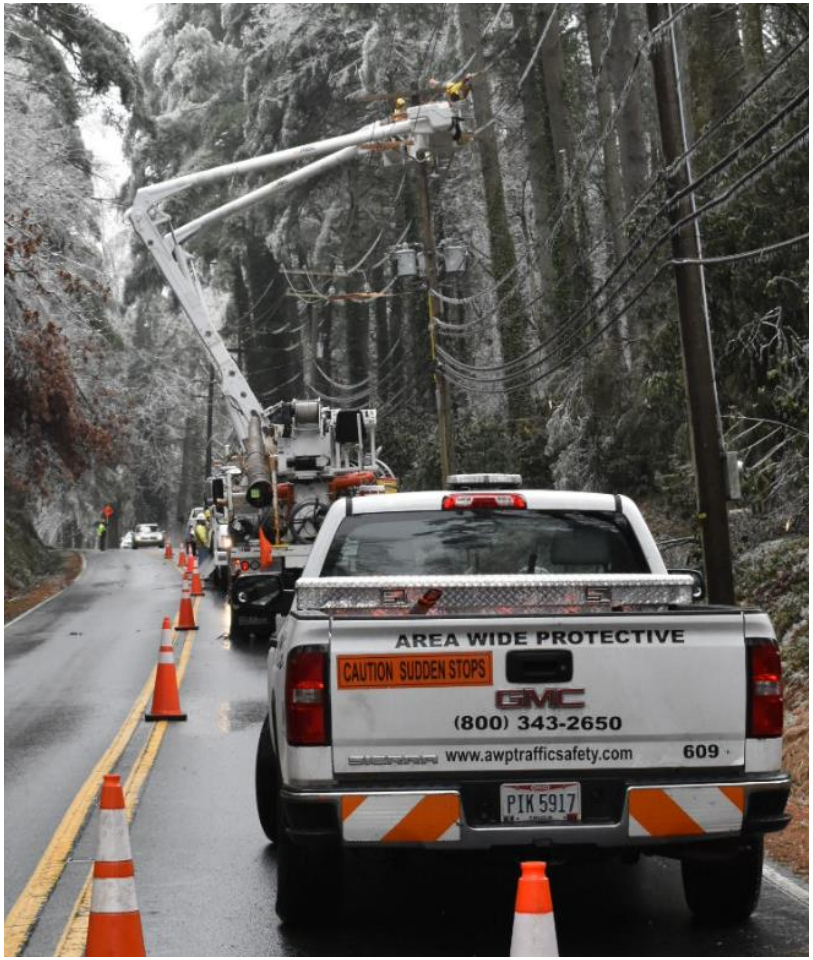
Two distribution feeders serving the Lake Lure area



Feeder backbone from substation at dam to Town Hall is approximately 5 miles

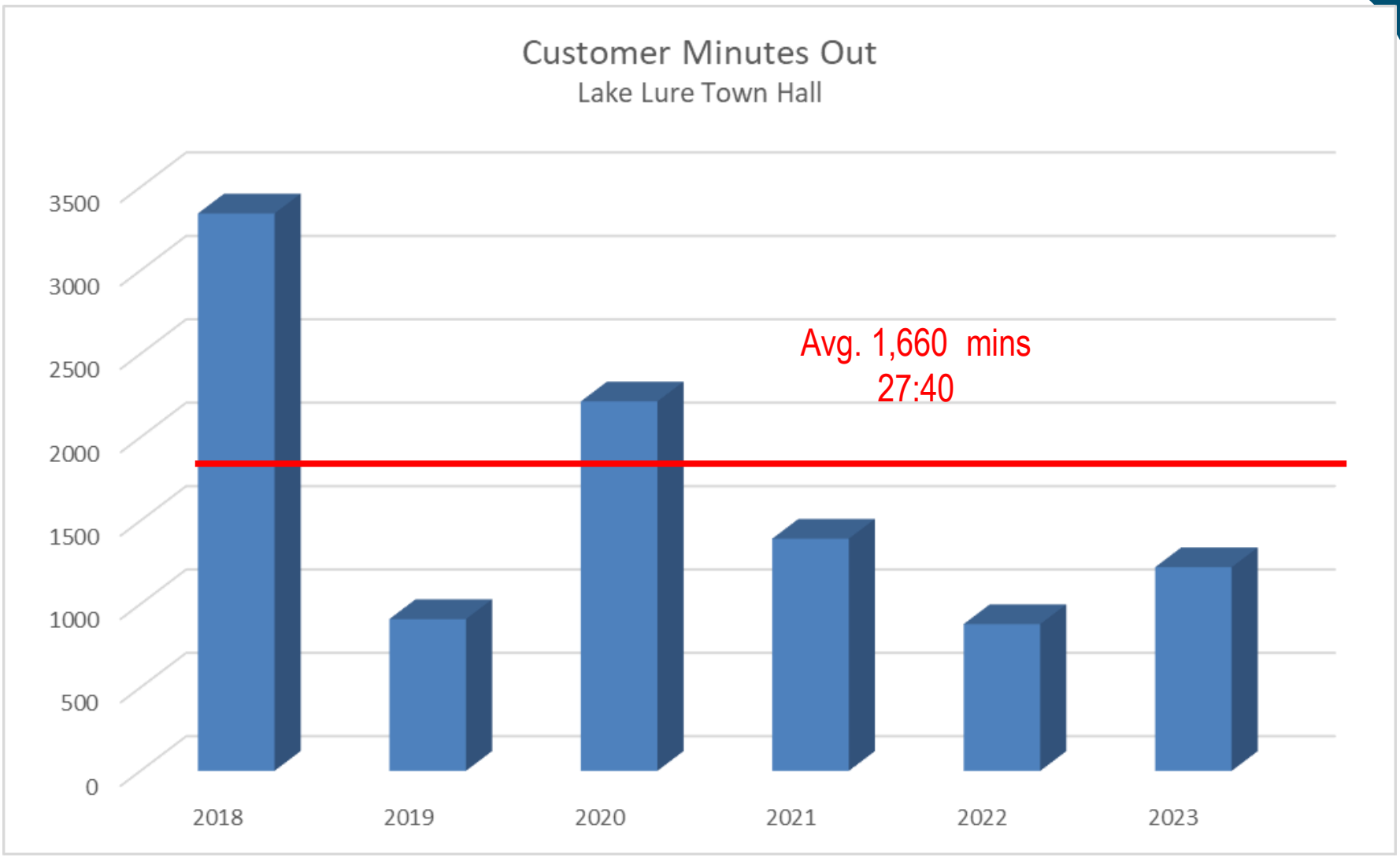


What causes outages?

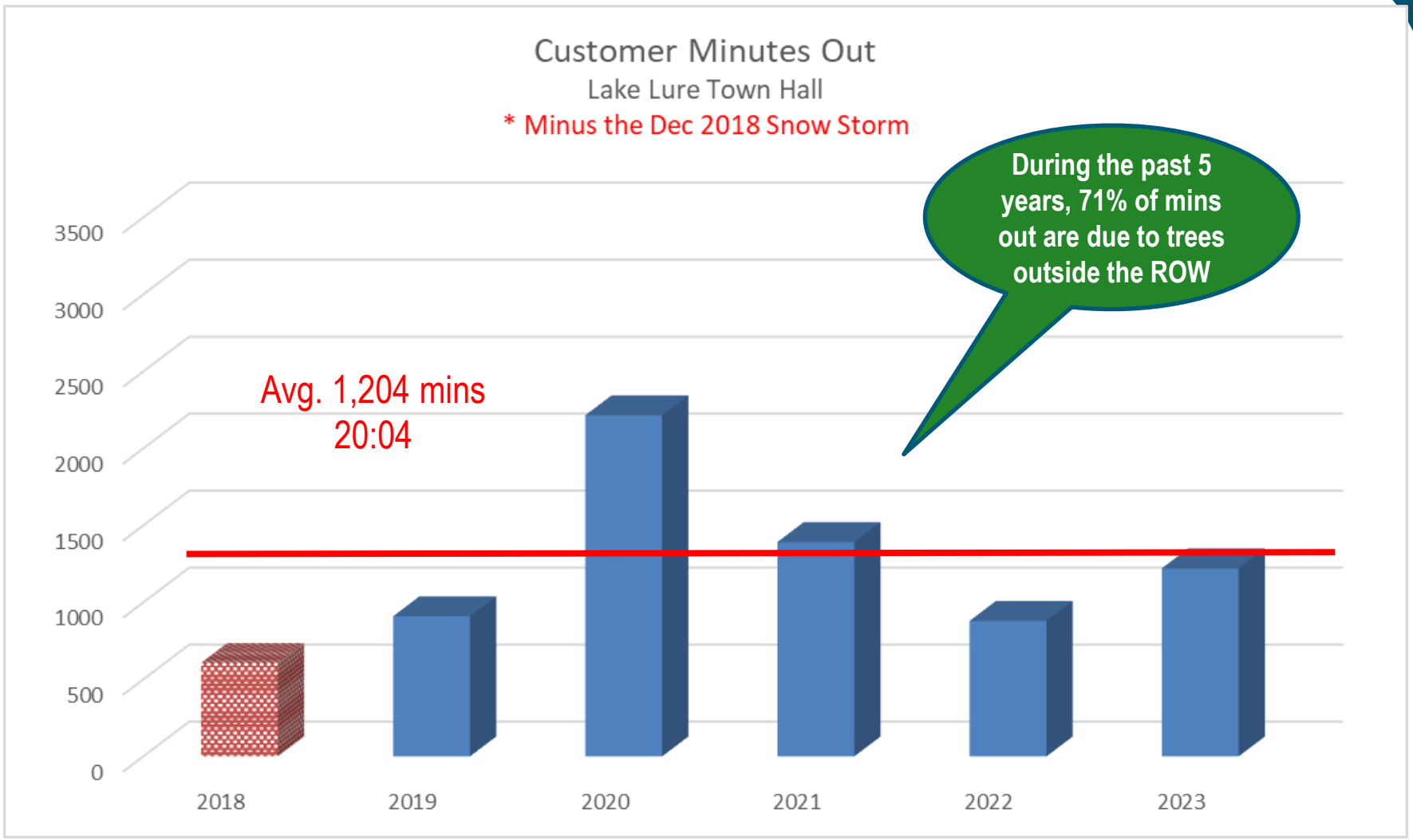


- Weather: thunderstorms, snow, ice, rain, etc.
- Vegetation: trees inside the Right of Way (ROW), vines, etc.
- Vegetation: trees outside the ROW
- Vehicle accidents
- Animals: squirrels, birds, ants
- Equipment failure; UG cable
- Third-party interference
- Planned outages

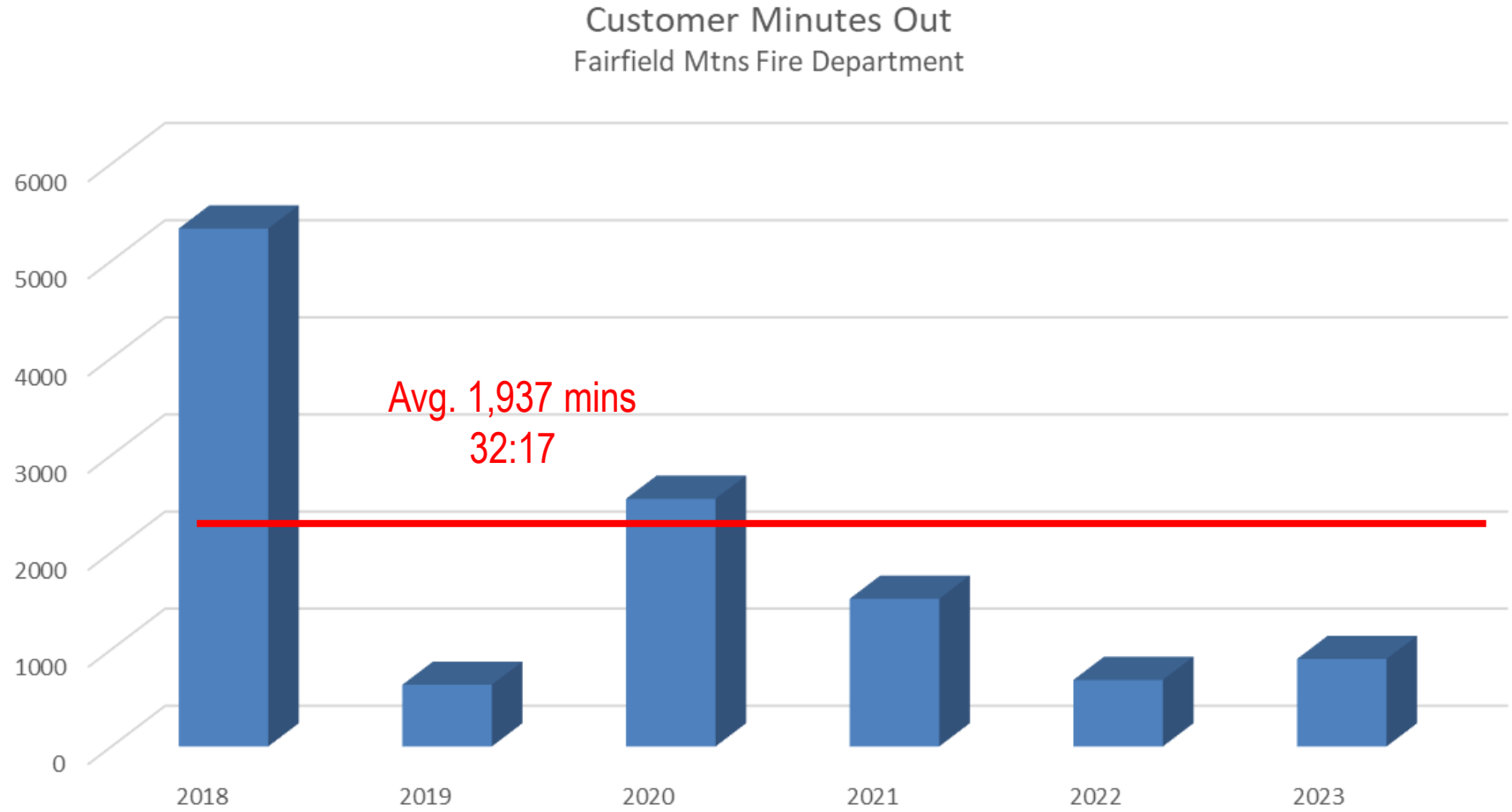
Outage History: Lake Lure Town Hall



Outage History: Town Hall



Outage History: Fairfield Mountain Fire Department



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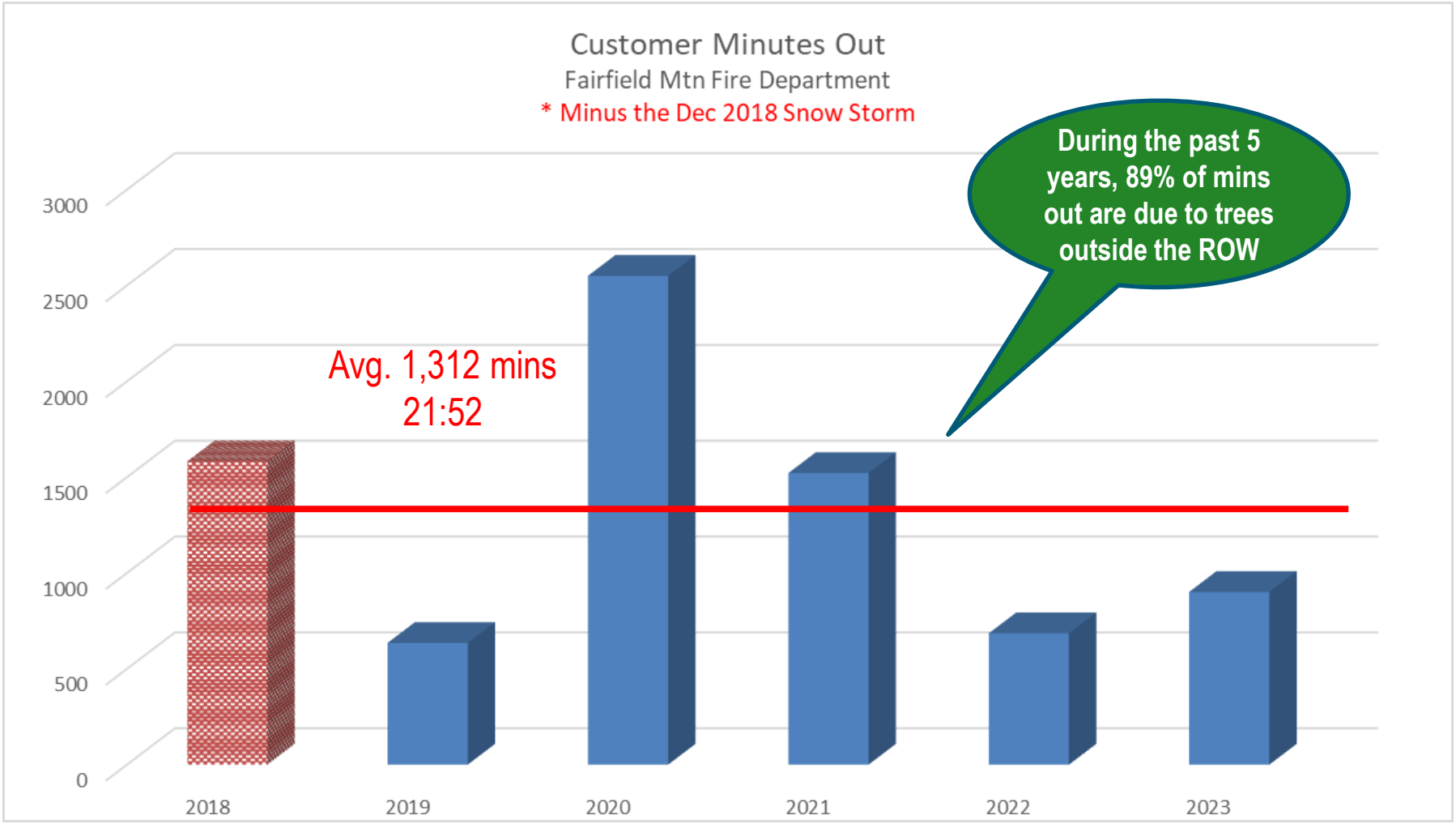


Vegetation Management

- Duke Energy has a 30’ ROW on our distribution lines
- The “Town Hall” circuit was last trimmed in 2008, and 2017. Being trimmed again in 2024.
  - Helicopter trimming next week
- The “Fairfield” circuit was last trimmed in 2009 and 2019
- We periodically patrol for “Hazard Trees”, which are often outside the ROW and would damage the feeder if they fell.
- 59 Hazard Trees were identified and removed in 2023
- Both feeders are receiving a lot of attention.

Vegetation Management

- Helicopter trimming week of Feb 26

Lines are impacted by trees on both sides of the road

Reliability Enhancement Projects Discussed in 2019

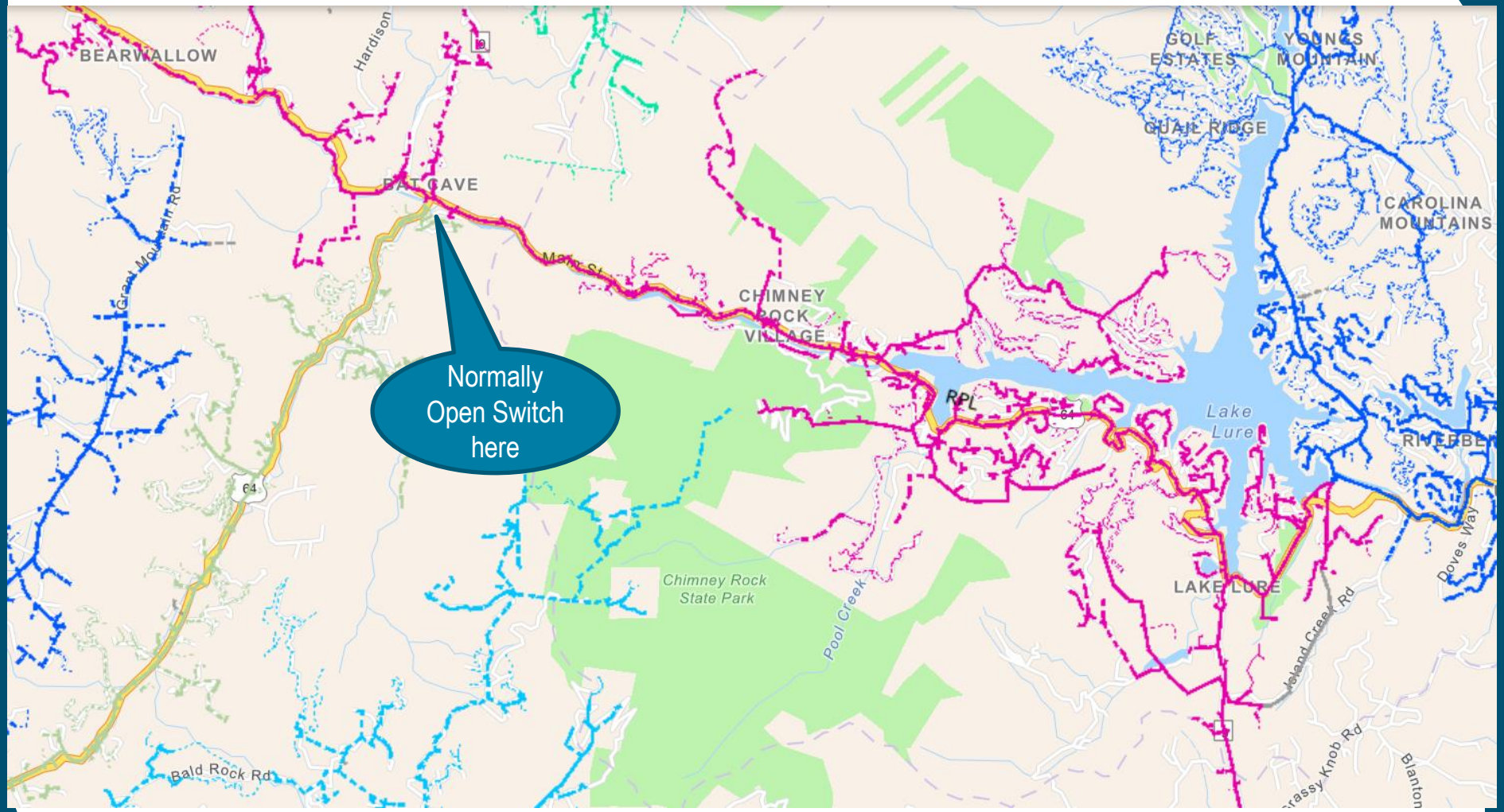
- Increased capacity in Lake Lure Substation
- Upgraded the Fairfield circuit by adding a second set of conductors
- Replace failing underground cables in Rumbling Bald area
- Installed electronic reclosers to automatically sectionalize outages
- Installed additional opening points to better isolate damaged facilities and minimize customer impacts
- Long-term: Exploring backfeed capabilities

Help Keep our Crews Safe!

Reliability Enhancement Projects Implemented since 2019

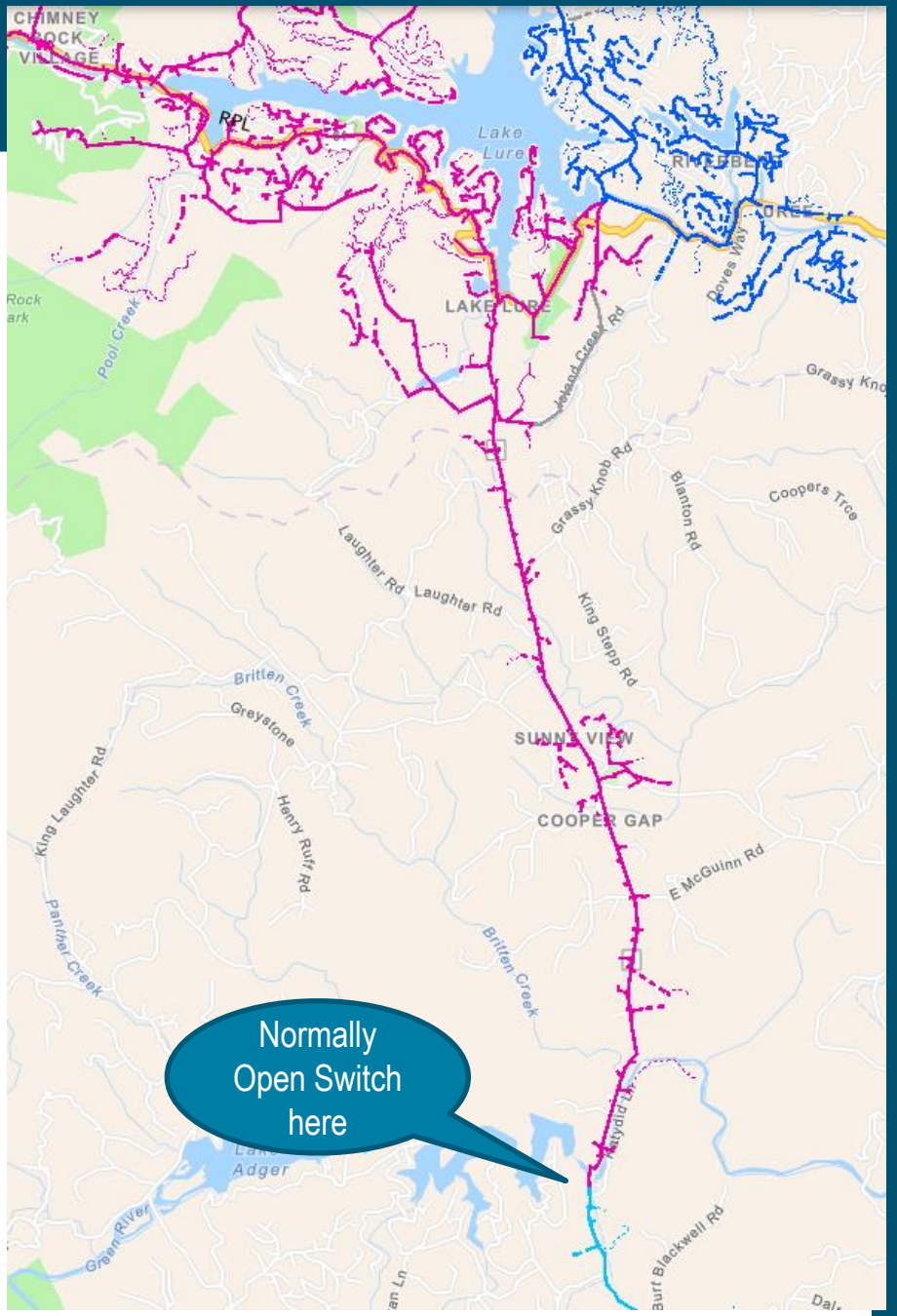
- Increased capacity in Lake Lure Substation again in spring of 2023
- Installed electronic reclosers to automatically sectionalize outages
- Installed additional opening points to better isolate damaged facilities and minimize customer impacts
- Implemented new backfeed capabilities:
  - Up Hwy 9 from Turner Shoals: Columbus 1202 Feeder can tie to the “Town Hall Feeder”
  - New Laycock Substation in Edneyville area: Laycock 1207 Feeder can tie to “Town Hall Feeder” at Bat Cave
- Capacity is currently limited during high load conditions (summer heat, winter cold)
- New project being considered that would upgrade the wire size from Bat Cave to Boys Camp Road
- Also install larger wire down Boys Camp Road.

Backfeed capability from Laycock feeder 1207



Backfeed from Columbus 1202

- Normally open switch at Turner Shoals
- Normally closed switches on the Lake Lure feeder can be opened, and electricity fed from Columbus



Questions?

Building A Smarter Energy Future